

Early clinical trial success for new rheumatoid arthritis treatment

June 3 2015



Professor Ranjeny Thomas (right). Credit: University of Queensland

University of Queensland researchers have developed a world-first vaccine-style therapeutic approach to treat rheumatoid arthritis, a debilitating disease affecting more than 450,000 people in Australia.

UQ Diamantina Institute lead researcher Professor Ranjeny Thomas said results from the phase one clinical trial, published in *Science Translational Medicine* today, demonstrate the new [treatment](#) is safe and effective in suppressing the immune response.

Rheumatoid arthritis is a disease in which the immune system attacks healthy tissues, particularly in the joints, causing inflammation, pain and deformity.

Professor Thomas said the treatment targeted the underlying cause of rheumatoid arthritis.

"Current therapies only treat the symptoms and slow the progression of the disease," Professor Thomas said.

"We have designed a vaccine-style treatment or 'immunotherapy' specifically for individuals carrying high-risk rheumatoid arthritis genes and specific rheumatoid arthritis antibodies, called anti-CCP.

"This type of rheumatoid arthritis is called 'CCP-positive' and accounts for the majority of cases.

"Our immune system is made up of specialised cells that move through blood and tissue, preventing disease and fighting infection by distinguishing between what is the body's own healthy tissue and what is foreign.

"This treatment teaches the patient's immune system to ignore a naturally occurring peptide that is incorrectly identified as 'foreign', resulting in the production of CCP antibodies and causing inflammation.

"A personalised immunotherapy was prepared for each patient by taking a sample of their blood and extracting a particular type of immune cell

called dendritic cells.

"The patient's dendritic cells were then challenged with the 'foreign' peptide and an [immune system](#) modulator.

"The treated dendritic cells were then injected back into the patient."

Professor Thomas said a single injection of the patient's own immune-modified [dendritic cells](#) was found to be safe and to help suppress the [immune response](#) in rheumatoid arthritis.

"This in turn was associated with reduced inflammation.

"At this stage, the technique would not be ideal for widespread treatment or prevention of rheumatoid arthritis because it's costly and time-consuming.

"However, the promising results of this trial lay the foundations for the development of a more cost-effective, clinically-practical vaccine technology that could deliver similar outcomes for patients.

Professor Thomas is working on a delivery technology with Dendright Pty Ltd (a UniQuest start-up company) in collaboration Janssen Biotech Inc., one of the Janssen Pharmaceutical Companies of Johnson & Johnson.

If the delivery of this technology proves successful in patients with [rheumatoid arthritis](#), it could also be applied to other autoimmune diseases such as Type 1 diabetes.

More information: Citrullinated peptide dendritic cell immunotherapy in HLA risk genotype–positive rheumatoid arthritis patients, [stm.sciencemag.org/lookup/doi/ ... scitranslmed.aaa9301](http://stm.sciencemag.org/lookup/doi/.../scitranslmed.aaa9301)

Provided by University of Queensland

Citation: Early clinical trial success for new rheumatoid arthritis treatment (2015, June 3)
retrieved 20 April 2024 from

<https://medicalxpress.com/news/2015-06-early-clinical-trial-success-rheumatoid.html>

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