

2021 SISMID Module 15: Microbiome Data Analysis

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Course resources

Zoom Meeting

<https://clemson.zoom.us/j/99110875036>

Slack

<https://sismidworkspace.slack.com/archives/C02319ZQ19R>

Google Drive

[SISMID-2115-Live](#)

Data

Top be posted

*****All times are PDT time zone*****

Please complete pre-module survey. See the link on Slack!

Wednesday, July 21

11:30-12:20 Live with breakouts

1. Introductions
 - 1.1. Instructor introductions
 - 1.1.1. Alex (4 min);
 - 1.1.2. Joey (4 min);
 - 1.1.3. John (2 min).
 - 1.2. Introduction to core resources
 - 1.2.1. Zoom mechanics and etiquette;
 - 1.2.2. Slack channel;
 - 1.2.3. Google Drive;
 - 1.2.4. Project Datasets.
2. Random-group ice breaker:
 - 2.1. Fill out survey (if you haven't done so yet)
 - 2.2. Then do activity

12:20 - 12:35 Break

12:35-1:25 Live Lecture 01

Lecture: Amplicon seq data generation and preprocessing with DADA2/R

1:25 - 1:40 break

1:40-2:30 Groups

1. Intro to the code steps (Lecture 01b)
2. Complete DADA2 tutorial (groups)

Homework: Read about the dataset you are assigned.

Thursday, July 22

8:00-8:50 Live Lecture 02

1. Debrief: DADA2 tutorial (30 min)
2. Lecture 02 - phyloseq package (20 min)

8:50 - 9:05 break

9:05 - 9:55 Live Lecture 03

Data normalization and alpha diversity with phyloseq

9:55 - 10:10 break

10:10 - 11:00 Start Group Data Analysis Project

1. Full group live to start
2. Talk about data
3. Pointer to Day-01 Doc
4. Breakouts

11:00 - 11:30 BREAK

11:30-12:20 Live Lecture 04 (w short breakout)

Multivariate microbiome data visualization and analysis:

- a. distances (break-out exercise)
- b. ordination
- c. clustering (with break-out exercise)

12:20 - 12:35 Break

12:35-1:25 (group exercises)

1. Computing distances
2. Ordination plots
3. Debrief

1:25 - 1:40 break

1:40-2:30 Live Lecture 05

Testing, multiple testing, feature selection

Homework: Group work, applied group's dataset

Friday, July 23

8:00-8:50 -- Group work, applied group's dataset

- Review dataset/experiment
- Microbial features selection: Taxa multiple testing tutorial
- PCoA
- Debrief (10 minutes)

8:50 - 9:05 break

9:05 - 9:55 -- Live Lecture 06

Testing Multivariate Hypotheses:

Robust MANOVA with W_d^*

Multivariate mediation analysis

9:55 - 10:10 Short break

10:10 - 11:00 Group work, applied group's dataset

1. PCoA (not again!)
2. Multivariate associations
3. Multivariate mediation analysis (if applicable)
4. Debrief (10 minutes)

11:00 - 11:30 BREAK

11:30-12:20 Group work, applied group's dataset

Meet on Zoom to discuss the format of the presentations; then work on the presentations in groups.

12:20 - 12:35 Break

12:35-1:10 Group work

1:10-1:25 Group 1 results (15)

1:25 - 1:40 break

1:40-2:30 Group work presentations

Group 2 results (15)

Group 3 results (15)

Summary and Discussion (5)

Wrap up (15 min)