



## CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:  
RP110041

Project Title:  
Unraveling the Molecular Mechanisms and Biomechanics of Glioblastoma  
Invasion

Award Mechanism:  
Individual Investigator

Principal Investigator:  
Bachoo, Robert

Entity:  
The University of Texas Southwestern Medical Center

### Lay Summary:

Lay Summary The invasion of Glioblastoma (GBM) cells into healthy brain tissue is the pathological hallmark of malignant gliomas which contributes to the failure of current therapies (surgery, radiation and chemotherapy) and all patients ultimately die of widely infiltrative tumor with the progressive physical and cognitive decline preceding death. Current therapies for malignant gliomas target cellular growth but not invasion, largely due to the complete lack of understanding of the mechanisms underlying invasion or glioma cell migration in the brain. The impact of a therapy that could prevent invasion would be groundbreaking – essentially having the ability to turn a glioma into a local rather than diffuse process, with the ability to apply local therapies which may be significantly more effective. However, progress in this area has been stalemated by the lack of accurate model systems to study basic properties of migration. Two years ago, a collaboration was forged between Dr. Bachoo and engineering faculty at UT Arlington, including Drs. Kim (in-vitro microfluidic model of cell migration), Dave (quantitative cell imaging) and Chuong (cellular biomechanics), to tackle this important problem in glioma biology. Through this collaboration, a novel custom-designed chamber was built and has been used to demonstrate unique properties of the migrating GBM cells. The current study uses human GBM cells taken from the original tumor surgery and grown in the brains of mice. These cells demonstrate the same invasion that they did in the patient and thus can be studied in the chamber. The studies are anticipated to generate new insights into this important clinical program and pave the way for new therapeutic strategies in glioblastoma.