

Genomics for Social Scientists (DRAFT)

Dates: June 12 – 16, 2017

Time & Location: 9:00 – 4:00

R0230 Ross School of Business

University of Michigan

MONDAY, June 12

- 8:30 - 9:00 *(Optional) Introduction to R*
- 8:30 - 9:00 Light breakfast and coffee served
- 9:00 - 9:15 *Introduction to the Workshop*
Jessica Faul & Colter Mitchell
- 9:15 - 10:00 *Introduction to biology and genetics – understanding genomic data in populations*
Sharon Kardia
- 10:00 - 10:30 *Collecting, extraction, and storing genetic material; cost and coverage of different platforms/chips*
Jessica Faul
- 10:30 - 10:45 Break
- 10:45 - 11:15 *Population stratification and admixture – avoiding the pitfalls and utilizing the strength of ancestry and admixture*
Jennifer Smith
- 11:15 - 12:00 *Quality control – estimating and interpreting minor allele frequency and Hardy-Weinberg equilibrium, heterozygosity, and linkage disequilibrium*
Wei Zhao & Sharon Kardia
- 12:00 - 1:00 Boxed Lunch Provided
- 1:00 - 4:00 *Lab: Understanding genetic file types and the content of the files*
Viewing and exploring Genome-wide data
Erin Ware
- 4:00 - *Mixer at Ross School of Business*

TUESDAY, June 13

- 8:30 - 9:00 Light breakfast and coffee served
- 9:00 - 10:30 *Description of the National Study of Adolescent Health and Tips in Navigating the Social Science and Genomics World*
Kathleen Mullan Harris
- 10:30 - 10:45 Break

- 10:45 - 11:15 *Imputation – basic explanation of genotype imputation, inputs and outputs, using online reference sources HapMap and 1000 Genomes Project*
Jennifer Smith
- 11:15 - 12:00 *GWAS and meta analyses - alleles, effects, models, p-values*
Jennifer Smith
- 12:00 - 1:00 Lunch (on your own)
- 1:00 - 4:00 *Lab: Understanding and working with different genomic coding schemes*
Assessing genomic data quality control
Erin Ware

WEDNESDAY, June 14

- 8:30 - 9:00 Light breakfast and coffee served
- 9:00 - 9:45 *Statistical Power issues - multiple testing and genomic inflation*
Colter Mitchell
- 9:45 - 10:30 *Structural and rare variants*
Jennifer Smith
- 10:30 - 10:45 Break
- 10:45 - 11:30 *SNP-based heritability*
Wei Zhao
- 11:15 - 12:00 *Collaborating – working with labs, finding a collaborator, working with consortia*
Jessica Faul
- 12:00 - 1:00 Lunch (on your own)
- 1:00 - 4:00 *Lab: Resources for determining genetic regions (external to data)*

Extracting genetic data for analysis
Erin Ware

THURSDAY, June 15

- 8:30 - 9:00 Light breakfast and coffee served
- 9:00 - 9:45 *Gene-environment interaction models – from candidate genes to GWAS data-based models, formal testing GxE*
Colter Mitchell
- 9:45 - 10:30 *Examining the Dynamic Gene: Telomeres and epigenetics*

Colter Mitchell

- 10:30 - 10:45 Break
- 10:45 - 12:00 *Constructing and Using Polygenic Scores*
Daniel Belsky, Duke University
- 12:00 - 1:00 Lunch on own
- 1:30 - 4:00 *Lab: Basic viewing of genetic data*
Genomic analyses primer
Constructing Polygenic Scores
Erin Ware
- 4:30 - *Mixer at ISR, 426 Thompson St*

FRIDAY, June 16

- 8:30 - 9:00 Light breakfast and coffee served
- 9:00 - 9:45 *Pitching your ideas and publishing your work - How to justify your work in a grant application, common review complaints, journals and funding*
Faculty Panel
- 9:45 - 10:30 *Student Presentations I*
- 12:00 - 1:00 Lunch
- 1:00 - 3:00 *Student Presentations II*
- 3:00 - 3:15 Break
- 3:15 - 3:45 *Future Training Opportunities*
Sharon Kardia
- 3:45 - 4:00 Final Remarks and Evaluation of Course