Genetic Variation Linked to Longer Telomeres and Lower Risk of Bladder Cancer

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Telomere length tends to shorten with age and stress.
Interventions to lengthen telomeres key to cancer interception.
Research simultaneously published in *Cancer Prevention Research*.

ORLANDO, Fla. - Using new genetic information, scientists have linked a commonly found human genetic variant with both longer telomeres and reduced risk of bladder cancer, according to findings presented at the AACR 102nd Annual Meeting 2011, held April 2-6, and simultaneously published in *Cancer Prevention Research*, a journal of the American Association for Cancer Research.

Jian Gu, Ph.D., assistant professor of epidemiology at The University of Texas MD Anderson Cancer Center, said the single-nucleotide polymorphism (SNP) rs398652 on 14q21 was linked to both longer telomeres and a 19 percent reduction in the risk of bladder cancer.

"This genetic locus is a determinant of both telomere length and bladder cancer risk, and long telomeres partially mediate the protective effect of the variant on bladder cancer," said Gu.

Gu and colleagues analyzed 300,000 SNPs in 459 healthy participants and found 15,120 of them that were associated with telomere length. They then conducted a further validation in 890 and 270 healthy participants and found four SNPs that were significantly associated with telomere length. Specific cross-analysis with genetic polymorphisms and risk of bladder cancer showed that rs398652 was associated with a 19 percent overall reduced risk of bladder cancer. Furthermore, smoking especially augmented the risk for bladder cancer in those people having the other genetic variant, associated with shorter telomeres.

AACR President Elizabeth H. Blackburn, Ph.D., the Morris Herzstein professor of biology and physiology in the department of biochemistry and biophysics at the University of California San Francisco, won the Nobel Prize in 2009 for her role in the discovery of telomeres and the enzyme telomerase.

In an accompanying editorial published in *Cancer Prevention Research*, Blackburn said that studies to date have not found a genetic link between both telomere length and cancer, which provides solid confirmation to population studies that suggested a role for telomeres in cancer development. Although she stressed that the effect of interventions to lengthen telomeres would need to be tested in prospective studies, she said the finding was a major research advancement.

"It has shed light on the biology of early cancers and their initiating events. These advances now create unprecedented opportunities for novel approaches directed at prevention and early interception of cancers deadly trajectory," said Blackburn.

Blackburn will become immediate past president of the American Association for Cancer Research at 12:30 p.m. ET on Monday, April 4, 2011.

Both Gu and Blackburn made presentations at an AACR Annual Meeting press conference on Saturday, April 2 at 2:00 p.m. ET in room W313 of the Orange County Convention Center.

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The mission of the American Association for Cancer Research is to prevent and cure cancer. Founded in 1907, the AACR is the worlds oldest and largest professional organization dedicated to advancing cancer research. The membership includes 33,000 basic, translational and clinical researchers; health care professionals; and cancer survivors and advocates in the United States and more than 90 other countries. The AACR marshals the full spectrum of expertise from the cancer community to accelerate progress in the prevention, diagnosis and treatment of cancer through high-quality scientific and educational programs. It funds innovative, meritorious research grants, research fellowships and career development awards. The AACR Annual Meeting attracts more than 18,000 participants who share the latest discoveries and developments in the field. Special conferences throughout the year present novel data across a wide variety of topics in cancer research, treatment and patient care. Including *Cancer Discovery*, the AACR publishes seven major peer-reviewed journals: *Cancer Research*; *Clinical Cancer Research*; *Molecular Cancer Therapeutics*; *Molecular Cancer Research*; *Cancer Epidemiology, Biomarkers & Prevention*; and *Cancer Prevention Research*. AACR journals represented 20 percent of the market share of total citations in 2009. The AACR also publishes *CR*, a magazine for cancer survivors and their families, patient advocates, physicians and scientists.

Media Contact:
Jeremy Moore
(267) 646-0557
Jeremy.Moore@aacr.org [6]
In Orlando, April 2-6:
(407) 685-4001

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