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PAN-RECEPTOR DECOY PROTEIN TO TREAT ENCEPHALITIC ALPHAVIRUSES

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Value Proposition: *Soluble engineered decoy receptor protein that on its own can be used to treat multiple alphavirus types.*

Technology Description

Researchers at Washington University in St. Louis have developed a composition of matter that consists of a mutagenized chimeric protein decoy, combining entry receptors from three major alphaviruses – Venezuelan, Eastern, and Western equine encephalitis (VEEV, WEEV, EEEV). Alphaviruses attack the brain and there are no approved vaccines or therapies for encephalitic alphavirus infections for humans. In equines, vaccinated horses are at significantly less risk, but if infected the case fatality remains high (70-90%).

This chimeric protein can neutralize infection from all three virus types, providing an effective prophylactic or therapeutic for these otherwise impossible to treat viruses.

Stage of Research

Proof of concept & preliminarily optimized for potency and half-life in murine models

Publications

Manuscript available on request under CDA. For background, please refer to:

- Structural basis for plasticity in receptor engagement by an encephalitic alphavirus. Cell 2025.
- The low-density lipoprotein receptor promotes infection of multiple encephalitic alphaviruses. Nat Commun. 2024
- The VLDLR entry receptor is required for the pathogenesis of multiple encephalitic alphaviruses. Cell Reports 2024
- LDLRAD3 is a receptor for Venezuelan equine encephalitis virus. Nature 2020

Applications

- Treatment of alphavirus, particularly applicable in animals

Key Advantages

- Each component of construct binds to distinctive sites on each virus that corresponds to those engaged by their endogenous receptors, providing broad protection given the co-circulatory nature of these viruses.

Patents
Patent pending

Related Web Links – Michael Diamond Profile; Diamond Lab