2017/2018 Summer Studentship Project Application Form

Send to: Research Office, University of Otago Christchurch, PO Box 4345, Christchurch, by 5pm on 3 July 2017

Supervisor Information (First named supervisor will be the contact):	
First Supervisor's Name and Title: Dr Sarah Appleby	
Department - UOC &/or CDHB (if applicable): Medicine, UOC	
First Supervisors Phone: 027 462 6866	First Supervisors Email: sarah.appleby@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): Associate Professor Chris Pemberton	

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

Project Title (20 words MAXIMUM):
Role and therapeutic potential of myoregulin in cardiovascular disease

Project Description:

Introduction:

Cardiovascular disease remains the leading cause of death in New Zealand, and new treatment options are needed. A recently discovered peptide, myoregulin, is believed to control calcium levels in muscle cells. Keeping calcium levels balanced in the heart is extremely important for normal heart functioning, thus, myoregulin may be an important regulator. However, as yet, there have been no studies exploring exactly how myoregulin works and the role it plays in the heart. This project will investigate the effect of myoregulin on heart function in both normal and damaged hearts using an *ex vivo* rat heart attack model; measuring changes in several parameters of cardiac function with the view of identifying therapeutic potential.

Aim:

To investigate the role of a novel peptide myoregulin on heart function using an *ex vivo* isolated rat heart model.

Possible impact (in lay terms):

This study will provide important scientific data on the functional role of myoregulin in healthy and damaged hearts, and provide the first evidence of myoregulin as a potential new therapeutic which may improve health outcomes and survival in patients with cardiovascular disease.

Method:

Sprague-Dawley rats obtained from the Christchurch Animal Research Facility, University of Otago, Christchurch, will be used for the experiments. Using an *ex vivo* isolated rat heart model, a method already established in the Christchurch Heart Institute, synthetic myoregulin will be administered directly into the rat heart. Hearts will be randomly assigned to either a control group, administered only perfusion buffer (Krebs-Henseleit solution) or to the myoregulin treatment group. For the treatment group, synthetic myoregulin will be diluted in the perfusion buffer and administered directly into the heart via a perfusion line using a syringe pump. Incrementing doses of myoregulin (1 nM to 10 nM) will be used to determine the dosage required for subsequent experiments. In the next set of experiments, hearts will undergo myocardial infarction by 30 minutes of total coronary flow occlusion, followed by a 90 minute reperfusion (ischaemia/reperfusion). Myoregulin will be perfused for 30 minutes either prior to ischaemia or starting at the time of reperfusion. This will be done under normal and increased external calcium to mimic calcium overload. Measures of cardiac function including contractility, left ventricular pressures and coronary flow will be made throughout the experiment.

Student Prerequisites (eg. Medical Student) if applicable:

We are looking for a student with a strong science background, and ideally, some laboratory experience. Medical students are also encouraged to apply.

Administration Details

1. Is ethical approval required? Yes

   If Yes: please circle or tick one of the following:

   a) Applied for (provide application #)

   b) Approved (attach a copy of the letter of approval from the ethics committee or application #) ✓

   c) To be done

2. Are you able to provide the funding for this project (ie. $5,000 for the student, incidental expenses should be met from departmental or research funds) No

   If Yes: Please provide name of the funder _____

   If No: Please provide ideas of possible funding sources, including past funding agents and topics often associated with this research area, for the Research Office to contact.

   _____

   If Yes: You will be sent a request for more information.

3. Medical Records or Decision Support accessed N/A

4. Health Connect South or other DHB records N/A

5. Signatures:

   - I have read the 2017/2018 Summer Studentship programme handbook.
   - I am prepared to supervise the project and will be available to the student during the studentship (including Christmas/New Year break if the student is working during this time).
   - I agree to assume responsibility for the submission of the student's reports to the Research Office by the due date 29 January 2018.
   - I agree that the project lay report may be available to local media for publicity purposes.

Signature of Project Supervisor(s):	Date: 26/07/17

- I understand that I am responsible for hosting the Summer Student chosen for this project and will meet any costs incurred. I agree that incidental expenses will be met from departmental or research funds.

Signature of Head of Department: (Print Name) Professor Lutz Beckert	Date: 26/07/17
Signature of Clinical Director: (if applicable) (Print Name) N/A	Date: