

# SCIENCE OF PERSISTENCE

Dr Fiona Simpson is applying her lifelong resolve to research work that could revolutionise treatment of aggressive cancers

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If it all pans out, if 28 years of study and research and begging for funding and sheer bloodymindedness lead to a quantum leap in treatment for cancer patients, then a bowl of porridge and a stirring rendition of *You're So Vain* will have played a role. But it all began with scrubbing out lambing sheds.

It was in the Scottish Highlands in the mid-1980s when an off-the-rails lass named Fiona Simpson was put to work amid the wet straw and afterbirth of a lambing shed and began to feel a sense of purpose. Whip-smart but trying to hide it at a tough school, the then 15-year-old had been "smoking and drinking and going with boys" until a concerned teacher found her an afternoon job with the veterinarians in her northern coastal town of Thurso. Her world opened up. Soon, the vets were taking her out of the lambing shed and on consulting trips to dramatic places such as Durness and Cape Wrath. They let her help with anaesthetics. And they showed her the secret life of cells under microscopes. "They got me obsessed," she says. "They took my head. Nobody had ever done that before."

Far from it. At school, her physics teacher told Simpson, the only girl in the class, she should abandon the subject, rather than distract the boys "who might actually use it in their futures". The feisty scientist relays this story as we're standing in the microscope room of the University of Queensland's Translational Research Institute (TRI) in the Princess Alexandra Hospital precinct at Woolloongabba, in inner-east Brisbane, surrounded by an array of hi-tech microscopes worth millions of dollars and requiring more than a passing knowledge of physics to use. Deadpan, Simpson says: "I've been back to visit him since."

If growing up poor in Thurso taught her one thing, it was how to stand up for herself in a fight. There have been "blazing arguments" with other researchers as one discovery has followed another and the impossible has become probable. "I've had 20 of them yelling at me that I'm wrong, and I'm going, 'Show me in the data what's wrong, not what you feel is wrong'. People swearing at me and slamming doors."

Others, though, have been captivated by Simpson's Scottish terrier-like drive and high-spiritedness, and supported her when things looked bleak. Ever since moving from pure science to translating that to cancer treatment seven years ago, she has been struck by how the right people enter her orbit at the right time. "Every time I've been stuck with this project, I've been sitting there thinking, I give up, somebody out of the blue has appeared and helped me," Simpson says. "Just randomly, they turn up."

Now, with \$250,000 funding from the PA Hospital Research Foundation, clinical trials are under way that could revolutionise the treatment of aggressive cancers such as head and neck, and the breast cancers, triple-negative and HER2 positive. The key? A cheap, widely used anti-nausea drug.

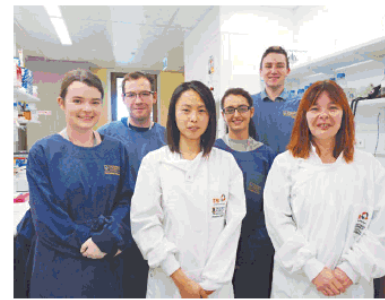
The battle is personal. Simpson's mother, Isabel, died at 55 from lung cancer, despite being a non-smoker. Simpson wants revenge.

**THE GEOGRAPHY TEACHER REMONSTRATED WITH THE TOUGH** kids of Thurso High School when they threw the rock collection off the balcony. So the kids threw him off, too.

That's the school environment Simpson was thrust into as an already angry teenager. She jokes that anger is a Highlander's starting position, but there was more at play than regional stereotyping. Her father, Donnie, had died of a pulmonary embolism when she was 10, and Isabel sank into clinical depression. "I'd come home and she'd be sitting in the kitchen, just crying." With her older sister, Yvonne, at university and Isabel too bereft to work, it fell to Simpson to keep the house running and to care for her younger sister, Heather.

"Dad had been in the Masons and he was so good to people and everyone liked him, so all the local businessmen gave me jobs. I had a job in the petrol station, I had jobs in the local kitchens washing dishes, and I paid the bills and looked after my little sister and cleaned the house," she says. High school was easy to start with; she got As without trying. But that made her a target with other students. "I'd walk out the back gate and they'd beat me up," she says. "So, of course, I tried to fit in to stop them picking on me for my grades. And I was angry as well."

Often, she'd take her fury out on her mother. "I was the teenager from hell because I thought, if I'm looking after everything, I should make my own choices. She'd tell me what to do and we'd fight. And I'm not an easy fight."



Dr Fiona Simpson (opposite page) and (above) with her team (L-R): Brigid King, Jake O'Donnell, Satomi Okano, Leanne Cornino and Sam Coxeter; (top) with daughter Rachel, then 12, in 2011.

**It was porridge that got (Professor Ian Frazer) talking to me. I've had a lot of porridge since**

If not for the guidance of the vets, Simpson's talents might never have made it out of Thurso. She was keen to become a vet but her grades were not good enough, so she was advised to do biochemistry. With a government grant of £2000 a year and working in pubs at night, Simpson put herself through a Bachelor of Science at the University of Edinburgh while sending money home. She remembers shivering her way down the shopping strip of Princes St one winter, with Edinburgh Castle perched majestically above, as ice-cold water sluiced through the holes in her boots. "Near the bridge, the big hotel, the Balmoral, had cakes and chocolates in the window," she recalls. "Oh, it was torture walking past every day because I was struggling to get a bowl of soup."

Her marks were no longer struggling, though. Science and Simpson clicked, and towards the end of her degree with honours in 1993, the vet school said she'd be welcome. But by then, she had interviews for a PhD position. At Cambridge University, no less. She walked through the hallowed halls, looked at the work being done in laboratories, spoke to remarkable scientists. But the clincher was the night she stayed at one of Cambridge's colleges. There was a talent show on. "One of the girls sang *You're So Vain*,

she sounded just like Carly Simon," Simpson says, wide-eyed. Law students, art students, science students, the entire gaggle of young intellectual might was gathered there to entertain and revel in each other's company. The sense of community captured her. "I heard all their conversations and they were just so focused on being really good at what they were doing. It was such an eye-opener. I think it's the first time I thought, it's actually OK for me to fit here, I'm allowed to be somewhere. Instead of getting beaten up."

She ditched the idea of vet school and moved to Cambridge to take up a PhD position under the supervision of molecular cell biologist Professor Margaret Scott "Scotty" Robinson. "I mean, to suddenly end up in St Edmund's College, Cambridge. From Thurso!" she says. "It was very cultured. I used to go into the coffee room and (biochemist, writer and intellectual) Terence Kealey was a consultant there and he'd go, 'Oh, they've let the chattering classes in'. And my response would be 'F--- off, Terence'. Which he loved."

By now, she'd met her future (now ex-) husband, Nick Fraser, and was working in cellular trafficking. She reaches out and touches my skin. "I worked out how people get different skin colours, the machinery that gives you melanin. The paper has more than 300 citations now as it led to the discovery of lots of proteins involved in melanoma."

With her PhD complete, the couple married and headed to San Diego, California, in 1997 where Simpson was to do a post-doctorate in the lab of Professor Sandra Schmid at the Scripps Institute after winning a Wellcome Trust fellowship, one of only five given out each year. Twelve months later, she was pregnant. Her mother, with whom she was now very close after coming through the tumultuous teenage years, was her first phone call. "And Mum said, 'Oh'. I said, 'You don't sound very happy'. She said, 'I've just had a test, I've got six weeks to live'."

Simpson learnt the sense of uselessness people can feel when a loved one is diagnosed with cancer. Sure, she could explain to her mother what her cells were doing, but she could do nothing to halt their progression. "It was just awful. (My sisters and I) had just got to the point where we could give Mum a good life and spoil her." The best Simpson could do was be there, flying home regularly. Isabel lived longer than predicted, long enough to see her granddaughter, Rachel. "Rachel would lie in bed, staring at Mum; she never cried. Mum was convinced she was an angel."

Simpson could have returned to Cambridge when her post-doctoral fellowship ended but that changed after meeting the then Brisbane-based Professor David James at the prestigious Gordon Conference in New England, in the US. James, who at the time ran his laboratory out of UQ, convinced Simpson that Brisbane was as sunny as San Diego. It piqued her interest; after all, she was an Australian. Simpson was born in Adelaide but her parents, who had come out as part of the "10 pound Pom" immigration program, returned to Scotland when she was nine months old because her grandmother was sick.

So in 2000, the family came to Brisbane. James left for Sydney after a year but Simpson continued to win prestigious fellowships and do important research in cell biology at UQ's Institute of Molecular Biology. In 2006, her son Euan was born. But when he was 10 months old, Simpson hit a wall. She was working herself ragged and felt unsupported by some of her colleagues. Simpson is only small in stature but her weight fell to an unhealthy 30kg. "I remember getting up to feed Euan and my bones hurt," she recalls. "I suddenly thought, why am I working so hard to be this ill and this miserable? So I just walked out the door."

Jenny Stow, now the IMB's deputy director (research) – "a wonderful woman" – stood by her, had her fellowship put on hold and by 2009, Simpson was back working with Professor John Prins and Dr Jon Whitehead at UQ's Diamantina Institute. She'd known them at Cambridge. "They just took me back in."

A year on, she was in the coffee room eating porridge, a favourite meal. And who should walk in but another Scot world-renowned scientist, co-developer of the Gardasil cervical cancer vaccine and the visionary behind TRI, Professor Ian Frazer. "I'd never met him before but I recognised him and I'm like, hero-worship," Simpson says. "And he came across and said, 'Are you eating porridge?'"

They bonded over the Scottish staple and got talking. That same day, after Frazer asked for her CV, he offered her a researcher's dream: her own laboratory. The condition? To do something translational, using her years of cell trafficking

