ANNOUNCEMENT

Interested Members of the University community are invited to attend the Final Oral Examination for the degree of Master of Science of

Kate Nicholson

of the Department of Biomedical Sciences (Ontario Veterinary College) on Friday August 16th at 9:00am in Biomedical Sciences Room 1642 (Seminar); and OVCM 3648 (Examination)

Glucocorticoid Regulation of the G-Protein Coupled Estrogen Receptor (GPER) in Mouse Hippocampal Neurons

Examination Committee
Dr. Neil MacLusky, Advisor
Dr. Bettina Kalisch, Committee Member
Dr. Laura Favetta, Additional Examiner
Dr. Matthew Vickaryous, Exam Chair

Advisory Committee
Dr. Neil MacLusky
Dr. Bettina Kalisch
Dr. Jon LaMarre

ABSTRACT

The most prevalent estrogen, 17β-estradiol, binds the non-classical G-protein coupled estrogen receptor (GPER) with high affinity resulting in rapid activation of the c-jun N terminal kinase (JNK) pathway. GPER activation mediates some of the rapid neurotrophic and memory enhancing effects of 17β-estradiol in the female hippocampus. However, exposure to stressful stimuli has been shown to impair these beneficial effects. This thesis characterizes neurosteroid receptor expression in murine-derived mHippoE cell lines that are subsequently used to investigate glucocorticoid regulation of GPER protein expression and functional activation. This thesis demonstrates that 24-hour treatment with a glucocorticoid receptor agonist reduces GPER protein expression and activation of JNK in female-derived mHippoE-14s. Using an in vivo model, treatment with glucocorticoids significantly reduces hippocampal activation of JNK in female ovariectomized CD1 mice. Collectively, this thesis uses in vitro and in vivo models to characterize glucocorticoid regulation of GPER expression and signalling in female murine hippocampal neurons.

PRESENTATIONS (* denotes presenter)


*Craig, E., Nicholson, K.C. and MacLusky, N.J. (June 2018). Validating the mHippoE cell lines as a model for stress responsiveness. **Graduate Student Research Symposium, Ontario Veterinary College** (Institutional).

**BIOGRAPHICAL DATA**

Kate graduated from the University of Guelph in 2017 with an Honours Bachelor of Science degree in Biomedical Sciences. Kate’s interest in research began during her 4th year research project in the department of Human Health and Nutritional Sciences. In May of 2017, Kate joined Dr. MacLusky’s lab in the course-based Master of Biomedical Sciences program where her research focused on characterizing an *in vitro* model for neurosteroid research. Interested in the findings from this project, Kate transferred into the thesis-based Master of Science in Biomedical Sciences with a specialization in Neuroscience in May of 2018 to further this research. Supported by OVC funding, Kate’s research has focused on the effects of stress hormones on estrogen receptor activation and signaling in female hippocampal neurons.

**AWARDS RECEIVED**

- OVC Doctoral Scholarship, University of Guelph 2019
- OVC Graduate Student Research Symposium-MSc Oral Presentation Award 2019
- Southern Ontario Neuroscience Association-MSc Poster Award 2019
- OVC MSc Scholarship, University of Guelph 2018
- University of Guelph Graduation with Distinction 2017
- University of Guelph Entrance Scholarship 2013