RESEARCH SCHOLAR PROGRAM – 2018

SUPERVISOR & PROJECT INFORMATION FORM

Please complete and return, via email only (crems.programs@utoronto.ca) by ***November 3rd 2017*** *(forms received after this date will not be posted).*

Supervisor Information

Name:
Dr. E. Ann Yeh

Email:
stephanie.grover@sickkids.ca (research manager)

Degree:
MA, MD, FRCPC, Dip ABPN

SGS Appointment (IMS, IHPME, LMP etc..):
IMS

Academic Rank:
Associate Professor

Field of Research:
Pediatric Multiple Sclerosis and Neuroinflammatory Disorders

Research Institution Affiliation (if applicable):
SickKids Research Institute

Allocation of student contact time (number of hours per week YOU are available to the student for any concerns or to review progress):

The student will work closely with fellows and other team members. I will have a scheduled meeting with the student weekly and be available for any other issues or concerns on an ad hoc basis throughout the week.

Project Information

Title: **Visual and MRI outcomes in pediatric MS and demyelinating conditions**

Description (max 500 words):

Visual abnormalities occur frequently in youth with demyelinating syndromes, with optic neuritis occurring in approximately 1/3 of this cohort, and clear evidence for subclinical visual involvement in the majority of patients. Furthermore, our previous studies have shown failure of age expected brain development in children with demyelinating syndromes, as well as evidence for brain and optic nerve atrophy after a single event. The presence of disease progression and visual abnormalities in these youth is associated with significant long term consequences including decreased quality of life, cognitive decline, motor impairment, depression, and fatigue.

Studying visual pathways may constitute an ideal way to examine the broad impact of inflammatory demyelination in childhood because (1) our cross sectional work has suggested significant functional abnormalities in visual metrics after inflammatory demyelination; (2) we have found evidence for irreversible and progressive structural injury after inflammatory demyelination; and (3) cognitive deficits related to the visual system, in visual processing, are seen in children who have experienced episodes of inflammatory demyelination.

The student's project will be part of a larger ongoing study which focuses on visual outcomes in patients with demyelinating syndromes. Our use of optical coherence tomography (OCT) (structural imaging which captures retinal changes using infrared technology) in this population of children has shown progressive injury to the anterior visual pathway, as well as correlations between functional visual outcomes and structural changes in the anterior visual pathway. While OCT allows for the evaluation of retinal layers, it does not provide information on the caliber and integrity of the optic nerve posterior to the orbit or of the visual projections beyond the optic nerve and chiasm. Furthermore, little is known about correlations between findings in the retinal layers and structural changes in the visual pathway, including optic radiations. With this in mind, the student's proposed project will focus on evaluation of structural changes in the visual pathway using advanced MRI techniques.

If human subjects are involved, have Ethics been obtained?

☒ YES ☐ NO ☐ Application Submitted ☐ N/A

Do you expect this work will be published within the 20 months?

☒ YES ☐ NO ☐ Uncertain

Student's roles and responsibilities (please be specific)

Please indicate who will serve as the student's direct report (PI, PhD student, technician etc…)

The student will be involved directly in manual segmentation of images of the optic nerve and radiations in patients with MS and other demyelinating disorders and a healthy control population. He/she will be engaged in the development of this data set, and learn techniques related to analysis of structural metrics of the visual pathway. The student's direct report will be the research manager of my lab and myself.