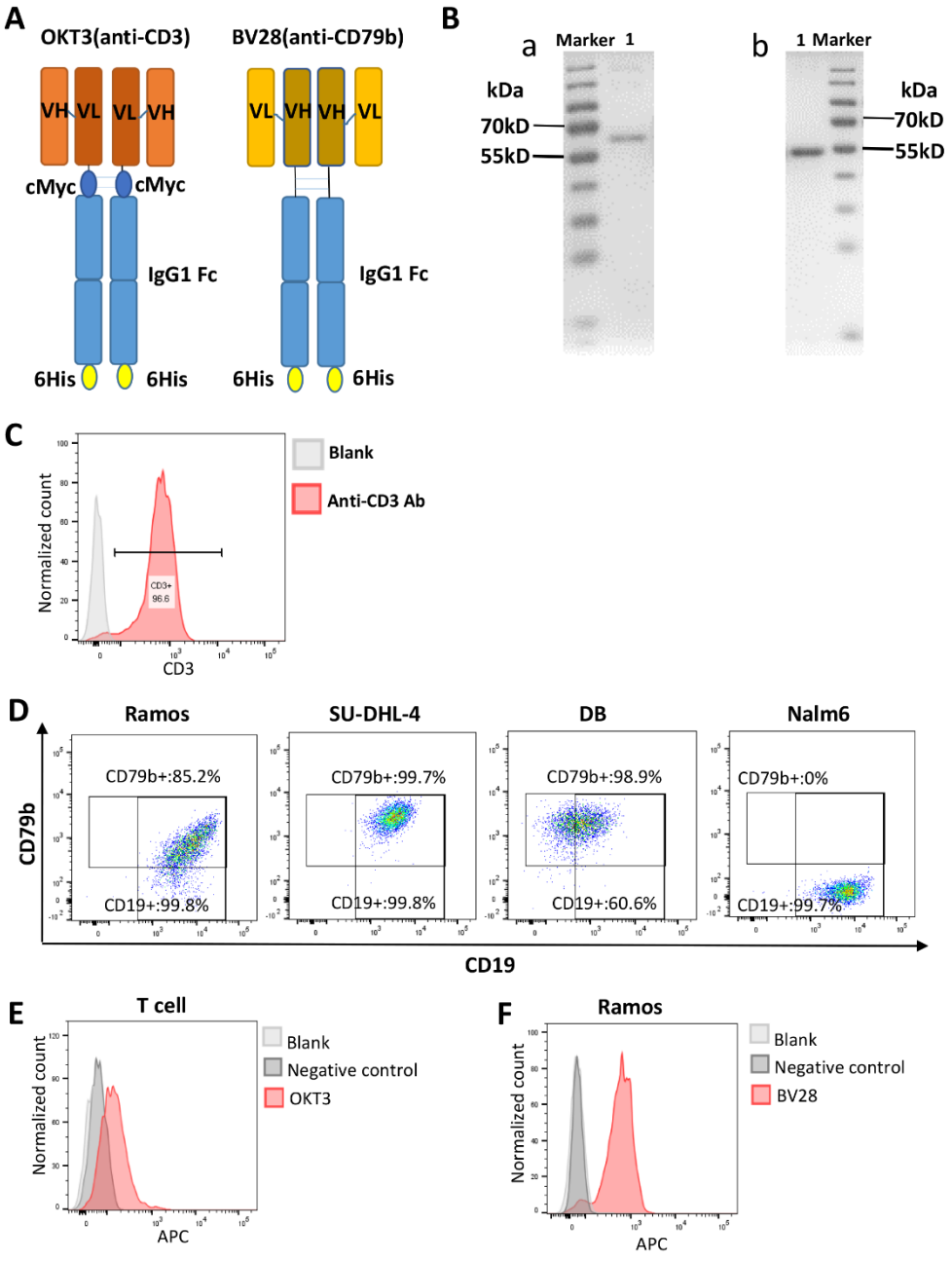
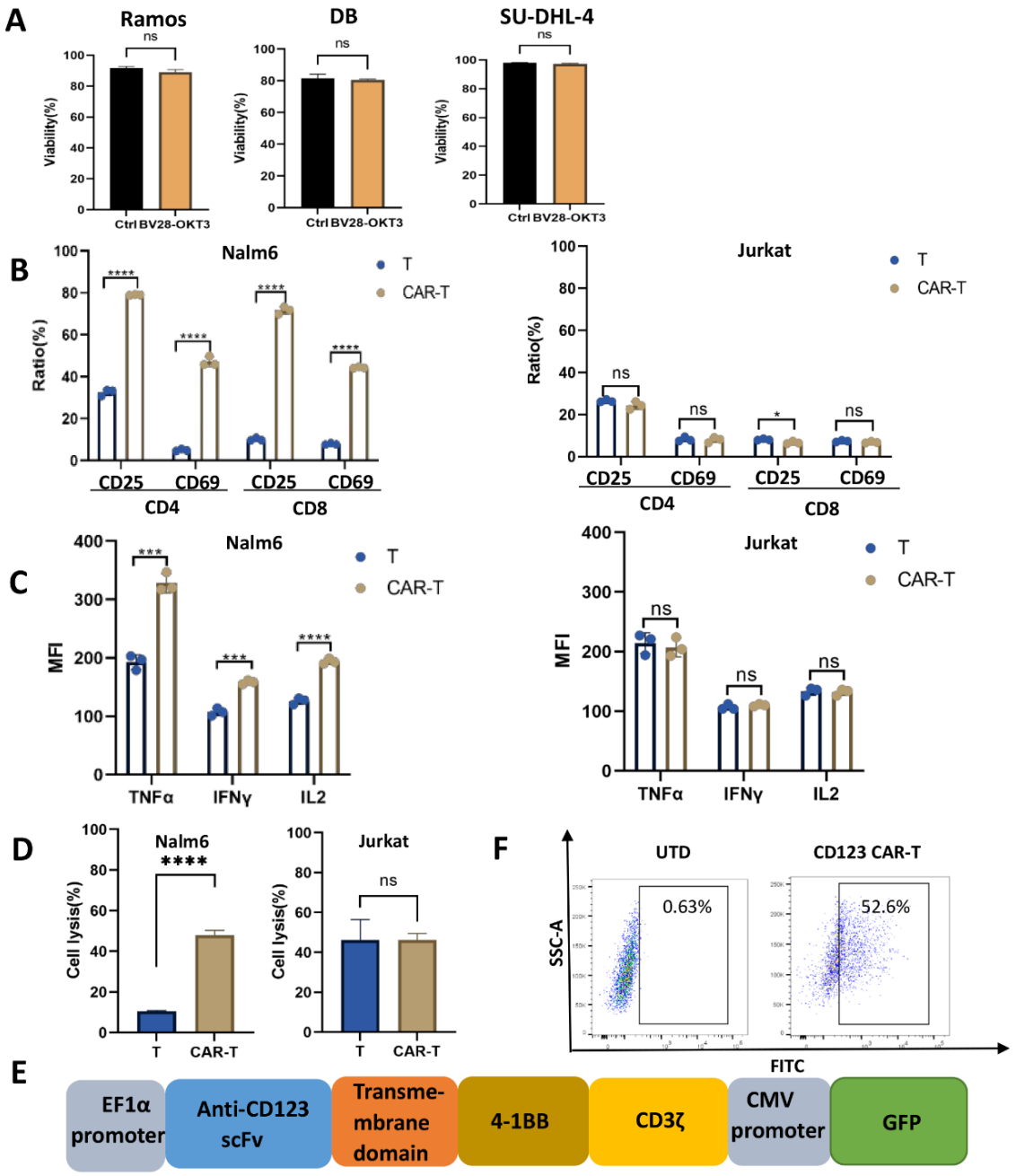
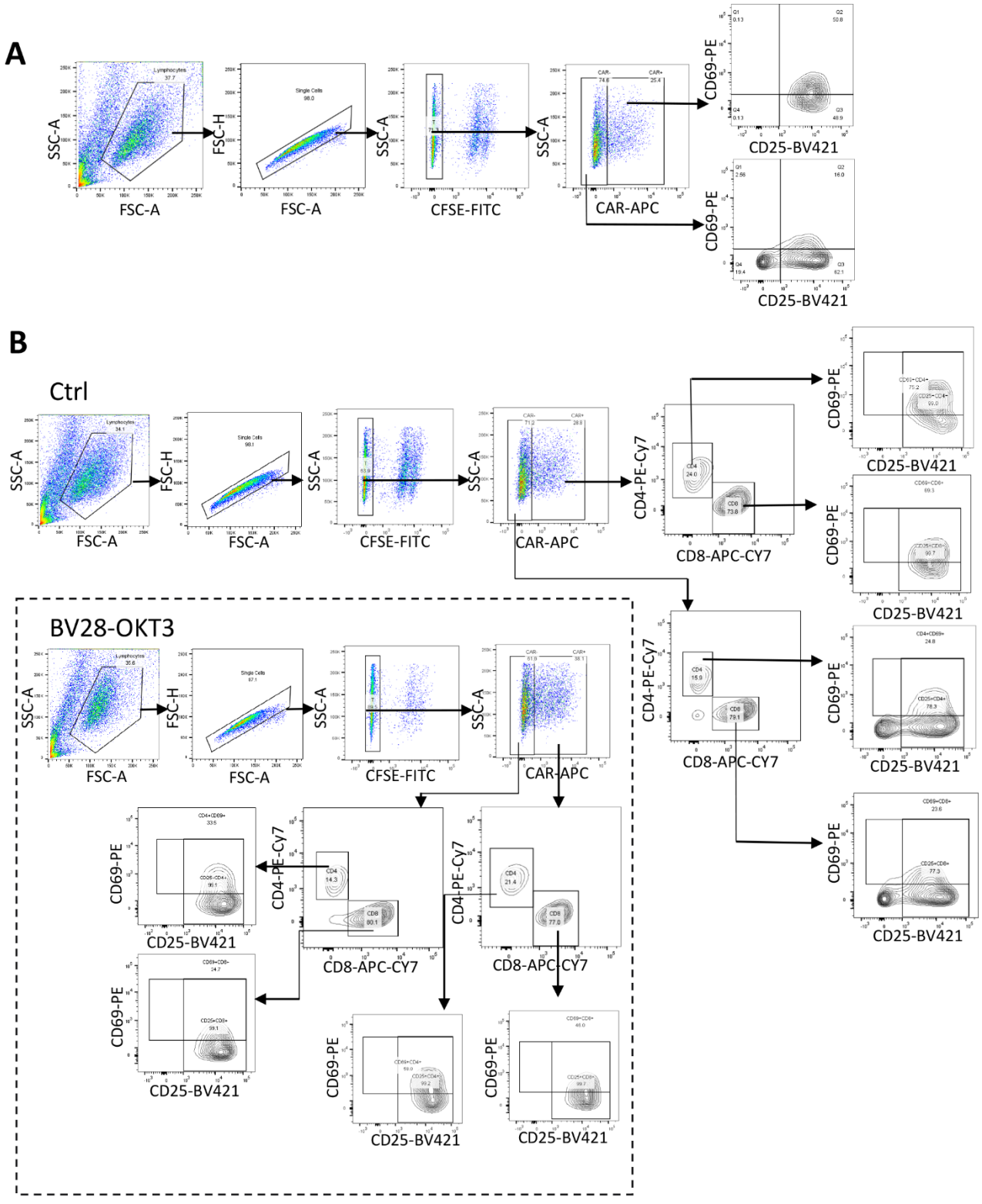
Supplementary Material



Supplementary Figure 1. (A) Structure of OKT3 (left) and BV28 (right). **(B)** SDS-PAGE analysis of the purified OKT3 (a) and BV28 (b). **(C)** Flow cytometric analysis of CD3 expression in PBMCs after stimulation for 48 h. **(D)** Flow cytometric analysis of CD19 and CD79b expression in Ramos, SU-DHL-4, DB, and Nalm6 cell lines. **(E)** Flow cytometric analysis of the binding ability of OKT3 to T cells. **(F)** Flow cytometric analysis of the binding ability of BV28 to Ramos. Samples without staining were indicated as blank, and negative controls were cells incubated only with anti-6-His tag antibody.



Supplementary Figure 2. (A) Flow cytometric analysis of lymphoma cell line viability in the presence of 10 μg/mL BV28-OKT3. **(B)** Nalm6 and Jurkat cells were co-cultured with equal numbers of T or CAR-T cells for 24h. Flow cytometric analysis of CD25+ or CD69+ cell ratios of CD4+ and CD8+ T cells. **(C)** Nalm6 or Jurkat cells were co-cultured with equal numbers of T or CAR-T cells for 18h, after the addition of transport protein inhibition, cultured continuously for another 6 h; The mean fluorescence intensity of TNFα, IFNγ and IL2 was tested by FMC. **(D)** CFSE-labeled Nalm6 and Jurkat cells were co-cultured with equal numbers of T or CAR-T cells for 24h. Flow cytometric analysis of cell lysis ratios of Nalm6 and Jurkat cells. **(E)** Structure of CAR123. **(F)** GFP expression in CAR123-T cells was assessed using flow cytometry.



Supplementary Figure 3. (A) Gating strategies of Fig 5A; **(B)** Gating strategies of Fig 5B; Images out of the dotted box indicated control group; Images in the dotted box indicated BV28-OKT3 group.