

## MacRobertson Travel Scholarship Report

### About me

My name is Rebecca Stevens, and I am originally from the South West of England. I'm currently a final year PhD student on the University of Strathclyde/GSK Collaborative PhD programme, based primarily at the GSK Medicines' Research Centre in Stevenage, UK. My PhD research aims to accelerate the rate of drug discovery with the use of automation, focusing on the high-throughput synthesis and biological evaluation of a class of medicinal molecules known as PROTACs. I was awarded the MacRobertson Postgraduate Travel Scholarship in April 2024 during the third year of my PhD, with an award value of £5000, to carry out an 11-week long research placement in the group of Professor Stuart Conway at University of California, Los Angeles (UCLA) between October and December 2024.



### Why did you apply for the Travel Scholarship?

I applied for the MacRobertson Travel Scholarship after being offered the opportunity to work with the Conway lab at UCLA for a few months. I thought this would be an incredible experience and the scholarship, in combination with a Royal Society of Chemistry Researcher Collaboration Grant, allowed me to carry it out. I was really eager to join the group for several reasons: to learn new biology techniques; the opportunity to work with Stuart, a leader in the medicinal chemistry and chemical biology field; and my first time to experience studying abroad, especially working within science in the US.

### Details of your visit

My main PhD project has been focusing on the development of high-throughput workflows that allow us to accelerate the rate of drug discovery by synthesising and testing new compounds approximately 100 to 1000-fold faster than traditional methods. Rather than carrying out individual experiments in round-bottomed flasks, then purifying and testing compounds one at a time, I have been performing chemistry using plates that contain 1536 miniature wells, with the help of automated systems such as liquid handling robots. The group I work with at GSK have also developed a method for testing our products directly without

purification, known as 'direct-to-biology', a field that has been rapidly expanding in recent years, especially within the pharmaceutical industry.

The aim of this placement was to set up similar high-throughput capabilities in the Conway group at UCLA and provide a proof-of-concept for using this technology to identify drug molecules for a target that the group specialises in. In order to achieve this, I worked closely with a postdoctoral research associate in the group to design new synthetic DNA constructs that would allow us to create a new cell line that we could evaluate our compounds in. This was a completely new experience for me, and I was really pleased to have the opportunity to learn a number of new biology techniques.

Alongside this biology work, I synthesised a tool compound that we could use to validate the direct-to-biology approach with this new system. The synthesis had some challenging steps, and I spent several weeks troubleshooting but identified some useful learnings for other group members in the process. I then worked with colleagues in the California NanoSystems Institute to use these tool compounds in plate-based synthesis and we were able to test a set of 20 novel molecules in our new cell line during the final week of my placement. Pleasingly, the experiment was successful, meaning that my research visit was able to provide a proof of concept for this new workflow!

The Conway group were incredibly welcoming and invited me to join them for all their social activities which made the visit a brilliant personal experience as well as professional. I took surf lessons in Santa Monica, enjoyed swimming in the outdoor UCLA pool at sunset, hiked to the Hollywood sign and used two national holidays during my visit to explore California with new friends.





*Photos from my time in California. (From left to right) 1. Conway group Christmas dinner in Beverly Hills; 2. My first surf lesson; 3. A weekend trip to Joshua Tree National Park with friends; 3. Sunrise in Santa Monica, where I surfed before work; 4. A hike to the Hollywood sign.*

### **Impact of the Travel Scholarship**

I am incredibly grateful to have been awarded the MacRobertson Travel Scholarship that provided me with this opportunity. It enabled me to solidify my understanding of the area that I have been researching during my PhD and develop confidence in sharing my learnings with other scientists, which I've really enjoyed. Working in a different environment and with a new group of researchers has reminded me of just how many different areas of science there are

to explore, and this has really excited me for my future career. As I am coming to the end of my PhD programme, I feel this placement has come at a good time for me to reflect on what I'd like to do next, as well as providing me with a wider network, a stronger CV, and a range of different perspectives. I have learnt a lot from all of the Conway group, and most of all from Stuart who was incredibly kind to host me in his group.

This placement has also been my first opportunity to study abroad, and I have thoroughly enjoyed exploring a new area and spending time with a fantastic group of people during that time. I'm so glad that I applied for this grant and would highly recommend it to other postgraduate students who are considering it in future.

### **Acknowledgements**

I'd like to thank the University of Glasgow for granting me the MacRobertson Travel Scholarship, as well as the Royal Society of Chemistry for a Researcher Collaboration Grant, both of which funded this research visit. I'd also like to thank my PhD supervisors, Afjal Miah and Glenn Burley, as well as Programme Directors, Harry Kelly, Billy Kerr and Laura Paterson, for their support in me undertaking this placement. Lastly, I'd like to thank all of the Conway group for welcoming me into the team, and Stuart for all of his help and for this fantastic opportunity.