

Supplementary Materials

Supplementary Fig. S1. T cell activation over time following treatment with ipilimumab and GM-CSF. The absolute numbers of Ki67+ CD4+ CD3+ FOXP3- T cells are shown from week 0-16 for (A) all patients and (B) separated by IRAE (red) and non_IRAE (black). The median and interquartile ranges are shown. Absolute numbers of Ki67+ CD4- CD3+ T cells are shown for (C) all patients (n = 21 across all timepoints) and (D) separated by IRAE (red, n = 11 patients across all timepoints) and non_IRAE (black, n = 10 patients across all timepoints). The median and interquartile ranges are again shown. Units for absolute numbers displayed are $\times 10^3$ per mcl.

Supplementary Fig. S2. Clonality over time following treatment with ipilimumab and GM-CSF. (A) All available data from baseline (week 0) and post-treatment timepoints up to week 12 are shown. Data from 35 patients are shown; each patient's clonality tracing is highlighted with a distinct color. (B) Relative clonality (= clonality at each timepoint divided by clonality at the immediately preceding timepoint) is shown for all patients at each timepoint. Declines in clonality are seen at week 2 and week 6. The median and interquartiles are shown for each timepoint.

Supplementary Fig. S3. Changes in clonotype frequency in CD4+ and CD8+ T cells with ipilimumab and GM-CSF. (A) The fraction of CD4 and CD8 clonotypes, which are found only at week 2 ("Week 2 only"), only at week 0 ("Week 0 only"), or at both timepoints ("Both") for all patients is shown. (B) CD4 and CD8 clonotypes are binned to analyze fold change in clonal frequency, ie the fraction of clones where the ratio of frequencies at week 2 divided by week 0 is greater than 4 ("Increased"), less than 0.25 ("Decreased"), or between 0.25 and 4 ("Unchanged"). The median and interquartiles are shown.





