

# MY JOURNEY IN STEM

BY **DR FIONA SIMPSON**, BSc PhD

Research Fellow, Queensland Head and Neck Research Centre  
UQDI in the Translational Research Institute, The University of Queensland



I'm looking out over the garden wondering what to tell you all about my journey in STEM. It should be straightforward. The positives are amazing. There are problems too. Having thought about this article for a while, I've decided to tell you a lot about the positives and then discuss general issues such as the biggest barriers to women in STEM today.

I was born in Australia but grew up in a small town on the North Coast of Scotland. I was luckily born quite bright and I aced primary school, winning numerous prizes for academic, sport and musical competitions. Then, when I was ten, my father died suddenly and my mother suffered from very severe clinical depression after that. I continued to be good at school but we struggled for money and so I started working full-time through the evenings at a local petrol station and at a newsagent at the weekend. Later, I picked up jobs washing dishes on fishing boats and finally, a job with the local vets. I continued to be good at school, although my final grades suffered from having no study time.

**FIONA SIMPSON** completed her PhD on cellular trafficking at the University of Cambridge, UK. She was then a Wellcome Trust Prize Post-doctoral fellow at The Scripps Research Institute, La Jolla, working on trafficking and endocytosis of RTKs. Fiona is currently a Fellow of the Queensland Head and Neck Cancer Centre.

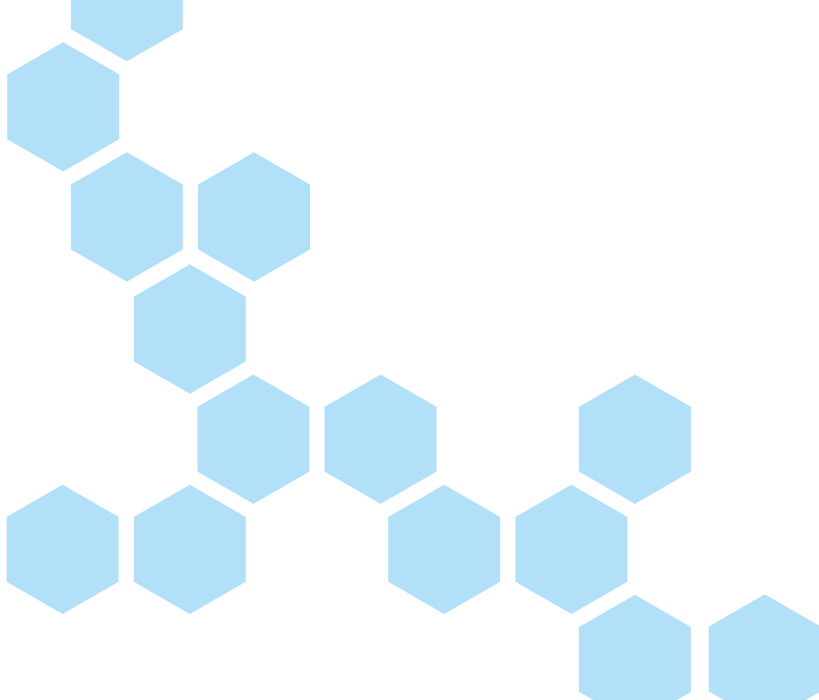
The Simpson lab research program is focused directly on the translation of research findings into new cancer therapies and has generated a novel method for antibody-mediated cancer therapy and associated companion diagnostic methods which are covered by three international patent applications and published in *Cell* (March 2020) and *Cell Press STAR Protocols* (Aug 2020).

Fiona was the lead scientific investigator on a Phase I proof of concept study of the novel therapy in head and neck cancer (HREC/15/QPAH/48) and the Lead scientific Investigator on Phase IB dose escalation trail (CESTEM-1), now completed.

 [f.simpson@uq.edu.au](mailto:f.simpson@uq.edu.au)

The local vets were highly intelligent and excellent teachers. With them, my fascination with science evolved. I was also supported by a local minister, actually the Reverend James Simpson who went on to become the Moderator of the Church of Scotland. Rev. Simpson was an ex-nuclear physicist. We argued theology and he always argued at the highest academic level, never simplifying anything. He knowingly, or perhaps unknowingly, taught me analytical thought processes.

From high school I went on to Edinburgh University to study Biochemistry in order to qualify for vet school. I started the life sciences course and I was in heaven. Surrounded by 'nerds' like me, I felt that I finally could fit somewhere (although I was a little 'rougher' than many of my contemporaries from more privileged backgrounds). I realised I was a born scientist and absolutely thrived on the learning. I worked full-time in the pubs every evening to pay my way through university so between study and work I used to sleep around three to four hours per night. In my second year of university, I finally got up the courage to ask my friend why some students were called 'students' and others were called 'PhD students'. She



explained, but she couldn't believe I'd never heard about PhDs before!

I decided to do a PhD and doing various interviews, ending up one night awaiting five interviews at Cambridge. Prof. Paul Luzio hosted me and I stayed at the college at which he was Master, St Edmunds. It was just before Christmas and the colleges were holding their talent evening. The performances were astounding. I loved every one but, at the same time, woke up for my interviews next day thinking I was in the wrong place and could never fit in with the extraordinary students I'd seen the previous evening. However, as is the main theme of my life, I just kept going anyway. 😊

One of my interviews the next day was with Prof. Margaret Scott Robinson (Scottie). She was the most intelligent woman I'd ever met, running her own laboratory at Cambridge. She was dressed in ragged jeans and trainers and hosted me through the day with wit, kindness and lots of science. I'd never met a woman like her in my entire life. Even now, 25 years later, I am still in awe of her. I joined her laboratory to complete my PhD and she trained me exceptionally well. She insisted on high standards, to perfection, while being kind and encouraging, looking after us all like family. She remains a role model for me now that I run my own lab.

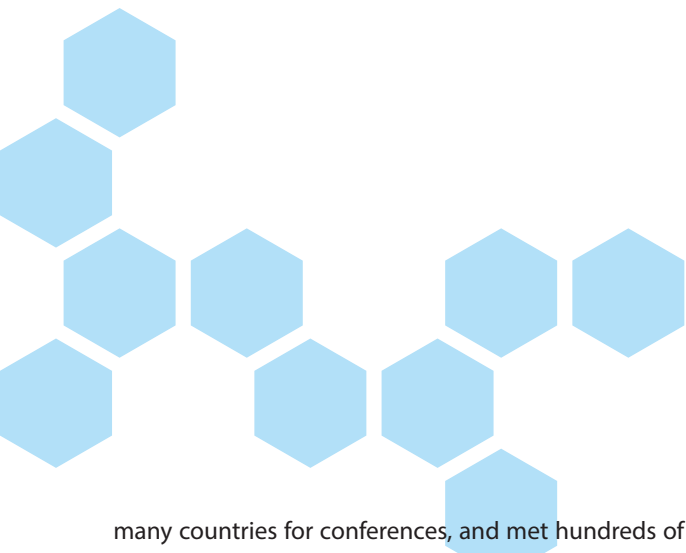
I published well during my PhD and won a Wellcome Trust Prize Post-doctoral Fellowship to further my training in the laboratory of Prof. Sandra Schmid (Sandy) at The Scripps Research Institute in California. Prof. Sandy was another role model, but with a very different style to Prof. Scottie. Again, exceptionally smart, she was very professional, determined and politically aware. Many of us in that laboratory completed research that led to very high impact publications. I became pregnant during my time in Sandy's lab and, at the same time, found out my Mum was dying of cancer. Prof. Sandy supported my visits home, my maternity leave and even babysat Rachel one night so I could go to the movies! She was a highly practical woman and, with two children of her own, led by example. I think, across staff of the whole lab, we had 10 pregnancies in the three years. Sandy always thought women so productive prior to maternity leave that it was a

definite advantage for the lab track record.

With the loss of Mum and a now one-year-old baby, I decided not to use the last year of my Wellcome Fellowship in the UK return year. Instead, I decided to come to Australia on a Juvenile Diabetes International Research Fellowship. I was born in Australia and it was a place Mum had never wanted to leave. I've been here now for 21 years. My son, now 14, was born here. On arrival in Australia, I had a few setbacks. I was appointed at a level lower than my Fellowship, which I hadn't expected. A year after arrival, the lab I had joined moved. It took me a few years to recover from all the changes and project changes. I won a further Fellowship and eventually a National Health and Medical Research Council (NHMRC) Career Development Award for five years. It was one year into the Fellowship that I became pregnant with my son. My husband, at the time, was working abroad for ten months and Rachel was eight. When Euan was ten months old I walked out of science, weighing 30kg and diagnosed with PTSD.

After ten lonely months at home, contemplating the end of a career I'd worked so hard for, I did return to science. In what I consider one of the luckiest moments of my life, I met Prof. Ian Frazer. After various discussions, I ended up having the opportunity to run my own research lab. With very little funding we have now survived for ten years. There are ten amazing young scientists in my lab. They are intelligent, hard-working and kind, and every day I look forward to working with them. We recently published a paper in the top journal CELL on a way to reverse cancer drug resistance and improve cancer therapy, which I invented, and the team worked so hard to run experiments on and prove. They've all won a number of prizes and we just heard we have been awarded our first NHMRC grant after 20 years of applications. We've initiated clinical trials supported by amazing clinicians and we have seen our science dream of actually moving our research into a patient setting. This is both an honour and a terrifying level of responsibility. I also have been promoted to Associate Professor.

So, it's a fantastic story. From small town poor girl to running a successful research lab! I've lived on three continents, visited



many countries for conferences, and met hundreds of bright and talented people. I love the actual science work and I love my lab and my children and my dog. From an external viewpoint, I really have it all.

Sounds straightforward and great? So why are only 9% of Associate Professor and Professor level STEM academics female? I think there is an issue which doesn't turn up in government or university reports.

I think a lot of women enter science from delight, fascination, and curiosity about the natural world. Many are driven to improve health or other aspects of life for humanity or the planet. However, I think that women often leave science or suffer in science as the culture changes especially with increasing seniority. As funding levels drop and people become more desperate and more competitive, the culture changes to a very 'corporate' model. I have observed women helping others, only to have the others turn on them when they refuse to give more and more. Then they stop giving. I have seen women try to defend their work outcomes, funding, and position. When someone determined (or nasty) starts causing issues or bullying, the women react. I think some of the responses to these reactions are the most insidious problems I have observed. The protagonist claims it's the woman's 'fault' or calls them 'emotional' or 'crazy'. The protagonist acts like an upstanding, sensible but "wounded bird". Often others, including management, buy into this. This is called 'victim shaming'. While an incident such as this may be manageable, it often re-occurs. The woman is now more vulnerable as she has already been labelled, and therefore the labels can be applied to her even more easily. As each occasion happens, it becomes a vicious cycle as the woman gets more emotional and hurt by the unfairness of the system.

I've had some interesting general discussions with senior scientists about this. Some agree that this is a culture that needs to be changed. However, others point out that we cannot afford to 'be nice' in science, or claim you must be ruthless and un-emotional to survive. I suspect that the motivations that drive people to do science and to love research are diametrically opposed to this 'dog eat dog' culture. I think,

combined with job insecurity and funding stresses, that this extra strain on their identities and unfriendly environments causes women to leave science. I've seen women become distressed and anxious and keep going until it affects their home life and children. Then they leave.

I don't think science should be defined by such cultures. How much potential data is lost as we lose diversity, lose people of colour, and lose women from science? How much do we lose by selecting only for senior scientists those who only respect 'tough', 'unemotional' and 'cut-throat' attitudes to a point where leadership and promotion are selected on these traits? I think each of us needs to do our best to make sure our post-doctoral, research and graduate staff are protected so that they can live their best science lives. For anyone strong enough, we also have to fight the culture that says you cannot be kind in science.

My journey in science so far has been an adventure full of wonder and discovery. I hope that we can create that for the young scientists coming through, regardless of gender, colour, religion or kindness levels. Discoveries are not limited to one type of human being. 😊

