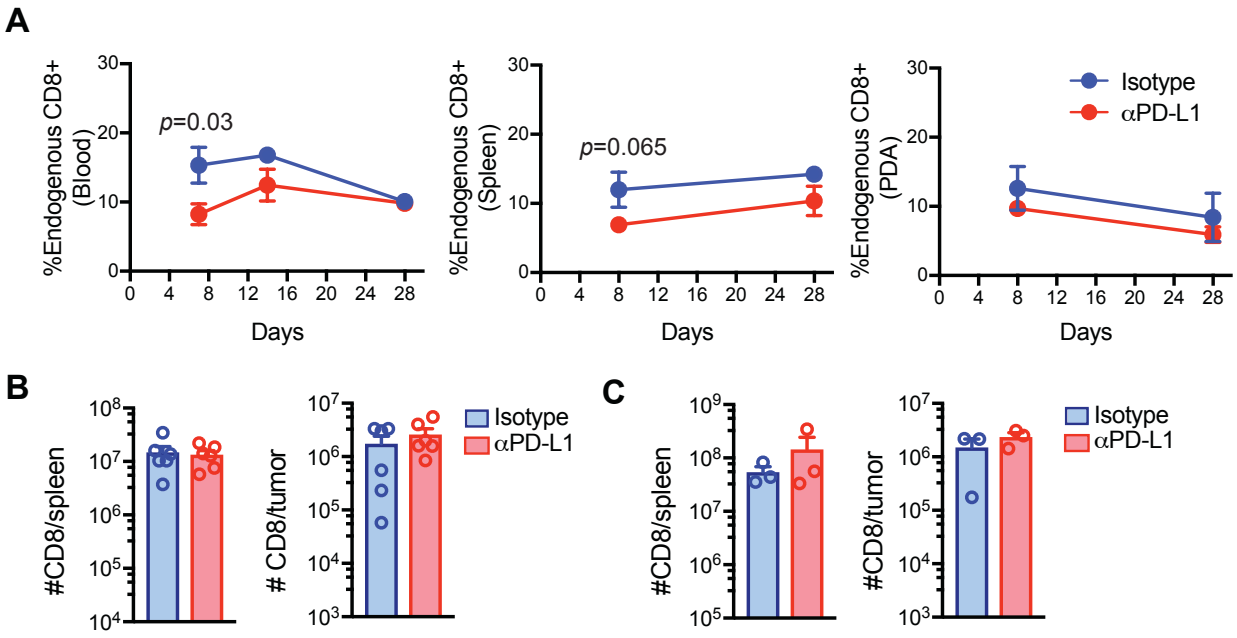
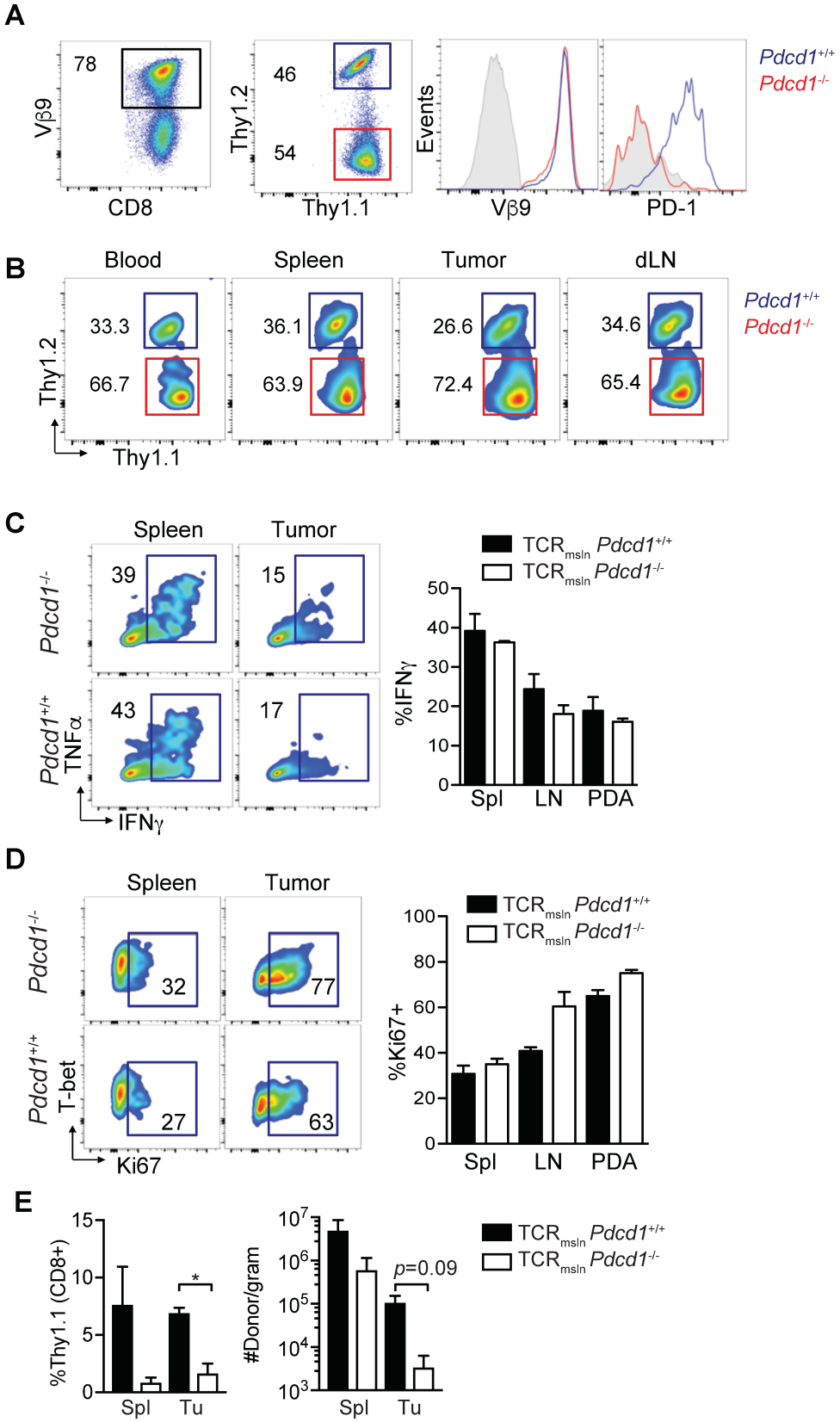
Supplementary Figure 1



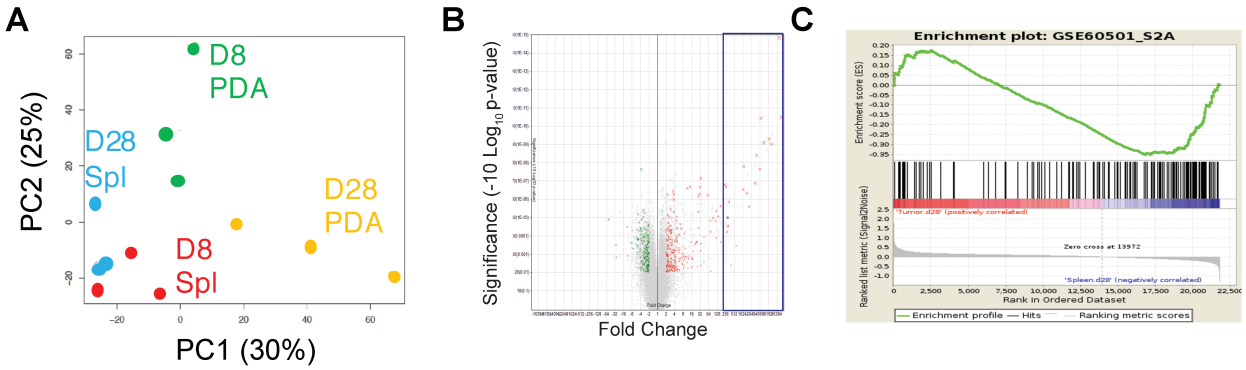
Supplementary Figure 1. Impact of PD-L1 blockade on endogenous CD8+ T cells in *KPC* PDA.
A) Proportion of endogenous CD8+ T cells in blood following TCR_{Msln} cell therapy and ± PD-L1 blockade. Data are mean ± SEM and reflect n=3-6 mice per group.
B) Total number of endogenous CD8+ T cells normalized to spleen or tumor gram at day 8. Data are mean ± SEM and reflect n=3-6 mice per group.
C) Total number of endogenous CD8+ T cells normalized to spleen or tumor gram at day 28. Data are mean ± SEM and reflect n=3-6 mice per group.

Supplementary Figure 2



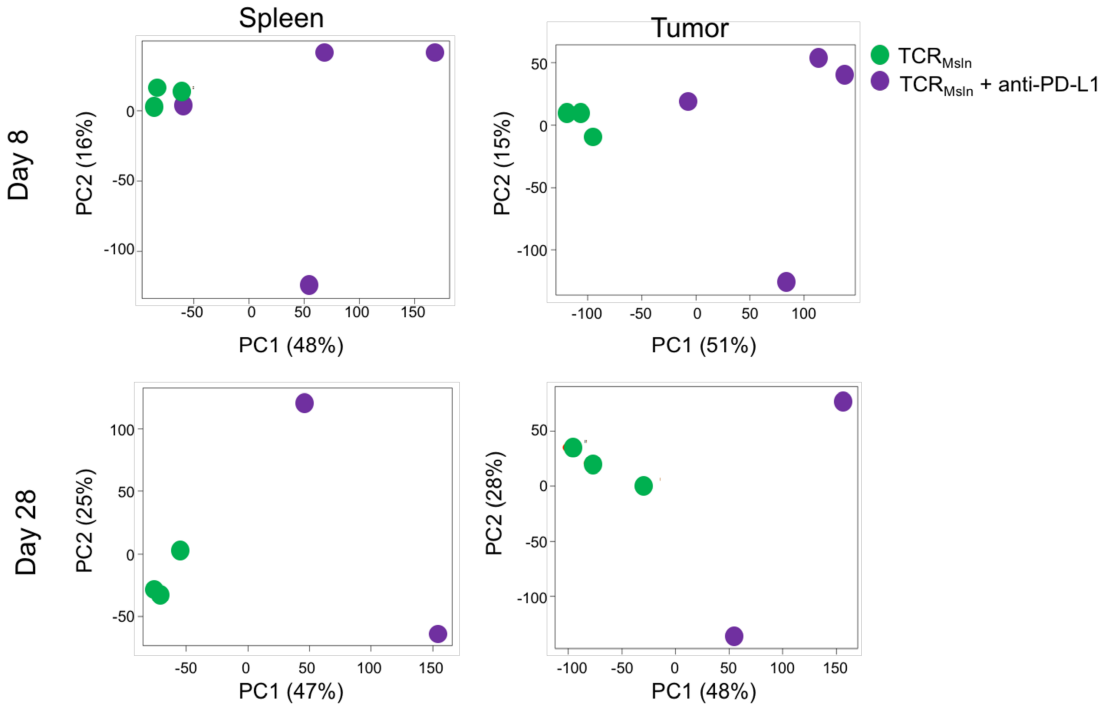
Supplementary Figure 2. Impact of PD-1-deficiency on engineered T cells in pancreatic tumors.
A) Representative flow cytometric staining of *Pdcd1*$^{+/+}$ and *Pdcd1*$^{-/-}$ TCR_{Msln} T cells prior to transfer.
B) Proportion of *Pdcd1*$^{+/+}$ and *Pdcd1*$^{-/-}$ TCR_{Msln} T cells at 8 days following infusion into *KPC* mice.
C) Proportion of *Pdcd1*$^{+/+}$ and *Pdcd1*$^{-/-}$ TCR_{Msln} T cells producing cytokines at day 8 post infusion. Data are mean ± SEM and reflect n=3 mice per group.
D) Proportion of *Pdcd1*$^{+/+}$ and *Pdcd1*$^{-/-}$ TCR_{Msln} T cells that express Tbet and Ki67 in spleen and tumor at day 8 post infusion. Data are mean ± SEM and reflect n=3 mice per group.
E) Proportion and number of TCR_{Msln} engineered *Pdcd1*$^{+/+}$ and *Pdcd1*$^{-/-}$ CD8+ T cells at day 28 post infusion. Data are mean ± SEM and reflect n=3 mice per group. *, $p<0.05$, unpaired student's T test.

Supplementary Figure 3



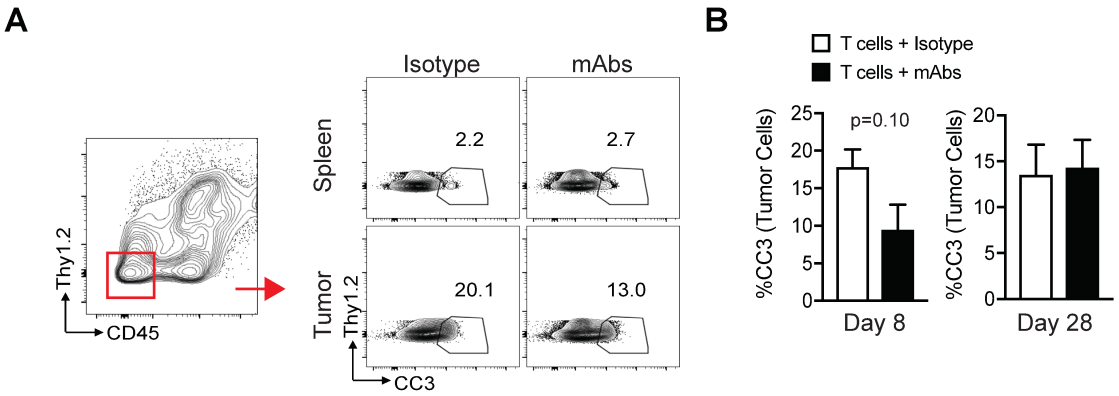
Supplementary Figure 3. Gene expression of engineered T cells isolated from spleen and tumors of *KPC* mice and comparison to endogenously primed tumor-specific T cells.
A) PCA plot of the indicated groups.
B) Fold change in gene expression in TCR_{Msln} cells isolated from tumors vs. spleens. Box indicates highly upregulated genes in TCR_{Msln} isolated from tumors that are pancreas specific.
C) GSEA comparison of DEGs overexpressed in intratumoral TCR_{Msln} cells at day 28 to DEGs overexpressed in tumor-specific T cells that endogenously encountered a liver tumor antigen at day 30 (GSE60501). Normalized enrichment score, NES= -1.87.

Supplementary Figure 4



Supplementary Figure 4. Impact of PD-L1 blockade on gene expression in TCR$_{MsIn}$ cells. PCA plots of TCR$_{MsIn}$ cells isolated from control or anti-PD-L1 treated mice.

Supplementary Figure 5



Supplementary Figure 5. Impact of multiple coinhibitory receptor blockade with TCR engineered T cell therapy on tumor cell apoptosis. *KPC* mice with 3-6 mm tumor mass received engineered T cell therapy + αPD-1, αTim-3 and αLag3, or isotype, according to Figure 6A. On day 8 or 28 following T cell transfer, single cell suspensions from tumors were stained for CD45, Thy1.1 and intracellular cleaved caspase 3 (CC3). **A**) Representative gating strategy to assess apoptosis in tumor epithelial cells. Note that Thy1.2 is expressed on CD45- cancer-associated fibroblasts and thus by gating on CD45-Thy1.2- cells, we are enriching for tumor epithelial cells. **B**) Data are quantified at day 8 and day 28 post T cell therapy and are mean ± S.E.M. n=3-6 mice per group/per timepoint.