

# Submission

**Submission ID** 42752

**Grading Status** Accepted

## Abstract

### ABSTRACT TITLE

Application of the Epitope Content Comparison Tool (EpiCC) to develop better swine rotavirus vaccines

### Objective

Rotavirus A and C (RVA and RVC, respectively) are a significant cause of piglet mortality. The outer capsid (VP7) and spike (VP4) proteins stimulate neutralizing antibodies. Cross-neutralizing B cell antibodies between RVA and RVC are nonexistent while there is limited heterotypic B cell neutralization across lineages of RVA and RVC. Given the large genetic diversity of VP7 and VP4 in swine, it is difficult to develop a B cell-based vaccine to prevent clinical disease. RV vaccines with high T cell epitope conservation with circulating strains may provide better cross-protective immunity. We investigated the presence of SLA class II putative T cell epitopes in the VP7 and VP4 of porcine RVA strains and VP7 of porcine RVC strains.

### Methods

PigMatrix was applied to identify SLA class II putative T cell epitopes in the VP7 and VP4 from porcine RVA and RVC strains. The T cell epitope content comparison tool, EpiCC, was used to identify putative T cell epitopes in a set of 155 VP7 and 145 VP4 porcine RVA sequences, and a set of 244 VP7 porcine RVC sequences. Conservatrix was used to identify conserved epitopes.

### Results

Using PigMatrix, we found that the swine RVA vaccine strains contain clusters of T cell epitopes that can bind to four or more SLA class II alleles. Based on the EpiCC analysis, conservation is observed within the same species and within different genotypes but not across the different RV species. Moreover, using Conservatrix, we found that a single peptide is conserved between two VP7 RVC strains and the VP7 of the OSU RVA vaccine strain.

### Conclusions

Differences in RVA and RVC T cell epitope content suggests that CD4 T cells specific to one species may not support antibody responses to the other while cross-conservation within species may be sufficient. Next, we will use EpiCC to analyze human RVA vaccine and outbreak strains to establish a threshold of T cell epitope coverage correlating with immune escape as a surrogate for porcine RV for which there is little vaccine usage data.

### PREFERRED PRESENTATION FORMAT

Poster

## TERMS AND CONDITIONS

- I have read and understand all of the terms and conditions listed above.

### 5a. Keyword 1 - Session Topics:

Vaccine

### 5e. Keyword 5 - Research Focus - Open Entry (optional):

T cell epitopes

No

### 5b. Keyword 2 - Target Species:

Pigs

### 5c. Keyword 3 - Research Focus (same list as Keyword 4):

Bioinformatics

### 5d. Keyword 4 - Research Focus (same list as Keyword 3):

Immunity - Adaptive

2785

Poster

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