

2018 SIS MID Module 8: Microbiome Data Analysis

Instructors:

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Course page: <https://www.biostat.washington.edu/suminst/SIS MID2018/modules/MD1808>

Monday, July 16 8:00am – Wednesday, July 18 12:00pm

8:00 am – 8:30 am Coffee

8:30 am – 10:00 am Class Session

10:00 am – 10:30 am Break

10:30 am – 12:00 pm Class Session

12:00 pm - 1:30 pm Lunch Break

1:30 pm – 3:00pm Class Session:

3:00 pm – 3:30 pm Break

3:30 pm – 5:00 pm Class Session

Tentative list of topics:

1. Introduction: Metagenomics in Biology and Medicine; Metagenomics assays and upstream informatics
2. Descriptive statistics, normalizations & testing
3. Mixture models for microbiome data
4. Combining Trees and other Data
5. Ecological distance metrics; Principal Coordinates Analysis
6. Generalized multivariate analysis of variance
7. Machine learning with microbiome data
8. Predicting metagenomic composition from 16S survey data
9. Networks*

Tentative list of laboratory exercises:

1. Preprocessing sequences with DADA2
2. Quality control, transformations, filtering, univariate testing, multiple comparison
3. Mixture models for differential abundance testing
4. Data and network manipulation with phyloseq
5. Computing distance matrices; PCoA
6. PERMANOVA with extensions
7. Clustering and classification
8. Working with functional data*
9. SpiecEasi networks tutorial*

**Time permitting*