

**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                                | Course instructors |     |
| Overview of Heritability – Variants of High Effect Size | Sahar Nissim       | 2-4 |
| Fabry's Disease (Patient visit)                         | Andy Stergachis    | 4-5 |
| Problem Set #1 distributed                              |                    |     |

Tuesday, September 18th

|                                       |                   |     |
|---------------------------------------|-------------------|-----|
| Clinical Genetic Testing              | Joel Krier        | 2-3 |
| Autism Spectrum Disorders             | Christopher Walsh | 3-4 |
| Usher Syndrome (Patient Visit)        | Marly Kenna       | 4-5 |
| Problem Set #1 due, PS #2 distributed |                   |     |

Tuesday, September 25th

|   |                    |     |
|---|--------------------|-----|
| Genetics of Schizophrenia (Patient Visit) | Rakesh Karmacharya | 2-3 |
| Genetic Architecture of Complex Traits    | Sek Kathiresan     | 3-5 |
| PS #2 due, PS #3 distributed              |                    |     |

Tuesday, October 2nd

|   |             |     |
|---|-------------|-----|
| Epigenetics: Mechanisms in Cell Specification and Inheritance | Salil Garg  | 2-3 |
| Evolution and Genotype-Phenotype Relationships                | Salil Garg  | 3-4 |
| Huntington's Disease (Patient Visit)                          | Diana Rosas | 4-5 |
| PS#3 due, PS #4 distributed                                   |             |     |

Tuesday, October 9th

|                                 |              |     |
|---------------------------------|--------------|-----|
| Cancer Genetics (Patient Visit) | Sahar Nissim | 2-5 |
| PS#4 due, PS #5 distributed     |              |     |

Tuesday, October 16th

|                             |                |     |
|-----------------------------|----------------|-----|
| Genome Editing              | Salil Garg     | 2-3 |
| Single Cell Analysis        | Salil Garg     | 3-4 |
| Gene Therapy in Retinopathy | Jason Comander | 4-5 |
| PS #5 due                   |                |     |

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