CITATIONS OF WINNERS

YOUNG SCIENTIST AWARD 2017

Biological & Biomedical Sciences Category

Dr Jingmei Li
Senior Research Scientist, Genome Institute of Singapore
Adjunct Assistant Professor, Department of Surgery, Yong Loo Lin School of Medicine, National University of Singapore

"For her research on mammographic density and its impact on women's health"

Dr Jingmei Li's research focuses on genetic differences that show who is likely to get breast cancer, and who is not. She aims to discover novel susceptibility markers and mechanisms, which may lead to finding new treatment options for the disease. She has dedicated her work to improving the health of women, particularly in the field of breast cancer research. An outstanding example of young women in science, Dr Li applies her research to predict, prevent and improve care for breast cancer, as well as increase public awareness of the disease.

Breast cancer is the most common cancer among women in Singapore and the leading cause of cancer deaths among women here[1]. Mammography is the best method for early detection of breast cancer, but only about five breast cancers are detected for every 1,000 examinations.

Breast cancer is not just one disease – some tumours are less aggressive than others. Knowing which genetic factors are associated with particularly aggressive tumours and poorer prognosis will ultimately be helpful in stratifying the population according to the likelihood of getting especially aggressive variations of the disease. This would be useful in allocating resources to individuals at high risk more often than those with below average risk of getting breast cancer. Identifying women at risk of developing the most severe forms of breast cancer is paramount in Dr Li's research.

Dr Li uses information from routine screening mammograms of healthy women without breast cancer. Working together with international collaborators, her research has definitively demonstrated that the proportion of radiologically dense tissue in the breast can predict a healthy woman's future risk of developing breast cancer. All other things

[1] Cancer Statistics, National Cancer Centre Singapore
https://www.nccs.com.sg/patientcare/whatiscancer/cancerStatistics

being equal, a woman with very dense breast tissue, has a four to six fold higher risk of developing breast cancer than a woman with little or no dense tissue. This knowledge has important implications for individual screening.

In women already diagnosed with breast cancer, Dr Li also showed that mammographic density can indicate whether breast cancer drugs are working effectively. Mammographic density is sensitive to oestrogen, which is in turn sensitive to Tamoxifen, a commonly prescribed breast cancer drug. It is typically given over five years, but different women respond differently to Tamoxifen based on how well they metabolise the drug, and it is not clear which patients will or will not benefit. Dr Li tracked the difference in mammographic density in mammograms taken after treatment was initiated, to predict which women were responding to Tamoxifen.

As mammographic density is sensitive to oestrogen, which is in turn sensitive to Tamoxifen, Dr Li tracked the difference in mammographic density for two consecutive mammograms taken soon after treatment initiation to predict which women were responding to Tamoxifen. She found that fewer women who experienced large mammographic density decrease were found to die from breast cancer than women who did not experience mammographic density change. This has prompted the possible use of mammographic density as a surrogate marker for breast cancer outcomes.

Dr Li's research has been published in internationally acclaimed medical journals such as the *Journal of the National Cancer Institute* and *Journal of Clinical Oncology*. Beyond mammographic density, Dr Li continues her research on genetic determinants of mammographic density and breast health. To date, she has co-authored over 100 peer-reviewed articles in top-tier journals including *Nature Genetics*. She is a recipient of an A*STAR Joint Council Office Career Development Award (2013), a UNESCO-L'Oréal International Fellowship (2014-2015), multiple institutional grants and awards from private foundations in Sweden (2016), and a National Research Foundation Fellowship Award in Singapore (2017).