



CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP140315

Project Title:
Accurate and High Throughput Detection of Breast and Ovarian Cancer
Cells in Whole Blood

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
The Methodist Hospital Research Institute

Lay Summary:

Accurate and High-Throughput Detection of Breast and Ovarian Cancer Cells in Whole Blood Metastasis, or spread of primary tumor cells, is the major cause of mortality in cancer patients. Studies have demonstrated that circulating tumor cells (CTCs) in the bloodstream are key players in establishing metastatic tumors. In addition, the presence of CTCs is directly associated with cancer progression, recurrence, and a poorer survival rate. Therefore, accurate and rapid CTC detection and quantification is needed for proper and timely cancer patient treatment. There is only one test system currently approved by the FDA for detecting cancer cells in the bloodstream, and it involves a lengthy isolation and identification process (>20 hours). It also requires a substantial amount of blood, as a significant amount is used during the procedure. Furthermore, the multi-step process makes it very labor-intensive, and only allows one patient sample to be tested at a time. To overcome these obstacles and address clinical needs, this project will develop a load-then-read assay that rapidly detects breast and ovarian cancer CTCs. This test system will use small molecules called aptamers that bind to and identify specific CTCs in patient blood. The test will be very accurate, because the aptamers recognize molecules solely present on the surface of cancer cells that are not present on normal cell surfaces. Importantly, this test system requires only a small amount of patient blood, and in minutes can simultaneously test several samples for different cancer types. This novel load-then-read test will be a technological advance over the existent time- and labor-consuming methodology for detecting CTCs. Reducing the time needed for testing, and increasing the accuracy of CTC detection, could result in more favorable prognoses and outcomes for cancer patients.