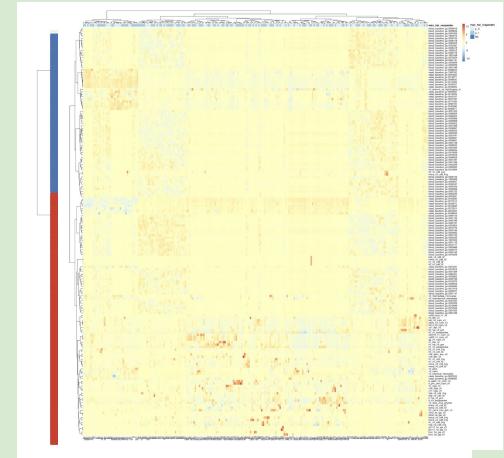## Our Motivation

- Interested in predicting HAI response
- Measure of neutralizing antibodies ➜ good metric for immunity
- Useful assay for determining long-term efficacy of vaccine with evolving strains
- Relatively easy, cost effective assay

Unsupervised Methods: Validation and Tuning

- Hierarchical Clustering to validate supervised model
- Determine features that could be excluded from dataset to decrease noise and improve model performance

Supervised Methods: Prediction

- nb, lda, **rf**, C5.0, nnet, mlpWeightDecay
- Excluded: all day 21 data, all fold change data, sex, age, ID, year
- Median impute, nzv, zv, center, scale

Results:
- Best performing: **rf**
- Accuracy: 0.7667
- Training AUC: 0.6171
- Predicted AUC: **0.8563**

Our Findings

- Variables of importance:
  - Viral shed
  - Day 0 HAI
  - Day 0 IgA