WashU

Office of Technology Management

VLDLR-BASED DECOY RECEPTORS TO PREVENT ALPHAVIRUS INFECTIONS

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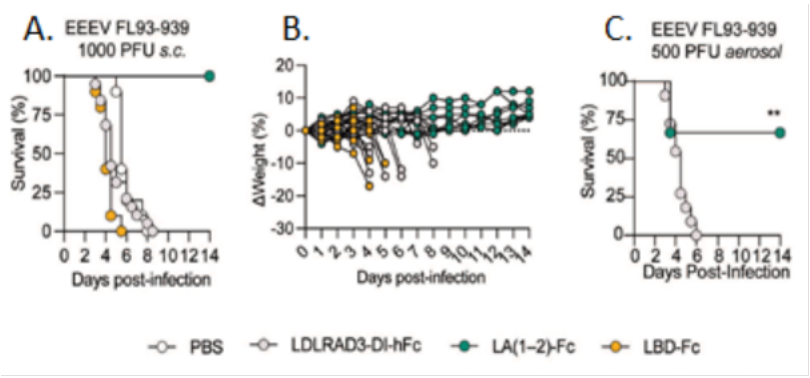
T-020745

Published date: 1/14/2026

Value Proposition: *Method and composition to potently neutralize EEEV infection.*

Technology Description

Researchers at Washington University in St. Louis have developed very low-density lipoprotein receptor (VLDLR) soluble decoy receptors with potent inhibitory activity in vitro and in vivo. Eastern equine encephalitis virus (EEEV) is one of several alphaviruses that utilizes VLDLR to promote attachment and entry into cells. It is one of the most pathogenic of the encephalitic alphaviruses and causes sporadic outbreaks across North America with human case fatality rates exceeding 30%. Though naturally transmitted by mosquitoes, an epidemic emergence of these alphaviruses would be of significant concern given their capacity for aerosolization and the current lack of treatments or countermeasures.



In mice (left), inoculation with the decoy receptor results in neutralization of EEEV infection with significant reductions in mortality (A and C) and weight loss (B) compared to an otherwise lethal infection in both subcutaneous (A) and aerosol (C) contexts.

Stage of Research

Extensive structural analysis and experimentation on EEEV binding resulted in effective design of decoy receptors and neutralization of EEEV in vitro.

Publications

Structural and functional basis of VLDLR usage by Eastern equine encephalitis virus. Cell 2024

Applications

Neutralizing EEEV and other alphavirus infections

Key Advantages

Countermeasure for weaponized EEEV and other alphavirus infections

Patents

US Non-Provisional filed 10/02/2024

Related Web Links – Michael Diamond Profile; Diamond Lab