CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
DP150052

Project Title:
High-throughput Flow-proteometric System in Screening Functional Complexes as Cancer Biomarkers

Award Mechanism:
Bridging the Gap: Early Translational Research Awards

Principal Investigator:
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Entity:
The University of Texas M.D. Anderson Cancer Center

Lay Summary:

Targeted therapy is one of the most important advances in cancer treatment because it has better therapeutic efficacy and fewer side effects compared with conventional chemotherapy by targeting specific molecules responsible for cancer progression without affecting normal cellular functions. Targeted therapy is used to treat cancer from multiple aspects, such as reactivation of immune response (immuno-check point therapy) and inhibition of cancer cell proliferation, invasion, and drug resistance. Hence, accurate molecular diagnosis will be critical for doctors to prescribe an appropriate drug for patients who will most likely respond to it. Currently, many clinical trials use “marker-guided treatment” to stratify patient population for targeted therapy. These cancer markers are typically the expression of a single protein, e.g., EGFR, MET, HER2, PD1, or PD-L1. However, examining protein expression alone does not always signify the activity of a signal pathway as cancer-related proteins form complexes with other biomolecules to deliver the cancer progression signals. For example, only 1/3 of HER2-overexpressing breast cancer patient tumors respond to Herceptin (trastuzumab). Therefore, instead of examining a single protein, a new generation of biomarkers associated with functional signaling complexes (termed functional biomarkers) may serve as better biomarkers for cancer molecular diagnosis. The device developed in this proposal will allow us to identify functional biomarkers in a high-throughput manner to predict treatment response for clinical use. Success of this proposal will establish a new generation of biomarkers (functional biomarkers) that may be more reliable than the currently used single protein biomarkers as a molecular diagnostic tool for cancer in the future.