

PRESS RELEASE

Singapore researchers find ways to diagnose and stop growth of rare but deadly Asian-centric lymphoma

- Discovery uncovers the common genetic variants affecting individual risk of NKTCL
- Indicate that our body's immune system plays a significant role in cancer controls

Singapore, 24th October 2016 – As part of the National Medical Research Council (NMRC) Translational and Clinical Research (TCR) flagship programme, a multidisciplinary team from the National Cancer Centre Singapore (NCCS), Singapore General Hospital (SGH), National University Cancer Institute Singapore (NCIS), and A*STAR's Genome Institute of Singapore (GIS) have identified the common genetic variants affecting individual risks of Natural killer T-cell lymphoma (NKTCL), a rare and aggressive cancer that currently have no targeted therapy.

While NKTCL (also known as extranodal NKTCL, nasal type) predominantly affects East Asians (e.g. Chinese, Korean, Japanese), it is also seen in Latin American populations. Grown outside the lymph node, it is commonly found in nasal area but can also occur in other parts of the body such as the skin, intestines and testis. The 5 year overall survival was 72% in patients with early stage NKTCL and less than 52% in patients with mainly late stage disease. Relapse is common for this disease and survival rate is low. In a year, NCCS sees about 15 to 20 NKTCL patients.

Prof Lim Soon Thye, Head and Senior Consultant, Division of Medical Oncology, NCCS commented, "This finding gives hope to NKTCL patients who currently face a poor survival rate upon diagnosis. We felt that even though it is rare, it is important that we research this deadly disease as it is most prevalent in the Asian population."

Little is known about the cause of extranodal NKTCL except for the strong association with Epstein-Barr virus (EBV). EBV is present in the tumour irrespective of the ethnic origin of the patients, suggests a probable causative role of the virus. The disease activity can also be monitored by measuring the amount of EBV DNA in the blood; a high level indicates extensive disease, poor response to therapy and poor survival. However, other risk factors might predispose individual to this deadly cancer.

The team had compared the genomes between patients with NKTCL and contrasting them against healthy individuals. The study found that individuals carrying the risk allele in the *HLA-DPB1* gene have a nearly 100% increased risk of getting NKTCL. This is the first report to describe a genetic association to this disease.

The *HLA-DPB1* gene provides instructions for making a protein that plays a critical role in the immune system. This gene is part of a family of genes called the human leukocyte antigen (HLA) complex. The HLA complex helps the immune system distinguish the body's own proteins from proteins made by foreign invaders such as viruses and bacteria. The risk allele is speculated to associate with weaker immune and inflammatory response, presumably because of poorer antigen recognition and tumour clearance. Thus, higher risk of NKTCL.

“Despite improvements in NKTCL therapy, the findings suggest that our body’s immune system plays a significant role in cancer controls. It may offer insights on how knowledge of our body’s immune system can be harnessed to our advantage to design new immunotherapies against NKTCL”, said Dr Khor Chiea Chuen, Group Leader, GIS.

The study is the first genome-wide association study of NKTCL and the findings was published in the journal, *The Lancet Oncology* in July 2016. It is contributed by Dr Li Zheng, Staff Scientist at GIS, Dr Ong Choon Kiat, Principal Investigator, Division of Medical Oncology, NCCS and study author, and Dr Khor Chiea Chuen. The National Medical Research Council (NMRC) Translational Research Clinical Research flagship programme is led by Prof Lim Soon Thye, who holds the Tanoto professorship in Medical Oncology, from NCCS.

Fundings

The research project is supported by grants from the National Medical Research Council of Singapore, Tanoto Foundation Professorship in Medical Oncology and New Century Foundation Limited, Ling Foundation, and NCC Research Fund.

About National Cancer Centre Singapore

National Cancer Centre Singapore (NCCS) provides a holistic and multi-disciplinary approach to cancer treatment and patient care. We treat almost 70 per cent of the public sector oncology cases, and they are benefiting from the sub-specialisation of our clinical oncologists. NCCS is also accredited by the US-based Joint Commission International for its quality patient care and safety. To deliver among the best in cancer treatment and care, our clinicians work closely with our scientists who conduct robust cutting-edge clinical and translational research programmes which are internationally recognised. NCCS strives to be a global leading cancer centre, and shares its expertise and knowledge by offering training to local and overseas medical professionals. www.nccs.com.sg

About A*STAR’s Genome Institute of Singapore (GIS)

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 achieve extraordinary improvements in human health and public prosperity. Established in 2000 as a

centre for genomic discovery, the GIS will pursue the integration of technology, genetics and biology towards academic, economic and societal impact.

The key research areas at the GIS include Human Genetics, Infectious Diseases, Cancer Therapeutics and Stratified Oncology, Stem Cell and Regenerative Biology, Cancer Stem Cell Biology, Computational and Systems Biology, and Translational Research.

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

For more information about GIS, please visit www.gis.a-star.edu.sg

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

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As a Science and Technology Organisation, A*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by contributing to societal benefits such as improving outcomes in healthcare, urban living, and sustainability.

We play a key role in nurturing and developing a diversity of talent and leaders in our Agency and Research Institutes, the wider research community and industry. A*STAR oversees 18 biomedical sciences and physical sciences and engineering research entities primarily located in Biopolis and Fusionopolis.

For more information on A*STAR, please visit www.a-star.edu.sg

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