Autoimmune diseases the target of new research

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Rhianna Lindop and Professor Tom Gordon

A revolutionary medical breakthrough by researchers at Flinders University could pave the way to a cure for two debilitating autoimmune diseases.

PhD student Rhianna Lindop has developed a world-first technique in conjunction with Flinders proteomics experts Dr. Georgia Arentz and Dr. Tim Chataway to analyse a type of antibody that contributes to the disease progression of lupus and Sjogren's syndrome, resulting in vital new information that could ultimately lead to targeted therapies.

Lupus and Sjogren's syndrome are autoimmune diseases caused when

the body mistakenly considers healthy tissue to be a harmful substance and, as a result, produces antibodies that actually attack the body's own organs.

"We all have proteins in our body but in people with autoimmune diseases the body recognises these 'self' proteins to be foreign and responds to them by producing antibodies that attack and destroy healthy tissues and organs," Ms. Lindop said.

"Usually when you're sick the body produces antibodies to fight off the infection but it has the opposite effect in people with autoimmune diseases," she said.

Using a mass spectrometry machine, the researchers have – for the first time – analyzed the antibody's molecular structure in 10 patients with lupus and Sjogren's to determine its sequence at a "protein level" rather than just on the genomic, or DNA scale, as previous research has done.

The findings have shown that all patients with the particular antibody demonstrated a common molecular signature.

"People always thought these antibodies were too complex to characterise but we found that the antibody was restricted and common to all of the patients and specified by unique features," Ms. Lindop, who is being supervised by Flinders Professor Tom Gordon, said.

"This means that we can now focus on developing novel targeted therapies aimed at removing the antibody in people with lupus or Sjogren's – and the same research could also be applied to other antibodies associated with other autoimmune diseases."

With no cure for the two conditions, Ms. Lindop said her groundbreaking research could lead to a "next generation of diagnostics

and therapeutics".

"Current immunosuppressive treatments are aimed at reducing the effects of the disease but they don't actually alter the antibody so this research could allow us to develop a drug that specifically targets the antibody," she said.

"It's really exciting because it fits into the bench to bedside concept – we're doing research at the bench that actually translates to the hospital bed to improve lives."

Ms. Lindop was a recent winner in Flinders University's Best Paper Award, a new initiative which aims to recognise, reward and promote excellence in student research.

Provided by Flinders University