

## 2015/2016 Summer Studentship Project Application Form

Send to: Research Office, University of Otago Christchurch, PO Box 4345, Christchurch, by 5pm on **3 July 2015**

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

Supervisor's Name and Title(s): Dr. Elisabeth Phillips, A. Prof. Gabi Dachs, and Dr Margaret Currie

Department: Mackenzie Cancer Research Group, Department of Pathology

Institution: UOC

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

**Clinical**

**Laboratory x**

**Community**

### Project Title (20 words MAXIMUM):

**The effect of comorbidities on breast cancer**

### Project Description:

We are looking for a bright, enthusiastic student to join a multidisciplinary cancer research group. The Mackenzie Cancer Research Group is interested in the cellular and molecular basis of cancer and response to therapy. We have close links with the clinic and the proposed study represents an important part of our ongoing research.

#### Background:

In breast cancer, many patients with comorbidities, such as obesity or metabolic syndrome, have worse outcomes and shorter survival, but the underlying mechanisms remain unclear. Using a novel cell co-culture system we have found that fat cells secrete proteins that cause nearby tumour cells to become mobile and resistant to chemotherapy. We now want to investigate these effects in a whole organism. We have developed mouse models with breast cancer that were obese, or had metabolic syndrome, or had a propensity for atherosclerosis, and have harvested tissues available for analysis. These tissues will be used to study tumour phenotype and hypoxia pathways, cancer-associated fat cells and secreted proteins. The overall aim of our research is to improve survival of breast cancer patients with comorbidities.

#### Aim:

Determine the impact of comorbidities on molecular factors in breast cancer.

#### Methods:

The student will:

1. measure factors associated with obesity, metabolic syndrome or atherosclerosis in tumour samples using Western blot analysis;
2. Investigate adipocytes in tumours, metastases, liver and mammary fat pads using immunohistochemistry.

All general laboratory methods are established in our group, and the student will be trained to carry out the procedures.

#### Significance:

Breast cancer is the most common cancer in NZ women, and comorbidities are a major hindrance to therapy. This study will contribute to our understanding of the basic biology associated with the comorbidities.

### Student Prerequisites (eg. Medical Student) if applicable:

Science student with some laboratory experience