



Uniformed Services University
of the Health Sciences
4301 Jones Bridge Road
Bethesda, MD 20814-4799

Release No.10-06-53

July 16, 2010

Contact: Ken Frager, Office of External Affairs

Voice: 301-295-3981 **Cell:** 240-281-2738

Email: kenneth.frager@usuhs.mil

USU researchers break new ground in prostate cancer detection

Bethesda, Maryland – A highly specific assay for the detection of a protein associated with tumor formations present in nearly two-thirds of all prostate cancers has shown unprecedented specificity (99.99%) for detecting prostate tumor cells in tissue specimens. These findings, reported in the advanced online publication of *Prostate Cancer and Prostatic Diseases* (Nature Publishing Group, June 29), offer great potential in the diagnosis of prostate cancer.

“We are excited about the potential of streamlining the detection of prostate cancer in clinical specimens,” said Dr. Shiv Srivastava, scientific director at the Uniformed Services University of the Health Sciences’ Center for Prostate Disease Research (CPDR). “This protein, ERG, is one of the common biologically relevant markers in prostate cancer and our protein-based test represents an incremental advance in the right directions to resolve some of the key issues faced in prostate cancer diagnosis and treatment.”

The study, co-led by Srivastava and Dr. Isabell Sesterhenn, from the Department of Genitourinary Pathology at Armed Forces Institute of Pathology (AFIP), in collaboration with researchers at Walter Reed Army Medical Center, provides first insights into how and where ERG protein is present in prostate tissues by developing a comprehensive map of whole-mount prostate sections of more than 130 patients. The team established the selective presence of ERG in malignant cells and the virtual absence of ERG in normal cells.

CPDR researchers have actively studied biology, biomarker and therapeutic utility of ERG alterations in prostate cancer since their original discovery of the frequent ERG overexpression in nearly two-thirds of all prostate cancer patients more than five years ago. Prostate cancer researchers have established that activation of the ERG gene and other related genes represent common genomic defects in prostate cancer and continued evaluation of these genes have promising potential in improving diagnosis and/or treatment of prostate cancer.

“This notable advancement in the field has been possible only because this type of assay is routinely used in pathology settings. We anticipate this strategy will open new opportunities in clinical evaluation of prostate cancer worldwide,” said Albert Dobi, Ph.D., assistant director of CPDR’s basic science research program and a co-author of the paper.

This past Spring, the American Cancer Society rewrote their recommendations regarding PSA screening for prostate cancer. “Blood-PSA protein assay, the current screening method, has no specificity for prostate tumor cells, as similar amounts of PSA is made in normal and tumor cells,” said Srivastava. “There are more cells overall in the prostate gland with a tumor, which is reflected in higher PSA in blood. However, we also detect high PSA during infection in the prostate or benign enlargement of the gland. The lack of cancer specificity found in PSA-based screening then leads to many associated problems and unnecessary follow-up testing.” While this assay is applicable in tissue testing, investigators including the CPDR team are looking into more specific diagnostic assays using urine and blood.

The complete study, “ERG oncoprotein expression in prostate cancer: clonal progression of ERG-positive tumor cells and potential for ERG-based stratification,” is available online at <http://www.nature.com/pncan/journal/vaop/ncurrent/full/pncan201023a.html>

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