

Scientists Identify Three New Genetic Variants that Increase Testicular Cancer Risk

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A study led by The Institute of Cancer Research (ICR) has identified three new genetic risk factors for testicular cancer. The findings, published online today in *Nature Genetics*, come during the Everyman Male Cancer Awareness Month, which aims to increase awareness and funding for vital research into testicular and prostate cancers.

Team members - from the ICR, the [Wellcome Trust Sanger Institute](#), and the [Cancer Research UK Genetic Epidemiology Units](#) in Cambridge and at the [University of Leeds](#) - scanned the genomes of almost 1,000 men with testicular cancer and almost 5,000 apparently unaffected individuals. They found genetic variants in three regions were significantly more common in the men with testicular cancer, and confirmed the results in a further 670 sufferers and 3,500 controls. The study was funded by the Everyman Campaign, Cancer Research UK and the Wellcome Trust.

Men who have any of the new regions on chromosomes 5, 12 and 9 have an increased risk of testicular cancer. Within each region, the researchers pinpointed an interesting gene most likely to be involved in causing testicular cancer. The three genes are called *TERT*, *ATF7IP* and *DMRT1*.

TERT and *ATF7IP* are important in maintaining the correct length of the ends of chromosomes, which are called telomeres. Shortened telomeres are known to occur in many cancers and genetic variants in *TERT* have already been linked to other cancers, including lung, bladder, cervical, pancreatic, skin and prostate cancer. The third gene identified in this new study, *DMRT1*, is pivotal in sex determination and has been implicated in the development of testicular cancer in mice.

Study senior author [Professor Nazneen Rahman](#), from the ICR, says: "The genes located in these regions give us clues to the mechanisms by which testicular cancer develops. In time this may allow us to develop new treatment options."

This study takes the number of genomic regions associated with testicular cancer risk to six, after the same team found the first three factors last year.

Lead study author Dr Clare Turnbull, from the ICR, says: "This study represents further, important progress towards identifying men who are at increased genetic risk of testicular cancer. Finding those men at highest risk may allow early detection or prevention of the disease."

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The researchers are keen to recruit more men with testicular cancer to the research, for more information visit www.everyman-campaign.org/Testicular_Cancer/

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Notes to editors:

- Testicular cancer is the most common cancer in men aged 15 to 45 years
- The disease has a strong genetic component and men who have a brother affected by testicular cancer have an eight -to ten-fold increased risk of developing the disease than men without a family history. These inheritance risk factors are much higher than for other cancer types, which are generally only two-fold
- The present study found risk factors for testicular germ cell tumour at chromosome position 5p15 (*TERT*) (OR=1.54 (95%CI 1.33-1.79) $P=1.14\times 10^{-23}$), chromosome position 12p13 (*ATF7IP*) (OR=1.27 (95%CI 1.12-1.44), $P=6.16\times 10^{-10}$) and chromosome position 9q24 (*DMRT1*) (OR=1.37 (95%CI 1.21-1.55), $P=1.12\times 10^{-23}$). The manuscript *Variants near DMRT1, TERT and ATF7IP are associated with testicular germ cell cancer* is being published online today in *Nature Genetics*
- The previous study found risk factors at positions 5q31 (*SPRY4*), 6p21 (*BAK1*) and 12p21 (*KITLG*). *A genome-wide association study of Testicular Germ Cell Tumour* was published in *Nature Genetics*, 2009

The Institute of Cancer Research (ICR)

- The ICR is Europe's leading cancer research centre
- The ICR has been ranked the UK's top academic research centre, based on the results of the Higher Education Funding Council's Research Assessment Exercise
- The ICR works closely with partner The Royal Marsden NHS Foundation Trust to ensure patients immediately benefit from new research. Together the two organisations form the largest comprehensive cancer centre in Europe
- The ICR has charitable status and relies on voluntary income, spending 90 pence in every pound of total income directly on research
- As a college of the University of London, the ICR also provides postgraduate higher education of international distinction
- Over its 100-year history, the ICR's achievements include identifying the potential link between smoking and lung cancer which was subsequently confirmed, discovering that DNA damage is the

basic cause of cancer and isolating more cancer-related genes than any other organisation in the world

For more information visit www.icr.ac.uk

Everyman

The Institute of Cancer Research is home to the UK's leading male cancer campaign, Everyman, which raises awareness and funds research into testicular and prostate cancers. Much of the research takes place at the ICR's Everyman Centre - Europe's first and only centre dedicated to male cancer research. All money raised during Everyman Male Cancer Awareness Month will go directly towards supporting research at the Everyman Centre and male cancer scientists at the ICR.

For more information visit www.everyman-campaign.org

The Wellcome Trust Sanger Institute

The Wellcome Trust Sanger Institute, which receives the majority of its funding from the Wellcome Trust, was founded in 1992. The Institute is responsible for the completion of the sequence of approximately one-third of the human genome as well as genomes of model organisms and more than 90 pathogen genomes. In October 2006, new funding was awarded by the Wellcome Trust to exploit the wealth of genome data now available to answer important questions about health and disease.

For more information visit www.sanger.ac.uk

The Wellcome Trust

The Wellcome Trust is a global charity dedicated to achieving extraordinary improvements in human and animal health. It supports the brightest minds in biomedical research and the medical humanities. The Trust's breadth of support includes public engagement, education and the application of research to improve health. It is independent of both political and commercial interests.

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- Together with its partners and supporters, Cancer Research UK's vision is to beat cancer.

For further information about Cancer Research UK's work or to find out how to support the charity, please call 020 7121 6699 or visit www.cancerresearchuk.org

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