



The Leder Human Biology and Translational Medicine Program

Harvard Medical School/HHMI Med-into-Grad Program/Harvard Catalyst T32 Program

Co-Directors: Connie Cepko and Thomas Michel, Associate Director Patricia D'Amore



GOALS OF THE LHB PROGRAM

To provide Harvard PhD students with training in human biology and disease, and to facilitate student contact with patients, clinicians, and scientists pursuing discovery in human biology and translational medicine.

LHB Faculty and Students

- 57 grad students over 5 years enrolled in the LHB program.
- There are 96 LHB faculty members from throughout Harvard University— from all Harvard Medical School graduate programs, including Biological and Biomedical Sciences, Virology, Immunology, Neurosciences, Systems Biology, and from all the major HMS teaching hospitals.
- Many new LHB faculty are hospital-based faculty who were not previously engaged in graduate student teaching.

LHBTM Leadership

Co-Directors: Connie Cepko and Thomas Michel
 Associate Director: Patricia D'Amore
 Clinical Curriculum: Jordan Kriedberg
 Advisers: above faculty, plus Elizabeth Engle and David Frank
 Steering Committee Chair: Joe Loscalzo

Program Components

Applications: G1 students from across all Harvard Life Sciences Graduate Programs can apply to LHB in the fall of their G1 year. All applicants are interviewed, and *nearly* all are admitted to LHB.

Curriculum: All semester-length LHB courses are available to all Harvard graduate students

Clinical Courses and Extracurricular Programs: Available only to LHB students

Advising: All LHB students are assigned an adviser from the LHB faculty leadership.

Program Support

- HHMI Med-into-Grad Award
- HMS teaching hospital contributions
- CTSC "Harvard Catalyst" T32 training grant
- Merck gift
- Leder endowment

Summary of LHBTM Program of Study

Yr 1 Fall	Yr 1 January	Yr 1 Spring	Summer Yr 1/2	Year 2 Fall
<i>Micro 230</i> <i>BCMP 200 and Gen 201 recommended</i> <i>Meet LHB Program Advisor</i>	HB 233: Case Studies in HBTM	BCMP 234. Cellular Metabolism and Human Disease HT 035. Principles of Pathology LHB Elective	*Continue laboratory rotations/thesis research. **Disease-Centered Tutorial and Clinic	BCMP 235 "Principles of human disease: physiology and pharmacology". **Start Mentored Clinical Case Book (MCCB) LHB Elective *Preliminary Qualifying Exam *PhD Courses
	*Laboratory rotations	*PhD Courses *Laboratory rotations		

Required Courses

Case Studies in Human Biology: course director Jeffrey Drazen and NEJM-based faculty (G1 January term)

Cellular metabolism and human disease: course directors Thomas Michel and Rob Lue (G1 Spring semester)

Principles of Pathology (offered through the Harvard-MIT HST Program): course director Kamran Badizadegan (G1 Spring)

Principles of Disease: Pathophysiology and Pharmacology: course directors David Sloane, Julian Seifter and David Golan (G2 Fall semester)

Elective courses: a total of 1.5 semesters in courses dealing with some aspect of human biology.

Translational Pharmacology: January term G2 year

One Clinical Course: Mentored Clinical Casebook or Mentored Disease-Centered Tutorial Clinics

Clinical Experiences

- Mentored Clinical Casebook: G2 students follow one patient longitudinally; meet with medical students and faculty advisor
- Mentored tutorial clinics: students shadow a physician-scientist in selected subspecialty clinics and encounter a variety of patients (Eight weekly-1/2 day sessions, in G2 Spring semester)

LHB Extra- and Paracurricular Activities

Student-Faculty Retreat

- ~75% of students attended in 2010
- Breakout sessions discussed LHB curriculum and the Harvard Catalyst
- Student talks and posters
- Faculty attended the poster session and dinner
- Student leadership group formed
- Peer mentoring/support group was created: "LHBuddies"

LHB Dinner Series

- Once every other month
- Career opportunities and networking

LHB-MD/PhD Grand Rounds

- Once every other month
- With MD/PhD students, residents and clinical faculty at BWH
- Clinical cases presented and discussed by master clinicians, followed by research based discussions by LHB and MD-PhD students
- Contact with clinicians

Student-organized Symposia

- Tissue Regeneration
- Translational Research
- Pathology

Additional Activities

- Pathology Sign-out Rounds
- Autopsy/Organ Recitals
- Field trips

Interactions of LHB within HMS and Beyond

- Active HMS participation in Med-into-Grad meeting at U. of Pennsylvania (17 students from HMS)
- LHB/MD-PhD Grand Rounds
- Harvard College programs and students
- Scholars in Clinical Science Program
- Medical students at HMS
- Physician-scientists in clinical courses

Interface with the Harvard Catalyst (CTSC)

- The HMS CTSC award (Harvard Catalyst) includes a T32 training grant for LHB Program
- The Harvard Catalyst Research and Education Program involves LHB as a key component of the Catalyst's educational mission in basic translational medicine.

LHB Student Thesis Topics

- 43% Translational
- 31% Direct medical relevance
- 26% Basic science

There is no requirement that students pursue "translational" thesis dissertation topics, but many do so.

Only one student has completed their PhD to date. Several more graduations are expected in the next academic year.

1st Class entering 2006	Thesis Topic	Thesis Lab
Chao, Michael	Events regulating hydrolysis of TB cell wall	Eric Rubin, HMS Microbiology and School of Public Health (Immunology)
Chiang, Charleston	Function of ultraconserved elements in human genome	Joel Hirschhorn, HMS Genetics and Children's Hospital
Chrisodoulou, Danos	Cardiac Metabolism	Rong Tian, Brigham & Women's Hospital
LeBleu, Valerie	Cell-based therapy of Alport Syndrome	Raghu Kalluri, HMS-BCMP, Beth Israel Deaconess Hospital
Madigan, Cressida	Host Factors for infection of Trypanosoma cruzi	D. Branch Moody, Brigham & Women's Hospital
Yang, Kailin	Deubiquitination in the Fanconi Anemia pathway	Alan D'Andrea, Dana Farber Cancer Institute
Zeng, Xing	Small molecule inhibitor of anaphase promoting complex	Randy King, HMS-Cell Biology
2nd Class entering 2007	Thesis Topic	Thesis Lab
Arany, Praveen	Mechanical forces for tooth formation	David Mooney, FAS
Bui, Duven (Amy)	Hippo/sal/lats pathway in breast cancer	Joan Brugge, HMS Cell Biology
Choi, Eun	fMRI in Primates	Randy Buckner, Psychology
Curtis, Stephen	Stem Cells in Lung Cancer	Carla Kim, Children's Hospital
Hall, Jessica	Thyroid hormone mechanism of action	Tony Bianco, BWH
Markovski, Monica	Using a synthetic lethal screen to find bacterial chromosomal segregation mutants that are sick without simA	Tom Bernhardt, HMS Micro
Paik, Elizabeth	Hox genes in stem cell development	Len Zon, Children's Hospital
Ramirez, Cherie	Zinc finger nucleases to target disease genes/RNAs	Keith Joung, Massachusetts General Hospital
Zhang, Chi	pro-apoptotic kinase MST1: role in stress induced apoptosis	Azad Bonni, HMS Pathology

LHB Web site:

http://www.hms.harvard.edu/dms/Leder_Human_Biology/Program.html