



## CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:  
RP100963

Project Title:  
Enrichment Filter and Point-of-use Assay Platform for Detection of  
Circulating Tumor Cells

Award Mechanism:  
Company Commercialization

Principal Investigator:  
Vykoukal, Jody

Entity:  
Ingeneron, Inc.

### Lay Summary:

An improved capacity to isolate and characterize circulating tumor cells (CTCs) would have a significant impact on the early detection, treatment, and scientific understanding of many types of cancer. Despite considerable progress in diagnosing and treating solid tumors, metastatic disease remains the foremost cause of cancer-related death. With current diagnostic approaches, the spread of tumor cells in most patients is undetected until after metastatic disease is well-established, and early, potentially effective, intervention is not an option. Introduction of a facile means for the early detection and continual systemic monitoring of circulating tumor cells would enable timely administration of a wider range of treatment options that are more appropriately tailored to a patient's specific disease. We propose to build a novel, compact system to detect, isolate, and characterize circulating tumor cells originating from primary solid tumors or their metastases. Specifically, we will develop two key technologies to demonstrate a portable system that comprises the following elements: 1) a self-assembled biofilter for specific capture, concentration, and recovery of circulating tumor cells from whole blood samples, and 2) a low-cost contact imaging cytometer for subsequent cell quantification and molecular analysis. Both the size selectivity and capture probe functionalization of the enrichment filter will be optimized to selectively trap CTCs from blood samples; dissolution of the filter will then yield a CTC-enriched sample for cell enumeration and further analysis. Employment of imaging cytometry will enable CTC analysis without a need for bench or lab-scale equipment, making the unit much more appropriate for bedside or clinic use compared to current CTC detection systems. Our ultimate aim is to combine these two core technologies into a system that will rival or surpass the sensitivity of current CTC detection technologies, interface with current medical sample handling techniques, and be easy for caregivers to use.