



## RESEARCH REPORT - JUNE 2009

Progress report March 2009 to June 2009 ovarian cancer biomarker laboratory changes in research group structure, management and staffing for 2009

In 2009 PHI initiated an internal restructuring of several institute research groups. As a result a new research group has been created – the Ovarian Cancer Biomarker Laboratory. This group became operational as of March 2009, and is led by Dr Andrew N. Stephens. The OCRF-funded research previously conducted by the Reproductive Hormones Laboratory led by Associate Professor David M. Robertson is now undertaken within the new Ovarian Cancer Biomarker research laboratory. In 2009 the OCRF also funded an additional postdoctoral scientist to join the group. This position has been filled by Dr Katie Meehan, who joined the group in May 2009 as the Witchery / Madison research fellow. The Ovarian Cancer Biomarker laboratory, funded by the OCRF, is now comprised of 5 members as follows; Dr Andrew N. Stephens - NAB OCRF Research Fellow, Group Leader Dr Katie Meehan – Witchery / Madison Research Fellow Dr Adam Rainczuk – Witchery Research Fellow Ms Rebecca Crook – OCRF Research Assistant Ms Nicole Fairweather – Senior OCRF Research Nurse The Ovarian Cancer Biomarker laboratory will submit written progress reports to the board at quarterly intervals. In addition an annual research report will be submitted to the board in December of each year, detailing the activities and progress made by the research group and outlining research goals and milestones for the coming 12 months.

### Research progress to June 2009

Previous work conducted by the Reproductive Hormones laboratory has focussed on the use of DIGE technology to investigate patient plasma samples for the presence of specific markers of ovarian cancer. Ultimately we expect that only some of these proteins will be useful in a diagnostic capacity, and as such we have continued to develop additional strategies aimed at identifying novel cancer markers of early stage disease to aid in achieving sufficient predictive power for early stage diagnosis. In 2009 the Ovarian Cancer Biomarker laboratory has significantly expanded the scope of research being undertaken to include several new and complimentary projects aimed at identifying and developing specific indicators of cancers. These projects are all accommodated within the current budget.



## DIGE Analysis of ovarian cancer patients

Ongoing work undertaken by the Reproductive Hormones laboratory has used DIGE technology to identify protein markers of ovarian cancer. Initial comparative analyses were performed on blood plasma from women with either stage IIIC epithelial ovarian cancer (EOC), or women with no evidence of disease. In this initial research phase approximately 100 proteins were flagged as potential cancer-specific indicators. In the second phase of the research, multiple individual patient samples were evaluated in a similar way; for these "phase II" studies the sample group was expanded to include women with benign ovarian growths, in addition to healthy women and stage IIIC EOC patients. Initial evaluation of the data suggested that around 40 proteins showed potential as cancer indicators in multiple patients; however, differentiation between cancer patients and women with benign growths using these potential markers was difficult. Current efforts are focussed on further statistical analysis of the dataset, and this is being undertaken by Associate Professor David Robertson. This is expected to yield a smaller group of "DIGE-identified candidates" contributing to a final pool of ovarian cancer markers for further development.

## ITRAQ Labelling technology for direct ms/ms analysis

As an extension of the previous DIGE work, the team is undertaking proteomic analyses using a technique known as iTRAQ. This is an analogous approach to the existing DIGE strategy, but allows both the quantitative comparison and simultaneous identification of proteins in liquid phase. iTRAQ technology is expected to deliver a different and complementary set of cancer markers to those from DIGE studies, providing additional candidates for further development. The iTRAQ strategy will be used to compare patient samples from healthy women, women with benign disease, and women with early stage or late stage EOC. We are currently evaluating initial pilot data to determine the accuracy and reproducibility of iTRAQ experiments, prior to applying iTRAQ to ovarian cancer patient samples.



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