



RESEARCH REPORT - YEAR ENDING 2008

Background

Ovarian cancer remains as the most lethal form of gynaecological cancer, with an overall 5-year survival rate of less than 30% for the majority of women diagnosed. Early detection leads to survival rates exceeding 90% - hence, early detection of these cancers is the key to improving patient prognosis. Around 1500 new diagnoses are made in Australia each year, with this number expected to increase as our population ages; our work therefore continues to focus on developing a routine screening test for the early detection of ovarian cancers.

Progress to date

By identifying proteins that are specifically produced by cancer patients, we can test for their presence in blood as a way to identify ovarian cancers early. To be useful for cancer diagnosis, a test must achieve two specific goals. First, it must be sensitive – that is, able to correctly identify 100% of the cancer patients in any group. Second, it must also be specific - able to identify 100% of the healthy women correctly. By combining these two parameters, the accuracy of the test can be assessed. In our initial pilot program using proteomics technologies, we identified 146 cancer-specific changes in patient blood samples. Over the past 12 months, we have completed this initial phase with the final identification of over 100 of these proteins. The proteins identified include a number that are involved in causing cells to grow inappropriately – the hallmark of a developing tumour. We are now nearing completion of phase two of our marker discovery program, which involves testing for the presence of these proteins in a set of 50 patient samples. Preliminary evidence suggests that 18 of the proteins that have been identified can, in combination, correctly identify 100% of cancer patients based on their levels in a patient's blood. The same set of proteins can also correctly identify over 90% of healthy women – a very promising beginning for an early detection test. The next phase of this research is to develop a specific combination test for each of these proteins, and determine its effectiveness for identifying cancer-specific changes in a much larger group of patients. To this end, we have begun recruiting healthy women to participate in the study. By donating a small amount of blood, participants are helping us to generate information that will ultimately be used to benefit ovarian cancer patients. We are also continuing our research to identify new and more specific markers, to increase the specificity of the test – that is, its ability to correctly identify healthy women. This is very important to prevent “false positives”, or an incorrect diagnosis of cancer when it is not present. We are currently working on the development of a new technology aimed at examining proteins that are too small to be assessed using our current systems.



This represents a future direction for our research team, and is expected to contribute further to developing a clinically useful early detection test.

Dr Andrew Stevens NAB Ovarian Cancer Research Foundation Research Fellow Group Leader

The technology required for laboratory-based discovery is different to that required for routine clinical testing. The panel of tumour markers developed over the course of the previous two years is now being assessed for development in single and combination tests, in a format more suitable for routine clinical use. We are working closely with expert assay specialist, Associate Professor David Robertson, to develop the approach required to move our research findings into a clinical context. This new development program reflects a move for the research team into the next phase of development. Once testing for individual proteins is established, it will be necessary to determine whether they are able to function correctly in combination. This represents a future direction for the development team. Dr Andrew Stevens NAB Ovarian Cancer Research Foundation Research Fellow Group Leader.



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