Subtype of immune B cells can delay type 1 diabetes onset in mice

December 6 2018

Dr. Massimo Pietropaolo. Credit: Baylor College of Medicine

A team of researchers at Baylor College of Medicine and the University of Michigan Medical School reports today in the *JCI Insight* that a subset of immune B cells, known as CD19+IgM+ B cells, can delay the onset of type 1 diabetes in a mouse model of the condition. These findings open an opportunity to develop novel treatments for a subgroup of diabetes mellitus that affects about 420 million people around the world.

"For many years, one of the research interests of my lab has been to better understand the role the immune system plays in type 1 diabetes," said corresponding author Dr. Massimo Pietropaolo, professor of medicine-endocrinology and McNair scholar at Baylor College of Medicine.

Increasing experimental evidence supports an important role of B cells, a subset of immune cells, in the development of diabetes, both in animal models and in humans. It's been shown, for example, that subsets of B cells can directly contribute to disease development.

"However, there are also indications that subsets of B cells may be involved in modulating the onset of the condition," Pietropaolo explains. "For instance, elimination of a specific subset of B cells carrying the μ-chain marker resulted in impaired diabetes progression in a mouse model."

In this study, Pietropaolo and his colleagues studied in more detail a specific subset of B cells, called CD19+ IgM+ B cells and how they affected the onset of diabetes in a mouse model of the condition.

The researchers discovered that when they transferred CD19+ IgM+ B cells to the mice, they were able to delay diabetes onset. The protective effect seems to be age specific. CD19+ IgM+ B cells from 6-week-old mice delayed diabetes onset, unlike CD19+ IgM+ B cells from mice older than 15 weeks.

"We are the firsts to describe that CD19+ IgM+ B cells play a strong regulatory effect that delays diabetes onset in a mouse model," Pietropaolo said. "Taken together, our results open the future possibility of developing new therapies for this disease by expanding this specific B cell subtype pharmacologically and in turn modulating their regulatory actions in ways that would interfere with the onset of type 1 diabetes."

More information: Andrew D. Vonberg et al, CD19+IgM+ cells demonstrate enhanced therapeutic efficacy in type 1 diabetes mellitus, *JCI Insight* (2018). DOI: 10.1172/jci.insight.99860

Provided by Baylor College of Medicine