

Division of Medical Sciences
Ph.D. Programs at Harvard Medical School

Quarter Courses

Fall Term 2017-2018

Classes Start: Wednesday, August 30, 2017

Online Check-In (formerly known as registration): August 14, 2017

Please visit the [Harvard University Knowledge Center](#) website for more information

Deadlines and Holidays: Please visit the [GSAS Calendar](#) to view deadlines and holidays for the 17-18 academic year

For information: Call **617-432-4134** or email dms_courses@hms.harvard.edu

DIVISION OF MEDICAL SCIENCES
Ph.D. Programs at Harvard Medical School
2017-2018 Fall Term Quarter Course Offerings

[BCMP 308qc. Cell Fate Decisions in Development and Disease](#)

Alan B. Cantor, George Daley, Ramesh Shivdasani and Zhe Li
Enrollment: Limited to 15

[Cell Biology 305qc. Intracellular Transport](#)

Victor Hsu

[Cell Biology 306qc. Teaching 100: The Theory and Science of Teaching](#)

Johanna L. Gutlerner and Bradley Coleman
Enrollment: Limited to 25

[HBTM 302qc. Imaging and Microscopy Methods in Biology and Medicine](#)

Lev Perelman, Le Qiu and Vladimir Turzhitsky

[HBTM 303qc. Vision: A System and its Assessment](#)

Russell Woods

[Immunology 307qc. Cancer Immunology](#)

Kai Wucherpfennig, Catherine Wu, Michael Goldberg and Stephanie Dougan
Enrollment: Limited to 15

[Medical Sciences 300qc. Conduct of Science](#)

Kristin White

[Medical Sciences 302qc. Conduct of Science Refresher](#)

Kristin White

[Neurobiology 301qc. Nervous System Disorders: Advances in Diagnostics and Emerging](#)

Bakhos Tannous

[Neurobiology 305qc. Biochemistry and Biology of Neurodegenerative Diseases](#)

Dominic Walsh

[Neurobiology 306qc. Quantitative Methods for Biologists \(offered August 2017\)](#)

Michael Springer and Richard T. Born
Enrollment: Limited to 80

[Neurobiology 308qc. Thinking about Data: Statistics for the life sciences](#)

Richard Born

[Neurobiology 315qc. Human Neuroanatomy and Neuropathology](#)

Matthew Frosch
Curriculum Fellow: Taralyn Tan

Neurobiology 318qc. Diseases of the Nervous System

Ziv Williams, Chris Walsh, Dennis Selkoe, Emery Brown, Mustafa Shahin, Elizabeth Thiel, Tom Schammell, Matthew Frosch and Takao Hensch
Curriculum Fellow: Taralyn Tan

Neurobiology 319qc. Neurobiology of Psychiatric Disease: From Bench to Bedside

Bill Carlezon and Kerry Ressler

SGBT 301qc. Speech and Hearing Laboratory Visits

Bertrand Delgutte

Biological Chemistry and Molecular Pharmacology

***BCMP 308qc. Cell Fate Decisions in Development and Disease**

Alan B. Cantor, Ramesh Shivdasani and Zhe Li

2 Units. Enrollment: Limited to 15.

W., 1:30PM-3:30 PM

This quarter course will offer students an in-depth examination of current knowledge regarding mechanisms of cell fate decisions. It will examine these processes in the context of developmental cell plasticity, cellular reprogramming, and cancer. This will primarily be a literature-based course with examination and discussion of key studies in the field. Concepts involving the instructive role of lineage-specific transcription factors, transcription factor cross-antagonism, feedback loops, gene regulatory networks, multilineage priming, pioneer factors, epigenetics, chromatin remodeling factors, “super enhancers”, stem cell bias, lineage identity maintenance, mitotic bookmarking, non-coding RNAs, cell polarity, asymmetric cell division, Notch signaling, lateral inhibition, lineage plasticity, and cellular reprogramming will be explored. These ideas will be examined in the context of several different tissue systems and organisms.

Fall 2017

Meeting Dates: Wednesday, September 20, 2017 through Wednesday, November 15.

Location: Karp Family Research Building (1 Blackfan Circle, Boston), 7th floor conference room.

Course Head: Alan Cantor, alan.cantor@childrens.harvard.edu

Cell Biology

Cell Biology 305qc. Intracellular Transport

Victor Hsu

2 Units. Enrollment: Limited to 10

W., 3:00PM – 4:59PM

This course will provide a practical guide to understanding the role of intracellular transport in physiology and disease settings. Basic mechanisms and also interdisciplinary areas that involve this fundamental cellular process will be selected for discussion.

Fall 2017

Meeting Dates: October 11, 2017 through December 6, 2017

Location: Brigham and Women's Hospital, BTM 6014

Course Head: Victor Hsu, vhsu@rics.bwh.harvard.edu

***Cell Biology 306qc. Teaching 100: The Theory and Science of Teaching**

Johanna L. Gutlerner and Bradley Coleman

2 Units. Enrollment: Limited to 20.

Th., 2:00PM – 4:00PM.

For many graduate students, teaching will be part of their career, whether as mentoring, formal classroom teaching, or outreach. In addition, the theory and research evidence accumulating in the disciplines of cognitive psychology, neuroscience, and from STEM classrooms, has turned the question of, 'How do we best teach science?' into its own scientific discipline. The Theory and Science of Teaching focuses on understanding why certain teaching methods are effective by examining the scientific research and theoretical frameworks that support these methods. We will read and discuss foundational educational and cognitive psychology texts and primary literature, and then develop annotated lesson plans that allows us to put these ideas into practice.

Note: The course has been designed as a companion to Genetics 302qc: Teaching 101, but neither course is a prerequisite of the other.

Fall 2017

Meeting Dates: Thursday, September 21, 2017 through Thursday, November 16, 2017

Location: TMEC 106

Course Head: Johanna Gutlerner, Johanna_gutlerner@hms.harvard.edu and Bradley Coleman, Bradley_Coleman@hms.harvard.edu

Human Biology and Translational Medicine

HBTM 302QC Imaging and Microscopy Methods in Biology and Medicine

Lev Perelman, Le Qiu and Vladimir Turzhitsky

2 units. Instructor consent required

T., 3:00PM – 5:00PM

Introduce modern imaging modalities with emphasis on modalities frequently employed in cellular and molecular biology and medicine. Will discuss basic principles of operation of modern advanced microscopy techniques, such as confocal, two-photon fluorescence, CLASS, super-resolution and STED microscopy. Overview noninvasive medical imaging techniques used in scientific research: X-ray CT, MRI, ultrasound, PET/SPECT, diffuse optical tomography (DOT), optical coherence tomography (OCT), and photoacoustic tomography (PAT). Lectures will be supplemented by visual and hands-on demonstrations of imaging systems and discussions of the operation principles of these systems

Fall 2017

Meeting Dates: October 10, 2017 through December 5, 2017

First Meeting Location: TMEC 445

Course Head: Lev Perelman, lperelman@fas.harvard.edu

HBTM 303QC: Vision: A System and its Assessment

Russell Woods, Tatjana Jakobs, François Delori, Michael Sandberg, Lotfi Merabet, Francisco Costela, Kimberley Chan, Corinna Bauer, Gabriel Kreiman, John Dowling, Jason Comander, Steven Savage, Matthew Bronstad, Alex Bowers, Ronald Hansen, Laura Fine, Regan Bergmark, and Kevin Houston

2 units. Instructor consent required

T., 3:00PM – 5:00PM

This course provides an introduction to the visual system; from photons entering the eye to perception, how we use vision, and how we assess it. In general, we will consider vision as a system rather than its low-level components. Each two-hour session consists of two lectures provided by faculty with expertise in that area. Topics will include basic science and clinical topics, normal vision and abnormal vision, methods of assessment of animals and humans, clinical and laboratory measures.

Fall 2017

Meeting Dates: September 13, 2017 through November 15, 2017

First Meeting Location: 2nd floor conference room, Schepens Eye Research Institute, 20 Staniford Street, Boston 02114

Course Head: Russell Woods

IMMUNOLOGY

***Immunology 307qc. Cancer Immunology**

Kai Wucherpfennig, Catherine Wu, Philip Kranzusch and Stephanie Dougan

2 Units. Enrollment: Limited to 15

M., 4:00PM – 6:00PM.

There have been many exciting recent developments in the cancer immunology field, and multiple therapeutic approaches have shown efficacy against diverse types of cancer. This course will emphasize new mechanistic insights, in particular on the following topics: Mechanisms of spontaneous protective anti-tumor immunity; Key effector cell populations of anti-tumor immunity; Inflammation and tumor microenvironment; Immunosuppressive mechanisms in tumor immunity; Targeting of inhibitory receptors; Cancer vaccines; new approaches for delivery of immunotherapies into tumors.

Note: Must be PhD student at Harvard or postdoctoral fellow

Fall 2017

Meeting Dates: November 6, 2017 through December 18, 2017

Location: Modell Center, 2nd floor conference room 258

Course Head: Kai Wucherpfennig, Kai_Wucherpfennig@dfci.harvard.edu

Medical Sciences

***Medical Sciences 300qc. Conduct of Science**

Kristin White

2 Units.

This course is a required course for all DMS students and all who receive support from NIH training grants. The goal of this course is to inform students about the appropriate conduct of research and the many ethical and social problems that they may encounter during their research career in graduate school. The course consists of three lectures for the entire class and five highly interactive sessions with a small group of fellow students moderated by a faculty member. Some of the issues that will be discussed in this course include appropriate methods of collecting laboratory data, interactions with members of the laboratory and the mentor and issues dealing with research misconduct.

Note: All current G2 students must register for this course on their Fall Semester 2017 study cards. **Specific enrollment instructions will be sent to current G2s and other eligible students in the upcoming weeks.** Please contact Tatevik Holmgren (Tatevik_Holmgren@hms.harvard.edu) for enrollment inquiries.

Note: Restricted to GSAS graduate students on the Longwood campus.

Fall 2017

Meeting Dates: September 14, 2017 through November 16, 2017

Course Directors: Kristin White

Course Administrator: Tatevik Holmgren, Tatevik_Holmgren@hms.harvard.edu

Location: Armenise 125 (D) Amphitheater

Lecture One on Thursday, September 14, 2017: Gretchen Brodnicki, J.D., HMS Dean for Faculty and Research Integrity

Lecture Two on Thursday, October 12, 2017: Melissa Brodrick, HMS Ombudsperson

Lecture Three on Thursday, November 16, 2017: Dr. George Church, Robert Winthrop Professor of Genetics

(All lectures will begin promptly at 3:30 p.m. and end at 5 p.m. Mandatory registration for students will begin at 3 p.m.)

***Medical Sciences 302qc. Conduct of Science Refresher**

Kristin White

2 Units.

This course is a required course for all DMS students and all who receive support from NIH training grants. This is a refresher course for advanced graduate students. The goal of this course is to inform students about the appropriate conduct of research and the many ethical and social problems that they may encounter during their research career in graduate school. The course consists of three lectures for the entire class and four highly interactive sessions with a small group of fellow students moderated by a faculty member. Some of the issues that will be discussed in this course include appropriate methods of collecting laboratory data, interactions with members of the laboratory and the mentor and issues dealing with research misconduct.

Note: All current G5 students must register for this course on their Fall Semester 2017 study cards. **G5 students are required to attend at least two out of the three didactic sessions. Specific enrollment instructions will be sent to current G5s and other eligible students in the upcoming weeks.** Please contact Tatevik Holmgren (Tatevik_Holmgren@hms.harvard.edu) for enrollment inquiries.

Note: Restricted to GSAS graduate students on the Longwood campus.

Fall 2017

Meeting Dates: September 14, 2017 through November 16, 2017

Course Directors: Kristin White

Course Administrator: Tatevik Holmgren, Tatevik_Holmgren@hms.harvard.edu

Location: Armenise 125 (D) Amphitheater

Lecture One on Thursday, September 14, 2017: Gretchen Brodnicki, J.D., HMS Dean for Faculty and Research Integrity

Lecture Two on Thursday, October 12, 2017: Melissa Brodrick, HMS Ombudsperson

Lecture Three on Thursday, November 16, 2017: Dr. George Church, Robert Winthrop Professor of Genetics

(All lectures will begin promptly at 3:30 p.m. and end at 5 p.m. Mandatory registration for students will begin at 3 p.m.)

Neurobiology

Neurobiology 301qc. Nervous System Disorders: Advances in Diagnostics and Emerging

Bakhos Tannous, Xandra Breakefield and Christian Badr

2 Units

T., 3:00PM – 5:00PM

This course will discuss current trends in diagnostic and therapeutic applications, including gene/cell therapy and CRISPR technology, for different nervous system disorders ranging from neurodegeneration, eye/ear diseases and brain tumors. We will also examine bench-to-bedside translation, ongoing clinical trials as well as imaging/biomarkers for diagnostics and therapeutic monitoring.

Fall 2017

Meeting Dates: September 5, 2017 through November 7, 2017

Location: TMEC L-007

Course Head: Bakhos Tannous, bakhos_tannous@hms.harvard.edu

Neurobiology 305qc. Biochemistry and Biology of Neurodegenerative Diseases

Dominic Walsh and Tim Bartels

2 Units. Limited to 20

M., 2:00 – 4:00

Biochemistry and biology are integrated to provide a broad perspective on major human neurodegenerative diseases. There will be particular focus on protein aggregation and the relationship between aggregation and disease.

Fall 2017

Meeting Dates: November 6, 2017 through December 18, 2017

Location: The Building for Transformative Medicine, 60 Fenwood Road, Boston, MA 02115

Course Head: Dominic Walsh, DWALSH3@PARTNERS.ORG

****Neurobiology 306qc. Quantitative Methods for Biologists (offered in August 2017)**

Michael Springer and Richard T. Born

2 Units. Enrollment: Limited to 80.

M., W., F., 10:00AM – 4:00PM; T., Th., 1:00PM – 5:00PM

The goals of this course are to introduce students to programming in the MATLAB environment and to begin using this tool for analyzing data and for gaining intuition about the behavior of complex systems through the use of numerical simulations.

Note: This boot camp course will meet in August. **Please contact Jennie Epp, Jennie_Epp@hms.harvard.edu for enquiries.**

Fall 2017

Meeting Dates: August 7, 2017 through August 18, 2017

Location: Maxwell Dworkin G115 (33 Oxford St, Cambridge), Aug 7, 9, 11, 14, 16, and 18(MWF) (10-4). TMEC 227, Aug 8, 12, 15, and 17 (T. Th) (1-5)

Course Instructor: Michael Springer, Michael_Springer@hms.harvard.edu

**** Please put this course on your fall term study card if you wish to receive credit for it.**

Neurobiology 308qc. Thinking about Data: statistics for Life sciences

Richard T. Born and Brian Healy

2 units. Enrollment limited to 25

W., 6:00PM – 8:00PM

Probability & statistics taught with an emphasis on using simulations and re-sampling methods to both analyze data and understand core statistical concepts. Prior to class, students will view online lectures from Dr. Brian Healy's biostatistics course. In class, we will focus on MATLAB coding exercises to practice different approaches to analyzing real data sets, with an emphasis on resampling methods.

Prerequisite: Should have taken Neurobiology 306qc

Fall 2017

Meeting Dates: September 6, 2017 through October 25, 2017

Location: TMEC 128

Course Head: Richard Born, richard_born@hms.harvard.edu

Neurobiology 315QC Human Neuroanatomy and Neuropathology

Matthew Frosch and Jean Augustinack

4 units. Enrollment limited to 20

M., W., F., 8:30AM – 12:00PM

This course will cover human neuroanatomy in depth, with an emphasis on the functional implications of structure and medical implications of lesions. Teaching occurs through lectures, small group sessions, brain dissection and homework assignments.

Course Note: All lectures on Friday end by 10:30 am.

Fall 2017

Meeting Dates: September 25, 2017 through November 3, 2017

Location: TMEC 250

Course Head: Matthew Frosch, MFROSCH@mgh.harvard.edu and Jean Augustinack (jean@nmr.mgh.harvard.edu)

Neurobiology 318QC Diseases of the Nervous System

Ziv Williams, Chris Walsh, Dennis Selkoe, Emery Brown, Mustafa Shahin, Elizabeth Thiel, Tom Schammell, Matthew Frosch and Takao Hensch

2 units. Enrollment limited to 60

M., W., F., 8:30AM – 12:00PM

This block provides a basic framework for understanding common disease processes that affect the central and peripheral nervous system as well as their pathophysiology and treatment. Specific focus is placed on disorders frequently encountered in clinical practice such as neurodegenerative disorders, seizures, addiction and trauma. For each topic, clinical vignettes will be tied into basic diagnostic options and treatments. Disorders will also be broken down into their principle biological underpinnings, cellular and molecular dysfunction. Finally, a brief overview will be given of ongoing advancements in these fields and future directions.

Fall 2017

Meeting Dates: December 4, 2017 through December 20, 2017

Location: TMEC 250

Course Head: Ziv Williams, zwilliams@partners.org

Neurobiology 319QC Neurobiology of Psychiatric Disease: From Bench to Bedside

Bill Carlezon and Kerry Ressler

2 units.

T., 1:00PM – 4:00PM

To provide clinical insight and critical analysis of basic and translational science approaches necessary for students to approach psychiatric disorders as scientific problems, and thus contribute future research work with clinical relevance. Each pair of lectures presents 1) basic neuroscience approaches to the neural circuitry, cell and molecular biology underlying disease, followed by 2) clinical neuroscience, genetics, neuroimaging, etc., including case studies of the disorders.

The lectures will focus on a range of psychiatric disorders, neural systems underlying behavior, and translational approaches to novel interventions, while providing insight on disease characteristics, current, novel and translationally-informed treatments, gene vs. environmental risk factors, animal models, and gaps in knowledge across the field. There will also be laboratory-based sessions (organized visits to McLean Hospital) to demonstrate examples of basic and human laboratory approaches to the study and treatment of psychiatric illness.

Fall 2017

Meeting Dates: September 12, 2017 through October 17, 2017

Location: Goldenson 229

Course Head: Bill Carlezon, (bcarlezon@mclean.harvard.edu) and Kerry Ressler (kressler@mclean.harvard.edu)

SGBT 301QC Speech and Hearing Laboratory Visits

Bertrand Delgutte

2 Units

W

Research on topics in theoretical, experimental, clinical, or translational aspects of Speech and Hearing Sciences arranged on an individual basis with a research supervisor.

Spring 2017

Meeting Dates: contact Bertrand Delgutte

Location: Varies

Course Head: Bertrand Delgutte, bertrand_delgutte@meei.harvard.edu