

A pathway to pain free



RNSH doctors are building a biobank they believe will cure arthritis, writes Andrea McCullagh

Someone you know has arthritis. Almost four million Australians live with this painful condition and chances are they are either one of your friends or family. In its most common form it affects the joints of the knees, fingers and toes in people over 40. In other types the immune system attacks healthy cells in children.

There is no cure. Given the high number of people it affects, arthritis gets relatively little government funding leaving the search for answers a challenging process. Despite the enormous hurdles, a team of doctors at Royal North Shore Hospital have been quietly working on what they believe will lead to a cure. The arthritis biobank, officially called A3BC, is the only project of its kind in the world and the hospital's head rheumatologist Prof Lyn March AM is its leading light.

"If we collect enough data we will find a solution. I think the biobank is an answer," Prof March said. "The way we have been doing things up until now we haven't found an answer."

The Australian Arthritis and Autoimmune Biobank Collaborative was formed after a donation from a private family trust who shared her vision to find a cure. For several years at RNSH they had already been collecting data on the impact arthritis has on individual patients' daily life and functioning. To take the project to the next level they started collecting biospecimens: blood, saliva, faeces and synovial tissue directly from affected joints. Freezers are now filling up with human samples and it is hoped masses of data will eventually be extracted and analysed using new technology such as artificial intelligence. Prof March predicts that all this complex work will eventually provide the data to create individually targeted treatments for patients.

"We've got the vision, if we do collect enough information down to that micro level genomics, DNA and RNA and we can put all that together in a clever way we should be able to cure arthritis in the future," she said. "A group of us said 'If you don't say you would like to do this you are never going to be able to do this'.

"We are leading the project at RNSH and we have recruited rheumatologists and scientists around the country to partner in the project. The more we share the more we have."



Common types of the condition, osteoarthritis, rheumatoid and psoriatic, affect each patient in very different ways. In one it could cause pain in their knees and wrists, in another it could be their hands and feet. It is not known why this happens. Another treatment issue is that sometimes patients can try up to four different drugs before finding the right one for them. This wastes precious time and money. During this trial and error period patients are damaging their

joints and also exposed to risks of infection and unwanted side effects. Data from the biobank could change this by providing a clear treatment pathway from the start. It could also potentially predict who is going to have the most severe forms of the disease and allow doctors to intervene earlier.

Dr Craig Willers is the national director of the biobank project. He explained the problem with research into complex chronic disease is the amount of information you actually need to figure out the causes and discover what can drive more precise treatments and preventions. This is expensive work and he would like more funding granted to their research. He believes there is a clear mismatch between level of burden and the level of funding on a national level.

"These are very disabling and burdensome diseases that need more resources, funding and research," Dr Willers said.

"For example musculoskeletal has 10 times the burden yet receives about 10 times less funding compared to diabetes. If you look at that fault difference it's quite remarkable, particularly when you start to drill down on how much it costs the health system.

"It's a long road and a lot of hard work. But what keeps us pushing forward is the knowledge that at the end we will have a very comprehensive solution to improve treatment and change lives."

To date they have collected samples from almost 50 patients and need thousands more. Answers from the biobank won't come until years into the future and for patients being diagnosed now there are treatments available.

We are going to have a pretty comprehensive solution that no one else in this space is anywhere near

Since starting her studies at Sydney University, Prof March has seen developments in the field and the important differences these make to quality of life. There are now powerful medications that can control inflammatory arthritis and almost put patients into remission if treatment is started early enough.

Prof March is also involved in programs at RNSH to improve quality of life for people with arthritis, osteoporosis and back pain.

Her key advice is that the best thing is to keep moving and build up muscles around affected joints, which can prevent replacements.

"It really works if people can do it but we know it's quite hard when they are in pain," Prof March said.

"It's about helping people manage that pain better and helping people understand that movement is a good thing to do."

An arthritis exercise and lifestyle program at RNSH helped Cremorne local Tom Buttel avoid a knee replacement.



**Rheumatologist Professor Lyn March at the Kolling Centre at Royal North Shore Hospital.
Picture: John Appleyard**

rugby injury led to the development of osteoarthritis in his right knee, which he has lived with for more than 30 years.

He had two early surgeries and was hospitalised last year after he fell in an accident.

"My knee can only bend 30 per cent of a normal person's knee and when I fell it went all the way. My heel hit the buttocks and it hadn't hit it for 35 years," he said.

For Mr Buttel the biobank is an exciting prospect. If it delivers a cure it would transform his life.

"I'd love to be able to just go for a run," he said. "The research being done holds out for a cure or maybe even reversing the effects of osteoarthritis."

If you would like to be involved in the biobank project and donate samples go to a3bc.org.au. The team is looking for samples from people with and without arthritis.

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