

# Laidlaw Undergraduate Research and Leadership Programme Reflective Report

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As I look back on my Laidlaw experience, I can conclude with certainty that it has had a hugely beneficial impact on my life, both academically and personally. In this report I have focused on why I decided to apply for the scholarship, my main learnings and what I enjoyed most as I progressed through the programme. I hope that this can encompass how positively I feel about the programme and how much I would recommend it to anyone who is curious about applying.

When I read about the Laidlaw programme in my second year of Nanoscience, I would have been very apprehensive at the thought of approaching a senior academic in my department or devising a research project by myself. Despite this, I could see the huge opportunities a programme like this would offer me, and I was very eager to gain an insight into the world of academic research. After speaking with some of the scholars from the previous year, I decided to apply. I heard about their experience I saw just how exciting and insightful this programme had been for them. They had all gained a huge amount of perspective over their first twelve months as scholars and could not commend the programme highly enough. I resolved to immediately get in contact with a senior researcher in the field of nanoscience, despite my previous reservations!

Upon researching the type of work carried out in the academic labs in Trinity, I came across a field that encompasses two of my passions; physical sciences and tackling healthcare inequality. The lab, run by the principal investigator Professor Martin Hegner, focuses on nanotechnologies for biophysics. Part of his research focus for the last number of years had been the development of sensing devices that could be the basis for future point-of-care testing kits for cancer detection, blood coagulation issues or virus identification. This immediately grabbed my attention as a hugely important area, not only as a novel method using newly developed microcantilever chips, but as part of a wider effort to bring cheaper technologies to areas with less developed healthcare facilities. I got in contact with Professor Hegner to ask about the possibility of pursuing a research project with him.

Shortly after our initial contact, I was lucky enough to be invited to meet Martin and discuss potential projects that would be suitable for my ten-week time frame. The unique structure of the project, with an 11-month gap between finishing the first research period and starting the second, opened some interesting research opportunities for us. It was decided that I would spend the first five weeks in summer of 2019 learning the measurement techniques used in the Nanobio lab and conducting proof of concept experiments. Preparing samples, coming to terms with the microfluidic systems and interpreting my own data would allow me to have a more active role and take independent measurements in my second summer, where I could use test samples from real clinical trials. The lab in Trinity had access to samples from studies carried out in Switzerland and Tanzania on the efficacy of candidate vaccines for Malaria. This was of huge interest to me and I was delighted to hear I could contribute to such an important and influential area of study. With this plan in place, I was excited and energised to begin my research proposal.

Preparing for the Laidlaw interview turned out to be a difficult yet rewarding exercise. I was lucky enough to be in contact with an applicant from the previous year, who organised a practise interview session for myself and some other interviewees. This improved my confidence hugely and practising with my peers helped me to home in on what had gone well and what needed improvement. Little did I know I had taken the first step in a long path of self-discovery and insight that I would undertake as a Laidlaw scholar. On the day of interview, I remember feeling very nervous, yet delighted to get a chance to share my enthusiasm for my project with the Laidlaw coordinators in Trinity.

Once the interview had passed, I was delighted to be looking forward to my first summer of research. I knew it would give me a big boost in deciding what career would suit me and what area I would like to study if I went into further research. However in early May, I was quite surprised by how much I enjoyed the first of our four main leadership weekends. This session gave us our first introduction to what effective leadership might look like, and what we could learn about our own leadership styles.

Our first session as Laidlaw scholars was a networking workshop. We learned different techniques such as how to enter and exit conversations, as well as how to pitch our research to others in less than two minutes. I found this to be very useful at that early stage in our leadership development training, as it gave us the tools to connect with those involved with our research projects that summer. We had plenty of chances to practise our “elevator pitch” to the other new scholars that day, which was helpful for getting to know everyone! I found it to be a very inspiring experience overall, as I also got to hear about the exciting research planned by everyone for their first summer.

Other aspects of this weekend included learning what to expect from our supervisors and how best to manage our relationship with them. This also came at a helpful time, in advance of our first in-depth research session with them that summer. The last workshop of the day focused on the importance of recognising and embracing our personal styles of leadership. I found this particularly fascinating as I had never thought too much about the idea that leadership can be broken down into simple components. I learned that there is a huge difference between the words “manager” and “leader”, despite thinking of them as interchangeable definitions before. I was able to pinpoint some of the main characteristics discussed in my own style of leadership for the first time in this session, by looking back at times I had been in a position to lead others through sport.

The second day of this weekend contained a particularly enjoyable session in presenting and voice coaching. The breath and posture exercises left me feeling more confident in my ability to communicate and engage with large groups. I felt better equipped to deal with situations of nervousness in the future, like I had experienced directly before my interview. I felt extremely privileged to have had access to this course through the Laidlaw programme, as well as all of the speakers on that memorable first weekend.

Shortly after this weekend had passed, I embarked upon my first research period in the lab. Naturally, I was quite nervous to meet the research team at first. However, I was lucky to find an incredibly encouraging group of people to work with. I was brought in to the lab almost immediately to begin learning about the practical work carried out by the team, and by the end of the week I had made significant progress in preparing to carry out my own measurements. My most memorable reflection from this first week was getting to see the “coaching” style of leadership that Martin, my supervisor, took with his team.

As this work used elements of chemistry, engineering, physics and biology, the team members had all come from different academic backgrounds. While this allowed a great scope for problem solving and collaboration in the lab, it also meant that each team member needed instruction and training from time to time to be brought up to scratch in certain subjects. Martin always encouraged his team to ask questions and often had individual meetings with them to explain difficult concepts. I noticed also that this approach to leadership created great trust amongst the group and an openness to learning and asking questions.

As the weeks progressed, I found myself really enjoying the lab work. There were times when I would feel a slight lull in my enthusiasm, but they were short-lived. My supervisor kept me very engaged by providing new reading materials and some tutorials to ensure I understood the theory of what I was doing. I found the busier times were the most enjoyable for me. As my project measurements sought to quantify the human immune response to a parasite or vaccine, I found I had a lot of reading to do in biology and immunology. This was a particular challenge for me, having never studied biology in college or at school! However, I also would consider this one of the more exciting aspects of my project, as I got the chance to learn first-hand from an expert in the field.

Another observation I encountered from my time in the lab was the way problems were dealt with within the group. The small team of five would meet several times each day for lunch and coffee breaks with Martin. These casual gatherings would often act as informal meetings, where people would bring forward their concerns or issues about their work to the group. This proved to be a great resource for problem solving at an early stage, before the issue became too large. I enjoyed seeing this interesting dynamic play out during my time working in the group. It struck me as something all leaders should try to incorporate in their approach, as it makes for a greater relationship with those in your team.

By the end of my first five weeks I felt like I had gotten a brilliant insight into the life of a researcher. I had performed some of my own measurements and had learned so much in that short yet intense time. I was excited for my next five weeks in summer two and felt ready to face what challenges they might bring.

The next Laidlaw leadership experience came in the form of the scholars’ conference in London. Having heard such good reports of the previous years’ conference, I was anticipating an exciting and inspiring weekend away. I knew I would get excellent opportunities to find out how everyone’s

research had gone, and to get to know everyone a little bit better. The trip provided us many chances to do just this, as well as to have many eye-opening discussions and conversations together after our summers of independent work.

The talks and developmental activities we attended over the weekend were incredibly engaging. Hearing the young business leaders share their expertise was inspiring, and I again felt very privileged to get the chance to attend. The networking sessions with scholars from universities around the world was particularly exciting for me, as I found many scholars with research interests similar to my own. Getting a chance to share my passion for my research with like-minded students was lots of fun and gave me a chance to put my networking skills to good use! Getting to meet the creator of the programme, Lord Laidlaw, over video call was an exciting experience for all involved. We got great insight into why he invests his time and resources into the programme, and how strongly he believes in its mission. It was a truly inspiring weekend for me, and I have many fond memories of this time.

After the exciting trip away, our next leadership development day pushed us to understand ourselves and our motivations to an even greater extent. The first session consisted of an engaging panel discussion with several entrepreneurs. We learned about the gritty reality of taking an idea from concept to product, and how it is important to stay upbeat for the sake of your team. We saw how some of the speakers seem to lead by example, in a “pacesetter” style. We also heard about the life of an animator working as a free-lance creator and director, and the difficulties that can come with self-leadership. I found this session to be very thought provoking and a well-rounded view of life as a successful young leader in your sphere. The talks gave us a glimpse into the passion and persistence needed for free-lance or entrepreneurial careers.

In the next part we got a comprehensive talk titled “Innovation in Research” from the Dean of Research in Trinity, Professor Linda Doyle. I found this session very relevant to my interests, as we spoke a lot about the communication of science and its impact on the public. I have often considered pursuing a career science media, so this appealed to me very much. Next up was a very introspective session with Niamh Hannan from Mindworks. As a psychologist, she was able to give us great insight into how different working styles can be used to positively influence others. It opened my eyes to the fact that my approach to work may be very different to those I am collaborating with or managing. I found this to be a useful exercise that encouraged me to reflect, something that I now know is vital to becoming an empathetic and resilient leader. I am very grateful to the Laidlaw Team in Trinity for providing us with such an engaging weekend session and bringing the group together at this point in our Laidlaw journey.

The next of our four leadership sessions took place in the new year and saw us embark on a trip to Kippure in the Wicklow Mountains. Considering what a fulfilling and exciting time we had had in London I was greatly anticipating the overnight stay in the idyllic surroundings. Our first session of the day was facilitated by Gerry Hussey, one of Ireland’s leading health and performance coaches. The interactive talk focused on human perception and wellness, and touched on topics such as our belief system and learning to value ourselves over social affirmation. The wide-ranging discussion

became controversial at times and invited a lively and engaging debate. I thoroughly enjoyed getting to share some of my own reflections with the group and hear what others had to say. As it happened, the thought-provoking discussion lasted much longer than the actual session as we continued to voice our thoughts in lively conversations that evening over dinner. I found this session to be quite challenging, as I really had to examine my own beliefs and values before making up my mind on certain issues. While it was difficult to do this, I believe it was a very important exercise, particularly in the context of moral and ethical leadership. I feel I gained a lot from the session, as I was able to clearly state and defend my point of view in the group setting, which I would have found quite daunting in the past.

The following day, we had a teamwork activity facilitated by the staff at Kippure Estate. This involved quite a bit of problem solving, and again offered us the opportunity to get to know each other that bit more. I enjoyed seeing the roles taken on by each member of our group. While some preferred a vocal and directing style, others tended to work things out themselves before contributing to the team strategy. Luckily our group worked quite well together, and we managed to win the group challenge of creating a mechanism to prevent an egg from breaking when dropped from a height.

I found this weekend to have been very thought-provoking and intellectually stimulating. It was great to have such a diverse group of people to work with for activities such as these, and I count myself lucky to have been part of it. As it was our third formal leadership session, I began to see how much the group had progressed since the start of the programme in terms of confidence and resilience.

This, unfortunately, was to be our final group meeting before the coronavirus restrictions were brought in towards the middle of March. While I missed our in-person sessions together, I found the leadership talks presented by each university to be a great resource for virtually engaging with other scholars. This succeeded in keeping me engaged with the foundation until such a time as our events could be rescheduled, albeit over Zoom.

Although my research for summer two could no longer go ahead on the planned dates, I was very fortunate to be allocated four weeks in September to complete my project in the lab. I was very excited to get this lucky break, as many labs had to be closed entirely or restricted over the summer due to the pandemic.

In the 15 months since I had last been a member of the Nanobio research group, quite a lot had progressed with the malaria vaccine research. The team had submitted a research paper about their findings to a journal over lockdown. This had been sent back with some suggested changes that needed to be included for them to consider publishing it. The team now needed a new data set to add to their paper in a matter of weeks. As my research period coincided with this, I decided to shift my research focus to help them achieve this goal. Instead of measuring serum samples from immunised patients I worked in tandem with a PhD student to create a calibration curve for the measuring device. This involved functionalising the sensors with a vaccine formulation and using a

solution of pure antibodies to test how sensitive our serum measurements really are. This sensitivity could then be directly compared to the standard immunoassay measurement kit, ELISA. I was delighted that I made this switch, as I really felt connected to the greater research community by contributing to this collaborative paper. While the four weeks were very tough, I was satisfied I had made the right decision. I was overjoyed to hear that I could be included as a contributor to this body of work and would be formally acknowledged on the text.

Our last formal event in the Laidlaw leadership programme took place over zoom, where we got an insight into emotional intelligence and social enterprise. It was, as always, an engaging and informative session. It really summed up a lot of the learnings we had picked up about ourselves over the previous 18 months. Although it was a sad occasion, coming to the end of our formal training, I cannot help but be proud of myself and the group of Trinity scholars for having given all of their energy and enthusiasm to this programme. The progress made by each and every scholar was immense, and really shows the value of an initiative like this. I hope I can stay involved with the Laidlaw programme throughout my career, to give back even a little bit of what I gained from participating.

Deciding to apply for the Laidlaw programme was one of the best decisions of my academic life, and the skills and expertise I gained will stand to me for the rest of my career. As I am sure you have seen from this reflection, I could not commend the programme highly enough and I hope it continues for many years to come. The experience and networks I have built over the past 18 months will be an invaluable asset to my future endeavours, as well as the lifelong connections formed with my fellow scholars. I would like to thank the Laidlaw team in Trinity and the Laidlaw Foundation most sincerely for making this all possible.