



Genomics for Social Scientists

Epigenetics
NATIONAL INSTITUTE ON AGING

Dates: June 12 – 16, 2023
Location: Institute for Social Research
426 Thompson St, Room 1430
University of Michigan

MONDAY, June 12

9:15 Light breakfast and coffee served
9:30 – 10:30 *Introduction to the Workshop, Student Introductions*
Colter Mitchell & Jessica Faul
10:30 – 12:00 *Biology of Epigenetics*
Dan Notterman
12:00 – 1:00 Boxed Lunch Provided
1:00 – 1:45 *Collection, Storage, and Stability of DNA methylation*
Jessica Faul
1:45 – 2:00 Break
2:00 – 4:45 *Lab:*
Intro R/R Studio
R Markdown
Importing/Exploring the Data
Erin Ware
5:00 *Social Event at ISR*

TUESDAY, June 13

8:45 Light breakfast and coffee served
9:00 – 9:30 Recap of the previous day and questions
9:30 – 11:00 *DNA methylation quality control*
Colter Mitchell
11:00 – 11:15 Break
11:15 – 12:00 *Clinical and Biological Perspectives*
Dan Notterman
12:00 – 1:00 Lunch (on your own)
1:00 – 2:15 *Fundamental epigenetic analysis*

Jennifer Smith

2:15 – 2:30 Break
2:30 – 5:00 *Lab:*
Intensity analysis
Bisulfite quality
Hybridization quality
Detection p-values
Red/green dye bias
Probe types I and II
Cross-reactive probes
Gap probe identification
Erin Ware

WEDNESDAY, June 14

8:45 Light breakfast and coffee served
9:00 – 9:30 Recap of the previous day and questions
10:00 – 10:30 *Data reduction in epigenetic data*
Colter Mitchell
10:30 – 11:00 *Online resources for epigenetic data and analyses*
Erin Ware
11:00 – 11:15 Break
11:15 – 12:00 *Mediation methods*
Jennifer Smith
12:00 – 1:00 Lunch (on your own)
1:00 – 2:30 *Genetics and Methylation*
Jennifer Smith
2:30 – 2:45 Break
2:45 – 4:45 *Lab:*
Background Correction
Between sample normalization (not recommended)
Contamination checks
Sex and Ancestry checks
Batch examination and adjustments
Cell type estimation
Erin Ware

THURSDAY, June 15

8:45 Light breakfast and coffee served
9:00 – 9:30 Recap of the previous day and questions
9:30 – 10:15 *Epigenetic Clocks*
Jessica Faul
10:15 – 10:45 *Measurement and Reliability of DNA methylation*
Colter Mitchell
10:45 – 11:00 Break

- 11:00 – 11:45 *NICOLA*
Claire Potter
- 11:45 – 12:15 *Studies with DNA methylation*
Jessica Faul
- 12:15 – 1:15 Lunch (on your own)
- 1:15 – 1:45 *Conversation: Epigenetics for health disparities*
Workshop Faculty
- 1:45 – 3:45 *Lab:*
Global analysis
Single site analysis, EWAS
DMR
Pathway analysis
Data visualization
meQTL
Finding code/pipelines online
Finding data online
Erin Ware
- 5:30 *Social Event at Bill's Beer Garden, Ashley St. Ann Arbor*
210 S. Ashley St, Ann Arbor, MI 48104
Weather alternative: ISR lobby

FRIDAY, June 16

- 8:45 Light breakfast and coffee served
- 9:00 – 9:30 Recap of the previous day and questions
- 9:30 – 10:30 *Student Presentations Group A*
- 10:30 – 10:45 Break
- 10:45 – 11:45 *Student Presentations Group B*
- 11:45 – 12:45 Lunch (provided)
- 12:45 – 1:45 *Student Presentations Group C*
- 1:45 – 2:15 ISR & lab tour



Agenda August 2022

Dates: August 8 - 11, 2022
Location: Virtual!

MONDAY, August 8th

Topics covered in video or live lectures

- Motivation for epigenetics in social and behavioral research
- Biology of epigenetics
 - Overview, DNA modifications
 - Histone modifications, regulatory RNA, cells and tissues
 - Timing, genes and the environment
- Strategies for collection and measurement of DNA methylation

Office Hours: 2:00 -2:30 PM (ET)

Lab 1: 2:30 PM – 5:00 PM (ET)

- RStudio Cloud info
- Introduction to R
- Importing/exploring the data

TUESDAY, August 9th

Lab 1 Help Desk: 9:30 AM -11:30 AM (ET)

Office Hours: 11:00 AM -12:00 PM (ET)

Topics covered in video or live lectures

- DNA methylation quality control I
- Consortia and studies with epigenetic data (Live! lecture during discussion)
- Online resources for epigenetic data and analyses

Office Hours: 2:00 -2:30 PM (ET)

Lab 2: 2:30 PM – 5:00 PM (ET)

- Intensity analysis
- Bisulfite quality
- Hybridization quality
- Detection p
- Red/green probe quality



- Cross-reactive probes
- Gap probe identification

WEDNESDAY, August 10th

Lab 2 Help Desk: 9:30 AM -11:30 AM (ET)

Office Hours: 11:00 AM -12:00 PM (ET)

Topics covered in video or live lectures

- Fundamental epigenetic analyses
- Data reduction in epigenetic data
- Data reduction in epigenetic data - Clocks (Live! lecture during discussion)
- Genetics and methylation

Office Hours: 2:00 -2:30 PM (ET)

Lab 3: 2:30 PM – 5:00 PM (ET)

- Background Correction
- Sample normalization (not recommended)
- Contamination checks
- Sex and Ancestry checks
- Batch examination and adjustments
- Cell type estimation

THURSDAY, August 11th

Lab 3 Help Desk: 9:30 AM -11:30 AM (ET)

Office Hours: 11:00 AM -12:00 PM (ET)

Topics covered in video or live lectures

- Special analysis topics in epigenetics (Live! Lecture during discussion)
- Next steps (Live! lecture during discussion)

Office Hours: 2:00 -2:30 PM (ET)

Lab 4: 2:30 PM – 5:00 PM (ET)

- Epigenetic clocks
- Global analysis
- Single site analysis, EWAS
- DMR
- Pathway analysis
- Data visualization



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- meQTL
- Finding code/pipelines online
- Finding data online

FRIDAY, August 12th

Lab 4 Help Desk: 9:30 AM -11:30 AM (ET)



Agenda August 2021

Dates: August 9-12, 2021

Location: Virtual!

MONDAY, August 9th

Topics covered in video or live lectures

- Motivation for epigenetics in social and behavioral research
- Biology of epigenetics
 - Overview, DNA modifications
 - Histone modifications, regulatory RNA, cells and tissues
 - Timing, genes and the environment
- Strategies for collection and measurement of DNA methylation

Office Hours: 2:00 -2:30 PM (ET)

Lab 1: 2:30 PM – 5:00 PM (ET)

- RStudio Cloud info
- Introduction to R
- Importing/exploring the data

TUESDAY, August 10th

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Office Hours: 11:00 AM -12:00 PM (ET)

Topics covered in video or live lectures

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- Consortia and studies with epigenetic data
- Online resources for epigenetic data and analyses

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- Hybridization quality
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- Cross-reactive probes
- Gap probe identification

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- Data reduction in epigenetic data - Clocks (Live! lecture during discussion)
- Genetics and methylation

Office Hours: 2:00 -2:30 PM (ET)

Lab 3: 2:30 PM – 5:00 PM (ET)

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- Cell type estimation

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- Single site analysis, EWAS
- DMR
- Pathway analysis
- Data visualization



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- meQTL
- Finding code/pipelines online
- Finding data online

FRIDAY, August 13th

Lab 4 Help Desk: 9:30 AM -11:30 AM (ET)

Agenda January 2021

Dates: January 11-14, 2021

Location: Virtual!

MONDAY, January 11th

Topics covered in video or live lectures

- Motivation for epigenetics in social and behavioral research
- Biology of epigenetics
 - Overview, DNA modifications
 - Histone modifications, regulatory RNA, cells and tissues
 - Timing, genes and the environment
- Strategies for collection and measurement of DNA methylation

Lab 1:

2:30 PM – 5:00 PM (EST)

- RStudio Cloud info
- Introduction to R
- Importing/exploring the data

TUESDAY, January 12th

Topics covered in video or live lectures

- DNA methylation quality control I
- Consortia and studies with epigenetic data
- Online resources for epigenetic data and analyses

Lab 2:

2:30 PM – 5:00 PM (EST)

- Intensity analysis
- Bisulfite quality
- Hybridization quality
- Detection p
- Red/green probe quality
- Cross-reactive probes
- Gap probe identification



WEDNESDAY, January 13th

Topics covered in video or live lectures

- Fundamental epigenetic analyses
- Data reduction in epigenetic data
- Data reduction in epigenetic data - Clocks (Live! lecture during discussion)
- Genetics and methylation

Lab 3:

2:30 PM – 5:00 PM (EST)

- Background Correction
- Sample normalization (not recommended)
- Contamination checks
- Sex and Ancestry checks
- Batch examination and adjustments
- Cell type estimation

THURSDAY, January 14th

Topics covered in video or live lectures

- Special analysis topics in epigenetics
- Next steps (Live! lecture during discussion)

Lab 4:

2:30 PM – 5:00 PM (EST)

- Epigenetic clocks
- Global analysis
- Single site analysis, EWAS
- DMR
- Pathway analysis
- Data visualization
- meQTL
- Finding code/pipelines online
- Finding data online