# SRF VACATION SCHOLARSHIP REPORT 2016

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| **Student's Name:** | Áine Kavanagh | **Student's Institution/University:** | University of Edinburgh |
| **Degree Title and year of study:** | BSc. Biomedical Science (Reproductive Biology), third year at time of placement (penultimate year) | | |
| **Supervisor's Name:** | Dr. Rod Mitchell | **Supervisor's Department and Institution:** | Centre for Reproductive Health, University of Edinburgh |
| **Project Title:** | The role of DMRT1 in human testis development | | |

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

DMRT1 is a transcription factor which has been shown to have a role of maintaining the male phenotype. In mouse studies global DMRT1 knockouts have shown testis dysgenesis and even transdifferentiation from cells expressing male markers to cells expressing female markers. Dr. Mitchell has developed a human fetal testis development model, and this project aimed to test how knocking out DMRT1 in developing human testis using this model would affect the testis development - specifically in protein markers of cell proliferation, apoptosis, and sex-specific phenotype.

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

Some minor changes:

Aimed to look at OCT4 (gonocyte marker), MAGE-A4 (prespermatogonia), DMRT1 (male phenotype), FOXL2 (female phenotype), Ki67 (proliferation) and cleaved caspase 3 (apoptosis), but didn't manage to look at FOXL2 or OCT4 and additionally looked at GATA4, AP2γ and Cleaved PARP.

Investigated hanging drop cultures instead of tissue xenografts

Much of the tissue was from early gestation and was fairly homogenous, thus it was difficult to do all of the histology comparisons as intended.

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

The apoptosis and proliferation results did not differ significantly between the control, scrambled virus treated and DMRT1 KO, meaning both the scrambled treatment did not adversely change those processes in the cell, and also that knocking out DMRT1 did not have an observable effect.

Unfortunately most of the other results were inconclusive due to suspected artefactual or ineffective staining, most likely due to my inexperience with the immunohistochemistry protocol and the sometimes variable response of human tissue to immunoassays, despite performing multiple optimisation procedures.

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

I concluded that a further length of time for development is likely needed for DMRT1 knockout effect to be observable (this was further supported by other colleagues' findings in the lab), and that also there is a possibility that the knockout effect simply may not be observable in first trimester tissue.

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

It's given me such insight into the technical and administrative difficulties of research and given me such respect for those who make it their careers.

The creativity and dynamic problem-solving aspect of the work pleasantly surprised me, as I had really expected that I would just be following a set protocol with little variation.

From discussions with my colleagues, I learned a lot about the difference between industry and academic research, and feel now that academia appeals to me more.

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

***Student:*** I am very grateful for the scholarship itself, as completing the lab placement otherwise would have been very challenging. As regards the placement I was so lucky to have experienced such independence and responsibility while still feeling very supported by Dr. Mitchell and his colleagues. It was an environment which allowed me to learn a great deal.

***Supervisor:***