Researchers harness Zika virus vaccine under development to target glioblastoma

Researchers at The University of Texas Medical Branch at Galveston have successfully harnessed a Zika virus vaccine under development to target and kill the brain cancer known as glioblastoma. The findings are currently available in *MBio*.

The Zika virus can cause microcephaly, a condition where the fetal brain doesn't fully develop when a pregnant woman is infected with the virus. In contrast, glioblastoma dangerously multiplies brain cells into cancerous tumors. The altered Zika vaccine effectively targeted and destroyed the cancerous brain cells in mice but not healthy cells.

"These findings represent major progress toward developing the Zika vaccine as a safe and effective virotherapeutic treatment for human glioblastoma," said UTMB's Pei-Yong Shi, professor in the department of biochemistry and molecular biology.

Glioblastoma is the deadliest and most common type of brain tumor. Despite surgery, radiation and chemotherapy, glioblastoma has a high rate of return with an average survival of less than two years. The late Sen. John McCain's battle with glioblastoma has drawn into sharp focus how aggressive this form of brain cancer can be.

Glioblastoma is a cancer of the glial cells enmeshed throughout the brain that provide structure, nutrition and oxygen for the nerve cells. The tumor recurrence is likely due to cancerous glioblastoma stem cells that hide in brain tissue close to the tumor mass even after surgery. Microcephaly likely develops because Zika virus targets stem cells in the fetal brain.

These observations led Shi and his colleagues at UTMB and in China to test the safety and effectiveness of UTMB's potential Zika virus vaccine in treating mice that were given human glioblastoma tumors to see if the virus would infect and kill the glioblastoma stem cells without harming normal brain cells. They found that the Zika vaccine caused no neurological symptoms or behavioral abnormalities while significantly reducing tumor growth and prolonging survival.

"The current study takes advantage of our recently developed Zika vaccine candidate," Shi said. "We will continue to improve the therapeutic potential of this platform by increasing the safety and increasing the specific cancer-killing activity. It is exciting to turn the "bad" side of the virus into cancer treatment."

Source:

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