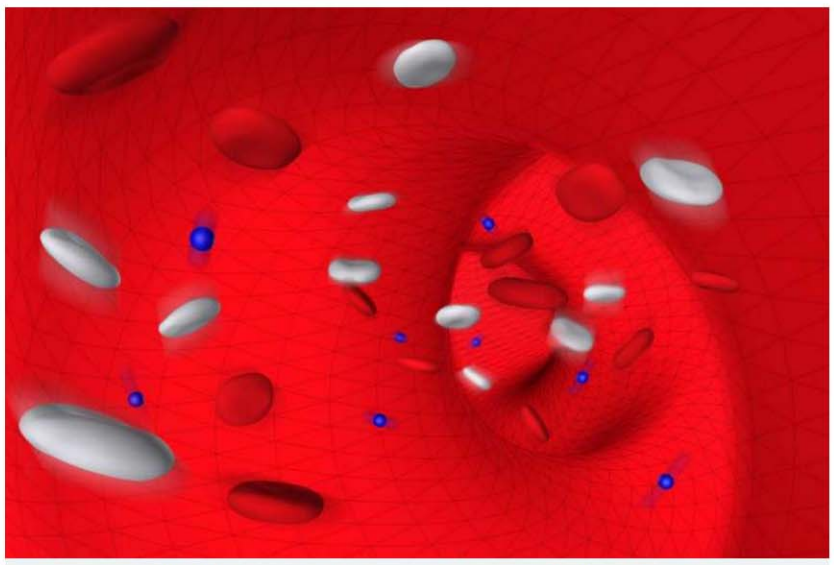
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New discovery paves the way for more precise treatment of white blood cell cancer



The presence of the NUDT15 gene variants change the breakdown of a key anti-cancer drug. PHOTO: ISTOCKPHOTO

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SINGAPORE - Different versions of a gene prevalent among Asian children, including Singaporeans, have been found to make patients of a type of white blood cell cancer more sensitive to chemotherapy in a bad way.

The discovery paves the way for more accurate and tailored dosages of anti-cancer drugs to be administered to patients to reduce the side effects from too high a dose.

A team of scientists, including researchers from Singapore, discovered that one in five children in Singapore undergoing chemotherapy for acute lymphoblastic leukaemia (ALL) have variants of the gene, called NUDT15.

The presence of these gene variants changes the breakdown of a key anti-cancer drug used in treating ALL called mercaptopurine.

This causes the patient to be very sensitive to the drug and could lead to serious side effects such as prolonged fever, infection and even death.

ALL accounts for about 40 per cent of all cancers diagnosed in children in Singapore and is the most common leukaemia in young children worldwide.

The study, published in February in the medical journal Nature Genetics, looked at clinical trials involving 270 children with ALL in Singapore, Japan and Guatemala. The trials began in 2014 and lasted one and a half years.

The Singapore trial, which had 76 children, was led by Associate Professor Allen Yeoh from the National University of Singapore (NUS) Yong Loo Lin School of Medicine's Department of Paediatrics.

On the research findings, Associate Professor Yeoh, who also co-authored the study, said they could lead to better "precision medicine", in which the dosage of chemotherapy drugs are adjusted according to a patient's genetic make-up.

He was speaking on Friday at the launch of a new $10 million research centre at NUS in support of leukaemia research.

Called the Viva-NUS Centre for Translational Research in Acute Leukaemia (Central), it will be helmed by Associate Professor Yeoh and focus on childhood acute leukaemia conditions such as ALL. The centre also aims to conduct genetic screening for ALL patients to better tailor chemotherapy doses to each individual.

"For many years, dosing Asian children with mercaptopurine was very much a hit-and-miss, causing unnecessary side effects of infections and fever in the sensitive ones and probably under-dosing the majority because of the fear of side effects," said Associate Professor Yeoh.

Until now, researchers did not understand why some ALL patients could tolerate large doses of the mercaptopurine anti-cancer drug, while others suffered distressing side effects like oral and anal pain from similar doses.

Dr Jun J. Yang, an associate member at St Jude Children's Research Hospital in Tennessee, United States, and a co-author of the study, explained that the recent findings may allow ALL patients to be screened for the harmful gene variants and have their drug doses adjusted even before therapy starts.

"We are planning clinical studies to move these findings from the laboratory to the clinic with the hope to guide individualised therapy in the future," added Dr Yang, who also hopes that the findings can improve the treatment of other diseases, such as inflammatory bowel disease, where similar drugs are used.

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