

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

Quarter Courses

Spring Term 2015-2016

Spring Term Online Registration Opens – Wednesday, January 20, 2016

FAS Study Card Deadline: Friday, January 29 at 5 p.m.

Add/Drop Deadline (without fee): Monday, February 8, 2016

Final Add Course Deadline (with fee): Monday, March 7, 2016

Final Drop Course Deadline (with fee): Tuesday, March 22, 2016

Holidays:

Martin Luther King Day: Monday, January 18, 2016

Presidents' Day: Monday, February 15, 2016

Spring Recess: March 12-20, 2016

Online Registration: January 20 at 9:00 a.m. – January 25 at 11:59 p.m.

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

DIVISION OF MEDICAL SCIENCES
Ph.D. Programs at Harvard Medical School
2015-2016 Spring Term Quarter Course Offerings

BCMP 311OC Unmet Medical Needs and Translational Solutions

Enrollment: Limited to 30.

Jagesh Shah and Catherine Dubreuil

BCMP 312OC Quantitative Methods in Pharmacology *(Updated)*

Enrollment: Limited to 20.

Jagesh Shah and Catherine Dubreuil

Cell Biology 302OC Advanced Experimental Design for Biologists

Enrollment: Limited to 24.

Randall King and David Glass

Cell Biology 304OC Introduction to Human Gross Anatomy for Graduate Students and Research Fellows

Enrollment: Limited to 20.

David Cardozo and Gerald Greenhouse

Cell Biology 307OC Molecular Aspects of Chromatin Dynamics *(Updated)*

Enrollment: Limited to 25.

Raul Mostoslavsky, Danesh Moazed, Johnathan Whetstine, and Lee Zou

Cell Biology 308OC Introduction to Histology for Graduate Students

Enrollment: Limited to 11.

Adrian Salic, Gerald Greenhouse, and Stephen Liberles

Genetics 302OC Teaching 101: Bringing Effective Teaching Practices to your Classroom

Enrollment: Limited to 8.

Bradley Coleman and Emily Gleason

Genetics 303OC Current Tools for Gene Analysis

Enrollment: Limited to 15.

Neena Haider

Curriculum Fellow: Emily Gleason

HBTM 305OC The Molecular Bases of Eye Disease

Darlene Dartt and Magali Saint-Geniez

Course Coordinator: Bridget Boles

Immunology 301OC Autoimmunity

Francisco Quintana

Immunology 302OC Clinical Sessions

Rachael Clark

Immunology 303OC The Warring Genomes: Innate Immunity and Host Defense

Jonathan Kagan

Immunology 305OC Neuro-Immunology in Development, Regeneration and Disease

Isaac Chiu, Michael Carroll, and Beth Stevens

Immunology 308OC Transformational Immunology - Research and Papers that Changed the Field *(Updated)*

Enrollment: Limited to 12.

Laurence Turka and Shiv Pillai

Neurobiology 307OC Molecular Causes of Congenital Defects of the CNS

Enrollment: Limited to 12.

Mary Loeken

Virology 302OC Viruses of Nonvertebrate Eukaryotic Hosts: Alternative Means of Transmission and Spread

Enrollment: Limited to 8.

Max Nibert

Biological Chemistry and Molecular Pharmacology

BCMP 311OC Unmet Medical Needs and Translational Solutions

Jagesh Shah and Catherine Dubreuil

2 Units Enrollment: Limited to 30, consent of instructor required.

Mon-Fri 9:00-5:00

The central goal of modern biomedical research is to understand the cause of human disease and to use this knowledge to develop approaches that lessen human suffering. The path from identifying an unmet medical need through the development of interventions that impact disease is a complex process demanding the best of medicine and science, strong project management, significant financial support, and persistence. In this course, students will learn to evaluate how unmet medical needs can be "translated" into new clinical practices. The course will feature assessment of unmet medical needs, case studies of successes and failures in translation, seminars from translational medicine experts, and workshops that engage students in substantive and intense discussions on current topics. Lecturers will include innovators who have successfully led the development of therapeutic interventions, leaders in basic science who have helped uncover the underlying causes of disease and investigators who have led clinical trials that lead to the approval of new interventions.

Course Notes: This course is application-based; applications are typically due in mid-January. The HMS portion of the course is limited to 30 students. This course will meet Mondays through Fridays in June. Dates: June 13-24. There is also an optional Global component that takes place in Durban, South Africa (same application). A limited number of students will be selected for this part of the course. Dates: June 25-July 1.

Spring 2016

Meeting Dates: Monday, June 13, 2016 to Friday, June 24, 2016

First Meeting: Monday, June 13, 2016

Final Meeting: Friday, June 24, 2016

Location: TBA

Dates for the Optional Global Component (Durban, South Africa): Saturday, June 25, 2016 to Friday, July 1, 2016

Course Head: Jagesh Shah, jagesh_shah@hms.harvard.edu

Course Instructor: Catherine Dubreuil, catherine_dubreuil@hms.harvard.edu

BCMP 312OC Quantitative Methods in Pharmacology (Updated)

Jagesh Shah and Catherine Dubreuil

2 Units. Enrollment: Limited to 20

Wed 1:00-3:00PM

This course will cover basic models of pharmacology using computational modeling tools. We will learn how to model basic enzyme kinetics and inhibition and whole body pharmacokinetics and use these to model specific problems in pharmacology. We will investigate case studies in infectious disease, glucose regulation, cancer therapy and unique examples of drug pharmacology. The course will be built around in-class coding exercises (using MATLAB and SimBiology) and homework assignments, as well as lectures from HMS faculty and industry leaders. No previous programming experience required. A basic understanding of enzyme kinetics and pharmacology is assumed

Course notes: A plus if taken Biochemistry classes, and BCMP 200 but not required

Spring 2016

Meeting Dates: February 3, 2016 – April 27, 2016

First Meeting: Wednesday, February 3, 2016

Final Meeting: Wednesday, April 27, 2016

Location: SGM 106A

Course Head: Jagesh Shah, jagesh_shah@hms.harvard.edu

Course Instructor: Catherine Dubreuil, catherine_dubreuil@hms.harvard.edu

Cell Biology

Cell Biology 302OC Advanced Experimental Design for Biologists

Randall King and David Glass

2 Units Enrollment: Limited to 24, consent of instructor required.

Mon and Wed 4:00-6:00 PM

This course will focus on both the theory and practice of experimental design. The emphasis is on project planning and vetting, individual experimental design, and trouble-shooting. Special focus will be placed on methods to avoid experimental bias, and potential sources of inappropriate interpretation. Also the importance of system validation is especially emphasized.

Spring 2016

Meeting Dates: February 1 – March 9, 2016

First Meeting: Monday February 1, 2016

Final Meeting: Wednesday March 9, 2016

Location: TMEC 328 and TMEC 448. Schedule below.

Course Heads: Randall King, randy_king@hms.harvard.edu, and David Glass, david_glass@hms.harvard.edu

The course will be divided into five sections:

1. Establishing frameworks for experimentation (hypotheses vs. questions; project questions, experimental questions). Some philosophy and history of science.
2. System validation. How do you know your system is capable of addressing your experimental question or hypothesis?
3. Experimental design. Distinct types of controls: negative, positive, experimentalist, and assumption controls. Establishing the correct N. Establishing the correct statistical tests.
4. Experimental readouts and model building. Model validation and perturbation.
5. Data reporting and presentation; flow-charting experiments and experimental projects.

By the end of the course, students should be able to:

- Identify the overarching theme that motivates your work (framework)
- Understand the difference between asking questions and posing hypotheses, and how hypotheses can bias experimentation
- Be able to pose an unbiased question that can be answered experimentally
- Identify components of the system - your 'tool box' - that you will need to do your experiment
- Be able to identify the strengths and weaknesses of your experimental system

- Know how to validate your system
- Identify and perform proper positive and negative controls for your experiment
- Understand sources of bias in the design and interpretation of your experiment
- Understand the role of statistics in choosing sample size and in planning your experiment; understand the role of the pilot experiment in this process
- Be able to use flow charts to develop a strategic plan for your project
- Be able to troubleshoot your experiments using problem solving and analytical reasoning
- Understand the role of model building in the interpretation of experiments and design of subsequent experiments

Session Topics and Meeting Locations (All times 4-6 PM)

1. Monday February 1 - TMEC 328

Introduction to the course (King, Glass)

What is an experimental framework? What is the difference between a hypothesis and a question? How do you develop an inductive framework for posing an appropriate question?

2. Wednesday February 3 - TMEC 328

The role of statistics in experimental design (King)

What is the difference between descriptive and inferential statistics? What statistical test is appropriate for a particular experiment? What is the role of repetition in experimental design?

3. Monday February 8 - TMEC 328

Class discussion on experimental frameworks based on homework assignment.

4. Wednesday February 10 - TMEC 448

System Choice, Validation and Design (Glass)

Which experimental system is best to answer a specific question? How do you validate that the chosen system can address the experimental question?

5. Monday February 22 - TMEC 328

Class discussion on system validation based on homework assignment.

6. Wednesday February 24 - TMEC 448

Negative and positive controls (Glass)

Why are controls so important? What is the difference between negative and positive controls? What purposes do they serve? What is the “all but X” control?

7. Monday Feb 29 - TMEC 328

Class discussion on controls based on presentations from students on particular experiments.

8. Wednesday March 2th - TMEC 448

Other Controls, Model Building, and Flow charting (Glass)

What are method, reagent, subject, assumption and experimentalist controls? Why are they important for interpreting the results of experiments? What do you do with an experimental result? What is a model? How do you validate and refine a model? How do you design an experimental program? How should different experiments relate to one another? How can you use flowcharts to think strategically about your experimental program?

*9. Monday March 7th - TMEC 328

Student presentations

*10. Wednesday March 9th - TMEC 448

Student presentations

*Note: Upon discussion with the class, we may consider moving the last two sessions to after spring break (spring break is March 12-20). Depending on course enrollment, we may consider adding a session.

Cell Biology 304OC Introduction to Human Gross Anatomy for Graduate Students and Research Fellows

David Cardozo and Gerald Greenhouse

2 Units Enrollment: Limited to 20, consent of instructor required.

Mon, Wed, and Fri 12:00-7:00

Lectures, laboratory dissections, and prosections will provide students an opportunity to explore the gross structure and function of the human body. The course will provide a foundation for the student to acquire practical skills in recognizing, dissecting, and differentiating key anatomical structures. Structure/function relationships will be emphasized and some foundation will be provided for understanding the anatomic basis of diseases.

Each of the 13 sessions will include a lecture, 3 hours of dissection, and an evening guest lecturer on clinical or research aspects related to the dissections (supper provided).

Spring 2016

Meeting Dates: June 3, 6, 8, 10, 13, 15, 17, 20, 22, 24, 27, 29, and July 1

First Meeting: Friday, June 3, 2016

Final Meeting: Friday, July 1, 2016

Location: TMEC-448

Course Head: David Cardozo, david_cardozo@hms.harvard.edu

Course Instructor: Gerald Greenhouse, gerald_greenhouse@hms.harvard.edu

Additional Lab Instructors: Everett Anderson, everett_anderson@hms.harvard.edu, Mohini Lutchman, mlutchman@mghihp.edu, and Giorgio Giatsidis

Cell Biology 307OC Molecular Aspects of Chromatin Dynamics (Updated)

Raul Mostoslavsky, Danesh Moazed, Johnathan Whetstine, and Lee Zou

2 Units Enrollment: Limited to 25, consent of instructor required.

Lectures: Tuesdays 3-5 p.m. Discussion Sessions: Thursdays 3-5 p.m.

This course will discuss the role of chromatin dynamics in modulating molecular and cellular processes. The genetic information encoded in our DNA is organized in a defined set of chromosomes, which are condensed about 10,000 fold in order to fit in the cell nucleus. This compaction occurs through packaging of the DNA around histone proteins, a structure known as chromatin. In what was thought to be a rigid structure, today we know that chromatin is an amazingly dynamic folding that plays a crucial role in controlling accessibility of factors to the DNA, and as such, it regulates a vast number of critical biological functions, including gene transcription, DNA replication, DNA repair and cellular identity. In this course we will attempt to cover some of the basic molecular mechanisms that play a role in regulating chromatin dynamics, and in turn how chromatin itself modulate biological processes, including basic mechanisms of inheritance. We will specifically discuss the role of DNA methylation, histone modifications, nucleosome dynamics and novel epigenetic modulators in the context of different biological processes for which chromatin accessibility appears to play a crucial role.

Notes: The course consists of 12 sessions, 1.5 hr each session; 8 regular Sessions, 4 Discussion Sessions.

Spring 2016

Meeting Dates: March 15, 22, 29, and 31; April 5, 7, 12, 14, 19, 26 and 28; May 3

First Meeting: Tuesday, March 15, 2016

Final Meeting: Tuesday, May 3, 2016

Location: TMEC-447

Course Head: Raul Mostoslavsky, rmostoslavsky@mgh.harvard.edu

Course Lecturers: Danesh Moazed, danesh_moazed@hms.harvard.edu, Johnathan Whetstine, jwhetstine@hms.harvard.edu, and Lee Zou, zou.lee@mgh.harvard.edu

Guest Lecturers (Discussion Sessions): Yang Shi, Bob Kingston, Yi Zhang, and Jay Bradner

Note on Discussion Sessions: In these sessions students should come prepared to discuss a pre-selected recent paper from the lecturer's lab.

Session Topics:

Session 1. General overview on chromatin dynamics and mechanisms of inheritance (**JW**). **March 15th**

Session 2: Basic concepts on epigenetic mechanisms of inheritance (**DM**). **March 22th**

Session 3. The chemistry of DNA methylation. Establishment, maintenance and erasure of DNA methylation. The function of DNA methyl-transferases and methyl-binding proteins. The new kid on the block: cytosine 5-hydroxymethylation (**RM**). **March 29th**

Session 4. Discussion Session: **Yi Zhang.** Tet proteins as regulators of 5-OH-MeC. **March 31th**

Session 5. Histone modifications and histone variants. Translating epigenetic marks into function: the code, the writers and the readers. **(JW). April 5th.**

Session 6: Discussion Session. **Yang Shi:** specificity of histone demethylases. **April 7th.**

Session 7. Nucleosome remodeling and the transcriptional silencing/activation switch. The role of ATP-remodelling complexes, Polycomb Group Proteins and Trithorax Group Proteins **(LZ). April 12th.**

Session 8: The RNA world. Roles of RNAi in heterochromatin Assembly. Non-coding RNAs in epigenetic mechanisms of inheritance **(DM). April 19th.**

Session 9. Discussion Session. **Bob Kingston:** PGC and Trx complexes in epigenetics. **April 21st**

Session 10: Beyond transcription: chromatin regulation of DNA replication and DNA repair **(LZ). April 25th.** Note: this class is on a Monday and will be 10am-12pm

Session 11: Discussion Session. **Jay Bradner:** “Targeting chromatin factors in the clinic: lessons from bromodomain proteins”. **April 28th.**

Session 12: Epigenetics and human disease: chromatin determinants in cancer and neurodegenerative disorders. Emerging roles for chromatin in other diseases **(RM). May 3rd.**

Cell Biology 308OC Introduction to Histology for Graduate Students

Adrian Salic, Gerald Greenhouse, and Stephen Liberles

2 Units Enrollment: Limited to 11, consent of instructor required.

Mon, Wed, and Fri 1:00-5:00 (10 Sessions)

Histology—the study of structure and how structure relates to function, in cells and tissues. The class will include a session on each of the major tissue types—epithelium, connective, muscle, and nerve. This will be followed by sessions during which organ systems will be studied. Each session will include an introductory lecture followed by shared observation of slides using a 12-headed light microscope. Pathology correlates will be included when possible. In the last two sessions, students will have hands on training in tissue staining with recently developed compounds in the lab of Adrian Salic and learn frozen section technique on brain tissue from Stephen Liberles.

Spring 2016

Meeting Dates: July 6, 8, 11, 13, 15, 18, 20, 22, 25, and 27

First Meeting: Wednesday, July 6, 2016

Final Meeting: Wednesday, July 27, 2016

Location: TMEC-209 (lectures), TMEC-202 and 203 (observations)

Course Head: Adrian Salic, adrian_salic@hms.harvard.edu

Course Instructors: Gerald Greenhouse, gerald_greenhouse@hms.harvard.edu, and Stephen Liberles, Stephen_Liberles@hms.harvard.edu

Genetics

Genetics 302OC Teaching 101: Bringing Effective Teaching Practices to your Classroom

Bradley Coleman and Emily Gleason

2 Units Enrollment: Limited to 8, consent of instructor required.

Th 2:00-4:00

Survey basics of effective teaching practices, focusing on practical application and real-life examples. Topics include effective lecturing techniques, using goals and learning styles to inform lesson planning and design, assessing student understanding, and facilitating discussions.

Spring 2016

Meeting Dates: February 11, 2016 to April 14, 2016

First Meeting: Thursday, February 11, 2016

Final Meeting: Thursday, April 14, 2016

Location: NRB 230

Course Co-Head Instructors: Bradley Coleman, Bradley_Coleman@hms.harvard.edu, and Emily Gleason, Emily_Gleason@hms.harvard.edu

Course Learning Objectives

- Students will learn to plan lessons with clear goals and objectives.
- Students will distinguish between active and passive learning techniques and create active in-class activities that support their learning objectives.
- Students will become comfortable presenting material to students and gain confidence facilitating learning activities and discussions.

Brief Syllabus

Date	Topic
2/11	Presentation Skills
2/18	Learning Objectives
2/25	Creating an Active Classroom
3/3	Formative Assessments as Learning Tools
3/10	Evaluating Your Own Teaching
3/17	- NO CLASS -
3/24	Large Group Teaching Demo (NRB 350)
3/31	Mock Small Group Tutorial
4/7	Small group, continued
4/14	Small Group Teaching Demo

Genetics 303OC Current Tools for Gene Analysis

Neena Haider

2 Units Enrollment: Limited to 15, consent of instructor required.

Th 10:00-12:00 (Please note that the final meeting on April 7 will be held from 10 a.m. to 1 p.m.)

The goal of this course is to explore a number of the current online tools to analyze genes, gene function, pathways, DNA, RNA, and protein analysis. Each class we will introduce a new online tool. The majority of the class will be spent exploring the tool together in an interactive manner. At the end of each class students will be given an assignment which utilizes the knowledge they gained in class and helps them to further explore the new tool. Assignments will be reviewed in class the following week. After taking this class students will be proficient in the use of each online tool and will be able to apply their knowledge to learning new tools and programs. Students will need to bring a laptop to class each day.

Spring 2016

Meeting Dates: February 4, 2016 to April 7, 2016

First Meeting: Thursday, February 4, 2016

Final Meeting: Thursday, April 7, 2016 (Time: 10-1)

Location: Countway Library, Room L2-025

Course Head: Neena Haider, neena_haider@meei.harvard.edu

Curriculum Fellow: Emily Gleason, emily_gleason@hms.harvard.edu

Genetics 303QC Course Schedule:

Date	Room	Tool	Lecturer	Assignment Due
February 4 th	L2-025	Course Introduction and UCSC Genome Browser	Neena Haider Arne Nystuen Principal Scientist, Biosciences Neurotech	
February 11 th	L2-025		Neena Haider	UCSC Assignment
February 18 th	L2-025	NCBI Database	David Osterbur Access and Public Services Librarian, Countway	
February 25 th	L2-025	Ensembl Genome Browser	Paul Bain Reference and Education Services Librarian, Countway	NCBI Assignment
March 3 rd	L2-025	Next Generation Sequencing Technologies and Analysis	Kristina Holton Research Computing Consultant, HMS Research Computing	Ensembl Assignment
March 10 th	L2-025	Next Generation Sequencing Technologies and Analysis	Kristina Holton Research Computing Consultant, HMS Research Computing	Choose your tool for the final assignment
March 17 th		Spring Break – No Class		
March 24 th	L2-025	ExpASy Bioinformatics	Neena Haider	NGS Assignment
March 31 st	L2-025	ExpASy Bioinformatics	Neena Haider	
April 7 ^{th**}		Final Presentations – Pick a Tool!		ExpASy Assignment and Final Assignment

Human Biology and Translational Medicine

HBTM 3050C The Molecular Bases of Eye Disease

Darlene Dartt and Magali Saint-Geniez

2 Units Enrollment: Consent of instructor required.

Mon 3:00-5:00

This course provides an overview of the pathogenic process of prevalent ocular diseases. The goals of the course are: (i) to explore the structural and functional aspects of the eye relevant to understanding the pathology, (ii) to review the manifestations of the disease and its effects on vision, (iii) to discuss current views and research in the pathophysiology, and strategies for therapeutic intervention. For most sessions, the basic science and clinical topics will be presented by two faculty lecturers.

Spring 2016

Meeting Dates: January 11, 2016 to April 18, 2016

First Meeting: Monday, January 11, 2016

Final Meeting: Monday, April 18, 2016

Location: Schepens Eye Research Institute, 20 Staniford Street, 2nd Floor Conference Room, Boston, MA 02114

Course Head: Darlene Dartt, Darlene_Dartt@MEEI.HARVARD.EDU

Course Instructor: Magali Saint-Geniez, Magali_Saintgeniez@MEEI.HARVARD.EDU

Course Coordinator: Bridget Boles, Bridget_Boles@MEEI.HARVARD.EDU

Immunology

Immunology 301OC Autoimmunity

Francisco Quintana

2 Units Enrollment: Consent of instructor required.

Mon 4:00-6:30

This course will focus on basic immunological mechanisms of autoimmune diseases, with an emphasis on recent advances in the field. At each session, we will focus on a particular topic and discuss three important publications.

Spring 2016

Meeting Dates: March 14, 28; April 4, 11, 18; May 2, 9

First Meeting: Monday, March 14, 2016

Final Meeting: Monday, May 9, 2016

Location: Jeffrey Modell Immunology Center, 2nd floor Conferences Rm 258

Course Head: Francisco Quintana, FQUINTANA@PARTNERS.ORG

Immunology 302OC Clinical Sessions

Rachael Clark

2 Units Enrollment: Consent of instructor required.

Tue 12:00-1:00

Lectures by physician scientists and clinical exposure to patients with immunologically mediated diseases. The goal is to foster translational research into human immunologic disease.

Course Notes: Limited to Immunology students.

Spring 2016

Meeting Dates: March 8, 22, and 29; April 5, 12, 19, and 26

First Meeting: Tuesday, March 8, 2016

Final Meeting: Tuesday, April 26, 2016

Location: Modell 100A (except Mar 8, in TMEC 250)

Course Head: Rachael Clark, RCLARK@BWH.HARVARD.EDU

Immunology 303OC The Warring Genomes: Innate Immunity and Host Defense

Jonathan Kagan

2 Units

Tue 4:00-6:00

Focus on basic cellular and molecular aspects of innate immunity, with an emphasis on recent advances in the field. Each class will cover a specific topic, and supporting literature will be provided by the instructor.

Spring 2016

Meeting Dates: April 5 – May 17, 2016

First Meeting: Tuesday, April 5, 2016

Final Meeting: Tuesday, May 17, 2016

Location: Jeffrey Modell Immunology Center, 2nd floor Conferences Rm 258

Course Head: Jonathan Kagan, jonathan.kagan@childrens.harvard.edu

Immunology 305OC Neuro-Immunology in Development, Regeneration and Disease

Isaac Chiu, Michael Carroll, and Beth Stevens

2 Units Enrollment: Consent of instructor required.

Th 4:00-6:30

It is increasingly clear that the nervous system and immune system share parallel molecular pathways, and communication between neurons and immune cells play significant roles in homeostasis and disease. This course will investigate current topics in neuro-immunology: CNS development, chronic pain, neuro-degeneration, aging, axon regeneration, auto-immunity and infection. We will focus our discussions on molecular mechanisms shared by the immune and nervous systems and the molecular cross-talk between these two systems.

Course Notes: Each class will cover a specific topic in neuro-immunology. Students should be prepared to lead discussions on pre-selected papers for each session.

Spring 2016

Meeting Dates: April 14, 21, and 28; May 5, 12, 19, and 26; June 2

First Meeting: Thursday, April 14, 2016

Final Meeting: Thursday, June 2, 2016

Location: Jeffrey Modell Immunology Center, 2nd floor Conferences Rm 258

Course Heads: Isaac Chiu, Isaac_Chiu@hms.harvard.edu, Michael Carroll,

Michael.Carroll@childrens.harvard.edu, and Beth Stevens,

Beth.Stevens@childrens.harvard.edu

Immunology 308OC Transformational Immunology – Research and Papers that Changed the Field (*Updated*)

Laurence Turka and Shiv Pillai

2 Units Enrollment: Limited to 12, consent of instructor required.

Wed 9:30-11:30

This is a reading course with central themes on advances in immunology that created new paradigms and changed the field. There will be a reading requirement of 2-3 relevant papers on the topics of discussion for each week. Each session will consist of a student-led presentation of background on the topic (which will consist of a brief introduction followed by a discussion involving the whole class) followed by another student's presentation of the key points of the papers and how the new findings transformed the field. Each student is expected to make two presentations during the seven-week course. Evaluation is based on presentations and class participation.

Course Prerequisite: Enrollment in the immunology PhD program. Other applicants need permission of the course director.

Spring 2016

Meeting Dates: January 27; February 3, 10, 17, 24; March 2, 9

First Meeting: Wednesday, January 27, 2016

Final Meeting: Wednesday, March 9, 2016

Location: Ragon Institute (Jan 27, Feb 24, Mar 2, Mar 9). MGH Navy Yard – Room 5101B (Feb 3, Feb 10, Feb 17)

Course Heads: Laurence Turka, LTURKA@PARTNERS.ORG, and Shiv Pillai, pillai@helix.mgh.harvard.edu

Neurobiology

Neurobiology 307OC Molecular Causes of Congenital Defects of the CNS

Mary Loeken

2 Units Enrollment: Limited to 12, consent of instructor required.

Tue 2:00-5:00

Congenital defects can be caused by inheritance of a defective gene, maternal infection, or prenatal exposure to environmental teratogens. Use of mutant mouse strains and genomic sequencing have been particularly useful in the rapid proliferation of our understanding of the cellular and molecular mechanisms by which congenital defects of the brain or nervous system arise, and how they lead to functional consequences that range from biochemical abnormalities to gross structural defects.

Notes: Given every three years.

Spring 2016

Meeting Dates: January 26; February 2, 9, 16, 23; March 1 and 8

First Meeting: Tuesday, January 26, 2016

Final Meeting: Tuesday, March 8, 2016

Location: TMEC 111

Course Head: Mary Loeken, mary.loeken@joslin.harvard.edu

Virology

Virology 302OC Viruses of Nonvertebrate Eukaryotic Hosts: Alternative Means of Transmission and Spread

Max Nibert

2 Units Enrollment: Limited to 8, consent of instructor required.

Tue 2:00-4:00

In this course, we will expand our view, commonly focused on viruses of humans and sometimes other vertebrates, to viruses of more evolutionarily distant eukaryotic hosts including protozoa, fungi, plants, & arthropods. Emphasis will be placed on alternative means of transmission and spread exhibited by these viruses, but other distinctive aspects of their life cycles will be considered as well. Active student participation will be expected and essential for the success of this readings- and discussions-based course, which is intended for more advanced students who have some previous background in virology.

Notes: This course will be offered in even-numbered years, starting 2016.

Spring 2016

Meeting Dates: March 22 and 29; April 5, 12, 19 and 26; May 3 and 10

First Meeting: Tuesday, March 22, 2016

Final Meeting: Tuesday, May 10, 2016

Location: HIM-1051

Course Head: Max Nibert, max_nibert@hms.harvard.edu

Tentative Schedule

Sessions 1 and 2: protozoal viruses

Sessions 3 and 4: fungal viruses

Sessions 5, 6, and 7: plant and arthropod viruses

Session 8: other nonvertebrate animal viruses