

How tumour donations from patients help scientists understand cancer

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"You don't exactly want your tumour to take home and stick on your mantelpiece - give it to the research people and let them make some use of it."

Mike Malley, 72, was diagnosed with a type of [kidney cancer](#) called [renal cell carcinoma](#) in February 2015. Whilst undergoing treatment, he signed up to a Cancer Research UK funded study called [Renal TRACERx](#) (Tracking Cancer Evolution through therapy) that looks at the evolution of [kidney cancer](#) to try and better predict [tumour](#) behaviour, in the hope of improving treatments in the future.

To highlight the critical role of patients in clinical research, we invited Mike to the Crick to meet some of the scientists working on the Renal TRACERx project - an ongoing collaboration between scientists and clinicians from the Crick, UCL, The Royal Marsden and Guy's and St Thomas'.

Together they have collaboratively analysed over 1,000 tumour samples from 100 kidney cancer patients in order to reconstruct the sequence of genetic events that led to the cancer in each patient. In total, Renal TRACERx will follow 300 patients, tracking how their kidney cancer evolves over time.

Scientists at the Crick were involved in genetically profiling and characterising each patient's specific cancer, through the collection and analysis of tumour samples from each patient.

Referring to 'kidney cancer' as one disease glosses over the fact that each patient's kidney cancer is different and evolves differently, and even within a single patient, different bits of their tumour can be genetically very different.

As a results, scientists need to collect multiple samples from each patient's tumour. The recently published Renal TRACERx results come from the analysis of over 1,000 samples from 100 primary tumours, approximately 10 samples per tumour on average.

Andrew Rowan, Principal Laboratory Research Scientist in Charlie Swanton's Translational Cancer Therapeutic Lab, described meeting a patient as a 'rare event' for a research scientist. He showed Mike around the lab, talking him through his role in the process, from collecting the tumour and blood samples from the hospital to isolating the DNA for genetic sequencing.

He explained to Mike that thanks to improved technology, the sequencing process itself has become a lot cheaper and quicker than it was early on in Andrew's career, making projects like TRACERx possible.

"25 years ago, you would sequence 200 to 300 base pairs of DNA at most, now you can sequence the whole genome, approximately 3 billion base pairs, in two days!

"This means we now have huge amounts of data and information to process and analyse, so there's a real need for computational and data science expertise in our research."

Talent manager and model railway enthusiast, Mike, was extremely impressed with all the 'mind-boggling' science using his tumour and blood samples.

"When I was asked if I wanted to get involved in this research, I thought 'Yeah, why not if it can help?'"

"It's been really interesting to see exactly what these dedicated scientists are doing with my samples. If we can continue this important cancer research, then hopefully one day scientists will come up with something that my kidney helped to achieve, which is a satisfying thought. Definitely an afternoon well spent!

"I'm so glad I signed up and I would definitely encourage anybody else who is in a position to donate tissue samples to research to do it - there's no reason not to."

Andrew echoed Mike's sentiments about the critical importance of patients for clinical research.

"We completely rely on donations from patients to be able to continue this important research. We're incredibly grateful to all patients who choose to support [research](#) in this way and we encourage as many [patients](#) as possible to donate."

"I hope we were able to give Mike a good understanding of the work that we're doing at the Crick and the ways in which we are putting his donated samples to good use in order to better understand kidney cancer."

Provided by The Francis Crick Institute

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