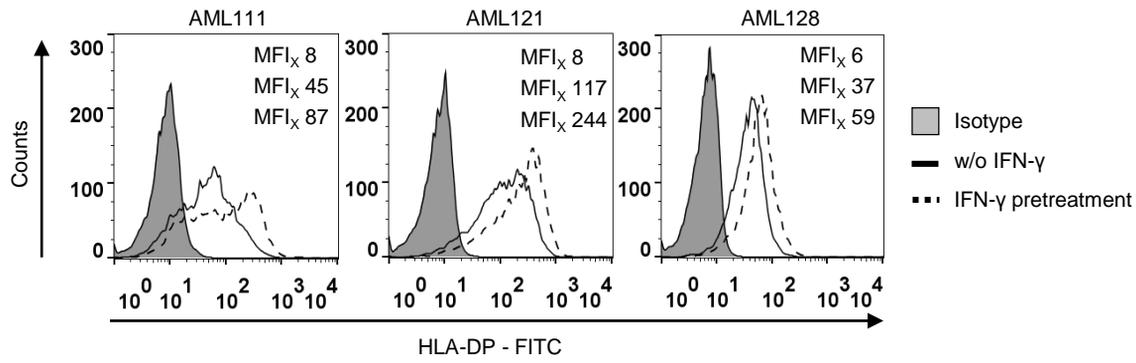
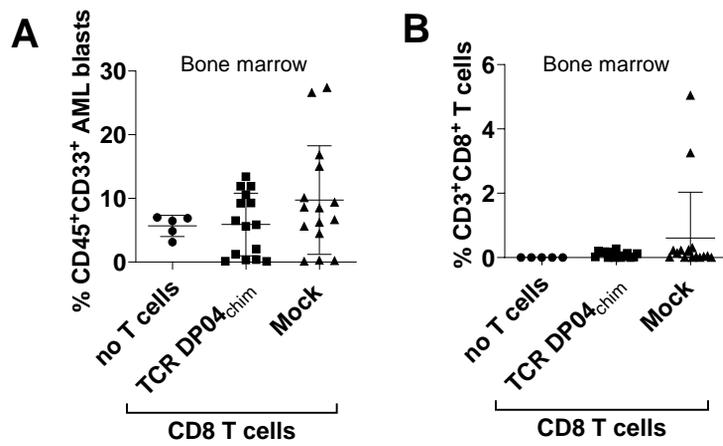


# Figure S1



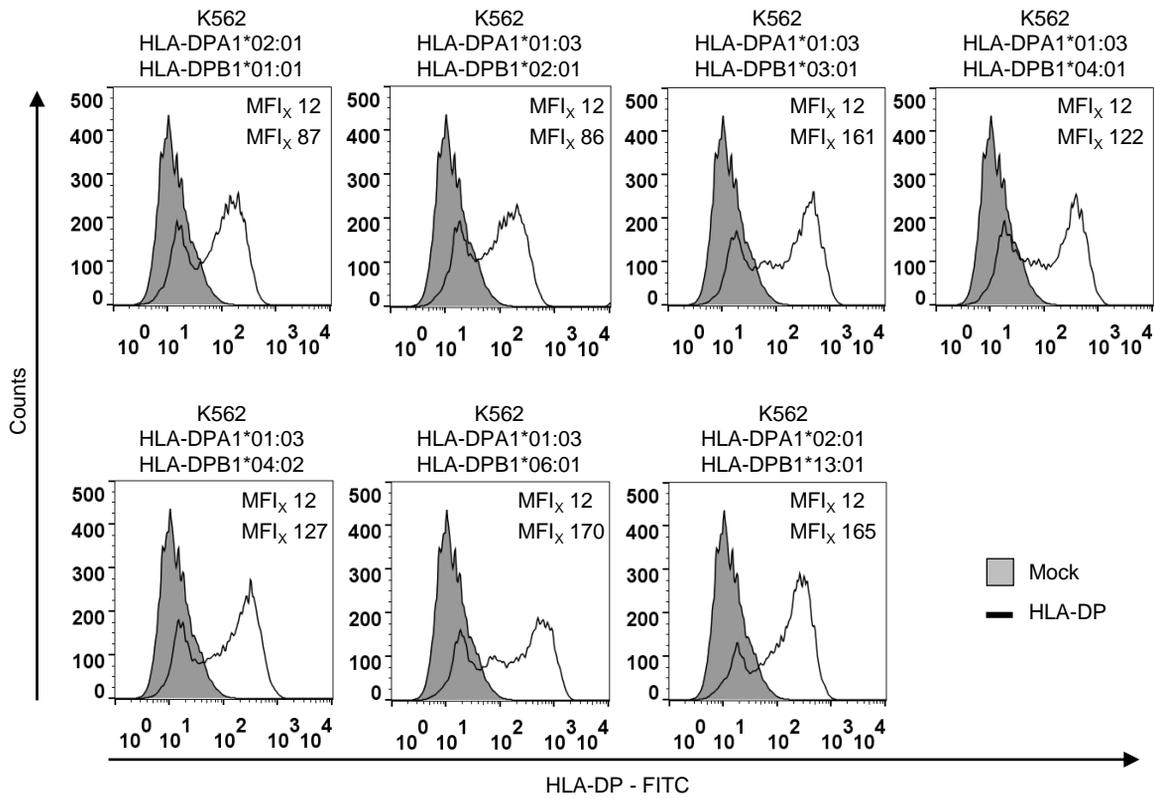
**Supplementary Figure 1.** HLA-DP surface expression on primary AML blasts. AML samples from individual patients (AML111, AML121, AML128) were analyzed cytofluorometrically for surface expression of HLA-DP. Cells were either left untreated (solid black line) or pretreated with IFN- $\gamma$  (500 IU/mL) for 24 h (black dotted line) before staining with HLA-DP specific mAb. Isotype mAb stained cells served as control (filled black line). MFI values are shown in the following order: Isotype (upper value), untreated (middle value), IFN- $\gamma$  pretreated (lower value).

## Figure S2



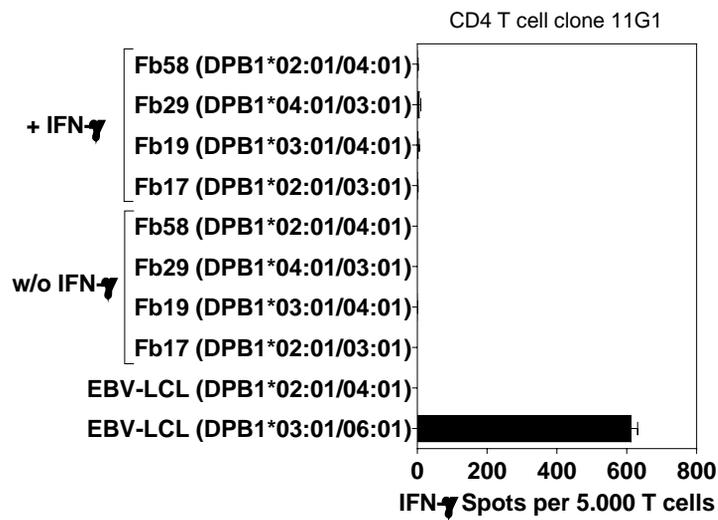
**Supplementary Figure 2.** Anti-leukemic activity of TCR DP04<sub>chim</sub> modified CD8 T cells in AML engrafted NSG mice. Sublethally irradiated (1.5 Gy) NSG mice were intravenously injected with  $4 \times 10^6$  primary blasts of AML167 (HLA-DPB1\*04:01/17:01). On day 21, when leukemia engraftment reached a level of 1-5 % in bone marrow as confirmed in identically treated control mice,  $1 \times 10^7$  CD8 T cells retrovirally transduced with TCR DP04<sub>chim</sub> (n=15) or empty vector(Mock; n=15) were intravenously injected along with single doses of rh IL-2 (1000 U) and FcIL-7 (20  $\mu$ g). Animals in the control group without T cells (n=5) only received rh IL-2 and Fc-IL-7. On day 28 (i.e. 7 days after T cell transfer), **(A)** AML burden (CD45<sup>+</sup>CD33<sup>+</sup> cells) and **(B)** T cell frequencies (CD3<sup>+</sup>CD8<sup>+</sup> cells) were analyzed in bone marrow. Results are pooled from three independent experiments. Symbols represent individual mice and horizontal bars mark mean values with standard deviation.

# Figure S3



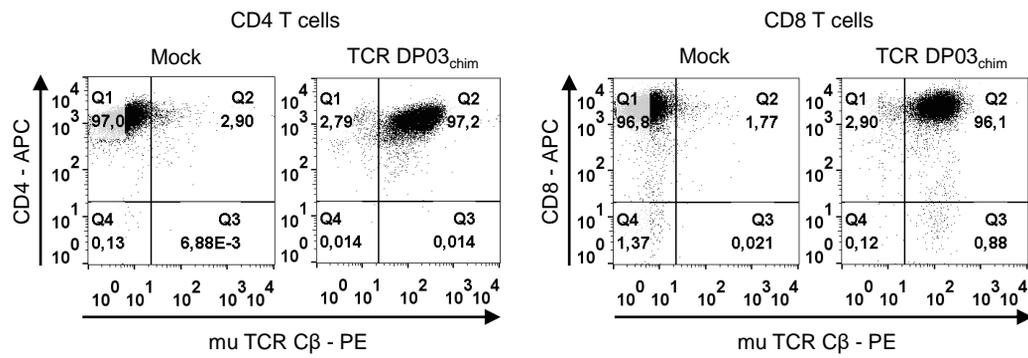
**Supplementary Figure 3.** HLA-DP cell surface expression on K562 cells. K562 cells were analyzed for surface expression of HLA-DP by flow cytometry 16-20 h after RNA transfection. Cells were either electroporated with IVT-RNA (10  $\mu$ g each) encoding for the indicated HLA-DPA1\* and -DPB1\* alleles (solid black line) or electroporated without RNA (Mock, filled grey line). MFI values for HLA-DP surface staining are shown in the following order: Mock (upper value), HLA-DP electroporated (lower value).

# Figure S4



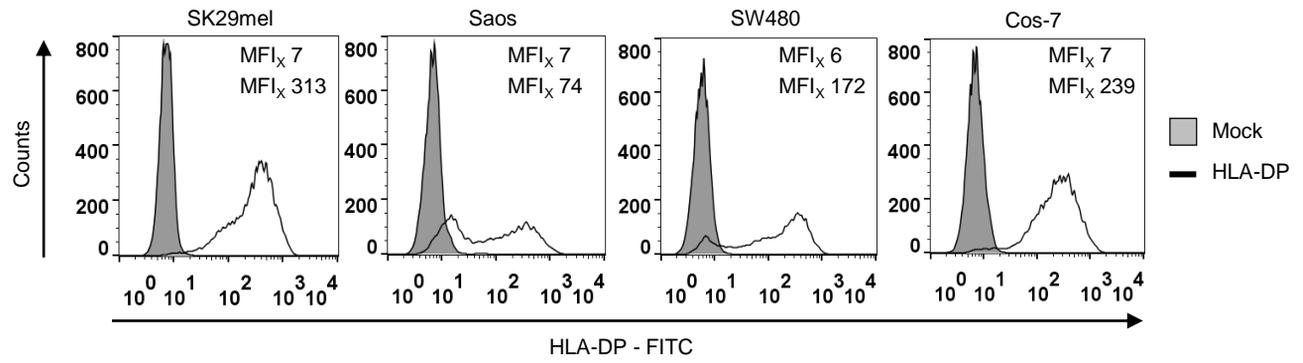
**Supplementary Figure 4.** Reactivity of clonal CD4 T cells 11G1 against primary fibroblasts. T cells from clonal CD4 population 11G1 were incubated with untreated or IFN- $\gamma$  pretreated primary fibroblasts from individual HLA-DPB1\*03:01 positive and negative donors at an E:T ratio of 0.1:1. IFN- $\gamma$  spot production was measured after 16-20 h. EBV-LCL from HLA-DPB1\*03:01 positive and negative donors served as controls. Standard deviation of mean of two technical replicates is shown.

# Figure S5



**Supplementary Figure 5.** TCR expression of TCR DP03<sub>chim</sub> redirected T cells. Immunomagnetically selected and prestimulated human CD4 (left panels) and CD8 T cells (right panels) from an HLA-DPB1\*03:01 negative healthy donor were transfected with TCR DP03<sub>chim</sub> coding RNA (CD4 TCR DP03<sub>chim</sub> and CD8 TCR DP03<sub>chim</sub>) or without RNA (CD4 Mock and CD8 Mock) and analyzed after 16-20 h by flow cytometry for expression of CD4, CD8, as well as of TCR DP03<sub>chim</sub> using murine TCR constant  $\beta$  domain (mu TCR C $\beta$ )-specific mAb.

# Figure S6



**Supplementary Figure 6.** HLA-DP cell surface expression on tumor cell lines. Indicated human (SK29mel, Saos, SW480) and primate (Cos-7) tumor cell lines were analyzed cytofluorometrically for surface expression of HLA-DP 16-20 h after RNA transfection. Cells were either electroporated with IVT-RNA (10  $\mu$ g each) encoding for HLA-DPA1\*01:03 and -DPB1\*04:01 alleles (solid black line) or electroporated without RNA (Mock, filled grey line). MFI values for HLA-DP surface staining are shown in the following order: Mock (upper value), HLA-DP electroporated (lower value).