TRANSLATIONAL RESEARCH

HOWARD HUGHES MEDICAL INSTITUTE MED-INTO-GRAD TRANSLATIONAL TRAINING PROGRAM (TTP)

The Howard Hughes Medical Institute - University of Chicago PhD/MS Translational Training Program (TTP) is designed to engage students in both basic biological and clinical research, and to bridge the gap between highly specialized research and human disease processes in the context of a formal PhD program. Graduates will receive a PhD in their chosen discipline and an MS in Translational Research.

In addition to gaining a strong understanding of modern research methodology, trainees will simultaneously be trained in pathophysiology and exposed to clinical problems that present them with opportunities to establish credentials as a biomedical researcher.

First-year doctoral students in the Biomedical Sciences cluster, which includes the Committees on Cancer Biology, Immunology, Microbiology, Molecular Metabolism and Nutrition, and the Department of Pathology, Molecular Pathogenesis and Molecular Medicine program, are eligible to apply. These five academic units share several common courses, seminar series, retreats and additional common events.

Students in the Neuroscience cluster, specifically the Committees on Neurobiology and Computational Neuroscience, are also welcome to apply. Neurobiology is an interdepartmental program designed to provide training and instruction for students interested in the biology of the nervous system, while computational neuroscience is concerned with how components of the various nervous systems interact to produce behaviors.

The Translational Training Program courses (several that were designed specifically for this program), lectures and workshops offer exposure to a wide array of clinical situations which would not be experienced in a regular basic science program. In addition, the requirement of having a thesis supervisor with a clinical background assures a medical focus in the research project.

Participants are also required to develop thesis projects focused on human biology or disease processes, and remain intellectually engaged with translational research topics through various conferences, seminars and the CTSA Translational Research and Outcomes Research workshops. Each trainee will have two mentors: one from their primary program and one with a clinical background.

Program participants receive a supplement to the current stipend levels, as well as funds toward laboratory expenses (core facilities charges, statistical analysis, etc.), consumables and conference attendance.
MOLECULAR PATHOGENESIS & MOLECULAR MEDICINE COURSES

MPMM 30900. Cancer Biology 2: Molecular Mechanisms in Cancer Biology. 100 Units.
This course provides students with an in-depth understanding of how key cellular processes are deregulated in cancer and the molecular mechanisms underpinning these defects. The course covers cell cycle checkpoint control, cell death, tumor suppressor and oncogene function, DNA repair mechanisms, epigenetics of cancer, nuclear hormone receptor activity in cancer, tumor metabolism, hypoxia responses, angiogenesis and metastasis. In addition to material covered in formal lectures, discussion sessions cover tumor stem cells, "oncogene addiction," inflammatory responses, cancer therapeutics, mouse models of human cancer and other topical subjects relevant to understanding tumor initiation and progression, as well as how current research may facilitate cancer treatment.
Instructor(s): Donald Vander Griend Terms Offered: Winter
Equivalent Course(s): CCTS 40200, CABI 30900

MPMM 33000. Extracellular Matrices: Chemistry and Biology. 100 Units.
This course covers advanced topics dealing with the biology and chemistry of the extracellular matrix, cell-matrix interactions, and current methodologies for engineering these interfaces.
Instructor(s): J. Collier, M. Mrksich, M. Gardel, K. Matlin Terms Offered: Spring
Prerequisite(s): For College students: Completion of the first three quarters of a Biological Sciences fundamentals sequence or consent of instructor.
Equivalent Course(s): BIOS 21357

MPMM 34300. Selected Topics in Molecular Engineering: The Engineering and Biology of Tissue Repair. 100 Units.
This course will examine the biomolecular and cellular bases for tissue engineering, including biological processes and biomolecular actors underlying morphogenesis and tissue repair in a number of tissue systems. Biomaterials and drug release principles being developed for tissue engineering will be examined, and the means by which molecular engineering is interfaced with the biomolecules and cells involved in tissue morphogenesis for tissue engineering will be elaborated. Selected case studies in different tissue engineering applications will be considered both through didactic presentations and projects undertaken by the students.
Course work or research experience in cell biology and biochemistry strongly recommended.
Instructor(s): Joel Collier Terms Offered: Spring
Prerequisite(s): BIOS 20186 or BIOS 20234
MPMM 36600. Molecular Nutrition II. 100 Units.
This course is an extension of Molecular Nutrition 1 and investigates the physiological control of systemic metabolism. Heavy emphasis is placed on the coordinate regulation of glucose and lipid metabolism by skeletal muscle, liver, adipose tissue, pancreas and brain. The format of the course is a combination of lectures and student presentations of primary literature. At the end of the course, students are expected to write a grant application to investigate a current area of metabolism research and then present and defend the proposal to the lecturers and students
Instructor(s): M. Brady, C. Reardon, Staff Terms Offered: Winter. Winter 2016
Equivalent Course(s): MOMN 36600

MPMM 40400. Genomics of Personalized Medicine. 050 Units.
Aspects of genomics have slowly become integrated into many levels of medical research. This has led to the incorporation of genomics into clinical trial design, cost-effectiveness research, pharmacogenetic studies, as well as influencing the direction of basic science investigation. The field of medical genomic is fast moving and requires specialized knowledge in genetics, statistics, molecular and cell biology, animal models, and epidemiology, thus making it a highly collaborative and translational field. This is a new course designed specifically for upper level graduate students, fellows and junior faculty members, and is meant to provide a strong overview of several areas of knowledge needed to integrate genomics into medical research. Each class will address a different aspect of genetics and genomics as they relate to disease, with emphasis on state-of the-art research methods, current study designs and analysis, and relevant clinical examples drawn from a wide range of medical fields. At the end of this course, clinicians and translational researchers will have a good understanding of how genetics/genomics provides a basis for personalized medicine.
Instructor(s): Minoli Perera Terms Offered: Summer
Equivalent Course(s): CABI 40400,CCTS 40003

MPMM 40500. Team Translational Project I. 100 Units.
No description available.
Instructor(s): Louis Philipson and Richard Kraig Terms Offered: Summer
Prerequisite(s): Admission to HHMI-MiG program

MPMM 40614. Team Translational Project II. 100 Units.
No description available.
Instructor(s): Louis Philipson and Richard Kraig Terms Offered: Autumn
Prerequisite(s): Admission to HHMI-MiG program

MPMM 40700. Team Translational Project III: Translational Research and Associated Clinical Trials. 100 Units.
No description available.
Instructor(s): Nancy Schwartz Terms Offered: Winter
Prerequisite(s): Consent of instructor
MPMM 40800. Team Translational Project IV: Clinical Experience. 100 Units.
No description available.
Instructor(s): Nancy Schwartz Terms Offered: Summer
Prerequisite(s): Admission to HHMI-MiG program