Legends of Supplementary Figures

Supplementary Figure 1. Phenotype of $CD3^+CD8^+$ T cells of tumor-bearing mice receiving PTX combined with anti-PD-1 Ab and anti-BTLA Ab

(A) Distribution of selected clusters of $CD3^+CD8^+$ T cells from spleens. Four clusters with a percentage ≥10.0% in $CD3^+CD8^+$ T cells were determined. **(B)** Expression of surface markers in selected clusters of $CD3^+CD8^+$ T cells from spleens. In addition to HVEM, TIM-3, CD69, and CD103, alteration of A2AR and CTLA-4 was detected among these 4 selected clusters. **(C)** Distribution of selected clusters of $CD3^+CD8^+$ T cells from ascites. Five clusters with a percentage ≥10.0% in $CD3^+CD8^+$ T cells were determined. **(D)** Expression of surface markers in selected clusters of $CD3^+CD8^+$ T cells from ascites. In addition to HVEM, TIM-3, CD69, and CD103, alteration of A2AR and CTLA-4 was identified among these 5 selected clusters.

Supplementary Figure 2. Regulation of LIGHT expression through TLR9 pathway activation.

(A) Representative flow cytometric analyses of *in vitro* impacts of various manipulations on LIGHT expression on splenocytes. Splenocytes ($5x10^5$ cells) were co-cultured with PBS, WF-3/Luc tumor cells ($1x10^5$ cells), or WF-3/Luc tumor cells ($1x10^5$ cells) and PTX (1 μM) for 48 hours and the expression of LIGHT was analyzed. **(B)** Bar figures of LIGHT expression on splenocytes with various manipulations. When splenocytes were *in vitro* co-cultured with tumor cells or tumor cells and PTX, increased expression of LIGHT was detected on splenocytes.

Expression of LIGHT on splenocytes co-cultured with tumor cells and PTX was higher than that treated with tumor cells alone. (n=5) **(C)** Representative flow cytometric analyses of $CD11c^+$, $CD19^+$, or $NK1.1^+$ cells in LIGHT-expressing splenocytes treated with tumor cells and PTX. Splenocytes ($5x10^5$ cells) were co-cultured with WF-3/Luc tumor cells ($1x10^5$ cells) and PTX (1 μM) for 48 hours and percentages of $CD11c^+$, $CD19^+$, or $NK1.1^+$ cells in the LIGHT-expressing splenocytes were evaluated. **(D)** Bar figures of expression of $CD11c^+$, $CD19^+$, or $NK1.1^+$ cells in LIGHT-expressing splenocytes treated with tumor cells and PTX. The percentage of $CD19^+$ or $CD11c^+$ cells was higher than that of $NK1.1^+$ cells in the LIGHT-expressing splenocytes. (n=5) **(E)** Representative flow cytometric analyses of *in vitro* impacts of PTX, LPS, or CpG-ODN on LIGHT expression on sorted $CD19^+$ B cells. Sorted B lymphocytes ($5x10^5$ cells) were treated with PBS, PTX (1 μM), LPS (0.5 μg/mL), or CpG-ODN (1 μg/mL) for 24 hours. Expression of LIGHT was evaluated. **(F)** Bar figures of LIGHT expression on sorted $CD19^+$ B cells *in vitro* treated with PTX, LPS, or CpG-ODN. CpG-ODN could increase LIGHT expression on sorted $CD19^+$ B cells; however, PTX or LPS inhibited it. (n=5) **(G)** Representative flow cytometric analyses of *in vitro* impacts of PTX, LPS, or CpG-ODN on CD11c expression on sorted $CD19^+$ B cells. Sorted B lymphocytes ($5x10^5$ cells) were treated with PBS, PTX (1 μM), LPS (0.5 μg/mL), or CpG-ODN (1 μg/mL) for 24 hours. Expression of CD11c was evaluated. **(H)** Bar figures of CD11c expression on sorted $CD19^+$ B cells *in vitro* treated with PTX, LPS, or CpG-ODN. CD11c could be detected

(~40.0%) on naïve $CD19^+$ B cells. CpG-ODN could increase CD11c expression on sorted $CD19^+$ B cells; however, PTX or LPS inhibited it. (n=5) **(I)** Bar figures of LIGHT expression on $CD11c^-$ or $CD11c^+$ $CD19^+$ B cells *in vitro* treated with PTX, LPS, or CpG-ODN. Sorted B lymphocytes ($5x10^5$ cells) were treated with PBS, PTX (1 μM), LPS (0.5 μg/mL), or CpG-ODN (1 μg/mL) for 24 hours. LIGHT expression on $CD11c^-$ or $CD11c^+$ $CD19^+$ B cells was evaluated. Alteration of LIGHT expression was only observed on $CD11c^+CD19^+$ B cells with these manipulations. CpG-ODN could increase LIGHT expression on $CD11c^+CD19^+$ B cells; however, PTX or LPS inhibited it. (n=5) **(J)** Representative flow cytometric analyses of relationship between LIGHT and IL-15 in sorted $CD19^+$ B cells *in vitro* treated with PTX, LPS, or CpG-ODN. Sorted B lymphocytes ($5x10^5$ cells) were treated with PBS, PTX (1 μM), LPS (0.5 μg/mL), or CpG-ODN (1 μg/mL) for 24 hours. Relationship between LIGHT and IL-15 was evaluated. $LIGHT^+IL\text{-}15^-$, $LIGHT^-IL\text{-}15^+$, and $LIGHT^+IL\text{-}15^+$ cells were obviously induced in sorted $CD19^+$ B cells treated with LPS (~45.0%) or CpG-ODN (>65.0%). **(K)** Bar figures of percentages of $LIGHT^+IL\text{-}15^+$ cells in sorted $CD19^+$ B cells *in vitro* treated with PTX, LPS, or CpG-ODN. The percentage of $LIGHT^+IL\text{-}15^+$ cells was higher in sorted $CD19^+$ B cells induced by LPS or CpG-ODN was higher than that induced by PTX. (n=5) **(L)** Representative flow cytometric analyses of relationship between LIGHT and BTLA in sorted $CD19^+$ B cells *in vitro* treated with PTX, LPS, or CpG-ODN. Sorted B lymphocytes ($5x10^5$ cells) were treated with PBS, PTX (1 μM), LPS (0.5 μg/mL), or CpG-ODN (1 μg/mL) for 24 hours. Relationship

between LIGHT and BTLA was evaluated. BTLA was noted on more than 40.0% of LIGHT-expressing $CD19^+$ B cells treated with CpG-ODN. **(M)** Bar figures of $LIGHT^+BTLA^+$ cells in sorted $CD19^+$ B cells *in vitro* treated with PTX, LPS, or CpG-ODN. Under CpG-ODN treatment, the highest percentage of $LIGHT^+BTLA^+$ cells was identified in sorted $CD19^+$ B cells. (n=5) (*$p < 0.05$, **$p < 0.01$, by Kruskal-Wallis test)

Supplementary Figure 3. Expression of different cytotoxic markers

(A) Representative flow cytometric analysis of expression of different cytotoxic markers in $HVEM^+PD\text{-}1^+TIM\text{-}3^+$ $CD3^+CD8^+$ T lymphocytes from spleens of tumor-bearing mice receiving PTX. **(B)** Bar figures of percentages of cytotoxic marker expression in $HVEM^+PD\text{-}1^+TIM\text{-}3^+$ $CD3^+CD8^+$ T lymphocytes from spleens of tumor-bearing mice receiving PTX. More than 50.0% of $HVEM^+PD\text{-}1^+TIM\text{-}3^+$ $CD3^+CD8^+$ T cells expressed GZMB, TNF-α, IFN-γ or CD107a. (n=5)