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## PRESS RELEASE

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### **Scientists find genes associated with the development of a form of throat cancer called nasopharyngeal carcinoma, through a large scale study of more than 10,000 subjects**

Scientists from Singapore, China and USA have identified three new susceptibility genes in a genome-wide association study of nasopharyngeal carcinoma (NPC). The study, led by the Genome Institute of Singapore (GIS), a biomedical research institute of the Agency for Science, Technology and Research (A\*STAR), and the Sun Yat-Sen University Cancer Centre, identified genetic risk factors of NPC that advances the understanding of the important role played by host genetic variation in influencing the susceptibility to this cancer.

NPC is a type of cancer that forms in the epithelial lining of the nasopharynx, the area of the upper throat that lies behind the nose. It is particularly prevalent in southern China, such as Guangdong, with an occurrence rate of about 25 times higher than that in most regions of the world. NPC is therefore referred to as the *Cantonese<sup>1</sup> Cancer*. Led by Dr Liu Jianjun, Associate Director and Senior Group Leader of Human Genetics

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<sup>1</sup> Cantonese is a variety of the Chinese language spoken in and around the city of Guangzhou in Southern China.



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at the GIS, and Professor Yi-Xin Zeng, President of the Sun Yat-sen University Cancer Center, the findings were published in Nature Genetics on May 30, 2010.

To search for the genetic risk factors for NPC, the scientists carried out a comprehensive genetic analysis of the human genome in a large clinical sample of southern Chinese descent - approximately 5,000 patients and 5,000 controls. The researchers found that the genetic variation within the human leukocyte antigen (HLA)<sup>2</sup> and the three genes known as TNFRSF19, MDSIEV11 and CDKN2A/2B can significantly influence a person's risk of developing NPC. The researchers also noticed that these three susceptibility genes for NPC have been reported to be involved in the development of leukemia, suggesting there might be some shared biological mechanism between the developments of these two diseases. This finding provides an important opportunity for biologists to understand the molecular mechanism underlying the development of this cancer, and its unusual pattern of high prevalence in southern China.

Co-lead author Dr Liu Jianjun said, "Although many groups have attempted to identify the genetic risk factors of NPC, the findings of previous studies were limited by the small number of genes and clinical samples used. Because of this large-scale study of approximately 10,000 subjects in total, we are able to break through with more robust evidence compared to previous studies."

Co-lead author Prof Zeng added, "This finding confirmed the strong genetic effect of HLA locus in the risk of NPC. By using the high density of genetic markers, our finding helps to narrow down the chromosome region to search for the causative gene variant(s) associated with HLA loci. The identification of susceptibility genes involved in

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<sup>2</sup> Human leukocyte antigens (HLA) are cell surface glycoproteins that play a significant role in the immune system. The major HLA antigens are essential elements for immune function.



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the risk of NPC will help to develop a model for risk prediction and then screen for high risk populations, which in turn will be helpful for early diagnosis of NPC.”

Dr Malcolm Simons, Chief Scientific Officer of Simons Haplomics Limited who first discovered the association of HLA genes with NPC in Singapore in 1974, said, “This confirmatory study finalises the evidence produced over the past three decades from case-control and linkage studies of single NPC cases and of multiple case families that the HLA gene system is principally involved in risk for NPC development in Chinese. There is no longer a need to perform any more studies for evidence of the HLA association. The challenge is now to identify the location within or outside the HLA complex that underlies this genetic association or associations, and to determine whether the genetic change is required to be present on both of the pair of chromosomes (known as recessive homozygosity). The indication of three new genes contributing risk, albeit at a much lower level of significance than that of HLA, provides a focus for molecular biological analysis of these candidate risk genes”.

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#### **Notes to the Editor:**

##### Research publication:

The research findings described in the press release can be found on the Advance Online Publication (AOP) on 30 May 2010 on *Nature Genetics's* website under the title “A genome-wide association study of nasopharyngeal carcinoma identifies three new susceptibility loci”.

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### **About the Genome Institute of Singapore**

[www.gis.a-star.edu.sg](http://www.gis.a-star.edu.sg)

The Genome Institute of Singapore (GIS) is an institute of the Agency for Science, Technology and Research (A\*STAR). It has a global vision that seeks to use genomic sciences to improve public health and public prosperity. Established in 2001 as a centre for genomic discovery, the GIS will pursue the integration of technology, genetics and biology towards the goal of individualized medicine. The key research areas at the GIS include Systems Biology, Stem Cell & Developmental Biology, Cancer Biology & Pharmacology, Human Genetics, Infectious Diseases, Genomic Technologies, and Computational & Mathematical Biology. The genomics infrastructure



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at the GIS is utilized to train new scientific talent, to function as a bridge for academic and industrial research, and to explore scientific questions of high impact.

**About the Agency for Science, Technology and Research (A\*STAR)**

[www.a-star.edu.sg](http://www.a-star.edu.sg)

A\*STAR is the lead agency for fostering world-class scientific research and talent for a vibrant knowledge-based and innovation-driven Singapore. A\*STAR oversees 14 biomedical sciences, and physical sciences and engineering research institutes, and nine consortia & centres, which are located in Biopolis and Fusionopolis, as well as their immediate vicinity.

A\*STAR supports Singapore's key economic clusters by providing intellectual, human and industrial capital to its partners in industry. It also supports extramural research in the universities, hospitals, research centres, and with other local and international partners.

**About the Sun Yat-Sen University Cancer Center**

[www.sysucc.org.cn](http://www.sysucc.org.cn)

Sun Yat-Sen University Cancer Center was founded in 1964. It is the largest specialized Cancer center integrated with cancer treatment, training, research and cancer prevention in southern China. As a renowned tertiary care center, It accepts patients from all over the China and the Southeast Asia.

The Sun Yat-Sen University Cancer Center is the WHO Collaborative Center in Cancer



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Research, the sister hospital of the M. D. Anderson Cancer Center of the United States. It also houses the South China State Key Laboratory for Cancer Research.

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