Injection offers hope for treating auto-immune disease

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Australian researchers have uncovered a potential new way to regulate the body's natural immune response, offering hope of a simple and effective treatment for auto-immune diseases.

Auto-immune diseases result from an overactive immune response that causes the body to attack itself.

The new approach involves increasing good regulating cells in the body, unlike most current research which focuses on stopping "bad" or "effector" cells, says lead researcher Dr. Suzanne Hodgkinson, from

UNSW's Faculty of Medicine and Liverpool Hospital.

The researchers induced the body's T-cell front-line defences by injecting cell-signalling proteins called cytokines, in particular cytokine Interleukin-5 (II-5 cytokine).

When T-regulatory cells are grown in a way to make them specific to a particular protein they develop receptors for the Il-5 cytokine. The Il-5 cytokine boost allows the body's immune system to better regulate its response to disease without going into overdrive.

The team cloned II-5 cytokine and injected it into rats with the neurological condition Guillain–Barré syndrome. These rats recovered much quicker and, if treated as a precaution, did not fall ill. The method has also shown promise in animals with multiple sclerosis, with kidney disease nephritis and trying to overcome organ transplantation rejection.

"One of the nice things about this discovery is that it is one of the few treatments in the auto-immune world and in the transplantation world that works not by attacking the effector cells, but by increasing the good regulating cells. So it works in a very different way from almost every other treatment we've got available," Dr. Hodgkinson says.

Il-5 injections could be more palatable than inoculation by parasitic worms – another approach in regulating auto-immune conditions, the researchers say.

International research shows swallowing helminths parasites can regulate the immune system and boost T-cell production to combat illnesses such as celiac disease and multiple sclerosis. The absence of the worms in guts in the developed world has been cited as a possible cause for the sharp rise in auto-immune diseases in Western nations.

“The process we’ve developed may be the same process that the helminths kick off. When you get a helminths infestation, one of the changes in your immune response is an increase in cells called eosinophils and these cells make the cytokine Interleukin-5,” Dr. Hodgkinson says.

“In this new treatment, it’s a matter of injecting the interleukin-5 and the body does the rest. It’s both safe and effective and we think inducing the immune response by injection may be more attractive to people than swallowing parasitic worms.”

The next step is to take the treatment to human trials, which could be underway within two to five years, says Dr. Hodgkinson, whose paper outlining the study has been published in the journal *Blood*.

Provided by University of New South Wales