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SOLUBLE DECOY RECEPTORS FOR TREATING TICK-BORNE ENCEPHALITIS VIRUS

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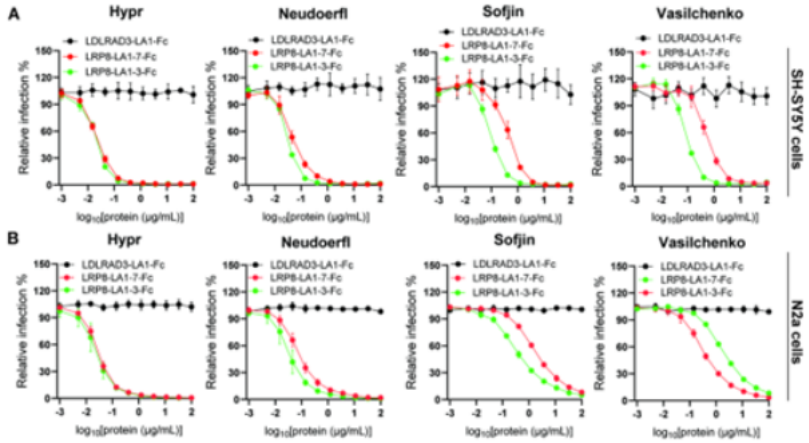
Value Proposition: *Entry receptors that bind directly to TBEV, promoting virus attachment to treat TBEV and other viruses.*

Technology Description

Researchers at Washington University in St. Louis have developed LRP8 soluble decoy receptors (minimal domains-Fc fusion proteins) that inhibit tick-borne encephalitis viruses (TBEV) and other related virus infections. Orthoflaviviruses are a genus of RNA viruses that infect humans and other vertebrate animals on a global scale, resulting in extensive morbidity and mortality. Among the orthoflaviviruses, tick-borne encephalitis viruses (TBEV) are an antigenic group that causes severe neurological disease in humans. TBEV is maintained between ticks and different vertebrate hosts, with humans as incidental hosts. Current methods of treatment are somewhat effective; however, morbidity and mortality have continued to rise.

This invention is based on LRP8 entry receptors, which promotes TBEV entry.



Above figure: LRP8-Fc decoy proteins neutralize TBEV infection. (A-B) Serial dilutions of LDLRAD3-LA1-Fc, LRP8-LA1-7-Fc, or LRP8-LA1-3-Fc were mixed with the indicated TBEV RVPs (MOI of 1) for 30 min prior to inoculation of SH-SY5Y (A) or N2a (B) cells. 24 h later, infection was monitored by GFP expression and flow cytometry.

Stage of Research

LRP8 is preferentially expressed in neurons, shown to directly bind the virions of TBEV as well as other tick-borne orthoflaviviruses (TBFV). Expression is necessary for TBEV neuronal infection. Decoy receptors were designed based on specific subdomains of LRP8 and shown to block TBEV and TBFV infection in cell lines, primary neuron cultures, and in mice.

Publications

LRP8 is an entry receptor for tick-borne encephalitis viruses. PNAS 2025

Applications

- Treatment of TBEV or other tick borne orthoflaviviruses; neutralization of TBEV or other tick borne orthoflaviviruses

Key Advantages

- Identification of a new candidate entry receptor for TBEV and TBFV. Also demonstrating a tool for neutralization and a corresponding treatment.

Patents

Patent pending

Related Web Links – Michael Diamond Profile; Diamond Lab