Host microRNA Response to Infection

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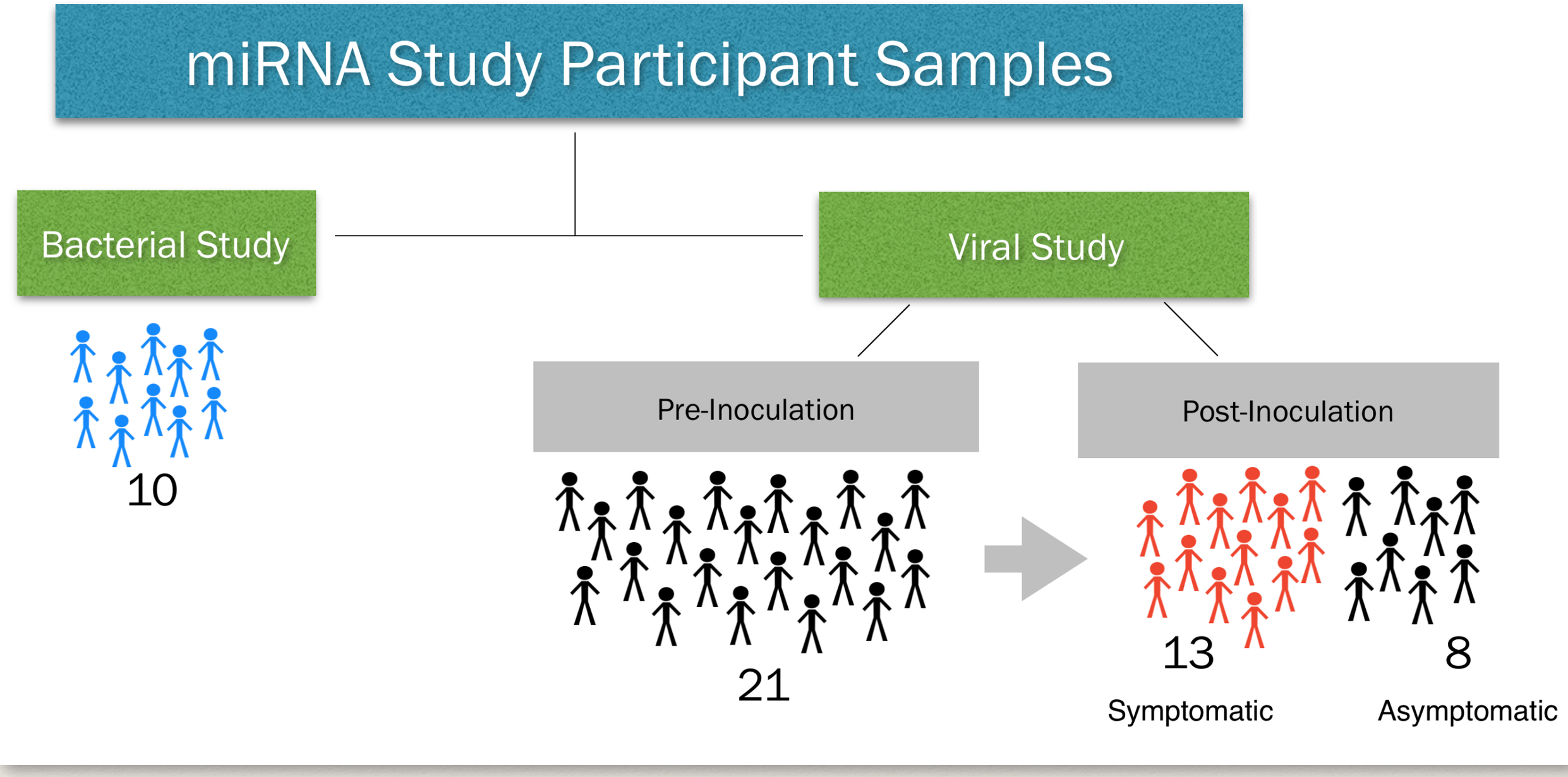
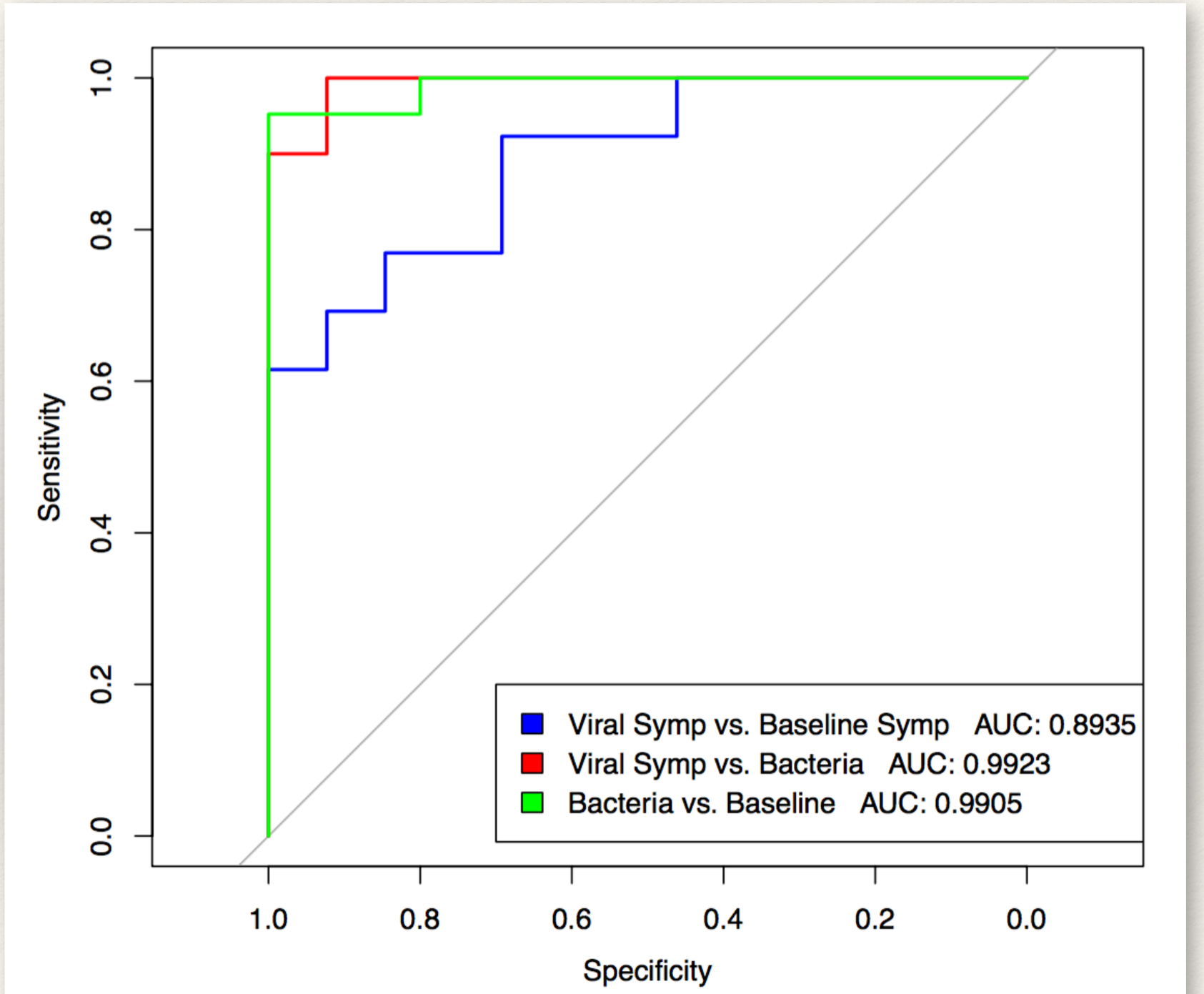


RNA Seq → miRDeep2 → Data Matrix
52 Samples x 333 miRNAs

Classification of Disease Using miRNAs

Logistic Regression ROC Curves

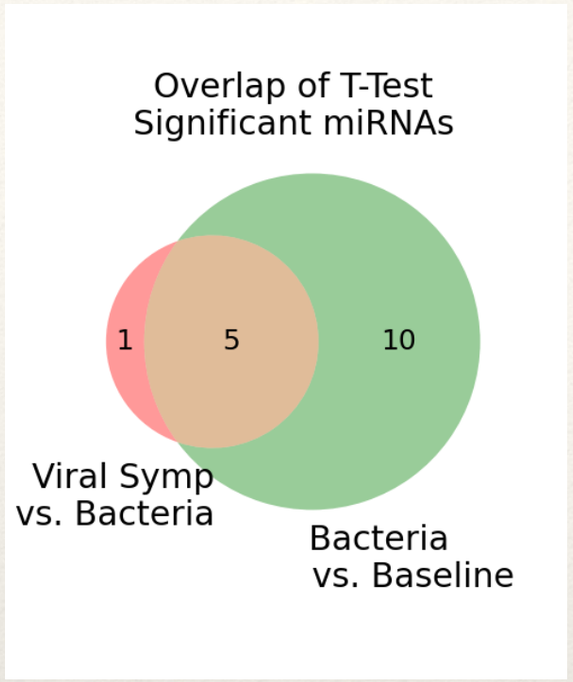


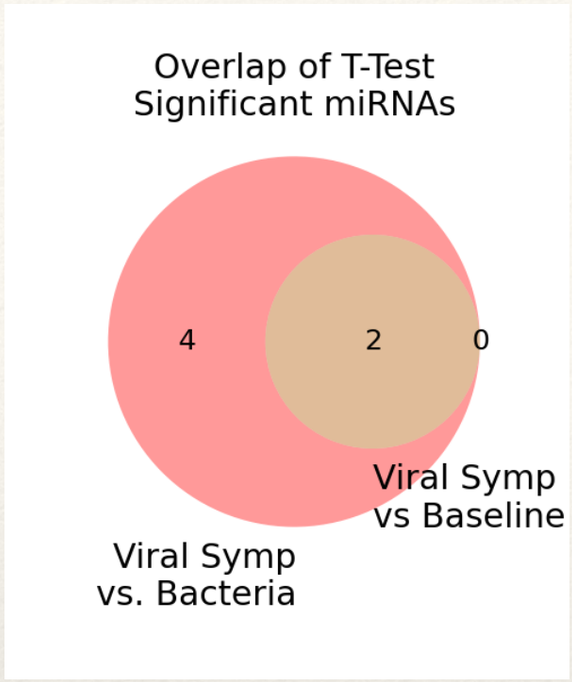
Lasso regularized, LOOCV

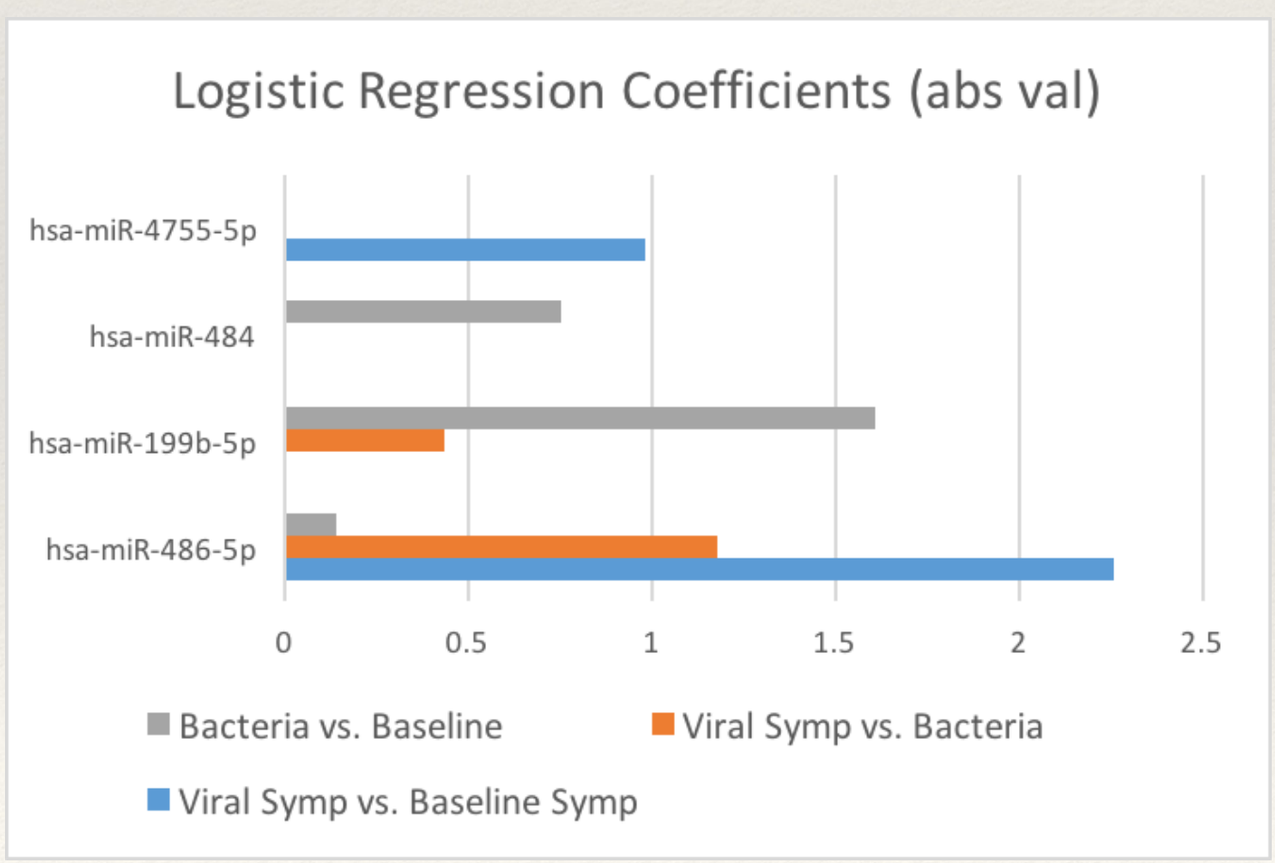
Other Analyses:

- PCA
- T-Tests per miRNA
- Permutation Tests
- Random Forest: ~95% OOB classification accuracy

Summary







Selected the most significant coefficients

Motivation: Clinicians overprescribe antibiotics because they can't easily distinguish between a bacterial and viral infection. miRNA expression is poorly characterized in infectious disease.

Results: Identified several miRNA biomarkers distinguishing types of infection. These results are the first step towards developing a fieldable diagnostic test that differentiates types of infection based on stable miRNA biomarkers.

Impact: Such a test can combat antibiotic resistance from a preventative standpoint and lower overprescription of antibiotics