



**Name:** Ryan Brown

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**Major Professor:** Joan Jorgensen

**Degree Objective:** M.S. Endocrinology and Reproductive Physiology

**Background:** BS Molecular Biology, Nicholls State University

**Current Research Project:**

Spontaneous abortions have been reported to affect up to 43% of parous women, with over 20% occurring before pregnancy is clinically diagnosed. Establishment of pregnancy is dependent on proper embryo-uterine interactions and implantation. Besides oocyte abnormalities, implantation failure is a major contributor to early pregnancy loss. Previously, we demonstrated that two members of the *Iroquois* homeobox transcription factor family, IRX3 and IRX5, exhibited distinct and dynamic expression profiles in the developing ovary to promote oocyte and follicle survival. Elimination of each gene independently caused subfertility, but with different breeding pattern outcomes. *Irx3* KO (*Irx3<sup>LacZ/LacZ</sup>*) females produced fewer pups throughout their reproductive lifespan which could only be partially explained by poor oocyte quality. Based on prior studies, we hypothesized that IRX3 is expressed in the uterus where it acts to establish functional embryo-uterine interactions. To test this hypothesis, I am harvesting nonpregnant and pregnant uteri from control and *Irx3* KO females to evaluate IRX3 expression profiles, the integrity of early embryo implantation sites, and the expression profiles of genes associated with implantation.

**Honors:**

NSF-GRFP Honorable Mention 2020

NSF-GRFP Honorable Mention 2018

**Publications:**

Bergeron SA, **Brown RM**, Homer JW, Rehage SM Boopathy RM (2016). Presence of Antibiotic Resistance Genes in Different Salinity Gradients of Freshwater to Saltwater Marshes in Southeast Louisiana, USA." *Int Biodeter Biodegr.* 113: 80-87.

Thomas VM, **Brown RM**, Ashcraft DS, Pankey GA (2019). Synergistic Effect Between Nisin and Polymyxin B against Pandrug-Resistant and Extensively Drug-Resistant *Acinetobacter baumannii*. *Int J Antimicrob Agents.* 53: 663-668.

Davis HR, **Brown RM**, Ashcraft DS, Pankey GA (2020). *In Vitro* Synergy with Fosfomycin Plus Doxycycline Against Linezolid and Vancomycin-resistant *Enterococcus faecium*. *J Glob Antimicrob Resist.*



## **Submitted Paper:**

Fu A, Koth ML, **Brown RM**, Shaw SA, Krentz KJ, Zhang X, Hui C, Jorgensen JS (2020). *Irx 3 and Irx 5 Contribute to Female Fertility Through Regulation of Granulosa Cell Functions.* (Submitted to *Biol Reprod*).

## **National Presentations:**

Submitted: R.M. Brown, M.P. Mussar, A. Fu, A. Kannan, C. Hui, I. Bagchi, J.S. Jorgensen. *Irx3* contributes to female fertility via promotion of embryo-uterine interactions. Society for the Study of Reproduction. July 9<sup>th</sup> 2020.

## **Other Presentations:**

Selected for Oral Presentation: R.M. Brown, M.P. Mussar, A. Fu, A. Kannan, C. Hui, I. Bagchi, J.S. Jorgensen. *Irx3* contributes to female fertility via promotion of embryo-uterine interactions. Endocrinology Reproductive Physiology Symposium. June 4<sup>th</sup> 2020.

Oral Presentation: R.M. Brown, M.P. Mussar, A. Fu, A. Kannan, C. Hui, I. Bagchi, J.S. Jorgensen. *Irx3* contributes to female fertility via promotion of embryo-uterine interactions. Developmental Endocrinology Seminar. May 28<sup>th</sup> 2020.

Poster: R.M. Brown, A. Fu, E. Liu, M.P. Mussar, A. Kannan, I. Bagchi, J.S. Jorgensen (2019). Contributions of *Irx 3* and *Irx 5* During Embryo Implantation. Illinois Symposium on Reproductive Science. Champaign, IL.

Oral: R.M. Brown, J.S. Jorgensen. Regulation of Fetal Testosterone Synthesis. Endocrinology and Reproductive Physiology Seminar. September 19<sup>th</sup> 2019.

## **Teaching and Mentorship:**

TA: Responsible Conduct of Research Course (OBS&GYN 955)

## **ERP Service:**

ERP Student Committee: Fall 2019