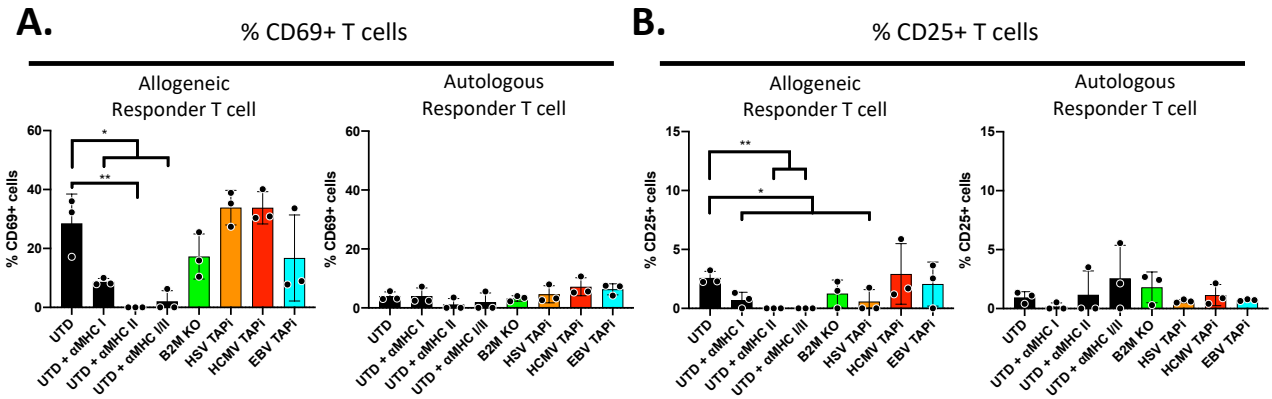
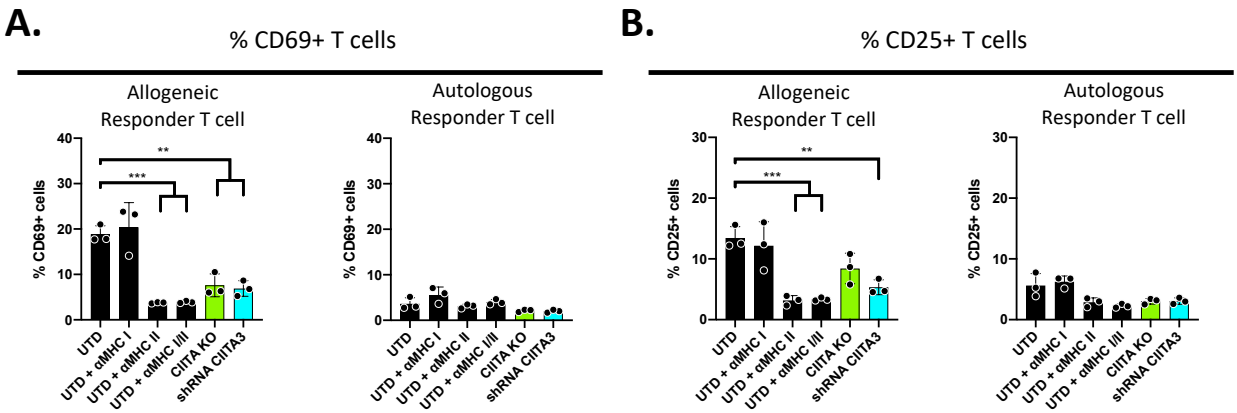
Supplemental Table 1. Overview antibodies utilized for flow cytometric analysis

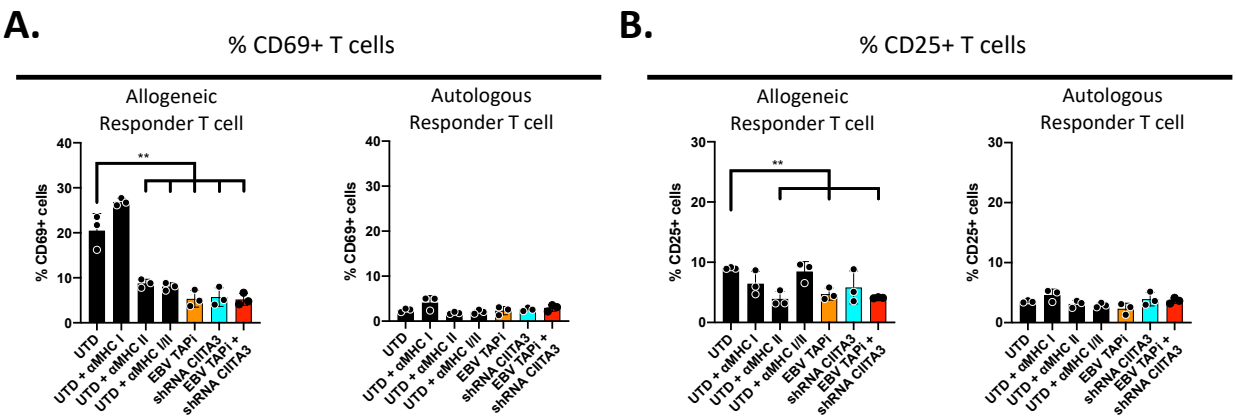
Flow Cytometry Antibodies		
antigen	clone	company
CD4	SK3	Biolegend
CD8	SK1	Biolegend
CD3	OKT3	Biolegend
CD25	BC96	Biolegend
CD69	FN50	Biolegend
HLA-A/B/C	W6/32	Biolegend
HLA-DR/DP/DQ	Tü39	Biolegend
CD107a	H4A3	Biolegend
CD45RA	HI100	Biolegend
CCR7	2-L1-A	BD Biosciences
murine erythroid cells	Ter-119	Biolegend
murine Ly6G/6C	RB6-8C5	Biolegend
murine CD11b	M1/70	Biolegend
murine NK1.1	PK136	Biolegend



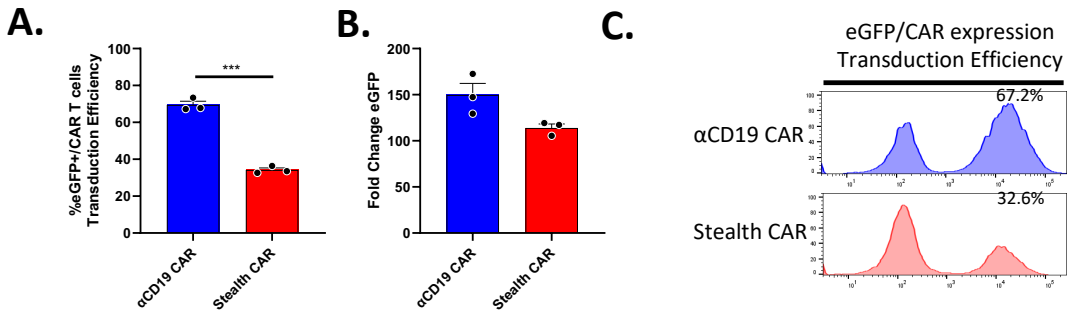
Supplemental Figure 1. Assessment of CD25 and CD69 expression of responder cells in MLR assay assessing allogeneic and autologous responses towards TAPi-expressing T cells. (A-B) TAPi-expressing or β2M KO T cells generated from 3 donors were mixed with allogeneic T cells from one additional donor or autologous T cells (responder cells) labeled with Celltrace Violet, after 16 days stained for CD25 and CD69 measured and analyzed by flow cytometry. Bars represent the mean +SEM of 3 donors. Dots represent the mean values of individual donors from 3 technical replicates with the same allogeneic responder cells. (Asterixes indicated statistical significances compared to the UTD - *: P≤ 0.05; **: P≤0.01; ***: P≤ 0.001; ****: P≤ 0.0001)



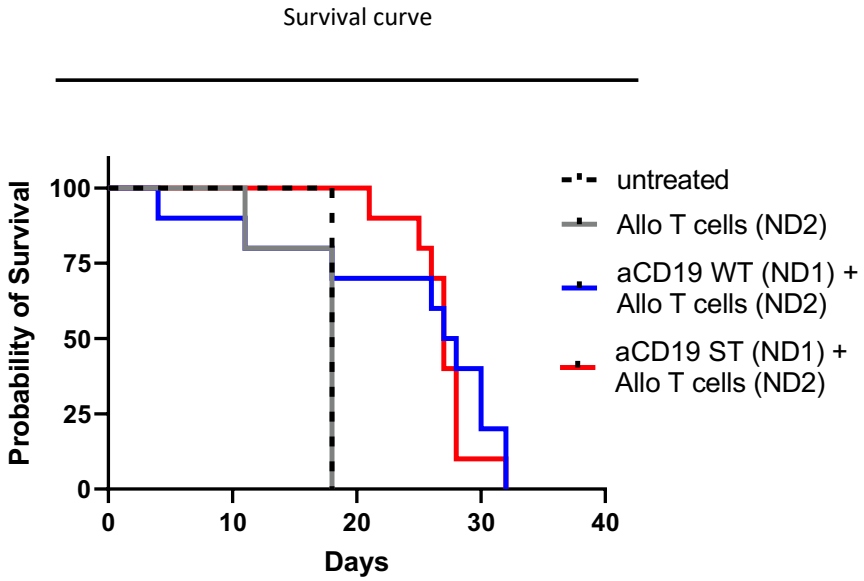
Supplemental Figure 2. Assessment of CD25 and CD69 expression of responder cells in MLR assay assessing allogeneic and autologous responses towards T cells expressing shRNA targeting CIITA. (A-B) CIITA shRNA3-expressing T cells or CIITA KO T cells generated from 3 donors were mixed with allogeneic T cells from one additional donor or autologous T cells (responder cells) labeled with Celltrace Violet, after 16 days stained for CD25 and CD69 measured and analyzed by flow cytometry. Bars represent the mean +SEM of 3 donors. Dots represent the mean values of individual donors from 3 technical replicates with the same allogeneic responder cells. (Asterixes indicated statistical significances compared to the UTD - *: P≤ 0.05; **: P≤0.01; ***: P≤ 0.001; ****: P≤ 0.0001)



Supplemental Figure 3. Assessment of CD25 and CD69 expression of responder cells in MLR assay assessing allogeneic and autologous responses towards T cells expressing EBV TAPi and shRNA targeting CIITA. (A-B) T cells expressing EBV TAPi and/or shRNA targeting CIITA cells generated from 3 donors were mixed with allogeneic T cells from one additional donor or autologous T cells (responder cells) labeled with Celltrace Violet, after 16 days stained for CD25 and CD69 measured and analyzed by flow cytometry. Bars represent the mean +SEM of 3 donors. Dots represent the mean values of individual donors from 3 technical replicates with the same allogeneic responder cells. (Asterixes indicated statistical significances compared to the UTD - *: P≤ 0.05; **: P≤0.01; ***: P≤ 0.001; ****: P≤ 0.0001)



Supplemental Figure 4. Transduction efficiency and eGFP expression of αCD19 CAR T cells and stealth CAR T cells. αCD3/αCD28-activated T cells from 3 healthy donors were transduced by lentivirus to express the αCD19 CAR linked by T2A-linker to eGFP with and without including the stealth technology: EBV TAPi and shRNA CIITA3. **A.** Transduction efficiency of both constructs were measured by percentage eGFP-positive cells and **B.** eGFP expression was calculated as fold change compared to UTD. **C.** A representative histogram of eGFP from a single donor is provided. Bars in graphs represent the mean + SEM of 3 donors. Dots represent the mean values of individual donors. (Asterixes indicated statistical significances - *: P≤ 0.05; **: P≤0.01; ***: P≤ 0.001; ****: P≤ 0.0001)



Supplemental Figure 5. Survival curve of mice in the allogeneic *in vivo* model. NSG mice were engrafted with αCD3/αCD28-expanded allogeneic T cells (from normal donor 2, ND2), inoculated with NALM6 tumor cells, and treated with αCD19 CAR T cells (from ND1) with or without stealth technology or left untreated. Survival was indicated by Kaplan-Meier curve. Mice perished early due to graft-versus-host disease as observed by fur loss and sclerosis.