Working with the Cooper Group

- Fairly large group with research in a variety of areas
- Very Diverse with many international members
- Karl (my mentor) focuses on synthetic organic chemistry research and is involved with CO-ADD and COLOP projects which are both in the realm of drug discovery research
- The aim of my project was to perform an aza-amino acid scan of octapeptin C4 (compound effective in treating multi-drug resistant Gram negative superbugs)
- Goal: synthesize gram quantities of the aza-Dab(Alloc) compound for the aza-amino acid substitution at position 4 of octapeptin C4
- Performed synthetic organic chemistry research, characterization ($^{13}$C NMR, $^1$H NMR, LC/MS, TLC), purification (manual column with both liquid loading and solid loading, Biotage Isolera)
What A Typical Day Looks Like
Final Products
I entered the internship with very little organic chemistry research, aside from two semesters of organic chemistry lab.

Going from almost no experience in an organic chemistry lab to being able to independently run reactions and ACTUALLY problem solve was one of the best feelings.

My project required a lot of trial and error.

Close to the end of my internship, we needed to create a new reaction scheme because the previous reaction scheme was proving especially difficult during the purification steps and resulted in a very low yield of pure product. The new reaction scheme ended up being much better than the original scheme with pure solid precipitating out during the final step of the reaction. This means further purification wasn’t necessary. Seeing the LC/MS scan and holding the final product left me feeling so satisfied.

**Most Rewarding Aspect**

*New Reaction Scheme*
My Work’s Impact on the Organization

- Synthesizing small molecules for a project that my supervisor (Karl) will ultimately be carrying out
- Establishing an optimal method for Karl to use in the future will decrease his workload and help him in the future synthesis
- He can reliably repeat this synthesis in the future
- Also provides him with a significant amount of starting material
My Work’s Impact on Me

- Confirmed my decision to pursue a career in pharmaceutical research, but now I would like to focus specifically on medicinal chemistry research. I’m definitely going to be taking more chemistry classes.

- Learned how to more effectively problem solve and the importance of patience especially when completing particularly tedious work (TLC’s!!!)

- Learned that trial and error and tedious work is an unfortunate part of research but is necessary in order to make any steps forward. Every reaction I ran had a specific purpose; both the successes and failures taught us something in trying to find the best method to synthesize our final product. We had to run reactions with many different conditions until we found the right combination of steps.
I was initially really nervous about being alone abroad, but I ended up having a really great experience. I do plan on going back to Australia someday whether it be to complete a PhD abroad or just to travel more of the country.

This summer was an experience in pushing me outside of my comfort zone. Many of the amazing adventures I had were because I forced myself to try something different. I really tried to take advantage of every opportunity I was presented in Australia.

Had a taste of what it was like to be an adult: how to find safe housing for myself, figure out how to get to and from work, cook for myself, plan trips, and explore the city.

Learned how to be more fearless.
Travel: From Sunshine Coast to Gold Coast
Turning 20 at Byron Bay and Exploring Stradbroke Island
Bondi Beach, Sydney