

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. Tim Anderson

Department - UOC &/or CDHB (if applicable): Department of Medicine

First Supervisors Phone: 3786 078

First Supervisors Email: tim.anderson@cdhb.health.nz

First Supervisors Mailing Address: New Zealand Brain Research Institute, 66 Stewart St, Christchurch 8011

Co-Supervisors Name and Title(s): Dr Michael MacAskill

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

Clinical

Laboratory

Community

Project Title (20 words MAXIMUM):

Eye movement symptoms in Huntington's disease: evidence from a large international collaboration

Project Description:

Introduction:

Huntington's disease (HD) is a fatal inherited neurodegenerative disorder that leads to disabling movement, mood, and cognitive symptoms. Although the genetic marker is known and allows reliable diagnosis (via CAG repeat length), there is currently no known treatment of the underlying process. The course of the disease is highly variable, and useful markers of disease progression are needed to monitor the effects of potential treatments as they become available. As the disease is relatively rare, the best way to search for such markers is to combine data across many sites. The Enroll-HD study allows this, combining data from multiple centres, with a goal of enrolling 20 000 patients across the world. The Christchurch Movement Disorders Clinic under Prof. Anderson is one of those contributing centres, giving us the right to access the entire dataset for specific projects. We propose to analyse the Enroll-HD data to resolve a question about eye movement pathology that could not be resolved within a single centre, and to examine how clinical eye movement observation relates to other clinical measures.

Aim:

It has traditionally been considered that vertical saccades are more impaired than horizontal saccades in disorders that affect the basal ganglia, including HD. It is our clinical observation, however, that many patients have greater impairment of horizontal saccades. **We will examine the eye movement components of the comprehensive Unified Huntington's Disease Rating Scale (UHDRS) in the Enroll-HD database to compare scoring of latency and velocity of vertical in comparison to horizontal saccades in controls, pre-manifest and, particularly, manifest HD.** We will also explore associations of the oculomotor parameters with age, CAG repeat length and other clinical characteristics.

Possible impact (in lay terms):

This study will conclusively confirm or reject the received wisdom that Huntington's differentially impairs the control of vertical rather than horizontal eye movements, improving our understanding of the underlying neuropathology. We propose that quantitative eye movement recordings can be a useful marker of disease progression, and these definitive findings will aid the planning of such assessment protocols. This initial project will provide the foundation for the Christchurch centre to take the lead in coordinating those other sites with eye tracking technology to collaborate in supplementing the clinical observation data currently shared within Enroll-HD. This may aid future pharmaceutical development.

Method:

Access to the international data has been granted. The student will be taught skills in using the R statistical environment to compare the ratings of velocity and latency of saccadic (fast) eye movements in both vertical and horizontal directions across all patients. Longitudinal changes in both saccadic and smooth pursuit ratings will be compared to progressive changes in other movement and cognitive symptoms, using linear mixed effects models. Using reproducible science techniques (R Markdown notebook), the student will summarise the findings in a manuscript to be submitted to an international journal. Opportunity will also be available for the student to attend clinics to observe how the ratings are gathered in practice.

Student Prerequisites (eg. Medical Student) if applicable:

Medical student with an interest in neuroscience and clinical neurology.

Administration Details

1. Is ethical approval required? ~~Yes~~/No (this international study already has ethical approval).

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) ~~Yes~~/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.

Neurological Foundation

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

3. Medical Records or Decision Support accessed ~~Yes~~/No

4. Health Connect South or other DHB records ~~Yes~~/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):

Prof. Tim Anderson

Date:

3 July 2017

- 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:

Prof. Lutz Beckert

Date:

3 July 2017

Signature of Clinical Director: (if applicable)

Not applicable

Date: