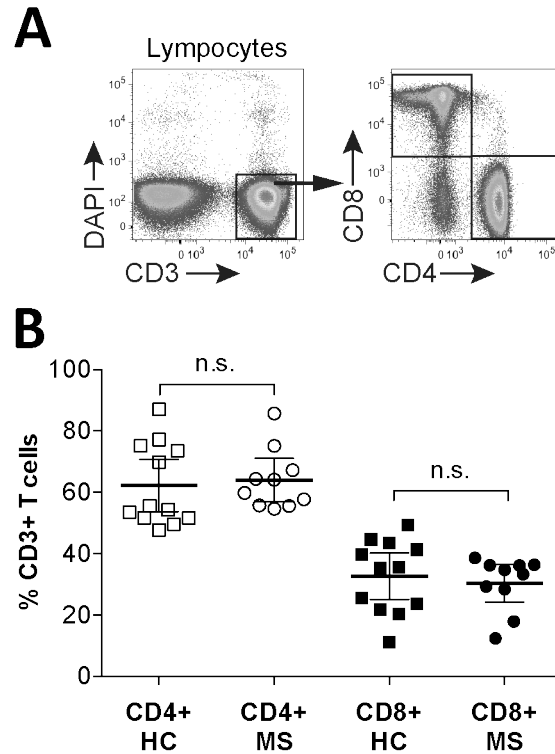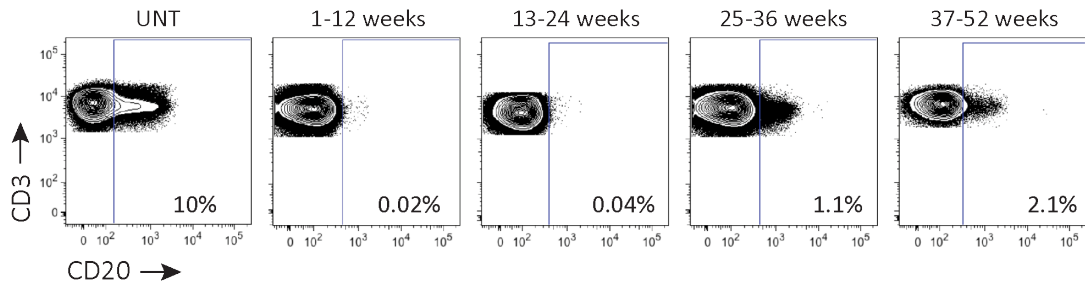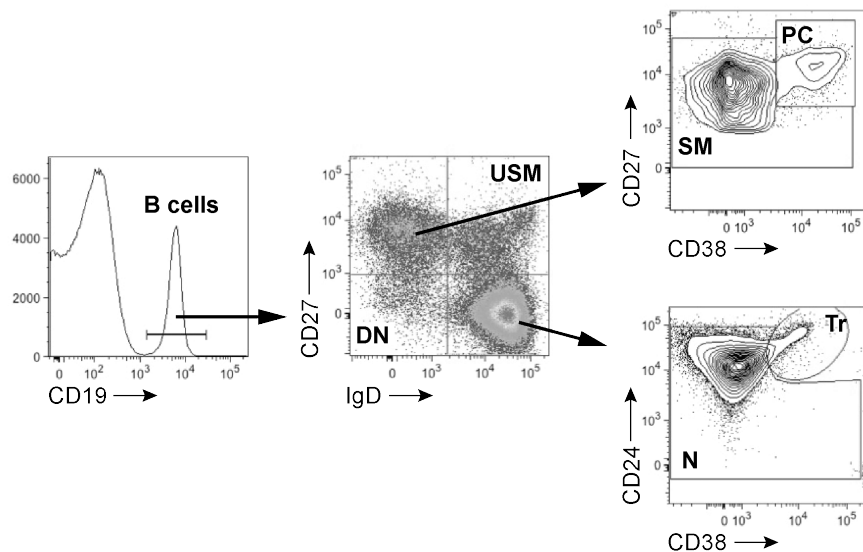**Supplementary Materials**

FIGURES

Figure S1: No difference of CD4$^+$ and CD8$^+$ cells among CD3$^+$ T cells in MS patients and healthy controls. Shown are CD3$^+$ T cell gating strategy (**A**) and scatter plots (**B**; mean and 95% CI) of CD4$^+$ and CD8$^+$ cells among CD3$^+$ T cells in untreated MS ("MS") patients and healthy controls ("HC"). Comparisons between MS and HC were made using one-sided t-test; n.s.=not significant.

Figure S2: Rituximab depletes CD3^{+}CD20^{dim} T cells. Shown are representative flow cytometry plots of CD3^{+}CD20^{dim} T cells in an untreated MS patient (UNT) and in patients at the indicated time points after RTX treatment.

Figure S3: Flow cytometry of B cell subsets. Shown are representative flow cytometry plots demonstrating the gating strategy to identify the indicated B cell subpopulations: Naïve B cells (**N**, CD19+CD24loCD38loCD27-IgD+), transitional B cells (**Tr**, CD19+CD24hiCD38hiCD27-IgD+), unswitched memory B cells (**USM**, CD19+CD27+IgD+), double negative B cells (**DN**, CD19+CD27-IgD-), switched memory B cells (**SM**, CD19+ CD27+IgD-), and plasma cells/plasmablasts (**PC**, CD19+ CD27hiCD38hiIgD-).