A novel T-cell subset associated with type 1 diabetes

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A study conducted at the University of Eastern Finland demonstrated that a recently described T-cell subset, so-called peripheral T helper cells, may have a role in the development of type 1 diabetes. The frequency of circulating peripheral T helper cells was observed to be increased both in children with recently diagnosed type 1 diabetes and in

healthy children who later progressed to type 1 diabetes. The study was published in the journal *Diabetologia*.

Type 1 diabetes is an autoimmune disease that typically manifests in childhood. In type 1 diabetes, insulin-producing beta cells in the pancreas are destroyed by the immune system. In addition to genetic susceptibility, the appearance of autoantibodies in blood is predictive of future development of type 1 diabetes.

The appearance of autoantibodies before clinical diabetes is caused by B cell activation against proteins in the pancreatic islets. The activation of B cells in lymphoid tissues is, in turn, controlled by follicular helper T cells. Earlier work by Academy Research Fellow Tuure Kinnunen and his research group at the University of Eastern Finland has demonstrated that the frequency of blood follicular helper T cells is increased in children close to the onset of type 1 diabetes.

A similar ability to activate B cells was recently attributed to a novel T-cell subset. These so-called peripheral helper T cells resemble follicular helper T cells, but they express receptors that enable them to migrate to inflamed tissues.

The current study suggests a role for peripheral helper T cells in the development of type 1 diabetes. Researchers demonstrated that the frequency of these cells was increased in blood of both children with recently diagnosed type 1 diabetes as well as healthy, autoantibody-positive children. Importantly, the frequency was most clearly increased in those autoantibody-positive children who later developed type 1 diabetes.

"Based on our results, it is possible that peripheral helper T cells may have a role in the development of type 1 diabetes. This information could be employed in the development of better methods to predict type

1 diabetes risk and new immunotherapies for the disease. However, more studies need to be conducted to verify our results and to further characterize the functionality of peripheral helper T cells," early stage researcher Ilse Ekman from the University of Eastern Finland notes.

The study was conducted utilizing samples from the Finnish DIPP study in which the development of type 1 diabetes is followed from birth in children with genetic risk for the disease. The study involved researchers from the Universities of Turku, Helsinki and Oulu as well as Harvard University.

More information: Ilse Ekman et al, Circulating CXCR5−PD-1hi peripheral T helper cells are associated with progression to type 1 diabetes, *Diabetologia* (2019). DOI: 10.1007/s00125-019-4936-8

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