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Genomic fingerprint may predict aggressive prostate cancer in African-Americans

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African American men are more likely to develop prostate cancer than European American men, and are also more than twice as likely to die from it. Although there are many reasons that contribute to this health disparity, new research shows that African American men may have a distinctly different type of prostate cancer than European American men, according to new genomic fingerprinting results.

"This study, this line of research, is about finding better and more appropriate therapies for African American men," says corresponding author of the study, Kosj Yamoah, M.D., Ph.D., Chief Resident in the Department of Radiation Oncology, Sidney Kimmel Cancer Center at Thomas Jefferson University. "The first step is to figure out how prostate cancer is different and more aggressive at the genomic level." In research published in the *Journal of Clinical Oncology* on July 20th, Dr. Yamoah and colleagues identify a subset of genes known as biomarkers that define a genomic subtype of prostate cancer that is more common in African American men, and which signals a more aggressive disease.

The researchers scanned the literature for genes that were functionally associated with prostate cancer initiation and progression and found 20 genes. These 20 included prostate cancer markers and genes involved in hormone receptor function and cell metabolism. Dr. Yamoah and colleagues then examined the clinical records of prostate cancer patients to find a pool of 154 African American and 243 European American men whose prostate cancer characteristics were matched using a validated scoring system known as CAPRA-S, indicating very similar

disease at the outset. (The CAPRA-S predicts disease severity and risk of recurrence after surgical removal of the prostate and is based on a number of measures including the grade of tumor, number of lymph nodes containing signs of cancer, whether the cancer has spread into supportive structures of the prostate, PSA score, and other measures.) The researchers then analyzed samples from these patients to find out which of the 20 validated genes—some of which initiate and some which drive cancer—were expressed in high or low quantities in the two populations of men.

They found a subtype that the researchers coined "triple negative prostate cancer," defined as the absence or low levels of three genes called ERG, ETS, and SPINK1. African American men with high CAPRA-S scores and more advanced Gleason grade disease at diagnosis were more likely to be triple negative when compared to European American men with a similar disease scores at diagnosis.

The researchers also found other genes that were expressed at different levels in African American versus European American men, including genes involved in cell metabolism and the androgen receptor pathway. Further studies are already underway to validate the significance of this trend.

Despite being the largest study to date on African American prostate cancer biomarkers, the numbers of African American patients studied was still relatively small. "Much of what we understand in terms of the genetics of prostate cancer to date has been based on clinical trials in Caucasian men," says Dr. Yamoah. "However, the data here suggest that a subset of African American men may have a type of prostate cancer that arises from molecular pathways that are distinctly different from those of European American men."

"This, and our previous work in this area, shows that some African

American men with prostate cancer might have a better shot at survival if they are treated with a different approach than standard of care." The next steps, says Dr. Yamoah are to "refine the biomarkers that will capture these differences and develop approaches that help reduce the disparities in outcomes that we see."

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