

**HST.160**  
***Genetics in Modern Medicine***  
**Syllabus – Fall 2018**

## COURSE INFORMATION

MIT E25 – Room 111, Tuesdays 2-5 PM

### Tuesday, September 11th

Introduction and Welcome  
Overview of Heritability – Variants of High Effect Size  
Fabry's Disease (Patient visit)  
Problem Set #1 distributed

Course instructors  
Sahar Nissim 2-4  
Andy Stergachis 4-5

### Tuesday, September 18th

Clinical Genetic Testing  
Autism Spectrum Disorders  
Usher Syndrome (Patient Visit)  
Problem Set #1 due, PS #2 distributed

Joel Krier 2-3  
Christopher Walsh 3-4  
Marly Kenna 4-5

### Tuesday, September 25th

Genetics of Schizophrenia (Patient Visit)  
Genetic Architecture of Complex Traits  
PS #2 due, PS #3 distributed

Rakesh Karmacharya 2-3  
Sek Kathiresan 3-5

### Tuesday, October 2nd

Epigenetics: Mechanisms in Cell Specification and Inheritance  
Evolution and Genotype-Phenotype Relationships  
Huntington's Disease (Patient Visit)  
PS#3 due, PS #4 distributed

Salil Garg 2-3  
Salil Garg 3-4  
Diana Rosas 4-5

### Tuesday, October 9th

Cancer Genetics (Patient Visit)  
PS#4 due, PS #5 distributed

Sahar Nissim 2-5

### Tuesday, October 16th

Genome Editing  
Single Cell Analysis  
Gene Therapy in Retinopathy  
PS #5 due

Salil Garg 2-3  
Salil Garg 3-4  
Jason Comander 4-5

### Tuesday, October 24th

Final Exam 2-5

## **COURSE GOALS**

Our goal is to prepare you to become a future leader in biomedicine. The course is targeted to medical students, biomedical scientists, biomedical engineers, and future instructors across all medical disciplines. Genetics increasingly occupies a central role in how we think about disease pathophysiology and is at the forefront of personalized medicine. We will expose you to some of the leading thinkers in Genetics across varied topics with the knowledge that most HST graduates go on to future leadership roles in these areas. Some specific questions to be addressed include:

What constitutes the genetic basis of a disease, and how does one go about identifying it?  
What technologies are used to make genetic diagnoses and how can these be improved?  
What molecular mechanisms contribute to genetic disease, and what others could we be missing?

## **COURSE EXPECTATIONS**

We expect everyone to participate and engage in the course. This includes turning in problem sets in a timely fashion. If circumstances demand, extensions can be arranged with the TAs. Additionally, we will have patient visitors for many classes. Please dress appropriately and give them your full attention while they tell their stories. It is perfectly acceptable to take notes on a laptop during lectures but for our patients please refrain until they are finished to give them your undivided attention.

## **COURSE INSTRUCTORS**

Course Co-Director – Sahar Nissim, M.D. Ph.D.

Course Co-Director – Salil Garg, M.D. Ph.D.

Teaching Assistant – Travis Hughes

Teaching Assistant – Swati Kataria