**Supplementary Figure 1. Naïve T cells express KDELR1 and KDELR2.**

RT-PCR of KDELR family members using cDNA from naïve T cells.

**Supplementary Figure 2. CD5High naïve CD8+ T cells contain higher levels of ZAP70/Syk phosphorylation.**

A) ZAP70/Syk phosphorylation levels in CD5Low and CD5High population (25% from each side) of CD44Low naïve CD8+ T cells are shown. B) The mean fluorescent intensity of ZAP70/Syk phosphorylation levelsis shown. Each column represents the mean + SEM. \*P < 0.05.

**Supplementary Figure 3. Foxp3+CD25+CD4+ regulatory T cells are not significantly reduced in T-Red mice.**

A) Foxp3+CD25+CD4+ regulatory T cell population in the spleen is shown. Pseudo-color plots are gated on CD8-negative, CD4+ population. B) Absolute numbers of CD44Low naïve CD4+, CD8+ T cells, and Foxp3+CD25+CD4+ regulatory T cells in the spleen. \*P < 0.05, \*\*P < 0.01 and NS, not significant.

**Supplementary Figure 4. TCR stimulation by anti-CD3/CD28 induces eIF2 phosphorylation.**

Sorted naïve CD4+ T cells from WT mice were stimulated with anti-CD3/CD28 or IL-7 for the indicated hours (hrs). Phospho-eIF2 S51 and total eIF2 were detected by Western blotting.

**Supplementary Figure 5. Forced expression of Bcl-2 rescues the T-Red phenotype.**

Retroviral transduction of Bcl-2 or mock transduction was performed in bone-marrow cells from T-Red mice. CD44High population (%) within CD4+ and CD8+ T cells in the bone-marrow chimera are shown. The data represent the mean + SEM. \* P < 0.05, and \*\* P < 0.01.

**Supplementary Figure 6. Stronger TCR stimulation inhibits eIF2 phosphorylation in vivo.**

CFSE labeled OT-I cells were transferred to naïve congenic mice on day 0, and then a stronger T4 OVA altered peptide ligand or a weaker Q4H7 peptide was injected on day 1. Intracellular staining of phosphor-eIF2 in donor OT-I cells in the spleen was performed on day 3. A) The CFSE profiles of donor OT-I cells after T4 or Q4H7 peptide injection. B) The mean fluorescent intensity (MFI) of phosphor-eIF2 staining in donor OT-I cells at each cell division is shown. Data represent the mean + SEM. \*P < 0.05, and \*\*P < 0.01 vs. Q4H7; #P < 0.05 and ##P < 0.01 vs. 0 division.