ANNOUNCEMENT

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

Reem Sabry

of the Department of Biomedical Sciences (Ontario Veterinary College) on Thursday August 15 at 9:00am in Biomedical Sciences Room 1642 (Seminar); and Room 3648 Biomedical Sciences (Examination)

The effects of BPA and BPS on microRNAs during bovine oocyte maturation and early embryo development

Examination Committee
Dr. Jonathan LaMarre, Advisor
Dr. Laura Favetta, Co Advisor
Dr. Neil MacLusky, Additional Examiner
Dr. Tarek Saleh, Exam Chair

Advisory Committee
Dr. Jonathan LaMarre
Dr. Laura Favetta
Dr. Jim Petrik

ABSTRACT

The regulation of oocyte and embryo development are crucial, hormone dependent events that are uniquely susceptible to toxic insult by EDCs that can inappropriately activate hormone pathways. While many of the resulting detrimental effects on fertility and development are probably the result of changes in canonical gene expression pathways, evidence is emerging to suggest that small RNA pathways involving small noncoding RNAs known as microRNAs may also be key participants in the response to EDCs that contribute to their toxic effects. This study investigated the hypothesis that abnormal expression of key miRNAs in oocyte maturation and embryo development occurs after BPA and BPS exposure. To this end, miR-21, -155, -34c, -146a expression were examined in a bovine model of in vitro matured cumulus-oocyte complexes, in vitro fertilized embryos, and in vitro cultured...
cumulus cells all treated with BPA and BPS at the LOAEL (0.05 mg/mL) dose. Additional investigation of a predicted downstream target of several miRNAs, DNMT3A, expanded our understanding of the nature of EDC interference in epigenetic regulation in female reproduction. The experimental data supported this hypothesis, with dynamic expression changes observed in different microRNAs in cumulus and oocyte constituents at distinct stages of development in response to BPA treatment during maturation. In contrast, these studies did not reveal any effects on microRNA expression in BPS treated cells, suggesting that it may not have the same effect on miRNA expression in this context. Overall, this thesis presents novel findings of BPA-induced miRNA dysregulation in in vitro matured bovine oocytes and in in vitro cultured bovine cumulus cells.

PRESENTATIONS (* denotes presenter)


*Sabry, R*, Nguyen, M. Stalker, L, LaMarre, J, and Favetta, L. A. Epigenetic effects of BPA and BPS during bovine oocyte maturation and early embryo development. Poster presentation at Graduate Research Symposium, Biomedical Sciences; 2019 June, 12; Guelph, ON, CA.


PUBLICATIONS


BIOGRAPHICAL DATA

Reem attended the University of Waterloo for her undergraduate degree in Biomedical Sciences where she gained a particular interest in reproductive biology. After graduating, Reem started at the University of Guelph in the MBS program where she gained an additional interest in research. Reem continued her research by transferring into the MSc program in Biomedical Sciences with Dr. Jonathan LaMarre and Dr. Laura Favetta.

AWARDS RECEIVED

Dr. Casey Buizert Memorial Award 2019
Harry G. Downie Travel Scholarship 2019
Lena Cooke Memorial Award 2019
OVC MSc Scholarship 2018