



## RESEARCH SCHOLAR PROGRAM – 2018 SUPERVISOR & PROJECT INFORMATION FORM

Please complete and return, via email only ([crems.programs@utoronto.ca](mailto:crems.programs@utoronto.ca)) by **November 3<sup>rd</sup> 2017** (forms received after this date will not be posted).

### Supervisor Information

Name: James Drake Email: [james.drake@sickkids.ca](mailto:james.drake@sickkids.ca)

Degree: BSE, MBBCh, MSc, FRCSC, FACS SGS Appointment (IMS, IHPME, LMP etc.): IMS, IBBME, MSc

Academic Rank: Professor Field of Research: Image Guided Surgery/Robotics

Research Institution Affiliation (if applicable): Centre of Image Guided Innovation and Therapeutic Intervention (CIGITI) , Sickkids RI

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

2 hrs

### Project Information

Title: Development and Testing of Novel Minimally Invasive Neurosurgical Tools

Description (max 500 words):

Minimally invasive surgery has become the standard of care in many disciplines with however limited application in pediatric neurosurgery in particular. A number of proposed dextrous and robotic tools have been developed by our lab, but there has been limited testing in both physical models and animals. These tools are applicable to other surgical areas including Skull Base, ENT, General and Urological Surgery.

The project will involve working with other engineering student and engineering staff to fine tune dextrous instruments and test them on robotic platforms and 3D printed models of specific patient pathologies. The testing will involve quantification of outcomes of the specific models prepared to standard techniques and will involve recruitment of surgical trainees and staff to participate. Similarly animal testing for the fundamentals for surgical principles including incision, coagulation, cutting and resection in live animals to demonstrate efficacy will be undertaken. The student will learn some of the fundamentals of robotic surgery (using a DaVinci surgical system) 3D printing, fabrication, model and animal testing. The project will be supported by principal investigator and the engineer/research lab manager and by a number of engineering students in the laboratory. The research will take place at the Centre of Image Guided Innovation and Therapeutic Intervention (CIGITI) [www.cigiti.ca](http://www.cigiti.ca), and there is ample opportunity for clinical exposure to pediatric neurosurgery.

If human subjects are involved, have Ethics been obtained?

YES X       NO       Application Submitted     N/A

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

YES X       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 come familiar with the technology, and physical models, surgery on the models, design of testing scenarios and evaluation, and animal surgery. Modifications of the technology/models will be supported by the engineering staff and students. An interest, but not necessarily background in engineering applications to medicine will be an asset.*

