# CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP180178

Project Title:
Imaging glucose stimulated zinc secretion (GSZS) from the prostate by MRI: A potentially powerful method for early detection of prostate cancer

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
The University of Texas Southwestern Medical Center

Lay Summary:

Prostate cancer (PCa) accounts for 33% of all newly diagnosed malignancies and is the second most common cause of death among men in the United States. Screening for PCa commonly consists of a measure of plasma prostate specific antigen (PSA) and a digital rectal exam (DRE). In the current era of widespread PSA testing, ~75% of all prostate cancer cases are detected as a result of abnormal PSA findings but the test remains controversial as it is unclear whether the benefits of early detection by PSA outweigh the risks of misdiagnosis. Benign prostatic hyperplasia (BPH), inflammation, and age can all affect PSA levels. When a PSA test reveals an abnormally high level, clinicians often order an ultrasound or MRI exam in an effort to verify that cancer is present. Although multi-parametric MRI (mpMRI) is considered the gold standard for PCa detection, there are regions within the prostate gland where it can be difficult to differentiate PCa from BPH. If a region of tissue appears suspicious by mpMRI, a follow up image-guided biopsy becomes necessary to confirm PCa. Each of these added tests contribute to the increased costs associated with PCa detection and verification well before any surgical interventions.
It is well-known that the prostate contains the highest levels of zinc in the human body and that zinc levels fall as prostate cells become malignant making zinc an attractive biomarker for detection and evaluation of PCa. We have recently demonstrated in rodents that zinc secretion from the healthy prostate is stimulated by glucose and that it can be detected in a simple MRI exam. The goal of this study is to evaluate the effectiveness of this MRI detection method in distinguishing between healthy and diseased dog prostate, to measure the distribution of zinc in human prostate tissue samples correlating those results with Gleason scores, and to develop a clear path for translating this MRI method to cancer patients by the end of this three-year grant.