



## CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:  
RP110782

Project Title:  
LTQ Orbitrap Velos Mass Spectrometer to Support Cancer Research

Award Mechanism:  
Shared Instrumentation Awards

Principal Investigator:  
Person, Maria D

Entity:  
The University of Texas at Austin

### Lay Summary:

Cutting edge tools and technologies are essential for progress in cancer research, and the sensitive, high throughput LTQ Orbitrap Velos mass spectrometer reduces experiment time and increases knowledge output. This instrument has the sensitivity to observe molecular details from the earliest stages of DNA damage, through cell proliferation, invasion and metastasis, and to provide detailed characterization of interactions of drugs with DNA and proteins. It has high throughput for analyzing large numbers of patient samples to enable personalized treatment plans and for simulating heterogeneity in animal models by using multiple strains and carcinogens. 16 cancer research projects supported include innovative, multidisciplinary approaches from the University of Texas at Austin and M.D. Anderson Cancer Center across three themes: (I) Potentially high impact immune approaches take advantage of whole genome sequencing and bacterial engineering to establish the first ever cancer antibody profiling facility which will monitor cancer patient antibody repertoires and manufacture therapeutic antibodies for treatment of ovarian cancer. A mouse model is employed for testing antibody therapies directed against a protein turned on during breast cancer. (II) Understanding mechanisms of DNA damage and repair processes will delineate critical protein partners and modifications. Double-strand break repair pathways are relevant to leukemias and lymphomas, while anticancer DNA-interactive drugs with selective reactivity in cancer cells can reduce side effects. (III) Identifying targets inside relevant contexts will improve diagnosis and treatment. Differentiating the 2% of newly diagnosed diabetics with pancreatic cancer enables early intervention treatment. Pathway analysis of tumor promotion across multiple mouse strains and carcinogens teases out early stage events for prevention activities, while novel methods identify candidate drugs and their effects on signaling proteins.