Researcher Profile

UHN Microarray Centre

Dr. Susan Done

Investigating genomic alterations in breast cancer

At the University Health Network, Dr. Done's research involves the identification and characterisation of the molecular alterations that lead to the development of solid cancers, particularly breast cancer. By finding and studying the genetic aberrations that are specific to certain cells, the goal of her research is identify potential diagnostic and predictive cancer biomarkers and therapeutic targets.

Using an array-based technique called array Comparative Genomic Hybridisation (aCGH), Dr. Done and her colleagues are able to identify genes and chromosomal regions that are amplified or deleted. Dr. Done and her team have published numerous studies using UHNMAC Human 19K cDNA microarrays for aCGH studies (1, 2, 4). Most recently, a study was published that compared the genomic alterations in primary breast cancers with their sentinel and more distal lymph node metastases (1). This study found that amplification within the 17q24.1-24.2 region was associated with the presence of sentinel or more distal lymph node metastases, larger tumour size, and higher histological grade. Gain on 17q22-24.2 was also identified by them, in a separate study, as a candidate region for further testing as a predictor of invasion when detected in ductal carcinoma in situ (DCIS) and predictor of nodal metastasis when detected in infiltrating duct carcinoma (2). In 2008, Dr. Done together with Dr. Wey Leong and their team published a study that examined the effects of timing of breast tumour biopsies on gene expression profiles. By comparing the expression profiles of breast tumours taken *in vivo* and *ex vivo*, this study found that FOS-related genes, which have been associated with hypoxia and breast cancer development, were differentially expressed before and after surgery (3).

Other recent investigations, in collaboration with Drs. Kristin McLarty and Raymond Reilly, have involved the targeted radiotherapy of cancer and molecular imaging (5-7). One study identified responding and nonresponding human breast cancer xenografts in athymic mice treated with trastuzumab (Herceptin; a HER2 inhibitor) based on changes in the tumour uptake of ^{18}F-fluorodeoxyglucose (5). Another study with Dr. Dan Constantini, also in Dr. Reilly's group, was aimed at the development and preclinical evaluation of radioimmunotherapy of HER2 positive breast cancer using 111In-NLS-trastuzumab.

Dr. Susan Done is an Associate Professor at the University of Toronto in the Departments of Laboratory Medicine & Pathobiology, and Medical Biophysics, and a Pathologist at the University Health Network.

References

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