

ME.260 (MOLECULAR BIOLOGY AND GENETICS)

Courses

ME.260.696. Research Elective in Molecular Biology and Genetics.

ME.260.709. Molecular Biology and Genomics. 1.5 Credits.

This course covers the molecular biology and genomics of both prokaryotes (using *E. coli* as the model organism) and eukaryotes, with a focus on "model organisms" including yeast, flies, worms, mice as well as humans. Both the molecular biology (reductionist) perspective and the genomics (systems biology) perspective will be provided on each topic, and there will be heavy emphasis on mechanism and regulation of fundamental processes in biological information transfer DNA->RNA->protein. This lecture module will cover genes and genomes, transcription and RNA world, replication, chromosome structure and function and genome instability.

ME.260.711. Transcription Mechanisms. 1 Credit.

Discussion of current topics in transcription regulation.

ME.260.715. Practical Applications of Single Cell Sequencing. 1 Credit.

Single Cell Sequencing is a focused discussion on the technical and biological use of single cell RNA/DNA/ATAC sequencing and spatial technologies in biological research. Beginning with an overview of historic and current sequencing technologies, followed by capture and library prep methodologies for RNA and DNA sequencing at or near single cell resolution. After laboratory session, giving hands on experience, we will explore the intricacies of data analysis and validations studies. The course will also include guest lecturers that are experts in varying aspects of these methodologies to explain their current and future roles in biological research.

ME.260.802. Molecular Biology and Genetics Research. 1 - 18 Credits.

Opportunities to carry out special studies and research in various branches of immunology will be made available not only to candidates for advanced degrees but also to other qualified students. Arrangements for such work must be made with individual members of the faculty.

ME.260.811. Special Studies and Research. 1 - 18 Credits.

Laboratory Research

ME.260.812. Great Experiments in Biology. 1 Credit.

We will read approximately 30 classic papers. The course aims to expose students to some of the greatest experiments in biology from 1750 to the present and the creative thinking that inspired them. Open to all members of the JHMI community.

ME.260.813. Foundations of Vision Science. 1 Credit.

This course will cover all of vision science in ten lectures. Topics include: ocular structure; photoreceptors; information processing in the retina; intra-ocular fluid dynamics, circulation, and metabolism; the cornea and tear film; central visual pathways and information processing; development and evolution of visual systems; future challenges and opportunities in ophthalmology