

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: Prof Mark Hampton

Department - UOC &/or CDHB (if applicable): Centre for Free Radical Research, Department of Pathology, UOC

First Supervisors Phone: 03 378-6225

First Supervisors Email: mark.hampton@otago.ac.nz

First Supervisors Mailing Address: PO Box 4345, Christchurch 8140

Co-Supervisors Name and Title(s): Dr Heather Parker

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

Laboratory

Project Title (20 words MAXIMUM):

Manipulation of immune cell function by hydrogen peroxide from *Streptococcus pneumoniae*

Project Description:

Introduction:

One hundred years ago *Streptococcus pneumoniae* was branded the “captain of the men of death” due to its ability to cause pneumonia, sepsis and meningitis. It still kills over one million people per year, primarily children and the elderly. We are particularly interested in the ability of this bacterium to generate hydrogen peroxide, which is thought to inhibit the growth of other bacterial species attempting to establish themselves in the same vicinity as *S. pneumoniae*. Human cells generate their own hydrogen peroxide as a signalling molecule, where it modulates a broad range of functions ranging from proliferation and differentiation through to regulated cell death pathways. However, the effect of hydrogen peroxide from *S. pneumoniae* on host cell signalling pathways has not been investigated

Aim:

The aim of this project is to measure hydrogen peroxide production by a selection of *S. pneumoniae* clinical isolates, and determine if the hydrogen peroxide generated by the bacteria can react with and influence the function of white blood cells.

Possible impact (in lay terms):

S. pneumoniae remains an important human pathogen, and in this era of increasing antibiotic resistance it is important that we have a greater understanding of the interactions between bacteria and immune cells. Compromising the ability of pathogens to evade or compromise immune cell function could offer new therapeutic strategies.

Method:

The student will learn to culture bacteria and human cells, and use biochemical techniques to measure hydrogen peroxide production in biological systems. Microscopy, protein electrophoresis and western blotting will be used to measure the functional responses of immune cells to hydrogen peroxide.

Student Prerequisites (eg. Medical Student) if applicable:

Science student with a background in biochemistry, cell biology or microbiology

Administration Details

1. Is ethical approval required? No

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 No

4. Health Connect South or other DHB records No

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:

- 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)

Date:

Signature of Clinical Director: (if applicable)
(Print Name)

Date: