

CELL BIOLOGY

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<https://medicine.yale.edu/cellbio>

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CBIO 635a / ENAS 5180a / MB&B 6350a, Quantitative Methods in Biophysics

Staff
An introduction to quantitative methods relevant to analysis and interpretation of biological data. Topics include statistical testing, data presentation, and error analysis; introduction to artificial intelligence-based data analysis tools, Alpha Fold Tutorial, introduction to mathematical modeling of biological dynamics; and Fourier analysis in signal/image processing and macromolecular structural studies. Instruction in basic programming skills and data analysis using MATLAB; study of real data from MB&B research groups. Prerequisites: MATH 120 and MB&B 600 or equivalents, or permission of the instructors.

CBIO 5605b / CBIO 801 / PTB 5605b, Grantsmanship and Preparing Training Award

Applications Megan King and Patrick Lusk

This course is designed to further refine an existing draft of a research and training proposal in the structure of an NIH F31 application in preparation for submission. In addition to providing peer and mentored feedback on the scientific proposal, this course focuses on the preparations of other materials required for the F31 application, including development of a statement of training goals. While students ineligible (or not intending) to apply for an F31 are welcome to participate (and indeed transferable skills in scientific writing and goal setting will benefit all Ph.D. students), the course is structured to prepare an F31 application for the April F31 deadline. Required for Ph.D. students in the Program in Translational Biomedicine.

CBIO 6020a / MB&B 6020a / MCDB 6020a, Molecular Cell Biology Thomas Melia, Christian Schlieker, Shawn Ferguson, Julia von Blume, Binyam Mogessie, Karin Reinisch, Xiaolei Su, Valerie Horsley, Megan King, Patrick Lusk, Martin Schwartz, Christopher Burd, Julien Berro, David Breslow, and Shaul Yogev

A comprehensive introduction to the molecular and mechanistic aspects of cell biology for graduate students in all programs. Emphasizes fundamental issues of cellular organization, regulation, biogenesis, and function at the molecular level. Graduate Prerequisites: Some knowledge of basic cell biology and biochemistry is assumed. Students who have not taken courses in these areas can prepare by reading relevant sections in basic molecular cell biology texts. We recommend Pollard et al., *Cell Biology* (4th ed., 2024), Alberts et al., *Molecular Biology of the Cell* (7th ed., 2022), or Lodish et al., *Molecular Cell Biology* (9th edition, 2021). Undergraduate Prerequisites: This is a graduate-level cell biology class. Any undergraduates wishing to enroll must have already taken MCDB 2050. In addition, undergraduates are strongly encouraged to reach out to the course directors prior to enrollment.

CBIO 6030a / MCDB 603 / MCDB 6030a, Seminar in Molecular Cell Biology Min Wu, Xiaolei Su, Valerie Horsley, Thomas Melia, Christian Schlieker, Patrick Lusk, Shawn Ferguson, Julien Berro, David Breslow, Shaul Yogev, and Karin Reinisch

A graduate-level seminar in modern cell biology. The class is devoted to the reading and critical evaluation of classical and current papers. The topics are coordinated with the CBIO 6602 lecture schedule. Thus, concurrent enrollment in CBIO 6602 is required. Prerequisites: Any undergraduates wishing to enroll must have already taken MCDB 205. In addition, undergraduates are strongly encouraged to reach out to the course directors prior to enrollment.

CBIO 6600a and CBIO 6601b, Science at the Frontiers of Medicine Staff

This full-year graduate seminar (CBIO 6600/CBIO 6601) for first-year M.D./Ph.D. students—an elective course for M.D. students—matches the progression of topics in the eighteen-month preclinical medical school curriculum and emphasizes the connections between basic and clinical science, human physiology, and disease. It is directed by M.D./Ph.D. program faculty, and many class discussions are led by expert Yale School of Medicine faculty members who select the papers to be read. Students explore scientific topics in depth, learn about cutting-edge research, and improve their presentation skills. The curriculum provides a framework for critically reading and analyzing papers drawn broadly from the biomedical sciences; this breadth of knowledge is also leveraged in team-based exercises that promote peer-to-peer teaching and learning. Enrollment limited to students who have taken or are currently taking CBIO 5501/CBIO 5502.

CBIO 6606b, Advanced Topics in Cell Biology Staff

This seminar course, which meets once weekly, covers advanced topics in cell biology. Each topic is discussed over two or three sessions, which start with an introductory overview and are followed by a discussion of key papers led by an expert in the field. This class is designed for BBS graduate students with an interest in performing thesis research in laboratories exploring molecular cell biology mechanisms. The course is also designed as a more in-depth follow-up to CBIO 6020. Students who do not meet these pre-existing criteria should contact the course coordinator before enrolling. Graduate Prerequisite: CBIO 6020. Undergraduate Prerequisite: Undergraduates are to reach out to the course instructor prior to enrollment for approval.

CBIO 7701b, Illuminating Cellular Function Staff

The focus of the course is on the technical treatment of light microscopy and its applications. The course provides biology and bioengineering students with the knowledge and skills necessary to design and undertake advanced light microscopy experiments. It covers conceptual elements of fluorescence microscopy imaging and analysis (without going too heavily into the theory and math); new advances in super-resolution modalities; biological applications; and hands-on practical work. Enrollment limited to fifteen.

CBIO 9000a / GENE 9000a / MCDB 9000a, Research Skills and Ethics I Stefania Nicoli

This course consists of a weekly seminar that covers ethics, writing, and research methods in cellular and molecular biology as well as student presentations (“rotation talks”) of work completed in the first and second laboratory rotations.

CBIO 9010b / GENE 9010b / MCDB 9010b, Research Skills and Ethics II Chenxiang Lin

This course consists of a weekly seminar that covers ethics, writing, and research methods in cellular and molecular biology as well as student presentations (“rotation talks”) of work completed in the third laboratory rotation.

CBIO 9110a / GENE 9110a / MCDB 9110a, First Laboratory Rotation Andrew Xiao

First laboratory rotation for Molecular Cell Biology, Genetics, and Development (MCGD) and Plant Molecular Biology (PMB) track students.

CBIO 9120a / GENE 9120a / MCDB 9120a, Second Laboratory Rotation Josh Gendron

Second laboratory rotation for Molecular Cell Biology, Genetics, and Development (MCGD) and Plant Molecular Biology (PMB) track students.

CBIO 9130b / GENE 9130b / MCDB 9130b / MCDB 913b and MCDB 913ob, Third Laboratory Rotation Andrew Xiao

Third laboratory rotation for Molecular Cell Biology, Genetics, and Development (MCGD) and Plant Molecular Biology (PMB) track students.