Comprehensive Research Experience for Medical Students (CREMS)
2022 Supervisor and Project Information Form

Please complete and return via email ONLY to crems.programs@utoronto.ca by February 18, 2022.

Supervisor Information

NOTE: CREMS will not support pre-determined pairings of students and supervisors. Supervisors must agree to open their projects to all students and interview all that are interested.

Name: Dr. Mark Boulos

Email: mark.boulos@utoronto.ca

Department: Medicine (Neurology)

Hospital/Research Institution: Sunnybrook Health Sciences Centre / Sunnybrook Research Institute

SGS Department(s) (if applicable): Institute of Medical Science

ORCID ID (see https://orcid.org/ - If you do not have an ORCID ID we encourage you to sign up for one):
https://orcid.org/0000-0002-9547-1889

Please check PubMed for most up-to-date publications:

Location of Work:
Sunnybrook Health Sciences Centre

Field of Research (up to 4 keywords):
Sleep disorders
Obstructive sleep apnea
Cannabinoids
Therapy

Student contact time (number of hours per week YOU are available to the student for any concerns or to review progress):
I will meet with the student at least once per week for 1-2 hours per week and will provide additional time if needed. I am also available by phone or email if they need me outside of our meetings times.
Project Information

NOTE: If this project is selected, this information will be posted on CREMS website for interested student applicants to view research opportunities.

PROJECT TITLE:
Evaluating the Relationship between Cannabinoid Use and Obstructive Sleep Apnea: A Retrospective Cohort Study

PROJECT DESCRIPTION:
Including background, aim(s), method(s) and significance of the project. Maximum 300 words.

Background: Obstructive sleep apnea (OSA) is characterized by recurrent obstruction of the upper airway during sleep due to intermittent loss of tone in the muscles of the throat. OSA is prevalent and is linked with an increased risk of stroke, heart attack, daytime sleepiness, depressed mood, and overall reduced quality of life. Continuous positive airway pressure (CPAP) is the standard therapy for OSA and has been shown to improve mood, reduce daytime sleepiness as well as enhance quality of life. Unfortunately, CPAP is poorly tolerated by many patients. Since OSA has a significant negative impact on health and is treatable, it is imperative that effective, well-tolerated alternative management strategies are developed to address this important condition. As of yet, no pharmacological therapies have been formally approved for clinical use in OSA.

Cannabinoids (i.e. cannabis, cannabidiol, tetrahydrocannabinol [THC]) are a class of drugs which work on the endocannabinoid receptors. Emerging evidence suggests that dronabinol, a synthetic form of THC, can reduce OSA severity and improve sleep quality. However, data supporting this association is limited to only two studies with small samples sizes, and only examines one form of synthetic THC. Therefore, the effect of cannabis on OSA severity and sleep quality remains inconclusive.

Aim: To determine whether cannabis use, in its various forms, is associated with changes in OSA severity and sleep-related outcomes. We hypothesize that cannabinoid use is associated with a decrease in OSA severity and an improvement in clinical sleep parameters.

Methods: We have collected a detailed set of clinical, physiological, and polysomnographic data from over 5000 adults who underwent daytime and overnight sleep studies at the Sunnybrook Health Sciences Centre Sleep Laboratory from 2010 till present. We will retrospectively examine associations between use of products containing cannabinoids in any form (i.e. oil, smoke, edibles) and OSA severity, as well as various sleep parameters captured during overnight polysomnography. Analysis will be performed using multivariable linear regression models adjusting for factors known to affect both OSA and sleep quality.

Significance: This study has the potential to be the first step towards development of a pharmacological therapy for OSA. This could assist with providing therapy to numerous people with OSA who are unable to tolerate current therapies.

Is this project remote-capable (in case of new restrictions) or have an alternative remote option?
☒ Yes, remote capable ☐ No
☐ Yes, alternate remote option. Please specify (100 words max): Click or tap here to enter text.
If human subjects are involved, have the appropriate Research Ethics Board approvals been obtained?
☒ Yes ☐ No ☐ Not Applicable

If yes, please list the application submission date:

Do you expect this work will be published?
☒ Yes ☐ No ☐ Uncertain / Other
**Research Environment and Student Roles and Responsibilities**

Please be specific as possible. Please describe the research environment, including availability of required facilities/equipment/expertise, supervisor’s experience and mentorship plans. Please clearly outline the student role(s) and responsibilities related to the project, potential educational value, and indicate who will serve as the student’s direct report for daily oversight (PI, PHD student, technician, etc.). **Maximum 300 words.**

Research Environment: In the case of restrictions related to the pandemic, the entire study can be completed remotely through the computing infrastructure available at Sunnybrook. The trainee will be provided with a workstation with access to the statistical package SPSS, database software (e.g. MS Access), and other software necessary to carry out the proposed project. If they work in-person, the workstation will be near Dr. Boulos’ office and the sleep clinics.

Supervisor’s Experience and Mentorship Plans: In my role as a Clinician-Investigator with both clinical and research training in sleep neurology, I have both the expertise and dedicated time to directly supervise the trainee in carrying out the proposed project. The trainee will meet with me at least once a week to ensure the necessary guidance for a successful research experience. In addition, they will benefit from collaborations with two other sleep neurologists and several research personnel. I have had the privilege of supervising more than 40 trainees, many of whom are lead authors on the manuscripts for their projects.

Potential Education Value: Aside from that which was already noted above, the trainee will also have the opportunity to attend weekly lectures in various neurological subspecialties, as well as observe weekly outpatient sleep and stroke clinics, and polysomnography interpretation sessions, if time/circumstances permit. Furthermore, there will be several other undergraduate, medical, and graduate students, as well as divisional clinical research fellows, making this a dynamic learning experience.

Student’s Role: The trainee will be responsible for reviewing and extracting the necessary information from previously collected data from the Sunnybrook Sleep Laboratory. Under the guidance of the PI, they will also compute the statistical analyses for the study and prepare a manuscript for publication.

Daily Oversight: PI (Dr. Boulos) and Lab Manager