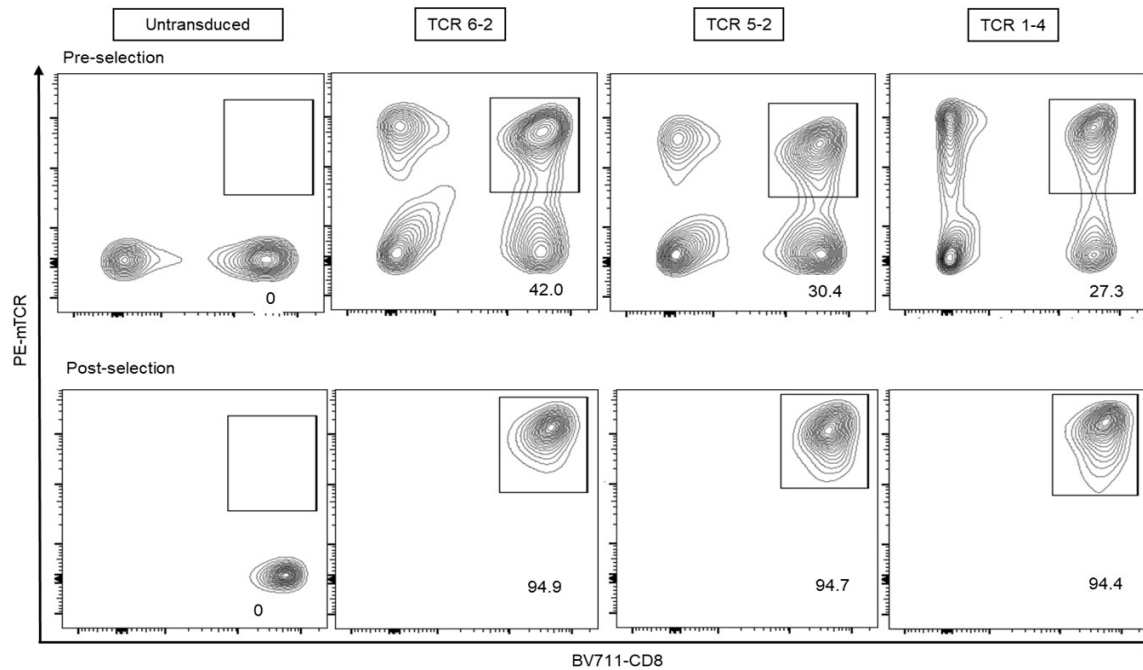
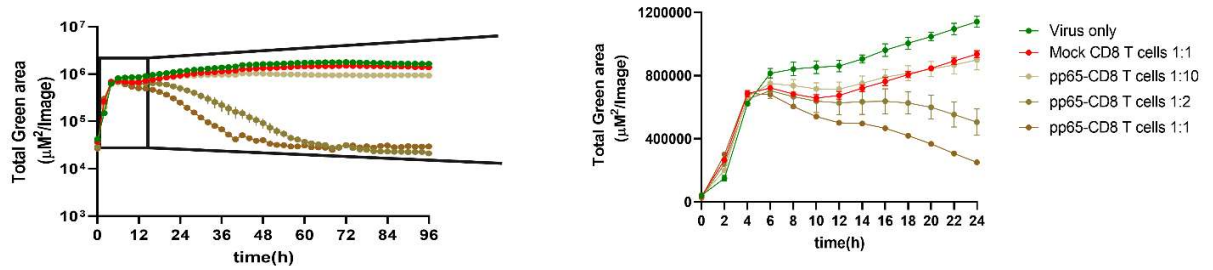
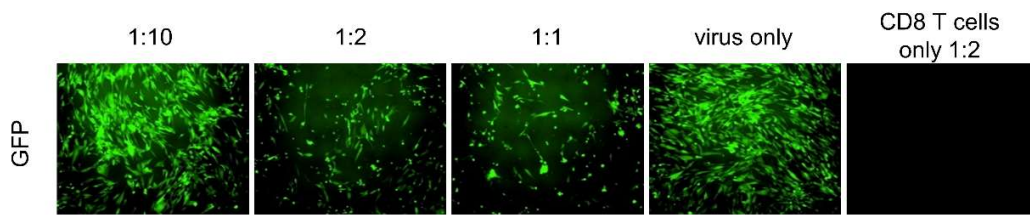


## Supplementary Figures

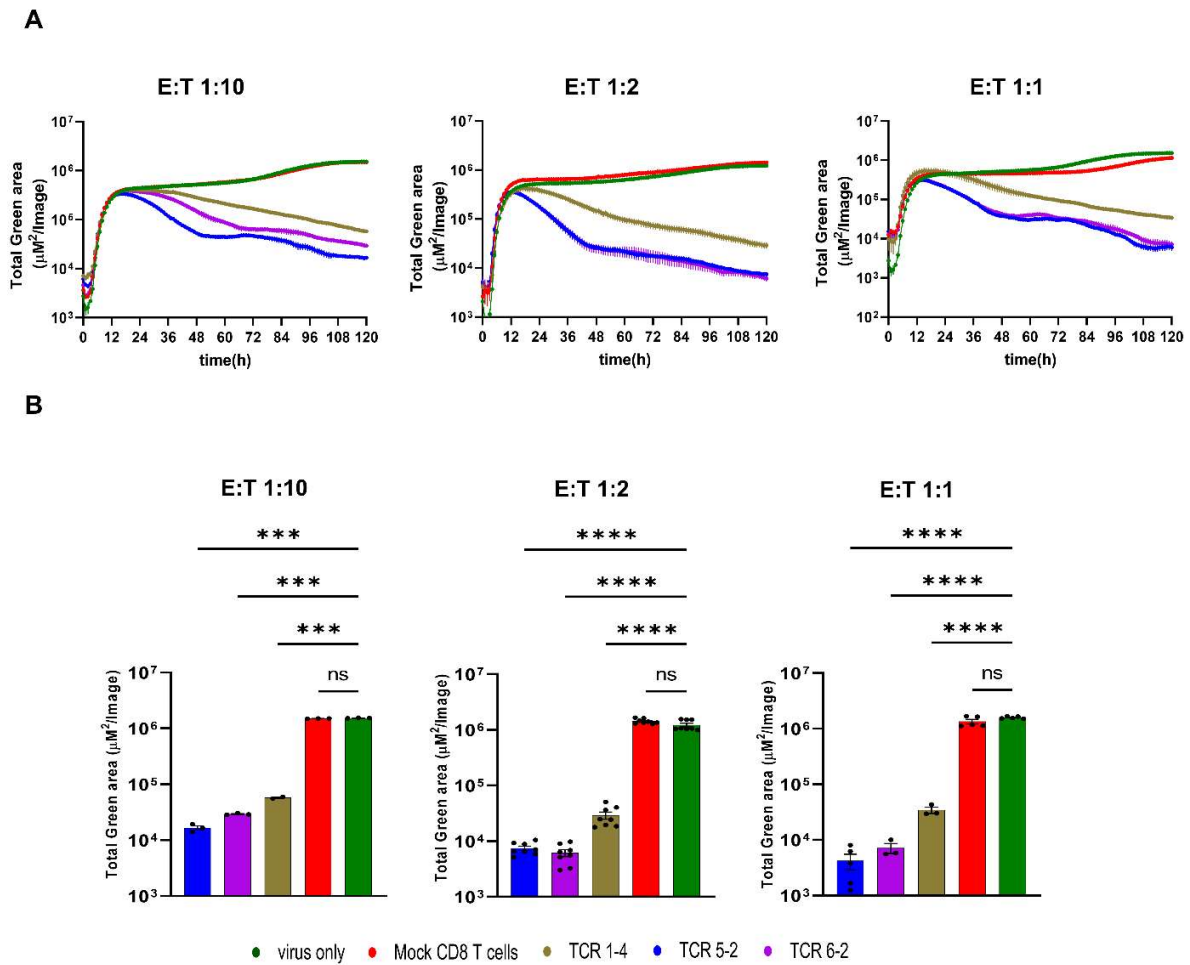


### Supplementary Figure 1

Flow cytometric validation of transgenic CD8<sup>+</sup> mTCR<sup>+</sup> cell purification efficiency. CD8 T cells were transfected with retroviruses expressing the indicated TCR and grown for 3-7 days. Transduction efficiency was validated by Flow cytometry staining of CD8<sup>+</sup> mTCR<sup>+</sup> cells (upper panel) and the same was performed upon MACS-sorting of mTCR<sup>+</sup> CD8 T cells (lower panel) to control the purity of T-cells used in co-culture experiments. Representative purities are shown, no cultures with <80% of mTCR<sup>+</sup> cells have been used in any experiment.

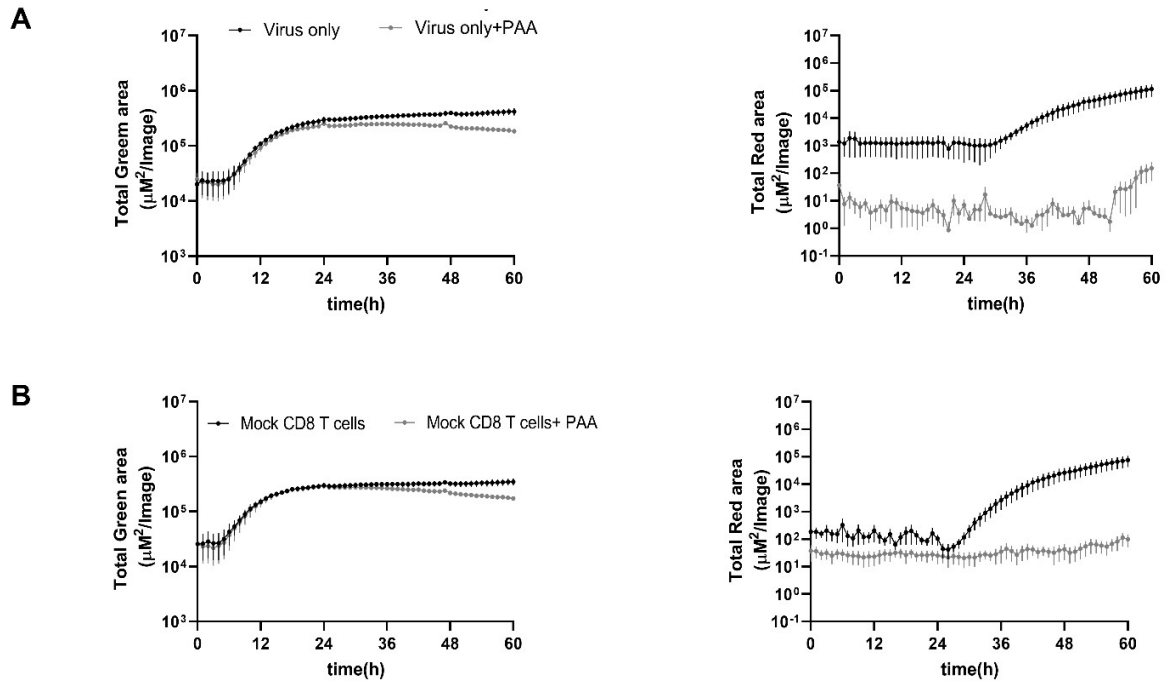
**A****B****Supplementary Figure 2**

Early expression of pp65 gene and recognition by pp65-specific CD8 T cells. MRC-5 cells were infected with TB40<sup>IE<sub>mNG</sub></sup> at a MOI of 1 and co-cultured with pp65-specific CD8 T cells transfected with the Intermediate-avidity TCR 1-4 at 1:10, 1:2 and 1:1 E:T. Total Green area indicated on the y-axes corresponds to mNeonGreen-*ie1/2* expression, indicating viral loads plotted for up to 96h (Left panel) or 24 hours (Right panel) post infection in ARMATA. Each data point corresponds to the average  $\pm$  SEM of biological duplicates from two independent experiments. (B) Representative images of co-culture at 24 hpi showing control of TB40<sup>IE<sub>mNG</sub></sup>- infected MRC-5 cells at indicated E:T ratios of Intermediate-avidity CD8 T cells.



### Supplementary Figure 3

Antiviral activity of transgenic pp65-specific CD8 T cells against HCMV<sup>3F</sup>. (A) MRC-5 cells were infected with TB40/HCMV<sup>3F</sup> at MOI of 0.1 and co-cultured with CD8 T cells transfected with indicated pp65-specific TCRs at 1:10, 1:2 and 1:1 E:T. Total Green area indicated on the y-axes corresponds to mNeonGreen-ie1/2 expression indicating viral loads plotted for up to 120 hpi in ARMATA. (B) Representative plots showing endpoint green area. Each symbol corresponds to a biological replicate at indicated E:T ratios, pooled from  $\geq 3$  independent experiments. Histograms depict means  $\pm$  SEM. Statistical analysis was done using Welch ANOVA and Dunnett's T3 test. \*\*\*P < 0.001 \*\*\*\*P < 0.0001, P > 0.05 not significant (ns).



**Supplementary Figure 4**

Immediate-early and late gene expression dynamics of HCMV<sup>3F</sup> reporter genes in the presence or absence of PAA. MRC-5 cells were infected with HCMV<sup>3F</sup> at MOI 0.1 and were either left untreated or treated with PAA (100  $\mu\text{g/ml}$ ) at the time of infection. Total Green area shown on y-axes of graphs on the left side corresponds to mNeonGreen-ie1/2 while Total Red area shown on y-axes of graphs on the right side represent SCP-mCherry expression, indicating viral loads in distinct stages of the lytic replication cycle plotted for up to 60 hpi. Panel A shows signals in cells infected in absence of any T cells, and panel B the cells that were treated with mock-TCR transfected CD8 T cells. Each data point corresponds to independent biological replicates ( $n=4$ ) from two individual experiments. Data with error bars depict mean  $\pm$  SEM.