



# Increased Levels of Type 1 Interferon in a Type 1 Diabetic Mouse Model Induce the Elimination of B Cells from the Periphery by Apoptosis and Increase their Retention in the Spleen

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## Abstract:

**Background:** The autoimmune disease type 1 diabetes mellitus (T1D) is associated with a defect in the immune response, which increases susceptibility to infection. We recently demonstrated that prolonged elevated levels of type 1 interferon (IFN) induce lymphocyte exhaustion during T1D. **Aims:** In the present study, we further investigated the effect of blocking the type I IFN receptor signaling pathway on diabetic dyslipidemia, in which an abnormal lipid profile leads to the exhaustion of B cells and alteration of their distribution and functions. **Methods:** T1D was induced in a mouse model by an intraperitoneal injection of a single dose (60 mg/kg) of streptozotocin (STZ). Three groups of mice were examined: a non-diabetic control group, a diabetic group and a diabetic group treated with an anti-IFN (alpha, beta and omega) receptor 1 (IFNAR1) blocking antibody to block type I IFN signaling. **Results:** We observed that induction of T1D was accompanied by a marked destruction of B cells and a reduction in the insulin levels in the diabetic group. Diabetic mice exhibited many changes, including alterations in their lipid profiles, expansion of splenic B cells, increased caspase-3, -8 and -9 activity, and apoptosis in peripheral B cells. Blocking type 1 IFN signaling in diabetic mice significantly returned the insulin and lipid profiles to normal levels, subsequently restored the B cell distribution, and rescued the peripheral B cells from apoptosis. **Conclusion:** Our data suggest the potential role of type I IFN in mediating diabetic dyslipidemia and an exhausted state of B cells during T1D.

## Published In:

Cellular Physiology and Biochemistry , 35(1) , 137-147