Supplemental Figure 1. ***The Vβ repertoire of ex vivo BMLF1-specific T cells is skewed from that of the ungated CD8 T cell population.*** CD8 T cells were isolated from the peripheral blood of donor D-002 and were immediately co-stained with BMLF1-specific tetramer and Vβ-specific antibodies. The bar graph illustrates the % of BMLF1 tetramer+ cells (black bars) using each respective Vβ family and compares it to the repertoire of the ungated CD8 T cell population (grey bars).

Supplemental Figure 2. ***Each tetramer-defined sub-population of a T cell line has a distinct Vβ repertoire as compared to tetramer negative population.*** **a)** CD8 T cells isolated from patient E1101 were cultured for 3 weeks in the presence of M1-pulsed T2 cells before being co-stained with M1- and BMLF1-specific tetramers. Following incubation with tetramers, cells were stained with Vβ-specific antibodies. Each bar graph illustrates the % of cells within its respective tetramer-defined gate that use each Vβ family as compared to the tetramer negative population. **(b)** CD8 T cells isolated from patient E1101 were cultured for 3 weeks in the presence of BMLF1-pulsed T2 cells before being co-stained with M1- and BMLF1-specific tetramers. Following incubation with tetramers, cells were stained with Vβ-specific antibodies. The bar graph illustrates the % of BMLF1-tetramer+ cells that use each Vβ family as compared to the tetramer negative population.

Supplemental Figure 3. ***The Vβ repertoire of cross-reactive cells is often comprised of multiple Vβ families.*** CD8 T cells were isolated from 4 healthy donors and 5 patients with IM. CD8 T cells were cultured for 3-4 weeks in the presence of M1-pulsed T2 cells before being co-

stained with M1- and BMLF1-specific tetramers followed by Vβ-specific antibodies. Three tetramer-defined gates were analyzed separately: M1+ BMLF1+ (CXR-1), M1- BMLF1+ (CXR-2), and M1+ BMLF1- (non-cross-reactive M1). CD8 T cells were cultured for 3-4 weeks in the presence of BMLF1-pulsed T2 cells before being stained with tetramers and Vβ-specific antibodies. The Vβ usage of M1- BMLF1+ (non-cross-reactive BMLF1) cells was assessed. This graph demonstrates the number of patients using a particular Vβ in each of these subsets. The results from the two crossreactive populations were pooled.