# SRF Vacation Scholarship report 2018

The form below should be completed by the student, then forwarded to the supervisor for approval and submission to [srf@conferencecollective.co.uk](mailto: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.

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| **Student’s Name:** | Sijia Yao | **Student’s Institution/University:** | Imperial College London |
| **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:** |  | | |

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| **Briefly outline the background and aims of the project** *(max 200 words)* |
| The placenta is vital for pregnancy. It transports nutrients to the fetus and secretes hormones that adapt maternal physiology to support fetal nutrient supply. Impaired placental function disrupts materno-fetal nutrient allocation and results in pregnancy complications, with long-lasting impacts on offspring cardio-metabolic function. However, little is known about the importance of placental endocrine function on offspring reproductive function. We have established a mouse model where placental endocrine function is selectively modified by conditionally deleting the expression of insulin-like growth factor-2 (Jz-Igf2-loss). Recent work has found that this leads to fetal growth restriction and metabolic dysfunction of female offspring postnatally. We hypothesised that Jz-Igf2-loss females will also have reproductive defects. The aim of this project was to reproductive measures of female Jz-Igf2-loss offspring.  Vaginal opening was recorded and smears were then obtained from 8 week old control and Jz-Igf2-loss females over 14 days to assess their estrous cyclicity. At 13 weeks, offspring were sacrificed and ovaries weighed and processed for histology. Sections of ovaries from mice in proestrus were stained with haematoxylin and eosin and the number of primordial, primary, secondary, tertiary and atretic follicles, and corpus luteum quantified. Mid-ovary sections were immunostained with antibodies to detect cleaved caspase-3 and pAKT. |
| **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)* |
| Vaginal opening occurred earlier in Jz-Igf2-loss females versus controls (29.4±0.7 vs 35.7±0.7 days <0.001). Jz-Igf2-loss females also displayed longer estrous cycles (Jz-Igf2-loss 5.7±0.2 versus control 5.1±0.1 days, p<0.05) due to an 80% greater time spent in estrus (p<0.05). Ovaries from Jz-Igf2-loss females were 23% heavier and contained more atretic and fused follicles but fewer secondary and tertiary follicles compared to controls (p<0.05). There was a greater cleaved caspase-3 and reduced pAKT abundance in secondary follicles of ovaries from Jz-Igf2-loss females (p<0.05). |
| **What do you conclude from your findings?** *(max 150 words)* |
| This is the first study to show placental endocrine malfunction programs changes in the reproductive system of female offspring. The earlier vaginal opening and increased time in estrus may reflect an attempt to increase reproductive fitness, which may however, have come at the expense of normal folliculogenesis. |
| **How has this experience influenced your thinking regarding your future/ongoing studies, and/or career choice?** *(max 150 words)* |
| This experience has been hugely influential on my future plans. It has given me the insight and confidence to pursue research and I am certain that I would now like to do a PhD and hopefully incorporate research throughout my career. I have truly loved the experience of thinking critically about a question; stepping up to new challenges; learning new skills and of course working with my wonderful lab members. It would be truly difficult to imagine not going back into something I have enjoyed so much. |
| **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:*** Sijia was a delight to have in the lab and rapidly gained confidence in many lab techniques. She has generated very novel and exciting data on the importance of placental function in programming the reproductive health of offspring. The data generated are currently being prepared for publication. |