PRESS RELEASE

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Novel, non-invasive method to predict and reduce the relapse of childhood cancers

Singapore, 5 Oct 2022 – A team of scientists and doctors from the KK Women's and Children's Hospital (KKH), Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine) and the Institute for Health Innovation and Technology has discovered a novel, non-invasive method to predict and reduce the relapse of childhood cancers.

The most common form of solid tumour affecting children is neuroblastoma. It is known to be the cause of a disproportionate number of childhood cancer deaths. The majority of relapsed patients would have a very low chance of survival despite being given the best care.

"The bone marrow is the site where majority of neuroblastoma relapses occur. This discovery provides a simplified method of assessing cancer spread. The current method of sampling bone marrow can be complex, painful and costly. This is particularly daunting for young patients and their families," explained Dr Amos Loh, Senior Consultant at the Department of Paediatric Surgery, Deputy Chair of the Division of Surgery, and Chair of the Paediatric Brain and Solid Tumour Programme, KK Women's and Children's Hospital.

"Where current methods may show patients as cancer-free at the end of treatment, our novel approach may detect 'leftover' disease not identified by current means. This could one day save patients' lives through appropriate early interventions to prevent relapse," added Dr Loh.

Cancer relapse is usually caused by a small number of 'leftover' cancer cells that remain circulating in the blood long after treatment. These cells can eventually settle in various parts of the body and give rise to multiple tumours, years later.

The new, non-invasive method to monitor neuroblastoma is pain-free and less costly, and involves only a small amount of blood from the patient. The blood sample is processed to separate cancer cells from other cells. The cancer cells are then analysed for genes that would help doctors to determine the likelihood for the cancer to spread to the bone marrow, thereby predicting the likelihood of a relapse. The study identified several genes that predicted relapse in a group of neuroblastoma patients. These include OLFML2B, STAT1, ARHGDIB, STAB1 and TLR2 – genes known to be associated with a more aggressive disease state in neuroblastoma.

"We hope that this method can replace current invasive methods such as sampling of bone marrow in the near future, and be potentially expanded to other childhood cancers," said Associate Professor Chen Zhi Xiong from the Department of Physiology and NUS Centre for Cancer Research at NUS Medicine.

"We are also exploring the use of circulating cancer cells to better understand the biology of neuroblastoma and variations in treatment response to provide more personalised care for

neuroblastoma patients. Besides cancer cells, we are also investigating other circulating biological entities in blood that may provide further options to monitor treatment effectiveness, and help predict cancer spread and relapse in childhood cancers."

The team hopes that the new method of predicting and reducing the relapse of childhood cancers can soon be put to clinical practice in the near future.

The study was published in Frontiers in Oncology earlier this month.

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About National University of Singapore (NUS)

The National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 16 colleges, faculties and schools across three campuses in Singapore, with more than 40,000 students from 100 countries enriching our vibrant and diverse campus community. We have also established our NUS Overseas Colleges programme in more than 15 cities around the world.
Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, 30 university-level research institutes, research centres of excellence and corporate labs focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

For more information on NUS, please visit www.nus.edu.sg

About the NUS Yong Loo Lin School of Medicine (NUS Medicine)

The NUS Yong Loo Lin School of Medicine is Singapore's first and largest medical school. Our enduring mission centres on nurturing highly competent, values-driven and inspired healthcare professionals to transform the practice of medicine and improve health around the world.

Through a dynamic and future-oriented five-year curriculum that is inter-disciplinary and inter-professional in nature, our students undergo a holistic learning experience that exposes them to multiple facets of healthcare and prepares them to become visionary leaders and compassionate doctors and nurses of tomorrow. Since the School's founding in 1905, more than 12,000 graduates have passed through our doors.

In our pursuit of health for all, our strategic research programmes focus on innovative, cutting-edge biomedical research with collaborators around the world to deliver high impact solutions to benefit human lives.

The School is the oldest institution of higher learning in the National University of Singapore and a founding institutional member of the National University Health System. It is one of Asia's leading medical schools and ranks among the best in the world (Times Higher Education World University Rankings 2022 by subject and the Quacquarelli Symonds (QS) World University Rankings by subject 2022).

For more information about NUS Medicine, please visit https://medicine.nus.edu.sg/

About KK Women's and Children's Hospital

KK Women's and Children's Hospital (KKH) is Singapore's largest tertiary referral centre for obstetrics, gynaecology, paediatrics and neonatology. The academic medical centre specialises in the management of high-risk conditions in women and children.

Driven by a commitment to deliver compassionate, multidisciplinary care to patients, KKH leverages innovation to advance care. In 2021, the hospital launched the SingHealth Duke-NUS Maternal and Child Health Research Institute (MCHRI). This centre of excellence aims to support the growth of every woman and child to their fullest potential through research and innovation, to transform national heath in Singapore and the region.

Some of the hospital's recent breakthroughs include uSINE®, a landmark identification system for the administration of spinal epidural, the discovery of new genetic diseases like Jamuar Syndrome, and a series of guidelines for women and children to improve metabolic health.

The Academic Medical Centre is also a major teaching hospital for Duke-NUS Medical School, Yong Loo Lin School of Medicine and Lee Kong Chian School of Medicine. In addition, KKH runs the largest specialist training programme for Obstetrics and Gynaecology, and Paediatrics in Singapore. The programmes are recognised by the Accreditation Council for Graduate Medical Education International (ACGME-I), and are highly rated for the quality of clinical teaching and translational research.

KKH was founded in 1858. For more information, visit www.kkh.com.sg

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