

Division of Medical Sciences

Ph.D. Programs at Harvard Medical School

# First Meeting of January and Spring Term Quarter Courses 2014-2015

**You must sign up for January courses on your spring term study cards.**

**Online Registration:** January 21-26, 2015

## **Study Card Days:**

Harold Amos Graduate Student Lounge, TMEC Room 442

9:30 AM – 4:00 PM

- Wednesday, January 28 (G3's and above)
- Thursday, January 29 (G1's and G2's)

*Final day to turn in Study Cards to Cambridge in Dudley House: Friday, January 30*

**Add Course Deadline:** Monday, March 9

**Drop Course Deadline:** Tuesday, March 24

## **Holidays:**

Martin Luther King Day: Monday, January 19

President's Day: Monday, February 16

Spring Recess: March 14-22

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

**DIVISION OF MEDICAL SCIENCES**  
**Ph.D. Programs at Harvard Medical School**  
**2014-2015 January and Spring Quarter Course Offerings**

**\*BCMP 301qc. Translational Pharmacology (January Course)**

Catalog Number: 97487, Enrollment: Enrollment may be limited.

*Donald M. Coen (Medical School) 7617 and David E. Golan (Medical School)*

**\*BCMP 310qc. Eukaryotic Gene Regulation – New Course**

Catalog Number: 10699 Enrollment: Limited to 8.

*Steve Buratowski, Ph.D. (Medical School) and members of the Department*

**\*BCMP 307qc. Approaches to Drug Action, Discovery, and Design -- Will not be offered; only offering full credit course (BCMP 236) this term**

Catalog Number: 52371 Enrollment: May be limited.

*Nathanael Gray (Medical School) 5730, and members of the Department*

**\*BCMP 309qc. Principles of Drug Action in Man -- Will not be offered; only offering full credit course (BCMP 236) this term**

Catalog Number: 63265

*Timothy J. Mitchison (Medical School) 3713*

**\*Cell Biology 304qc. Introduction to Human Gross Anatomy**

Catalog Number: 61023 Enrollment: Limited to 10.

*David Lopes Cardozo (Medical School) 5995, Gerald Greenhouse (Medical School), Everett Anderson (Medical School), Mohini Lutchman (Medical School)*

**\*Cell Biology 308qc. Introduction to Histology**

Catalog Number: 38084 Enrollment: Limited to 11.

*Adrian Salic (Medical School), Gerald Greenhouse (Medical School) and Stephen Daniel Liberles (Medical School)*

**\*Cell Biology 309qc. Advanced Topics in Cell Biology – Postponed; will be offered 2015-2016**

Catalog Number: 14797

*David L. Van Vactor (Medical School) 2089 and members of the Medical School Faculty*

**\*DRB 330qc. Experimental Approaches to Developmental Biology (January Course)**

Catalog Number: 6590, Enrollment: Limited to 16.

*Paola Arlotta 6703, and members of the Department*

**\*Genetics 302qc. Teaching 101: Bringing Effective Teaching Practices to your Classroom**

Catalog Number: 91159 Enrollment: Limited to 15.

*Fred Winston (Medical School) 7877, Yan Liu (Medical School), and members of the Department*

**\*Genetics 303qc. Current Tools for Gene Analysis – (New Course)**

Catalog Number: 98485 Enrollment: Limited to 15.

*Fred Winston (Medical School) 7877 and Neena Haider (Medical School)*

**\*Genetics 390qc. Advanced Experimental Methods: Experimental Approaches in Genetic Analysis (January Course)**

Catalog Number: 8039 Enrollment: Limited to 8.

*Fred Winston (Medical School) 7877 and members of the Department*

**\*Genetics 391qc. Advanced Experimental Design in Genetics (January Course)**

Catalog Number: 70918. Enrollment: Limited to 8.

*Fred Winston (Medical School) and members of the Department*

**HBTM 301qc. Case Studies in Human Biology and Translational Medicine (January Course)**

Catalog Number: 95905 Enrollment: Will be limited.

*Caren Grossbard Solomon (Medical School) 6960 and Mary Elizabeth Hamel (Medical School)*

**\*HBTM 305qc (formerly \*Pathology 301qc). The Molecular Bases of Eye Disease**

Catalog Number: 85085

*Darlene Ann Dartt (Medical School) 6904 and Magali Saint-Geniez (Medical School)*

**\*Immunology 301qc. Autoimmunity**

Catalog Number: 69978

*Kai Wucherpfennig (Medical School) 2481, Vijay K. Kuchroo (Medical School)*

**\*Immunology 302qc. Clinical Sessions**

Catalog Number: 40428

*Rachael Ann Clark (Medical School) 3429*

**\*Immunology 303qc. The Warring Genomes: Innate Immunity and Host Defense**

Catalog Number: 55535

*Jonathan C. Kagan (Medical School) 6235*

**\*Immunology 304qc. Current Concepts in Mucosal Immunology -- Will not be offered**

Catalog Number: 25936

*J. Rodrigo Mora (Medical School) and Scott Snapper (Medical School)*

**\*Immunology 305qc. Neuro-immunology in Development, Regeneration and Disease**

Catalog Number: 98545

*Beth Stevens (Medical School) 6678*

**\*Immunology 306qc. Systems Immunology**

Catalog Number: 87129

*Nir Hacohen (Medical School) 5157, William Nicholas Haining (Medical School), Christophe O. Benoist (Medical School), and visiting speakers*

**\*Immunology 308qc. Translational Immunology and Immunotherapy - (New Course)**

Catalog Number: 90209 Enrollment: Limited to 12.

*Laurence A. Turka (Medical School) 2633, Thorsten Roman Mempel (Medical School) 6173, and Shiv S. Pillai (Medical School) 3393*

**[\*Microbiology 301qc. Molecular Mechanisms of Microbial Pathogenesis] -- Replaced by Microbiology 214, fall session**

Catalog Number: 76052 Enrollment: Limited to 15.

*Marcia Goldberg (Medical School) 3783 and Simon L. Dove (Medical School)*

**\*Microbiology 302qc. Introduction to Infectious Disease Research: Infectious Diseases Consortium Boot Camp (January Course)**

Catalog Number: 96439

*Eric J. Rubin (Medical School) 4084*

**\*Neurobiology 306qc. Quantitative Methods for Biologists -- Will not be offered May 2015**

Catalog Number: 85319 Enrollment: Limited to 80.

*Michael Springer and Richard T. Born (Medical School)*

**Neurobiology 310qc. Careers in Neuroscience -- (New Course)**

Catalog Number: 54233 Enrollment: Limited to 25.

*David D. Ginty (Medical School) 7431*

**\*SHBT 203. Anatomy of Speech and Hearing (January Course)**

Catalog Number: 17772 Enrollment: Limited to 12.

*Barbara C. Fullerton (Medical School), James Tracey Heaton (Medical School), and James Bradley Kobler (Medical School)*

**\*Virology 301qc. Advanced Topics in Virology - Viral Oncology (January Course)**

Catalog Number: 33563

*James DeCaprio (Medical School)*

***OTHER COURSES OF INTEREST:***

**\*Systems Biology 301qc. Studying Evolution through Models and Experiments (January Course)**

Catalog Number: 31854

*Roy Kishony (Medical School) 5501*

**\*Systems Biology 305qc. Practical Synthetic Biology (January Course)**

Catalog Number: 22318

*Jeff Way (Medical School) 1595 and Pamela Silver (Medical School)*



**\*BCMP 301qc. Translational Pharmacology (January Course)**

Catalog Number: 97487 Enrollment: Enrollment may be limited.

*Donald M. Coen (Medical School) 7617 and David E. Golan (Medical School)*

*Quarter course (spring term). M. through F., 9:30-4.*

This is an intensive course held during the first two full weeks of **January** (ten days) covering basic principles of pharmacology and how they are translated into the development of new drugs. Students participate actively in project groups composed of both graduate students and post-graduate M.D.'s to propose a strategy for drug development from target choice through clinical trials. There are two hours of lectures each of the first eight mornings; in the afternoons, there are case studies discussed by Harvard faculty and guest faculty from the pharmaceutical and biotechnology industries, or time to work on the group project. Evaluation is based on the project and class participation. Enrollment may be limited.

**January Session 2015**

**Meeting dates:** January 5, 6, 7, 8, 9, 12, 13, 14, 16

**Time:** 9:30 – 11:50 AM; 1:00 – 4:00 PM

**First Meeting:** Monday, January 5, 2015

**First Meeting Location:** Jeffery Modell Immunology Center, Fred S. Rosen Lecture Hall, Room 100A

**Concluding Discussion & Party:** January 16, 2015

**Course Heads:** Don Coen [don\\_coen@hms.harvard.edu](mailto:don_coen@hms.harvard.edu) and David Golan [david\\_golan@hms.harvard.edu](mailto:david_golan@hms.harvard.edu)

**Curriculum Fellow:** Catherine Dubreuil, [Catherine\\_dubreuil@hms.harvard.edu](mailto:Catherine_dubreuil@hms.harvard.edu), 617-432-7882

**Contact:** Stuart Ferguson, [stuart\\_ferguson@hms.harvard.edu](mailto:stuart_ferguson@hms.harvard.edu)

**\*BCMP 310qc. Eukaryotic Gene Regulation – New Course**

Catalog Number: 10699 Enrollment: Limited to 8.

*Steve Buratowski, Ph.D. (Medical School) and members of the Department*

*Quarter course (spring term). Tu., 2–3pm, Th., 2–4pm*

Gene regulation is central to control of all functions in the organism. This course will explore our contemporary understanding of gene regulation by providing molecular and biochemical perspectives on topics that include general aspects of gene regulation such as the basal transcriptional machinery, chromatin remodeling and its role in gene regulation, and co-transcriptional processes, in addition to gene regulation in specific contexts. This course is an advanced reading course designed for students with introductory exposure to biochemistry, molecular biology and/or genetics with BCMP 200 or an equivalent as a prerequisite.

*Prerequisite:* Introductory exposure to biochemistry, molecular biology and/or genetics with BCMP 200 or an equivalent.

**Spring 2015**

**Meeting dates:** Tuesdays and Thursdays, April 7 – May 14 (April 7, 9, 14, 16, 21, 23, 28 and 30; May 5, 7, 12 and 14)

**Meeting Times:** Tuesdays 2p – 3p, Thursdays 2p – 4p

**First Meeting:** April 7, 2015

**Final Meeting:** May 14, 2015

**Location:** SGM, 3rd Floor Conference Room

**Course Heads:** Steve Buratowski, Ph.D., [steveb@hms.harvard.edu](mailto:steveb@hms.harvard.edu)

## *Cell Biology*

### **\*Cell Biology 304qc. Introduction to Human Gross Anatomy**

Catalog Number: 61023 Enrollment: Limited to 10.

*David Lopes Cardozo (Medical School) 5995, Gerald Greenhouse (Medical School), Everett Anderson (Medical School), Mohini Lutchman (Medical School)*

*Quarter course (spring term). M., W., F., 12–7, and some 12-5.*

Lectures, laboratory dissections, and prosections to explore the gross structure and function of the human body. Provide a foundation to acquire practical skills in recognizing, dissecting, and differentiating key anatomical structures.

*Note: Open to graduate students only.*

### **Schedule**

DATE	SESSION	12:00—2:00	2:00—5:00	5:00—7:00
22 June	Session 1 TMEC 447	Visit Morgue—discuss HMS anatomical gifts program—discuss dissecting room etiquette	Lecture Back & Posterior Upper Limb	Guest Lecture TBA
24 June	Session 2 TMEC 447	Lecture Spine	Dissect Back & Posterior Upper Limb	Guest Lecture TBA
26 June	Session 3 TMEC 447	Lecture Gluteal Region & Posterior Lower Limb, Knee	Dissect—Laminectomy—Expose Spinal Cord	Guest Lecture TBA
29 June	Session 4 TMEC 447	Lecture Chest Muscles & Axilla (Brachial Plexus), Movement of Shoulder Joint	Dissect Gluteal Region & Posterior Lower Limb	Guest Lecture TBA
1 July	Session 5 TMEC 447	Lecture Upper Limb & Hand	Dissect Chest Muscles & Axilla (Brachial Plexus)	Guest Lecture TBA
6 July	Session 6 TMEC 447	Lecture Thorax—Lungs, Pleural Cavities, Mediastinum, Heart, Great Vessels	Dissect Upper Limb & Hand	Guest Lecture TBA
8 July	Session 7 TMEC 447	Lecture Anterior Lower Limb & Foot	Dissect Thorax—Lungs, Pleural Cavities, Mediastinum	Dissection Heart, Great Vessels
10 July	Session 8 TMEC 447	Lecture Abdominal Wall, Abdominal Viscera, Retroperitoneum, & Pelvis	Dissect Anterior Lower Limb & Foot	Guest Lecture TBA
13 July	Session 9 TMEC 447	Lecture Neck	Dissect Abdominal Wall, Abdominal Viscera, Retroperitoneum	Dissection Pelvis
15 July	Session 10 TMEC 447	Lecture Cranial Cavity	Dissect Neck	Guest Lecture TBA
17 July	Session 11 TMEC 447	Lecture Mastication	Dissect Cranial Cavity—Cranial Nerves	Guest Lecture TBA
20 July	Session 12 TMEC 447	Lecture Eye	Dissect Posterior Pharynx, Nasal Cavity, Oral Cavity	Guest Lecture TBA
22 July	Session 13 TMEC 447	Dissect Infratemporal fossa & TMJ	Dissect Eye	Guest Lecture TBA

### **Spring 2015**

**Meeting dates:** Monday, Wednesday, Friday

**First Meeting:** June 22, 2015



**Final Meeting:** July 22, 2015

**Location:** TMEC 448

**Course Heads:** Gerald Greenhouse, [gerald\\_greenhouse@hms.harvard.edu](mailto:gerald_greenhouse@hms.harvard.edu)

**\*Cell Biology 308qc. Introduction to Histology**

Catalog Number: 38084 Enrollment: Limited to 11.

*Adrian Salic (Medical School), Gerald Greenhouse (Medical School) and Stephen Daniel Liberles (Medical School)*

*Quarter course (spring term). M., W., F., 1-4.*

This class is recommended for graduate students whose thesis work will benefit from a strong working knowledge of cell structure and tissue architecture. If there is room postdoctoral fellows may also attend.

Class size is limited to 11. To receive credit students must attend all sessions and participate enthusiastically. All sessions will be held in the TMEC Building on the Longwood Medical Campus.

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 three 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 2015**

**First Meeting:** May 29, 2015

**Final Meeting:** June 19, 2015

**Location:** TMEC 126, TMEC 128, TMEC 129, TMEC 130, TMEC 132, TMEC 133

**Course Heads:** Adrian Salic [adrian\\_salic@hms.harvard.edu](mailto:adrian_salic@hms.harvard.edu), Stephen Liberles [stephen\\_liberles@hms.harvard.edu](mailto:stephen_liberles@hms.harvard.edu), Gerald Greenhouse [gerald\\_greenhouse@hms.harvard.edu](mailto:gerald_greenhouse@hms.harvard.edu)

# *Developmental and Regenerative Biology*

## **\*DRB 330qc. Experimental Approaches to Developmental Biology (January Course)**

Catalog Number: 6590, Enrollment: Limited to 16.

*Paola Arlotta 6703, and members of the Department*

*Quarter course (spring term). M. through Sa., 10:30–6\*\*, January 5-January 21, 2015.*

This laboratory course is designed to provide a survey of major topics and contemporary research in developmental and regenerative biology. Students will rotate in the laboratories of DRB faculty across the Harvard campuses and affiliated hospitals. Students engage with faculty and gain hands on experience in a variety of model systems, experimental techniques and research areas. Each day of the course will consist of a lecture followed by hands-on laboratory activities and interactive discussions.

*Note:* Intensive January course. Open to first-year and second-year BBS students. Not repeatable for credit.

### **Schedule**

#### **Tentative Topics include:**

1. Matt Pecot: Neural circuit Assembly in the *Drosophila* nervous system
2. Jennifer Waters: Imaging theory and Practice
3. Trista North & Wolfram Goessling: Vessel Development in Zebrafish
4. Jay Rajagopal: Lung regeneration
5. Ya-Chieh Hsu: Mammalian Skin and Hair follicle regeneration
6. Jeffrey Macklis: Neurogenesis in Mammalian Central Nervous System
7. Kiran Musunuru: Human genetic studies
8. Jessica Whited: Regeneration of vertebrate limbs (axolotl)
9. Amar Sahay: Learning and memory in mammals
10. Additional Faculty: Matt Harris, Vicki Rosen and Kristin White

Location and exact schedule along with background readings and detailed information for each day will be posted on the course iSite.

### **January Session 2015**

**Meeting Dates:** January 5 – January 21, 2015

**Time:** 10:30 AM – 6:00 PM. \*\*Please note, some sessions may run until 7:00 PM.

**First Meeting:** Monday, January 5, 2015, 5:00 PM

**First Meeting Location:** Sherman Fairchild G62, Cambridge campus

**Course Head:** Paola Arlotta, [paola\\_arlotta@hms.harvard.edu](mailto:paola_arlotta@hms.harvard.edu)

**Curriculum Fellow:** Abha Ahuja, [abha\\_ahuja@hms.harvard.edu](mailto:abha_ahuja@hms.harvard.edu), 414-467-8348

## *Genetics*

### **\*Genetics 302qc. Teaching 101: Bringing Effective Teaching Practices to your Classroom**

Catalog Number: 91159 Enrollment: Limited to 15.

*Fred Winston (Medical School) 7877, Yan Liu (Medical School), and members of the Department*

*Quarter course (spring term). Th., 1-3:30.*

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.

### **Schedule and Assignments**

#### Week 1 (Feb. 19th, 2015): “Presentation Skills”

Course Intro

Sarah Jessop communication activity OR spontaneous teaching exercise

Teacher’s Toolbox lecture

Examples of good and bad teaching (Eric Mazur, etc)

#### Week 2 (Feb. 26th, 2015): “Learning Objectives and Assessments”

Creating learning objectives

Designing CATs

#### Week 3 (Mar. 5th, 2015): “Assessments and Evaluation of Assessments”

Identifying misconceptions and prior knowledge

Alignments of learning objectives

Designing good detractors for MCQs

Evaluating assessments

#### Week 4 (Mar. 12th, 2015): “LISAM and Active Learning”

LISAM

Decide on nanocourse topics

Write learning objectives for nanocourse

Lecture on active learning, innovative teaching, and technology in the classroom

Design an active learning activity for a large lecture

#### Week 5 (Mar. 26th, 2015): “Large Group Teaching Practice”

Individual presentations of first day of nanocourse, including active learning technique – videoed

Written peer evaluation (collected by instructors)

(Between weeks 5 and 6 – students view their lecture and self-evaluate, meet with instructors to receive peer and instructor feedback)

#### Week 6 (Apr. 2nd, 2015): “Small Group Teaching”

Lecture on small vs large group teaching

Mock tutorial 3

Feedback on mock tutorial

#### Week 7 (Apr. 9th, 2015): “Small Group Teaching Practice”

Individual presentations of second day of nanocourse

In-class feedback

**Spring 2015**

**Meeting dates:** February 19, 26; March 5, 12, 26; April 2, 9.

**First Meeting:** Thursday, February 19, 2015

**Final Meeting:** Thursday, April 9, 2015

**Location:** TMEC 109

**Course Instructors:** Yan Liu, Yan\_Liu@hms.harvard.edu; Emily Gleason,  
Emily\_Gleason@hms.harvard.edu; Meg Mittelstadt, megan\_mittelstadt@hms.harvard.edu

**\*Genetics 303qc. Current Tools for Gene Analysis - (New Course)**

Catalog Number: 98485 Enrollment: Limited to 15

Fred Winston (Medical School) 7877 and Neena Haider (Medical School)

Quarter course (spring term). Th., 10–12. EXAM GROUP: 12

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.

*Note:* Students will need to bring a laptop to class each day. This course was developed and will be taught by Dr. Neena Haider, Associate Scientist at the Schepens Eye Research Institute and Associate Professor of Ophthalmology at Harvard Medical School.

*Prerequisite:* Genetics 201 or with permission from the instructor.

**Course Schedule (tentative)**

Week	Tool	Lecturer	Assignment
1. February 5 <sup>th</sup>	Introduction and NCBI Database	Neena Haider	
2. February 12 <sup>th</sup>	Genomic analysis: UCSC Genome Browser		Week 1 Assignment
3. February 19 <sup>th</sup>	Genomic analysis: Ensemble database		Week 2 Assignment
February 26 <sup>th</sup>	No Class		
4. March 5 <sup>th</sup>	Pathway analysis: Ingenuity		Week 3 Assignment
5. March 12 <sup>th</sup>	Protein analysis: Expasy	Neena Haider	Week 4 Assignment
March 19 <sup>th</sup>	Spring Break – No Class		
6. March 26 <sup>th</sup>	Protein remodeling: TBD		Week 5 Assignment
7. April 2 <sup>nd</sup>	Whole Genome analysis: Galaxy		Week 6 Assignment
8. April 9 <sup>th</sup> **	Transcription analysis: Prosite, Transfac	Neena Haider	Week 7 Assignment
9. April 16 <sup>th</sup> **	Final Presentations – Pick a Tool!		Week 8 Assignment and Final Assignment

\*\* Please note: In order to accommodate all final presentations, class on April 2<sup>nd</sup> will be held from 10am – 1pm.  
A celebratory lunch will be provided\*\*

**Spring 2015**

**First Meeting:** February 5, 2015 (*tentative*)

**Final Meeting:** April 9, 2015 (*tentative*)

**Final Presentations:** April 15, 2015 (*tentative*)

**Location:** TMEC 446

**Course Instructor:** Neena Haider, Neena\_Haider@MEEI.HARVARD.EDU

**Curriculum Fellow:** Emily Gleason, Emily\_Gleason@hms.harvard.edu

**\*Genetics 390qc. Advanced Experimental Methods: Experimental Approaches in Genetic Analysis (January Course)**

Catalog Number: 8039 Enrollment: Limited to 8.

*Fred Winston (Medical School) 7877 and members of the Department*

*Quarter course (spring term). M. through F., 8:30-4:00, January 5-January 16, 2015.*

A survey of major themes in genetics combined with exposure to various experimental techniques, technologies, and model systems. Combines lectures and hands-on laboratory activities emphasizing experimental methods, hypothesis generation and testing, and data analysis.

*Note:* Limited to 8 students. Priority will be given to G1 graduate students in the BBS Department. Students must first contact the faculty for enrollment approval prior to registration for the course. Meeting Dates/Times: Approximately 8:30 A.M. - 4:00 P.M. each day for 10 days January 5 – 16, 2015 (Monday – Friday).

*Prerequisite:* Students must also enroll in, or have taken, Genetics 201.

**Schedule**

<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
<b>5</b> Dr. Harris (Zebrafish)	<b>6</b> Dr. Hochschild (Bacteria)	<b>7</b> Dr. Winston (Yeast)	<b>8</b> Dr. Sinclair (Mouse/aging)	<b>9</b> Dr. DePace ( <i>Drosophila</i> )
<b>12</b> Dr. Blackwell ( <i>C. elegans</i> )	<b>13</b> Dr. Blower ( <i>Xenopus</i> )	<b>14</b> Dr. Warman (Mouse/humans)	<b>15</b> Dr. Churchman (Yeast/NET-seq)	<b>16</b> Dr. MacArthur and Dr. Daly (Humans)

**January Session 2015**

**Meeting Dates:** January 5 – 16, 2015 (Monday – Friday)

**Time:** Approximately 8:30 A.M. – 4:00 P.M.

**First Meeting:** Monday, January 5, 2015

**First Meeting Location:** Enders Building, Room 260 (Matt Harris's lab), 300 Longwood Avenue, Boston, MA 02115

**Course Head:** Fred Winston, [winston@genetics.med.harvard.edu](mailto:winston@genetics.med.harvard.edu)

**Curriculum Fellow:** Emily Gleason, [Emily\\_Gleason@hms.harvard.edu](mailto:Emily_Gleason@hms.harvard.edu), 617-432-7203



**\*Genetics 391qc. Advanced Experimental Design in Genetics (January Course)**

Catalog Number: 70918. Enrollment: Limited to 8.

*Fred Winston (Medical School) and members of the Department*

*Quarter course (spring term). M. through F., 8:30-4:00, January 5-January 16, 2015.*

To be run concurrently with Genetics 390qc. Students will have the opportunity to design experimental approaches that aim to answer specific questions in the field of genetics. Combined with the hands-on laboratory experience of Genetics 390qc, students will use their knowledge of experimental methods and data analysis with a variety of model organisms and techniques. Over the two-week course period, students will be asked to reflect daily on their experiences and design two unique experiments that will broaden their experience in the areas of hypothesis testing and data interpretation.

*Note:* Must be taken concurrently with Genetics 390qc. Limited to 8 students. Priority will be given to G1 graduate students in the BBS Department. Students must first contact the faculty for enrollment approval prior to registration for the course. Meeting Dates/Times: Approximately 8:30am – 4:00pm each day for 10 days from January 5 – 16, 2015 (Monday – Friday).

**Schedule**

<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
<b>5</b> Dr. Harris (Zebrafish)	<b>6</b> Dr. Hochschild (Bacteria)	<b>7</b> Dr. Winston (Yeast)	<b>8</b> Dr. Sinclair (Mouse/aging)	<b>9</b> Dr. DePace ( <i>Drosophila</i> )
<b>12</b> Dr. Blackwell ( <i>C. elegans</i> )	<b>13</b> Dr. Blower ( <i>Xenopus</i> )	<b>14</b> Dr. Warman (Mouse/humans)	<b>15</b> Dr. Churchman (Yeast/NET-seq)	<b>16</b> Dr. MacArthur and Dr. Daly (Humans)

**January Session 2015**

**Meeting Dates:** January 5 – 16, 2015 (Monday – Friday)

**Time:** Approximately 8:30am – 4:00pm

**First Meeting:** Monday, January 5, 2015

**First Meeting Location:** Enders Building, Room 260 (Matt Harris's lab), 300 Longwood Avenue, Boston, MA 02115

**Course Head:** Fred Winston, [winston@genetics.med.harvard.edu](mailto:winston@genetics.med.harvard.edu)

**Curriculum Fellow:** Emily Gleason, [Emily\\_Gleason@hms.harvard.edu](mailto:Emily_Gleason@hms.harvard.edu), 617-432-7203

## *Human Biology and Translational Medicine*

### \*HBTM 301qc. Case Studies in Human Biology and Translational Medicine (January Course)

Catalog Number: 95905 Enrollment: Will be limited.

*Caren Grossbard Solomon (Medical School) 6960 and Mary Elizabeth Hamel (Medical School)*

*Quarter course (spring term). M. – Th., 9-11, & F., 9-10.*

Two-week course that is required of and restricted to first-year LHB students. Each week of the course focuses on a different "case study" in translational medicine.

*Note:* January term course. Restricted to students in the Leder Human Biology and Translational Medicine Program only.

#### Schedule

##### *Week 1*

##### **Monday, Tuesday: Leukotriene Inhibition Therapy for Asthma (Jeff Drazen)**

Dr. Drazen will review how basic discoveries in the enzymology of leukotrienes led to the development of new therapeutic agents used to treat asthma.

##### **Wednesday: Cohort Studies (Solomon)**

##### **Thursday: Randomized Controlled Trials #1 (Hamel)**

##### **Friday: (Drazen, Solomon, Hamel)**

##### *Week 2*

##### **Monday, Tuesday: Fabry Disease (Mark Goldberg)**

Dr. Goldberg will describe the research establishing the molecular defect causing Fabry Disease ( $\alpha$ -galactosidase A deficiency), and the development and clinical testing of effective treatment of the disease with alpha-galactosidase beta.

##### **Wednesday: Case Control Studies (Solomon)**

##### **Thursday: Randomized Controlled Trials #2 (Hamel)**

##### **Friday (Goldberg, Hamel, Solomon)**

#### January Session 2015

**Meeting Dates:** January 5-9, January 12-16

**Time:** 9:00 – 11:00 AM

**First Meeting:** Monday, January 5, 2015

**Final Meeting:** Friday, January 16, 2015

**Location:** New England Journal of Medicine Conference Room, 6<sup>th</sup> Floor of Countway

**Course Head:** Caren Solomon ([csolomon@nejm.org](mailto:csolomon@nejm.org)) and Mary Beth Hamel ([mhamel@nejm.org](mailto:mhamel@nejm.org))

**Curriculum Fellow:** Joya Mukerji, [joya\\_mukerji@hms.harvard.edu](mailto:joya_mukerji@hms.harvard.edu)

**\*HBTM 305qc (formerly \*Pathology 301qc). The Molecular Bases of Eye Disease**

Catalog Number: 85085

*Darlene Ann Dartt (Medical School) 6904 and Magali Saint-Geniez (Medical School)*

*Quarter course (spring term). M., 3–5.*

In this course, we will strive for an understanding of the molecular bases for diseases that target the eye. 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 2015**

**Meeting dates:** January - April 2015

**First Meeting:** Monday, January 5, 2015

**Final Meeting:** Monday, April 13, 2015

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

**Course Heads:** Darlene Dartt, 617-912-0272, [darlene.dartt@schepens.harvard.edu](mailto:darlene.dartt@schepens.harvard.edu) and Magali Saint-Geniez, 617-912-2580, [magali.saintgeniez@schepens.harvard.edu](mailto:magali.saintgeniez@schepens.harvard.edu)

**Course Coordinator:** Mary Wheeler, 617-912-2586, [mary\\_wheeler@meei.harvard.edu](mailto:mary_wheeler@meei.harvard.edu)

## *Immunology*

### **\*Immunology 301qc. Autoimmunity**

Catalog Number: 69978

*Kai Wucherpfennig (Medical School) 2481, Vijay K. Kuchroo (Medical School)*

*Quarter course (spring term). M., 4–6.*

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.

*Note:* Expected to be given in 2014–15. Offered in alternate years.

#### **Specific topics will include:**

Session 1: Genetics of autoimmunity

Session 2: Antigen presentation & dendritic cells

Session 3: Induction of autoimmunity by Th17 cells

Session 4: Protection from autoimmunity by Tregs

Session 5: Role of MHC molecules in autoimmunity

Session 6: Target antigens in autoimmunity

Session 7: Glial cells in CNS autoimmunity

#### **First Session, Spring 2015**

**Meeting Dates:** Jan. 26, Feb. 2, 9, 23, March 2, 9, 16

**Time:** Mondays, 4:00 - 6:00 p.m.

**First Meeting:** Monday, Jan. 26 at 4:00 p.m.

**Location:** Jeffrey Modell Immunology Center, 2nd floor conference room, Room 258

**Course Head:** Kai Wucherpfennig, [Kai\\_Wucherpfennig@dfci.harvard.edu](mailto:Kai_Wucherpfennig@dfci.harvard.edu)

**\*Immunology 302qc. Clinical Sessions**

Catalog Number: 40428

Rachael Ann Clark (Medical School) 3429

*Quarter course (spring term). Tu., at 12. Hours for clinical visits to be arranged.*

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

*Note:* Limited to Immunology students. Hours for clinical visits to be arranged.

**Spring 2015**

**Meeting dates:** March 3, 10, 31; April 7, 14, 21, 28

**First Meeting:** March 3, 2015

**Final Meeting:** April 28, 2015

**Location:** Jeffrey Modell Immunology Center, 2nd floor conference room, Room 258

**Course Director:** Rachael Clark, MD, PhD, [rclark1@partners.org](mailto:rclark1@partners.org)

**\*Immunology 303qc. The Warring Genomes: Innate Immunity and Host Defense**

Catalog Number: 55535

Jonathan C. Kagan (Medical School) 6235

*Quarter course (spring term). T., 4–6.*

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.

*Prerequisite:* Students are expected to have already taken IMM201.

**Spring 2015**

Feb 3rd: Introductory Lecture.

Feb 10th. Genetics of PRRs.

Feb 17th. Cell Biology of PRRs.

Feb 24th. Systems approaches to PRRs.

Mar 3rd. Inflammasomes.

Mar 10th. Structures of PRRs.

Mar 17th. Spring Break

Mar 24th. How to make an immunoregulatory drug.

Mar 31st. Final.

**Spring 2015**

**Meeting dates:** February 3, 10, 17, 24; March 3, 10, 17, 24, 31

**First Meeting:** Tuesday, February 3, 2015

**Final Meeting:** Tuesday, March 31, 2015

**Location:** Jeffrey Modell Immunology Center, 2nd floor conference room, Room 258

**Course Head:** Jonathan Kagan, [jonathan.kagan@childrens.harvard.edu](mailto:jonathan.kagan@childrens.harvard.edu)

**\*Immunology 305qc. Neuro-immunology in Development, Regeneration and Disease**

Catalog Number: 98545

Beth Stevens (Medical School) 6678

Quarter course (spring term). Th., 4–6.

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.

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

**Tentative Schedule**

Week	Date	Course Topic	Lecturer
1	April 23	Introduction: “Neuroimmunology” redefined	Beth/Mike/Isaac
2	April 30	Neuro-immune interactions in infectious diseases	
3	May 7	Neuro-immune mechanisms in pain	
4	May 14	Neuro-immune molecular genetics	
5	May 21	Role of macrophage lineage cells in neurodegenerative diseases (AD)	
6	May 28	Neuro-immune mechanisms of axon regeneration	
7	June 4	Neuro-immune interactions in the blood brain barrier	
8	June 11	Neuro-immune signaling during brain wiring/development	

**Spring 2015**

**Meeting dates:**

**First Meeting:** Thursday, April 23, 2015

**Final Meeting:** Thursday, June 11, 2015

**Location:** Jeffrey Modell Immunology Center, 2nd floor conference room, Room 258

**Course Heads:** Beth Stevens, [beth.stevens@childrens.harvard.edu](mailto:beth.stevens@childrens.harvard.edu), Clifford Woolf, [clifford.woolf@childrens.harvard.edu](mailto:clifford.woolf@childrens.harvard.edu)

## **\*Immunology 306qc. Systems Immunology**

Catalog Number: 87129

*Nir Hacohen (Medical School) 5157, William Nicholas Haining (Medical School), Christophe O. Benoist (Medical School), and visiting speakers*

*Quarter course (spring term). F., 9–11.*

Our focus in this course is on the emerging field of systems immunology. Each session will review a class of experimental approaches, followed by a critical discussion of illustrative papers. Hands-on workshops will introduce students to computational tools for analyzing large-scale datasets, focusing on gene expression. Integrative sessions will review how systems biology has been used in specific areas. In addition, students will organize into small groups to analyze published genomic datasets, and present their results at the last session.

### **Schedule**

30-Jan Overview of systems immunology  
6-Feb Functional Screens  
13-Feb RNA profiling  
20-Feb Immunogenetics  
Feb 27 (9-12) WORKSHOP I: Expression analysis & project options  
6-Mar Chromatin States  
13-Mar Global Proteomics  
24-Mar NO CLASS - Spring recess  
27-Mar INTEGRATION I: Pathogen-sensing  
Apr 3 (9-12) WORKSHOP II: Basic tools & project discussions  
10-Apr INTEGRATION II: T cell activation and memory  
1-May Systems Medicine  
May 8 (9-12) WORKSHOP III: Project presentations

### **Spring 2015**

**First Meeting:** Friday, January 30, 2015

**Final Meeting:** Friday, May 8, 2015

**Location:** TMEC 340

**Course Heads:** Nir Hacohen, [nhacohen@partners.org](mailto:nhacohen@partners.org),  
Nick Haining, [Nicholas\\_Haining@dfci.harvard.edu](mailto:Nicholas_Haining@dfci.harvard.edu),  
Christophe Benoist, [Christophe\\_Benoist@hms.harvard.edu](mailto:Christophe_Benoist@hms.harvard.edu)



**\*Immunology 308qc. Translational Immunology and Immunotherapy - (New Course)**

Catalog Number: 90209 Enrollment: Limited to 12.

Laurence A. Turka (Medical School) 2633, Thorsten Roman Mempel (Medical School) 6173, and Shiv S. Pillai (Medical School) 3393

*Quarter course (spring term). W., 10–12. EXAM GROUP: 14*

This is a reading course with central themes on mechanisms and treatment of immune mediated disorders, including autoimmunity, transplant rejection, and tumor immunotherapy. 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. Each student is expected to make two presentations during the seven-week course. Evaluation is based on presentations and class participation.

**Schedule**

1. Loss of self-tolerance – mechanisms of autoimmunity
2. Alloreactivity and transplant rejection
3. Immunologic basis for tumor surveillance
4. Immunotherapy for autoimmunity and transplantation I: antigen-specific approaches
5. Immunotherapy for autoimmunity and transplantation II: antigen-non specific approaches that target T cells and B cells
6. Tumor immunotherapy – antigen-specific
7. Tumor immunotherapy – checkpoint inhibitors

**Spring 2015**

**Meeting Dates:** Wednesdays, February 4, 11, 18, 25; March 4, 11, 18

**Time:** 10am-12pm

**First Meeting:** February 4

**Final Meeting:** March 18

**Location:** Room 5101.B, Charlestown Navy Yard (CNY) - Building 149, Massachusetts General Hospital (149 13th Street, Charlestown MA 02129)

**Course Heads:** Laurence A. Turka, [LTURKA@PARTNERS.ORG](mailto:LTURKA@PARTNERS.ORG)

## *Microbiology*

### **\*Microbiology 302qc. Introduction to Infectious Disease Research: Infectious Diseases Consortium Boot Camp (January Course)**

Catalog Number: 96439

*Eric J. Rubin (Medical School) 4084*

*Quarter course (spring term). M. through F., 9-5.*

This intensive January course provides an introduction to the breadth of infectious disease research carried out at Harvard. Students will learn techniques for studying infectious diseases, more about different types of infectious diseases, and meet faculty, students, and postdocs in infectious diseases labs at Harvard.

#### **Schedule**

Please refer to the [Microbiology 302qc bootcamp site](#) for more information about the course schedule.

#### **January Session 2015**

**Meeting Dates:** January 12-16, 2015

**Time:** 9:00 AM – 5:00 PM

**First Meeting:** Monday, January 12, 2015

**Final Meeting:** Friday, January 16, 2015

**Location:** TMEC 334

**Course Director:** Eric Rubin, 617-432-3335 (office), [erubin@hsph.harvard.edu](mailto:erubin@hsph.harvard.edu)

**Course Coordinator/Curriculum Fellow:** Zofia Gajdos, [zofia\\_gajdos@hms.harvard.edu](mailto:zofia_gajdos@hms.harvard.edu), 617-432-1871 (office)

Please refer to the [Microbiology 302qc site](#) for more information about the course schedule.

## *Neurobiology*

### **Neurobiology 310qc. Careers in Neuroscience - (New Course)**

Catalog Number: 54233 Enrollment: Limited to 25.

*David D. Ginty (Medical School) 7431*

*Quarter course (spring term). Every other Tu., 5:30-7:30. Exact dates to be arranged.*

This course provides graduate students in the Program in Neuroscience with early exposure to the opportunities and challenges associated with a variety of rewarding careers in the field of neuroscience, as well as essential steps along the path towards those careers. Academic career topics will include postdoctoral training, obtaining and starting independent faculty positions, grant writing and reviewing, and opportunities for research and teaching positions. Other topics will include career opportunities in biotechnology, the pharmaceutical industry, patent law, journal editing/science writing, science policy, and consulting. One main topic will be covered at each class meeting, and one or more invited discussion leaders with expertise in the topic will participate in the class. Discussion leaders will include Harvard faculty members as well as outside experts.

*Note:* The course is required for all third year PiN students. To limit class size for optimal discussion (25 or fewer enrollees), enrollment is restricted to graduate students in their third year and beyond, and priority will be given to PiN students. The class meetings are open only to those who take the course for credit. A grade of satisfactory or unsatisfactory will be based on attendance.

### **Spring 2015**

**Meeting dates:** January – May, 2015; exact dates to be arranged

**First Meeting:** January 20, 2015 (*tentative*)

**Final Meeting:** TBA

**Location:** WAB 236

**Course Director:** David Ginty, [david\\_ginty@hms.harvard.edu](mailto:david_ginty@hms.harvard.edu)

**Teaching Assistant:** Brendan Lehnert

**\*SHBT 203. Anatomy of Speech and Hearing**

Catalog Number: 17772 Enrollment: Limited to 12.

Barbara C. Fullerton (Medical School), James Tracey Heaton (Medical School), and James Bradley Kobler (Medical School)

Half course (spring term). Lecture: M.-F., 9:30- 10:30 am, Lab: M.- F., 10:30-1:30 pm.

This course covers anatomy of the head and neck, with cadaver dissection, stressing structures important in speech and hearing. Lecture topics also include basic neuroanatomy, imaging, surgery, and cancer of head and neck.

Note: This is an intensive January Course. Offered jointly with MIT as HST 718. Classes to be held at the Harvard Medical School campus (HMS)

Prerequisite: Introductory biology or equivalent and permission of the course director.

**Schedule (UPDATED 12/11)**

<b>DATE</b>	<b>LECTURE- 9:30 am</b>	<b>LAB- 10:30 am-1:30 pm</b>	<b>LOCATION</b>
Mon., 1/5	Introduction Heaton	Thorax (lab 1); Kobler, BF	HMS, 443MEC
Tues., 1/6	Anat of respiration- Heaton	Thorax, II (lab 1, cntd.); Kobler, BF	HMS, 443MEC
Wed., 1/7	Anatomy of neck I- Fullerton	Neck I (lab 2); BF; Kobler	HMS, 443MEC
Thurs., 1/8	Anat of neck II- Fullerton	Neck II (lab 2, cntd.); BF, Kobler	HMS, 443MEC
Fri., 1/9	Cranial cavity/nerves I Fullerton	Cranial cavity (lab 3); BF	HMS, 443 MEC
Mon., 1/12	Temporal bone – ROSOWSKI	9:30-11 am- bone specimens, no lab	MEEI: 4th fl. Conf
Tues., 1/13	Anatomy of face- Fullerton	Face (lab 4) Fullerton	HMS, 443MEC
Wed., 1/14	Brain I – Fullerton	Brain lab I- human brain; Fullerton	MEEI: 4th fl. Conf
Thurs., 1/15	Anatomy of jaw- Fullerton	Infratemporal fossa (lab 5); BF, Kobler	HMS, 443MEC
Fri., 1/16	Brain II- Fullerton	Brain lab II- human brain; BF; ?	MEEI: 4th fl. Conf
Mon., 1/19	<b>HOLIDAY- MLK DAY</b>		
Tues., 1/20	Cranial nerves II/eye? Fullerton	Infratemp. fossa, TMJ (lab 5 cntd); BF, Kobler	HMS, 443MEC
Wed., 1/21	Larynx & phonation- Kobler	Fresh cow larynx lab - Kobler	HMS, 443MEC
Thurs., 1/22	Oral cavity,pharynx-	Oral cavity, pharynx, larynx (lab 7);	HMS, 443MEC

Heaton

JTH

Fri., 1/23  
8:30 am Functional anatomy of vocal tract- STEPP Pharynx, larynx, (lab 7, cntd); JTH, JK HMS, 443MEC

Mon., 1/26 Neural control of speech- Heaton Lecture 9:30-11; student models 11-12:30 pm HMS, 443MEC

Thurs.,1/29 EXAM TIME TO BE DETERMINED- 12:30 or 1 pm HMS, 443 MEC

**DATE            LECTURE- 9:30 am            LAB- 10:30 am-1:30 pm            LOCATION**

**January Session 2015**

**Meeting Dates:** January 5-30, 2015 (*subject to change*)

**Time:** 9:30 – 11:00 AM (lecture); 11:00 AM – 1:00 PM (lab)

**First Meeting:** Monday, January 5, 2015

**Examination Date:** Friday, January 30

**Location:** TBA

**Course Instructors:** Barbara Fullerton ([Barbara\\_fullerton@meei.harvard.edu](mailto:Barbara_fullerton@meei.harvard.edu)), James Kobler, James Heaton

**Guest lecturers:** Joe Perkell, John Rosowski

**\*Virology 301qc. Advanced Topics in Virology - Viral Oncology (January Course)**

Catalog Number: 33563

James DeCaprio (Medical School)

Quarter course (spring term). Tu., Th., 4:30–6:00.

Introduction to viral oncology and critical evaluation of key papers in viral oncology. Requirements include presentations, written critiques and class participation.

*Note:* Offered in the month of January.

**Tentative Schedule**

<b>When</b>	<b>What</b>	<b>Who</b>	<b>Pathway</b>
Tue 01/06/15 4:30 - 6:00	Introduction to Viral Oncology	DeCaprio	
Thu 01/08/15 4:30 - 6:00	HTLV-1	Jacobsen	
Tue 01/13/15 4:30 - 6:00	KSHV	Kaye	
Thu 01/15/15 4:30 - 6:00	HPV	Howley	p53
Tue 01/20/15 4:30 - 6:00	EBV	Gewurz	
Thu 01/22/15 4:30 - 6:00	MCPyV	DeCaprio	Rb

**January Session 2015**

**Meeting Dates:** January 6, 8, 13, 15, 20, 22

**Time:** 4:30 – 6:00pm

**First Meeting:** Tuesday, January 6, 2015

**Last Meeting:** Thursday, January 22, 2015

**Location:** TMEC 447

**Course Head:** James A. DeCaprio, [james\\_decaprio@dfci.harvard.edu](mailto:james_decaprio@dfci.harvard.edu)

## *Other courses of interest*

### **\*Systems Biology 301qc. Studying Evolution through Models and Experiments (January Course)**

Catalog Number: 31854

Roy Kishony (Medical School) 5501

*Quarter course (spring term). M. through F., 10–11:30.*

Intensive January course covering theoretical foundations in population genetics, genetic drift versus selection, identifying selection in genomes, advances in laboratory evolution experiments, with applications to key questions in systems biology and evolution.

*Note:* January 12, 2015 - January 23, 2015. Class will be held in Armenise RM 627, HMS. To register for this course, please contact the Systems Biology Department at SysBio.Courses@hms.harvard.edu.

Course website: <http://isites.harvard.edu/k100765>.

#### **January Session 2015**

**Meeting Dates:** January 12-23, 2015

**Location:** Armenise RM 627, HMS

**\*Systems Biology 305qc. Practical Synthetic Biology (January Course)**

Catalog Number: 22318

*Jeff Way (Medical School) 1595 and Pamela Silver (Medical School)*

*Quarter course (spring term). M. through F., 4–6.*

Synthetic biology is a new discipline that seeks to enable the predictable engineering of biological systems. According to one conception of synthetic biology, proteins and genetic regulatory elements are modular and can be combined in a predictable manner. In practice however, assembled genetic devices do not function as expected. The purpose of the course is to go beyond the textbook, first-pass description of molecular mechanisms and focus on details that are specifically relevant to engineering biological systems.

*Note:* January 12, 2015 - January 23, 2015. Class will be held in Warren Alpert RM 563, HMS. To register for this course, please contact the Systems Biology Department at [SysBio.Courses@hms.harvard.edu](mailto:SysBio.Courses@hms.harvard.edu). Course website: <http://isites.harvard.edu/k100763>.

**January Session 2015**

**Meeting Dates:** January 12-23, 2015

**Location:** Warren Alpert RM 563, HMS