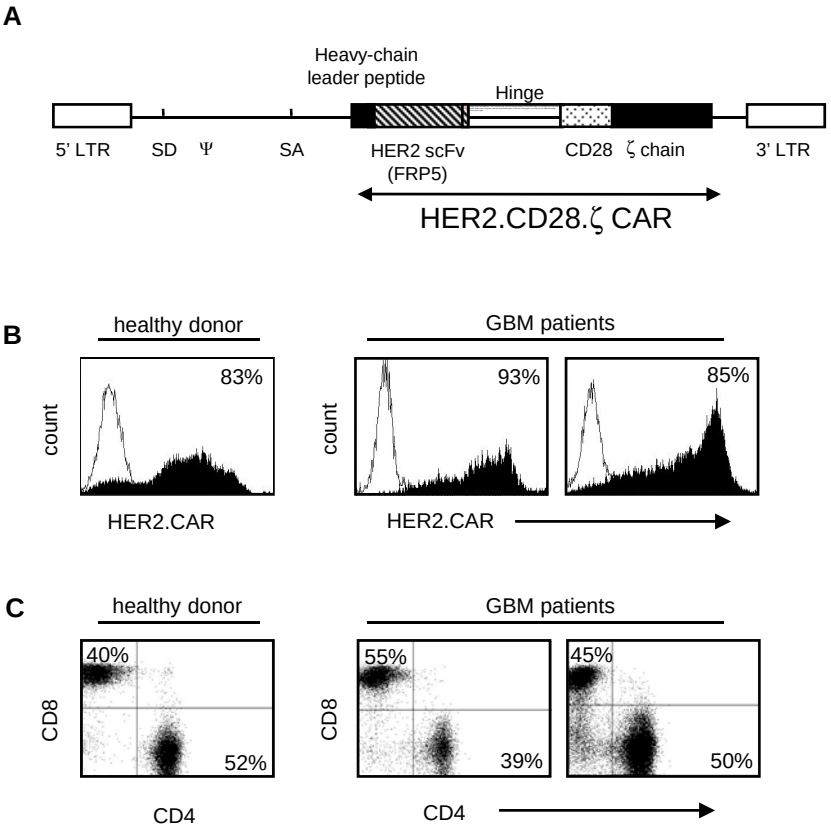
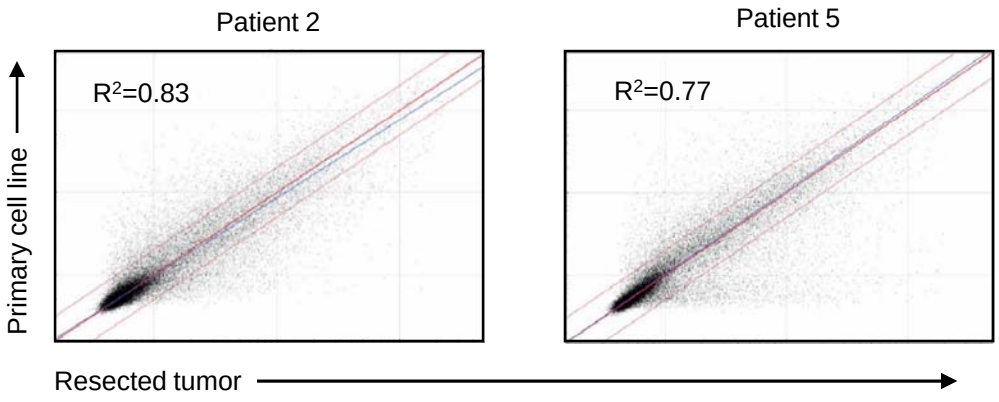
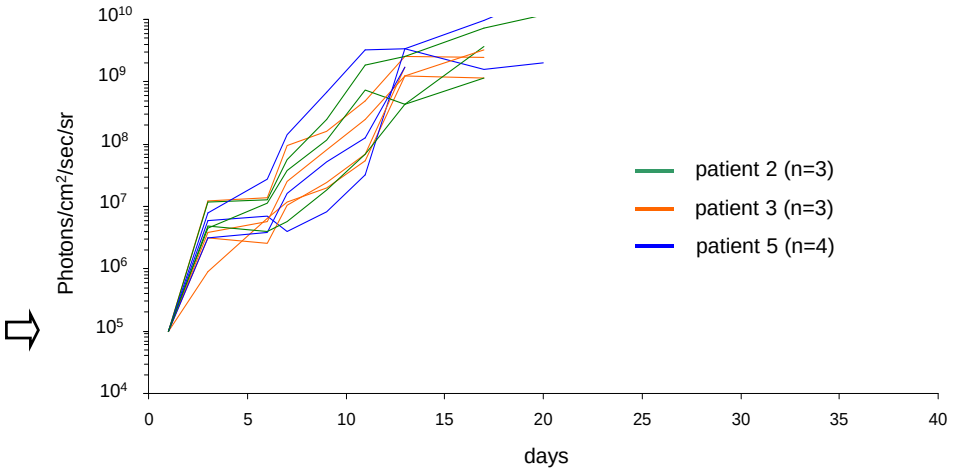


Supplemental figure 1: Generation and characterization of GBM patients' HER2-specific T cells: A. Schematic of the HER2-specific second generation CAR; B. The surface expression of the HER2 CARs transgene was determined as described in the materials and methods section. On average, 79% (SD +/-15%) of GBM patients' T cells expressed HER2-specific CAR, and (C) transduced cells contained CD4- and CD8-positive T cells. Transduction rates of GBM patients' T cells and their phenotype were similar to those of healthy donors.

A

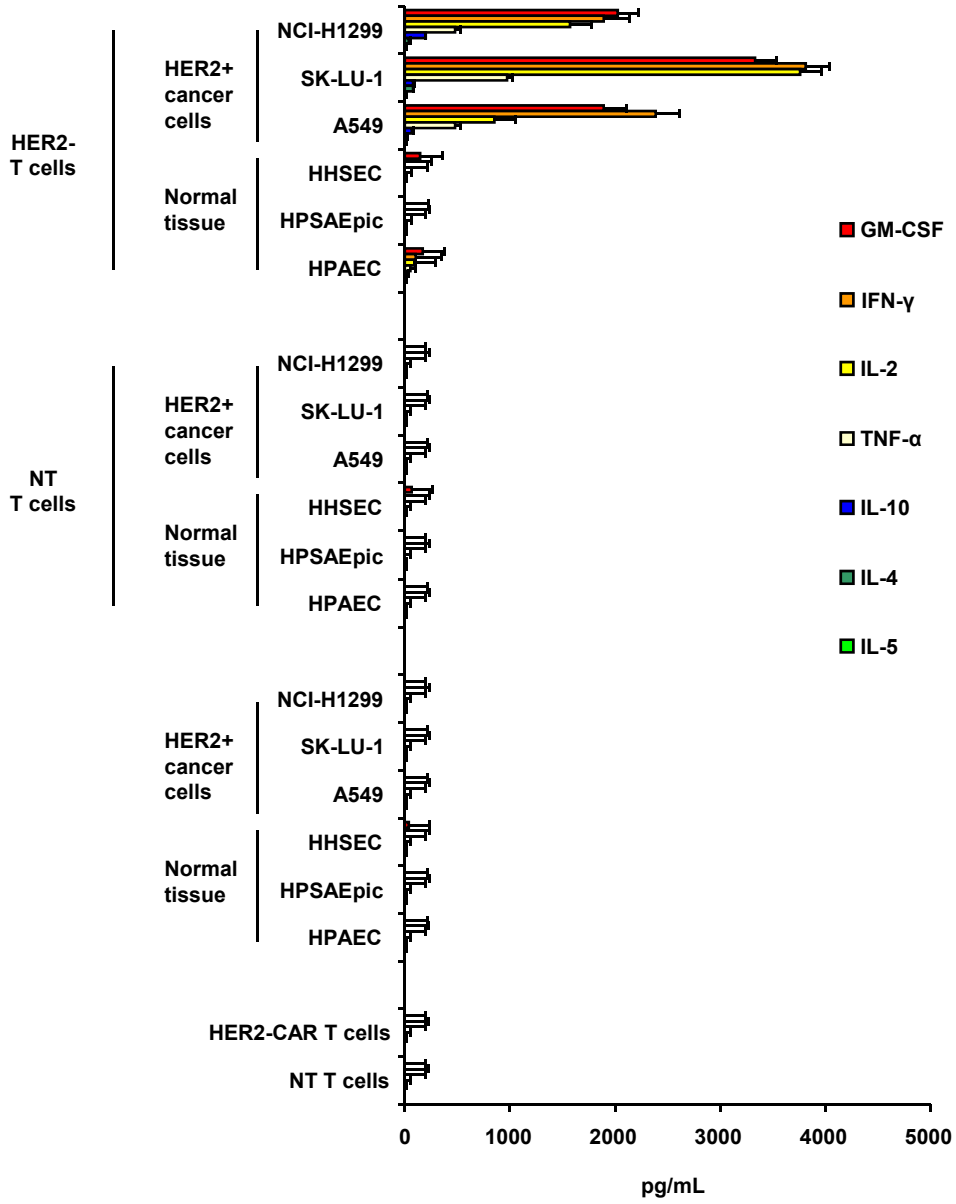


Supplemental figure 2: Gene expression array of the primary cell line correlates with the parental tumor. Scatter plots are shown for two representative patients demonstrate the correlations expressed as Pearson coefficient (r^2) using all 48,000 probe signal intensity (Illumina, Inc.). Both axes are logarithmic. Red lines represent the identity line and 2 fold increase /decrease. Blue line represents the best fit.



Supplemental figure 4: Successful engraftment of GBM xenografts. 5x10^4 primary GBM cells expressing the eGFP.FFLuc gene from patients 2 (3 mice), 3 (3 mice) and 5 (4 mice) were injected stereotactically into the right hemisphere of 9 to 12 week old SCID mice. Bioluminescence imaging of tumor xenografts demonstrate the progressive exponential growth of tumors in all experimental animals. Animals had a median survival of 17 days (range 14-22)

Supplemental figure 3



Supplement Figure 4: HER2-specific T cells do not recognize primary endothelial and epithelial cells. HER2-specific T cells (HER2-T cells) or nontransduced T cells (NT-T cells) were cocultured with HER2-positive cancer cell lines (NCI-H1299, SK-LU-1, A549), primary human hepatic sinusoidal endothelial cells (HHSEC), primary human small airway epithelial cells (HSAEpiC), or human pulmonary artery endothelial cells (HPAEC).* After 18 hours the production of cytokines (GM-CSF, IFN-γ, IL-2, TNF-α , IL-10, IL-4, IL-5) was determined by Multiplex analysis. Only HER2-positive lung cancer cells activated HER2-CAR T cells as judged by the production of GM-CSF, IFN-γ, IL-2, TNF-α where as primary cells did not. In addition, unstimulated HER2-CAR T cells did not produce any cytokines. * *HER2-positive cancer cell lines were obtained from American Type Culture Collection (ATCC; Manassas, VA) and the primary cells from ScienCell™ (Carlsbad, CA).*

Supplemental figure 4