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: Crystal Chan
Email: Cryssie.chan@mail.utoronto.ca

Department: OB/GYN
Hospital/Research Institution: Markham Stoufville Hospital/Markham Fertility Centre

SGS Department(s) (if applicable): Lab Medicine and Pathology

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

Location of Work: Markham Fertility Centre

Field of Research (up to 4 keywords): Assisted Reproductive Technologies, implantation, pre-implantation genetic testing, endometrial receptivity

Student contact time (number of hours per week YOU are available to the student for any concerns or to review progress): 5 hours
**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:**
The effect of subcutaneous immunoglobulin (SCIG) on women with recurrent IVF failure

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

**Introduction**

Recurrent *in vitro fertilization* failure (RIF), defined as failed implantation after multiple good-quality embryo transfers (ETs), is a leading challenge in the field of Reproductive Medicine. Canadian Assisted Reproductive Technologies Register data indicate that the live birth rate for patients under 35 years of age is approximately 40% per ET. The underlying mechanisms behind RIF have not been fully elucidated, but studies suggest that the maternal immune response to the embryo may be a critical factor. Therefore, immunotherapy has received great attention, including intravenous immunoglobulin (IVIG). Although no consistent benefit of IVIG over placebo has been proven in controlled trials on patients with RIF, there are observational studies that suggest benefit, and some practitioners offer IVIG treatment as empiric therapy. However, since the COVID-19 pandemic, access to IVIG in Canada has been severely limited. In the treatment of other immune disorders, subcutaneous immunoglobulin (SCIG) has been shown to have a similar efficacy and safety profile as compared to IVIG, and improved patient compliance. Currently, there are no published studies on the effect of SCIG in patients with RIF.

**Objective**

1) To assess the effect of SCIG on women with RIF; 2) To compare the efficacy between SCIG and IVIG

**Methods**

This is a retrospective cohort study of all RIF patients who received SCIG or IVIG in the past five years at a high-volume fertility clinic. All the transferred embryos were screened with pre-implantation genetic testing and determined to be euploid. Pregnancy outcomes after euploid embryo transfer including biochemical pregnancy, clinical pregnancy, miscarriage, and live birth rates will be compared between patients who received SCIG, IVIG, or those that did not receive immune treatment.

**Outcomes**

The primary outcome is live birth. The results of this study will provide insights into the immunological management of patients with RIF.
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.

Markham Fertility Centre (MFC) is a high-volume fertility clinic that provides comprehensive, state-of-the-art fertility care. This includes in vitro fertilization, pre-implantation genetic testing, and prenatal follow up. Dr. Crystal Chan is a U of T OB/GYN Assistant Professor who is cross-appointed to the Department of LMP and is a course director in the Masters of Health Sciences Program (Clinical Embryology Stream). She is a previous Clinician Investigator from Mt Sinai Hospital who has rich experience in research supervision. She has one post-doctoral fellow and a graduate student currently under her supervision, and has received CREMS funding in the past. She is currently Scientific Director at MFC and oversees research and innovation. The student will be given access to the electronic medical record of MFC (eIVF access). He/she will develop data collection forms and complete retrospective chart review. Statistical analysis will be performed by the student with a contracted biostatistician. Regular meetings with Dr Chan will take place – she is extremely responsive to students and has one academic/research day per week to directly supervise. Manuscript and abstract writing will be performed by the student and supervised closely. The student would be first author.