

Molecular Medicine

Director

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Faculty: <https://medicine.uiowa.edu/mcb/faculty>

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Courses

Molecular Medicine Courses

MMED:3310 Practical Data Science and Bioinformatics 3 s.h.

Understanding how to access large biological data sets and use them to answer biological questions is an important skill for researchers; immersive introduction to computational handling of data; how to access and analyze publicly available data; critically evaluate data quality and analysis in context of measuring gene expression; basic coding in R/RStudio, plotting and data display, fitting and regression, statistical inference, statistical models, downloading and data wrangling; basic introduction to machine learning (clustering); for students with no computational background. Prerequisites: BIOL:1411 with a minimum grade of C- and BIOL:1412 with a minimum grade of C-. Requirements: college algebra. Recommendations: BMB:3110, or BMB:3120 and BMB:3130, or other upper-level life sciences courses. Same as BMB:3310, CBIO:3310.

MMED:5270 Pathogenesis of Major Human Diseases 3 s.h.

Critical analysis of pathogenesis models in a series of major human diseases; clinical presentation, analysis of cellular and molecular events leading to the disease, discussion of key papers. Offered spring semesters of even years. Same as IGPI:5270, PATH:5270.

MMED:6220 Mechanisms of Cellular Organization 3 s.h.

Current understanding of basic cell biological processes; key experiments that led to guiding insights; mechanisms that cells use for compartmentalization and how those mechanisms are regulated; biogenesis of major organelles (e.g., mitochondria, peroxisomes, nucleus, secretory/endocytic membrane system); functions of cytoskeleton in cell motility, organelle motility, and cell division. Prerequisites: BMB:3130. Same as ACB:6220, MPB:6220.

MMED:6225 Growth Factor Receptor Signaling 1 s.h.

Mechanisms of signaling by growth factors; cytokines and related molecules that regulate cell proliferation, development, differentiation, and survival; emphasis on molecular mechanisms of signaling, relevance of these signaling processes to various human diseases. Same as ACB:6225, MPB:6225, PCOL:6225.

MMED:6226 Cell Cycle Control 1 s.h.

Cell cycle regulation, DNA damage-dependent cell cycle regulation, redox-dependent cell cycle regulation, cellular senescence. Same as ACB:6226, MPB:6226.

MMED:6227 Cell Fate Decisions 1 s.h.

Cellular fate decisions including signal integration, terminal differentiation in development, mechanisms of embryonic stem cell gene regulation/cellular reprogramming, cell death paradigms, and cell death in development and cancer. Same as ACB:6227, MPB:6227.

MMED:6230 Pathogenesis of Metabolic and Cardiovascular Disorders 3 s.h.

Students focus on metabolic and cardiovascular diseases—the leading cause of morbidity and mortality in the United States; introduction to major subclasses of metabolic and cardiovascular diseases, definition of pathogenesis and clinical features of diseases, and exploration of methodologies used to study diseases; course format includes lecture, critical examination of literature, and demonstration of experimental models.

MMED:6250 Mechanisms of Parasitism Journal Club 1 s.h.

Reviews of recent publications in molecular parasitology research and thesis research by training grant or journal club students; for students pursuing graduate thesis research in microbiology or a related discipline. Same as MICR:6250.

MMED:6260 Methods for Molecular and Translational Medicine 1 s.h.

Basic and advanced scientific techniques used to integrate biological questions in molecular and translational medicine; particularly useful for comprehensive exam preparation.

MMED:6270 Pathogenesis of Cardiovascular Disorders 3 s.h.

Students focus on cardiovascular diseases—the leading cause of morbidity and mortality in the United States; introduction to major subclasses of cardiovascular diseases, definition of pathogenesis and clinical features of diseases, and exploration of methodologies used to study diseases; format includes lecture, critical examination of literature, and demonstration of experimental models.

MMED:6280 Critical Thinking in Molecular Medicine 1 s.h.

Opportunity to work closely with participating faculty to gain skill in critical reading of research literature and facility in presenting material to an audience. Requirements: advanced graduate standing.

MMED:7290 Seminars in Molecular Medicine 1 s.h.

Research findings in molecular biology. Requirements: molecular and cellular biology graduate standing.

MMED:7305 Molecular Medicine Research arr.

Requirements: molecular and cellular biology graduate standing.

MMED:7310 Translational Medicine Education Rounds 1 s.h.

Students obtain clinical insights into their area of specialty in biomedical research through selection of a clinical mentor to complement the expertise of their research mentor; clinical mentors provide students with case studies, clinical scenarios, and physician shadowing opportunities which may allow students to gain new perspectives and insight into applications of biomedical research. Requirements: enrollment in Molecular Medicine Program, completion of rotations, and selection of a research mentor.

MMED:8115 Molecular Physiology 4 s.h.

Principles of human physiology, organ systems, cell function. Offered fall semesters.