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Monoclonal Antibody Therapeutics against West Nile Virus with Improved CNS Penetration

AzTE Case # M11-088

Inventors

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Invention Description

West Nile virus (WNV), a member of the Flavivirus genus, can cause severe neurological disease, long-term morbidity, and death. In the last decade, nearly 30,000 cases of severe WNV infection have been diagnosed in the U.S. Historically, there has been a lack of effective and specific antiviral treatment for flavivirus infection; current treatment for WNV is supportive and no vaccine or therapeutic agent has been approved for human use. A promising humanized murine Mab (monoclonal antibody) mHu-E16 therapeutic candidate is in Phase II clinical trials, but since it does not cross the blood-brain barrier (BBB), it has a limited window of efficacy.

Researchers at the Biodesign Institute of Arizona State University have built upon their earlier success (AzTE Case # M10-092) developing a plant-derived Hu-E16 antibody that has inhibitory activity indistinguishable from mammalian cell-produced mHu-E16. This new innovation is a bifunctional form of Hu-E16 that additionally binds receptors of endothelial cells of the BBB, allowing this antibody to rapidly penetrate the CNS and accumulate in concentrations sufficient for neutralizing the infecting WNV.

This plant-derived Mab has the potential to provide greater efficacy and an enhanced treatment window compared to mammalian cell-produced versions, while being less expensive to produce and more scalable to industrial production.

Potential Applications

- therapeutic for West Nile virus infection
- possible prophylactic vaccine for West Nile virus

Benefits and Advantages

- readily crosses the blood-brain barrier for improved CNS penetration and better treatment efficacy
- extended treatment window

Intellectual Property Status:

Patent Pending

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