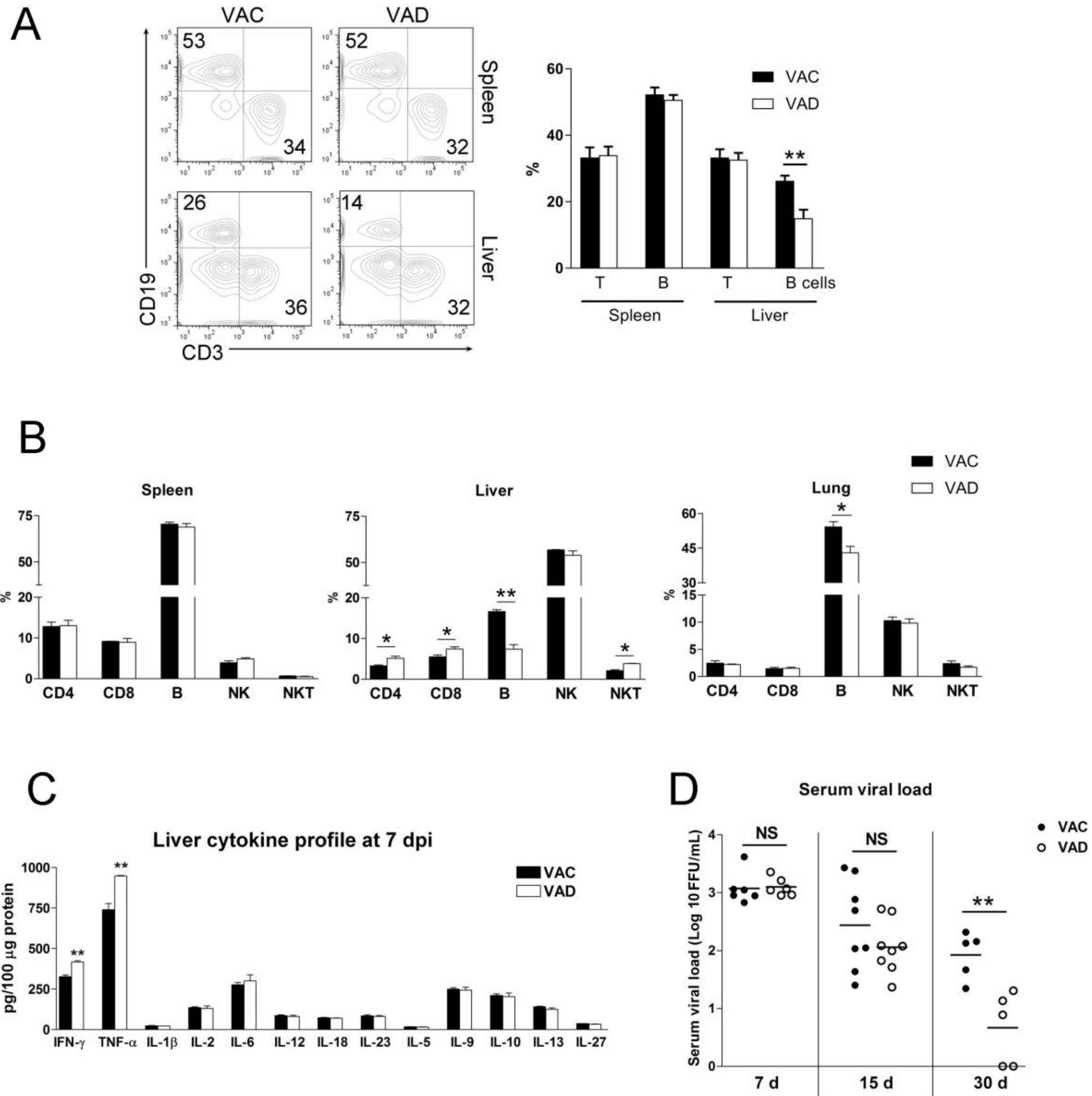

Figure S1. A) Naïve VAC and VAD mice (8 weeks old) were sacrificed. T and B cells were analyzed in the spleen and liver. B) VAC and VAD were infected with LCMV (2×10^6 FFU). Percentages of T cells, B cells, NK cells and NKT cells at 2 dpi were examined by flow cytometry. C) Liver cytokine profile was analyzed by multiplex assay at 7 dpi. D) Serum viral loads were measured at 7, 15 and 30 dpi. The data are shown as mean $\pm$ SEM of five to six mice per group from a single representative experiment. The experiment was repeated three times independently. A two-tailed Student's t test was used to compare the two groups. * $P<0.05$, ** $P<0.01$, NS, no significance.

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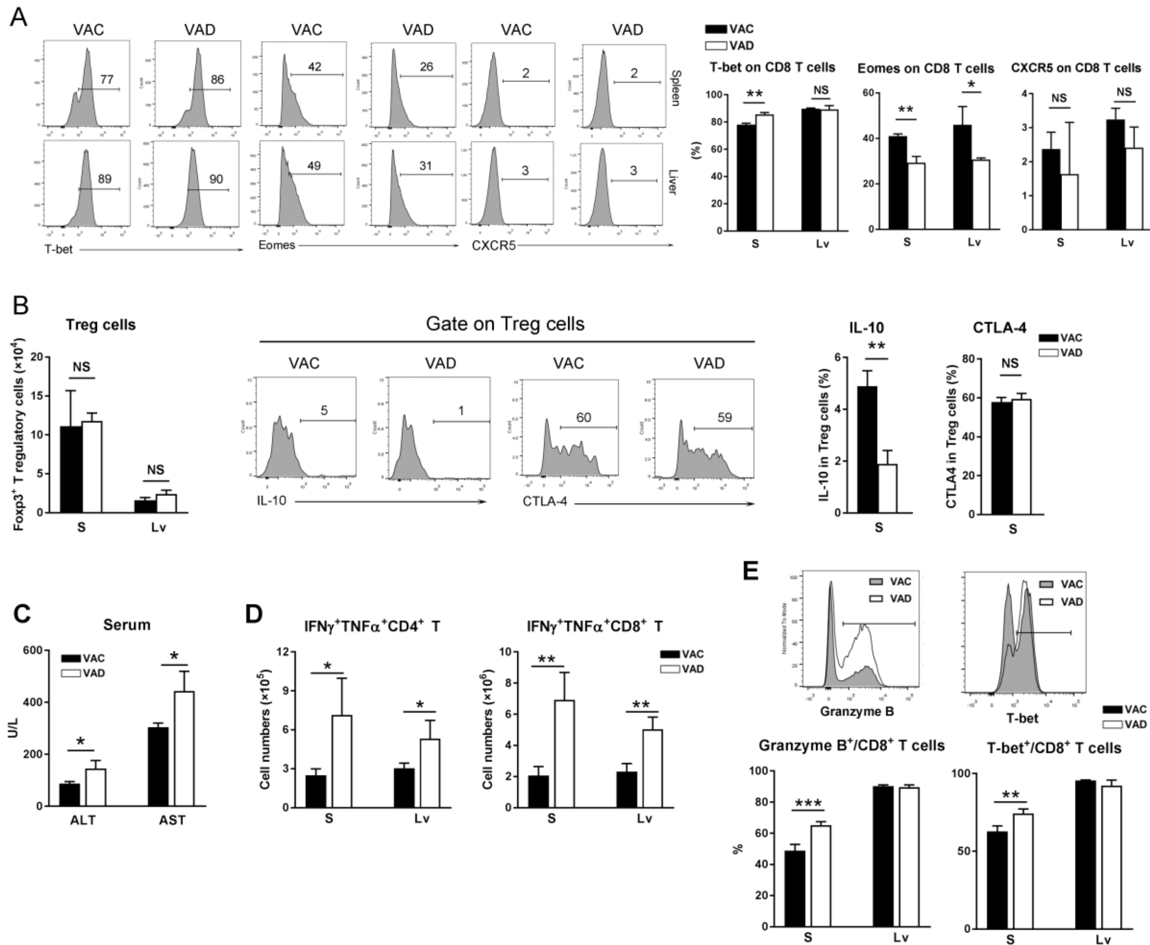

Figure S2. A) VAC and VAD mice were infected with LCMV Cl13 (2×10^6 FFU) and sacrificed at 7 dpi. The expression of T-bet, Eomes and CXCR5 on CD8 T^+ cells in spleen (S) and livers (Lv) were analyzed. B) Regulatory T cells were first gated based on $CD4^+Foxp3^+$, followed by the analysis of IL-10 and CTLA-4 levels. PMA/Ionomycin and Brefeldin A were used for the stimulation of IL-10 production *in vitro*. C) VAC and VAD mice were infected with LCMV Armstrong (1×10^5 FFU) and sacrificed at 6 dpi. Serum ALT and AST were measured. D) Cytokine-producing T cells and E) intracellular granzyme B and T-bet were analyzed by flow cytometry. The experiment was performed twice independently. * $P<0.05$, ** $P<0.01$, *** $P<0.001$, NS, no significance.

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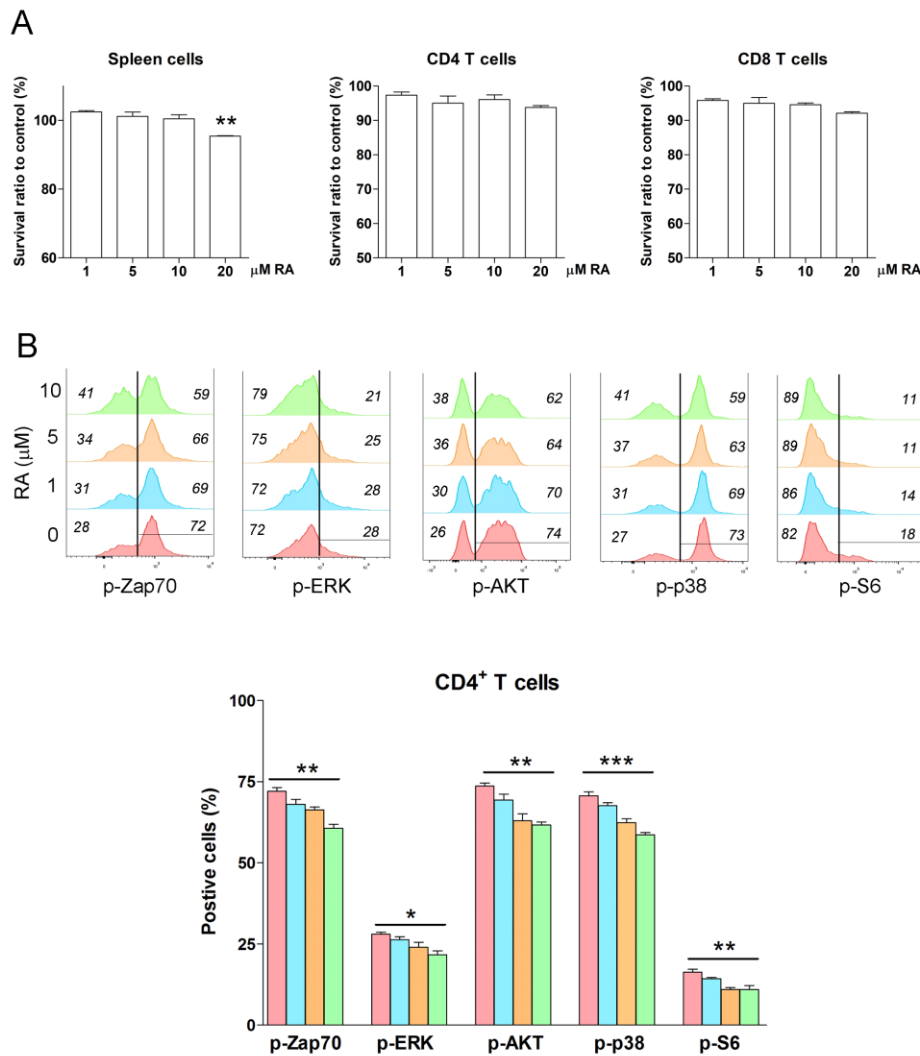

Figure S3. A) Splenocytes of naïve mice were treated with various concentrations of RA *in vitro* for 24 h. DMSO was used as a control. Cells were collected and stained with surface markers as well as Live/Dead Fixable dye. The viabilities of cells were compared to the control group. B) Splenocytes were isolated and cultured with RA *in vitro* for 24 h, followed by anti-CD3/CD28 antibody (1 μg/mL) stimulation for 10 mins at 37°C. Cells were fixed immediately by BD Phosflow Lyse/Fix buffer at 37 ℃ for 12 mins and permeabilized by BD Phosflow Perm Buffer III on ice for 30 mins. Cells were then incubated with surface CD4 antibodies and phosphorylated antibodies for 1 h, followed by flow cytometry analysis. The data are shown as mean ± SEM of triplicates per group from a single representative experiment. The experiment was repeated three times independently. One-way ANOVA was used to compare more than two groups. * P<0.05, ** P<0.01, *** P<0.001.

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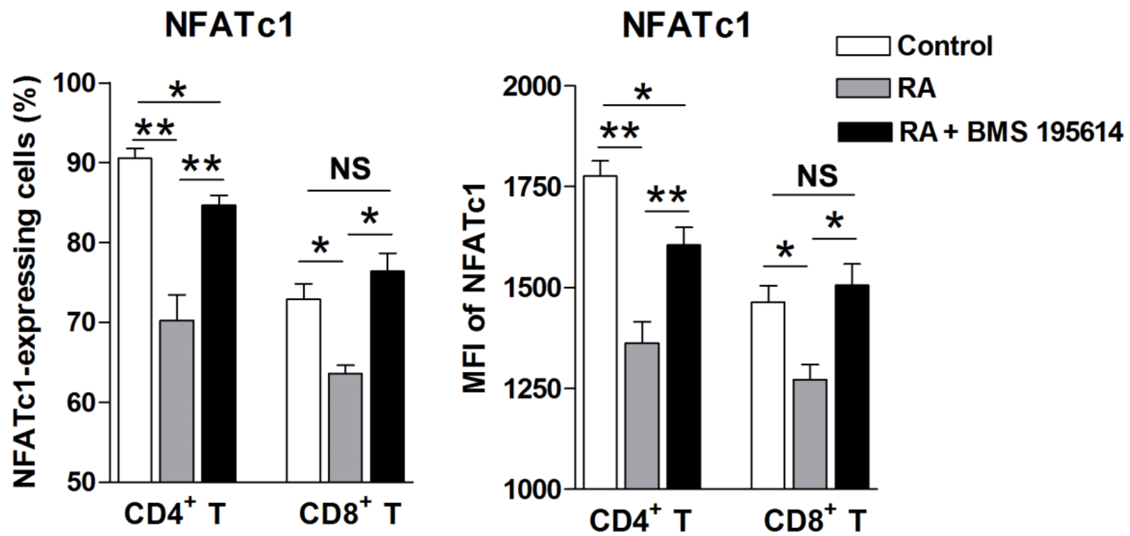

Figure S4. Splenocytes of naïve mice were cultured *in vitro* by anti-CD3/CD28 antibody stimulation with or without RA (1 μM). The neutral retinoic acid receptor (RAR) α-selective antagonist BMS 195614 (1 μM) was used to block RAR signals. After 4-day culture, NFATc1 expression was analyzed by flow cytometry. The data are shown as mean $\pm$ SEM of triplicates per group from a single representative experiment. The experiment was repeated three times independently. One-way ANOVA was used to compare more than two groups. * $P<0.05$; ** $P<0.01$, NS, no significance.

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