

Supplementary Table 1: List of top 50 gene correlates of Ki67 from RNA sequencing of purified CD8 T cells at serial timepoints.

Gene	Corr	Gene	Corr	Gene	Corr	Gene	Corr	Gene	Corr
<i>MKI67</i>	1	<i>HLA.DRB1</i>	0.802198	<i>CD38</i>	0.747253	<i>BPGM</i>	0.714286	<i>TRBV28</i>	-0.73077
<i>CTLA4</i>	0.884615	<i>EPB41L4A</i>	0.801117	<i>RFC2</i>	0.74553	<i>ANKS6</i>	-0.70426	<i>PPAN</i>	-0.73453
<i>HLA.DQB1</i>	0.884615	<i>FADS2</i>	0.79952	<i>ORMDL3</i>	0.741758	<i>FAM213B</i>	-0.70621	<i>PCDH1</i>	-0.73453
<i>CENPF</i>	0.873626	<i>CDCA7</i>	0.785127	<i>COL5A3</i>	0.740343	<i>TRIO</i>	-0.70702	<i>C9orf89</i>	-0.73829
<i>RRM2</i>	0.855572	<i>HAVCR2</i>	0.78022	<i>TP53I11</i>	0.737277	<i>ZNF823</i>	-0.70799	<i>RP11.173A16.2</i>	-0.74003
<i>KIR3DX1</i>	0.851243	<i>LDLR</i>	0.769231	<i>HLA.K</i>	0.737277	<i>DKK3</i>	-0.71626	<i>CXXC5</i>	-0.74102
<i>KIF19</i>	0.846154	<i>FBXO5</i>	0.763736	<i>LMNB1</i>	0.730769	<i>ZNF605</i>	-0.72527	<i>RP11.213G2.3</i>	-0.74176
<i>ARHGAP11A</i>	0.82967	<i>ITGAD</i>	0.760519	<i>PRKAR1B</i>	0.724521	<i>VSIG1</i>	-0.72902	<i>GLTPD1</i>	-0.74176
<i>IFI6</i>	0.813187	<i>ALDOC</i>	0.758242	<i>CLSPN</i>	0.71978	<i>MAMLD1</i>	-0.72988	<i>IKZF2</i>	-0.74725
<i>SYNGR1</i>	0.802198	<i>GAMT</i>	0.751393	<i>UBE2L6</i>	0.714286	<i>DBN1</i>	-0.73077	<i>VCAN</i>	-0.75929

Supplementary Table 2: TCR sequences present among top 10 clones in the tumor and identified in peripheral blood.

14784	Nucleotide	AA	PBMC Freq (%)	TIL Freq (%)
1	CCCCTGATCTGAGTGCAGCCCAACCCAGACCTCTGTACTTCTGTGCCAGCAGTCTATTACGAGCAGTACTTCGGGCCG	CASSSYEQYF	8.04	0.31
2	AGTGCCATCTGAAGACAGCAGCTTCTACATCTGAGTGTAGGAGCACCGGGACTATGATTCGGCTGAGCAGTCTTCGGGCCA	CSARSTGMIRAEQFF	1.45	0.27
3	CTGACTGTGAGCAACATGAGCCCTGAAGACAGCAGCATATATCTGTGACGCTCAAGGGGGATCTCTGAAGCTTCTTTGGACAA	CSVQGGSPAEFF	1.38	0.22
4	CTAAACCTGAGCTCTGGAGCTGGGGACTCAGCTTTGATTTCTGTGCCAGCAGCTGTAGGGGATGAGCAGTCTTCGGGCCA	CASSVLGDEQFF	0.80	0.64
5	CTGAATGTGAAGCCTTGTGCTGGGGACTCGGCCCTATCTGTGCCAGCAGCTTTAGGTCCGGGGAGCTTTTTTGGAGAA	CASSFRSGELFF	0.43	0.25
6	CTGCTGGGGTGGAGCTCGGCTCCCTCCAAACATCTGTACTTCTGTGCCAGCCGAGGGTTTTGGCTACACCTTCGGTTCG	CASRQGFYTF	0.14	1.35
7	ACTCTGACGATCCAGCCACACAGCAGGAGGACTCGGCCGTATCTCTGTGCCAGCAGCTTAGGGTACACCATATATTTGGAGAG	CASSLGYTIYF	0.03	1.56
8	CAGCCCTGCAGCCAGAACTCAGCCCTGTATCTGTGCCAGCAGCAAGTGCCTAGCGGCCCTACGAGCAGTACTTCGGGCCG	CASSQVPSGPEYQF	0.03	0.82
9	ACCAGTCCCACTCTGAAGACAGCAGCTTCTACATCTGAGTGTCCGGGGATCGGGCAGCGGGGACTGAAGCTTCTTTGGACAA	CSAPGIGRRGTEAFF	0.00	0.27
10	GCTGCTCCCTCCAGACATCTGTACTTCTGTGCCAGCAGTCTAACAGGGGTGGTATATACACCGGGAGCTTTTTTGGAGAA	CASLTGVVIYTGELFF	0.00	0.27
12288	Nucleotide	AA	PBMC Freq (%)	TIL Freq (%)
1	CTGAAGTCCAGCCCTCAGAACCAGGGAAGCTCAGCTGTACTTCTGTGCCAGCAGTCCCTTGGGTACGAGCAGTACTTCGGGCCG	CASSPLGYEQYF	2.37	0.42
2	AGCACCTTGGAGCTGGGGACTCGGCCCTTATCTTTGCGCCAGCAGCGGGGGACAGCCAGCTCTCAGCAGCAGTACTTCGGGCCG	CASSGGQASSYEQYF	0.30	0.58
3	ATCCGCTCCACAAAGCTGGAGGACTCAGCCATGTACTTCTGTGCCAGCAGGACAAAGACCAGAACACTGAAGCTTCTTTGGACAA	CASRGQDQNTAEFF	0.24	0.89
4	CTCAGGCTGGAGCTCGGCTCCCTCCAGACATCTGTACTTCTGTGCCAGCAGTGAACAGCAGCAGTGAAGCTTCTTTGGACAA	CASSETDTEAFF	0.04	0.51
5	CACCTACACACCCTGCAGCCAGAAGACTCGGCCGTATCTCTGTGCCAGCAGCAAAATCGGGGATAAGAGGCTTCTTTGGACAA	CASSQIGDKTAEFF	0.02	1.12
6	AAGATCCAGCCTGCAGAGCTTGGGACTCGGCCGTATCTCTGTGCCAGCAGCATACAAACACCGGGAGCTTTTTTGGAGAA	CASSHTNTGELFF	0.01	0.57
7	TTGGAGTCCGCTGCTCCCTCCAAACATCTGTACTTCTGTGCCAGCAGTACGGGGGACAGGGGCTGAAGCTTCTTTGGACAA	CASSYGGQGPEAFF	0.01	0.44
8	GAGATCCAGCAGCAGCAGCAGGGGACTCGGCCATGTATCTCTGTGCCAGCAGTCTAGTCCGGGGGAGGGAAGCTTCTTTGGACAA	CASSLVGGREAFF	0.00	1.30
14835	Nucleotide	AA	PBMC Freq (%)	TIL Freq (%)
1	CAGCCCTGCAGCCAGAAGACTCAGCCCTGTATCTGTGCCAGCAGCTGGACAGGGGTATAATCAGCCCAAGCATTTCGGTGTAT	CASSLDRGYNQPQHF	23.03	1.09
2	CAACTGCAAGCTTGGAGACTCGGCCGTGTATCTGTGCCAGCAGCTTAATGGGGAGATGAACACTGAAGCTTCTTTGGACAA	CASSFNGEMNTEAFF	0.01	1.36
13416	Nucleotide	AA	PBMC Freq (%)	TIL Freq (%)
1	TTGGAGATCCAGCCACAGCAGCAGGGGACTCGGCCATGTATCTCTGTGCCAGCAGCTTCTCTTCCACCTCCACTTTGGGAAC	CASSLSSSPLHF	15.16	1.42
2	TCTAAGAAGCTCTCTCAGTACTCTGGCTTCTATCTCTGTGCCAGCAGGGGAGGCGACTATGGCTACACCTTCGGTTCG	CAFVSRGGDYGYTF	14.59	0.65
3	CTGAGCTCTCTGGAGCTGGGGACTCAGCTTTGATTTCTGTGCCAGCAGCCTCCGGCTGGGGCTGAAGCTTCTTTGGACAA	CASSASAWAAEAF	7.38	1.34
4	ATGAGCTCCTTGGAGCTGGGGACTCAGCCCTGTACTTCTGTGCCAGCAGCTCAGGACTAGGTGGAATGAGCAGTCTTCGGGCCA	CASSRTRWNEQFF	6.73	0.78
5	CTGAAGTCCAGCCCTCAGAACCAGGGAAGCTCAGCTGTACTTCTGTGCCAGCAGTGTAACTATGGCTACACCTTCGGTTCG	CASSSANYGYTF	2.26	1.94
6	GAACCTGAACATGAGCTCTTGGAGCTGGGGACTCAGCCCTGTACTTCTGTGCCAGCAGTCTATCTGATACGAGTATTTGGCCAA	CASSSDTQYF	0.00	0.82
13471	Nucleotide	AA	PBMC Freq (%)	TIL Freq (%)
1	TCTCTGGAGCTGGGGACTCAGCTTTGATTTCTGTGCCAGCAGCTAGGGGCTGTGAAACACCATATATTTTGGAGAG	CASSVDRGSGNTIYF	5.80	0.60
2	TCCGCTACCACTCCAGACACTGTGTACTTCTGTGCCAGCAGTACCTCGGCCGCCGCCAGATACGAGTATTTTGGCCCA	CAISDLGGPAADTQYF	0.84	0.29
14746	Nucleotide	AA	PBMC Freq (%)	TIL Freq (%)
1	CCCAGCCCAACAGCAGCTCTGTACTTCTGTGCCAGCAGTTATGGGGCGGGGAGCTCTCAATAGCAGTCTTCGGGCCA	CASSLWGGSSYNEQFF	9.96	3.54
2	CAGCCTGCAGAACTGGAGATTCTGGAGTTTATTCTGTGCCAGCAGCAACTGACAGGGGCTGACACTGAAGCTTCTTTGGACAA	CASSQLTGADTEAFF	0.40	0.59

Pre – Tumor Burden

Rank	Immune Subset	IS
1	CD8/Lag3+ Freq. of Parent (%)	9.55
2	CD8/Ki67+ Freq. of Parent (%)	9.46
3	CD4 Freq. of Parent (%)	5.66
4	CD4/Non-Tregs/Q4: CD45RA- , CD27- Freq. of Parent (%)	4.75
5	CD4/Tregs/Tim3+ Freq. of Parent (%)	3.05
6	CD8 Freq. of Parent (%)	2.96
7	CD4/Non-Tregs/Q1: CD45RA- , CD27+ Freq. of Parent (%)	2.57
8	CD8/Eomes+ Freq. of Parent (%)	0.76
9	CD8/Tim3+ Freq. of Parent (%)	0.51
10	CD8/Gzmb+ Freq. of Parent (%)	0.44
11	CD8/naive Freq. of Parent (%)	0.22
12	CD4/Non-Tregs/Q3: CD45RA+ , CD27- Freq. of Parent (%)	0.19
13	CD4/Non-Tregs/Q2: CD45RA+ , CD27+ Freq. of Parent (%)	-0.04
14	CD8/Q23: CD45RA+ , CD27- Freq. of Parent (%)	-0.23
15	CD4/Tregs/PD1+ Freq. of Parent (%)	-0.54
16	CD8/PD1+ Freq. of Parent (%)	-0.61
17	CD8/Q24: CD45RA- , CD27+ Freq. of Parent (%)	-0.66
18	CD4/Non-Tregs/Lag3+ Freq. of Parent (%)	-1.24
19	CD8/Q21: CD45RA- , CD27+ Freq. of Parent (%)	-1.39
20	CD8/Q22: CD45RA+ , CD27+ Freq. of Parent (%)	-1.81
21	CD4/Non-Tregs/CTLA4+ Freq. of Parent (%)	-1.83
22	CD8/CD160+ Freq. of Parent (%)	-2.09
23	CD4/Non-Tregs/PD1+ Freq. of Parent (%)	-2.15
24	CD4/Tregs/naive Freq. of Parent (%)	-2.16
25	CD4/Non-Tregs/Eomes+ Freq. of Parent (%)	-2.19
26	CD4/Non-Tregs/Ki67+ Freq. of Parent (%)	-2.93
27	CD4/Tregs Freq. of Parent (%)	-3.09
28	CD8/CTLA4+ Freq. of Parent (%)	-3.30
29	CD4/Tregs/Ki67+ Freq. of Parent (%)	-3.73
30	CD4/Tregs/Eomes+ Freq. of Parent (%)	-3.96
31	CD4/Tregs/naive Freq. of Parent (%)	-4.01
32	CD4/Tregs/Lag3+ Freq. of Parent (%)	-4.08
33	CD8/Tbet+ Freq. of Parent (%)	-4.78
34	CD8/Gzmb+ Freq. of Parent (%)	-4.82
35	CD4/Tregs/Gzmb+ Freq. of Parent (%)	-4.82
36	CD4/Non-Tregs/Tbet+ Freq. of Parent (%)	-7.01
37	CD4/Non-Tregs/Gzmb+ Freq. of Parent (%)	-7.48
38	CD4/Tregs/CTLA4+ Freq. of Parent (%)	-7.61
39	CD4/Non-Tregs Freq. of Parent (%)	-7.85

Wk3 – Tumor Burden

Rank	Immune Subset	IS
1	CD8/Ki67+ Freq. of Parent (%)	32.47
2	CD4/Non-Tregs/PD1+ Freq. of Parent (%)	17.58
3	CD8/Lag3+ Freq. of Parent (%)	13.41
4	CD4/Tregs/Tim3+ Freq. of Parent (%)	11.47
5	CD8/CTLA4+ Freq. of Parent (%)	8.04
6	CD4/Non-Tregs/Lag3+ Freq. of Parent (%)	6.75
7	CD4/Non-Tregs/Ki67+ Freq. of Parent (%)	5.92
8	CD4/Non-Tregs/CTLA4+ Freq. of Parent (%)	2.74
9	CD8/PD1+ Freq. of Parent (%)	2.24
10	CD8/Tim3+ Freq. of Parent (%)	1.79
11	CD8/Eomes+ Freq. of Parent (%)	0.95
12	CD4/Tregs/Tbet+ Freq. of Parent (%)	0.42
13	CD8/naive Freq. of Parent (%)	0.24
14	CD4/Tregs/PD1+ Freq. of Parent (%)	0.23
15	CD4 Freq. of Parent (%)	-0.23
16	CD8/Q21: CD45RA- , CD27+ Freq. of Parent (%)	-0.51
17	CD8/Q22: CD45RA+ , CD27+ Freq. of Parent (%)	-0.67
18	CD4/Tregs/Gzmb+ Freq. of Parent (%)	-0.71
19	CD8/Q24: CD45RA- , CD27- Freq. of Parent (%)	-0.74
20	CD4/Tregs/naive Freq. of Parent (%)	-1.01
21	CD4/Non-Tregs/Tim3+ Freq. of Parent (%)	-1.10
22	CD4/Non-Tregs/Q3: CD45RA+ , CD27- Freq. of Parent (%)	-1.15
23	CD4/Tregs/Eomes+ Freq. of Parent (%)	-1.35
24	CD4/Non-Tregs/Q2: CD45RA+ , CD27+ Freq. of Parent (%)	-1.38
25	CD8/CD160+ Freq. of Parent (%)	-1.53
26	CD4/Non-Tregs/Gzmb+ Freq. of Parent (%)	-1.99
27	CD8/Gzmb+ Freq. of Parent (%)	-2.06
28	CD4/Non-Tregs/Q4: CD45RA- , CD27- Freq. of Parent (%)	-2.19
29	CD4/Non-Tregs Freq. of Parent (%)	-2.19
30	CD4/Non-Tregs Freq. of Parent (%)	-2.25
31	CD4/Tregs Freq. of Parent (%)	-2.28
32	CD8/Q23: CD45RA+ , CD27- Freq. of Parent (%)	-2.35
33	CD4/Non-Tregs/Eomes+ Freq. of Parent (%)	-2.43
34	CD4/Non-Tregs/Q1: CD45RA- , CD27+ Freq. of Parent (%)	-2.72
35	CD4/Tregs/Ki67+ Freq. of Parent (%)	-2.94
36	CD4/Non-Tregs/Tbet+ Freq. of Parent (%)	-3.27
37	CD4/Tregs/Lag3+ Freq. of Parent (%)	-3.36
38	CD8/Tbet+ Freq. of Parent (%)	-3.83
39	CD4/Tregs/CTLA4+ Freq. of Parent (%)	-5.76

Pre – PFS

Rank	Immune Subset	IS
1	CD8/CD160+ Freq. of Parent (%)	30.75
2	CD8/Ki67+ Freq. of Parent (%)	14.48
3	CD4/Non-Tregs/Q3: CD45RA+ , CD27- Freq. of Parent (%)	11.54
4	CD8/Lag3+ Freq. of Parent (%)	7.30
5	CD4/Non-Tregs/Q4: CD45RA- , CD27- Freq. of Parent (%)	3.66
6	CD4/Tregs/Lag3+ Freq. of Parent (%)	3.53
7	CD4/Non-Tregs/Ki67+ Freq. of Parent (%)	3.15
8	CD8/Tbet+ Freq. of Parent (%)	2.71
9	CD8/Gzmb+ Freq. of Parent (%)	2.04
10	CD4/Non-Tregs/CTLA4+ Freq. of Parent (%)	1.63
11	CD4/Non-Tregs/Tbet+ Freq. of Parent (%)	1.23
12	CD8/Q22: CD45RA- , CD27+ Freq. of Parent (%)	0.70
13	CD4/Non-Tregs/PD1+ Freq. of Parent (%)	0.70
14	CD8/CTLA4+ Freq. of Parent (%)	0.42
15	CD8/Eomes+ Freq. of Parent (%)	0.22
16	CD4/Non-Tregs/Eomes+ Freq. of Parent (%)	-0.39
17	CD4 Freq. of Parent (%)	-0.49
18	CD4/Non-Tregs/Lag3+ Freq. of Parent (%)	-0.66
19	CD4/Non-Tregs/Tim3+ Freq. of Parent (%)	-1.02
20	CD8 Freq. of Parent (%)	-1.58
21	CD4/Non-Tregs/PD1+ Freq. of Parent (%)	-1.61
22	CD4/Tregs/Tim3+ Freq. of Parent (%)	-1.81
23	CD8/Q23: CD45RA+ , CD27- Freq. of Parent (%)	-1.82
24	CD4/Tregs/Ki67+ Freq. of Parent (%)	-2.14
25	CD4/Non-Tregs Freq. of Parent (%)	-2.90
26	CD4/Tregs/Tbet+ Freq. of Parent (%)	-2.98
27	CD8/naive Freq. of Parent (%)	-3.09
28	CD8/Tim3+ Freq. of Parent (%)	-3.28
29	CD8/Q24: CD45RA- , CD27- Freq. of Parent (%)	-3.60
30	CD4/Tregs/naive Freq. of Parent (%)	-3.61
31	CD8/Q21: CD45RA- , CD27+ Freq. of Parent (%)	-3.95
32	CD4/Tregs/CTLA4+ Freq. of Parent (%)	-3.99
33	CD4/Non-Tregs/Q1: CD45RA- , CD27+ Freq. of Parent (%)	-4.00
34	CD8/PD1+ Freq. of Parent (%)	-4.20
35	CD4/Tregs/Gzmb+ Freq. of Parent (%)	-4.65
36	CD4/Tregs Freq. of Parent (%)	-5.03
37	CD4/Non-Tregs/Gzmb+ Freq. of Parent (%)	-5.20
38	CD4/Tregs/Eomes+ Freq. of Parent (%)	-5.83
39	CD4/Non-Tregs/Q2: CD45RA+ , CD27+ Freq. of Parent (%)	-6.61

Wk3 – PFS

Rank	Immune Subset	IS
1	CD4/Non-Tregs/Tbet+ Freq. of Parent (%)	18.02
2	CD4/Non-Tregs/Q3: CD45RA+ , CD27- Freq. of Parent (%)	16.01
3	CD8/CTLA4+ Freq. of Parent (%)	12.41
4	CD8/CTLA4+ Freq. of Parent (%)	10.32
5	CD4/Non-Tregs/Eomes+ Freq. of Parent (%)	6.45
6	CD4/Non-Tregs/Tbet+ Freq. of Parent (%)	3.49
7	CD8/Gzmb+ Freq. of Parent (%)	2.84
8	CD8 Freq. of Parent (%)	2.36
9	CD8/PD1+ Freq. of Parent (%)	1.51
10	CD4/Non-Tregs Freq. of Parent (%)	1.54
11	CD8/Q24: CD45RA- , CD27- Freq. of Parent (%)	1.34
12	CD8/Tim3+ Freq. of Parent (%)	1.16
13	CD4/Non-Tregs/Ki67+ Freq. of Parent (%)	0.88
14	CD8/Eomes+ Freq. of Parent (%)	0.66
15	CD4 Freq. of Parent (%)	0.58
16	CD4/Tregs/PD1+ Freq. of Parent (%)	0.39
17	CD4/Tregs/Ki67+ Freq. of Parent (%)	-0.38
18	CD4/Tregs/Eomes+ Freq. of Parent (%)	-0.46
19	CD8/Q22: CD45RA+ , CD27+ Freq. of Parent (%)	-0.83
20	CD4/Tregs/Lag3+ Freq. of Parent (%)	-0.91
21	CD4/Non-Tregs/PD1+ Freq. of Parent (%)	-0.92
22	CD4/Non-Tregs/Gzmb+ Freq. of Parent (%)	-1.06
23	CD8/CD160+ Freq. of Parent (%)	-1.56
24	CD4/Tregs/Tim3+ Freq. of Parent (%)	-1.74
25	CD4/Non-Tregs/CTLA4+ Freq. of Parent (%)	-2.05
26	CD4/Non-Tregs/Tim3+ Freq. of Parent (%)	-2.28
27	CD4/Tregs/naive Freq. of Parent (%)	-2.42
28	CD4/Non-Tregs/Lag3+ Freq. of Parent (%)	-2.67
29	CD8/Tbet+ Freq. of Parent (%)	-2.68
30	CD4/Non-Tregs/Q2: CD45RA+ , CD27+ Freq. of Parent (%)	-2.75
31	CD4/Non-Tregs/Q1: CD45RA- , CD27+ Freq. of Parent (%)	-2.88
32	CD4/Tregs/CTLA4+ Freq. of Parent (%)	-2.96
33	CD4/Non-Tregs/Q4: CD45RA- , CD27- Freq. of Parent (%)	-3.02
34	CD4/Tregs/Gzmb+ Freq. of Parent (%)	-3.12
35	CD8/Q23: CD45RA+ , CD27- Freq. of Parent (%)	-3.12
36	CD8/Q21: CD45RA- , CD27+ Freq. of Parent (%)	-4.06
37	CD8/naive Freq. of Parent (%)	-4.57
38	CD8/Ki67+ Freq. of Parent (%)	-5.08
39	CD8/Lag3+ Freq. of Parent (%)	-5.30

Supplementary Table 3: Bootstrap importance scores in 39 immune parameters predicted by changes in tumor burden (left), and progression free survival (right) generated by random forest analysis at pre treatment and week 3.