

Internship Overview:

I did an internship in the Institute for Antiviral Research where we test antiviral compounds and vaccines in vivo and in vitro against Zika, influenza, SARS, dengue, yellow fever, West Nile, and other pathogenic viruses. As a lab technician I do in vitro testing for compounds designed to inhibit viral activity in Zika virus, Enterovirus 71, and Enterovirus D68.

Purpose:

It is important to always clean up using proper chemicals following working with a virus. Failure to do so may leave active virus on a surface or in a medium and present a potential hazard. This study was done to determine if viruses from the Flaviviridae, Adenoviridae, and Picornaviridae families can remain active for more than three weeks on a dry surface or in a liquid medium.

Materials and methods:

Virus was added to a twist cap tube containing MEM 2% FBS + Gentamicin or pure H₂O in triplicate. Samples were taken from both tubes at 0hr, 4hr, 8hr, d1, d2, d3, d4, d6, d8, d10, d14, & d21. Tubes were left at room with twist caps sealed tight.

To test dry surfaces, virus was added to wells in a 96-well plate and left at room temp with lids off so media would evaporate. When dry, lids were replaced to prevent cross-contamination. Samples were harvested by adding media to the wells and pipetting up and down to elute virus. All samples were stored in plastic tubes at -80°C until titered after day 21.

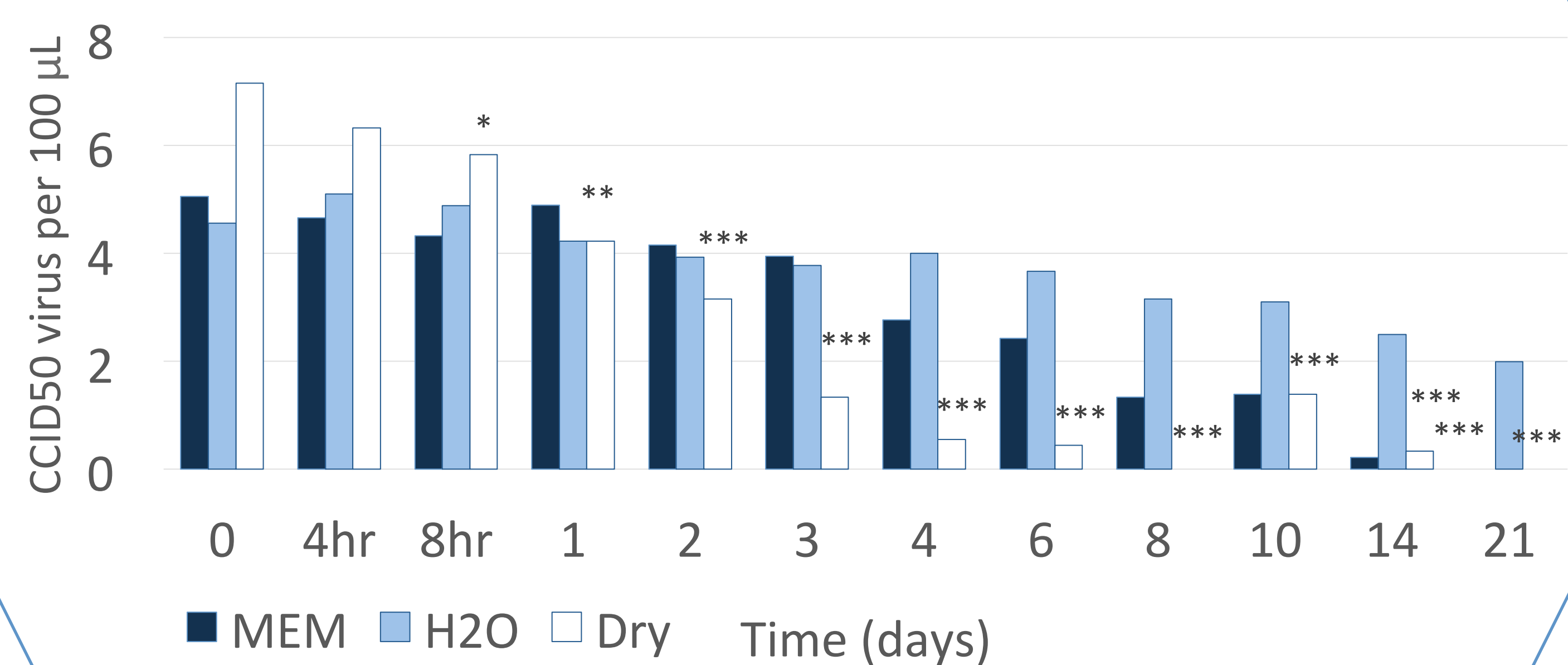
Samples from 3 replicates were titered on Vero 76 cells in a 96-well plate and using a standard endpoint dilution, average titer counts were calculated using the Reed & Muench method (1948).

Results/Conclusions:

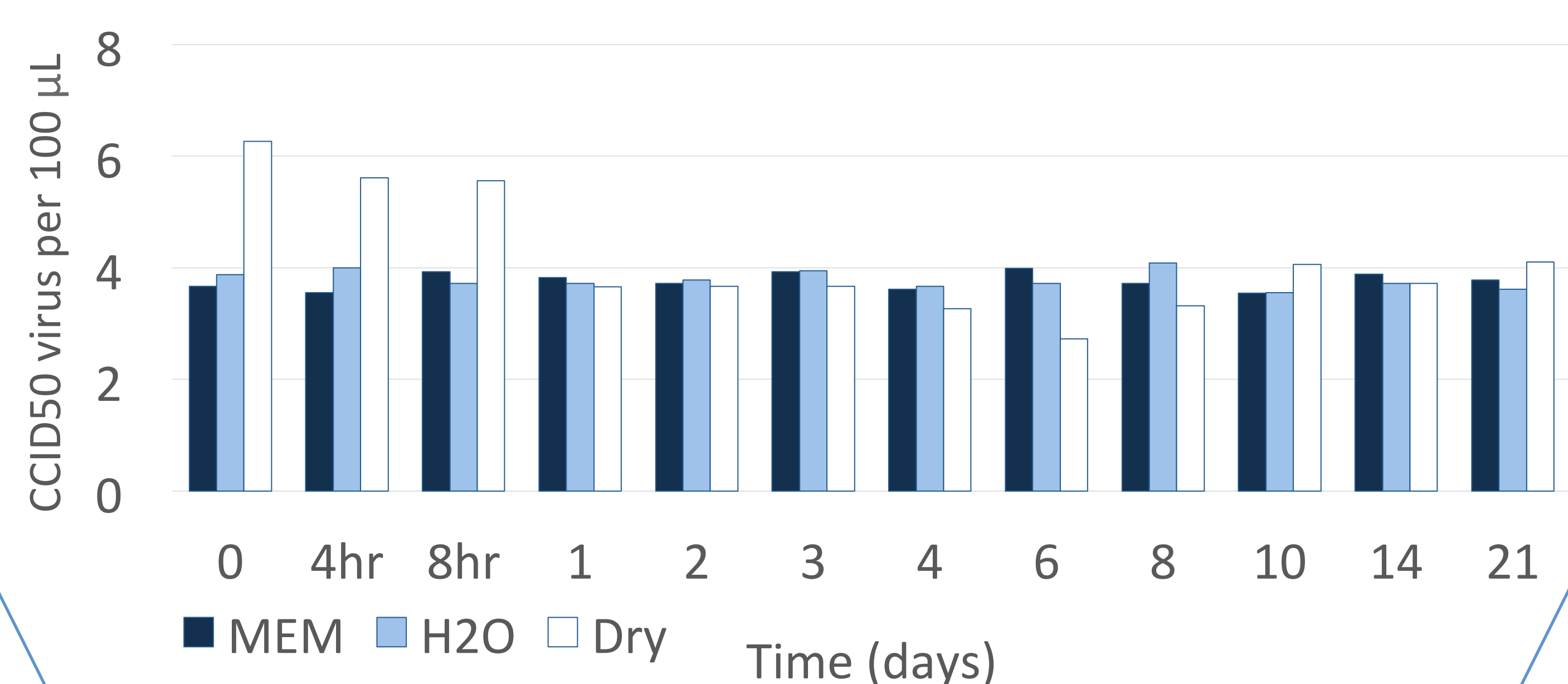
- Zika virus survived about 2 weeks in MEM and on a dry surface but more than 3 weeks in water.
- Adeno-5 virus survived more than three weeks in MEM, in water, and on a dry surface.
- EV-D68 virus survived longer than three weeks in MEM, in water, and on a dry surface.
- Polio-1 virus lasted more than three weeks in MEM and water but after 3 weeks the virus was reduced. On a dry surface, Polio-1 virus survived 2 days.

This project illustrates the need for diligence in proper clean-up following any work involving active virus. Improper clean-up presents a hazard for future work in that area. This also gives an indication as to how long a virus may be left at RT and remain useful for assays.

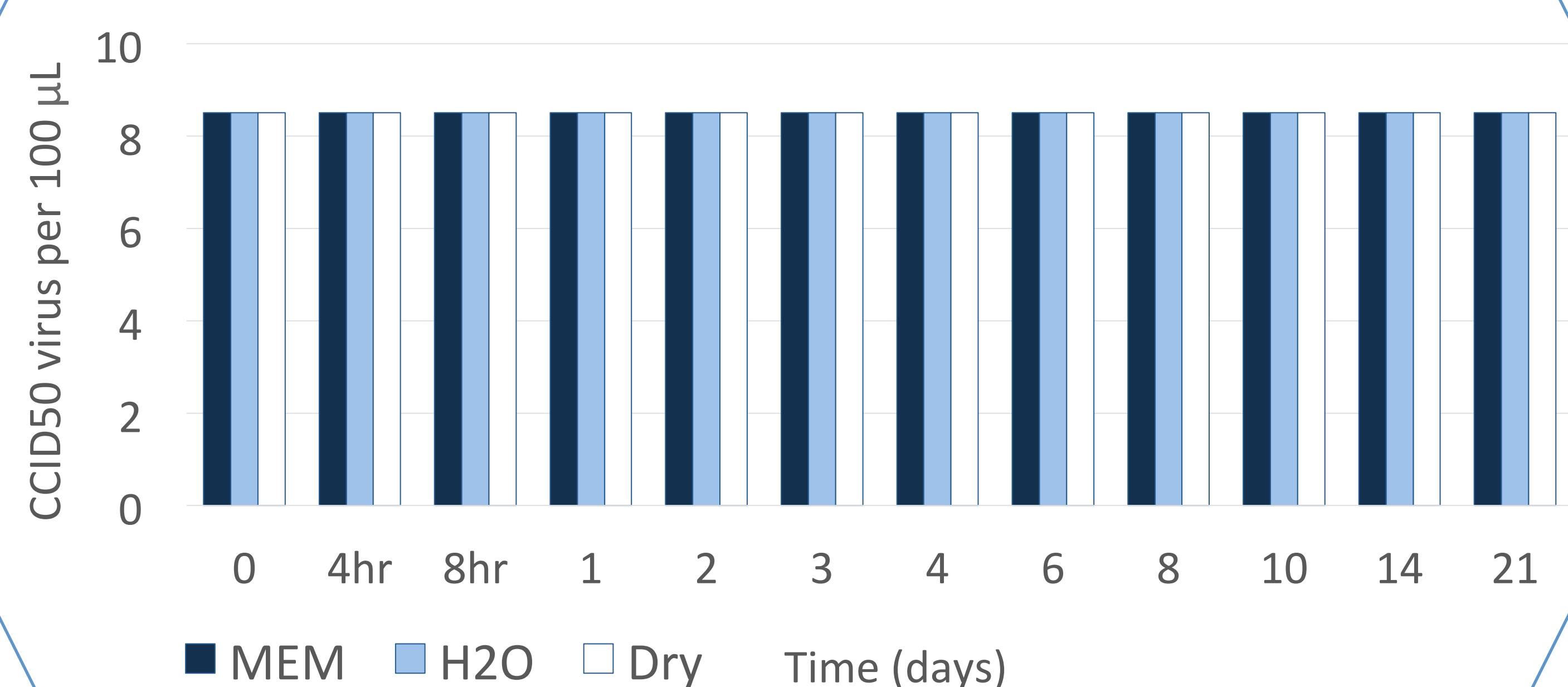
Zika Virus (Uganda) Titers



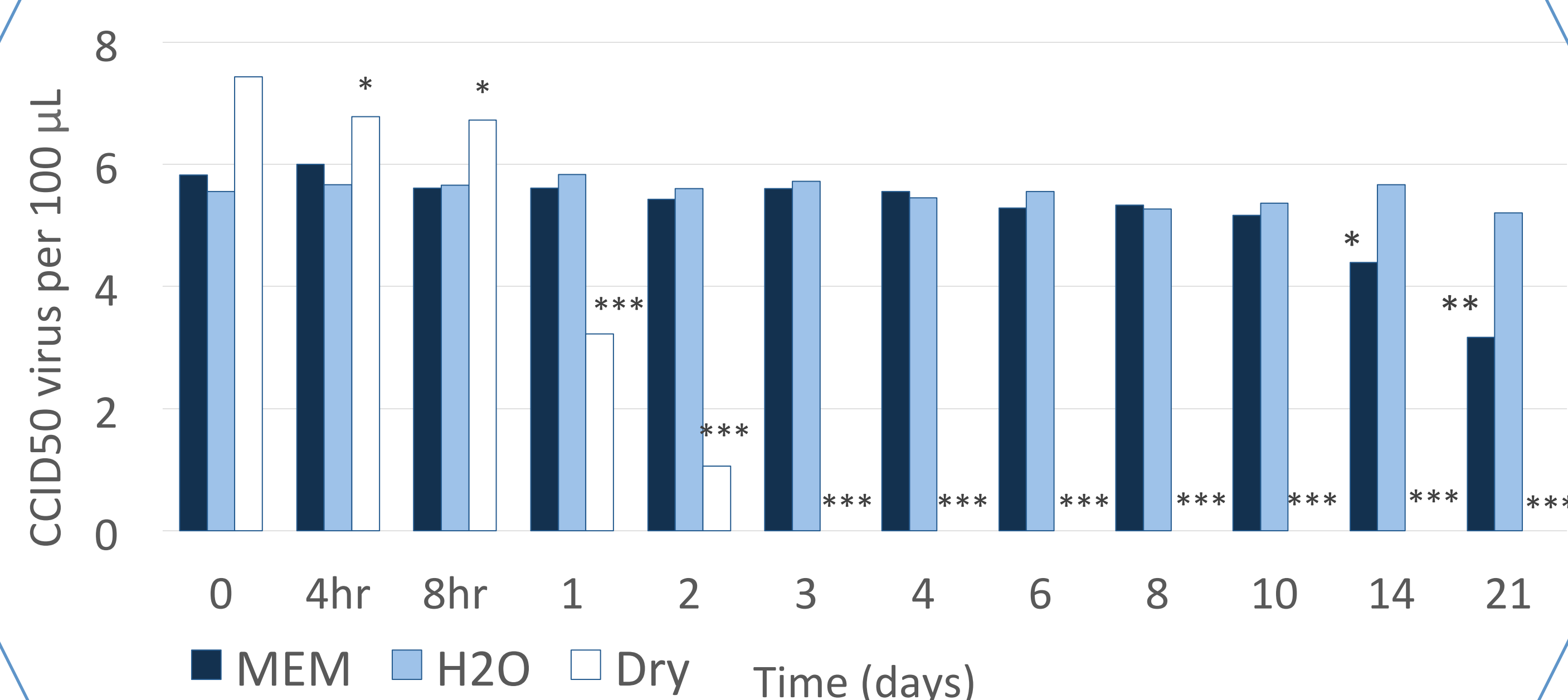
Adeno-5 Virus Titers



Enterovirus-D68 Titers



Polio-1 Virus Titers



P-values: * = <0.05; ** = <0.01; *** = <0.001
Values based on comparison to day 0 values