

## 2014/2015 Summer Studentship Project Application Form

Send to: Research Office, University of Otago Christchurch, PO Box 4345, Christchurch, by 5pm on **4 July 2014**

### Supervisor Information (First named supervisor will be the contact):

Supervisor's Name(s): Dr Elisabeth Phillips and Dr Margaret Currie

Department: Pathology

Institution: University of Otago Christchurch

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### Research Category (Choose one category only – to be used for judging the students' presentations):

**Clinical**

**Laboratory**

**Community**

Project Title (20 words MAXIMUM):

**Are breast tumour cells and adipocytes co-conspirators in aggressive breast tumours?**

Project Description:

We are looking for a bright, enthusiastic student to join a multidisciplinary cancer research group. The Mackenzie Cancer Research Group has close links with the clinic (Oncology, Pathology, Surgery), and is interested in the cellular and molecular basis of cancer and response to therapy.

The proposed summer-studentship represents an important part of our ongoing research into the role of adipocytes in the progression of cancer, but is designed for completion within a 10 week Summer-Studentship.

### **Background:**

Obesity is linked to a worse outcome in patient with breast cancer regardless of menopausal status and hormone receptor status. Our group has worked on primary cell culture of human adipocytes in a novel experimental co-culture system, where adipocytes from human breast adipose tissue are grown together with breast tumour cell lines. Culturing these cells together has remarkable impact on both the adipocytes and breast tumour cell lines. Adipocytes become de-differentiated, less lipid rich and secrete factors which promote the survival and migration of breast tumour cells *in-vitro* (cancer-associated adipocytes). Breast tumour cells become more resistant to chemotherapy, and display a more aggressive phenotype.

In our current research project we have identified a number of proteins of interest *in-vitro*; we would like to validate the proteins in breast cancer patient samples to see if these proteins and adipocytes are linked with more aggressive breast tumours.

### **Aim:**

To determine whether proteins involved in adipocyte-tumour cell cross-talk can be identified in patient samples, and determine if these correlate with tumour proliferation markers and patient outcome.

### **Method:**

The student will perform immunohistochemical (IHC) analysis on a tissue microarray of the breast tumour periphery to visualise relative levels and location of proteins of interest. Depending on progress, there will also be potential for the student to experience the *in-vitro* aspect of this work; performing cell culture and using immunofluorescence (IF) microscopy to look at proteins that have been identified as cancer associated adipocyte specific.

The project will be carried out under the supervision of an experienced post-doctoral fellow and Dr Margaret Currie. Results from the summer-studentship are intended to contribute to data for publication.

**Significance:** Obesity has a negative impact on breast cancer; obese women have more distant metastases at diagnosis and have higher mortality rates. This project will give greater insight into the biology of adipocytes and the interaction that occurs between tumour cells and this largely neglected stromal cell.

