2017/2018 Summer Studentship Project Application Form

Send to: Research Office, University of Otago Christchurch, PO Box 4345, Christchurch, by 5pm on 3 July 2016

Supervisor Information (First named supervisor will be the contact):	
First Supervisor's Name and Title: A/Prof Gabi Dachs	
Department - UOC &/or CDHB (if applicable): Pathology, UOC	
First Supervisors Phone: 033640544	First Supervisors Email: gabi.dachs@otago.ac.nz
First Supervisors Mailing Address: University of Otago Christchurch, 2 Riccarton Ave, PO Box 4345, Christchurch 8140	
Co-Supervisors Name and Title(s): Christina Wohlrab	

Research Category (Choose one category only **– to be used for judging the students' presentations):**		
Clinical	Laboratory x	Community

Project Title (20 words MAXIMUM):

Analysis of the hypoxic pathway in kidney cancer

Project Description:

We are looking for a bright, enthusiastic student to join our 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.

Introduction:

Kidney cancer is a lethal disease with few treatment options and rising incidence in New Zealand. The most aggressive and most common type of kidney cancer, clear cell renal cell carcinoma (RCC), harbors an inactivating mutation in the VHL gene that allows tumours to accumulate high levels of a pro-survival transcription factor called HIF. The second main type of kidney cancer, papillary RCC, retains a functional VHL, and demonstrates regulated HIF levels. We have previously shown that higher tumour ascorbate (vitamin C) levels were associated with lower HIF-levels in endometrial, colorectal and breast cancer patients. Our current study is investigating whether the same also holds true for RCC. Our findings thus far show that in papillary, but not clear cell RCC, increased vitamin C concentrations are associated with reduced HIF-pathway activity. We also detected higher vitamin C levels in tumour compared to normal renal cortex.

Aim: To investigate the location and level of HIF-pathway proteins in clinical samples from patients with RCC.

Possible impact (in lay terms):

The use of vitamin C in cancer remains controversial, yet many cancer patients choose high dose vitamin C treatment. This study will provide valuable scientific data for the ongoing debate, particularly with respect to kidney cancer. This data is vital for the design of clinical trials in cancer patients.

Methods:

The student will

1. optimize immunohistochemistry (IHC) methods for staining of HIF-1 and HIF-2, and selected downstream targets (GLUT-1, CA-IX, BNIP-3, etc).
2. stain whole sections from 3 RCC patients and 2 tumour microarrays.
3. quantify degree of IHC staining using published semi-quantitative methods, which take both area stained and intensity into account.

All general laboratory methods are established in our group, and the student will be trained to carry out the IHC procedures, microscopy and analyses. Ethics approval has already been obtained from the University of Otago Ethics Committee (H14/020), and approval for use of samples from the Cancer Society Tissue Bank. Suitable tumour blocks and TMAs are available from the Cancer Society Tissue Bank, and de-identified cut sections are provided for this study.

Student Prerequisites (eg. Medical Student) if applicable:
We are looking for a student with a strong science background and some laboratory experience.