



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: Crystal Chan

Project Title: Evaluation of DNA fragmentation index as a predictor of pregnancy outcome in intrauterine insemination cycles

Hospital/Research Institution: Mount Sinai Hospital and Lunenfeld Tanenbaum Research Institute

Email: crystal.chan@sinaihealthsystem.ca

Field of Research (2 keywords): Intrauterine Insemination, DNA Fragmentation

Department: Obstetrics and Gynaecology

School of Graduate Studies Appointment (IMS, LMP, IHPME etc)? No

Brief Project Description (< 300 words):

Fifteen percent of couples experience infertility, defined as the failure to conceive after one year of unprotected intercourse. Abnormal sperm parameters are detected in up to 50% of infertility cases. Intrauterine insemination (IUI) is the first-line treatment for mild male factor and most subtypes of infertility. However, the efficacy of IUI is limited, and the cumulative pregnancy rate after 6 cycles of treatment is only 50%. If a patient fails to conceive from IUI, the next line of treatment is *in vitro* fertilization (IVF), which generally has a 4-fold higher success rate per cycle. However, the time delay accrued from undergoing repeated cycles of IUI often leads to older age at presentation to IVF and lower rates of success. Therefore, there is a pressing clinical need to identify sperm biomarkers that can enhance the prediction of success in IUI and to determine if a patient should bypass IUI and have expedited IVF. Conventional sperm parameters such as concentration and motility are poor predictors of IUI success. DNA Fragmentation Index (DFI) is a measurement of the degree of DNA damage in sperm, and has been proposed as a prognostic tool. However, its predictive ability is poorly validated. One of the limitations of previous studies is the heterogeneity of methods used to measure DFI. Currently, the preferred method of assessing DFI is Sperm Chromatin Structure Analysis (SCSA). At Mount Sinai Fertility, over 1000 patients have had sperm DFI measured by SCSA and clinical data collected. Approximately a third of these patients have had at least one cycle of IUI. The objective of this study is to determine if DFI can predict clinical pregnancy and live birth rates from IUI, in patients with normal and abnormal conventional sperm parameters, and if so, receiver operating curves will be generated to determine threshold predictive levels.