#### Microbiome Premature

#### Jaewoong Lee

Ulsan National Institute of Science and Technology jwlee230@unist.ac.kr

2020-09-07

#### Overview

- Introduction
- Materials
- Methods
- 4 Results
- 5 Proceedings
  References

### Microbiome

### Ribosomal RNA

### Premature

# 16s rRNA Sequencing

### Qiime 2

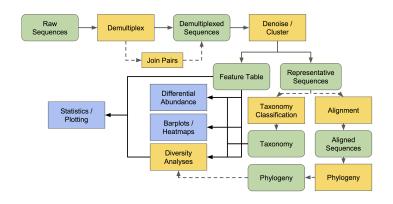


Figure: QIIME 2 workflow

### Mothur



Figure: Mothur

Note: Still in progress

# Taxonomy Classification

- Greengenes (DeSantis et al., 2006)
- SILVA (Pruesse et al., 2007; Quast et al., 2012)

# t-distributed Stochastic Neighbor Embedding

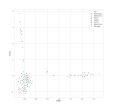


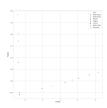
Figure: t-SNE with handwritten data (Maaten & Hinton, 2008)

↓□▶ ↓□▶ ↓□▶ ↓□▶ □ ♥Q♥

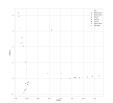
10 / 16

#### t-SNE with Site





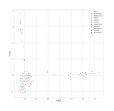
(a) DADA2 + GG (b) DADA2 + SILVA

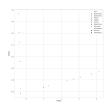




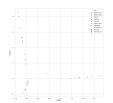
- (a) Deblur + GG (b) Deblur + SILVA

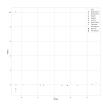
#### t-SNE with Site + Premature





(a) DADA2 + GG (b) DADA2 + SILVA





- (a) Deblur + GG (b) Deblur + SILVA

### Yields I

# Requirements I

# Expectations I

#### References I

- DeSantis, T. Z., Hugenholtz, P., Larsen, N., Rojas, M., Brodie, E. L., Keller, K., . . . Andersen, G. L. (2006). Greengenes, a chimera-checked 16s rrna gene database and workbench compatible with arb. *Applied and environmental microbiology*, 72(7), 5069–5072.
- Maaten, L. v. d., & Hinton, G. (2008). Visualizing data using t-sne. Journal of machine learning research, 9(Nov), 2579–2605.
- Pruesse, E., Quast, C., Knittel, K., Fuchs, B. M., Ludwig, W., Peplies, J., & Glöckner, F. O. (2007). Silva: a comprehensive online resource for quality checked and aligned ribosomal rna sequence data compatible with arb. *Nucleic acids research*, *35*(21), 7188–7196.
- Quast, C., Pruesse, E., Yilmaz, P., Gerken, J., Schweer, T., Yarza, P., ... Glöckner, F. O. (2012). The silva ribosomal rna gene database project: improved data processing and web-based tools. *Nucleic acids research*, *41*(D1), D590–D596.