Comprehensive Research Experience for Medical Students
Summer Research Program 2019

Supervisor/Project Information Form

Due February 20 2019 by email to crems.programs@utoronto.ca

Supervisor Name: David Goldstein; Andrew Hope; Geoffrey Liu

Project Title: Pharmacogenomics of Platinum Toxicities in Cancer Patients: Combined Translational and Knowledge Implementation Study

Hospital/Research Institution: University Health Network (Toronto General Hospital and Princess Margaret Cancer Centre)

Email: Geoffrey.Liu@uhn.ca

Field of Research (2 keywords): Translational Oncology Research; Knowledge Implementation Study

Department: Otolaryngology; Radiation Oncology; Medicine; Medical Biophysics; Epidemiology

School of Graduate Studies Appointment (IMS, LMP, IHPME etc)? Yes/No: Yes**If YES, please name:** IMS, Epidemiology, Radiation Oncology; and Medical Biophysics

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Brief Project Description (<300 words):

Pharmacogenomics is the evaluation of heritable characteristics that determine treatment-related outcomes and toxicities. This is an immersive experience in a multifaceted translational program of three inter-related projects that combines translational research with observational pharmacoepidemiology and implementation science/knowledge translation, and innovative point-of-care testing, perfect for a future clinician-investigator physician leader. In an international effort (Canada, US, Europe), we have been identifying genetic markers of cisplatin nephro- and oto-toxicity in head and neck cancers. Cisplatin is one of the most ubiquitous anti-neoplastic agents, used for sarcomas/mesenchymal tumours, thoracic, head and neck, hematologic, gastrointestinal, and genitourinary cancers. Our work has also identified subclinical permanent ototoxicity as being frequently occurring in head and neck cancer survivors treated with cisplatin, leading us to develop implementation strategies to perform hearing tests routinely and efficiently on our patients. The student's study aims are: (a) to assess the role of genomics to predict cisplatin toxicities in a case-outcomes analysis of biobanked samples; (b) to assess the clinical prevalence and severity of cisplatin toxicities, both short term and long term, building on our 2000+ annotated database; (c) to develop a clinical routine-based strategy of using a novel point-of-care tablet-based hearing test to screen for ototoxicity. The student will participate in: study design; patient recruitment; data and sample collection; quality control of data; and data analysis/interpretation. Skills that will be developed include: observational outcomes trial design; pharmacogenomics; biomarker pipeline development; analytical and statistical skills; working knowledge of implementation science and the CIHR Knowledge-to-Action framework. The student will also participate in a structured lecture/seminar series on research methodology (see www.uhncombiel.com) with other medical undergraduate, undergraduate, post-graduate, and graduate students

from medicine, epidemiology, basic and translational science, health science research and statistics from the Americas, Europe and Asia. All our past summer CREMS students have presented nationally/internationally with authorship on publications.