



High School Cancer Competition - research internship reflections

Stephanie Kallas, Queensland Academies of Health Sciences QLD

My name is Stephanie Kallas and I am currently a student studying at Queensland Academies of Health Sciences on the Gold Coast. Recently, I participated in the 2018 ACHSC High School Cancer Competition and unbelievably received 1st place. With this came a surreal reward - an opportunity to have a one-week research internship at the Olivia Newton-John Cancer Research Institute (ONJCRI) in Heidelberg, Melbourne. It was the first time the competition was expanded outside the state of Victoria and I flew from the Gold Coast to Melbourne to take part in the internship.

When I arrived at the ONJCRI on the first day, I was twitchingly nervous, unsure about what to expect but at the same time, eager to expand my knowledge of cancer research. I was assigned to work in the Metastasis Research Laboratory, on the fourth floor of the facility. It was exciting for me to be in a real laboratory where metastatic cancer was being thoroughly investigated. All the researchers helped me to settle in quite quickly and I was delighted that I was to have them as colleagues for the upcoming week.

Over the course of the internship, I was taught about the different projects and experiments each researcher was conducting, and it was an information packed week to say in the least. Some highlights from the whole experience include; learning about RT-PCR (reverse transcriptase polymerase chain reaction), observing the injection of human cancer cells into immunodeficient mice, cell culturing, learning about confocal microscopy, observing a mice dissection, genotyping, western blotting, and protein lysing.

The process I found most interesting would have to be the use of PCR (polymerase chain reaction). PCR is basically a three-step process where the prepared solution is first, heated to about 95°C where it is 'denatured' meaning that the double-stranded DNA is split into single-stranded DNA. Next, the temperature is lowered to about 50-65°C where the sample 'anneals' meaning the DNA primers in the solution attach to a specific/target DNA template. Finally, the temperature is raised to about 72°C where the DNA is 'extended' and a new strand of DNA is created by the Taq polymerase enzyme. The end result of this process is that a large amount of the target DNA is created. PCR is used in processes such as genotyping, which (during my internship) was used to find genetic variants of genetically modified mice, or in processes such as RT-PCR, which was used to detect certain amounts of RNA specific to a protein which mimicked the effect of tumour suppressor gene BMP4.

I was able to gain a quick and deep insight into each of these processes which helped expand my knowledge about cancer. Each researcher was able to breakdown the theory behind their work and the outcomes of what they were doing so that I could understand how and why they were conducting their research. It helped me to fully comprehend the



urgency in finding out more about metastatic cancer. I gained not only a high level of respect for the researchers but high regard for the ambitions and purpose of their work, it holds so much hope for helping people with this disease.

My research internship was truly an eye-opening experience and I learnt so much in such a short amount of time and have made new connections within the field of science. This experience has allowed me to have an insight on cancer research, and a possible career path. Thank you to the ACHSC organisation who coordinated this opportunity, to Olivia Newton-John Research Institute for allowing me a week-long internship and the principal of Queensland Academies of Health Sciences, Mrs Vanessa Rebgetz, for working in accordance with both the organisations to ensure I had a very educational and beneficial time. I have experienced such a knowledgeable week and have learnt so much over the course of the internship, both about cancer and the field of research. I have grown as a person and as an intellectual.

Angie Zhou, Queensland Academies of Health Sciences QLD

Stephanie and I were lucky enough to win the AHSCC and go to the Olivia Newton-John Cancer Research Institute for a week-long work placement! During the placement, I was assigned to the Tumour Targeting laboratory and got to experience what real life working in the laboratories was like.

Within the group, I was supervised by Ingrid Burvenich. She is currently working on a project involving Fn14 receptors, and in turn, a symptom of cancer called cachexia. Previous research has discovered that cachexia (or a sudden weight loss and wasting of the body towards the end of a cancer patient's life) is linked to the activation of Fn14. Hopefully by deactivating Fn14, it will lead to a better quality of life for cancer patients.

I got to watch the process of culturing cancer cells, as well as several different imaging techniques they use to observe the added fluorescent tags that mark the different types of cancer cells. I also toured the antibody production facility, where scientists create antibodies for use by groups within the centre. But perhaps the part I was most interested in was the work they do with animals. They utilized about 40 mice for testing of their antibody. I got to observe first-hand how they prepare the mice and inject them with the cancer cells, as well as the learning about the ethics surrounding the use of animals for research (which are quite similar to the ethics process we learn here in psychology!).

Overall, this was a really fun trip and I learned so much about cancer research and how laboratories and research processes work. I'm really grateful I got the chance to go and it definitely opened my eyes to the possibility of a future career in research! Thank you to ACHSC and ONJCRI for making this possible for us – it was an amazing opportunity that I will not forget.



2020 High School Cancer Competition



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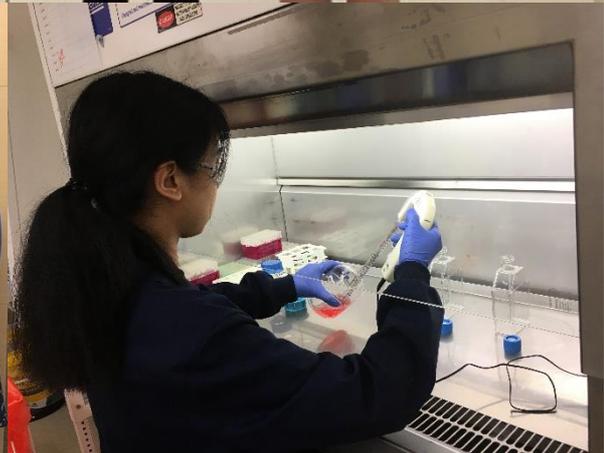
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Parker Arnel, Mac.Robertson Girls' High School VIC

The week-long internship organised by ACHSC was one of the most interesting and eye-opening experiences that I have had. I was placed in the Translational Breast Cancer lab with a lot of talented and knowledgeable scientists and students. It was my first experience working in a lab and it was cool to see their daily activities and how everything was conducted and the type of work that they were undertaking.

It was amazing to see all the different biological aspects that were being investigated and researched and to see the level of depth that everyone could teach me. All of the researchers were willing to sit down with me and explain the mechanics behind what they were doing and how it was applicable to the overall research. It was enlightening to see the broad scope of the possible applications for every little task that undertaken and needed to be done, no matter how repetitive. It was also good to see the ethical aspects and guidelines that were in place throughout all aspects of the research, no matter how confronting the work was.

This internship provided me with many hands on and observational activities which greatly deepened my knowledge and understanding of cancer biology and cancer research. I now have a much deeper understanding of what it takes to be a researcher, not just specifically in relation to cancer, but the general laboratory environment. I also now have a much deeper appreciation of the time and effort that is needed, as well as the diligence, dedication, and extensive study of everyone who undergoes a career in this field. I would encourage everyone to participate in High School Cancer Competition if they have the opportunity!

