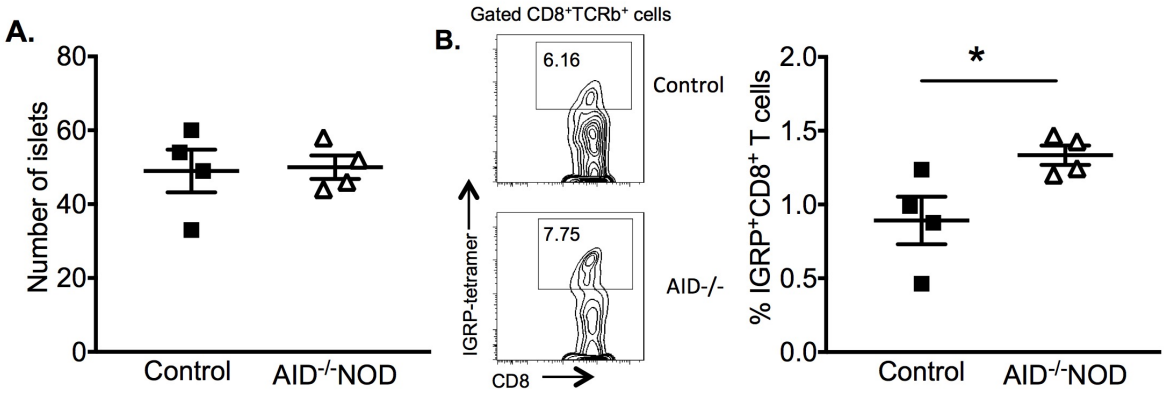
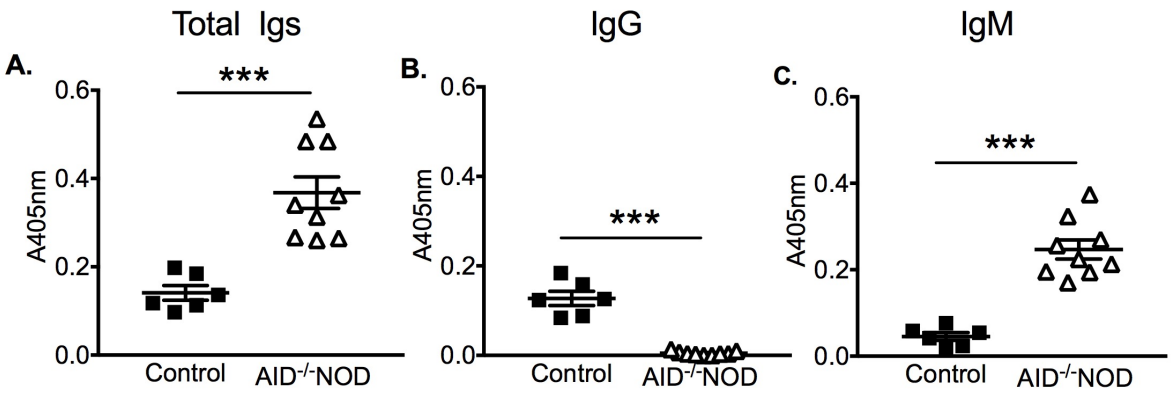
Supplementary Figure 1



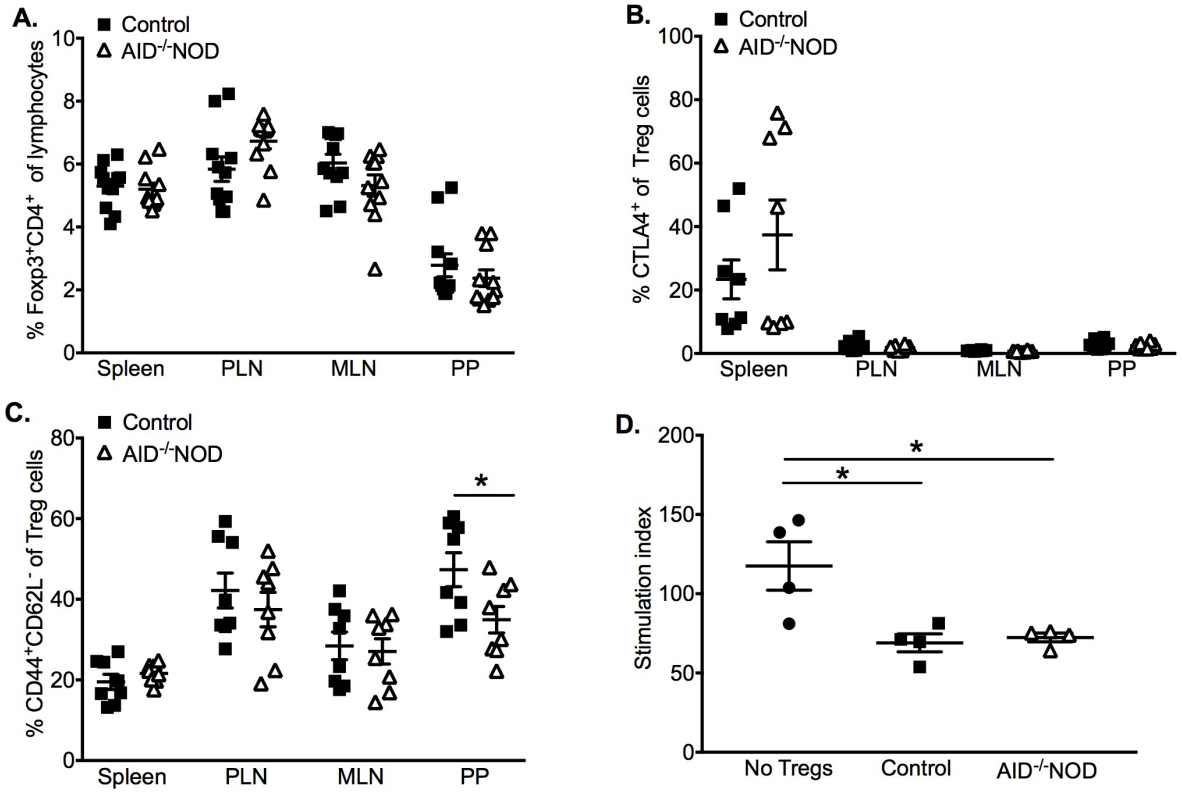
Supplementary Figure 1. **Increased IGRP-reactive CD8$^+$ T cells infiltrated islets of female AID$^{-/-}$NOD mice**. Islets were hand-picked from collagenase-digested pancreata of 10-week-old female AID$^{-/-}$NOD and control AID-sufficient mice and followed by cell dissociation. Immune cells were stained with anti-CD45, anti-CD8, anti-TCRβ and PE-conjugated IGRP-tetramer and subjected to flow cytometric analysis. (**A**) Total number of islets. (**B**) Percentage of IGRP$^+$CD8$^+$ T cells in islet infiltrates. Left, Representative flow cytometric plots; Right: Summary of the percentage of IGRP$^+$CD8$^+$ T cells. Data are presented as mean±SEM. N=4 mice/group. * P<0.05. Student's t test (**A**).

Supplementary Figure 2



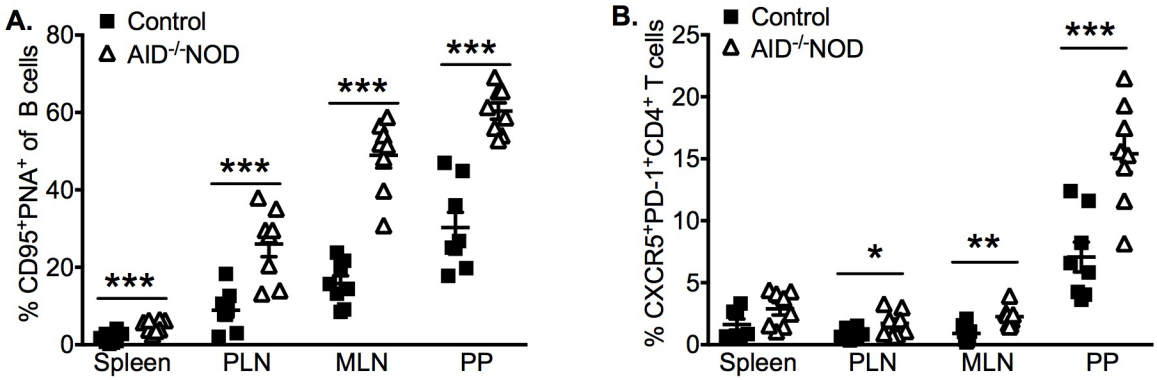
Supplementary Figure 2. Insulin autoantibody detection. Sera from 8-10 week-old female AID$^{-/-}$NOD and control mice were used to measure insulin autoantibody by ELISA. (**A**) Total anti-insulin Ig (IgH+L); (**B**) Anti-insulin IgG and (**C**) Anti-insulin IgM. Data are presented as mean±SEM. N=6-9 mice/group. *** P<0.001. Student's t test (**A**-**C**).

Supplementary Figure 3



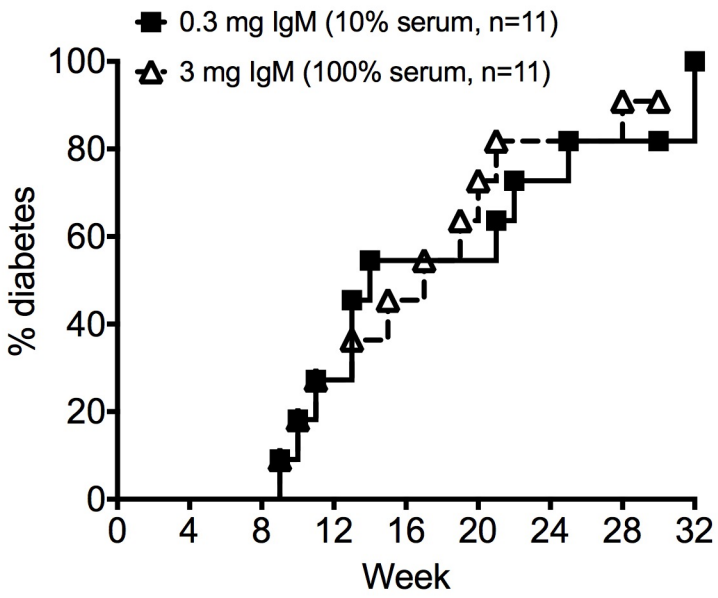
Supplementary Figure 3. AID deficiency does not affect Treg phenotypes and functions. Lymphocytes from spleen, PLN, MLN and PP of 8-10 week-old female AID$^{-/-}$NOD and control mice were stained with fluorescence-conjugated antibodies followed by flow cytometric analysis. (**A**) Percentage of Tregs (Foxp3^{+}CD4^{+}TCRβ^{+}) of lymphocytes. Data were pooled from three independent experiments. N=10-11 mice/group. (**B**) CTLA4 expression in Tregs (Foxp3^{+}CD25^{+}CD4^{+}TCRβ^{+}). (**C**) Percentage of CD44^{+}CD62L^{-} Tregs (Foxp3^{+}CD25^{+}CD4^{+}TCRβ^{+}). Data were pooled from two independent experiments and shown as mean±SEM. N=8 mice/group. (**D**) Treg suppression assay. Splenic regulatory T cells (CD25^{+}CD4^{+}) were purified with positive selection and then co-cultured with magnetic beads-purified BDC2.5 CD4^{+} T cells plus irradiated NOD splenocytes in the absence of presence of mimotope peptide (0 or 5 ng/ml). Data was shown as stimulation index. N=4 mice/group. * P<0.05. Student's t test (**C** and **D**).

Supplementary Figure 4



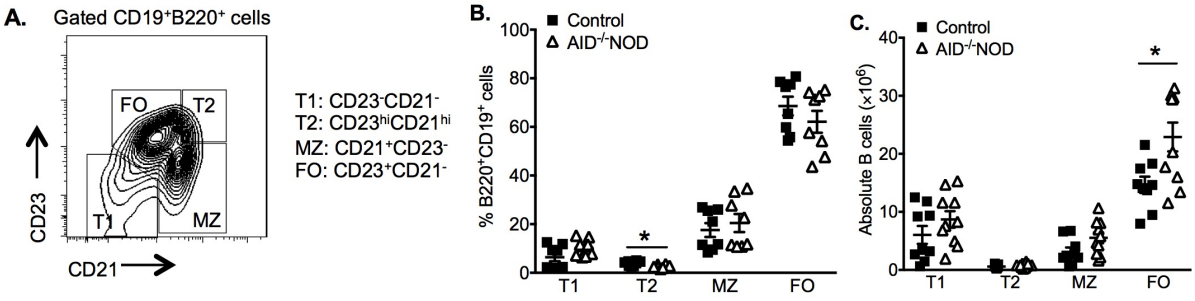
Supplementary Figure 4. Expanded GC B cells and T_{FH} cells in AID$^{-/-}$NOD mice. Lymphocytes from spleen, PLN, MLN and PP of 8-10 week-old female AID$^{-/-}$NOD and control mice were stained with fluorescence-conjugated antibodies followed by flow cytometric analysis. (**A**) Percentage of GC B cells (PNA^{+}CD95^{+}) of B cells (B220^{+}CD19^{+}). (**B**) Percentage of T_{FH} cells (CXCR5^{+}PD-1^{+}CD4^{+}TCRβ^{+}). Data were pooled from at least two independent experiments and shown as Mean±SEM. N=8-10 mice/group. * P<0.05; ** P<0.01; *** P<0.001. Two-tailed Student's t test was used for statistical analysis.

Supplementary Figure 5



Supplementary Figure 5. The effect of IgM in diabetes development. Rag$^{-/-}$NOD mice (4-5 wks old) were infused (i.v.) with serum from AID-/-NOD mice at different dilutions containing either 3mg IgM or 0.3mg IgM, the day before adoptively transfer (i.v.) of purified BDC2.5 CD4^{+} T cells. Mice were screened daily by testing for glycosuria. Diabetes was confirmed by blood glucose (≥250mg/dl) and the experiment was terminated 32 days after the T cell transfer or the time the mice developed diabetes.

Supplementary Figure 6



Supplementary Figure 6. B cell subsets in the presence or absence of AID. Splenocytes from control ($AID^{+/+}$ or $AID^{+/-}$) and $AID^{-/-}$ mice (8-10 wks old, females) were harvested and stained for anti-B220, anti-CD19, anti-CD21 and anti-CD23. Gated splenic B cells ($B220^{+}CD19^{+}$) were analyzed for the expression of CD21 and CD23 to define different B cell subsets. (**A**) Representative gating plot. (**B**) Percentage of different splenic B cell subsets. **(C)** Absolute numbers of different splenic B cell subsets. Data were pooled from two to three independent experiments and shown as Mean±SEM. N=8-10 mice/group. * $P<0.05$; ** $P<0.01$; *** $P<0.001$. Two-tailed Student's t test was used for statistical analysis.