Supplemental Figure 1

A)

CD8 and tetramer staining of three wells from a 48 well plate are shown. It is not uncommon to have wells with 20% or higher CD8+, tet+ MART-1 specific cells.

B)

Percentage CD8+, tetramer+ cells for each well of a 48 well plate are shown following 2 stimulations using MART-1 peptide (M27). Even when high proportions of CD8+, tet+ cells are not seen, there are usually detectable CD8+, tet+ populations in each well of a 48 well plate.
Supplemental Figure 2

Supplemental Figure 2: CD8 and NY-ESO-1 Tetramer staining of fully expanded, clinical grade products.
Supplemental Figure 3: Expression of markers of memory phenotype CD45RO, CD27, CD28, CD62L, CCR7, and CD127 (blue) and controls (red).
Supplemental Figure 4: IFN gamma and TNF alpha of fully expanded clinical grade products following co-culture with peptide pulsed and un-pulsed T2 lymphocytes.
Supplemental Figure 5: Chromium release assay demonstrating specific lysis of the SS tumor line SYO-1 and the MRCL tumor line 402 at a 20:1 effector to target ratio. Because these tumor lines do not express the HLA A*0201, they were transfected with a lentivirus encoding for A*0201, purified for the A02 expressing cells by flow sorting and grown in culture prior to this assay.
Supplemental Figure 6: V$\beta$ spectratyping of each fully expanded clinical products.
Supplemental Figure 6 (continued)

Patient 3

Patient 4
Supplemental Figure 6 (continued)

Patient 5

Patient 6
Supplemental Figure 7: T cell products are oligoclonal.

A) Number of dominant peaks on spectratyping of the final product related to the number of positive wells containing NY-ESO-1 specific T cells after DC stimulation and the number of wells used for cell sorting and expansion.

B) Pie chart showing most common sequences seen in the final T cell products for Patients 1 and 4.