

## **T cell Proliferation Assays.**

**CMV specific T cell Proliferation Assays.** Mononuclear cells ( $1-3 \times 10^6$ ) isolated from blood or tissues, were cultured in 96 well tissue culture plates at  $5 \times 10^5$  cells/mL RPMI-1640, 10% FBS, 1mM sodium pyruvate, 100 U/mL penicillin, 100ug/mL streptomycin, 2mM L-glutamine, and 100 $\mu$ M  $\beta$ -Mercaptoethanol in presence of 0.3 $\mu$ g/mL HCMV pp65 peptide mix (JPT Peptide Technology). IL-2 100U/mL was added on day 2 and cells were analyzed at day 8 or 9 after stimulation.

HLA multimer reagents containing epitopes of CMV (CMV-multimers) were obtained from Prommune (Table S8, D194, D199, D249). Staining with multimers was done according to the manufacturers protocols. Briefly, cells isolated from bone marrow, blood, and lymph nodes were washed with PBS and stained for 10mins at 37°C with tetramer reagent. Cells were washed and subsequently stained with other antibodies for downstream analysis as described in methods.