Discovery of crucial protein boosts hopes of preventing type 1 diabetes

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Australian researchers may be a step closer to preventing type 1 diabetes after identifying a crucial protein that could prevent the autoimmune disease from taking hold.

University of Queensland and Mater researchers have developed a biological agent, sRAGE, that boosts white blood cell function, which is damaged in individuals who develop type 1 diabetes.

Type 1 diabetes is a potentially life-threatening chronic condition in which the pancreas produces little or no insulin.

UQ Faculty of Medicine researcher, Professor Josephine Forbes said the protein discovery was an exciting development.

"Our laboratory tests show sRAGE can correct faulty regulatory T-cells to better prevent the immune system from going haywire and causing diabetes," said Professor Forbes.

"Our pre-clinical studies indicate this agent will be safer and far less intrusive than current treatments being tested for type 1diabetes prevention, such as regulatory T-cell infusions.

"We've already started working with companies overseas to explore ways of delivering the treatment in tablet form and we're optimistic about starting clinical trials within three years."

Mater Researcher, Dr. Sherman Leung said the laboratory tests in human cell models showed the sRAGE treatment increased regulatory T-cells at important sites in the body critical for type 1 diabetes development.

"We found boosting the regulatory T-cells using sRAGE in the pancreas, pancreatic lymph nodes and spleen prevented diabetes, and also resulted in better insulin expression and function," Dr. Leung said.

"Our study suggests sRAGE could also be used to treat patients who have already developed type 1 diabetes to help with better blood glucose control because it can stop the inflammatory response that causes the

symptoms of the disease."

The findings have been replicated by an independent research group at Novo Nordisk in the U.S.

According to the Australian Institute of Health and Welfare, type 1 diabetes affects about 12 in every 100,000 Australians, with an average of about seven new cases diagnosed per day. The onset of type 1 diabetes occurs suddenly, often at an early age and is not linked to lifestyle factors. Individuals with type 1 diabetes are at greater risk of premature death from disease complications including heart attacks.

The research has been published in the American Diabetes Association journal *Diabetes*.

More information: Sherman S. Leung et al, Soluble RAGE Prevents Type 1 Diabetes Expanding Functional Regulatory T Cells, *Diabetes* (2022). DOI: 10.2337/db22-0177

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