

Biological markers of prostate cancer shed light on cancer burden faced by African-American men

Researchers based at Tulane University report the discovery of biological markers of prostate cancer which are involved in the growth of tumor cells, shedding light on the genetic basis for the prostate cancer burden faced by African-American men. The research is being presented today at the American Association for Cancer Research conference on The Science of Cancer Health Disparities in Racial/Ethnic Minorities and the Medically Underserved, being held November 27-30.

In prostate tumors samples taken from African-American and Caucasian men, the researchers found that two proteins are overproduced in 90 percent of tumor cells from the African-Americans studied. These structural proteins, called hnRNP-H1 and SAFB-2, in part comprise the nuclear matrix, the mesh of molecules that serves as the supporting “skeleton” of the cell’s nucleus.

“We have employed a unique functional genomics approach to unravel the molecular mechanisms underlying the disproportionate incidence and mortality among African-American men,” said Asim B. Abdel-Mageed, D.V.M, Ph.D., associate professor and director of the Molecular Oncology Research program in the Department of Urology at Tulane University School of Medicine.

Currently, prostate specific antigen (PSA) and digital rectal examinations are the two most common methods of detecting prostate cancer. African Americans are typically diagnosed with prostate cancer more frequently and later – when the cancer is at an advanced stage and more aggressive – than any other ethnic group in the United States. According to Abdel-Mageed, earlier detection of prostate cancer might decrease this health disparity. “The target genes may have potential clinical utility as biomarkers or prognostic indicators of disease progression in African-American men independent of a PSA screen,” Abdel-Mageed said.

With funding from the National Cancer Institute and American Cancer Society, the researchers compared prostate cancer cells from 50 African-American and Caucasian men, aged 50 to 60, matched so that each group comprised similar tumor grades. Using DNA sequencing and screening techniques to determine the genetic activity of these tumor cells, the researchers demonstrated the increased production of heterogeneous nuclear ribonucleoprotein H1 (hnRNP-H1) and scaffold attachment factor B2 (SAFB-2) in African-American men as opposed to Caucasians.

In addition to their role as potential blood-borne biomarkers for disease screening, the researchers are excited by the role these proteins play in chemical pathways that control disease progression. “Both of these genes share many structural and functional similarities, including possession of messenger RNA binding sites that could allow them to regulate how other genes are read from the DNA,” said Abdel-Mageed.

Through related means, Abdel-Mageed says, these proteins are somehow involved in the relationship between hormones and prostate cancer progression. The researchers determined that hnRNP-H1 protein, in particular, binds to and activates the androgen receptor (AR), a nuclear protein that serves as an intermediate that allows male hormones from the bloodstream, such as testosterone, to activate genes encoded in the DNA. Testosterone and other hormones have been shown to influence prostate cancer growth, Abdel-Mageed says.

“Similarly, SAFB-2 was shown to have a role in regulation of hormone-related genes. “Based on these data, we believe their selective expression may represent a novel a mechanism for disease progression and development of hormone refractory disease in African Americans,” said Abdel-Mageed.

Source: American Association for Cancer Research

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