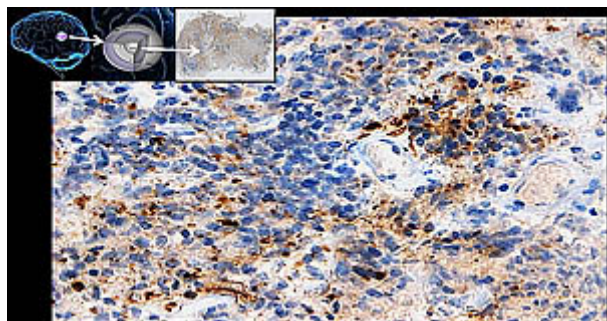


UC San Diego among First in Nation to Treat Brain Cancer with Novel Viral Vector

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Directly injected viral vector, Toca 511, is designed to spread through brain cancer cells and kill them while leaving healthy cells unharmed

UC San Diego Moores Cancer Center researchers and surgeons are among the first in the nation to treat patients with recurrent brain cancer by directly injecting an investigational viral vector into their tumor. The treatment is being developed by a local San Diego Company, Tocagen Inc.



The Toca 511 virus replicates by budding and spreads through tumor tissue.

“This clinical trial targets glioblastoma – one of the deadliest forms of brain tumor,” said principal investigator Santosh Kesari, MD, PhD, director of neuro-oncology in the Moores Cancer Center and in the Department of Neurosciences at the University of California, San Diego. “Clinical trials of investigational therapies such as this may lead to new treatment options for patients battling this deadly disease.”

The current standard of care for a newly diagnosed, high-grade glioma includes surgically removing as much of the tumor as possible, followed by radiation therapy and chemotherapy. Despite these measures, the tumor usually recurs making this trial a high priority.

The trial is investigating the use of Toca 511 (vocimagene amiretrorepvec), for injection in combination with Toca FC (flucytosine), extended-release tablets. Toca 511 is a retroviral replicating



The surgical procedure involves directly injecting the viral vector into the brain tumor.

stereotactic and radiosurgery, UC San Diego Moores Cancer Center and an investigator on the study. Chen administered Toca 511 into the first patients who have participated in this clinical trial at UC San Diego. “We fused the patient’s CT scan to their MRI and used neuro-navigation software to calculate exactly where in the tumor we needed to place the injection of Toca 511. The patients were given the injection and discharged from the hospital the day after the procedure.”

Co-investigator Bob Carter, MD, PhD, chief of the Division of Neurosurgery at UC San Diego Medical Center and Moores Cancer Center, noted that this novel agent is the culmination of years of multi-disciplinary efforts. “Tocagen’s investigational therapy, Toca 511 & Toca FC, is a representative example of the culmination of many technological advances that have come to pass during the last three decades,” said Carter. “It is a convergence of years of hard work by dedicated public and private practitioners in many different fields – including molecular biologists, basic scientists, virologists, physicists, mathematicians, surgeons, computer scientists, manufacturing experts, regulatory experts, and oncologists.”

vector (RRV) that is designed to deliver a cytosine deaminase (CD) gene selectively to cancer cells. After allowing time for the administered Toca 511 to spread through the cancerous tumor those cancer cells expressing the CD gene can convert flucytosine into the anti-cancer drug 5-fluorouracil (5-FU). In this study, patients receive cycles of oral Toca FC monthly for up to six months.

“This may provide a way to destroy the cancer cells without disrupting delicate neurocircuitry,” explained surgeon scientist Clark Chen, MD, PhD, director of

UC San Diego Moores Cancer Center Launches Brain Tumor Trial- Tocagen



Kesari discusses Tocagen clinical trial (click photo to view).

For Kesari, whose doctoral thesis focused on viral therapy for brain tumors, this has been a passion for 20 years. “I started this kind of research two decades ago, and to see a new technology like Toca 511 advance from bench to bedside completes the circle. This is the moment physician-researchers live for.”

“This trial is an exciting realization of the ability to help our patients that comes from outstanding science combined with innovative thinking and the desire to

deliver compassionate care,” said William C. Mobley, MD, PhD, chair of the Department of Neurosciences at the UC San Diego School of Medicine. “At UC San Diego, we are intent upon transforming the care of patients with disorders of the brain.”

Participants in this clinical trial must be 18 years or older; have a single, recurrent Grade three or four glioma and have had prior surgery and chemoradiation.

For more information please visit www.tocagen.com/clinical-trials or www.clinicaltrials.gov and search for “Toca 511.”

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