# Cellular Metabolism in B Cells in Type 1 Diabetes

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**Background/Objective:** Type 1 diabetes (T1D) is an immune-mediated disease that results in the destruction of pancreatic beta cells. While beta cell destruction is classically considered T cell mediated, autoreactive B cells play important roles in disease progression. B cell depletion prevents disease in non-obese diabetic (NOD) mice, and B cell depletion temporarily slows disease progression in individuals with new-onset T1D. However, mechanisms of autoreactive B cell function in T1D are not fully known. Cellular metabolism has been shown to drive autoimmune B cell development in other mouse models. We hypothesize that metabolic characteristics of B cells from NOD mice are distinct from metabolic characteristics of B cells from non-autoimmune C57BL/6J (B6) mice; therefore, making cellular metabolic pathways viable targets for therapeutic intervention.

**Methods:** Lymphocytes from spleen, pancreas, pancreatic lymph nodes, and mesenteric/lumbar lymph nodes were processed into single-cell suspensions. Glucose uptake was measured using fluorescent glucose analog 2-NBDG. Mitochondrial polarity was measured using fluorescent probes for mass and membrane potential. Cells were stained for surface markers and analyzed on an Attune Nxt flow cytometer.

**Results:** No statistically significant differences in glucose uptake or mitochondrial polarity for lymphocyte subsets in the spleen or PLNs of NOD and B6 mice were identified. In NOD mice, polarity was significantly higher in B cells in the pancreas compared to the spleen and PLNs. Polarity was also higher in B cells in PLNs compared to non-specific lymph nodes in NOD mice.

**Conclusions/Impact:** While no differences in glucose uptake or polarity in lymphocytes from NOD and B6 mice ex vivo were identified, future studies are needed to determine whether their activation drives metabolic alterations. Differences in polarity in the pancreas in NOD mice suggest that cellular metabolism is influenced by the islet microenvironment and has the potential to influence their function at the site of autoimmune attack.