Genetically-modified neural stem cells for treatment of high-grade glioma

Grant Award Details

Genetically-modified neural stem cells for treatment of high-grade glioma

Grant Type: Disease Team Planning

Grant Number: DT1-00708

Investigator:

Name:	Michael Barish
Institution:	City of Hope, Beckman Research Institute
Type:	PI

Disease Focus: Brain Cancer, Cancer, Solid Tumors

Award Value: $55,000

Status: Closed

Grant Application Details

Application Title: Genetically-modified neural stem cells for treatment of high-grade glioma

Public Abstract: Our proposal details assembly of a multidisciplinary Disease Team whose goal will be to take into the clinic a novel and promising stem cell-based strategy for selectively targeting invasive tumor cells in high-grade glioma. These tumor cells form small foci scattered throughout the brain that are resistant to standard treatments and are the tumor in large part responsible for the poor prognosis of glioma patients. Therapies to eliminate invasive brain tumor cells while sparing normal brain are urgently needed to address this clinical gap. The therapy we intend to develop is centered on our initial preclinical results demonstrating that neural stem cells (NSCs) can be used to target and deliver chemotherapeutic agents to tumors and infiltrative microfoci. Only cell-based therapies have the capability to actively seek out tumor cells, a property essential to targeting dispersed invasive glioma microfoci. Our fundamental observation and lead approach has been established in pre-clinical glioma models: a well-characterized immortalized human neural stem cell line will localize to tumor sites, track invading tumor cells, and deliver therapeutically effective drug. We are now uniquely poised to take this NSC-based therapeutic concept to the next level. Our goal is refining the this therapeutic approach while identifying and ameliorating potential clinical complications, to be followed by implementation in a clinical trial. We envision team focus on critical therapeutic development areas, with alternative approaches evaluated using a set of strong analytical methods and metrics. Participation of the clinical implementation-oriented members of the disease team in all aspects of therapeutic development and evaluation will ensure that NSCs selected for clinical use will have been derived under conditions where they can directly pass into manufacture and meet regulatory standards.

Statement of Benefit to California:	Glioma is among the most intractable cancers, in part because invasion of the normal brain by tumor cells makes surgery only palliative. Therapies to eliminate invasive brain tumor cells while sparing normal brain are urgently needed to address this clinical gap. Our proposal details assembly of a multidisciplinary Disease Team whose goal will be to take into the clinic a novel and promising stem cell-based strategy for selectively targeting invasive tumor cells in high-grade glioma. Participation of the clinical implementation-oriented members of the disease team in all aspects of therapeutic development and evaluation will ensure that stem cells selected for clinical use will have been derived under conditions where they can directly pass into manufacture and meet regulatory standards. Our hope is that this novel approach will yield a unique therapy targeting tumor cells that cannot be eliminated by other therapeutic methods. Any progress towards reducing the virulence of glioma will be of immense benefit to the State of California and its citizens.
