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A kinase inhibitor cocktail as a broad spectrum antiviral

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Viruses from the Arenaviridae, Flaviviridae, and Filoviridae families have the potential to cause hemorrhagic fever in humans, while viruses from the alphavirus family have the potential to cause debilitating disease. Currently, therapeutics for these viruses are limited and Ribavirin and supportive care remain the only substantial therapeutic options for viral hemorrhagic fever. In this report, we demonstrate that pre-treatment of host cells with a kinase inhibitor cocktail consisting of genistein and tyrphostin AG1478 leads to inhibition of infection in cells infected with numerous viruses including Venezuelan equine encephalitis virus, Dengue virus, West Nile virus, Pirital virus, Pichindé virus, Lassa virus, Flexal virus, Ebola virus, and Marburg virus. Additionally, we tested the affects of the kinase inhibitor cocktail in the Pirital virus (PIRV)-Syrian golden hamster model, since infection results in hemorrhagic fever and 100% mortality and because this model can be used to screen antivirals intended to treat hemorrhagic fever. Treating the PIRV-infected Syrian golden hamsters with the kinase inhibitor cocktail led to significant survival, lower viral titers in specific tissues and viremia, and a mitigation of disease signs. In all, the results from these studies demonstrate that a kinase inhibitor cocktail may serve as a broad spectrum antiviral that may be used as a therapeutic or prophylactic against a myriad of virus infections.

Biography

Dr. Vela has 12 years of experience as a virologist and is currently the Manager for Virology and Toxinology at the Battelle Biomedical Research Center. He has extensive experience with a myriad of viruses including highly pathogenic avian influenza, seasonal influenza, Pichindé virus, Lassa virus, Pirital virus, Flexal virus, Ebola virus, Marburg virus, Dengue virus, West Nile virus, Human Immunodeficiency virus, and Simian immunodeficiency virus. His animal modeling research has involved ferrets, guinea pigs, nonhuman primates, and hamsters. As a Post-Doctoral Fellow, Dr. Vela studied arenavirus pathology and as a graduate student (under the supervision of Dr. Jagannadha Sastry), Dr. Vela studied HIV-1 entry mechanisms into host cells.

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