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Society for
Reproduction
and Fertility

SRF VACATION SCHOLARSHIP REPORT 2019

The form below should be completed by the student, then forwarded to the supervisor for approval and submission to srf@conferencecollective.co.uk within 8 weeks of completing the project. Please submit the form as a Word document.

A maximum of one figure (with legend of less than 100 words) may be appended if required.

Please note: excerpts from this form may be published on the SRF website, so please ensure content is suitable for website publication, and does not compromise future dissemination of data in peer-reviewed papers etc. The SRF reserves the right to edit responses to ensure suitability for publication on the website, newsletter or in promotional material.

Student's Name:	John Louca	Student's Institution/University:	University of Cambridge
Degree Title and year of study:	Medicine, year 2		
Supervisor's Name:	Dr Amanda Sferruzzi-Perri	Supervisor's Department and Institution:	Physiology, development and Neuroscience University of Csmbridge
Project Title:	Molecular mechanism underlying placental endocrine regulation of resource allocation during pregnancy and its importance for the reproductive health of offspring		

Briefly outline the background and aims of the project (*max 200 words*)

The importance of placental function in fetal development cannot be understated. It supplies nutrients and oxygen to the fetus and secretes hormones that mediate changes in maternal physiology to support fetal growth during pregnancy. Impaired placental function can lead to poor fetal growth, with long lasting impacts on health into adulthood, yet relatively little is known about the programming of the reproductive system of the offspring. Previous work from our lab has shown altered folliculogenesis, a prolonged estrus phase and an increase in the estradiol: progesterone ratio in pups that had been supported by genetically-malfunctioning placentas (loss of *Igf2* in the endocrine junctional zone of the placenta; *Jz-Igf2* loss). The aim of this study was to determine whether these changes were accompanied with altered expression of genes involved in folliculogenesis and steroidogenesis, as well as defects in uterine morphology in *Jz-Igf2* loss pups.

At 13 weeks, control and *Jz-Igf2* loss offspring were sacrificed and ovaries and uteri weighed. Ovaries and uteri were then frozen for qPCR analysis and/or processed for histology. Data were analysed by t-test and significant when $p < 0.05$.

Did the project change from that proposed in the application? If so, what changes were made and why? (*max 100 words*)

No.

What were the main results/findings of the project? (*max 300 words*)

There were trends for altered steroidogenesis in the ovary as indicated by an increase in *Stard1* ($p=0.0564$) and *Pparg* expression ($p=0.053$) in the *Jz-Igf2* loss females. However all other genes analysed were not altered (*Lhr*, *Fshr*, *Era*, *Erb*, *3bhsd*, *Hmgcr*, *Cyp17a1*, *Ppara*, *Leptin*, *Ki67* and *Caspase3*). There were also no changes in gross morphology of the uterus (proportion of perimetrium,

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myometrium, endometrium and lumen) and any difference in uterine abundance or distribution of actin, Caspase-3 or Ki67 in Jz-*Igf2*-loss, versus control female pups.

What do you conclude from your findings? (max 150 words)

Changes in ovarian morphology and circulating sex steroid concentrations in female pups exposed to placental malfunction (in Jz-*Igf2* loss) are accompanied with altered ovarian expression of steroidogenesis genes and normal uterine morphology. This study has thus built upon previous work from the lab which found altered folliculogenesis in female pups exposed to placental malfunction.

How has this experience influenced your thinking regarding your future/ongoing studies, and/or career choice? (max 150 words)

The experience was invaluable in informing me about my decision to undertake further research in my career. I now feel more confident in a lab and am sure that I will incorporate research along with my clinical work in the future. The research was also quite challenging at times which I felt built up my resilience and I look forward to working in a lab again in the future.

Please use the space below to add any other comments/thoughts about the SRF Vacation Scholarship (max 100 words)

Student: I am very grateful to the SRF for providing me with the funding to take on this project and would like to thank all the people involved in making it possible.

Supervisor: John rapidly gained confidence in many lab techniques and generated important data on the impact of placental function in programming the reproductive health of offspring. Data generated are currently being prepared for publication