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## Supplemental information

# Cryopreserved anti-CD22 and bispecific anti-CD19/22 CAR T cells are as effective as freshly infused cells

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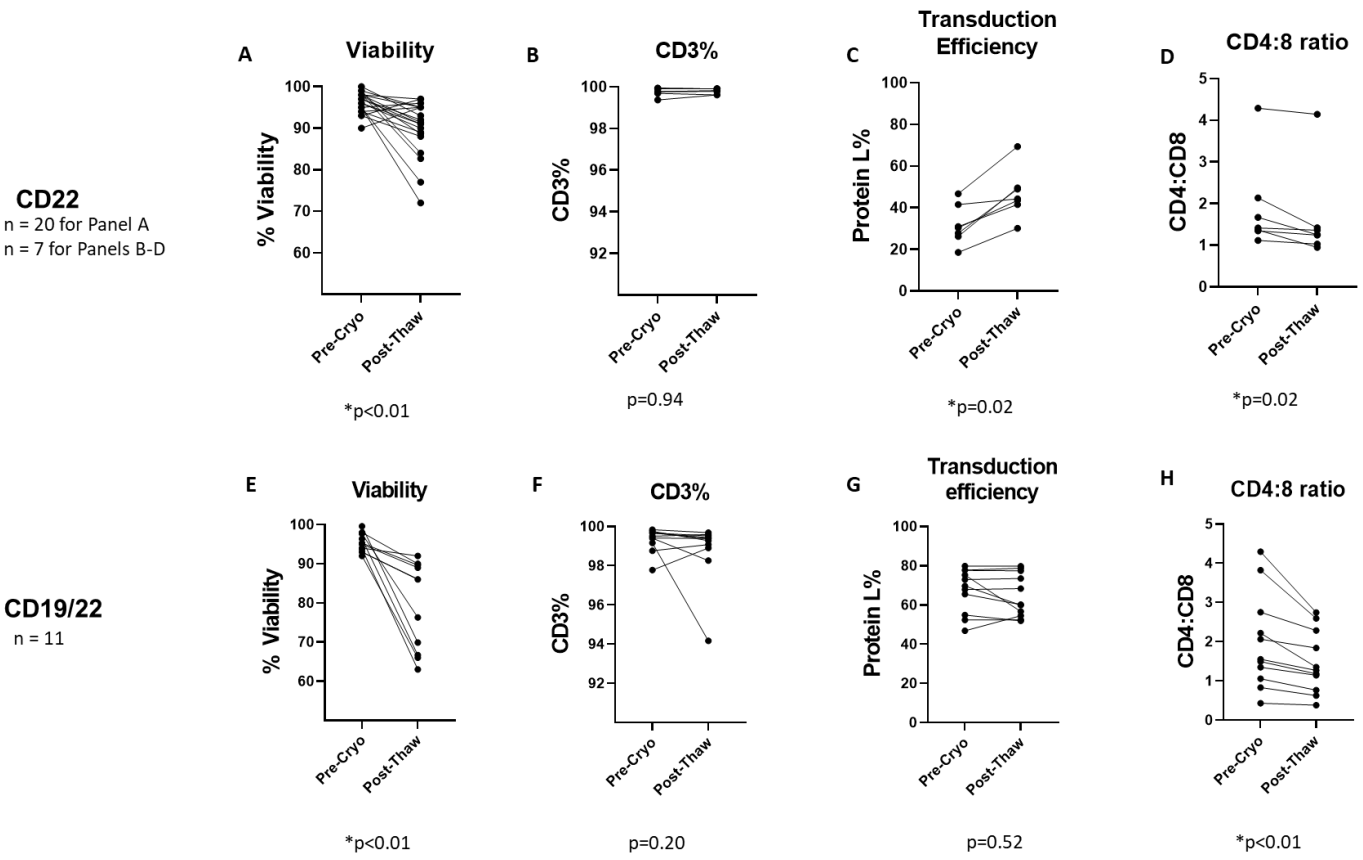


**Figure S1. Paired Comparisons of Cell Characteristics Pre- and Post-Cryopreservation**

Viability, CD3%, Transduction Efficiency (based on Protein L%) and CD4:8 ratios were tested before and after cryopreservation for a subset of anti-CD22 CAR T-cells (n=7; n=20 for viability) and anti-CD19/22 CAR T-cells (n=11). The results of testing anti-CD22-CAR T-cell products are shown in panels A-D and those of anti-CD19/CD22 bispecific CAR T-cell products are shown in panels E-H. Panels A and E show the viability, B and F the percent of cells expressing CD3, C and G the percent of cells expressing Protein L and D and H the ratio of CD4:CD8 expressing cells. P-values represent results of a Wilcoxon signed-rank test.

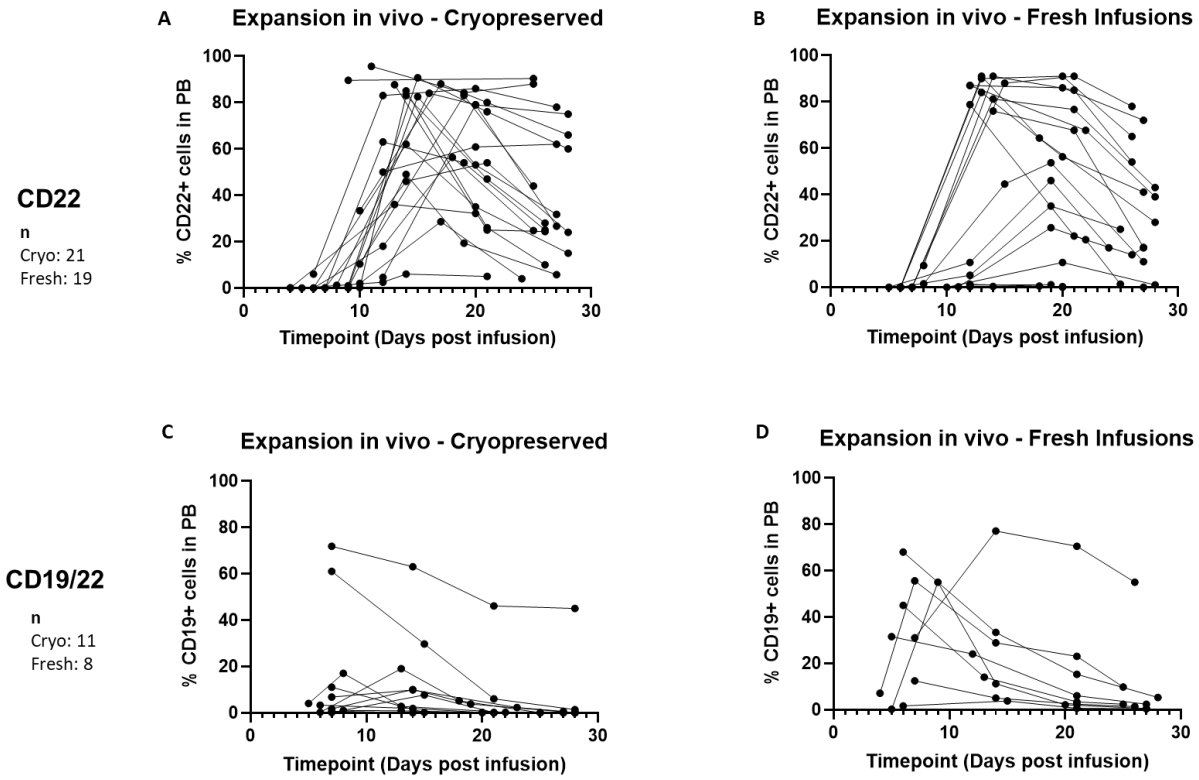


**Figure S2. In vivo Expansion Over Time**

Expansion of CAR T-cells in peripheral blood in the first 30 days after infusion is depicted for each time point at which peripheral flow cytometry was completed. Panel A shows expansion of cryopreserved anti-CD22 CAR T-cells. Panel B shows expansion of freshly infused anti-CD22 CAR T-cells. Similarly, Panel C shows cryopreserved anti-CD19/22 bispecific CAR T-cells and Panel D shows freshly infused anti-CD19/22 bispecific CAR T-cells.

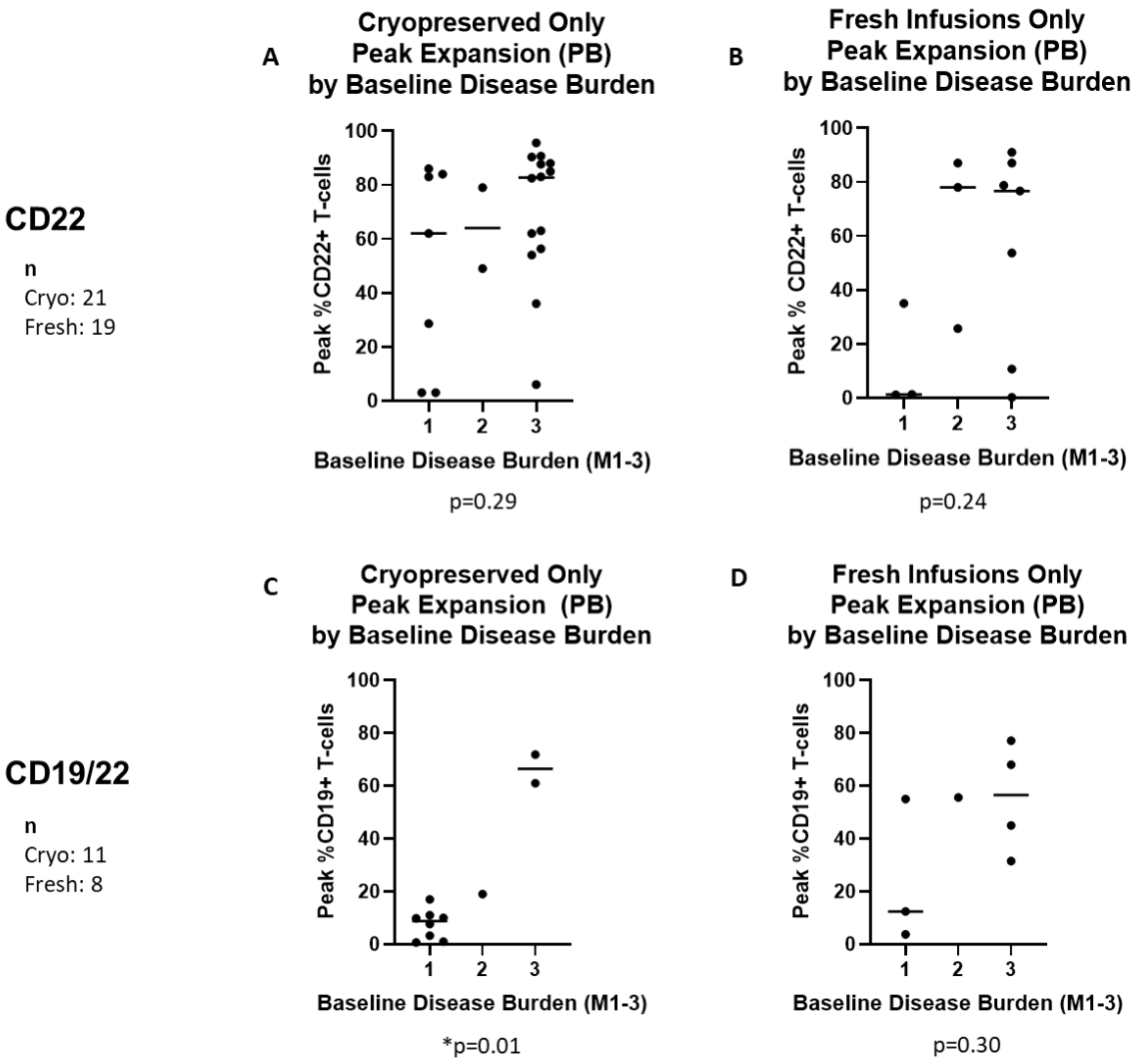


**Figure S3. Expansion as a Function of Disease Burden**

Peak expansion in peripheral blood is shown for patients grouped by baseline disease burden in the bone marrow, where M1 disease is <5% blasts by morphology, M2 is 5-25% blasts, and M3 is >25% blasts. Panels A and C show expansion by disease burden group for the cryopreserved cells, in the CD22 and the CD19/22 cohorts, respectively. Panels B and D show expansion by disease burden group for the freshly infused CD22 and CD19/22 CAR T-cells, respectively.

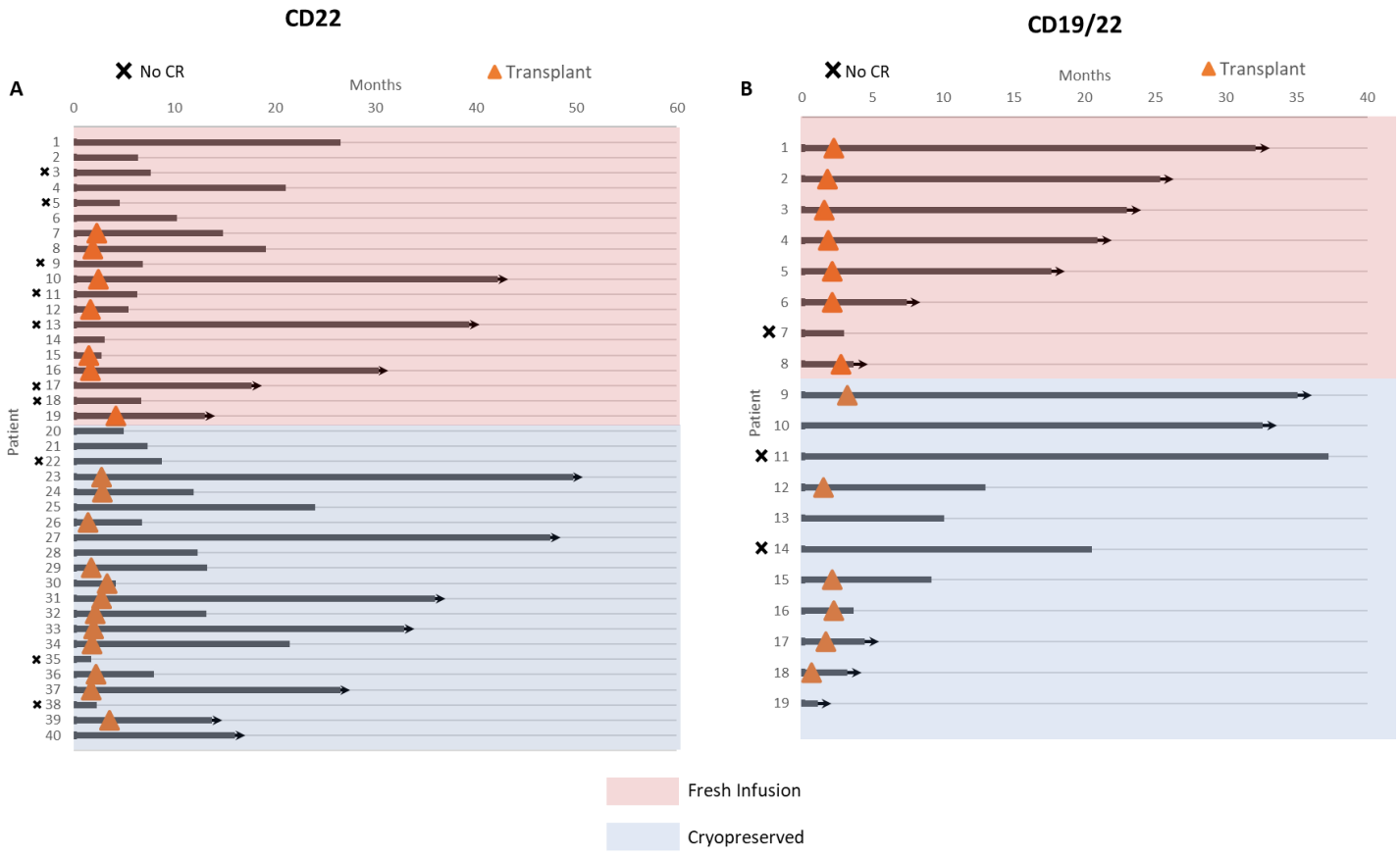


**Figure S4. Timeline of Hematopoietic Stem Cell Transplant and Survival after CAR-T Infusions**

Swimmer plots depicting patient outcomes following CAR-T cell infusion. The triangles represent HSCT. Patients who did not achieve CR are labeled with an "x". Arrows indicate patients who are living at the time of analysis. Panel A shows patients who received anti-CD22 CAR-T cells, and Panel B shows those who received anti-CD19/22 CAR-T cells. Patients who received fresh products are shown in pink, and those who received cryopreserved products are in blue.

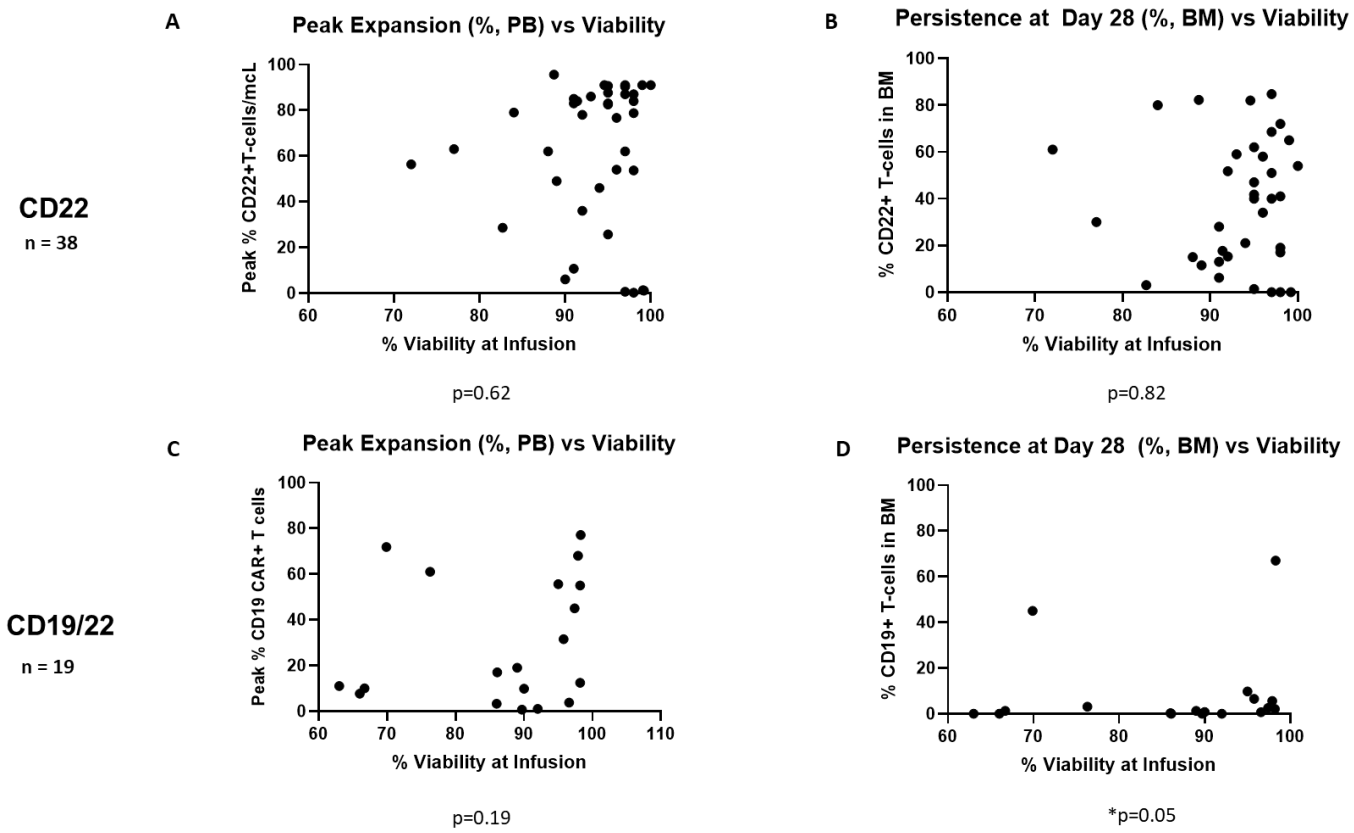


**Figure S5. Outcomes Correlating with Viability at Infusion**

Peak expansion in peripheral blood and Day 28 persistence in bone marrow are shown as a function of % viability at infusion. Panels A and C show peak expansion for the CD22 and CD19/22 cohorts, respectively. Panels B and D show Day 28 Persistence for CD22 and CD19/22 cohorts, respectively. P-values represent significance of Spearman's correlation.