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Singapore scientists develop new DNA technology to detect breast cancer relapse

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Research uncovers unique tumour DNA found in blood which can be detected with a simple blood test for numerous clinical applications.



Singapore – Researchers in Singapore, together with international collaborators from Denmark and USA, have successfully identified a unique biomarker that is strongly associated with breast cancer relapse. This finding has led to the development of a simple blood test which has numerous clinical applications, such as detecting relapse early and testing treatment efficacy. The study was recently published in scientific journal Nature Medicine in September 2017.

Jointly led by A*STAR's Genome Institute of Singapore (GIS), Tan Tock Seng Hospital (TTSH) and National University Health System (NUHS), the research utilised an integrative genomic approach to analyse tumour samples from breast cancer patients, which led to the identification of this biomarker. The identified biomarker was found in more than 70% of recurrent tumours, taken from breast cancer patients who suffered relapse of the disease.

In addition, the study shows that early stage patients whose tumours tested positive for this biomarker at the time of diagnosis are nearly 40 times more likely to develop a relapse within 5 years than patients whose tumours tested negative. The finding prompted GIS Innovation Fellow Dr Goh Jian Yuan and his colleagues to develop a blood-based diagnostic test kit to detect tumour DNA in the blood. "Tumour relapse remains the main reason for breast cancer mortality. However, there are unmet clinical demands for new technology to monitor patients or treatment to prevent disease relapse.

The blood test we developed based on this finding can be potentially used to monitor tumour progression after treatment so that doctors can make early decisions on other forms of therapy," explained the study's lead author Prof Yu Qiang, Senior Group Leader, Cancer Therapeutics & Stratified Oncology at GIS. "A finding like this has strong clinical potential; it warrants

further prospective clinical validations and future commercial development," he added.

Breast cancer is the most common cancer in women worldwide. It is estimated that over 508,000 women died in 2011 due to breast cancer.