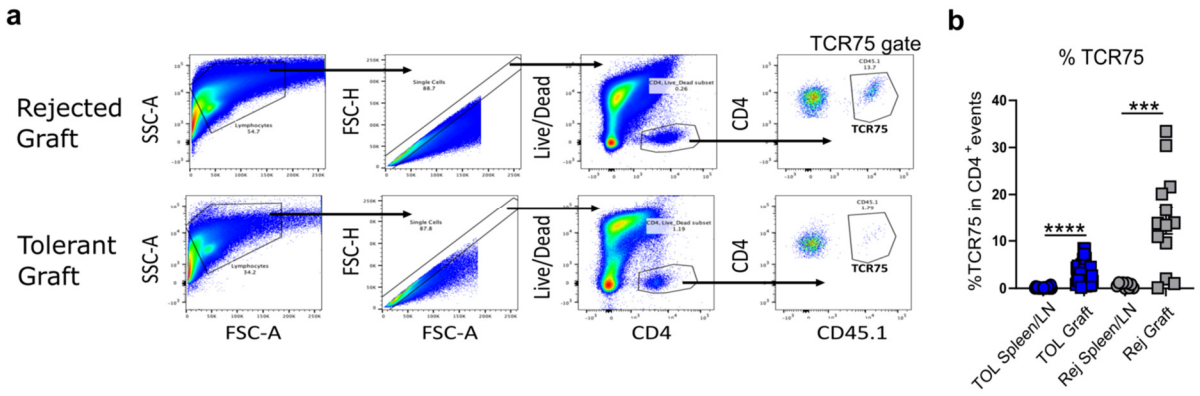
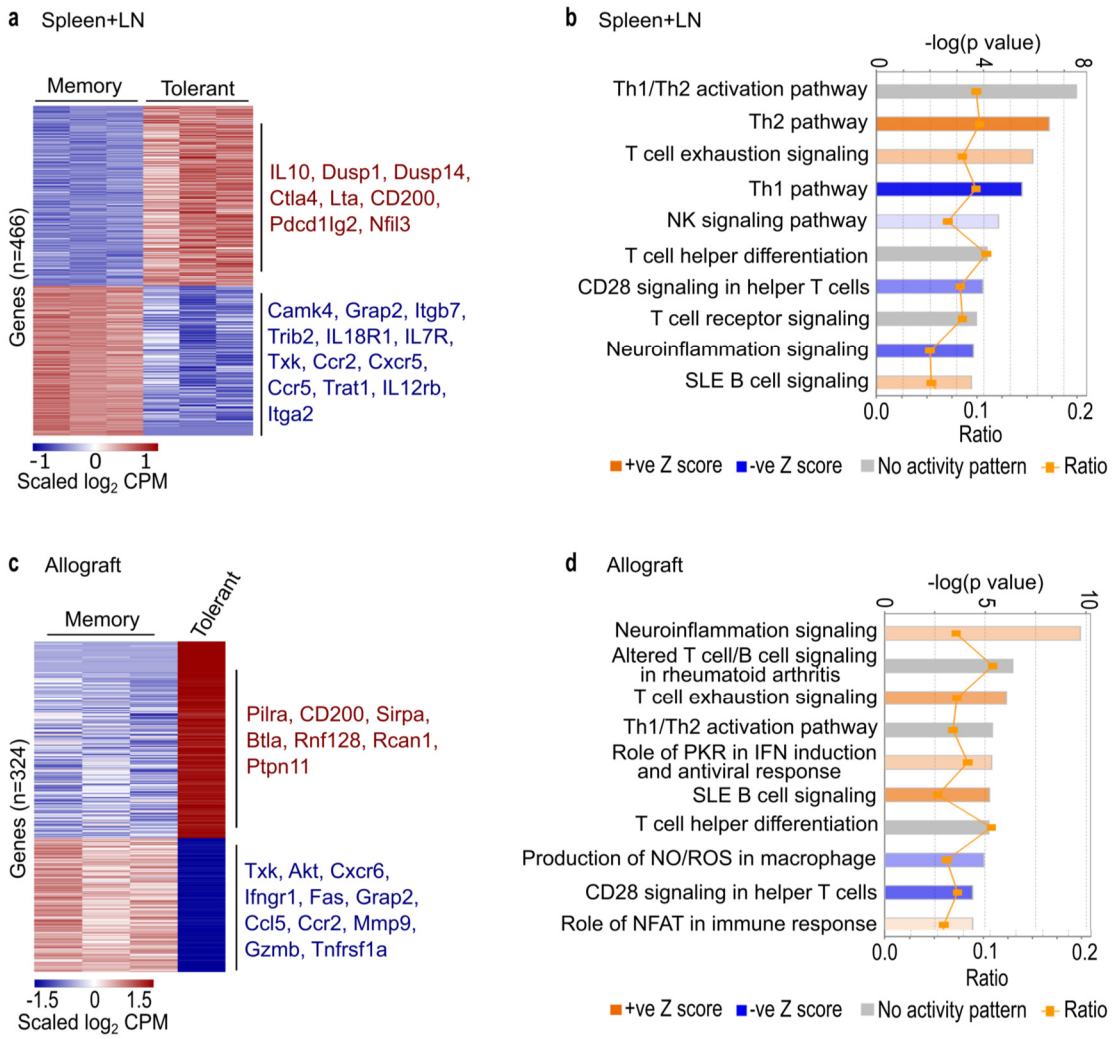
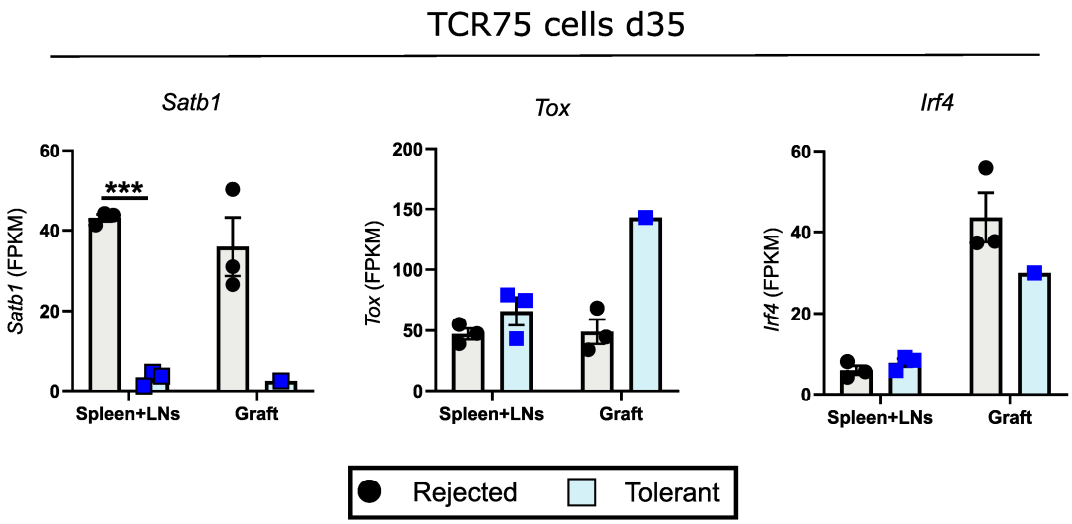
**Supplementary Material:** Figures S1 to S11
Tables S1 to S2



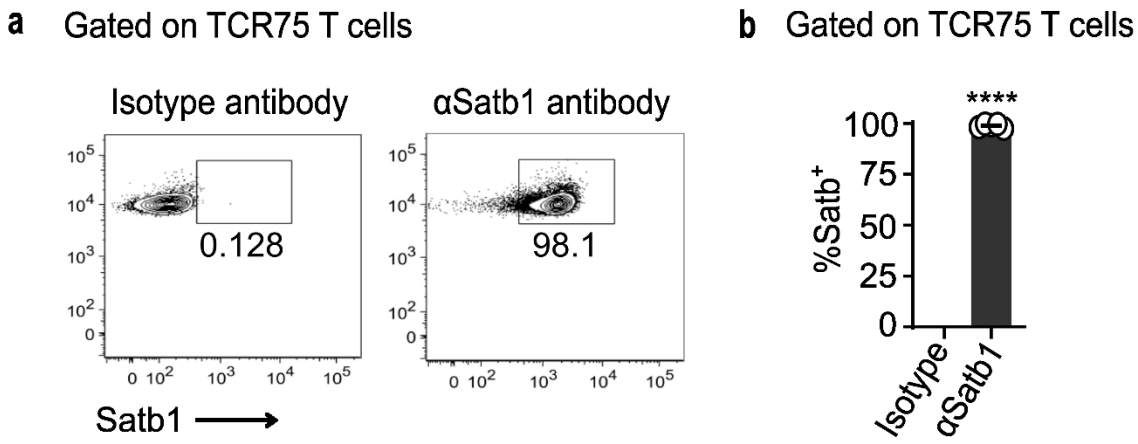

**Supplementary Figure 1. Gating strategy for TCR75 and percent TCR75 cells in the periphery and the graft of tolerant and rejector mice.** (**a**,**b**) TCR75 cells were seeded into B6 mice one day prior to B/c heart transplantation +/- anti-CD154/DST as in Figure 1a. Cells were isolated from the grafts and the spleen+LNs on d>35 post-transplantation, enriched for CD45.1 and stained with Live/Dead Aqua, anti-CD45.1 and anti-CD4. (**a**) Gating strategy for sorting of TCR75 cells. (**b**) Percentages of TCR75 cells among $CD4^+$ events from spleen+LNs and grafts (n=9-32). ***p<0.001, ****p<0.0001 (unpaired Student's t-tests within each treatment group).



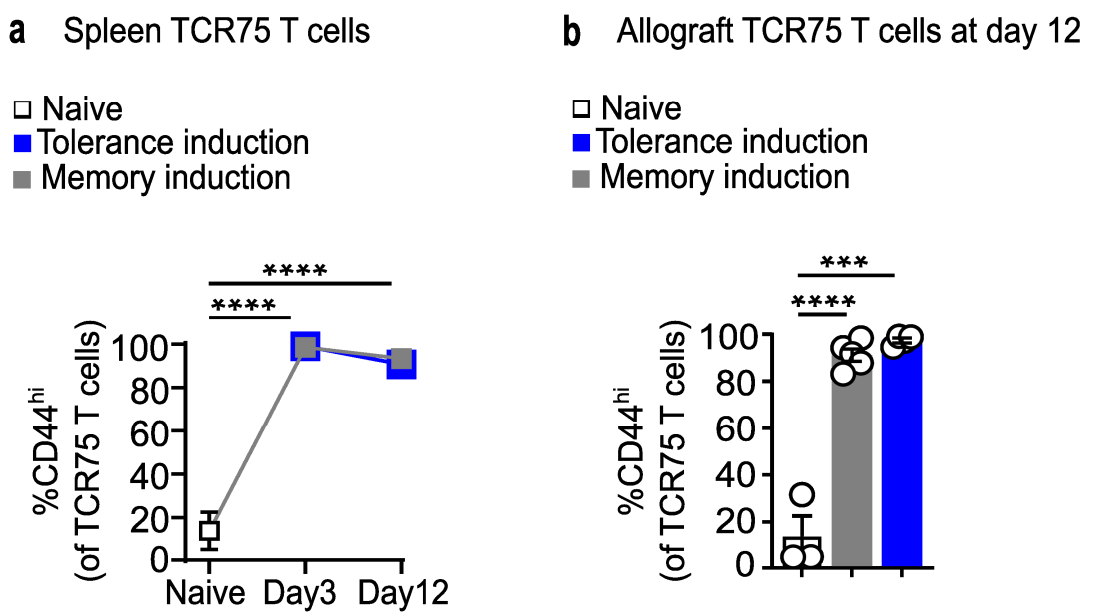

**Supplementary Figure 2. Transcriptional profiles of TCR75 T cells in tolerant mice.** (**a, c**) Heatmap of RNA-seq expression of differentially expressed genes (fold change≥1.5; adjusted p≤0.05) in TCR75 T cells isolated from spleen and lymph nodes (LNs) (**a**) or allograft (**c**) of tolerant or rejecting mice. TCR75 T cells from tolerant mice upregulated (red) T cell exhaustion genes and downregulated (blue) genes associated with T cell differentiation and effector function. The color coding indicates normalized log2 transformed counts per million (CPM). n=3 for all groups (1 mouse/replicate, except tolerant spleen+LNs for which 5 mice were pooled/replicate, and n=1 for the tolerant allograft for which 15 mice were pooled). (**b, d**) Ingenuity pathway analysis (IPA) of differentially expressed genes in TCR75 T cells in spleen (**b**) or allograft (**d**) from tolerant versus rejecting mice.



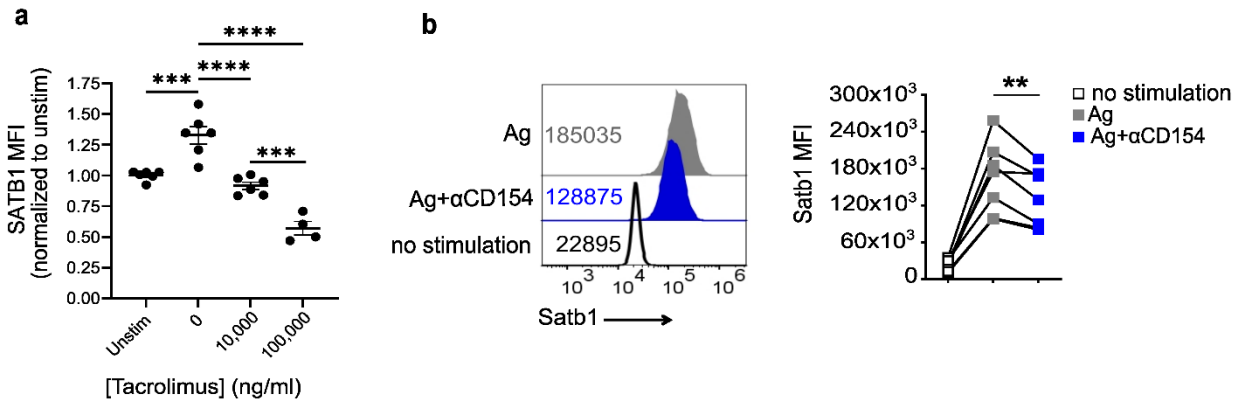

**Supplementary Figure 3. Reduced expression of *Satb1* but similar expression of *Tox* and *Irf4* in TCR75 cells from rejected and tolerant mice.** TCR75 cells seeded on d-1, isolated on d35 and subjected to RNA-seq as in Figure 1a. Expression of *Satb1*, *Tox* and *Irf4* in TCR75 cells isolated from spleen and lymph nodes, and from the graft is shown. Data are presented as mean+/-SEM (data points represent single animals except in the tolerant group of which shows a pool of 5 mice per group in tolerant spleen+LNs and of 15 mice in the tolerant graft sample. ***p<0.001 by two-way ANOVA.



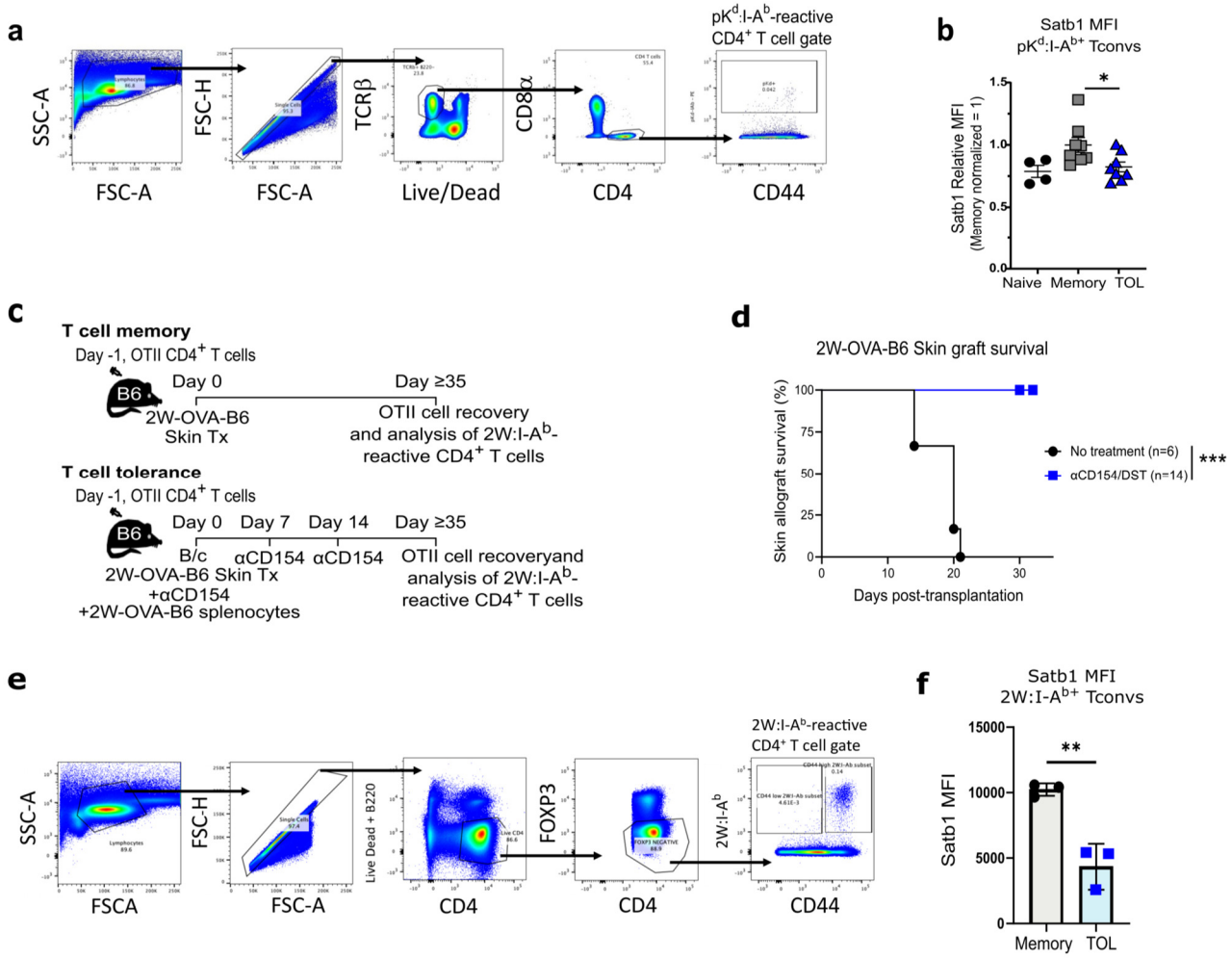

**Supplementary Figure 4. TCR75 T cells from unmanipulated mice constitutively express Satb1.** Splenocytes from unmanipulated TCR75 transgenic mice were stained with anti-Satb1 antibody and analyzed by flow cytometry. (**a**) Representative contour plots showing percentage of Satb1$^+$ cells on gated TCR75 T cells. (**b**) Percentage of TCR75 T cells that express Satb1. n=5; ****p<0.0001 (unpaired Student's t-test).



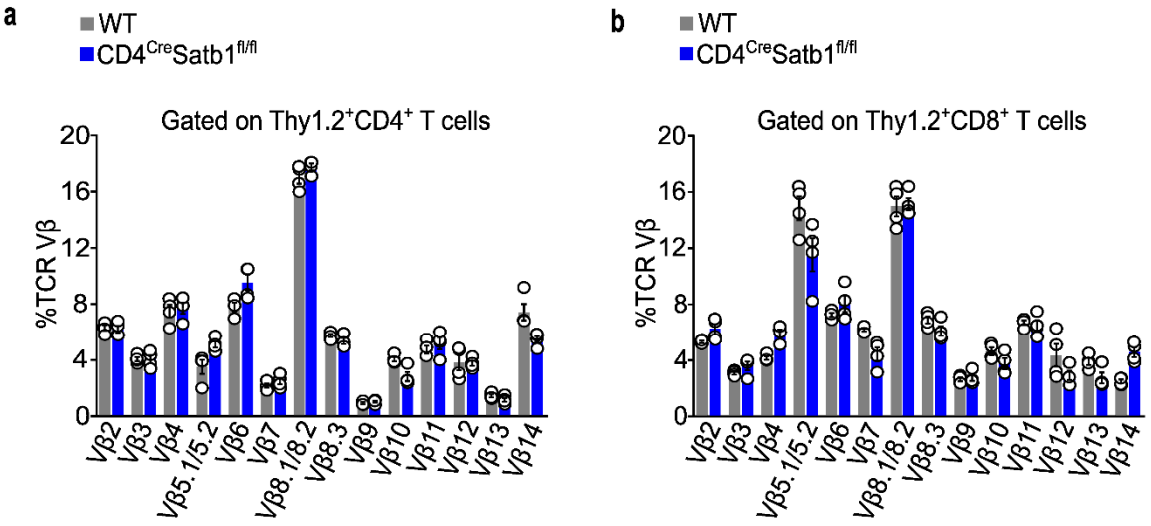

**Supplementary Figure 5. TCR75 T cells in tolerant mice are not antigen-ignorant.** As in **Figure 1d-e**, TCR75 T cells were analyzed during induction (day 3±1 and day 12±2) of memory and tolerance. (**a, b**) Frequency of $CD44^{hi}$ events in TCR75 T cells from spleen (**a**) and allograft (**b**), was measured by flow cytometry. Naive shows CD44 expression of splenic TCR75 T cells before transfer and is reproduced in (**a, b**). n=3-9/group (**a**); ****p<0.0001, n=3-5/group (**b**); ****p<0.0001; ***p=0.0001. Data are analyzed by ANOVA (two-way for **a**, one-way for **b**, with pairwise comparisons).



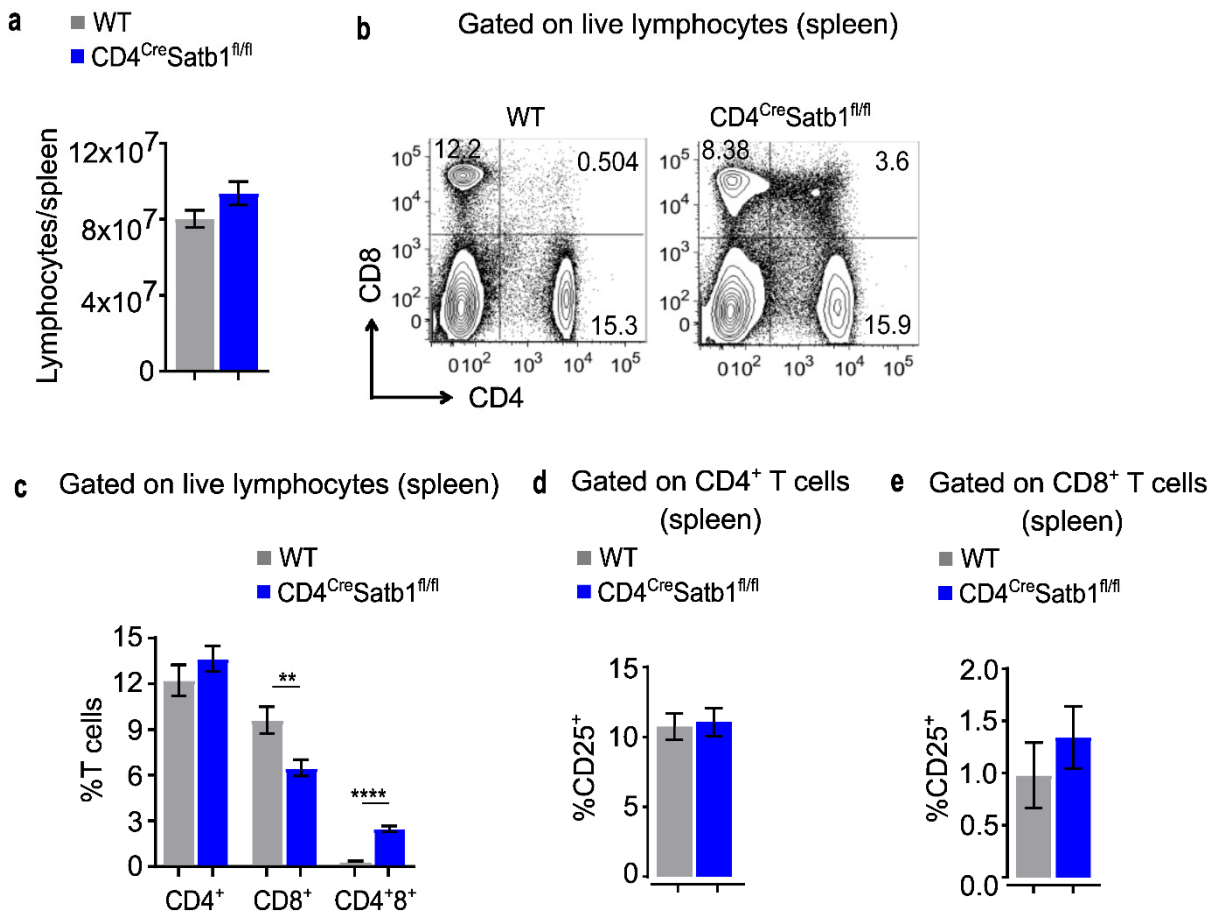

**Supplementary Figure 6. Inhibition of NFAT or blockade of CD154 limits upregulation of Satb1 in TCR75 cells following stimulation in vitro.** (**a**) Naïve Foxp3-negative polyclonal $CD4^+$ Tconvs were sorted from $Foxp3^{GFP}$-Tg mice and stimulated with anti-CD3 (5μg/ml) and $Rag^{-/-}$ splenocytes in the presence or absence of the indicated concentrations of tacrolimus. Expression of Satb1 in Tconvs was assessed by flow cytometry on d2 and normalized to expression in unstimulated Tconvs. (n=6; ***p<0.001, ****p<0.0001 by one-way ANOVA. (**b**) Sorted naive TCR75 T cells were activated with T-cell depleted and lipopolysaccharide (LPS)-stimulated splenocytes from CB6F1 mice±anti-CD154. Satb1 expression was analyzed by flow cytometry on d3 in $CD44^{hi}$ TCR75 T cells. Each connecting line is an independent experiment (n=7; **p=0.0069 by one-way ANOVA with pairwise comparisons).



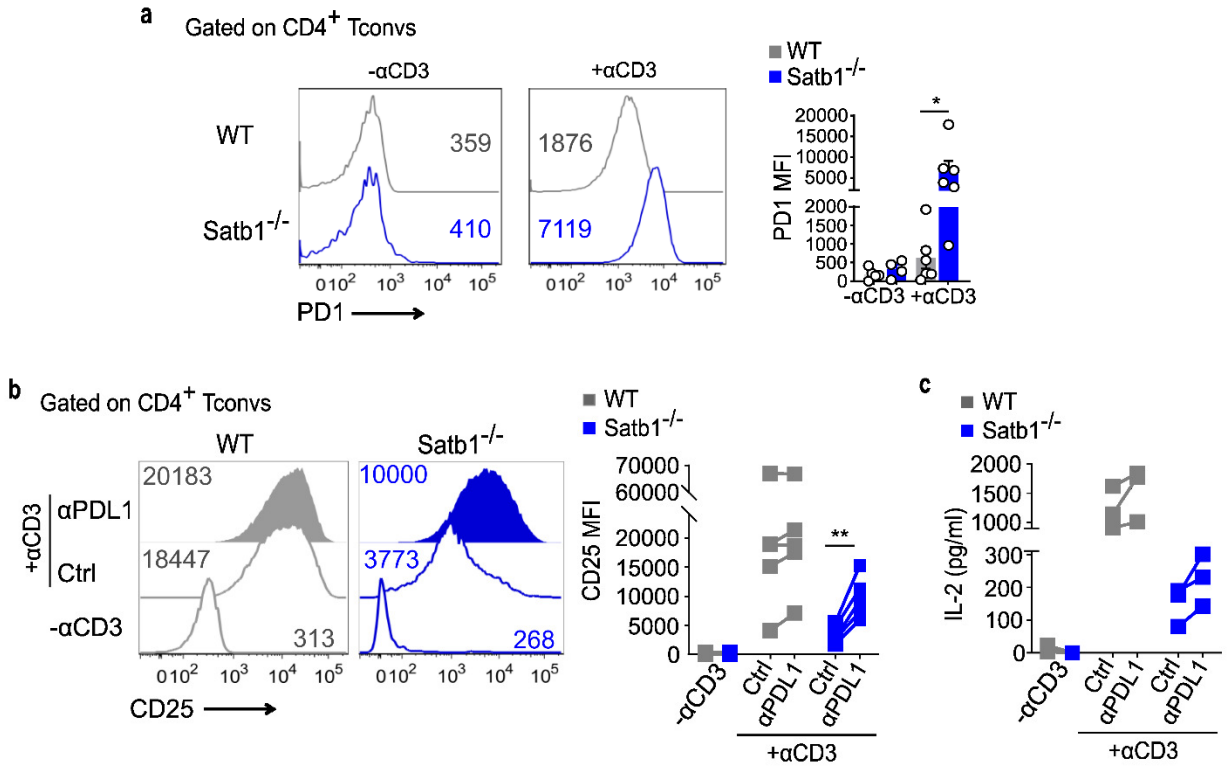

**Supplementary Figure 7: Expression of Satb1 in polyclonal endogenous CD4⁺ T cells mirrors that in TCR75 cells.** (**a,b**) B6 mice were transplanted with B/c hearts and treated with anti-CD154/DST (B/c) to induce tolerance (TOL) or with B/c DST to generate memory. Cells were harvested from the spleen >d30. (**a**) Gating strategy for identifying alloreactive endogenous pK$^{d}$:I-A$^{b}$-reactive CD4$^{+}$ T cells with pMHC tetramers. (**b**) Expression of Satb1 protein (MFI) in pK$^{d}$:I-A$^{b}$-alloreactive CD4$^{+}$ T cells. Data were pooled from 2 independent experiments (n=4=8). (**c-f**) B6 mice were seeded with OVA-reactive OTII CD4$^{+}$ T cells one day prior to transplantation with a 2W-OVA-B6 skin graft. Animals were treated or not with anti-CD154/DST (2W-OVA-B6) and cells harvested at d35. (**c**) Experimental strategy. (**d**) 2W-OVA-B6 skin graft survival over time. (**e**) Gating strategy for identifying 2W:I-A$^{b}$-reactive endogenous polyclonal CD4$^{+}$ T cells. (**f**) Expression of Satb1 protein (MFI) in 2W:I-A$^{b}$-reactive, endogenous cells CD4$^{+}$ T cells following overnight stimulation with anti-CD3 (0.1μg/ml). *p<0.05, **p<0.01, ***p<0.001 by one-way ANOVA (**b**), Log-rank Mantel-Cox test (**d**) or unpaired Student's t-test f).



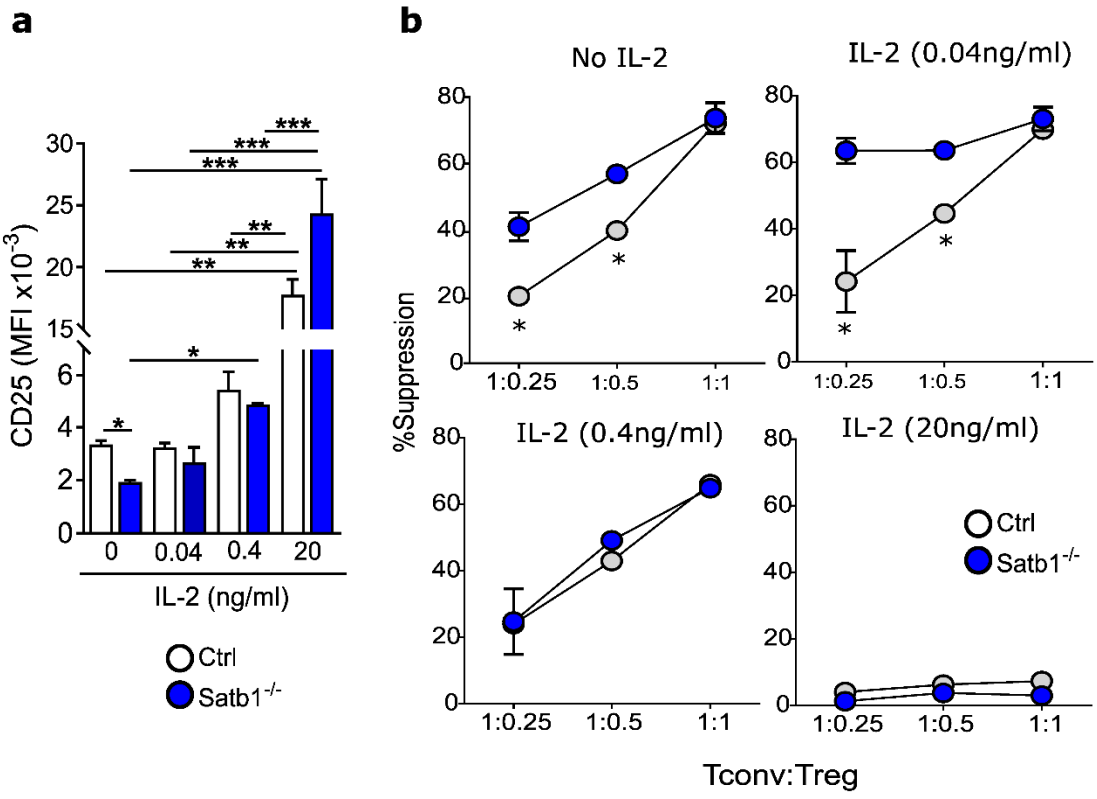

**Supplementary Figure 8. TCRVβ repertoire remains polyclonal in CD4CreSatb1$^{fl/fl}$ mice.** Flow cytometry measurement of usage of 14 TCRVβ families by T cells in spleens from CD4-Cre negative Satb1$^{fl/fl}$ (WT) or CD4CreSatb1$^{fl/fl}$ mice. (**a, b**) Percentage of individual TCRVβ population in Thy1.2$^{+}$CD4$^{+}$ (**a**) or Thy1.2$^{+}$CD8$^{+}$ (**b**) T cell gate. n=4 (WT and CD4CreSatb1$^{fl/fl}$).




**Supplementary Figure 9. Profiles of T cell subsets in CD4CreSatb1$^{fl/fl}$ mice.** Spleens from CD4-Cre negative Satb1$^{fl/fl}$ (WT) or CD4CreSatb1$^{fl/fl}$ littermates were tested for the proportions of T cell subsets by flow cytometry. (**a**) Absolute numbers of overall lymphocytes. n=40 (WT) and n=38 (CD4CreSatb1fl/fl). (**b**) Contour plots with percentage of CD4$^+$, CD8$^+$, CD4$^+$CD8$^+$ T cells in lymphocyte size gate. (**c**) The overall frequency of T cell populations in lymphocyte size gate. n=16 (WT) and n=17 (CD4CreSatb1$^{fl/fl}$); **p=0.0043; ****p<0.0001. (**d**) Percentage of CD25$^+$ in CD4$^+$ T cell gate. n=18 (WT) and n=19 (CD4CreSatb1$^{fl/fl}$); ****p<0.0001. (**e**) Proportions of CD25$^+$ in gated CD8$^+$ T cells. n=5 (WT) and n=6 (CD4CreSatb1$^{fl/fl}$). Data were analyzed by two-way ANOVA with pairwise comparisons.




**Supplementary Figure 10. PDL-1 blockade partially restores CD25 expression and IL-2 production by Satb1-deficient CD4⁺ Tconvs.** Sorted naive WT or Satb1$^{-/-}$ CD4⁺ Tconvs were stimulated with soluble anti-CD3 (0.1 µg/ml) in the presence of B6 Rag-/- splenocytes. (**a**) Expression of PD-1. (**b**) CD25 expression in the presence or absence of anti-PDL1. (**c**) IL-2 levels in the presence or absence of PDL1 blockade. PD1 and CD25 expression were measured by flow cytometry on d3. Number in histograms represents MFI. IL-2 levels were quantitated using ELISA in culture supernatants on d1. In **a**, data (mean±SEM) are pools of 6 independent experiments; in **b** and **c**, 3-6 individual experiments are shown. *p<0.05; *p<0.05, **p<0.005 by two-way ANOVA without (a) and with (b,c) pairwise comparisons.




**Supplementary Figure 11. Exogenous IL-2 abolishes the increased sensitivity of Satb1$^{-/-}$ Tconvs to Treg suppression.** Sorted CFSE-labeled naïve CD4$^{+}$ Tconvs from Satb1$^{-/-}$ or control littermates were stimulated with soluble anti-CD3 (0.1μg/ml) in the presence of B6 Rag$^{-/-}$ splenocytes and of the indicated doses of exogenous IL-2. Tregs were added at the indicated ratios. (**a**) CD25 expression on Tconvs in the absence of Tregs, by flow cytometry on d3. (**b**) Percent suppression in the presence of Tregs. Data are presented as mean±SEM (n=3) and were analyzed by two-way ANOVA with multiple pairwise comparisons.

**Supplementary Table 1.** Differentially expressed genes in tolerant relative to memory TCR75 cells.

| Spleen+LNs | | | | Allograft | | | |
|---|---|---|---|---|---|---|---|
| Gene ID | *p* value | FDR | Fold change | Gene ID | *p* value | FDR | Fold change |
| Nrn1 | 1.71E-08 | 0.000143 | 37.64526 | Nr3c2 | 1.64E-08 | 0.000134 | 641.7728 |
| B4galnt4 | 2.58E-08 | 0.000143 | -8.33833 | Edn3 | 2.22E-08 | 0.000134 | 5000.291 |
| Cxcr5 | 3.58E-08 | 0.000143 | -9.43425 | Susd2 | 4.88E-08 | 0.000196 | 21.19212 |
| Pou2f2 | 6.71E-08 | 0.000202 | 6.40611 | Cpm | 7.68E-08 | 0.000231 | 8.331325 |
| Ly6c2 | 1.05E-07 | 0.000252 | -24.9692 | Plcxd2 | 2.67E-07 | 0.000642 | -16.3906 |
| Slc16a5 | 1.50E-07 | 0.0003 | -86.7006 | Vdr | 3.46E-07 | 0.00069 | 113.2143 |
| Myo6 | 1.77E-07 | 0.000304 | -6.59255 | Myh10 | 4.06E-07 | 0.00069 | 76.14834 |
| Edn3 | 2.27E-07 | 0.000341 | 458.3758 | Sostdc1 | 4.66E-07 | 0.00069 | 132.4046 |
| Ttc39c | 5.55E-07 | 0.000741 | -7.81703 | Cybb | 5.16E-07 | 0.00069 | 106.6782 |
| Satb1 | 7.24E-07 | 0.00087 | -12.5699 | Il6ra | 1.20E-06 | 0.001153 | 24.10856 |
| Rab27a | 1.09E-06 | 0.001139 | -5.15884 | Trpm6 | 1.23E-06 | 0.001153 | 1859.638 |
| Penk | 1.14E-06 | 0.001139 | 9.946494 | Sntb2 | 1.27E-06 | 0.001153 | -8.98948 |
| Atp1b1 | 1.30E-06 | 0.001139 | -14.4411 | Vipr1 | 1.28E-06 | 0.001153 | -94.0161 |
| Zbtb32 | 1.33E-06 | 0.001139 | 27.47714 | St8sia1 | 1.54E-06 | 0.001153 | -18.1513 |
| F2r | 1.52E-06 | 0.00122 | -6.67734 | Rasgrp2 | 1.64E-06 | 0.001153 | -7.6007 |
| Sytl3 | 1.75E-06 | 0.001318 | -6.93281 | Ms4a6c | 1.68E-06 | 0.001153 | 15.23518 |
| Runx3 | 1.94E-06 | 0.001375 | -3.22498 | Trim2 | 1.71E-06 | 0.001153 | 16.96907 |
| Ccr2 | 2.09E-06 | 0.001394 | -8.51478 | Tgm2 | 1.78E-06 | 0.001153 | 316.381 |
| Sidt1 | 2.31E-06 | 0.001402 | -6.90253 | Mapk12 | 1.82E-06 | 0.001153 | 69.13926 |
| Spry1 | 2.38E-06 | 0.001402 | 6.835346 | Grap2 | 1.97E-06 | 0.001184 | -14.7019 |
| Inhba | 2.45E-06 | 0.001402 | 164.1483 | Arhgap5 | 2.66E-06 | 0.001521 | 12.33997 |
| Pde3b | 3.64E-06 | 0.001989 | -27.0462 | Prnp | 2.96E-06 | 0.001576 | 6.998173 |
| Ptger2 | 4.87E-06 | 0.002543 | 4.037855 | Ifit1bl1 | 3.01E-06 | 0.001576 | -13.3816 |
| H2-Q2 | 5.23E-06 | 0.002543 | -11.2517 | Nfkbid | 3.53E-06 | 0.001768 | -5.72959 |
| Pnisr | 5.57E-06 | 0.002543 | 2.824942 | Ptp4a3 | 4.34E-06 | 0.002002 | -16.3012 |
| Igfbp7 | 5.78E-06 | 0.002543 | 89.57672 | Ly6c2 | 4.43E-06 | 0.002002 | -73.3112 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Gm14085 | 5.87E-06 | 0.002543 | -13.8546 | Btla | 4.50E-06 | 0.002002 | 5.875272 |
| Ms4a6c | 5.92E-06 | 0.002543 | 7.530758 | Il9r | 6.73E-06 | 0.002889 | 259.9451 |
| Zfp683 | 6.49E-06 | 0.002692 | -39.4142 | Slco2b1 | 7.74E-06 | 0.00321 | 204.9508 |
| Slc9b2 | 6.82E-06 | 0.002732 | 9.742775 | Pou2af1 | 9.47E-06 | 0.003794 | 37.73788 |
| Sqle | 8.30E-06 | 0.00322 | -4.21442 | She | 1.03E-05 | 0.003846 | 930.3191 |
| Nr4a2 | 8.57E-06 | 0.003221 | 4.887755 | Ajuba | 1.06E-05 | 0.003846 | 9.719601 |
| Vipr1 | 9.19E-06 | 0.003348 | -4.17918 | Atp1a3 | 1.07E-05 | 0.003846 | 92.71083 |
| Ndrg3 | 9.96E-06 | 0.003524 | -2.42185 | Ctsl | 1.09E-05 | 0.003846 | 15.944 |
| Il7r | 1.10E-05 | 0.003794 | -2.91432 | Slc25a23 | 1.18E-05 | 0.003954 | -62.7125 |
| Cd83 | 1.22E-05 | 0.004074 | 3.716062 | Ccr2 | 1.22E-05 | 0.003954 | -24.6402 |
| Acoxl | 1.34E-05 | 0.004303 | -38.8874 | Gpr35 | 1.25E-05 | 0.003954 | 4175.442 |
| Baiap3 | 1.36E-05 | 0.004303 | -12.4884 | Ralyl | 1.27E-05 | 0.003954 | 811.0484 |
| Cnrip1 | 1.48E-05 | 0.004377 | 5.230643 | Gzmb | 1.28E-05 | 0.003954 | -54.5203 |
| Hid1 | 1.48E-05 | 0.004377 | -14.9296 | Pard6g | 1.60E-05 | 0.004806 | 53.89215 |
| Gnaq | 1.55E-05 | 0.004377 | 6.772279 | Selplg | 1.70E-05 | 0.004918 | -5.53748 |
| Adam19 | 1.56E-05 | 0.004377 | -4.33217 | Cd200 | 1.72E-05 | 0.004918 | 6.567354 |
| Atp1a3 | 1.63E-05 | 0.004377 | -18.2335 | Ifit1 | 1.78E-05 | 0.00497 | 4.870762 |
| Dusp1 | 1.63E-05 | 0.004377 | 3.655908 | Cdh23 | 1.83E-05 | 0.005006 | 5.83397 |
| Gzmb | 1.65E-05 | 0.004377 | -7.86508 | Hmgn3 | 1.93E-05 | 0.005031 | 22.83069 |
| Sytl2 | 1.70E-05 | 0.004377 | -15.5497 | Gstm1 | 1.95E-05 | 0.005031 | 1072.715 |
| Krt83 | 1.74E-05 | 0.004377 | -456.981 | Shtn1 | 1.97E-05 | 0.005031 | 186.9524 |
| Nrgn | 1.75E-05 | 0.004377 | 51.88843 | H2-Aa | 2.18E-05 | 0.005439 | 196.5385 |
| Ctla4 | 1.99E-05 | 0.004881 | 4.993649 | Pygl | 2.26E-05 | 0.005439 | -78.1691 |
| Ccr5 | 2.47E-05 | 0.005851 | -22.0635 | Cpq | 2.34E-05 | 0.005439 | 18.37825 |
| Plscr1 | 2.48E-05 | 0.005851 | 3.540066 | Btk | 2.35E-05 | 0.005439 | 420.6925 |
| Fam101b | 2.72E-05 | 0.006288 | -4.80222 | Dusp5 | 2.35E-05 | 0.005439 | -7.07529 |
| Fam71b | 2.80E-05 | 0.006346 | -452.028 | Neurl3 | 2.41E-05 | 0.005461 | -4.103 |
| Spp1 | 2.85E-05 | 0.006346 | 70.69768 | Rnf128 | 2.55E-05 | 0.005592 | 4.8435 |
| Serpinb1a | 2.96E-05 | 0.00647 | 9.137485 | Enpp2 | 2.56E-05 | 0.005592 | 46.92672 |
| BC094916 | 3.07E-05 | 0.006551 | -3.02133 | Nfam1 | 2.68E-05 | 0.005765 | 525.6156 |
| Tgfbr3 | 3.11E-05 | 0.006551 | -5.2084 | B4galnt4 | 2.79E-05 | 0.005877 | -6.06282 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Tiam1 | 3.29E-05 | 0.006756 | 7.641765 | Cacna2d4 | 2.89E-05 | 0.00599 | 22.93816 |
| Map3k8 | 3.31E-05 | 0.006756 | 2.521586 | Ifngr1 | 3.02E-05 | 0.00599 | -9.80281 |
| Cask | 3.52E-05 | 0.007061 | 11.72745 | Tespa1 | 3.05E-05 | 0.00599 | 4.483014 |
| Ccdc28b | 3.62E-05 | 0.007134 | 5.530387 | Mrc1 | 3.09E-05 | 0.00599 | 63.34948 |
| Ifit1bl1 | 3.81E-05 | 0.007341 | -3.13488 | Runx3 | 3.09E-05 | 0.00599 | -4.18408 |
| Cd200 | 3.85E-05 | 0.007341 | 4.085579 | Nbn | 3.14E-05 | 0.005992 | 3.590973 |
| Kmt5a | 3.97E-05 | 0.007457 | 3.025454 | Slc25a13 | 3.31E-05 | 0.006204 | 19.69514 |
| Camk4 | 4.11E-05 | 0.007597 | -2.08452 | Egln3 | 3.35E-05 | 0.006204 | -16.1934 |
| Il12rb2 | 4.24E-05 | 0.007733 | -38.77 | AI607873 | 3.42E-05 | 0.006233 | 117.0801 |
| Trib1 | 4.44E-05 | 0.007783 | 2.341022 | Ccl8 | 3.52E-05 | 0.006265 | 975.2862 |
| Lilr4b | 4.46E-05 | 0.007783 | -3.84702 | Rbpms | 3.59E-05 | 0.006265 | 623.0443 |
| Armc7 | 4.53E-05 | 0.007783 | -2.24383 | Nrn1 | 3.67E-05 | 0.006265 | 7.371457 |
| Tnrc6a | 4.56E-05 | 0.007783 | 2.305893 | Mgat4a | 3.69E-05 | 0.006265 | -5.7251 |
| Otx1 | 4.60E-05 | 0.007783 | 156.201 | Stfa3 | 3.74E-05 | 0.006265 | 7075.817 |
| Marcksl1 | 4.89E-05 | 0.007965 | 4.120524 | Cd83 | 3.78E-05 | 0.006265 | 4.372617 |
| Tmbim1 | 4.90E-05 | 0.007965 | 4.594431 | Sh3tc1 | 3.80E-05 | 0.006265 | 182.9984 |
| Nfat5 | 4.92E-05 | 0.007965 | 4.543533 | Maged2 | 3.88E-05 | 0.006311 | 5.668187 |
| Gpr55 | 5.07E-05 | 0.007965 | -7.83293 | Cyp2s1 | 4.07E-05 | 0.006526 | -92.5779 |
| Pla2g2d | 5.09E-05 | 0.007965 | 11.4509 | Marcksl1 | 4.44E-05 | 0.00703 | 5.880958 |
| P2rx7 | 5.10E-05 | 0.007965 | -3.68898 | Fgd2 | 4.52E-05 | 0.00706 | 293.2904 |
| Ank | 5.28E-05 | 0.008138 | -3.09032 | Fosl2 | 4.72E-05 | 0.007225 | -4.7913 |
| Ccrl2 | 5.41E-05 | 0.00817 | 3.761443 | Wls | 4.75E-05 | 0.007225 | 6.233902 |
| Gpr155 | 5.50E-05 | 0.00817 | -3.30967 | Nr4a1 | 5.27E-05 | 0.007922 | -5.02518 |
| Tox2 | 5.50E-05 | 0.00817 | -8.05449 | Ugcg | 5.36E-05 | 0.00796 | -5.20423 |
| Chst2 | 5.65E-05 | 0.008284 | 10.59418 | Rcan1 | 5.59E-05 | 0.008201 | 3.902709 |
| Mgarp | 5.97E-05 | 0.008544 | -49.7662 | Dhrs3 | 5.95E-05 | 0.00862 | 12.42616 |
| Dmrta1 | 6.01E-05 | 0.008544 | -82.0216 | Tbxa2r | 6.19E-05 | 0.008859 | -6.95613 |
| 1110032F04Rik | 6.04E-05 | 0.008544 | 4.220795 | Bank1 | 6.26E-05 | 0.008859 | 375.7255 |
| Hmgn3 | 6.51E-05 | 0.009101 | 10.42431 | Pde3b | 6.53E-05 | 0.009134 | -102.429 |
| F2rl2 | 6.62E-05 | 0.009147 | -11.1424 | Mapk11 | 6.87E-05 | 0.009493 | 4.62839 |
| 1700017B05Rik | 6.70E-05 | 0.00916 | -2.73214 | Tlr3 | 7.06E-05 | 0.009642 | 675.5058 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pdzk1ip1 | 6.89E-05 | 0.009254 | 17.00445 | Satb1 | 7.21E-05 | 0.009743 | -15.362 |
| Stip1 | 6.93E-05 | 0.009254 | -2.95312 | Hck | 7.85E-05 | 0.010488 | 102.5411 |
| Ankrd11 | 7.13E-05 | 0.009382 | 2.347237 | Gng12 | 8.02E-05 | 0.010596 | -16.3149 |
| Ctsw | 7.18E-05 | 0.009382 | -5.4045 | Pex11a | 8.13E-05 | 0.010626 | 9.118795 |
| Sp8 | 7.35E-05 | 0.009425 | 2.45116 | Ppp2r2c | 8.31E-05 | 0.010741 | -2811.39 |
| Serpina3f | 7.37E-05 | 0.009425 | -10.0043 | Zfp536 | 8.66E-05 | 0.011083 | 190.4722 |
| Spsb1 | 7.48E-05 | 0.009425 | -10.8157 | Phf19 | 8.83E-05 | 0.011145 | -460.099 |
| Smc4 | 7.52E-05 | 0.009425 | 3.002098 | Dock4 | 8.90E-05 | 0.011145 | 178.5274 |
| Smim10l2a | 7.64E-05 | 0.009448 | 8.353688 | Klf11 | 9.11E-05 | 0.01129 | -15.5127 |
| Cbfb | 7.75E-05 | 0.009448 | -1.9449 | Scin | 9.89E-05 | 0.012137 | 69.40267 |
| Ccl8 | 7.83E-05 | 0.009448 | 59.36621 | Sirt1 | 0.000103 | 0.01252 | -16.965 |
| Atrx | 7.86E-05 | 0.009448 | 2.232989 | Zfp516 | 0.000105 | 0.0126 | 458.1651 |
| Dlg4 | 8.18E-05 | 0.009739 | 7.820748 | Sec16b | 0.000107 | 0.012791 | 24.61371 |
| Klf4 | 8.32E-05 | 0.009804 | 5.63471 | Tg | 0.000111 | 0.01302 | 8.867779 |
| Ccl5 | 8.58E-05 | 0.010019 | -11.0014 | Tiam1 | 0.000113 | 0.01302 | 8.47702 |
| Myo1f | 8.86E-05 | 0.010246 | -10.2095 | F2r | 0.000113 | 0.01302 | -7.52166 |
| Ppcdc | 9.21E-05 | 0.01041 | 2.780179 | Gramd3 | 0.000114 | 0.01302 | -10.4407 |
| Gna12 | 9.24E-05 | 0.01041 | 6.992502 | Esr1 | 0.000119 | 0.013521 | 45.32381 |
| Fam46c | 9.27E-05 | 0.01041 | -3.51422 | Osgin1 | 0.000122 | 0.013727 | -13.0287 |
| Ypel2 | 9.35E-05 | 0.01041 | 5.477715 | Larp1 | 0.000126 | 0.014009 | -5.23804 |
| Ppm1j | 9.66E-05 | 0.01061 | -2.69427 | Gsn | 0.000128 | 0.014098 | 5.322505 |
| Rcn1 | 9.71E-05 | 0.01061 | -3.13461 | Acoxl | 0.00013 | 0.014163 | -1041.42 |
| Trat1 | 0.000105 | 0.011268 | -8.45103 | Mical3 | 0.000131 | 0.014175 | 78.93165 |
| Stk26 | 0.000105 | 0.011268 | -1.97294 | Rtn4rl1 | 0.000135 | 0.01428 | -90.7586 |
| Dalrd3 | 0.000107 | 0.011358 | 2.404981 | Csf1r | 0.000136 | 0.01428 | 29.66396 |
| Me2 | 0.000109 | 0.01153 | -2.70374 | Trib3 | 0.000136 | 0.01428 | -17.3313 |
| Magi3 | 0.000115 | 0.01199 | 6.279479 | Stc2 | 0.000137 | 0.01428 | 17.4441 |
| Tob1 | 0.000117 | 0.012125 | -2.26656 | Fgf2 | 0.000147 | 0.015186 | 34.61755 |
| Cxcr6 | 0.000119 | 0.012125 | -4.70845 | Mmp9 | 0.000148 | 0.015186 | -34.1293 |
| Wisp1 | 0.000119 | 0.012125 | 28.05666 | Apobec1 | 0.000151 | 0.015226 | 7.797591 |
| Slc35c1 | 0.000121 | 0.012195 | -2.69784 | Cd81 | 0.000151 | 0.015226 | 15.48959 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Tnfrsf4 | 0.000122 | 0.012224 | 5.729491 | 1700017B05Rik | 0.000152 | 0.015226 | -4.33942 |
| Npepps | 0.000126 | 0.012505 | 2.234242 | St3gal6 | 0.000154 | 0.015226 | -25.8394 |
| Tnfsf10 | 0.000128 | 0.012613 | 2.391792 | Ttll12 | 0.000154 | 0.015226 | -2.97793 |
| Spcs3 | 0.00013 | 0.012677 | -2.13849 | Sdc2 | 0.000156 | 0.015258 | 630.5388 |
| Padi2 | 0.000134 | 0.012934 | -4.19573 | Oasl2 | 0.000161 | 0.015359 | 14.67517 |
| Srebf2 | 0.000135 | 0.012934 | -2.47994 | Cd200r3 | 0.000161 | 0.015359 | 128.4067 |
| Ebi3 | 0.000136 | 0.012934 | 11.23039 | Ino80c | 0.000162 | 0.015359 | 3.183639 |
| Bbc3 | 0.000138 | 0.012934 | -2.25718 | Rassf4 | 0.000162 | 0.015359 | 787.9235 |
| Gm21887 | 0.000139 | 0.012934 | 7.360975 | Hectd2 | 0.000167 | 0.015617 | 14.55822 |
| Tmem229b | 0.000139 | 0.012934 | -2.38536 | Btg1 | 0.000168 | 0.015617 | -3.14806 |
| Stc2 | 0.00014 | 0.012939 | 12.08064 | Tmem156 | 0.000169 | 0.015649 | 6.54953 |
| Sept11 | 0.000143 | 0.013093 | -3.28553 | Ankrd46 | 0.000179 | 0.016348 | 2.448295 |
| Capg | 0.000144 | 0.013136 | 3.868923 | Ly86 | 0.000179 | 0.016348 | 100.3597 |
| Cyp4f13 | 0.000151 | 0.013592 | 2.536131 | Ispd | 0.000182 | 0.01644 | 36.09649 |
| Inpp4a | 0.000151 | 0.013592 | 3.641695 | Pitpnc1 | 0.000188 | 0.016882 | -3.06309 |
| Rtn4 | 0.000154 | 0.013635 | 3.192244 | Otx1 | 0.000192 | 0.017104 | 82.79375 |
| Kif13a | 0.000155 | 0.013635 | 3.862911 | Adam19 | 0.000199 | 0.01747 | -6.22497 |
| Gtf2i | 0.000156 | 0.013635 | -2.11318 | Cacnb1 | 0.000199 | 0.01747 | -3.31157 |
| Dusp14 | 0.000158 | 0.013635 | 7.811358 | Synpo | 0.000204 | 0.017785 | 9.564739 |
| Mmp9 | 0.000158 | 0.013635 | -6.60953 | Tmem38b | 0.000211 | 0.018259 | 3.845325 |
| Rpa1 | 0.000159 | 0.013635 | -2.60263 | Chpt1 | 0.000215 | 0.018434 | -16.108 |
| Ptpn4 | 0.000163 | 0.013896 | -2.91762 | BC094916 | 0.000216 | 0.018456 | -4.1463 |
| Phldb1 | 0.000167 | 0.01416 | 6.611434 | Ppm1l | 0.000219 | 0.018506 | 36.3381 |
| Gpd2 | 0.000168 | 0.014164 | -3.48303 | Rap2a | 0.000224 | 0.018719 | -10.01 |
| Nr3c2 | 0.000171 | 0.014267 | 5.485227 | Cd74 | 0.000224 | 0.018719 | 22.09347 |
| Chordc1 | 0.000174 | 0.014267 | -1.96621 | Tnfsf8 | 0.000229 | 0.01897 | 3.344785 |
| Zfp91 | 0.000174 | 0.014267 | 2.780948 | Vps37b | 0.000235 | 0.01938 | -11.23 |
| Zc3h6 | 0.000174 | 0.014267 | 3.342629 | Oxct1 | 0.000238 | 0.019458 | 2.304593 |
| Sgms1 | 0.000176 | 0.014276 | -2.27919 | Rassf10 | 0.00025 | 0.020318 | 2476.2 |
| Tgtp1 | 0.000177 | 0.014289 | -3.11689 | Pdgfc | 0.000253 | 0.020434 | 1005.264 |
| Myh10 | 0.000179 | 0.01436 | 6.982122 | A130010J15Rik | 0.000258 | 0.020686 | 7.933261 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Txk | 0.000183 | 0.014537 | -3.85793 | Kmt5a | 0.000261 | 0.020783 | -4.20015 |
| St3gal6 | 0.000185 | 0.014579 | -5.7587 | Ifrd1 | 0.000265 | 0.020981 | -2.74275 |
| Nhsl1 | 0.000186 | 0.014579 | -554.873 | Ccdc88a | 0.000267 | 0.020989 | 35.53234 |
| Prss16 | 0.000187 | 0.014636 | -116.648 | Znhit6 | 0.000269 | 0.021041 | 3.048247 |
| Rere | 0.000192 | 0.014899 | 1.91675 | Rxra | 0.000272 | 0.021123 | 4.104387 |
| Gstt3 | 0.0002 | 0.015378 | 4.383144 | Rgl1 | 0.000284 | 0.021773 | 124.6137 |
| Acsbg1 | 0.000203 | 0.015581 | -4.27572 | Sh2d2a | 0.000284 | 0.021773 | -2.61772 |
| Tmem38b | 0.000211 | 0.015996 | 2.884891 | Gadd45b | 0.000287 | 0.021833 | -6.01507 |
| Rasgrp1 | 0.000212 | 0.015996 | -3.68515 | Vcam1 | 0.00029 | 0.021895 | 17.13436 |
| Soat2 | 0.000217 | 0.016209 | -186.664 | Prdx6 | 0.000298 | 0.022374 | -6.22946 |
| Srsf5 | 0.000217 | 0.016209 | 1.962203 | Pilra | 0.000309 | 0.023041 | 154.4838 |
| Ube2h | 0.00022 | 0.016307 | -2.12149 | Pfkm | 0.000311 | 0.023068 | 3.994849 |
| Bmpr2 | 0.000224 | 0.016461 | 8.976406 | Clec4a3 | 0.000316 | 0.023295 | 353.2419 |
| Ybx3 | 0.000225 | 0.016461 | 10.00828 | Fdxr | 0.000319 | 0.023295 | 2.446727 |
| Fancf | 0.000227 | 0.016461 | 11.80324 | Wscd2 | 0.00032 | 0.023295 | -671.031 |
| Mtpn | 0.000227 | 0.016461 | -1.83241 | Tpst2 | 0.000322 | 0.023295 | -3.2205 |
| Alkbh6 | 0.000229 | 0.016461 | 4.042499 | Slamf6 | 0.000332 | 0.023907 | 4.16502 |
| Ntrk3 | 0.000235 | 0.01675 | -6.75412 | Tgif1 | 0.000336 | 0.023945 | -3.30915 |
| Entpd5 | 0.000235 | 0.01675 | -4.62752 | H2-DMb1 | 0.000337 | 0.023945 | 72.27906 |
| Zfp36l1 | 0.00024 | 0.016911 | 3.980671 | St3gal4 | 0.000341 | 0.024073 | -2.8413 |
| Mapk12 | 0.000241 | 0.016911 | 6.428866 | Ctla2b | 0.000343 | 0.024073 | -16.6185 |
| Marcks | 0.000243 | 0.016952 | 13.26635 | Fam105a | 0.000344 | 0.024073 | -3.40983 |
| Fkbp4 | 0.000245 | 0.016952 | -2.17453 | Tle4 | 0.000349 | 0.024144 | -11.6794 |
| Cntln | 0.000246 | 0.016952 | 2.593743 | Lypd6b | 0.000352 | 0.024144 | -13.4287 |
| Baz2b | 0.000247 | 0.016952 | 2.337354 | Usp31 | 0.000356 | 0.024144 | -9.95411 |
| Igtp | 0.000252 | 0.017243 | -2.35899 | Zbtb18 | 0.000359 | 0.024144 | -10.2414 |
| Kif15 | 0.000254 | 0.017243 | 6.108821 | Pkhd1l1 | 0.000361 | 0.024144 | 907.8356 |
| Rxra | 0.000255 | 0.017255 | 3.05206 | Csgalnact1 | 0.000362 | 0.024144 | 44.62998 |
| Prnp | 0.000262 | 0.017583 | 2.718024 | Errfi1 | 0.000365 | 0.024144 | -8.11411 |
| Abcb1a | 0.000263 | 0.017583 | -5.20228 | Zfp652 | 0.000365 | 0.024144 | -5.69603 |
| Gucy1a3 | 0.00027 | 0.017788 | 42.04256 | Dlg3 | 0.000367 | 0.024144 | 10.92491 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Selplg | 0.00027 | 0.017788 | -2.19915 | Wnt3 | 0.000367 | 0.024144 | 45.24612 |
| Slc2a3 | 0.000271 | 0.017788 | -3.82611 | Plxna1 | 0.000367 | 0.024144 | -104.72 |
| Izumo4 | 0.000278 | 0.018053 | 2.470329 | Dnah7a | 0.00037 | 0.024174 | 278.1149 |
| 5830411N06Rik | 0.000278 | 0.018053 | -716.327 | Peli1 | 0.000378 | 0.02458 | -2.26659 |
| Prelid2 | 0.000281 | 0.018195 | 5.299974 | Irf1 | 0.000384 | 0.024808 | -2.74639 |
| Akt1 | 0.000283 | 0.018212 | 4.140876 | Pvr | 0.000395 | 0.025388 | -4.47962 |
| Elovl5 | 0.000285 | 0.018215 | -2.20533 | Zxdb | 0.000401 | 0.025522 | -19.6789 |
| Pxylp1 | 0.000292 | 0.018553 | -3.85927 | Camk2d | 0.000401 | 0.025522 | 2.976873 |
| Crlf3 | 0.000299 | 0.018942 | -1.77334 | Hk3 | 0.000414 | 0.026228 | 885.3521 |
| Tanc1 | 0.000305 | 0.019174 | -4.50876 | Spi1 | 0.000418 | 0.026296 | 47.70632 |
| Trim16 | 0.000313 | 0.019584 | 8.333518 | Optn | 0.000427 | 0.026575 | 11.61674 |
| Atp2b2 | 0.000315 | 0.019653 | 47.27536 | Cttnbp2nl | 0.000428 | 0.026575 | 240.8243 |
| Cyhr1 | 0.000321 | 0.019876 | 4.662578 | Rnf157 | 0.00043 | 0.026575 | -11.2783 |
| Sdhaf1 | 0.000331 | 0.020309 | 4.885659 | Gprasp2 | 0.000432 | 0.026575 | 33.45113 |
| Nfil3 | 0.000331 | 0.020309 | 2.578465 | Abcd3 | 0.000435 | 0.026575 | 5.104095 |
| Zfp703 | 0.000334 | 0.020356 | 3.624537 | Tlr8 | 0.000437 | 0.026575 | 600.5607 |
| Il18r1 | 0.000339 | 0.020507 | -3.17161 | Gpr132 | 0.000438 | 0.026575 | -2.80758 |
| Cyb5r4 | 0.000339 | 0.020507 | -1.75231 | Mical2 | 0.000444 | 0.026851 | -1068.59 |
| Itpk1 | 0.000341 | 0.020523 | -3.39356 | Slc11a1 | 0.00045 | 0.027075 | 32.62391 |
| C2cd4b | 0.000349 | 0.020829 | 73.70216 | Cnksr3 | 0.000459 | 0.027469 | 18.11392 |
| Bcl9 | 0.00035 | 0.020829 | 3.31549 | 0610040J01Rik | 0.000465 | 0.027664 | 1342.517 |
| Cyb561 | 0.000353 | 0.020829 | -120.985 | Gtf2i | 0.000468 | 0.027664 | -2.76888 |
| Plscr4 | 0.000354 | 0.020829 | 9.824695 | Hid1 | 0.00047 | 0.027664 | -24.1379 |
| Twf2 | 0.000355 | 0.020829 | -1.77964 | Rab37 | 0.000472 | 0.027664 | 2.339742 |
| Lrrc75b | 0.000358 | 0.020921 | -390.539 | Zmiz2 | 0.00048 | 0.028021 | -2.75977 |
| Gpc1 | 0.000364 | 0.021137 | -21.7574 | Rcor1 | 0.000493 | 0.02866 | -4.19177 |
| Galnt10 | 0.000366 | 0.021137 | -5.86654 | Lpl | 0.000499 | 0.028857 | 44.22736 |
| Plgrkt | 0.000369 | 0.021148 | 2.952241 | Tdrp | 0.000504 | 0.028996 | 5.904384 |
| Zcchc11 | 0.000369 | 0.021148 | 1.771528 | Tnfrsf25 | 0.000509 | 0.029136 | 2.711773 |
| Dtx3 | 0.00038 | 0.021638 | 2.409986 | Gpr18 | 0.000518 | 0.029525 | -7.50396 |
| Mctp2 | 0.000389 | 0.022036 | -9.67847 | Klrk1 | 0.000522 | 0.029631 | -8.61695 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Erdr1 | 0.000391 | 0.022088 | 8.254083 | Gtf2a1 | 0.000526 | 0.029717 | 3.172194 |
| Trpm6 | 0.000397 | 0.022296 | 9.44246 | Lpcat2 | 0.000531 | 0.029771 | 653.0223 |
| Tmod3 | 0.000399 | 0.022322 | -2.62634 | Creb3l2 | 0.000532 | 0.029771 | 3.574279 |
| Pqlc3 | 0.000409 | 0.022777 | 2.152317 | Rassf1 | 0.000537 | 0.02987 | -2.81356 |
| Ttc14 | 0.000413 | 0.022836 | 1.932964 | Rell1 | 0.00054 | 0.029885 | -3.281 |
| Ramp1 | 0.000414 | 0.022836 | 10.06635 | Bcl2l11 | 0.000542 | 0.029885 | -6.04676 |
| Ralyl | 0.000419 | 0.022886 | 44.38062 | Pde4b | 0.000546 | 0.029972 | -3.46427 |
| Tbx6 | 0.000419 | 0.022886 | 3.95053 | Ankrd13b | 0.000551 | 0.030041 | -34.377 |
| Scin | 0.000422 | 0.022886 | 27.86917 | Bambi | 0.000552 | 0.030041 | -11.5062 |
| Prf1 | 0.000423 | 0.022886 | -12.2349 | Clec4a2 | 0.000561 | 0.030372 | 278.2968 |
| Tcea2 | 0.000429 | 0.023017 | 2.147288 | St6gal1 | 0.000572 | 0.030717 | 3.674348 |
| Cpsf7 | 0.000429 | 0.023017 | 1.986175 | Smap2 | 0.000576 | 0.030717 | -2.17105 |
| Ubn2 | 0.000432 | 0.023061 | 3.131306 | Parp16 | 0.00058 | 0.030717 | -2.80673 |
| Amica1 | 0.000434 | 0.023101 | -3.64364 | Armcx2 | 0.000581 | 0.030717 | 7.824538 |
| Ttll12 | 0.000438 | 0.023212 | -1.87007 | Btg2 | 0.000584 | 0.030717 | -2.82713 |
| Samsn1 | 0.000441 | 0.02326 | 2.04852 | Penk | 0.000584 | 0.030717 | 4.318593 |
| Gna13 | 0.000444 | 0.023321 | -1.71975 | P2ry10 | 0.000585 | 0.030717 | -2.5156 |
| Vopp1 | 0.000454 | 0.023714 | -3.07626 | Dst | 0.000592 | 0.030927 | 6.875041 |
| Itga1 | 0.000458 | 0.023865 | -13.7457 | Enpp4 | 0.000604 | 0.03146 | -2290.73 |
| Il18rap | 0.000464 | 0.02397 | -4.03519 | Pde7a | 0.00061 | 0.031486 | -7.5293 |
| Hist1h2bg | 0.000464 | 0.02397 | 34.7316 | Fam160a1 | 0.000615 | 0.031486 | 155.893 |
| Fam234b | 0.000472 | 0.024156 | -3.8148 | Tmem158 | 0.000615 | 0.031486 | 21.23117 |
| Xlr3b | 0.000472 | 0.024156 | 3.58244 | Ankrd11 | 0.000615 | 0.031486 | -2.81493 |
| Kmt2b | 0.000474 | 0.024171 | 2.099503 | Kif13b | 0.000618 | 0.031486 | 4.102243 |
| Cyp2s1 | 0.000487 | 0.024731 | -4.07715 | Slc9b2 | 0.000624 | 0.03166 | 5.348618 |
| Sbk2 | 0.000492 | 0.024877 | -628.766 | Gucy2g | 0.00064 | 0.032336 | 1100.03 |
| Hrh2 | 0.000504 | 0.02536 | -5.00526 | Dnah12 | 0.000655 | 0.032707 | 54.23074 |
| Lyz2 | 0.000506 | 0.02536 | 17.77808 | Fli1 | 0.000655 | 0.032707 | -2.52448 |
| Tnfrsf25 | 0.000514 | 0.025651 | 2.142122 | Litaf | 0.000657 | 0.032707 | -3.76962 |
| Malt1 | 0.000522 | 0.025701 | -3.24956 | Tox | 0.000658 | 0.032707 | 2.918939 |
| Plcxd2 | 0.000525 | 0.025701 | -2.10092 | Usp6nl | 0.000663 | 0.03279 | 3.943386 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9930021J03Rik | 0.00053 | 0.025701 | 1.991111 | Bmp7 | 0.000679 | 0.033445 | -3.5264 |
| Slk | 0.000532 | 0.025701 | 2.229123 | Cdt1 | 0.000683 | 0.033445 | -2.80312 |
| Nrp1 | 0.000533 | 0.025701 | 3.48825 | Lrrn3 | 0.000686 | 0.033445 | 232.2625 |
| Plk2 | 0.000536 | 0.025701 | 3.205501 | Uck2 | 0.000688 | 0.033445 | -2.60951 |
| Tlcd2 | 0.00054 | 0.025701 | 5.291469 | Elmod1 | 0.00069 | 0.033445 | 5981.618 |
| Mob3a | 0.000543 | 0.025701 | -1.77869 | Cyp27a1 | 0.000695 | 0.033539 | 330.7584 |
| Itgb7 | 0.000548 | 0.025701 | -2.62871 | Fcrl1 | 0.000699 | 0.033539 | 18.34219 |
| Tbc1d22b | 0.000548 | 0.025701 | -2.22529 | Hacd4 | 0.0007 | 0.033539 | 150.8902 |
| Abcb9 | 0.00055 | 0.025701 | -2.44129 | Tbc1d9 | 0.000704 | 0.033553 | 413.198 |
| Tmem167b | 0.000551 | 0.025701 | -2.01549 | Hilpda | 0.000707 | 0.033553 | -16.8088 |
| F2rl1 | 0.000551 | 0.025701 | -16.7907 | Pla2g7 | 0.000709 | 0.033553 | 20.82128 |
| Bod1l | 0.000554 | 0.025701 | 1.860986 | Gata3 | 0.000716 | 0.033694 | 2.205321 |
| Rtn4rl1 | 0.000557 | 0.025701 | -5.09601 | Tbxas1 | 0.000717 | 0.033694 | 35.78983 |
| Abhd4 | 0.000559 | 0.025701 | 1.720343 | Slc26a11 | 0.000724 | 0.033868 | -2.96513 |
| Xkr6 | 0.000559 | 0.025701 | 15.18371 | Rnf125 | 0.000733 | 0.034108 | -4.0942 |
| Lmntd1 | 0.00056 | 0.025701 | -141.655 | Wdr95 | 0.000737 | 0.034108 | -3499.1 |
| Aim1 | 0.00056 | 0.025701 | -4.35332 | Ctla2a | 0.000738 | 0.034108 | -18.7403 |
| Haghl | 0.000562 | 0.025701 | 2.603295 | Plekhf1 | 0.000741 | 0.034111 | -1657.74 |
| Pabpn1 | 0.000562 | 0.025701 | 2.821729 | Chdh | 0.000743 | 0.034111 | 1102.693 |
| Edem1 | 0.000569 | 0.025701 | -2.61378 | Tbc1d4 | 0.000748 | 0.034196 | 4.85441 |
| Grap2 | 0.00057 | 0.025701 | -2.33415 | Slc7a8 | 0.000752 | 0.0342 | 137.0538 |
| Zfp950 | 0.000571 | 0.025701 | 2.460666 | Cbfa2t3 | 0.000754 | 0.0342 | 75.94509 |
| Cers6 | 0.000574 | 0.025701 | -3.5605 | Slamf1 | 0.000765 | 0.034575 | -3.20341 |
| Itga2 | 0.000575 | 0.025701 | -209.126 | Nudt4 | 0.000772 | 0.034641 | 3.919887 |
| Lgals4 | 0.000575 | 0.025701 | 2.680229 | Sh3bgrl | 0.000774 | 0.034641 | 2.241244 |
| Zbtb20 | 0.000577 | 0.025701 | 2.264049 | Phgdh | 0.000775 | 0.034641 | -4.25799 |
| Trib2 | 0.00058 | 0.025701 | -2.88846 | Gm14085 | 0.000782 | 0.034809 | -243.514 |
| Zfp395 | 0.000583 | 0.025701 | 2.759258 | Fas | 0.000794 | 0.035173 | -9.99588 |
| Cox7c | 0.000584 | 0.025701 | 3.758218 | Cnnm2 | 0.000796 | 0.035173 | 6.03909 |
| Sh3gl3 | 0.000586 | 0.025701 | 4.497596 | D16Ertd472e | 0.000803 | 0.035358 | -3.50078 |
| Nipbl | 0.000586 | 0.025701 | 1.747326 | Kif15 | 0.000808 | 0.035414 | 6.374796 |

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|---|---|---|---|---|---|---|---|
| Plxdc2 | 0.000588 | 0.025701 | 24.78023 | B430306N03Rik | 0.00081 | 0.035414 | 26.31969 |
| Gabbr1 | 0.000592 | 0.025772 | 2.703733 | Iigp1 | 0.000814 | 0.035461 | 4.278351 |
| Rcor1 | 0.000595 | 0.025804 | 2.408785 | Tlr1 | 0.00083 | 0.036039 | 3.728632 |
| Tmem191c | 0.000597 | 0.025804 | 2.233566 | H2-Q10 | 0.000852 | 0.036849 | -27.8644 |
| Ppic | 0.000601 | 0.025922 | 4.697559 | Ift140 | 0.000855 | 0.036849 | 7.369854 |
| Tg | 0.000606 | 0.026045 | 4.742553 | I830077J02Rik | 0.000869 | 0.037305 | 25.07549 |
| Fam20a | 0.000617 | 0.026327 | -4.6824 | Pcgf6 | 0.000876 | 0.037492 | -3.35895 |
| Fuz | 0.000617 | 0.026327 | 2.058562 | Cxcr6 | 0.000918 | 0.039128 | -7.43888 |
| Col27a1 | 0.000625 | 0.026513 | 58.43103 | Prrg1 | 0.000921 | 0.039128 | -384.687 |
| Atxn2 | 0.000628 | 0.026513 | 3.365688 | Tnfrsf1a | 0.000954 | 0.040373 | -2.91551 |
| Egln3 | 0.000636 | 0.026513 | -3.11834 | Impdh1 | 0.00096 | 0.040509 | -4.12866 |
| Cyb5r1 | 0.000636 | 0.026513 | 2.708821 | Lrig1 | 0.000964 | 0.040513 | 7.588391 |
| Rab21 | 0.000638 | 0.026513 | 6.078987 | Megf8 | 0.00098 | 0.04104 | 132.9312 |
| Prmt3 | 0.000639 | 0.026513 | -1.91854 | Spock2 | 0.000989 | 0.041293 | 11.43108 |
| Lta | 0.00064 | 0.026513 | 4.842162 | Txk | 0.000995 | 0.041293 | -6.46203 |
| Fbxw17 | 0.000641 | 0.026513 | 1.955254 | Inhba | 0.000996 | 0.041293 | 11.50163 |
| Pak6 | 0.000642 | 0.026513 | -67.7123 | Tlr7 | 0.001 | 0.041293 | 38.54696 |
| Glipr2 | 0.000655 | 0.026982 | -2.37516 | Sirpa | 0.001003 | 0.041293 | 19.47003 |
| Rundc3b | 0.000661 | 0.026994 | -5.40912 | Fam110a | 0.001007 | 0.041322 | -3.85337 |
| H2-Q10 | 0.000663 | 0.026994 | -5.80037 | Ccl5 | 0.001012 | 0.041391 | -23.0247 |
| 1700019D03Rik | 0.000663 | 0.026994 | 16.79286 | Ifih1 | 0.001017 | 0.041442 | 2.515213 |
| Kmt2a | 0.000665 | 0.026994 | 1.931099 | Tox2 | 0.001026 | 0.041501 | 6.078592 |
| Son | 0.000685 | 0.027722 | 1.718341 | Hfe | 0.001027 | 0.041501 | 24.66808 |
| Dgcr6 | 0.000691 | 0.027884 | 3.281629 | Fam71f2 | 0.001031 | 0.041501 | -300.77 |
| Csf2ra | 0.000695 | 0.027922 | 3.78261 | Parp3 | 0.001032 | 0.041501 | 2.456442 |
| Bdh1 | 0.000697 | 0.027922 | -1.78917 | H2-Eb1 | 0.001041 | 0.041711 | 28.75071 |
| Il10 | 0.000701 | 0.027939 | 26.3554 | Smim10l2a | 0.001062 | 0.042433 | 6.402576 |
| Relt | 0.000702 | 0.027939 | -1.89142 | Ncoa7 | 0.001067 | 0.042486 | 2.537475 |
| Ttll1 | 0.000705 | 0.027972 | -2.45069 | Adgre1 | 0.00108 | 0.042841 | 21.63724 |
| Rapgef5 | 0.000707 | 0.027972 | -454.658 | Gnaq | 0.001101 | 0.04353 | 4.352809 |
| Ergic1 | 0.00071 | 0.028004 | 1.888794 | Itsn1 | 0.001121 | 0.044212 | -2960.55 |

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|---|---|---|---|
| Stfa3 | 0.000737 | 0.028882 | 123.8387 |
| Pfkp | 0.000738 | 0.028882 | -2.87794 |
| Cd81 | 0.00074 | 0.028882 | 6.609463 |
| Gata3 | 0.000745 | 0.029008 | 1.809953 |
| Mbd6 | 0.000752 | 0.029187 | 3.321463 |
| Lgals7 | 0.000763 | 0.029505 | 11.04066 |
| Hsph1 | 0.000772 | 0.029654 | -3.51523 |
| Gtpbp2 | 0.000774 | 0.029654 | 1.863767 |
| Usp7 | 0.000774 | 0.029654 | 2.296074 |
| Dnajc21 | 0.00078 | 0.029713 | 3.101778 |
| Pcdhgc3 | 0.000781 | 0.029713 | -193.46 |
| Hs6st3 | 0.000792 | 0.030032 | 247.3719 |
| Ube2l6 | 0.000801 | 0.030304 | 2.229079 |
| Dpp4 | 0.000809 | 0.03047 | -2.96319 |
| Cercam | 0.000811 | 0.03047 | -42.8579 |
| Decr1 | 0.000819 | 0.030551 | 2.505704 |
| Rprd1b | 0.000819 | 0.030551 | -1.72818 |
| Sat1 | 0.000821 | 0.030551 | 4.28425 |
| Rars | 0.000823 | 0.030551 | -1.95787 |
| Hspa8 | 0.000828 | 0.030612 | -2.38893 |
| Sik1 | 0.00083 | 0.030612 | 3.178965 |
| Fam213b | 0.000837 | 0.030701 | 6.953992 |
| Cd79a | 0.000837 | 0.030701 | 8.467917 |
| Eya2 | 0.000844 | 0.030801 | -3.97807 |
| Sppl3 | 0.000847 | 0.030801 | 4.934532 |
| Klrb1c | 0.000854 | 0.030801 | -41.6159 |
| Idh3a | 0.000857 | 0.030801 | -1.86633 |
| D130040H23Rik | 0.000858 | 0.030801 | 2.717063 |
| Klhl4 | 0.000859 | 0.030801 | -1423.88 |
| Dnaja4 | 0.000859 | 0.030801 | -3.52376 |
| Tbx21 | 0.000861 | 0.030801 | -5.516 |

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|---|---|---|---|
| Pxylp1 | 0.001129 | 0.044371 | -6.59013 |
| Ampd3 | 0.001157 | 0.045305 | 24.05396 |
| Ephx1 | 0.001163 | 0.045396 | 2.899119 |
| Ksr2 | 0.001169 | 0.045396 | 30.85135 |
| Akt1 | 0.00117 | 0.045396 | -7.15773 |
| Mllt3 | 0.001182 | 0.045684 | 2.172341 |
| Slc2a3 | 0.001189 | 0.045788 | -6.16338 |
| Slc12a2 | 0.001192 | 0.045788 | 4.429697 |
| Mertk | 0.001198 | 0.045862 | 19.56504 |
| Tgfbr3 | 0.001207 | 0.046071 | -5.89374 |
| Fam65c | 0.001216 | 0.046284 | 98.2189 |
| Ikzf3 | 0.001232 | 0.046719 | -4.69382 |
| Ralgps1 | 0.00124 | 0.046893 | 5.719342 |
| Ptpn11 | 0.001254 | 0.047279 | 3.116447 |
| Vwa5a | 0.001281 | 0.048104 | 3.513787 |
| Atxn2 | 0.001286 | 0.048104 | -6.14186 |
| Klhl5 | 0.00129 | 0.048104 | 2.158335 |
| Espn | 0.001292 | 0.048104 | 3.727012 |
| Rbms1 | 0.001334 | 0.049494 | -2.629 |

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|---|---|---|---|
| Cacna1a | 0.000873 | 0.030801 | 3.622773 |
| Grm6 | 0.000873 | 0.030801 | 9.625441 |
| Cpne2 | 0.000876 | 0.030801 | 3.212918 |
| Grik5 | 0.000876 | 0.030801 | 4.094148 |
| 2410016O06Rik | 0.000878 | 0.030801 | -2.07444 |
| I830077J02Rik | 0.00088 | 0.030801 | 6.80483 |
| Trip4 | 0.00088 | 0.030801 | -2.21683 |
| Ube2j1 | 0.000881 | 0.030801 | -2.11566 |
| Smad4 | 0.000909 | 0.031634 | 3.650663 |
| Adgrg1 | 0.00091 | 0.031634 | -31.6431 |
| Ing4 | 0.000914 | 0.031665 | 3.758747 |
| Sirt5 | 0.000929 | 0.032043 | 2.69608 |
| Tbxa2r | 0.00093 | 0.032043 | -2.32847 |
| Dnah7a | 0.000947 | 0.032532 | 163.1425 |
| Rfwd2 | 0.000951 | 0.032572 | 3.235907 |
| Vipr2 | 0.000957 | 0.032627 | 8.592834 |
| Fosb | 0.000958 | 0.032627 | 6.609876 |
| Gbp2 | 0.000966 | 0.032794 | -1.94644 |
| Fus | 0.00097 | 0.032857 | 2.080349 |
| Themis | 0.000976 | 0.03298 | -2.79156 |
| Atp5b | 0.000983 | 0.033097 | -1.61701 |
| Tmc4 | 0.001007 | 0.033826 | 4.9569 |
| Apobec3 | 0.001024 | 0.034313 | 1.680912 |
| Vamp2 | 0.001028 | 0.034334 | 1.714948 |
| 1810030O07Rik | 0.001051 | 0.035003 | -1.76235 |
| Dck | 0.00106 | 0.035107 | -1.74342 |
| Adck5 | 0.001061 | 0.035107 | 2.087545 |
| Nup50 | 0.001063 | 0.035107 | -1.84714 |
| Msi2 | 0.001079 | 0.03556 | 2.566775 |
| Ccdc109b | 0.001083 | 0.035563 | 3.381393 |
| Fbxo11 | 0.001108 | 0.03625 | 2.564005 |

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|---|---|---|---|
| Bcl6 | 0.001114 | 0.03625 | -2.32429 |
| Rps13 | 0.001115 | 0.03625 | 2.17584 |
| S100a4 | 0.001115 | 0.03625 | 6.378086 |
| Fgl2 | 0.00112 | 0.0363 | -8.67381 |
| Lef1 | 0.001132 | 0.036596 | -2.55619 |
| Idh3b | 0.001147 | 0.036974 | 1.702943 |
| Tram1 | 0.00115 | 0.036974 | -1.74784 |
| Hist1h1c | 0.001157 | 0.0371 | 2.208211 |
| Ppp1r9b | 0.001166 | 0.037294 | 2.508359 |
| Ints8 | 0.001179 | 0.037522 | -2.34113 |
| Epas1 | 0.00118 | 0.037522 | -3.85801 |
| Unc119 | 0.001185 | 0.037583 | 2.305909 |
| Azin1 | 0.001203 | 0.038075 | -1.75394 |
| Gm5150 | 0.001209 | 0.03815 | 10.08429 |
| H2afz | 0.001216 | 0.038266 | 7.301786 |
| Art2b | 0.001228 | 0.038514 | -2.4258 |
| Gpd1l | 0.00123 | 0.038514 | -2.7536 |
| Cd302 | 0.001242 | 0.038733 | 8.817529 |
| Sema4d | 0.001243 | 0.038733 | -2.74154 |
| Pla2g4f | 0.001257 | 0.039056 | 36.98261 |
| Slc29a4 | 0.001264 | 0.039173 | -242.124 |
| Ndrg4 | 0.001278 | 0.039505 | -189.851 |
| Fgf13 | 0.001284 | 0.039577 | -4.14611 |
| Nup93 | 0.001288 | 0.039617 | -3.09519 |
| Akap7 | 0.001307 | 0.040099 | 5.100134 |
| Dennd4a | 0.00133 | 0.040643 | -3.51949 |
| Plekhf2 | 0.001336 | 0.040643 | -1.86656 |
| Hist1h2bc | 0.001337 | 0.040643 | 6.509552 |
| Srrm1 | 0.001339 | 0.040643 | 1.825339 |
| Tnfsf4 | 0.001349 | 0.040864 | 13.94985 |
| Aar2 | 0.001369 | 0.04137 | -1.77839 |

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|---|---|---|---|
| Epsti1 | 0.001378 | 0.041451 | -2.22429 |
| Il11ra1 | 0.00138 | 0.041451 | 4.098797 |
| Ttc3 | 0.001382 | 0.041451 | 1.82999 |
| Dnajc4 | 0.001395 | 0.04162 | 3.213033 |
| Mettl4 | 0.001395 | 0.04162 | -2.66333 |
| Abtb2 | 0.00141 | 0.041963 | -5.28662 |
| Crtap | 0.00142 | 0.042128 | 2.535136 |
| Cd84 | 0.001422 | 0.042128 | 1.81158 |
| Jakmip1 | 0.001433 | 0.042316 | -2.09757 |
| Slc39a13 | 0.001436 | 0.042316 | 1.840452 |
| Nedd4 | 0.00144 | 0.04234 | -39.5043 |
| Rnf125 | 0.001446 | 0.0424 | -2.25957 |
| Gch1 | 0.001449 | 0.042405 | 2.153733 |
| Rb1 | 0.001455 | 0.042449 | 2.684546 |
| Htra2 | 0.001471 | 0.042825 | 1.78705 |
| Ankrd12 | 0.001477 | 0.042911 | 2.380082 |
| Laptm4b | 0.001488 | 0.04307 | 4.771161 |
| Prkcb | 0.001492 | 0.04307 | -2.13735 |
| 1600014C10Rik | 0.001497 | 0.04307 | -2.3528 |
| Stambpl1 | 0.001498 | 0.04307 | 1.593668 |
| Slc29a3 | 0.001501 | 0.04307 | 2.069185 |
| Nfatc2 | 0.001507 | 0.043156 | -2.82764 |
| Zmiz2 | 0.001512 | 0.043174 | 1.772931 |
| Adgrg3 | 0.00152 | 0.043305 | -275.713 |
| Tnfsf9 | 0.001525 | 0.043305 | 2.944443 |
| Qpct | 0.001527 | 0.043305 | -28.2481 |
| Fosl2 | 0.001535 | 0.043421 | 1.943176 |
| Vps13d | 0.001547 | 0.043644 | 2.287115 |
| Sh3bgrl | 0.001553 | 0.043644 | 1.746975 |
| 4930452B06Rik | 0.001554 | 0.043644 | 78.1306 |
| Rabif | 0.001561 | 0.043705 | -1.87474 |

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|---|---|---|---|
| Mon2 | 0.001565 | 0.043705 | 2.078233 |
| Il15ra | 0.001568 | 0.043705 | 2.048914 |
| Gstm1 | 0.00157 | 0.043705 | 9.869063 |
| Setd7 | 0.001576 | 0.043705 | 2.385887 |
| G6pc3 | 0.001578 | 0.043705 | 2.293967 |
| Wnt3 | 0.001581 | 0.043705 | 14.44371 |
| Mxd4 | 0.001621 | 0.044715 | 2.030162 |
| Serpinc1 | 0.001635 | 0.044941 | 20.79477 |
| Brwd3 | 0.001637 | 0.044941 | 2.363071 |
| Klhl36 | 0.001663 | 0.045553 | 1.811353 |
| Ints5 | 0.001669 | 0.045599 | -1.90083 |
| Pdcd1lg2 | 0.001672 | 0.045599 | 3.589559 |
| Tspan14 | 0.001684 | 0.04575 | -1.65307 |
| Fabp5 | 0.001686 | 0.04575 | 5.189663 |
| Basp1 | 0.001706 | 0.046205 | 18.05892 |
| Itih5 | 0.00171 | 0.046208 | -4.25475 |
| Ccdc163 | 0.001736 | 0.0468 | 4.391215 |
| Dcaf7 | 0.00174 | 0.046806 | -2.47048 |
| Rbm25 | 0.001759 | 0.047146 | 2.065778 |
| Dyrk1a | 0.001761 | 0.047146 | 2.06491 |
| Gas2 | 0.001771 | 0.047211 | 3.506577 |
| Apol7e | 0.001774 | 0.047211 | -3.12139 |
| Ptpn22 | 0.001775 | 0.047211 | -2.07276 |
| Ptprs | 0.001784 | 0.047251 | 5.85928 |
| Rabep1 | 0.001785 | 0.047251 | 1.712011 |
| Slc43a3 | 0.001788 | 0.047251 | 4.101556 |
| Arsb | 0.001832 | 0.048235 | -5.16762 |
| Atp6v0a2 | 0.001833 | 0.048235 | -3.09703 |
| Rilpl2 | 0.00185 | 0.048544 | 2.298383 |
| Naa30 | 0.001853 | 0.048544 | -1.85715 |
| Lancl1 | 0.001878 | 0.049087 | 2.036827 |

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|---|---|---|---|
| Ninj1 | 0.001891 | 0.049211 | 3.104657 |
| Jade2 | 0.001891 | 0.049211 | 2.844902 |
| Pik3r5 | 0.001902 | 0.049386 | -3.38705 |
| Luc7l2 | 0.001925 | 0.049873 | 2.370652 |
| Perp | 0.001931 | 0.049873 | -7.07873 |
| Marveld1 | 0.001933 | 0.049873 | 3.541191 |

**Supplementary Table 2.** Differentially expressed transcription factors in tolerant relative to memory TCR75 cells.

| Spleen+LNs | | | | Allograft | | | |
|---|---|---|---|---|---|---|---|
| Gene ID | *p* value | FDR | Fold change | Gene ID | *p* value | FDR | Fold change |
| Pou2f2 | 6.71E-08 | 0.000202 | 6.40611 | Nr3c2 | 1.64E-08 | 0.000134 | 641.7728 |
| Satb1 | 7.24E-07 | 0.00087 | -12.5699 | Vdr | 3.46E-07 | 0.00069 | 113.2143 |
| Runx3 | 1.94E-06 | 0.001375 | -3.22498 | Pou2af1 | 9.47E-06 | 0.003794 | 37.73788 |
| Nr4a2 | 8.57E-06 | 0.003221 | 4.887755 | Enpp2 | 2.56E-05 | 0.005592 | 46.92672 |
| Camk4 | 4.11E-05 | 0.007597 | -2.08452 | Runx3 | 3.09E-05 | 0.00599 | -4.18408 |
| Otx1 | 4.60E-05 | 0.007783 | 156.201 | Fosl2 | 4.72E-05 | 0.007225 | -4.7913 |
| Nfat5 | 4.92E-05 | 0.007965 | 4.543533 | Nr4a1 | 5.27E-05 | 0.007922 | -5.02518 |
| Dmrta1 | 6.01E-05 | 0.008544 | -82.0216 | Satb1 | 7.21E-05 | 0.009743 | -15.362 |

| | | | |
|---|---|---|---|
| Cbfb | 7.75E-05 | 0.009448 | -1.9449 |
| Klf4 | 8.32E-05 | 0.009804 | 5.63471 |
| Tob1 | 0.000117 | 0.012125 | -2.26656 |
| Srebf2 | 0.000135 | 0.012934 | -2.47994 |
| Gtf2i | 0.000156 | 0.013635 | -2.11318 |
| Nr3c2 | 0.000171 | 0.014267 | 5.485227 |
| Zfp91 | 0.000174 | 0.014267 | 2.780948 |
| Mtpn | 0.000227 | 0.016461 | -1.83241 |
| Zfp36l1 | 0.00024 | 0.016911 | 3.980671 |
| Rxra | 0.000255 | 0.017255 | 3.05206 |
| Nfil3 | 0.000331 | 0.020309 | 2.578465 |
| Tbx6 | 0.000419 | 0.022886 | 3.95053 |
| Tcea2 | 0.000429 | 0.023017 | 2.147288 |
| Rcor1 | 0.000595 | 0.025804 | 2.408785 |
| Gata3 | 0.000745 | 0.029008 | 1.809953 |
| Tbx21 | 0.000861 | 0.030801 | -5.516 |
| Trip4 | 0.00088 | 0.030801 | -2.21683 |
| Ing4 | 0.000914 | 0.031665 | 3.758747 |
| Sirt5 | 0.000929 | 0.032043 | 2.69608 |
| Fosb | 0.000958 | 0.032627 | 6.609876 |
| Fus | 0.00097 | 0.032857 | 2.080349 |
| Bcl6 | 0.001114 | 0.03625 | -2.32429 |
| Lef1 | 0.001132 | 0.036596 | -2.55619 |
| Epas1 | 0.00118 | 0.037522 | -3.85801 |
| Rb1 | 0.001455 | 0.042449 | 2.684546 |
| Nfatc2 | 0.001507 | 0.043156 | -2.82764 |
| Fosl2 | 0.001535 | 0.043421 | 1.943176 |
| Basp1 | 0.001706 | 0.046205 | 18.05892 |

| | | | |
|---|---|---|---|
| Sirt1 | 0.000103 | 0.01252 | -16.965 |
| Esr1 | 0.000119 | 0.013521 | 45.32381 |
| Trib3 | 0.000136 | 0.01428 | -17.3313 |
| Otx1 | 0.000192 | 0.017104 | 82.79375 |
| Rxra | 0.000272 | 0.021123 | 4.104387 |
| Tle4 | 0.000349 | 0.024144 | -11.6794 |
| Irf1 | 0.000384 | 0.024808 | -2.74639 |
| Gtf2i | 0.000468 | 0.027664 | -2.76888 |
| Rcor1 | 0.000493 | 0.02866 | -4.19177 |
| Gtf2a1 | 0.000526 | 0.029717 | 3.172194 |
| Fli1 | 0.000655 | 0.032707 | -2.52448 |
| Gata3 | 0.000716 | 0.033694 | 2.205321 |
| Mllt3 | 0.001182 | 0.045684 | 2.172341 |