SRF VACATION SCHOLARSHIP REPORT 2022

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 PDF document and save it as: First name, Last name and 'VS'.

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:	Phoebe Anderson	**Student's Institution/University:**	University of Edinburgh
Degree Title and year of study:	BSc (Hons) Biomedical Sciences, Reproductive Biology (recently finished) 3rd year		
Supervisor's Name:	Dr Roseanne Rosario	**Supervisor's Department and Institution:**	MRC Centre for Reproductive Health, University of Edinburgh
Project Title:	Does anti-Mullerian hormone protect granulosa cells from chemotherapy-induced damage?		

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

It is understood that chemotherapeutic agents negatively affect fertility as ovarian follicles and their cells are susceptible to chemotherapy-induced damage. However, the underlying cellular pathways and potential long-term effects are not fully understood. Efforts have been made to explore potential agents that can protect ovarian tissue from chemotherapy-induced affects. The lack of cell-specific knowledge of chemotherapy-induced effects prevents equally as cell-specific protective strategies from being identified. Furthermore, the literature demonstrates a lack of human data in this area. This highlights a gap in the field that needs to be investigated in order to develop effective chemo protectants for ovarian tissue to improve fertility rates in cancer survivors.

Previous work in the host laboratory has demonstrated that anti-Mullerian hormone (AMH) can potentially protect human ovarian follicles from premature growth activation and direct damage induced by cyclophosphamide exposure during culture. However, this data was generated using a tissue culture model so it is unclear which cell type/s AMH is targeting.

The aim of this project is to determine the chemoprotective effect of AMH on human granulosa cells following cyclophosphamide exposure in vitro.

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

No Measurement of PI3K signalling upregulation using Western blotting or analysis of DNA damage using gH2AX immunofluorescence. This was due to lack of time as a result of focusing on cell culture (specifically the apoptosis readout).

Cells were cultured with 4-HC (active metabolite of cyclophosphamide) in addition to cisplatin to explore any difference between the two chemotherapies.

These cells were also treated +/- AMH plus a PUMA inhibitor, Torin, and Rapamycin (three other chemoprotectants) to establish if AMH had induced changes in the cells that also differed across multiple chemoprotectants.

Data was collected 24hr, 48hr, and 72hr following treatment

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

The fluorescent apoptotic marker NucView was introduced to HGRC1 cells before and after chemotherapy +/- chemoprotectant. This was followed by Incucyte readings that measured the level of fluorescence per well. Cell death was represented by level of fluorescence. It appeared that PUMA, AMH, and Rapamycin decreased the level of cell death, whereas Torin increased the level of cell death in cells following treatment with Cisplatin. In cells treated with 4-HC it appears that AMH and Rapamycin decreased, PUMA increased, and Torin had an overall null effect on the level of cell death. While AMH decreased the level of cell death, it did not appear to do so more than Rapamycin

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

Despite the results, the data does not suggest either of the 4 chemo protectants influenced cell death of HGRC1 cells and whether they demonstrated any chemo-protective effects. This is due to lack of statistical analysis as a result of high variation and issues with cell culture resulting in low sample size It was difficult to conclude whether AMH was having more/less of an effect in comparison to the other chemoprotectants or whether the level of effectiveness of the chemoprotectants differed across the two doses used for both cisplatin and 4-HC. It is therefore difficult to conclude whether AMH can protect granulosa cells from chemotherapy-induced damage based off these findings. However, the techniques used including the HGRC1 cell line and apoptotic marker NucView paired with Incucyte readings could still effectively explore these questions in-vitro.

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

Completing this project has reinforced my passion for practical work and has encouraged me to go forward with a lab-based project for my final honours year. I think the skills I have learned have made me so much more confident in the lab and can be transferred throughout the rest of my studies. Such skills include manual dexterity (especially using my non-dominant hand) and math, for example when using a hemocytometer. The independence I have gained has only added to this and the overall lab environment has allowed me to grow and develop in numerous ways. The team I have worked with have made me look forward to working with others in the future. This project has also encouraged me to look into MSc programmes for next year to further my education and hopefully get a position on a PhD programme in the future.

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

Student: I think the application process was very straightforward and the amount offered was very generous. It definitely helped me with my expenses throughout the course of the project. It's great that funds have been put aside for students such as me to be able to gain valuable experience that may not have been able to happen otherwise!

Supervisor: The SRF Vacation Scholarship provides an excellent opportunity to recruit and train young enthusiastic scientists, and helps set a solid foundation for students to build upon during their Honours projects.