Innovations
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

Chimeric Varicella Zoster Virus for *in vivo* Analysis and Vaccine Development

Product
Chimeric VZV-SVV virus

Indication
Research tool – animal model

Value Propositions
- Enhance *in vivo* analysis of VZV infection
- Development of antivirals & vaccines

Technology Market
- $2.7 million - Global varicella live vaccine market (5.7% CAGR 2021-2026)

Intellectual Property
- PCT pending*
- Available for licensing

Contact
Mary Tapolsky
Mary.Tapolsky@cuanschutz.edu
Ref# CU4813H
cuinnovations.cuanschutz.edu

Background on CU4813H
Varicella zoster virus (VZV) is the causative agent of varicella (chickenpox) and zoster (shingles). Primary VZV infection is followed by latent infection within ganglionic neurons. Reactivation of VZV results in zoster, increasing the risk for stroke, dementia, and Alzheimer's disease. There are a limited number of vaccines for VZV, and immunity to varicella does not protect against viral reactivation. One major barrier towards developing antivirals that can treat reactivated herpesviruses is the lack of an acceptable animal model for analyzing the efficacy of vaccines in humans.

Technical Innovation
A research team including University of Colorado's Dr. Ravi Mahalingam created a chimeric virus composed of VZV and simian varicella virus (SVV) that can be used to infect non-human primates. Infection with this chimera replicates the human virus infection in non-human primates - replication in host cells to produce varicella followed by ganglionic infection and latency with the ability to reactivate to produce zoster.

Intrabronchial/tracheal inoculation in non-human primates demonstrated reactivation via immunosuppression and CD4 T cell depletion; extremely low viremia and virus DNA was also observed in lungs and lymph nodes. These results validate the utility of this chimeric VZV-SVV virus as a tool to study *in vivo* herpes in non-human primates as a suitable animal model to facilitate the development and testing of vaccines and antivirals.

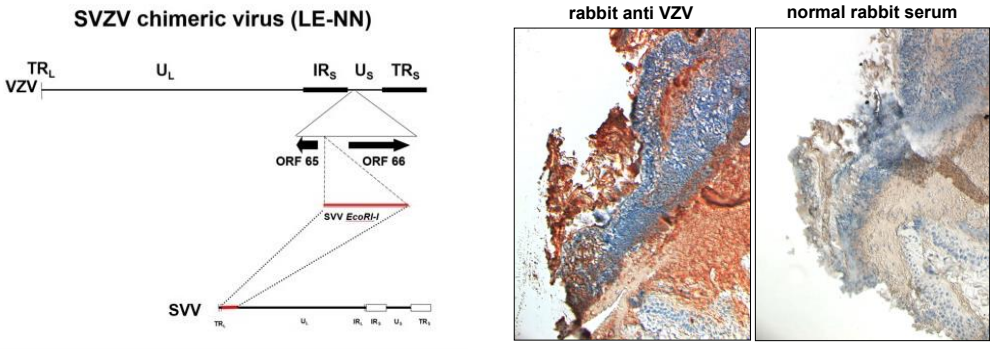

Figure: Varicella zoster virus (VZV) and simian varicella virus (SVV) genomes consist of a unique long (U_L) and a unique short (U_S) segment that is bound by internal (IR_S) and terminal (TR_S) repeat sequences (A). A recombinant chimeric virus (rVZV/SVV) was prepared. SVV sequences close to the left-ward terminus (LE) of the genome were inserted between VZV ORFs 65 and 66. African green monkey inoculated with the SVZVLE-NN resulted in skin rash. Presence of virus associated skin rash was confirmed by immunohistochemical analysis using rabbit polyclonal antibodies raised against VZV. Normal rabbit serum was included as a negative control.

*PCT pending: PCT/US22021/023769, Compositions, Methods, Models, and Uses for Simian Varicella Virus (SVV) Chimeric Constructs in Human Health Conditions