

University of Utah Molecular Medicine Med into Grad Program



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The University of Utah
Molecular Medicine

University of Utah Med into Grad (U2M2G) Program

The national discussion on translational medicine has focused on the dearth of physician-scientists.

Essential to reorient training of PhD-scientists who perform the majority of NIH funded research and populate biotechnology and pharmaceutical companies.

U2M2G Mission:

- 1) Transform basic-science graduate education by integrating medically-relevant courses into pre-doctoral training
 - Molecular Medicine core courses open to all interested PhD students
 - post-doc and faculty participate to maximize impact

- 2) Train a new breed of PhD scientists: **HHMI Med into Grad Scholars**
 - matriculate 6 PhD trainees/year into a 3 year course of study to acquire specialized skill sets



U2M2G Core Courses

Fundamentals of human physiology, pathophysiology, genetics and therapeutics to all interested PhD students, post-docs and faculty

Medicine and Physiology for the Molecular Biologist

Provides trainees with an understanding of normal and abnormal human physiology and relevant clinical experiences so they can connect their research to human disease.

Faculty is a cadre of successful physician-scientists

Each topic/organ system covers:

- 1) anatomy, histology and embryology
- 2) physiology
- 3) pathophysiology
- 4) current therapeutic challenges
- 5) clinical rounds on the relevant services with faculty and clinical trainees



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Utilization of Animal Models in the Development of Clinical Models

One of many U2M2G -sponsored activities in which basic science and clinical (CCTS) trainees interact.

Lectures emphasize use of genetically modified organisms to:

- dissect developmental and physiological processes
- design models of specific human pathologies
- develop new therapeutic approaches and pharmaceutical targets



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Genetics of Complex Human Diseases

Identification of susceptibility genes

GWAS design

Family studies

Gene-gene and gene-environment interaction and use of the Utah Population Database

Principles illustrated with current studies of complex diseases such as inflammatory bowel disease, juvenile idiopathic arthritis, hypertension, cancers, and psychiatric diseases.



HHMI Med into Grad Scholar Program

A specialized course of study for selected PhD candidates

- Didactic and informal components
 - * core and elective courses
 - * bootcamps, seminars, symposia and journal clubs
- Bespoke mentoring
- Financial support - currently through HHMI
- offer a Master of Science of Clinical Investigation

Integrates seamlessly with graduate training; completed concurrently

Nurtures research relevant to human health

Stimulates interactions with clinical scientists and technology developers



Med into Grad Scholar Program

Interfaces with translation, technology transfer and commercialization

A unique and important feature of the Med into Grad course of study is that clinicians, physician- and basic- scientists, bioengineers, entrepreneurs, and faculty in the Schools of Business and Law collaborate to teach the courses and mentor trainees in multiple contexts.

Goal: make trainees and faculty aware of the scientific, medical, business, and legal considerations required to translate scientific discoveries into medical advances.

A model of cooperation for other research, clinical and commercialization efforts.



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University of Utah HHMI Med into Grad Bootcamps

U2M2G Translational Research and Technology Development Bootcamp

Mentor trainees to view discoveries in the context of practical applications in medicine and industry

U2M2G Health Sciences-Targeted Grant Writing Bootcamp

Instills fundamentals of good grantsmanship; emphasis on preparing proposals for organizations with missions in human health

Workshops on concept and protection of IP, idea-to-development, commercialization, and components of a development team



Med into Grad Scholar Clinical Activities

Translational Medicine Education Rounds

Led by Attending Physicians, Chief Residents, and senior fellows in diverse clinical specialties

Case-based rounds explore presentation, diagnosis, treatment, ethics, and applied technologies

Clinical Research Conferences

Trainees teamed with clinical "translator" (resident/fellow) for weekly CRC in area of focus

Goal: help trainees become conversant with vocabulary of medicine, tests, treatments

Clinical Rotations

Individualized, final year of course of study

Translational Internship

Individualized, final year of course of study

Additional Program Activities

Bring U2M2G, CCTS, MD/PhD, Medical students together

Molecular Medicine Research Seminar

Physician-scientists present their research and its implications for pathophysiology and treatment of human disease.

Molecular Medicine Journal Club

Papers are selected that interrogate connection between basic science and medicine.

Molecular Medicine Symposium

Average 40 faculty and 100 U2M2G, MD/PhD, Medical Student Research, CCTS and T32 trainees present their research in platform and poster sessions. Outside guest speakers present their translational work and evaluate our program.



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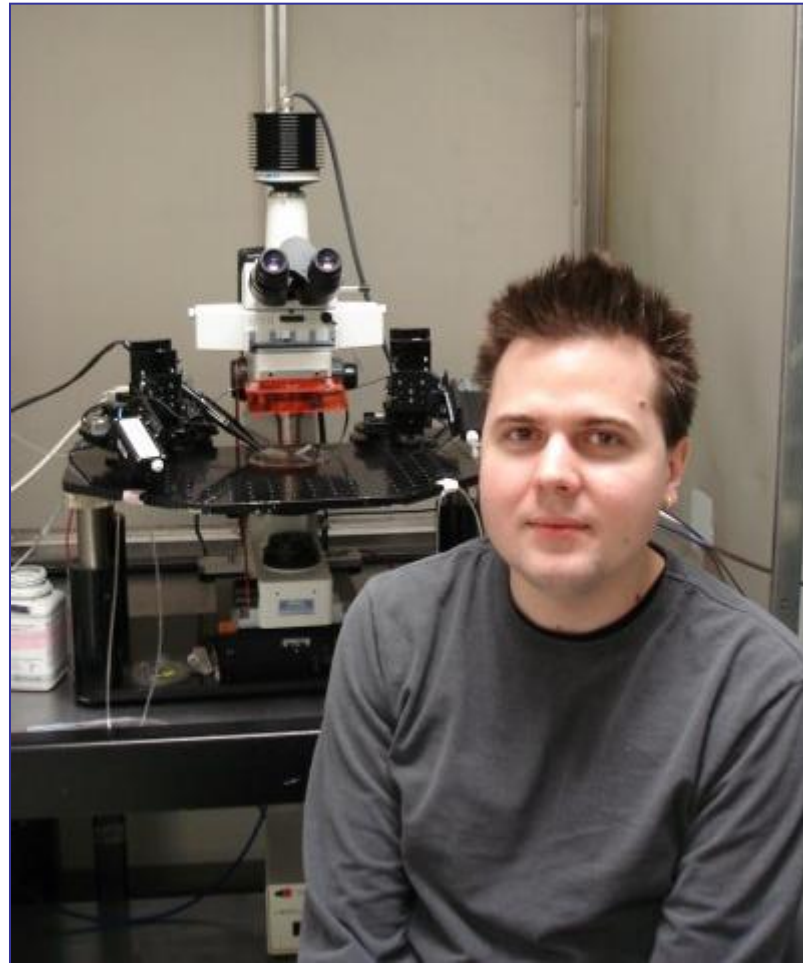
Molecular Medicine

Henok Eyob Oncological Sciences



“I believe that scientists should confront the reality of human disease and need to learn the human aspects of dealing with patients and their families.”

Andrew Zayachkivsky Neuroscience and Physiology



“Disorders that result from neonatal stroke such as cerebral palsy, cognitive deficits and epilepsy, inflict a tremendous amount of human suffering and present an enormous cost to society. Studying seizures and epilepsy using my model is particularly appealing to me because it is closely based on an actual injury seen in human neonates.”

Jodi McKenzie Oncological Sciences



“As basic scientists, it is easy to become so focused on the molecular aspects of the problem that the big picture of the human disease is lost... we forget the very essence that drives us to do research:

How can we understand a disease in a way that will ultimately allow us to help patients?”

Savita Sankar Oncological Sciences



“I want to develop a better understanding of clinically relevant principles, including the ability to identify the most important biological problem in my research area and the eye to translate the discoveries in basic science into disease intervention methods that will improve human health.”

David Woessner Pharmacology and Toxicology



“I believe translational research is quickly becoming the cornerstone of modern-day scientific pursuit. As Ph.D. researchers, we must aspire to look beyond the discovery of pathways and integrate that knowledge to correct clinical pathologies. “

Our thanks to Howard Hughes Medical Institute
for supporting the University of Utah Med into Grad Program
and our exceptional first class of HHMI Med into Grad Scholars.



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