MacRobertson Travel Scholarship Report

The Delhi Discovery: Glasgow's Journey of a Lifetime

About Me

My name is Kirsty Tinto, and I am a Scottish second year PhD student at the University of Strathclyde funded by the British Pharmacological Society's AJ Clark studentship award. In 2023, I was awarded the Mac Robertson Travel Scholarship (£4000). This scholarship enabled me to travel to Delhi, India to foster collaborations with Dr Soumen Basak's Systems Immunology Laboratory at the National Institute of Immunology. This trip provided me with new laboratory skills, gain access to a variety of laboratory tools which were previously inaccessible for me, exciting scientific discussions, and collaborations which I am confident will provide exciting research publications.

My main research interests include the exploration of pro-inflammatory cellular signalling pathways related to NFκB, a family of pro-inflammatory transcription factors, to identify better therapeutic drug targets in inflammatory-based diseases and cancer. More specifically, I investigate a novel IL-1β-mediated pathway which results in rapid phosphorylation of p100 (NFκB2). Most of my research is carried out in U2OS cells, a human Osteosarcoma cell line. However, this phenomenon has been demonstrated by our laboratory in multiple cell types. This is an exciting aspect of research, as I aim to understand which proteins p100 interacts with, and what genes are regulated by this pathway as a result. This will provide me with an insight into the inflammatory role of this cellular signalling pathway. To do this, I've got the best support system in my two supervisors, Prof. Robin Plevin and Dr Margaret Cunningham who provide me with their exceptional expertise and laboratory tools.

Prior to applying for the Mac Robertson Travel Scholarship, I became familiar with the research carried out by Dr Soumen Basak's Systems Immunology Laboratory. Dr Basak's research closely aligns with our group's research, and he has expertise in NFκB-regulated genes and NFκB activity. Dr Basak's laboratory specialise in Electrophoretic Mobility Shift Assays (EMSA), which utilises nuclear extracts from cells to enable quantification of NFκB-DNA complexes. This technique requires a radioactive NFκB probe to be used, which we do not have access to in our laboratory. EMSA techniques can provide invaluable information to give an insight into NFκB nuclear activity in the presence and absence of cell stimulation with pro-inflammatory ligand IL-1β in a time-dependent manner. Additionally, Dr Basak has spent many years developing genetically engineered cells from mice which have various known NFκB pathway-related genes knocked out which is required to further understand which proteins are involved in our novel signalling pathway. Therefore, I applied to the Mac Robertson Travel Scholarship to foster collaborations with Dr Basak's Laboratory in Delhi, which has since become a very successful collaboration.

Details of my visit across continents

After obtaining the Mac Robertson Travel Scholarship, I was able to pursue a unique opportunity of visiting another laboratory to learn new research techniques. This was the furthest I had ever travelled from home, my first time in Asia, and my first completely solo journey. However, I settled in comfortably in Dr Soumen Basak's (pictured on the left) laboratory. The trip fulfilled my hopes of learning new experimental techniques, as I carried out EMSA techniques. From this, I managed to optimise the optimal time points of interest which NFκB has DNA-binding potential following IL-1β stimulation during my visit which will aid the next stages of my PhD research. I worked collaboratively with other PhD researchers within Dr Basak's laboratory, which enabled us to openly share our findings surrounding NFκB and to give one another constructive feedback, ultimately learning from one another.

The only thing I am more passionate about than science is people, and luckily, I was surrounded by a wonderful group of people throughout my Delhi trip. From accepting me into their laboratory, and collaborating with me, the laboratory group made me feel so welcome (Dr Soumen Basak's PhD students pictured below).

Impact of the experience

My fundamental research understanding of NFκB and wider cell signalling pathways was aided drastically by this trip. Working in Dr Basak's laboratory who is a major researcher in the field, I had a great opportunity to learn directly from him, and from his students. The research I conducted in India will help me shape my PhD thesis and Dr Basak's laboratory have been generous to send our laboratory various cell types to the UK to carry out further research. Additionally, this trip taught me how to live independently and enabled me to not only learn about another culture, but to embrace it. My living conditions were different compared to home, as I lived without a shower and instead utilised a bucket and a tap. I was able to try

traditional Indian foods, including arguably the world's greatest garlic naan bread (pictured below).

A highlight for me, was of course a visit to one of the seven wonders of the world, the breathtaking Taj Mahal. Being able to experience the Taj Mahal was one of the greatest experiences of my life, and it truly demonstrated that even at a popular culturally significant attraction in a very busy area, there is a sense of calm and spirituality. The architecture in India was truly one of a kind! I visited various other places to enjoy the culture, whether it was trying local cuisine, or visiting India gate and the parliament buildings.

Visiting Delhi was an incredibly insightful, and once in a lifetime opportunity. I have so much to be thankful for from this opportunity, and this would never have been possible without being awarded the Mac Robertson Travel Scholarship! The Mac Robertson Travel Scholarship has revolutionised my academic and research trajectory. I am deeply thankful for this transformative experience, which has equipped me to make impactful research contributions to the field of molecular biology.