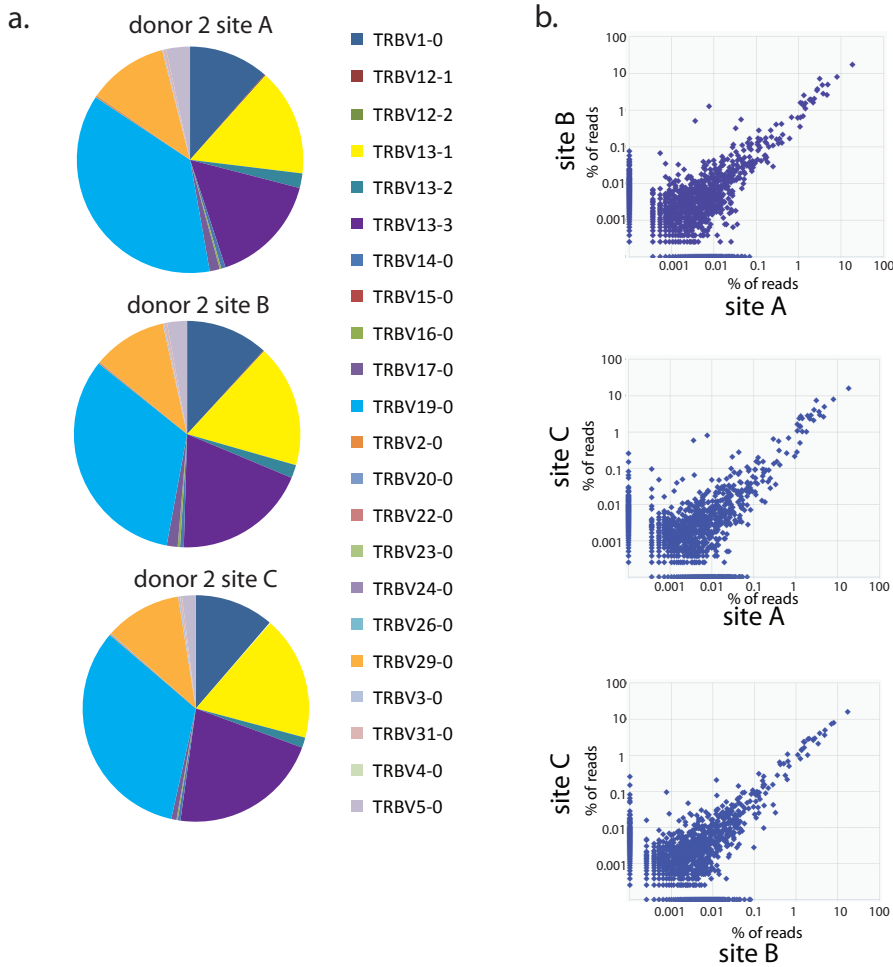


Supplementary Figure 1.



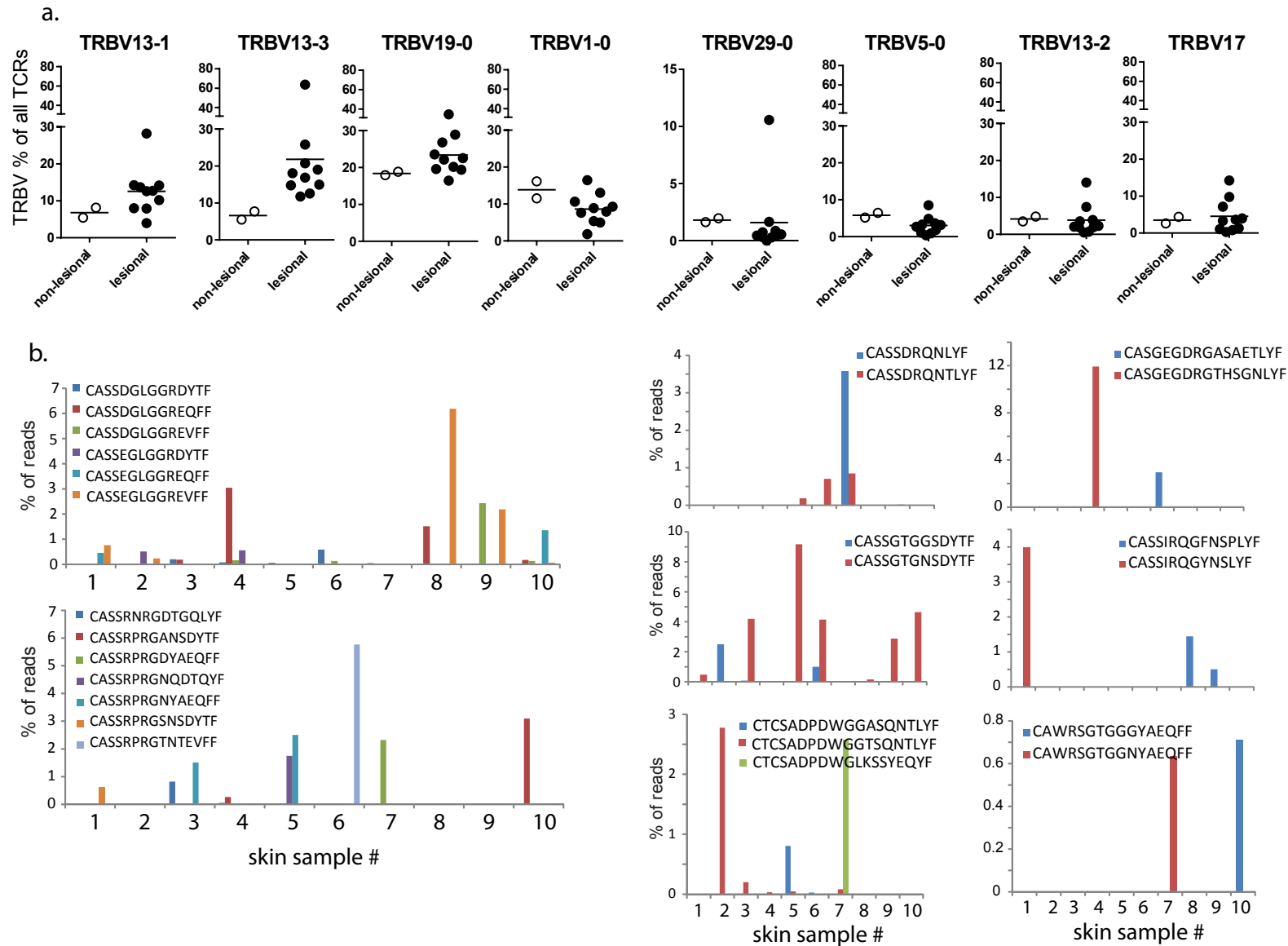
Supplementary Figure 1. Highly similar TCR repertoires in distinct affected skin sites.

Skin biopsies taken from 3 non-adjacent sites (A, B, C) on a C3H-HeJ mouse with spontaneous AA and TCR β chains were sequenced by high throughput sequencing.

Pie charts depict the TRBV usage of the T cell repertoires at distinct sites (a).

Frequencies (% of reads) of individual CDR3 β sequences were compared between the different skin locations. Each dot represents a unique sequence (b).

Supplementary Figure 2.

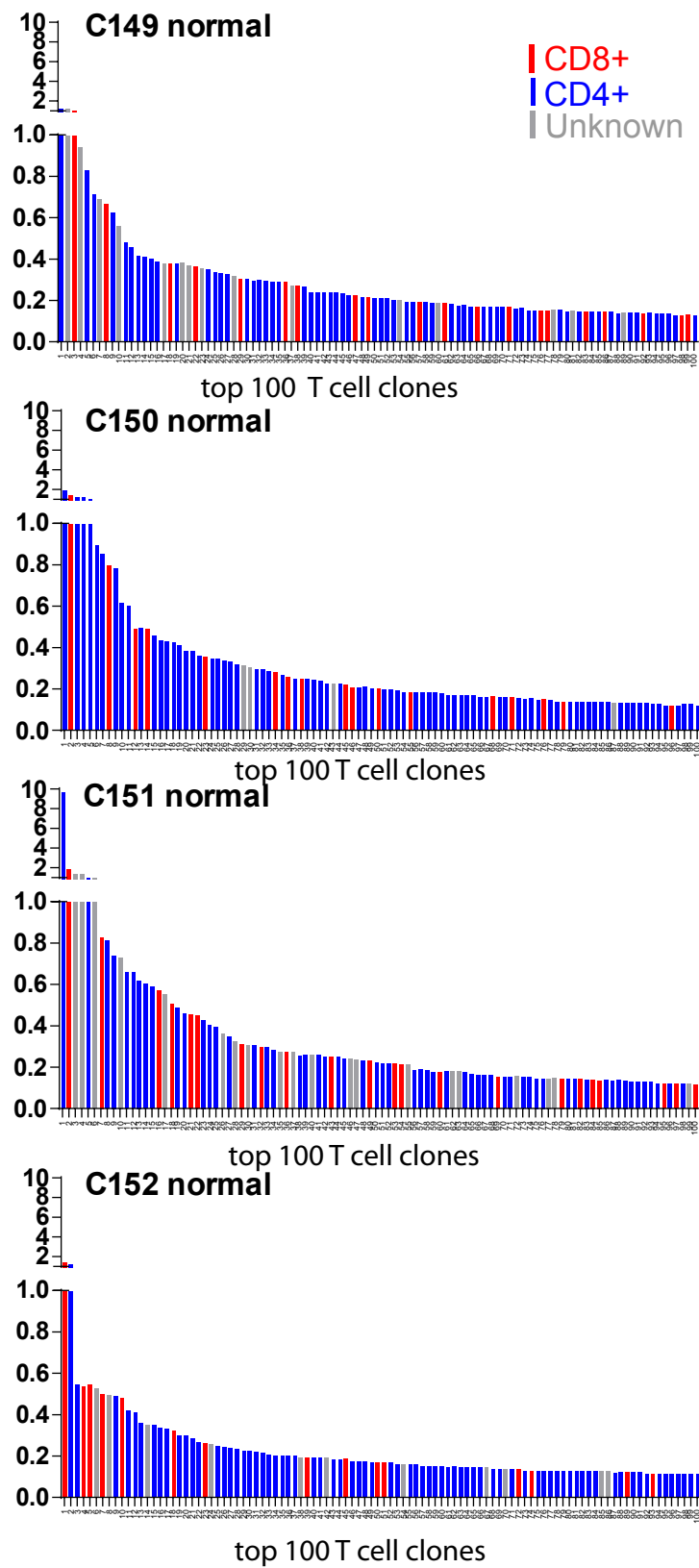


Supplementary Figure 2. Shared motifs in CDR3 β protein sequences

The percentage of TCR β chains with indicated variable region usage in non-lesional and lesional AA skin are plotted (**a**).

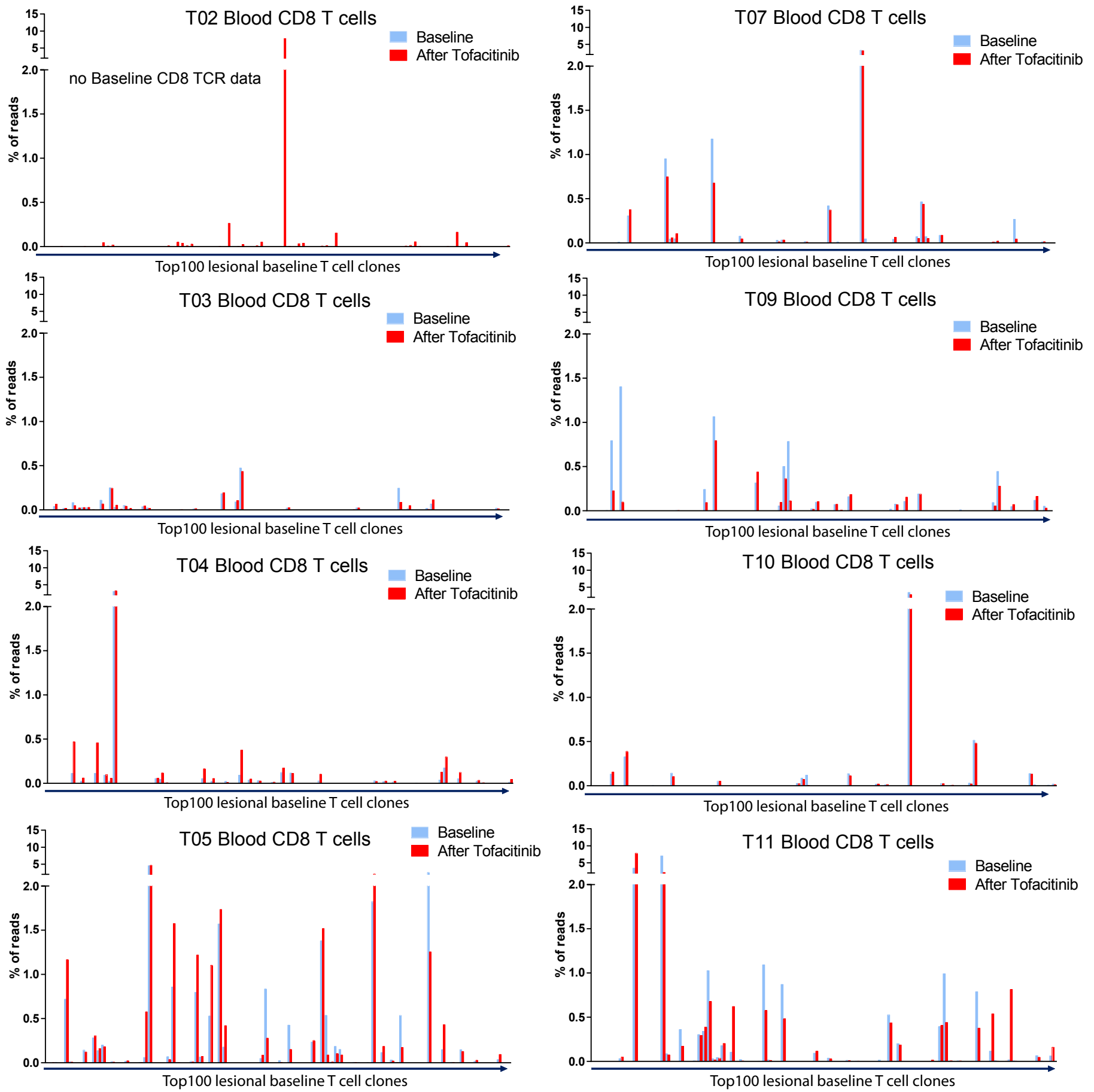
Depicted are the frequencies of the indicated CDR3 β regions with similar amino acid sequences within the individual affected skin samples (1-10). Sequences that were detected in unaffected skin at frequencies $>0.05\%$ were omitted from the analysis (**b**).

Normal Controls (scalp)



Supplementary Figure 3. Majority of expanded T cell clones in normal scalp are CD4+
 TCR sequencing of normal scalp biopsies and CD4+ and CD8+ T cell subsets from the same patient allowed us to cross reference the scalp T cell clones with the T cell subsets and determine which clones were CD4 and which were CD8. Depicted are the top100 most abundant clones in the scalp and the number of reads for each clone (red bars = CD8, blue bars = CD4, grey bars = unknown)

Supplementary Figure 4



Supplementary Figure 4. Frequency of expanded lesional CD8+ T cell clones before and after Tofacitinib

The graph depicts the top 100 lesional T cell clones in AA scalp (at baseline), and the frequency (% of total reads) with which these T cell clones are detected in the CD8+ T cell fraction of the peripheral blood at baseline (blue bars) and after 24 weeks of Tofacitinib (red bars).

Supplementary Table 1

Patient ID	AA	SALT (%) Baseline	SALT(%) Lowest recorded score after Tofacitinib
T01	AU	100	15
T02	AAP	46	11
T03	AAP	49	19
T04	AAP	84	0
T05	AU	100	99
T06	AAP	58	51
T07	AU	100	50
T08	AAP	92	80
T09	AAP	52	3
T10	AU	100	21
T11	AU	100	13
T12	AAP	95	87

Patients enrolled in the open-label Tofacitinib study

Highlighted cells indicate the AA patients from whom we were able to assess the TCR repertoire both at baseline and at 24 wks (or more) of treatment with Tofacitinib.