Prostate cancer biomarker may predict patient outcomes

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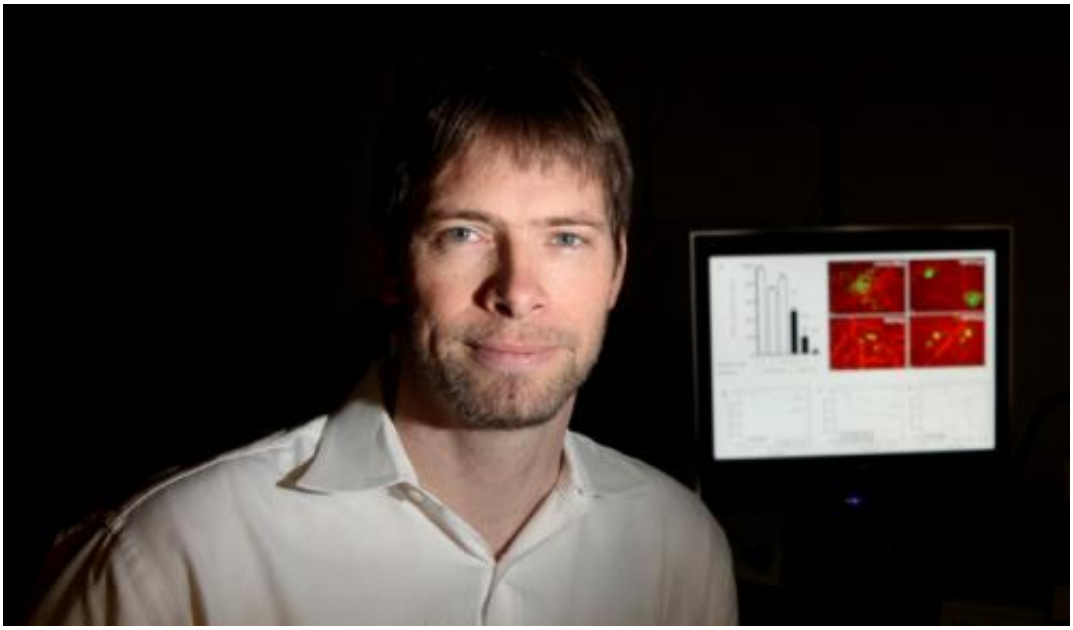

Andries Zijlstra, Ph.D., and colleagues are studying a biomarker that can help predict prostate cancer recurrence. Credit: Susan Urmy

Researchers at Vanderbilt University Medical Center and the University of Alberta in Canada have identified a biomarker for a cellular switch that accurately predicts which prostate cancer patients are likely to have their cancer recur or spread.

The study, posted online recently in advance of publication in *Cancer Research*, was led by co-investigators Andries Zijlstra, Ph.D., assistant

professor of Pathology, Microbiology and Immunology and Cancer Biology at Vanderbilt, and John Lewis, Ph.D., associate professor of Oncology and Frank and Carla Sojonky Chair in Prostate Cancer Research, University of Alberta.

Prostate cancer is the second leading cause of cancer-related deaths among men in North America.

While some prostate cancer spreads slowly and does not lead to serious symptoms, in other patients the cancer metastasizes to other parts of the body and proves fatal. Cancer researchers have been searching for biomarkers that indicate which patients should be treated aggressively and which patients can be followed through active surveillance.

Zijlstra and his colleagues have been investigating a protein called CD151 that facilitates the migration of cancer cells. In prostate cancer cell lines, they discovered that CD151 is free from its normal adhesion partner (integrin)—another protein that allows a cell to stick to the surrounding tissue. This form of CD151 called "CD151free" proved to be functionally important in cancer.

"It was a big surprise that some of this CD151 protein was now free of that partner and it turns out that it only occurs when a cancer is formed," said Zijlstra. "What's so novel about this discovery is we're not talking about changing protein expression, which is what we traditionally see. We're talking about a protein that changes its molecular state and detection of that molecular state is an indication of disease progression."

In collaboration with Lewis and colleagues in Alberta, the group looked at tissue samples from 137 patients treated for prostate cancer in Canada over the past 12 years.

The team determined that if patients tested positive for CD151free their

cancer recurred and spread earlier than patients without any detectable CD151free.

"Patients who tested positive for the biomarker developed metastasis an average of 10 years earlier than those who tested negative," said Lewis.

Preliminary work in other solid tumors besides prostate cancer suggests that this may be a universal mechanism important for cancer progression .

"It is increasingly clear that a molecular switch in cell migration corresponds to patient outcome in solid tumors," said Zijlstra. "Consequently, the detection of that switch can assist in determining whether a patient is going to develop aggressive cancer or if the disease will remain benign. That information ultimately determines the type of care given to a cancer patient."

Lewis and Zijlstra said the integrated collaboration among basic scientists, physicians and bioinformatics/biostatisticians led to these results which should be useful for patient management. The group is working on development of an antibody test for use in the clinic.

Provided by Vanderbilt University Medical Center

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