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Zika as an oncolytic virus to treat brain tumors

A method to treat aggressive brain cancers using Zika as an oncolytic virus combined with anti-cancer vaccinations.

IP Status: US Patent Issued; Patent No. 11,406,697 and 10,610,583

Applications

- Treatment for malignant brain tumors
- Potential therapeutic for other cancers

Key Benefits & Differentiators

- **Increases survival:** Use of Zika virus combined with formulated vaccines increases survival from 0% to 70% in a mouse model of brain cancer.
- **Targets affected cell types:** Zika virus has exhibited the capability to infect and kill neural stem stem cells and brain tumor stem cells.
- **Comparatively mild side effects:** Adults infected with zika experience relatively benign, non-permanent side effects (as compared to chemotherapy and radiation).

Oncolytic viruses (the enemy's enemy)

Glioblastoma is the most common malignant primary brain tumor in adults and has a 5-year survival rate of only 5% even with aggressive treatment including surgery, radiation and chemotherapy. This low survival rate emphasizes the need for new therapeutic approaches. One creative approach that has been extensively studied is the use of oncolytic viruses (including herpes simplex virus, measles, poliovirus, among others) in the treatment of cancer. Poliovirus has shown the most promise, but still leaves much to be desired with a 2-year survival rate of 29% in glioblastoma patients. In an effort to improve on this approach, researchers at the University of Minnesota have established that Zika virus combined with anti-cancer vaccinations is a promising new approach to treating brain tumors.

Putting zika virus to work

Zika virus shows potential based on its ability to infect brain tumor stem cells in vitro. Additionally, recent evidence has shown that adults infected with Zika virus experience a relatively benign course of illness with fever, rash, joint pain, conjunctivitis, and some symptoms of Guillain-Barre syndrome. Considering the infectivity of Zika virus on glioblastoma stem cells and the mild host of symptoms associated with the infection, this therapy shows promise as a potential therapy for glioblastoma patients. Testament to this potential, use of Zika in combination with anti-cancer vaccinations (irradiated, zika-infected tumor cells + GM-CSF) in brain cancer mouse models, improved long-term survival from 0% to approximately 70%.

Phase of Development

TRL: 3
Studies showing the ability of Zika virus to infect and kill brain tumor cells and increase survival in mouse models of disease.

Technology ID
20170095

Category
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Press Releases

University of Minnesota Foundation 2018

Researchers

- **Walter Low, PhD** Professor, Department of Neurosurgery
- **Craig Bierle, PhD** Position, Department of Pediatrics

References

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