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Cell research to aid diagnosis of arthritis in kids

Findings can also help predict which treatment will work best

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Civil war rages in the body when arthritis strikes. Its main defender – the immune system – turns traitor.

Instead of protecting the body as it is supposed to, it attacks the tissue, explained Professor Salvatore Albani, who is director of the SingHealth Translational Immunology and Inflammation Centre.

This causes a wide variety of symptoms ranging from inflamed joints to fatigue.

Selecting the most appropriate therapy has often come down to guesswork, and trial and error, as symptoms look similar even though patients respond differently.

Now, Prof Albani and his team from the SingHealth Duke-NUS Academic Medical Centre have uncovered a specific type of immune cells that could be used to predict if a patient will respond to treatment.

This group of regulatory T (Treg) cells – a subset of white blood cells that helps regulate the immune system – promotes joint inflammation when there are too many of them.

The team found that juvenile idiopathic arthritis (JIA) patients who have this type of Treg cells do not respond to Anti-TNF – the most common type of biologics, or complex medicines made from living organisms, used to treat human arthritis.

Said Prof Albani: "Clinicians could use this novel group of cells as a marker to diagnose JIA in patients, as well as predict or monitor patients' responsiveness to therapy."

So patients without the specific Treg cells, a subset of synovial Treg cells that are inflammation-associated, could be put on Anti-TNF, while other medicines would be used for those who have such cells.

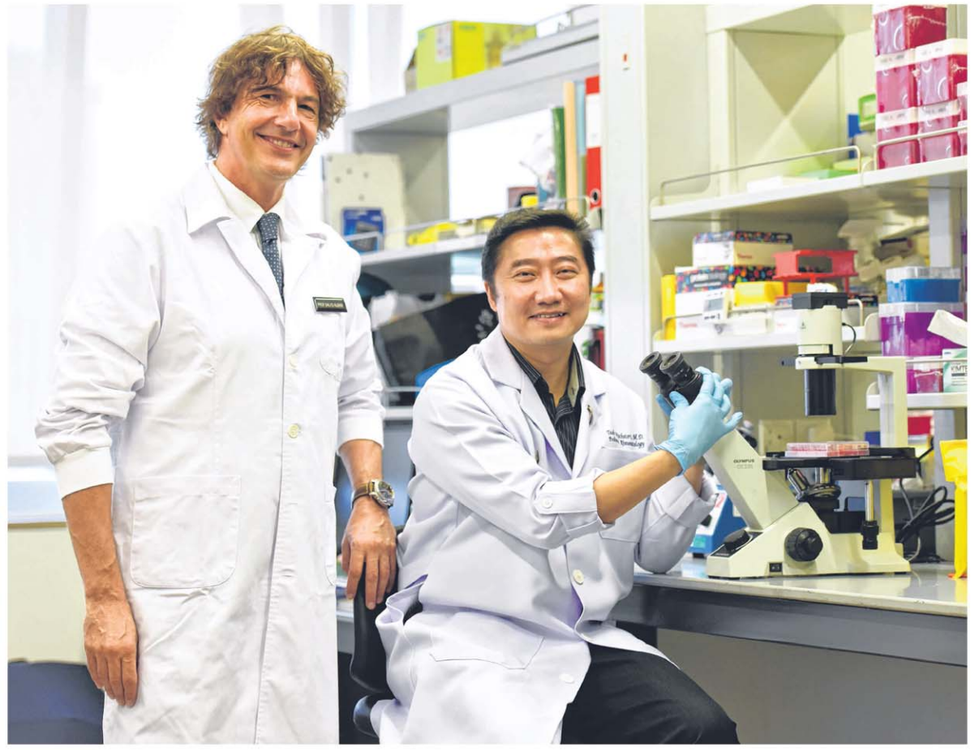
What is also promising is that these cells can be detected in blood, which means a simple blood test could in future easily distinguish those who will respond to treatment from those who will not.

Prof Albani said the technology used in the discovery could be used to identify biomarkers that can predict the outcomes of other biologics.

In addition, the team found that one's clinical "fate" is determined by epigenetics – the way each body uses its genes – rather than by genetic make-up.

"You must remember that the immune system is meant to defend us, so when you suppress it, you get a lot of side effects. You need to understand why the civil war started," noted Prof Albani.

The findings – which could be applied to adult rheumatoid arthritis, a condition that affects one in 100 adults worldwide – were published in the Annals of Rheumatic Diseases and Proceedings of the National Academy of Sciences of the United States.



Prof Salvatore Albani and Assoc Prof Thaschawee Arkachaisri hope work on Treg cells will help patients get the best treatment by eliminating ones they will not respond to. ST PHOTO: FELINE LIM

Further studies are being conducted by the researchers to validate their findings.

JIA is the most common form of the condition among those below 16, and affects an estimated 45 to 50 out of 100,000 individuals here.

Juvenile arthritis has no cure, and young patients can only ease the pain or prevent joint deterioration through medication or therapy.

There are three lines of treatment: non-steroidal anti-inflammatory drugs, disease-modifying anti-rheumatic drugs and biologics.

Associate Professor Thaschawee Arkachaisri, who heads the Rheumatology and Immunology Service at KK Women's and Children's Hospital, said 50-70 per cent of patients need third-line treatment, which costs $1,000 to $2,500 a month.

Because of the cost and variety of the biologics available, said Prof Arkachaisri, a co-author of the research paper, it is crucial to pick one that will elicit a response, so the patient can go into remission as soon as possible.

"We are dealing with kids who have 70 more years to go. You don't want them to have a disability that impairs them for the rest of their lives," he said.

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