

2026-2027 MCB Area of Interest Course Information

Cancer Biology

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

Area Directors

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FOUNDATIONAL COURSES

Foundational Course One:

Highly recommended by MCB students

Course Number: MCB 539

Course Title: Biological Basis of Neoplasia

Instructor (s): N/A

Location: FH

Credits: 3.0

Quarter, Weeks, and Frequency course is offered: Spring, weeks 1-10, even years.
Will be offered in Spring 2028.

Schedule for 2026-27: N/A

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.

Instructions: Contact graduateeducation@fredhutch.org for add code.

Foundational Course Two:

Course Number: PATH 518

Course Title: Emerging Topics in Cancer

Instructor (s): TBD

Location: UW

Updated September 2026

Credits: 2.0

Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-10, odd years.
Tentatively will be offered Winter 2027.

Schedule for 2026-27: TBD

Attributes: Lecture

Sub Area (if applicable):

Synopsis: Science and translational advances in cancer and therapeutics, related to recent major technological progress in cancer research. Explores how knowledge of cancer genetics as well as new molecular discoveries are translated to clinical management and treatment options.

ELECTIVE COURSES

Subtrack 1 – Cellular mechanisms of transformation

Elective Course 1A:

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, every year.
Will be offered in Winter 2027.

Schedule for 2026-27: Tues, Thurs. 3:20-4:50 p.m.

Attributes: Lecture, literature review, methods

Sub Area (if applicable): Structure

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.

Instructions: Contact graduateeducation@fredhutch.org for add code.

Elective Course 1B:

Course Number: GENOME 565

Course Title: Advanced Human Genetics

Instructor (s): Evan Eichler, Mary-Claire King

Location: UW

Credits: 4.0

Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-10.
Will be offered in Winter 2027.

Schedule for 2026-27: TBD

Attributes: Graded, Lecture, Literature review, Methods, Discussion

Sub Area (if applicable):

Synopsis The goal of the course is to provide students with knowledge and tools most useful for successful research in human genomics. Components of the course are: gene discovery and molecular function; genomic architecture; cancer genetics; and human diversity and evolution. The course meets winter quarter, with three lectures per week by the instructors and weekly section meetings. Multiple problem sets are based on real data.

Prerequisite: College-level genetics course (GENOME 361 or 371); for genetics courses taken elsewhere, please ask the instructors. The class typically includes about 60 students, including both undergraduate and graduate students.

Capacity Limit: 20

Elective Course 1C:

Highly recommended by MCB students

Course Number: MCB 522

Course Title: Developmental Basis of Human Disease

Instructor (s): Cecilia Moens

Location: FH

Credits: 3.0

Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-10, even years. *Tentatively will be offered Winter 2028.*

Schedule for 2026-27: N/A

Attributes: Lecture and literature review

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.

Instructions: Contact graduateeducation@fredhutch.org for add code.

Subtrack 2 – Computational biology techniques

Elective Course 2A:

Course Number: GENOME 552

Course Title: Technologies for Genome Analysis

Instructor (s): Lea M Starita

Location: UW

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 6-10.
Will be offered in Autumn 2026.

Schedule for 2026-27: Tues, Thurs. 10:30-11:50 a.m.

Attributes:

Sub Area (if applicable):

Synopsis: Discussion of current and newly-emerging technologies in genome analysis with regard to applications in biology and medicine and to potential advantages and limitations.

Prerequisite: Prior genetics coursework.

Instructions: Contact course instructor and state your interest for add code.

Capacity Limit: 20 - required for the GS first-year students. Remaining slots will be available on a first-come, first-served basis.

Elective Course 2B:

Course Number: GENOME 555

Course Title: Protein Technology

Instructor (s): Judit Villen

Location: UW

Credits: 1.5

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

Will be offered in Autumn 2026.

Schedule for 2026-27: Tues, Thurs. 9:00-10:20 a.m.

Attributes:

Sub Area (if applicable):

Synopsis: Focuses on current and emerging technologies and approaches in protein analysis, and considers applications of these technologies in biology, biotechnology, and medicine.

Instructions: Contact course instructor and state your interest for add code.

Elective Course 2C:

Course Number: GENOME 560

Course Title: Introduction to Statistical Genomics

Instructor (s): TBD

Location: UW

Credits: 3.0

Quarter, Weeks, and Frequency course is offered: Spring, weeks 1-10, every year. *Will be offered in Spring 2027.*

Schedule for 2026-27: TBD

Attributes: Graded, lecture

Sub Area (if applicable):

Synopsis: An introduction to fundamental concepts necessary for the analysis of genetic and genomic data including, basic elements of probability theory, parameter estimation, and hypothesis testing.

Instructions: Contact course instructor and state your interest for add code.

Capacity Limit: Required for the GS first-year students. Remaining slots will be available on a first-come, first-served basis.

Elective Course 2D:

Highly recommended by MCB students

Course Number: MCB 536

Course Title: Tools for Computational Biology

Instructor (s): Arvind "Rasi" Subramaniam

Location: FH

Credits: 3.0

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-10, every year. *Will be offered in Autumn 2026.*

Schedule for 2026-27: Tues, Thurs. 3:30-4:50 p.m.

Attributes: Graded, lecture, hands-on computational work

Sub Area (if applicable): Computational

Synopsis: Introduction to established best practices in computational biology. Learn to organize unstructured data into standard formats, transform data for statistical analyses, and visualize the transformed data. Learn workflows for reproducible research such as version control, project organization, and code documentation. Gain basic experience with Linux command line tools and the Python and R programming languages. Classes will involve hands-on learning through coding exercises, collaborative problem solving, and extensive use of online learning resources.

Instructions: Contact graduateeducation@fredhutch.org for add code.

Elective Course 2E:

Course Number: PATH 558/MOLMED558

Course Title: Integrative Omics

Instructor (s): TBD

Location: TBD

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: *Will be offered in Spring 2027.*

Schedule for 2026-27: TBD

Attributes:

Sub Area (if applicable):

Synopsis: Explores how to integrate genomic, transcriptomic, and proteomic approaches with state-of-the-art genetic engineering strategies to uncover a

systems-level understanding of pathway interactions that regulate disease pathogenesis and complex phenotypes.

Prerequisites: Undergraduate biology or cellular and molecular biology.

Subtrack 3 – Cancer Immunology

Elective Course 3A:

Course Number: IMMUN 532

Course Title: Intersection of Innate and Adaptive Immunity in Disease

Instructor (s): TBD

Location: SLU

Credits: 4.0

Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-10. *Will be offered in Winter 2027.*

Schedule for 2026-27: TBD

Attributes:

Sub Area (if applicable):

Synopsis: Examines the molecular and cellular basis of immune function. Topics include: hematopoiesis, innate immunity, antigen receptor structure, lymphocyte development, antigen presentation, effector T-cell functions, and immune-mediated diseases.

Prerequisite: Coursework in molecular genetics; intro to Immunology course; graduate standing in immunology; other graduate students with permission of instructor.

Elective Course 3B:

Highly recommended by MCB students

Course Number: IMMUN 537

Course Title: Immunological Methods

Instructor (s): Andrew Oberst

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

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 6-10. *Will be offered in Autumn 2026.*

Schedule for 2026-27: Tues, Thurs. 11:00 a.m. – 12:20 p.m.

Attributes (e.g., graded, lecture-based): Lecture and literature review

Sub Area (if applicable):

Synopsis: Introduces whole animal, cellular, biochemical, and molecular techniques used in immunological research. Discusses strengths and limitations of each technique and emphasizes caveats in interpreting the resulting data.