IN VITRO EFFICACY OF CIDOFOVIR AND ACYCLOVIR AGAINST FROG VIRUS 3

Sara D. Ferguson,1* Thomas B. Waltzek, MS, DVM, PhD,1 April J Johnson, DVM, MPH, PhD,1 Dipl ACVM(Virology), Dipl ACVPM,2 Amanda D. Rice, PhD,1 James Coleman, PhD,1 April L. Childress,1 and James F.X. Wellehan Jr, DVM, PhD, Dipl ACZM, Dipl ACVM(Virology, Bacteriology/Mycology)1

1University of Florida, Gainesville, FL 32610 USA; 2Purdue University, Lafayette, IN 47907 USA

ABSTRACT

The genus Ranavirus includes large double-stranded DNA (dsDNA) viruses within the family Iridoviridae. There are six recognized ranavirus species, three of which are endemic to the United States including: Ambystoma tigrinum virus, Santee-Cooper ranavirus, and frog virus 3 (FV3). They are significant pathogens associated with a high mortality rate affecting fish, amphibians, and reptiles in both managed and captive populations. Of the known species, FV3 has shown the lowest host specificity and is the most significant reptile pathogen. Sequencing of the ranaviruses has identified a thymidine kinase. Acyclovir, a chain terminating prodrug, has been shown to effectively treat herpesvirus infections but requires viral phosphorylation by thymidine kinase to become activated. Cidofovir is a weak chain terminating drug but is a direct inhibitor of viral polymerase and does not require viral activation. Both drugs were evaluated for their in vitro efficacy to reduce virus replication as well as to gauge cytotoxicity. While acyclovir assays were shown to have no cytotoxic effects at tested dilutions and there was a general decrease in titer associated with an increase in drug concentration, there was no statistically significant reduction. Cidofovir assays revealed similar results at the same dilutions as acyclovir. Cidofovir dilutions were increased to evaluate virus titers with higher drug concentrations, yet these levels may cause significant toxicity to the host. Although acyclovir and cidofovir have no significant impact on in vitro virus replication, other nucleoside analogue antiviral drugs should be evaluated for their efficacy to decrease ranavirus replication.