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Scientists here find way to improve outcome for breast cancer patients

Local scientists have discovered a way to use an alternative drug to counter resistance to a form of targeted therapy used to treat patients with HER2-positive breast cancer.

Drugs often used to treat patients with this condition may stop working after some time, causing a relapse.

Researchers from the Cancer Science Institute of Singapore at the National University of Singapore, the Genome Institute of Singapore (GIS) under the Agency for Science, Technology and Research, and the National University Cancer Institute, Singapore (NCIS), together with their international research collaborators in Denmark, have looked into why this happens.

The team, led by Professor Lee Soon Chin from the Cancer Science Institute and Professor Yu Qiang from GIS, focused on a protein called the HER2 (human epidermal growth factor receptor 2), which stimulates cancerous growth of breast cells when present in excessive amounts.

To decipher the resistance mechanisms of the cancer to the anti-HER2 therapy, the team used existing data from a biochemical database along with tumour samples from 29 patients enrolled in a clinical trial at NCIS.

Drugs that targeted the HER2 protein often became ineffective eventually, though scientists were unable to figure out why.

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They zeroed in on an enzyme sub-unit, known as PPP2R2B, which suppresses cancer by making chemical modifications in a signalling pathway.

Breast cancers that did not respond well to anti-HER2 therapy tended to have lower levels of the PPP2R2B enzyme.

The activity of the PPP2R2B enzyme was, in fact, suppressed by another enzyme, known as EZH2.

The researchers plan to conduct a clinical trial to test the efficacy of combining both drugs to treat patients with HER2-positive breast cancer.

In addition, the PPP2R2B enzyme could be used as a potential predictive marker to identify patients who may potentially be resistant to standard anti-HER2 therapy and may benefit from additional therapy.

Prof Lee, who is also head and senior consultant at the Department of Haematology-Oncology at NCIS, said that HER2-positive breast cancer makes up 20 per cent to 25 per cent of all breast cancers.

"Despite initial effectiveness, resistance to anti-HER2 therapy develops almost invariably in patients with advanced cancer, and they will eventually succumb to the disease," she noted.

"This study provides insights into why anti-HER2 drugs eventually fail and offers a solution to restore sensitivity to anti-HER2 treatment, which may prolong the survival of patients."

Cheryl Tan