SUPPLEMENTAL MATERIAL

Table S1: Antibody used flow cytometry-based ex vivo BsAb antibody assay

Marker	Channel	Clone	Supplier	Cat #
CD38	FITC	Multi-Epitope	ALPCO	70-38F2
CD269 (BCMA)	PE	19F2	Biolegend	357504
CD45	PE-CF594	HI30	BD Biosciences	562279
7-AAD	PerCP-Cy5.5	Kit	BD Biosciences	559925
CD8	PE-Cy7	RPA-T8	BD Biosciences	557750
Annexin V	APC	Kit	BD Biosciences	550474
CD3	APC-C750	UCTH-1	ALPCO	70-3AC750
CD138	BV421	MI15	BD Biosciences	562935
CD107a	BV510	H4A3	BD Biosciences	563078

Figure S1: Gating strategy for plasma cell and cytotoxic T cells. Following (**A**) doublet & debris exclusion based on morphological features, (**B**) plasma cells were defined as $CD38^{high}/CD138^{high}/CD45^{-/int}$ and PC lysis was calculated for each treatment group as follow $[\% \, lysis = \frac{Treated\ PC\ count \times 100}{Untreated\ PC\ counts}]$. (**C**) Cytotoxic T cells were defined as $CD3^{+}/CD8^{+}/CD45^{high}$ (**C**) and CTL distribution was calculated for each treatment group as follow $[\% \, CTL = \frac{Treated\ CTL\ count \times 100}{Untreated\ CTL\ counts}]$.

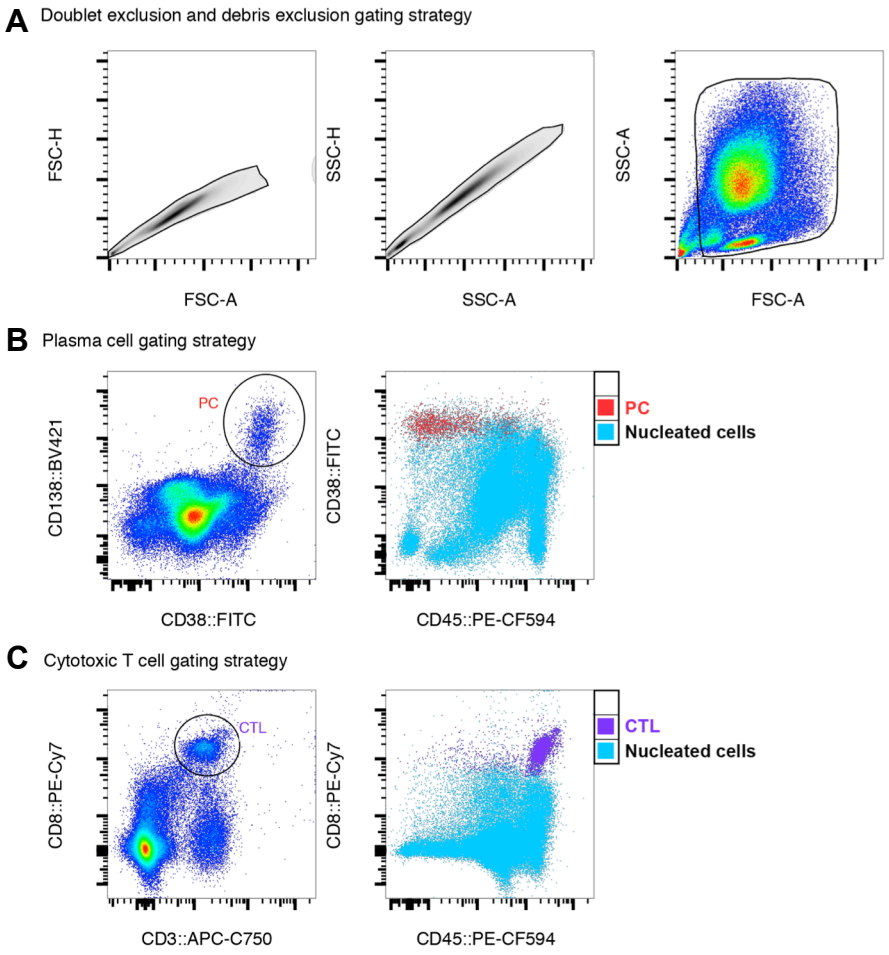
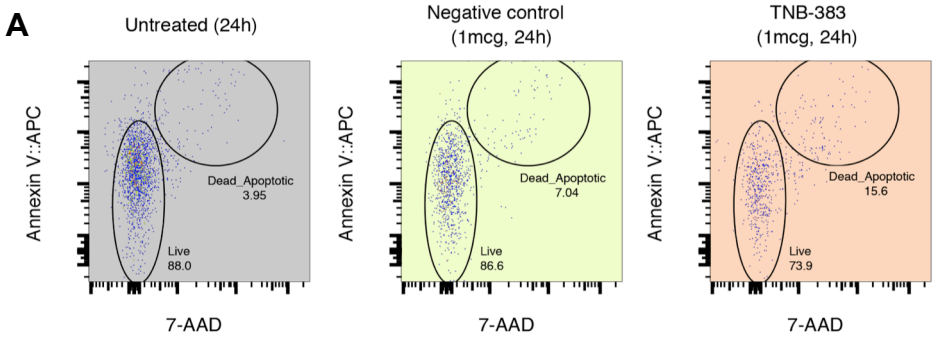
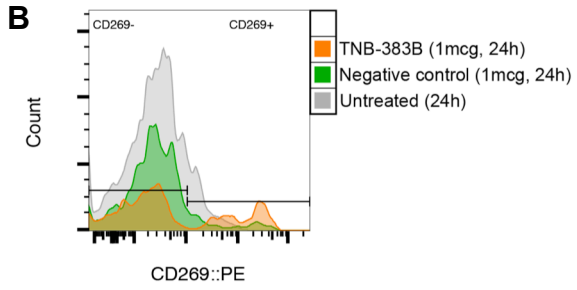


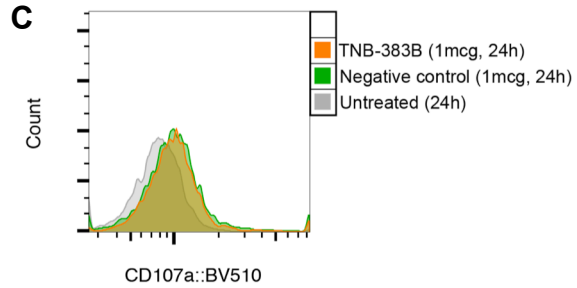
Figure S2: Gating strategy for plasma cell and cytotoxic T cells phenotyping. **(A)** Gated from $CD38^{high}/CD138^{high}/CD45^{-/int}$ population, live plasma cells were defined for each treatment group as 7-AAD^{-} PC and dead apoptotic cells as 7-AAD^{+}/Annexin V^{+} PC. **(B)** Gated from $CD38^{high}/CD138^{high}/CD45^{-/int}$ population, BCMA expression was expressed for each treatment group as average frequency of PC expressing BCMA (PC $BCMA^{+}$) and mean fluorescence intensity (BCMA MFI). BCMA expression by T cells (defined as $CD3^{+}/CD45^{high}$ population) was used as negative control. (**C**) Gated from $CD3^{+}/CD8^{+}/CD45^{high}$, CTL degranulation was determined for each treatment group by calculating mean fluorescence intensity of CD107a.





BCMA expression

Untreated	MFI : CD269 : 314
Negative control	MFI : CD269 : 285
TNB-383	MFI : CD269 : 306



CTL degranulation

Untreated	MFI : CD107a : 78.9
Negative control	MFI : CD107a : 98.4
TNB-383	MFI : CD107a : 98.2