Abstract: Vero cells and Vero-76 cells are both used to evaluate the antiviral effect of drugs in vitro. This study tested whether Vero and Vero-76 cells yield similar cytopathic effects when inoculated with yellow fever Virus (YFV) or Dengue Virus (DV). Each virus was plated on replicated 96 well plates of Vero and Vero-76 cells with different cell concentrations. The two cell lines did not give significantly different results for most cell and virus concentrations.

Introduction: Cell cultures are treated with potential antiviral compounds to test their efficacy in suppressing virus-induced cell lysis. Two African green monkey kidney cell lines, Vero and Vero-76 are used for different viruses. Vero-76 cells are modified Vero cells that show cytopathic effect (CPE) when infected with hemorrhagic fever viruses, Marburg or Ebola viruses. Preliminary work suggested that there was no difference between these cell types for most viruses. Using only Vero-76 cells for all antiviral assays would save effort and cost in the lab. Therefore this study examined whether Vero and Vero-76 cells yield similar cytopathic percentages.

Materials and Methods: 96-well plates (see Figure 1) were seeded with 1x10^4 and 4x10^4 cells per well of Vero or Vero-76 cells. Virus stocks were diluted with minimal essential media (MEM) the serial dilutions were inoculated into three replicate wells. Control wells were inoculated with MEM. We controlled for edge effect by not using Columns 1 and 12 or Rows A and H. Plates were incubated for 7 days. After incubation, plates were stained with neutral red for 2 hours. The neutral red was aspirated and the plates were rinsed with phosphate buffer saline (PBS). 200 µl of ethanol/citrate extraction buffer was added and allowed to sit for 30 minutes to extract the dye that was incorporated into the live cells. Optical density (OD) was read on a spectrophotometer at 540 nm. OD readings were then compared with uninfected controls to calculate cytopathic effect (CPE) caused by the virus present (Figure 2). Cytopathic effect differences between Vero and Vero-76 cells for each virus were compared using 2 way ANOVA for multiple comparisons Tukey test (Prism® 7.0). The results from the triplicate assays were averaged.

Conclusions/Results:
- For most cell concentrations and virus dilutions no significant differences were found between Vero and Vero-76 cell lines.
- For all viruses, the number of infectious particles inoculated per well had no affect on CPE
- For YFV, Vero cells had significantly more CPE than Vero-76 cells at 4E4 concentration when inoculated with 10^2.7 and 10^0.7 CCID_50 per well.

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Further Research:
- Determine a cell concentration to yield optimal percent cytopathic effect.
- Compare percent cytopathic effect of Tacaribe, Venezuelan Equine Encephalitis, and West Nile.
- Compare Vero and Vero-76 Cells in antiviral assays against known positive compounds.
- Compare the days of incubation, cell concentration, to maximize CPE.