

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](https://doi.org/10.1007/s00125-019-4936-8)

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