



University of
St Andrews | FOUNDED
1413 |



Laidlaw Leadership Essay

***A reflection on the intersection of
personal and professional leadership
development***

Cohort 2022/23

Eli King (they/them)

When I started my Laidlaw application in the winter of 2021, I was at my parental home, Christmas bunting still up and cards with season's greetings from family scattered across every available surface. I was researching my area of interest for the academic portion of the scholarship, how enzymes can biodegrade synthetic plastic wastes: the biochemical nature of a circular economy. I had been inspired by a news article that summer on wax worms' ability to chew through plastic packaging, and I wanted to know more. What has transpired since then has been an absolute whirlwind of new lab experience, leadership and personal development, global networking and teamwork to address this interdisciplinary problem; and a newfound love for biochemical solutions addressing global supply chain problems. It is hard to say how much the Laidlaw scholarship has changed my life, because I haven't lived my whole life yet. But what I do know is that I have made life-long friends, found an area of research I keenly want to explore via PhD or green industrial research, and have gone from a young person struggling with imposter syndrome, to a young person who feels empowered to create the change I want to see in the world: starting with plastic waste. I am unendingly grateful to the Laidlaw team, and hope in this essay to track my journey from a young bright-eyed waxworm article-reader to the person I am today.

I: The Research

When I began my application for the Laidlaw project, I saw it mostly as an opportunity to explore an area of research I was interested in. I truly had no idea just how far beyond the lab the Scholarship would take me, but to start at the beginning is to start with enzymes. Plastic-cleaving enzymes.

Plastics are polymers: a long chain of repeating units (monomers), wherein the chain linkages can be broken by a host of options: by light (UV-degradation), by mechanical shredding, or by chemical treatments (often strong acids). My area of research sought biochemical methods, such as enzymes, that can also break this chain linkage. I worked with Prof. Rebecca Goss as my supervisor, first to conduct a literature review to find an enzyme that could break down our chain linkage within the 6 week timeframe (a surprisingly difficult task, given how before-the-curve the area of research was at the time: now there are databases abundant even just one year on, with new papers released almost daily from labs across the globe). Once we had chosen and ordered our enzyme from the literature, I set to designing a synthetic pathway to create a "dimer": two monomeric units joined by a single chain linkage, to better isolate enzymatic action. This was opposed to a whole PET bottle as was my initial idea. Chemically, it would be near-impossible to isolate any data without learning computational chemistry – outside the scope of the, now seeming incredibly short, 6 weeks. Once in the lab, I synthesised and fluorine-tagged the molecules (a quick UV-active identification tool), created a buffer solution for the enzyme (new to me as I had zero experience with the biology part of my biochemical project!), and set the mixtures to incubate. By the end of my first summer, I had successfully synthesized – and cleaved with our enzyme – my first ever PE plastic. Most poignant was one fact: I wanted to continue this project. Parts deemed "out of scope" for my short 6-week experience sparked interest in the nature of STEM research, and laid the foundations for my passion now. I wanted to move beyond "just" breaking the chain linkage; most often it is used in greenwashed recycling processes, the molecules are typically just linked back up again to create a new plastic product. I wanted to derive my molecules away from their plastic roots: I found, through Prof. Goss, Dr. Joanna Sadler at the University of Edinburgh. She had found a way to turn PET monomers into vanilla essence – baking goods – to cut out the fossil fuels in the industrial manufacturing process, and use waste plastic stock instead. Remove plastic waste and create a biocompatible molecule: win-win. I am hoping to volunteer with Dr. Sadler next year from Laidlaw experience.

II: Learning that Accommodations are Okay

Despite successfully completing my first summer of Laidlaw, the experience was a tumultuous one and would continue to be for the next year. Just a month after my acceptance onto the scholarship, my younger sister left home abruptly and came to live with me. We were ill-equipped in my room in St Andrews, and after our landlord decided to sell the property we were housing insecure for the remainder of that summer, finally finding a house in Edinburgh that took all of my savings to secure. I never told my supervisor of my situation, and turned up dutifully Monday to Friday whilst trying to move home and bussing back and forth between the two towns. It was the start of a long journey to realise that I should, can, and must talk to people and ask for help when things get difficult. I ended the summer having to take a Leave of Absence from University, putting in jeopardy my scholarship until I was allowed to re-engage the following January.

The following January, I felt very strongly that I wanted to do a self-defined Leadership in Action, particularly as plastics pollution so disproportionately affects lower-income countries (in no small part due to illegal UK waste dumping and legalised waste trafficking to these countries, even for recyclable wastes). The deadline for self-defined projects had passed whilst I was on a Leave of Absence, however I managed to source and secure a placement with The Sea Cleaners, plastics NGO, within 72 hours after what must have been over a hundred LinkedIn messages to potential parties. This then later fell through, and led to a similarly hectic securement with The Indonesian Waste Platform to save my Plastics & Poverty LiA. In hindsight, I am unendingly grateful to the switch to IWP. The tumult though was not yet over: the previous summer, my sister had gotten her autism diagnosis and I had been a very hands-on young carer for the past year. The thought of leaving for 6 weeks, being gone for the first time since she came to live with me, was terrifying. I am unendingly grateful to our LiA coordinator, Cassice, for standing by me and allowing me to reduce my time abroad to 4 weeks as felt much accessible in my situation. The role Cassice has played cannot be understated. She coached me through talking with people about what was going on, connected me with Student Services when I needed, and I am wholly aware that at any point I could have lost the scholarship. I did not because of her kindness. If I had started the scholarship knowing what I know now in terms of the emotional capacity to ask for help and accommodations, I cannot express the stress and isolation that could have been avoided. I owe that growth to the Laidlaw and Student Wellbeing team at St Andrews.

III: The Indonesian Waste Platform

I arrived in Indonesia, still carrying the stress of the past year. I left in tears from the sheer kindness I was shown, and invaluable experience in a sector I care about. My LiA targeted the intersection between plastics and poverty; how the local people are impacted by plastic waste, especially in urban contexts vs. more rural areas without formalized waste collection. Unlike the Sea Cleaners, which was in effect a French international consultancy working in Indonesia, the Indonesian Waste Platform was wholly and innately intertwined with grassroots action, longevity of impact, and local stakeholderhip. The Sea Cleaners' project collapsed because the only person who was based in Indonesia became unavailable for my placement period. The Indonesian Waste Platform taught me about the neo-colonial nature of foreign "charitable" projects in Indonesia, the inevitable collapse of these projects when either funding or international interest runs out. Their on-the-ground team was 100% Indonesian, which is nearly unheard of in plastics NGOs, co-led by Nina who had lived in the

area for 10 years, and by Ica Marta who was indigenous to the region: part of the Manggarai people. I learned Indonesian language and a bit of the indigenous Manggarai language, stayed in a homestay, and took the time to really connect, respect, and learn about the unique problems facing the region from the grassroots up. Coming myself from the UK, I realised suddenly the greenwashing nature of many international charitable projects, fossil fuel and plastics lobby funding abound, and began to understand the nature of how policy is derived, how it impacts Indonesia's poorest, and how if not for this experience I would likely have become complicit in the international consultancy schema. I had assumed going in that these urban and rural communities needed to "develop" their waste management infrastructure. A landfill here, a recycling point there, job done. What I realised talking and working with these people is that the problem is inherently upstream. Downstream management does not work without severely reducing plastic production and regulatory bans on single-use and hard-to-recycle plastics. The tax burden for waste disposal is not available to impoverished and rural communities: if a landfill is introduced, it drains local resources and contaminates the local area. Incinerators cause intense illness as is happening in Bali. Recycling is unaffordable and misses many of the unrecyclable multi-layered food sachets, one main source of plastic waste in rural Indonesia. Without Laidlaw, I would not have gained this knowledge, nor the visceral grassroots experience as it shapes my approach moving forward.

IV: The Friendships

One aspect I did not expect was the friendships and the value of cohort from the Laidlaw experience. Our Leadership weekend at Hospitalview was the first time I felt that kinship; we were all there, in a strange place, learning to develop our respective leadership styles and to question habits or patterns that we held (learning that many people felt imposter syndrome across the cohort was a real watershed moment for me; I felt less alone and able to honestly talk about what held me back from effective leadership). I have developed friendships and respect for my fellow Laidlaw scholars that will last a lifetime, and feel so excited for the new incoming cohorts on their own Laidlaw journeys. I had always thought of leadership as a solitary exercise. I see it now as a community enterprise, filled with stakeholderism, debate, mutual support and communication when times get difficult. A good leader is not someone who is stoically correct, but someone who listens and engages. Perhaps most important is that I am able to look at the achievements of others and be proud, happy, and excited for our diverging paths. Before I started my Laidlaw journey, the accomplishment of someone else always somehow felt like I had failed myself. Laidlaw has given me the vocabulary to move from a "competition economy" to an "upliftership economy", and it feels so much better this way.

V: Moving Forwards

I will recommend the Laidlaw experience for as long as people are willing to listen. This scholarship has intersected the most difficult year of my life, and made me so much stronger for it. I have found friendship, I have developed my sense of self and have fallen in love with my area of research. Having attended a Beyond Growth conference on green fisheries (intersecting marine plastic debris and sustenance fishery communities, whom I visited on my LiA), I have contacts with researchers at Herriot-Watt and the EU Plastics Commission which I hope to get involved with in plastics advocacy. I hope to pursue research with Dr. Sadler on PET-to-vanilla enzymatic transformations, and have been looking for post-graduation PhD opportunities such as in Sweden using bio-compatible polymers (bioplastics) to create entirely biodegradable computers. Laidlaw has launched me into a future I

didn't know could exist for myself, and I am unendingly grateful to the Laidlaw Foundation for the opportunity. I am excited to give back to future cohorts – either through organizing events at St Andrews or wider research initiatives. Maybe I can host a Laidlaw scholar in a lab group of my own one day. Either way, I am committed this next cohort iteration to pursue that seed of interest. It will turn into something so much greater than anyone could have imagined.