

## Novel gene predicts both breast cancer relapse and response to chemotherapy

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Scientists have made it easier to predict both breast cancer relapses and responses to chemotherapy, through the identification of a unique gene. The newly found marker could help doctors classify each breast cancer patient and customise a treatment regimen that is more effective. The discovery was a collaborative effort by scientists from A\*STAR's Institute of Molecular and Cell Biology (IMCB), and the Cancer Science Institute of Singapore (CSI Singapore) at the National University of Singapore (NUS).

Despite advancements in cancer treatment, <u>breast cancer</u> remains the most common cancer among Singapore women . Thirty percent of early breast <u>cancer patients</u> in the world experience relapse due to metastasis, or the spread of cancer cells to other organs in the body. Some patients also do not respond well to <u>chemotherapy</u>. The inability to forecast relapses or the effectiveness of chemotherapy has led to a pressing need to identify predictive markers, which doctors can use to tailor appropriate treatment for each breast cancer patient at an early stage.

In a study published recently in the *Journal of Clinical Investigation*, a top-tier journal for discoveries in basic and clinical biomedical research, the team of scientists jointly led by Dr Vinay Tergaonkar, Principal Investigator at IMCB and Dr Alan Prem Kumar, Principal Associate at CSI Singapore and Assistant Professor at the Department of Pharmacology, NUS Yong Loo Lin School of Medicine, uncovered a gene, DP103, which is activated in metastatic breast cancer. DP103 acts as a master regulator, which expresses two sets of unfavourable proteins



– one leads to metastasis and the other causes patients to be unresponsive to chemotherapy. Consequently, doctors can predict the probability of metastasis by examining the levels of DP103 in breast cancer patients.
The same gene could also be used to predict whether a patient would respond to chemotherapy.

"Doctors are unable to tell if a breast cancer patient will respond to chemotherapy until six months after the treatment has been prescribed. It is very worrisome as the ones who are not responsive to chemotherapy usually also suffer relapses due to metastasis. This DP103 gene that we found explains the link and will facilitate doctors in selecting suitable treatments for different cases of breast cancer," said Dr Tergaonkar.

In addition, the study revealed that reducing the levels of DP103 could contain the cancer, shrink the tumour and make patients more amenable to chemotherapy. All the findings in the study have been validated with samples of breast cancer patients from Singapore, Canada, China and the USA.

"DP103 is a novel biomarker that could help doctors select appropriate treatments for <u>breast cancer patients</u> at an <u>early stage</u>. It is also a therapeutic target which could be explored further to develop drugs that suppress breast cancer growth, as well as metastasis," said Dr Kumar, who first discovered DP103's oncogene potential to drive <u>breast cancer metastasis</u>. He is also the Principal Inventor to a patent application on this discovery and is currently looking into ways to regulate DP103 levels in a variety of cancer types at CSI Singapore.

**More information:** Full text of the *Journal of Clinical Investigation* paper can be accessed online from: <a href="http://www.ncbi.nlm.nih.gov/pubmed/25083991">www.ncbi.nlm.nih.gov/pubmed/25083991</a>



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