Genomics for Social Scientists
Epigenetics
NATIONAL INSTITUTE ON AGING

Agenda 2026

Dates: January 20 – 23, 2026
Location: Virtual!

TUESDAY, January 20th

Topics covered in video or live lectures

- Introductions
- Motivation for epigenetics in social and behavioral research
  - *Videos to watch beforehand*:
    - Part I and Part II
- Biology of epigenetics
  - *Videos to watch beforehand*
    - Overview, DNA modifications
    - Histone modifications, regulatory RNA, cells and tissues
    - Timing, genes and the environment
- Strategies for collection and measurement of DNA methylation
  - *Videos to watch beforehand*:
    - Part I and Part II
- **Live lecture and discussion**
  - EPIC2 vs EPIC1 vs 450K (Trey Smith)
  - If time allows: Consortia and studies with epigenetic data (Jessica Faul)

Lab 1: 2:30 PM – 5:00 PM (ET)

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

WEDNESDAY, January 21st

Topics covered in video or live lectures

- DNA methylation quality control I
  - *Videos to watch beforehand*
    - Illumina array technology
    - Data cleaning pipeline
    - Sources of errors
- Fundamental epigenetic analyses
  - *Videos to watch beforehand*:
    - Part I and Part II

- **Live lecture and discussion**
  - Gene enrichment (Trey Smith)
  - Structured life-course modeling approach: SLCMA (Josh Goode)

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*

THURSDAY, January 22nd

Topics covered in video or live lectures

- Online resources for epigenetic data and analyses
  - *Videos to watch beforehand*
    - Part I and Part II
- Genetics and methylation
  - *Videos to watch beforehand*
    - Part I and Part II
- **Live lecture and discussion**
  - Mediation methods in epigenetics (Jen Smith)
  - Measurement and Reliability (Colter Mitchell)

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*

FRIDAY, January 23rd

Topics covered in video or live lectures

- Data reduction in epigenetic data
  - *Videos to watch beforehand*
    - Global methylation, somatic epimutations, polyepigenetic scores

- **Live lecture and discussion**
    - Data reduction in epigenetic data - Epigenetic surrogates: What have we learned (Colter Mitchell)
    - Data reduction in epigenetic data - Clocks (Jessica Faul)

Lab 4: 2:30 PM – 5:00 PM (ET) *If needed, we often get to this material in Lab 3

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

Dates: June 16 – 20, 2025
Location: Institute for Social Research
426 Thompson St, Room 1430
University of Michigan

MONDAY, June 16

9:15	Light breakfast and coffee served
9:30 – 10:30	*Introduction to the Workshop, Student Introductions* Colter Mitchell & Jessica Faul
10:30 – 11:30	*Biology of epigenetics* Colter Mitchell
11:30 – 1:00	Social Activity and 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 17

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 and array versions* Colter Mitchell
11:00 – 11:15	Break
11:15 – 12:00	*Epigenetics and physical activity* Farah Ammous
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 18

8:45 Light breakfast and coffee served

9:00 – 9:30 Recap of the previous day and questions

10:00 – 11:00 *Data reduction, epigenetic surrogates in epigenetic data*
Colter Mitchell

11:00 – 11:15 Break

11:15 – 12:00 *Epigenetic Clocks*
Jessica Faul

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 19

8:45 Light breakfast and coffee served

9:00 – 9:30 Recap of the previous day and questions

9:30 – 10:15 *Mediation methods*
Jennifer Smith

10:15 – 10:45 *Measurement and Reliability of DNA methylation*
Colter Mitchell

10:45 – 11:00 Break

11:00 – 11:30 *Structured Life Course Modeling Approach (SLCMA)*
Josh Goode

11:30 – 12:00 *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 20

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

Genomics for Social Scientists
Epigenetics
NATIONAL INSTITUTE ON AGING

Agenda 2025

Dates: January 6 - 9, 2025
Location: Virtual!

MONDAY, January 6th

Topics covered in video or live lectures

- Introductions
- Motivation for epigenetics in social and behavioral research
  - *Videos to watch beforehand*:
    - Part I and Part II
- Biology of epigenetics
  - *Videos to watch beforehand*
    - Overview, DNA modifications
    - Histone modifications, regulatory RNA, cells and tissues
    - Timing, genes and the environment
- Strategies for collection and measurement of DNA methylation
  - *Videos to watch beforehand*:
    - Part I and Part II
- Live lecture
  - EPIC2 vs EPIC1 vs 450K (Trey Smith)
  - If time allows: Consortia and studies with epigenetic data (Jessica Faul)

Lab 1: 2:30 PM – 5:00 PM (ET)

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

TUESDAY, January 7th

Topics covered in video or live lectures

- DNA methylation quality control I
  - *Videos to watch beforehand*
    - Illumina array technology
    - Data cleaning pipeline
    - Sources of errors
- Fundamental epigenetic analyses
  - *Videos to watch beforehand*:
    - Part I and Part II

- Live lecture
    - Gene enrichment (Trey Smith)
    - Structured life-course modeling approach: SLCMA (Josh Goode)

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, January 8th

Topics covered in video or live lectures

- Online resources for epigenetic data and analyses
    - *Videos to watch beforehand*
        - Part I and Part II
- Genetics and methylation
    - *Videos to watch beforehand*
        - Part I and Part II
- Live lecture
    - Mediation methods in epigenetics (Jen Smith)
    - Measurement and Reliability (Colter Mitchell)

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, January 9th

Topics covered in video or live lectures

- Data reduction in epigenetic data
    - *Videos to watch beforehand*
        - Global methylation, somatic epimutations, polyepigenetic scores

- Live lecture
    - Data reduction in epigenetic data - Epigenetic surrogates: What have we learned (Colter Mitchell)
    - Data reduction in epigenetic data - Clocks (Jessica Faul)

Lab 4: 2:30 PM – 5:00 PM (ET)

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

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

Genomics for Social Scientists
Epigenetics
NATIONAL INSTITUTE ON AGING

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

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

FRIDAY, August 12th

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

Genomics for Social Scientists
Epigenetics
NATIONAL INSTITUTE ON AGING

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

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
- 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 11th

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 12th

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
- 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

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

FRIDAY, August 13th

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

Genomics for Social Scientists
Epigenetics
NATIONAL INSTITUTE ON AGING
NIH National Institute on Aging

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