# FUSION PROTEIN FOR TREATING MULTIPLE STRAINS OF VENEZUELAN EQUINE ENCEPHALITIS VIRUS

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***Value Proposition:*** *Decoy receptor therapeutic that can treat multiple VEEV subtypes by blocking VEEV entry and infection.*

## Technology Description

Researchers at Washington University in St. Louis have developed a decoy Ldlrad3-D1-Fc protein for prevention of treatment of multiple Venezuelan equine encephalitis virus (VEEV) subtypes and strains. VEEV is a rare mosquito-borne infectious disease with debilitating consequences, causing fever, chills, headaches, lumbosacral pain and myalgia in humans. However, VEEV's aerosol transmissibility and its relatively rapid onset places it at grave risk for epidemic emergence, particularly as a significant subsegment of cases in both humans and equines results in severe, often lethal neurological complications. Despite this, there are no treatments or prophylaxis for VEEV that are approved for general human use.

This decoy receptor therapeutic utilizes Ldlrad3 that binds directly to VEEV particles and enhances virus attachment and internalization into cells. Domain truncation and infection analysis indicates that domain 1 (D1) of Ldlrad3 is necessary and sufficient to support VEEV infection. Consistent with these findings, a Ldlrad3-D1-Fc fusion protein blocks VEEV infection in cell culture, preventing severe VEEV infection and disease.
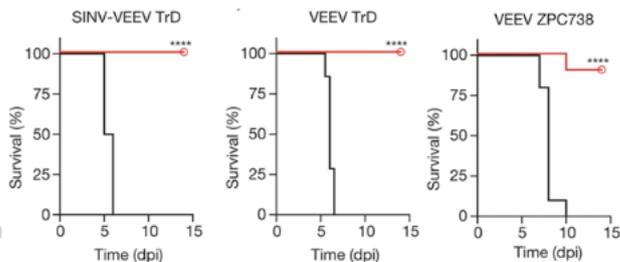


(Left) Across several VEEV strains tested, mice inoculated with this fusion protein had vastly reduced mortality and weight-loss relative to their control counterparts, all of which succumbed to VEEV infection in 5-10 days.

## Stage of Research

Validated that decoy receptor fusion protein blocks viral infection in vivo in mice, no viral RNA detected.

## Publications

LDLRAD3 is a receptor for Venezuelan equine encephalitis virus. ([Nature 2020](#))

**Applications**

Treatment for Venezuelan equine encephalitis virus

**Key Advantages**

- Enhances virus attachment and internalization into cells

- LDLRAD3 acts as a novel entry receptor for VEEV

**Patents**
US Non-Provisional filed on 10/28/2022.