1. Microbiome taxonomic observations COVID19 vs Control
   * 1. Stacked bar chart showing overall taxonomic composition in COVID19 positive BALF samples
     2. Ggcorr / pheatmap with ward2 clustering of samples based on taxonomic composition
     3. Histogram of DESeq2 transformed abundance within each sample.
2. Effect of abx, tmt, disease severity, outcome
   * 1. Stacked bar chart showing overall taxonomic composition in COVID19 positive BALF samples
     2. Ordinations
        1. β diversity bray Curtis / Jaccard dissimilarity matrix PCoA or tsne plot showing COVID19 + Control\_no\_abx + Control\_abx
        2. α diversity Shannon ~ variables box plots
     3. Statistical analyses showing overall and interaction effects of methodology, abx, tmt, and disease severity on diversity indices
        1. Spearmans correlation matric Cross-correlating data sets
        2. adonis PERMANOVA tables
        3. Partial Least Squares (PLS) / Random Forest (RF) supervised learning predictions biplots
     4. Stacked bar chart showing overall taxonomic composition in COVID19 samples.
     5. ANCOM of genus level taxa associated with aforementioned variables
        1. Violin/ bimodality plot on subset taxa
3. Effect of different extraction, storage, and library prep methodologies
   1. Best practices for future studies
4. GO tags