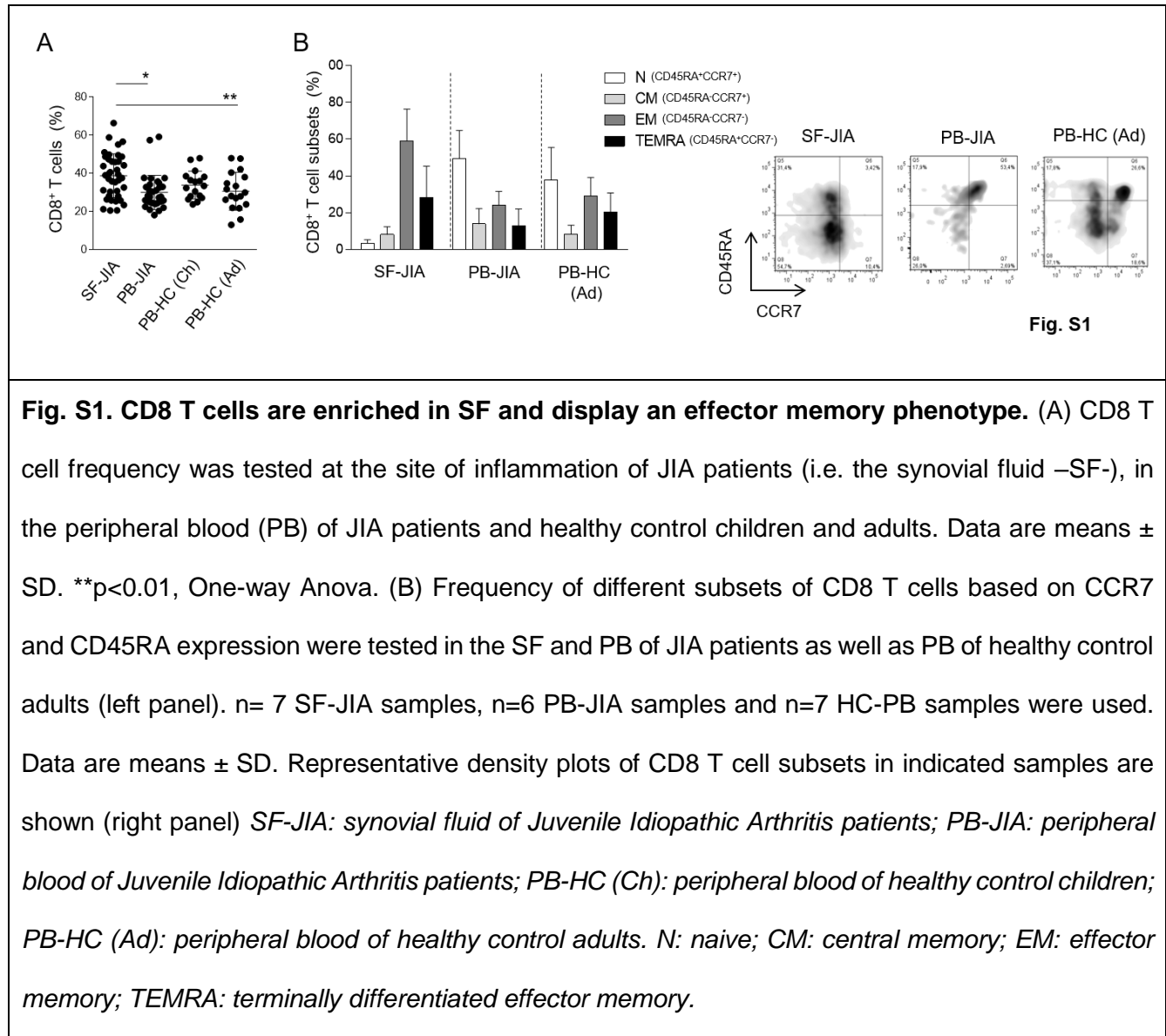


SUPPLEMENTARY MATERIALS



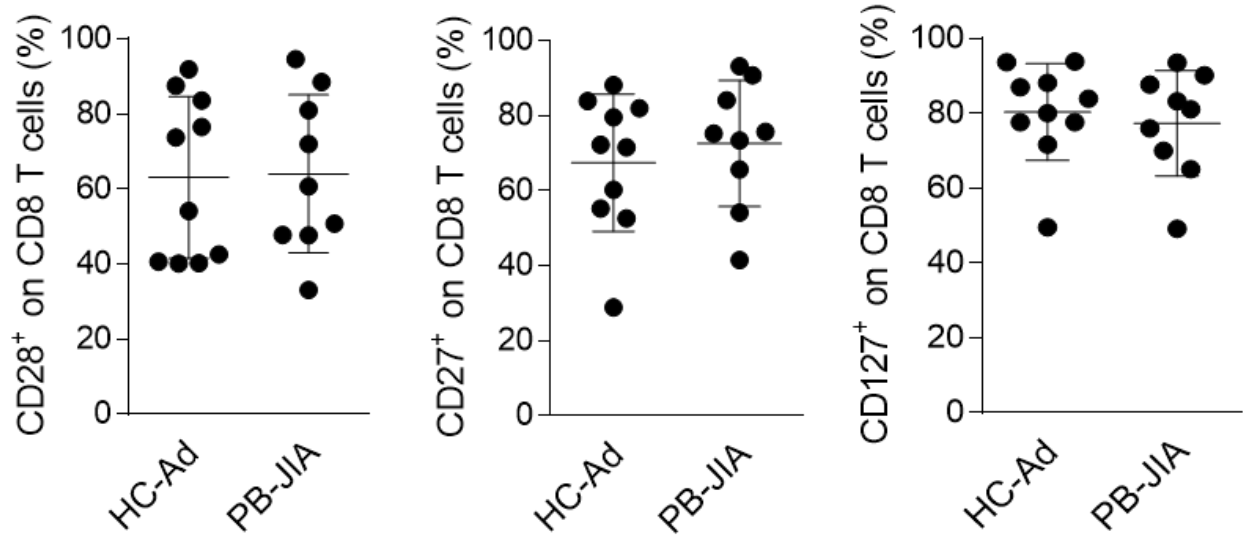


Fig. S2

Fig. S2. Comparable CD8 T cell profile between PB of JIA patients and HC adults. The frequency of CD28⁺, CD27⁺ and CD127⁺ cells on CD8 T cells was tested in the PB of JIA patients and HC adults. (n=4 per group). Data are means \pm SD. *ns*, unpaired Student's t-test. *HC-Ad* peripheral blood of healthy control adults; *PB-JIA*: peripheral blood of Juvenile Idiopathic Arthritis patients.

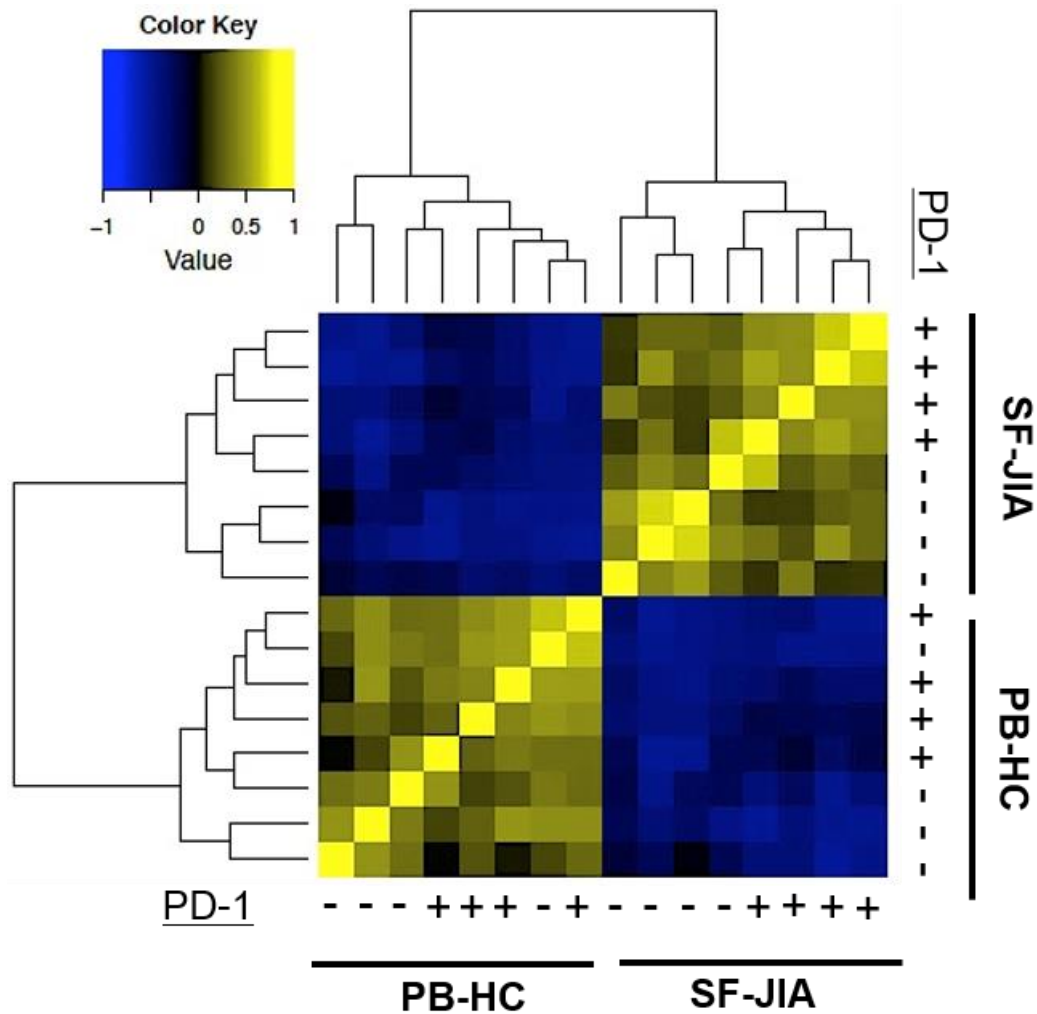


Fig. S3

Fig. S3. Heatmap from hierarchical clustering of variable genes. PD-1⁺ and PD-1⁻ CD8 T cells were sorted from SF of JIA patients and PB of healthy control adults and whole transcriptome sequencing was performed. Hierarchical clustering of variable genes is shown. *SF-JIA*: synovial fluid of Juvenile Idiopathic Arthritis patients; *PB-HC*: peripheral blood of healthy control adults.

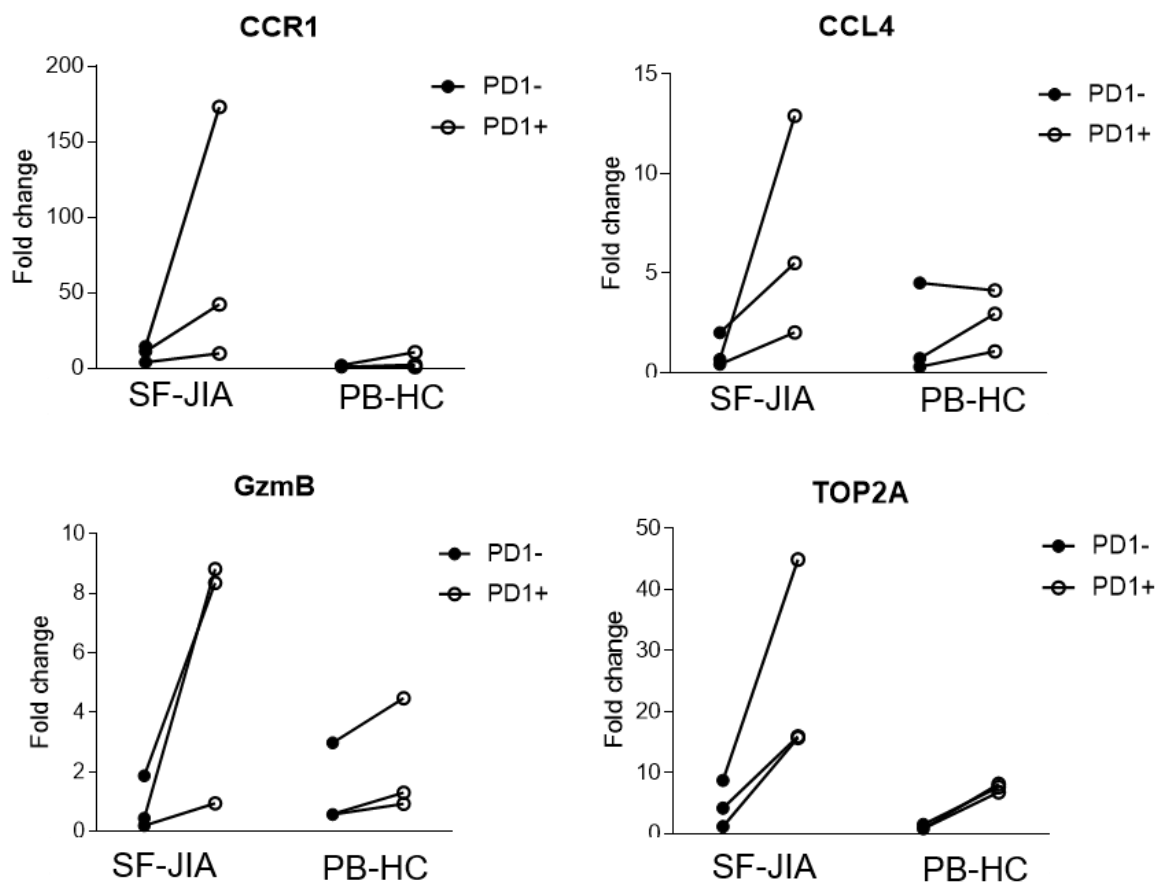
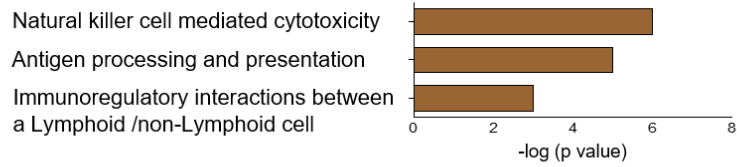


Fig. S4

Fig. S4. Expression levels of genes involved in cell activation. PD-1⁺ and PD-1⁻ CD8 T cells were sorted from SF of JIA patients and PB of healthy control adults and whole transcriptome sequencing was performed. Expression levels of selected genes up-regulated in PD-1⁺ CD8 T cells and associated with pathways involved in cell activation are shown. *SF-JIA: synovial fluid of Juvenile Idiopathic Arthritis patients; PB-HC: peripheral blood of healthy control adults.*

A Pathways:
DOWN in CD8⁺PD1⁺ vs. CD8⁺PD1⁻ SF-JIA



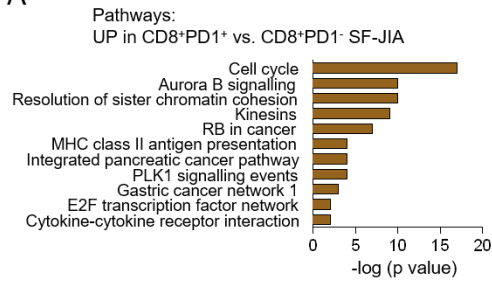
B Selected Downregulated Genes

NCR1
KIR2DL1
KIR2DL3
NCR3
KIR2DL4
KIR3DL1
KLRC2
KLRC3
KLRD1
SELL

Fig. S5

Fig. S5. Activating and inhibitory killer cell receptors are downregulated in PD-1⁻ CD8 T cells from SF-JIA. (A) Pathways enriched when genes down-regulated in PD-1⁺ compared to PD-1⁻ CD8 T cells from SF (n=179) were selected. (B) Selected genes from this analysis are shown. *SF-JIA*: synovial fluid of Juvenile Idiopathic Arthritis patients.

A



B

genes up-regulated in PD1⁺ SF-JIA vs. PD1⁺ PB-HC genes up-regulated in PD1⁺ vs. PD1⁻ SF-JIA

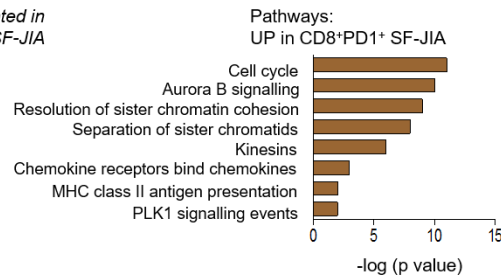
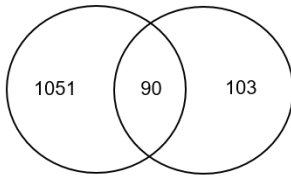


Fig. S7

Selected up-regulated genes

Cell cycle		Chemokines and receptors
<i>FOXM1</i>	<i>E2F2</i>	<i>CXCL13</i>
<i>CDKN2A</i>	<i>CDCA5</i>	<i>CCL3</i>
<i>KIF18</i>	<i>TOP2A</i>	<i>CCR2</i>
<i>KIF23</i>	<i>CENPF</i>	<i>CCR5</i>
<i>BRCA1</i>		<i>CXCR6</i>

Fig. S7. Enrichment of pathways involved in cell activation are evident in PD-1⁺ CD8 T cells from SF. (A) Pathways enriched when genes up-regulated in PD-1⁺ compared to PD-1⁻ CD8 T cells from SF were selected. (B) n=90 genes were shared between the following comparisons: genes up-regulated in PD-1⁺ from SF-JIA vs. PD-1⁺ from PB-HC and genes up-regulated in PD-1⁺ vs. PD-1⁻ from SF-JIA (left panel). Pathway enrichment analysis based on the n=90 genes is shown (middle panel). Selected genes from this analysis are shown in the right panel. *SF-JIA*: *synovial fluid of Juvenile Idiopathic Arthritis patients*; *PB-HC*: *peripheral blood of healthy control adults*.

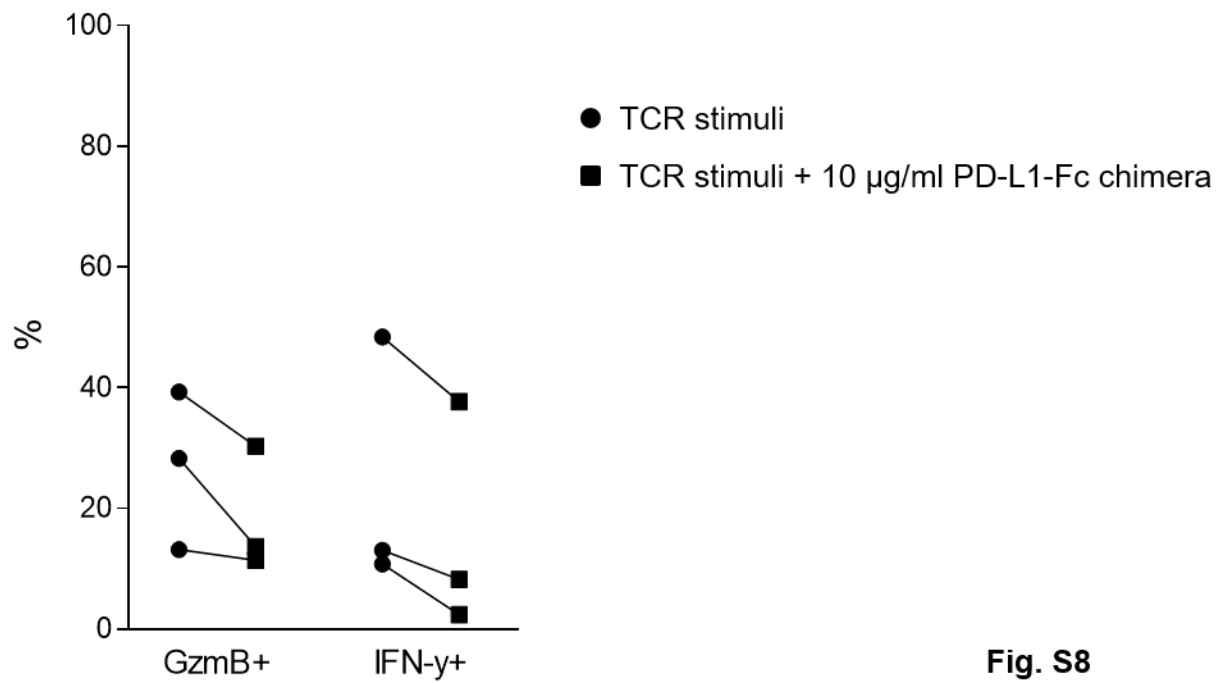


Fig. S8

Fig. S8 Responsiveness to PD-1 triggering. SF-derived FACS sorted PD-1⁺ CD8 T cells were exposed to low TCR stimulation (Dynabeads:cell ratio 1:50) in the absence or presence of anti-PD-L1 agonist (PD-L1-FC chimera, 10μg/ml). After 40-hours stimulation, GzmB and IFN-γ production were measured upon 4 hrs incubation with Golgistop.

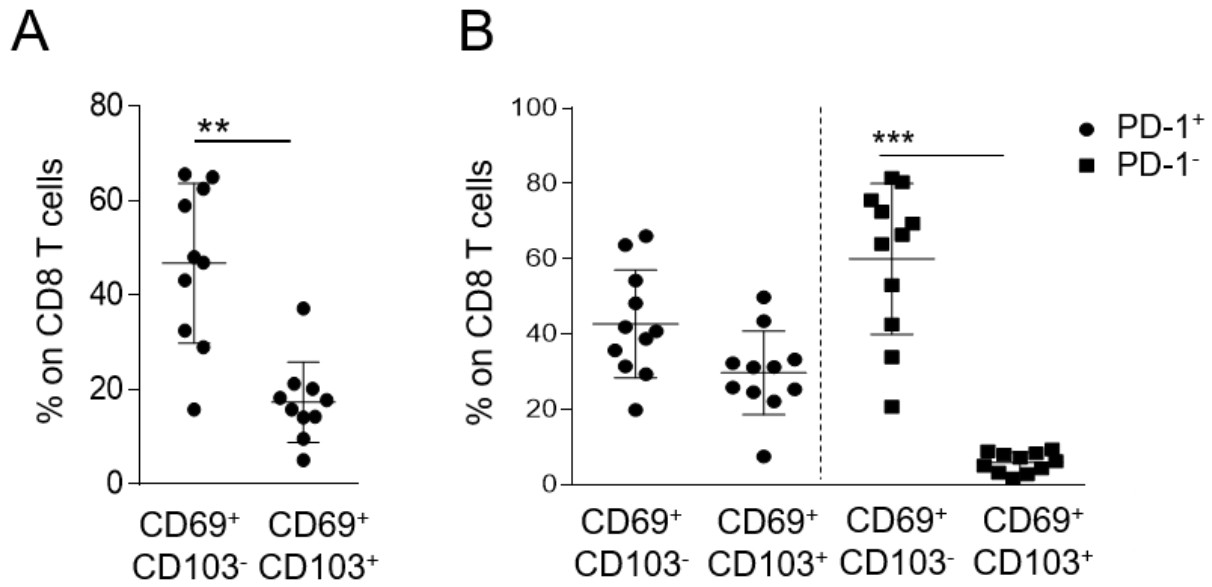


Fig. S9

Fig. S9. Tissue residency markers on CD8 T cells from SF. (A) The frequency of CD69⁺CD103⁻ and CD69⁺CD103⁺ CD8 T cell subsets in SF is displayed (n=11 per group). Data are means \pm SD. **p<0.01, Paired Student's t-test. (B) PD-1 expression on CD8 T cells expressing tissue residency markers in SF is described (n=11 per group) (right panel). Data are means \pm SD. ***p<0.0001, Paired Student's t-test.

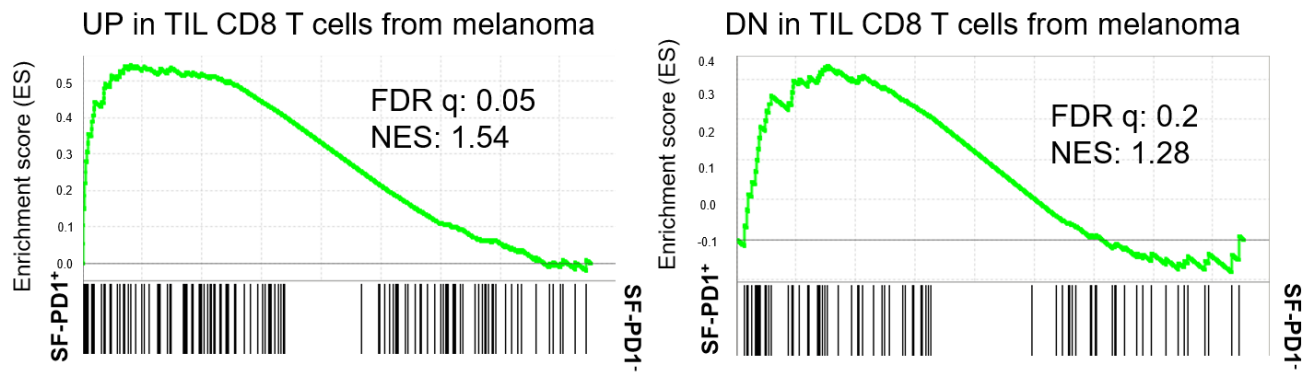


Fig. S10

Fig S10. Partial enrichment of the gene signature of human tissue-residing CD8 T cells in PD-1⁺ CD8 T cells from SF. Enrichment of the previously published gene signature (upregulated genes, left panel; downregulated genes, right panel) of tumor infiltrating CD8 T cells isolated from human metastatic melanoma (Baitsch L, J Clin Invest. 2011) was tested on PD-1⁺ vs. PD-1⁻ CD8 T cells from SF.

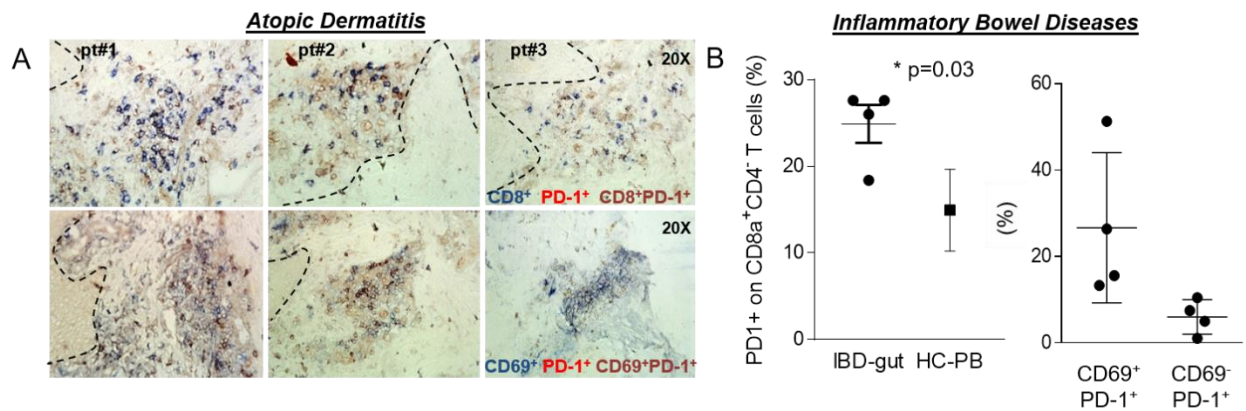


Fig. S11

Fig S11. PD1-expressing CD8 T cells display a TRM profile at the target sites of human inflammatory arthritis. (A) Double immunohistochemistry was performed on skin biopsies from inflamed tissue of patients with Atopic Dermatitis (AD). Single positive cells for CD8 (blue) and PD-1 (red) as well as double positive cells for CD8 and PD-1 (brown) are shown (top panels). Serial sections were stained for CD69 (marker of tissue-resident memory - T_{RM} - cells) and PD-1. Single positive cells for CD69 (blue) and PD-1 (red) as well as double positive cells for CD69 and PD-1 (brown) are shown in the bottom panels. (B) Immune cells were isolated from inflamed gut mucosa of patients with Inflammatory Bowel Diseases (IBD). PD-1 expression on $CD8a^+CD4^-$ T cells in the gut mucosa of IBD patients is compared to its expression on CD8 T cells from PB of HC (left panel), unpaired Student's t-test. PD-1 expression on T_{RM} ($CD69^+$) and recirculating ($CD69^-$) $CD8a^+CD4^-$ T cells is shown (right panel). *ns*, Paired Student's t-test.

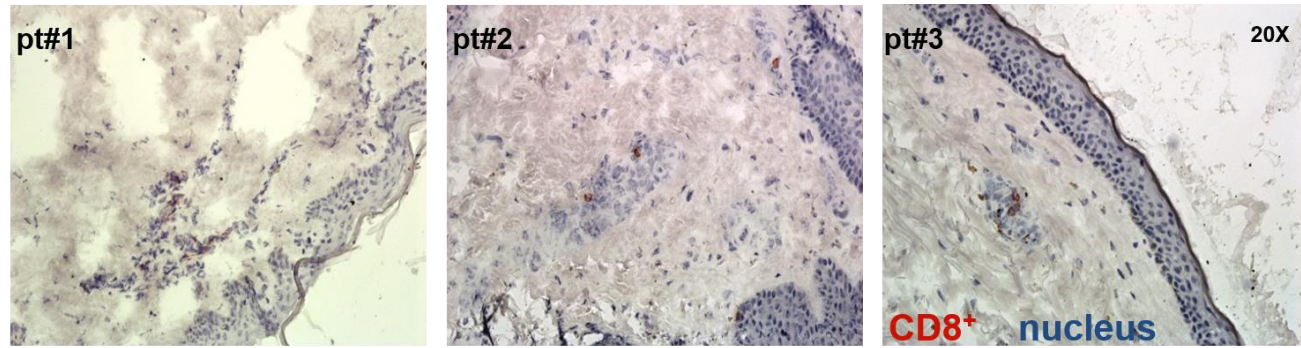


Fig. S12

Fig. S12. Few CD8 T cells are evident in non lesional skin of AD patients. (A) Immunohistochemistry was performed on skin biopsies from non-inflamed tissue of patients with atopic dermatitis (AD). CD8 cells are shown in red. Counterstaining with Mayer's Hematoxylin (blue) indicates cell nuclei.

Genes upregulated in PD-1+ vs. PD-1- CD8 T cells from SF of JIA patients

gene_name	refseq_id	log2FoldChange	adjusted p value
PDCD1	NM_005018	4.045781699	6.41523E-51
MKI67	NM_002417	3.012367951	1.18296E-29
MKI67	NM_001145966	2.99148211	5.40173E-29
MAF	NM_005360	2.665413109	2.48715E-17
TOP2A	NM_001067	2.628117805	1.1755E-16
MAF	NM_001031804	2.624504878	2.48715E-17
ASPM	NM_018136	2.607018068	2.19788E-13
FAM111B	NM_198947	2.44383223	5.47201E-09
FAM111B	NM_001142703	2.432443063	5.52046E-09
FAM111B	NM_001142704	2.432443063	5.52046E-09
RRM2	NM_001165931	2.3697854	3.5229E-09
RRM2	NM_001034	2.3697854	3.5229E-09
CDC2	NM_001786	2.360973028	2.41859E-09
CDC2	NM_001130829	2.360595011	2.42217E-09
CDC2	NM_033379	2.317114518	9.3665E-09
MYBL2	NM_002466	2.30160593	2.09533E-08
KIF23	NM_004856	2.296750094	2.16168E-07
KIF23	NM_138555	2.259128797	3.32718E-07
EVC	NM_153717	2.248606462	5.52046E-09
FASLG	NM_000639	2.243348733	1.01766E-09
KIF14	NM_014875	2.134779651	1.40577E-06
DTL	NM_016448	2.11597482	1.12308E-07
PLS3	NM_005032	2.110701672	5.2372E-06
PLS3	NM_001136025	2.110701672	5.2372E-06
TYMS	NM_001071	2.09878999	5.52046E-09
HJURP	NM_018410	2.097000781	2.23598E-06
TRIB1	NM_025195	2.080559273	3.8212E-08
BUB1B	NM_001211	2.061754304	1.43354E-06
ESPL1	NM_012291	2.061352058	1.76234E-06
E2F7	NM_203394	2.061104811	9.27699E-06
CSF1	NM_172212	2.045299073	6.00487E-07
C2orf85	NM_173821	2.044022622	1.28841E-06
ST8SIA1	NM_003034	1.997976614	6.85384E-08
CENPF	NM_016343	1.956517658	2.22993E-11
ASB2	NM_016150	1.944947379	2.81599E-05
IL28RA	NM_173065	1.944355971	9.8509E-10
IL28RA	NM_170743	1.940713704	1.19902E-09
IL28RA	NM_173064	1.933695271	1.50712E-09
NUSAP1	NM_016359	1.914723486	2.86547E-07
NUSAP1	NM_018454	1.914723486	2.86547E-07
MELK	NM_014791	1.908647933	6.99974E-05
CCNB2	NM_004701	1.893971907	2.74274E-05

KIF4A	NM_012310	1.893533618	6.77191E-05
CENPE	NM_001813	1.880637977	7.77131E-09
CSF1	NM_000757	1.871303506	9.27699E-06
FGL2	NM_006682	1.868079491	2.10353E-05
HLF	NM_002126	1.863565718	0.000119243
NUSAP1	NM_001129897	1.858673783	1.56069E-06
CKAP2L	NM_152515	1.844957101	8.29507E-05
CASC5	NM_170589	1.838071035	6.7792E-06
CASC5	NM_144508	1.838071035	6.7792E-06
PKMYT1	NM_004203	1.836339843	6.21428E-05
ST6GALNAC3	NM_152996	1.83224261	0.00011013
PKMYT1	NM_182687	1.818541548	7.02031E-05
TNFRSF9	NM_001561	1.801764922	2.28132E-05
KIF11	NM_004523	1.788002836	3.49418E-06
NCRNA00152	NR_024204	1.773164818	1.53525E-06
CDCA2	NM_152562	1.770209657	0.000210225
DEPDC1B	NM_018369	1.767596017	0.000113995
BIRC5	NM_001012270	1.764122709	9.3992E-05
DEPDC1B	NM_001145208	1.758129959	0.000163438
MIR155HG	NR_001458	1.743620771	8.90328E-05
BIRC5	NM_001012271	1.732379045	0.00011157
BIRC5	NM_001168	1.732379045	0.00011157
CTLA4	NM_001037631	1.721158046	9.66833E-05
CEP55	NM_018131	1.713541803	0.000268965
CTLA4	NM_005214	1.711059371	0.000114916
CSF1	NM_172211	1.703923185	0.000169729
CEP55	NM_001127182	1.687592562	0.000352797
GLT25D2	NM_015101	1.674570226	0.000322048
FRMD4B	NM_015123	1.673321914	9.80368E-05
GIN2	NM_016095	1.669081133	0.000371719
TOX2	NM_001098797	1.667966414	0.000751775
TOX2	NM_001098796	1.667966414	0.000751775
TOX2	NM_032883	1.667966414	0.000751775
TMEM155	NM_152399	1.657523119	0.000837207
DUSP4	NM_001394	1.641812336	1.2467E-05
CD70	NM_001252	1.633151472	0.000898411
CDT1	NM_030928	1.622017487	0.000269659
BMF	NM_033503	1.620503639	6.33507E-06
CLSPN	NM_022111	1.615686544	6.31679E-08
BMF	NM_001003940	1.613863012	6.3897E-06
KIAA0101	NM_014736	1.608405711	0.000272836
ARHGAP11A	NM_014783	1.607818473	3.55682E-07
BMF	NM_001003943	1.603922778	9.49108E-06
BCAT1	NM_005504	1.600812615	0.000163438
KIF18A	NM_031217	1.599296481	0.000145041

CDCA8	NM_018101	1.589597066	0.000480181
BMF	NM_001003942	1.586532783	1.42835E-05
KIFC1	NM_002263	1.575323288	0.000807346
KIF15	NM_020242	1.574592766	0.000748223
DUSP4	NM_057158	1.574064626	5.28485E-05
HLA-DMB	NM_002118	1.554452031	4.06134E-05
HLA-DMA	NM_006120	1.553423989	5.94748E-06
ZBTB32	NM_014383	1.553246859	0.001744279
TOX2	NM_001098798	1.545392346	0.002192065
DTHD1	NM_001136536	1.543393831	0.00069441
POLQ	NM_199420	1.542373924	0.001528994
ST6GALNAC3	NM_001160011	1.528714799	0.002387185
CCR5	NM_000579	1.524776458	0.002685807
CCR5	NM_001100168	1.524537463	0.002686731
NDC80	NM_006101	1.523266644	0.000149622
PTPRN2	NM_002847	1.520740219	0.000835215
PTPRN2	NM_130842	1.520740219	0.000835215
PTPRN2	NM_130843	1.520740219	0.000835215
CCDC141	NM_173648	1.516738241	0.001311903
HMMR	NM_012485	1.515953884	0.001528994
HMMR	NM_012484	1.515953884	0.001528994
HMMR	NM_001142556	1.515953884	0.001528994
NCRNA00152	NR_024206	1.503655784	0.000804897
ZWINT	NM_001005413	1.49580498	0.000331361
HMMR	NM_001142557	1.489048521	0.002162039
CHEK1	NM_001274	1.488531626	8.90328E-05
NCRNA00152	NR_024205	1.486979716	0.000898411
CDKN2A	NM_058195	1.481003289	0.002589521
HLA-DRB5	NM_002125	1.473918127	0.004084032
FOXM1	NM_202002	1.470419759	0.000226581
BUB1	NM_004336	1.469751349	8.12051E-05
ZWINT	NM_007057	1.46715675	0.000451838
CDKN2A	NM_058197	1.460820986	0.003166782
CDKN2A	NM_000077	1.458048271	0.003209968
ICOS	NM_012092	1.455721967	1.46214E-06
TESC	NM_017899	1.45470769	0.000214725
FOXM1	NM_021953	1.454024423	0.0003178
ZWINT	NM_032997	1.451630596	0.000476426
CD38	NM_001775	1.4501881	0.00421513
FOXM1	NM_202003	1.445765079	0.000351104
GZMA	NM_006144	1.444175973	0.004117329
RAD51AP1	NM_006479	1.436525149	0.000882445
RAD51AP1	NM_001130862	1.436525149	0.000882445
CD74	NM_001025159	1.433243177	1.06281E-06
CD74	NM_004355	1.431536422	1.12385E-06

CD74	NM_001025158	1.431382842	1.13582E-06
HLA-DPB1	NM_002121	1.430898454	7.51551E-05
KIAA0101	NM_001029989	1.427616644	0.003075166
ARHGAP11A	NM_199357	1.418385769	0.000995664
MAP1LC3A	NM_032514	1.417026791	0.002696831
CSGALNACT1	NM_018371	1.412345028	0.001056515
CSGALNACT1	NM_001130518	1.406398814	0.001105238
MAP1LC3A	NM_181509	1.406343864	0.003605519
MSC	NM_005098	1.405376778	0.003166037
C5orf36	NM_001145678	1.403622435	0.000252296
CDCA5	NM_080668	1.401811527	0.002508155
CCL3	NM_002983	1.399603902	0.006467044
CSGALNACT1	NR_024040	1.397788022	0.001277204
CCR2	NM_001123396	1.39724176	0.006032369
PLEKHF1	NM_024310	1.392390509	4.06134E-05
LGR6	NM_001017404	1.390973859	0.007549055
TTK	NM_003318	1.385630536	0.005702683
PLK1	NM_005030	1.381399229	0.004034409
C6orf174	NM_001012279	1.378868078	0.002017325
LGR6	NM_001017403	1.377528563	0.008519626
AURKA	NM_003600	1.376173078	0.005081608
AURKA	NM_198435	1.376173078	0.005081608
AURKA	NM_198434	1.376173078	0.005081608
AURKA	NM_198437	1.376173078	0.005081608
AURKA	NM_198436	1.376173078	0.005081608
AURKA	NM_198433	1.376173078	0.005081608
LGR6	NM_021636	1.359885472	0.009767242
CHEK1	NM_001114122	1.356101493	0.000188617
UHRF1	NM_001048201	1.351484169	0.001075608
RGS9	NM_001165933	1.339942976	0.003072493
C3orf14	NM_020685	1.339630085	0.005666489
POU3F1	NM_002699	1.337642202	0.012008678
KIF2C	NM_006845	1.336075546	0.003610286
ADA	NM_000022	1.32895688	9.00901E-05
D2HGDH	NM_152783	1.322957547	0.002140056
STMN1	NM_203401	1.319397252	8.82484E-06
STMN1	NM_203399	1.319397252	8.82484E-06
STMN1	NM_005563	1.317473835	9.27699E-06
PLEK	NM_002664	1.31008159	0.002596289
PTTG1	NM_004219	1.309340727	0.001066868
CHEK1	NM_001114121	1.308929113	0.000535569
APOBEC3H	NM_001166004	1.30682369	0.004855086
ANKRD32	NM_032290	1.28959887	0.001078862
TOX	NM_014729	1.288594414	0.001007802
RGS9	NM_001081955	1.282701146	0.003579015

PRF1	NM_001083116	1.280974583	0.000267906
PRF1	NM_005041	1.278614877	0.000268965
RDH10	NM_172037	1.277161712	7.38946E-05
RGS1	NM_002922	1.27344558	0.005261146
ZBP1	NM_001160419	1.270368509	0.000791294
RGS9	NM_003835	1.269024619	0.004321427
SPTBN5	NM_016642	1.262208207	0.012370351
CDKN3	NM_001130851	1.255352792	0.018566913
HLA-DRA	NM_019111	1.25317816	0.0233078
ZNF532	NM_018181	1.251655313	0.012390862
CCR2	NM_001123041	1.248497951	0.023029162
STMN1	NM_001145454	1.248243792	0.000139048
TIAM2	NM_012454	1.248182012	0.015218709
F2R	NM_001992	1.245498092	0.003424126
GPR19	NM_006143	1.244496425	0.006903969
ITPRIPL2	NR_028028	1.244104866	0.019976447
KIAA0408	NM_014702	1.241802636	0.009247868
THEMIS	NM_001010923	1.241702143	0.006032369
THEMIS	NM_001164685	1.239033886	0.00618705
LOC541471	NR_024373	1.238982366	0.019588057
SNX18	NM_052870	1.238319627	0.000618253
PTPN13	NM_006264	1.237673796	0.025580047
PTPN13	NM_080685	1.237673796	0.025580047
PTPN13	NM_080683	1.237673796	0.025580047
THEMIS	NM_001164687	1.235443892	0.006482953
CIT	NM_007174	1.235217763	0.001744279
PRC1	NM_003981	1.228244614	0.000793957
GZMK	NM_002104	1.22699517	0.001991472
SIT1	NM_014450	1.225036512	7.93839E-05
CXCL13	NM_006419	1.224132556	0.017151095
MLF1IP	NM_024629	1.223659242	0.000239541
ANLN	NM_018685	1.220515474	0.020685326
CTSC	NM_001814	1.219893846	0.001394881
BRIP1	NM_032043	1.219510565	0.006640039
SLC1A4	NM_003038	1.218939817	0.003216877
SLC1A4	NM_001135581	1.218400807	0.003022531
PRC1	NM_199413	1.217773498	0.000855418
PAQR4	NM_152341	1.216612261	0.011908214
CDKN3	NM_005192	1.215913353	0.015154179
ITPRIPL2	NM_001034841	1.21086783	0.025425738
CIITA	NM_000246	1.204523396	0.019647704
APOBEC3H	NM_001166003	1.203112371	0.009643707
PARD6G	NM_032510	1.20299609	0.027256178
PRR11	NM_018304	1.199854589	0.007690951
CCNA2	NM_001237	1.199352897	0.005332839

PRC1	NM_199414	1.197265219	0.001183572
NCF4	NM_013416	1.196500512	0.023540885
GFI1	NM_001127216	1.194316561	0.000508025
ARNTL2	NM_020183	1.192706313	0.023607665
APOBEC3H	NM_001166002	1.191402816	0.010899623
APOBEC3H	NM_181773	1.191402816	0.010899623
RYR1	NM_000540	1.18958006	0.015544725
RYR1	NM_001042723	1.18958006	0.015544725
GFI1	NM_005263	1.187082163	0.000578079
GFI1	NM_001127215	1.185689651	0.000583671
HLA-DPA1	NM_033554	1.181799011	0.031153312
NCF4	NM_000631	1.176204514	0.027627236
MT1E	NM_175617	1.17595795	0.026829274
E2F2	NM_004091	1.17386989	0.008329303
EZH2	NM_004456	1.169129106	0.000809882
KIF21A	NM_017641	1.168995406	0.00045204
C5orf36	NM_173665	1.167268471	0.017727366
TNF	NM_000594	1.16691827	0.021450439
CADM1	NM_001098517	1.160500856	0.022815306
TIGIT	NM_173799	1.160268861	0.004111842
HLA-DRB1	NM_002124	1.157440465	0.043934799
CADM1	NM_014333	1.155619768	0.008821049
CTNNA1	NM_001903	1.155379612	0.021989496
EVC2	NM_001166136	1.154127148	0.034927516
EVC2	NM_147127	1.154127148	0.034927516
EZH2	NM_152998	1.152840336	0.001528994
C21orf58	NM_058180	1.151780315	0.032164825
SKA1	NM_145060	1.148785417	0.013113739
SKA1	NM_001039535	1.148785417	0.013113739
NINJ2	NM_016533	1.147140928	0.015236991
MLF1	NM_001130157	1.145821834	0.046421404
MLF1	NM_022443	1.139937599	0.048000414
MLF1	NM_001130156	1.139937599	0.048000414
CD40LG	NM_000074	1.137814617	0.032243835
PHLDA1	NM_007350	1.13622617	0.048000414
MCOLN2	NM_153259	1.135865076	0.02487553
PLEKHG2	NM_022835	1.133051542	2.09533E-08
TMPRSS3	NR_027348	1.13100717	0.016938371
CXCR6	NM_006564	1.130739066	0.04631495
CD93	NM_012072	1.129862935	0.027975167
EFNA5	NM_001962	1.125790979	0.032727418
CTSC	NM_148170	1.122102107	0.000163438
RACGAP1	NM_013277	1.122030749	0.003005918
RACGAP1	NM_001126104	1.121866362	0.003262345
LMNB1	NM_005573	1.12116223	4.86924E-06

RACGAP1	NM_001126103	1.120910035	0.002986063
CTSC	NM_001114173	1.117917077	0.000224891
FAM179A	NM_199280	1.11727305	0.022796363
MYL6B	NM_002475	1.116688173	0.023927769
PHOSPHO1	NM_178500	1.107522136	0.034718624
STIL	NM_001048166	1.106894103	0.003346921
STIL	NM_003035	1.106894103	0.003346921
CD2	NM_001767	1.100332213	3.61643E-05
ATP8B3	NM_138813	1.098538088	0.029849884
HNRPLL	NM_138394	1.094947918	0.001723042
ATXN1	NM_001128164	1.09424879	0.003739782
PRR5L	NM_024841	1.092670448	0.029077435
ATXN1	NM_000332	1.091529729	0.003997244
TNFSF4	NM_003326	1.091053219	0.048568164
HNRPLL	NM_001142650	1.090402061	0.001991472
PRR5L	NM_001160167	1.087859276	0.030941307
PRR5L	NM_001160169	1.087771307	0.030259787
PHOSPHO1	NM_001143804	1.077858471	0.041750935
BRCA1	NM_007299	1.077135658	0.019588057
PRR5L	NM_001160168	1.076100885	0.034324062
ABI3	NM_001135186	1.070324222	0.013518683
ABI3	NM_016428	1.064379284	0.014099081
BRCA1	NM_007298	1.062722299	0.024062003
ZBP1	NM_030776	1.060209846	0.010996514
ZBP1	NM_001160417	1.060209846	0.010996514
ZBP1	NM_001160418	1.057600384	0.013541455
NCAPH	NM_015341	1.052638632	0.046460686
BRCA1	NM_007297	1.048738186	0.009795795
TRIM69	NM_182985	1.046377491	0.038246703
BRCA1	NM_007294	1.043667418	0.01053661
RAD51	NM_001164270	1.039400097	0.033811691
NBEAL2	NM_015175	1.032297791	7.82742E-05
GBP5	NM_052942	1.027299011	0.018954089
TRPS1	NM_014112	1.026073401	0.005313226
BRCA1	NR_027676	1.025719431	0.015389609
RAD51	NM_002875	1.02545032	0.033968894
GBP5	NM_001134486	1.02031476	0.020010541
SMC4	NM_005496	1.01699383	7.42627E-05
SMC4	NM_001002800	1.01547868	6.68593E-05
LOC146880	NR_027487	1.010790179	0.046460686

Downregulated in PD-1+ vs. PD-1- CD8 T cells from SF of JIA patients

gene_name	refseq_id	log2FoldChange	adjusted p value
ACVR1B	NM_020327	-1.000885946	0.02060346

MAL	NM_022440	-1.004100041	0.036317851
CYFIP1	NM_001033028	-1.004477115	0.017133941
SLC44A1	NM_080546	-1.005365713	0.008053808
ZNF629	NM_001080417	-1.007297093	0.033968894
MID2	NM_052817	-1.007665561	0.01260754
MID2	NM_012216	-1.007665561	0.01260754
RAPH1	NM_213589	-1.011320346	0.031720896
TAF4B	NM_005640	-1.011874564	0.000269659
SORBS3	NM_001018003	-1.012037056	0.013007149
DTWD2	NM_173666	-1.013003065	0.002849013
BEX4	NM_001127688	-1.01530183	0.001496347
BEX4	NM_001080425	-1.016775718	0.001528994
AMOT	NM_133265	-1.018820193	0.023692666
FLJ90757	NR_026857	-1.018825755	0.048126556
FRY	NM_023037	-1.020624864	0.017733063
MAL	NM_002371	-1.020736953	0.033968894
PDE9A	NM_001001567	-1.021005818	0.048241265
SNORD90	NR_003071	-1.02246497	0.027119639
SNORD69	NR_003057	-1.023406442	0.01786842
SORBS3	NM_005775	-1.023562585	0.00861172
PDE9A	NM_001001581	-1.026505986	0.047605204
PLCL1	NM_006226	-1.028462724	0.015111001
IKZF2	NM_001079526	-1.028547742	0.003218094
PDE9A	NM_001001577	-1.030467721	0.047030778
PDE9A	NM_001001576	-1.030571339	0.046519831
IKZF2	NM_016260	-1.030731724	0.003087544
PDE9A	NM_001001579	-1.031778676	0.04018726
SNORD52	NR_002742	-1.0319215	0.000855418
FARP1	NM_005766	-1.033328452	0.044742579
DHX32	NM_018180	-1.033762931	0.010221463
MCF2L	NM_001112732	-1.034045132	0.029187045
PRKAR2B	NM_002736	-1.037998289	0.03559815
MAL	NM_022438	-1.038185105	0.027396099
AMOT	NM_001113490	-1.038719736	0.02060346
ZNF563	NM_145276	-1.0413587	0.024524185
PDE9A	NM_001001574	-1.043196232	0.036786936
GIPC3	NM_133261	-1.043312752	0.031194006
SNORD80	NR_003940	-1.045111388	0.019647704
PDE9A	NM_001001578	-1.045849405	0.041513434
LAPTM4B	NM_018407	-1.04768955	0.015789332
ANKRD6	NM_014942	-1.050741916	0.019933442
ESYT2	NM_020728	-1.051950543	0.000476426
PDE9A	NM_001001575	-1.054186962	0.035311313
MCF2L	NM_024979	-1.054818677	0.025079281
PFKFB2	NM_001018053	-1.05513211	0.049981692

PDE9A	NM_001001571	-1.056932477	0.038246703
APP	NM_001136129	-1.057638602	0.002493805
EPHA4	NM_004438	-1.060192186	9.54967E-05
TRIO	NM_007118	-1.065493113	0.024845635
PDE9A	NM_001001572	-1.065822532	0.032479893
APP	NM_001136130	-1.067267904	0.001744279
APP	NM_201414	-1.07050322	0.001852945
PDE9A	NM_001001569	-1.070589356	0.030667854
LOC641518	NR_029374	-1.071279778	0.02521403
ZNF542	NR_024055	-1.074390918	0.000607499
APP	NM_201413	-1.077988308	0.001312776
APP	NM_000484	-1.079009521	0.001297876
SNORD38A	NR_001456	-1.081478563	0.026496925
FLT4	NM_002020	-1.081671423	0.042787267
PDE9A	NM_001001568	-1.082167534	0.027900863
BACH2	NM_021813	-1.086204641	0.025150686
AMIGO1	NM_020703	-1.086964311	0.000876425
ANKRD50	NM_020337	-1.089374791	0.02800992
SNORD82	NR_004398	-1.090341725	0.002696911
ZNF542	NR_003127	-1.091450193	0.000415835
SNORD116-1	NR_003316	-1.093707486	0.028899761
PPFIBP1	NM_003622	-1.095755777	0.038246703
PDE9A	NM_001001584	-1.097296728	0.023826461
SNORD66	NR_003055	-1.09747245	0.018310844
ZNF542	NR_024057	-1.098379206	0.000357724
GCNT4	NM_016591	-1.105787868	0.026065866
ZNF542	NR_024056	-1.11545674	0.000239013
STXBP1	NM_001032221	-1.115691937	0.018646739
CD300A	NM_007261	-1.116454993	0.025580047
GJB6	NM_001110219	-1.116614099	0.043019857
STAP1	NM_012108	-1.119307916	0.042787267
SPTB	NM_001024858	-1.119701358	0.046433045
PELI2	NM_021255	-1.120545392	0.010871573
SNORD38B	NR_001457	-1.123490089	0.037771257
ARRB1	NM_004041	-1.12476817	0.005155632
ARRB1	NM_020251	-1.12476817	0.005155632
NLN	NM_020726	-1.128093442	0.042826153
STXBP1	NM_003165	-1.128764251	0.016591786
GJB6	NM_006783	-1.130850528	0.038246703
GJB6	NM_001110221	-1.130850528	0.038246703
ZNF516	NM_014643	-1.131267368	0.036600829
MAP7	NM_003980	-1.132787199	0.046460686
ZFYVE9	NM_007323	-1.133406708	0.028889813
RNF144A	NM_014746	-1.136392606	0.004855086
LAT2	NM_032464	-1.137630175	0.009372368

LAT2	NM_032463	-1.144306157	0.009298923
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MAP3K1	NM_005921	-1.151098895	3.36868E-05
GJB6	NM_001110220	-1.151285925	0.033309769
PITPNM2	NM_020845	-1.152187816	0.001744279
ZNF853	NM_017560	-1.152263916	0.000995664
PFKFB2	NM_006212	-1.153664456	0.003897506
UST	NM_005715	-1.155386172	0.01053661
CAMSAP1L1	NM_203459	-1.156071638	0.019446607
ACVR1B	NM_004302	-1.156281239	4.83898E-05
ZFYVE9	NM_004799	-1.161024876	0.010738422
FAM46A	NM_017633	-1.161518179	6.35681E-05
SERPINB6	NM_004568	-1.161593482	0.003442605
KIAA0125	NR_026800	-1.162998383	0.032727418
ZFYVE9	NM_007324	-1.164972872	0.010231912
CLIC6	NM_053277	-1.165443294	0.018646739
FXD2	NM_001127489	-1.166886664	0.012005961
FXD2	NM_001680	-1.16701486	0.013296941
F2RL1	NM_005242	-1.167759188	0.017974413
SWAP70	NM_015055	-1.175762553	0.000485471
NCR3	NM_147130	-1.175857015	0.004848942
ACE	NM_152830	-1.176537712	0.02521403
SVIL	NM_003174	-1.179121774	8.29507E-05
ACTN1	NM_001130005	-1.181563631	0.00202508
NCR3	NM_001145466	-1.181725627	0.004664352
CNR2	NM_001841	-1.182815128	0.013314906
SNORD104	NR_004380	-1.183241994	7.36751E-05
METTL7A	NM_014033	-1.186771772	0.000530202
SVIL	NM_021738	-1.187693608	9.00901E-05
RRAS2	NM_012250	-1.188250061	0.000157573
VAV3	NM_006113	-1.1896868	1.47696E-05
BTBD3	NM_181443	-1.19296403	0.025425738
EPHX2	NM_001979	-1.193619692	0.001136401
ACTN1	NM_001102	-1.194495748	0.001416869
BTBD3	NM_014962	-1.194537952	0.023927769
RNF144B	NM_182757	-1.194958095	0.007652942
SPG20	NM_001142295	-1.195551369	0.01776458
ACTN1	NM_001130004	-1.195990884	0.001394881
ZNF667	NM_022103	-1.197279648	0.033692963
FCER1G	NM_004106	-1.197589836	0.007652942
ZNF238	NM_006352	-1.19980495	0.002510899
RASSF8	NM_007211	-1.20233287	0.027235892
PROCR	NM_006404	-1.204133038	0.012030922
NCR3	NM_001145467	-1.204581684	0.002540604
SPG20	NM_001142294	-1.205351965	0.016077469

FXYD2	NM_021603	-1.206899522	0.008796978
SPG20	NM_001142296	-1.206905262	0.015855242
SPG20	NM_015087	-1.208447894	0.015679933
NFIX	NM_002501	-1.208555907	0.023927769
ZNF238	NM_205768	-1.209674661	0.002377664
SNORD4A	NR_000010	-1.212604629	0.007377952
ZFH3	NM_001164766	-1.212702911	0.00160154
PLS1	NM_001145319	-1.224154178	0.007549055
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NIPAL2	NM_024759	-1.226331323	0.015323318
RRAS2	NM_001102669	-1.227634734	7.23084E-05
SNORD92	NR_003074	-1.233530083	0.006213593
HDGFRP3	NM_016073	-1.23768363	3.14923E-06
NR3C2	NM_000901	-1.245502612	0.006032369
PAIP2B	NM_020459	-1.245901286	0.000491163
PDGFD	NM_033135	-1.246354854	0.000832679
PDGFD	NM_025208	-1.246354854	0.000832679
KIR3DL2	NM_006737	-1.250720193	0.023094199
SNORD61	NR_002735	-1.251801085	5.68148E-07
FBP1	NM_000507	-1.253228741	0.017151095
NR3C2	NM_001166104	-1.25465684	0.005441021
NCR1	NM_001145457	-1.257535805	0.002690913
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FBP1	NM_001127628	-1.259313046	0.016375271
LEF1	NM_016269	-1.260121749	4.72555E-05
ZFH3	NM_006885	-1.261116445	0.001225037
LEF1	NM_001130713	-1.262470226	4.34528E-05
DENND5A	NM_015213	-1.26291018	0.000100072
LEF1	NM_001130714	-1.263045473	4.28407E-05
CRYBG3	NM_153605	-1.265105186	3.26149E-07
NCR1	NM_001145458	-1.265974604	0.00236457
SAMD12	NM_001101676	-1.266074495	0.004272408
ZNF223	NM_013361	-1.273667646	0.008518276
NCR1	NR_027041	-1.280448439	0.002156278
LEF1	NM_001166119	-1.28122974	1.80247E-05
AMOTL1	NM_130847	-1.282526275	0.001227085
SNORD27	NR_002563	-1.284011813	0.000211617
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NCR1	NR_027043	-1.289841035	0.001852945
PFN2	NM_002628	-1.297730519	0.00360435
VAV3	NM_001079874	-1.298334041	1.71916E-07
C8orf83	NR_015339	-1.300849469	0.003087544
ACE	NM_000789	-1.302714147	0.008123831
CXXC5	NM_016463	-1.306002064	0.000995664
DST	NM_015548	-1.30656531	0.00384531

FAAH2	NM_174912	-1.306655105	0.000643914
SYDE2	NM_032184	-1.307528466	0.002516715
DYSF	NM_001130985	-1.307700538	0.001048973
SPRY2	NM_005842	-1.311002645	0.000300049
DYSF	NM_001130987	-1.311220077	0.00103975
KIAA0649	NM_014811	-1.311445896	0.008053808
DYSF	NM_001130982	-1.312031078	0.000993765
C2orf89	NM_001080824	-1.31532467	0.002607815
DYSF	NM_001130980	-1.316585297	0.001006021
DST	NM_001144771	-1.318412178	0.003442605
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DYSF	NM_001130981	-1.319828779	0.001001275
DYSF	NM_001130979	-1.32079553	0.000949785
PFN2	NM_053024	-1.321525635	0.002225005
DYSF	NM_001130986	-1.321563549	0.000859319
SNORD26	NR_002564	-1.323074166	1.06079E-09
PAWR	NM_002583	-1.324852658	0.007377952
DYSF	NM_001130984	-1.325032832	0.000855418
RASSF8	NM_001164748	-1.325739727	0.008276207
DYSF	NM_001130455	-1.325919744	0.000832679
ZNF358	NM_018083	-1.326459917	8.32449E-05
SORT1	NM_002959	-1.326609334	0.001211001
DST	NM_183380	-1.329242236	0.003218094
DYSF	NM_001130983	-1.32937879	0.000829037
SELL	NM_000655	-1.329636768	0.000152883
DYSF	NM_001130976	-1.330419613	0.000835215
ANK1	NM_020478	-1.332359127	0.003744283
DYSF	NM_001130977	-1.333662952	0.000835215
DYSF	NM_003494	-1.33465588	0.000804897
FAM43A	NM_153690	-1.337510794	0.003123229
DYSF	NM_001130978	-1.33788921	0.000804512
KIR2DL3	NM_014511	-1.339649658	0.011956192
SELL	NR_029467	-1.340748755	0.000159408
CYB561	NM_001017916	-1.342752311	0.000583671
CYB561	NM_001017917	-1.343121898	0.000583671
CYB561	NM_001915	-1.343232435	0.000583671
ANK1	NM_001142445	-1.346550119	0.003262345
RASSF8	NM_001164747	-1.347585042	0.006757112
LYN	NM_001111097	-1.350347717	0.000105879
NBEA	NM_015678	-1.352817312	0.002018509
KLRD1	NM_001114396	-1.352914676	0.000201823
KLRD1	NM_002262	-1.355426191	0.0001875
GCET2	NM_152785	-1.35617773	0.000607499
SOX13	NM_005686	-1.357770088	0.000277842

TLR2	NM_003264	-1.359182053	0.009036674
LYN	NM_002350	-1.362505361	8.29507E-05
ANK1	NM_020480	-1.36355875	0.002798622
KLRD1	NM_007334	-1.364346032	0.000149675
GCET2	NM_001008756	-1.367905844	0.00048946
RASSF8	NM_001164746	-1.369168805	0.004118415
KIR2DL3	NM_015868	-1.376261344	0.008234611
RIN1	NM_004292	-1.377069605	0.004248498
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CFH	NM_001014975	-1.382067061	0.007042994
EGLN3	NM_022073	-1.389705848	0.004405503
TMEM170B	NM_001100829	-1.390089283	0.000606351
CKAP4	NM_006825	-1.393720058	0.000130784
CFH	NM_000186	-1.399956764	0.003303854
CDC42BPB	NM_006035	-1.401782245	0.002017325
D4S234E	NM_014392	-1.403794599	0.0007483
D4S234E	NM_001040101	-1.40755294	0.00069697
ASB13	NR_024581	-1.408891961	0.003075166
RAB32	NM_006834	-1.409751872	0.00618705
USP6NL	NM_001080491	-1.414002026	0.000383059
LOC644538	NM_001163438	-1.417470418	0.004167959
LATS2	NM_014572	-1.419475323	3.16088E-05
SIGLECP3	NR_002804	-1.424587379	0.001078862
ASB13	NM_024701	-1.425151946	0.002696831
RALGPS2	NM_152663	-1.428906468	0.000496745
KBTBD11	NM_014867	-1.429404572	0.001912259
USP6NL	NM_014688	-1.430489971	0.000215531
HOOK1	NM_015888	-1.437070624	1.42926E-05
SPINT2	NM_021102	-1.440940156	0.000156987
SNORD53	NR_002741	-1.443865733	0.001170523
TXK	NM_003328	-1.444159615	0.000962904
ANK1	NM_001142446	-1.447237768	0.00067245
GAB1	NM_002039	-1.449602152	0.002017325
GAB1	NM_207123	-1.449602152	0.002017325
ANK1	NM_020475	-1.450964549	0.000632852
ANK1	NM_000037	-1.451529537	0.000629468
ANK1	NM_020477	-1.454235351	0.000581891
CTBP2	NM_022802	-1.454861279	0.000201823
ANK1	NM_020476	-1.45605244	0.000607499
CTBP2	NM_001329	-1.467065001	0.000224891
CTBP2	NM_001083914	-1.468308677	0.000199021
PLAC8	NM_001130715	-1.471163678	7.33561E-05
TTC28	NM_001145418	-1.476216335	0.000189692
SPINT2	NM_001166103	-1.487845046	6.46105E-05
SNORD100	NR_002435	-1.490741206	2.32396E-05

TFCP2L1	NM_014553	-1.493068494	0.00013006
ITGAM	NM_000632	-1.493237373	0.000210244
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KIR2DL4	NM_001080770	-1.504301652	0.002384742
PLAC8	NM_001130716	-1.509460183	6.77191E-05
IGF1R	NM_000875	-1.511739346	0.00058858
GP5	NM_004488	-1.513462649	0.000243994
XCL1	NM_002995	-1.514173146	0.000121539
KIR2DL4	NM_002255	-1.51696636	0.00189119
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PLAC8	NM_016619	-1.518072807	4.76982E-05
SCRN1	NM_001145513	-1.518320473	7.00428E-06
SCRN1	NM_001145514	-1.518320473	7.00428E-06
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SCRN1	NM_001145515	-1.523765741	6.7792E-06
ARMCX2	NM_177949	-1.525862184	0.000530246
ARMCX2	NM_014782	-1.526259741	0.000491163
NUAK2	NM_030952	-1.537108053	8.76038E-06
RNF130	NM_018434	-1.53780486	1.31406E-05
EFHA2	NM_181723	-1.545678849	0.000835215
ARHGEF10	NM_014629	-1.548890283	0.001352836
EDA	NM_001005609	-1.5646639	0.001744279
EDA	NM_001399	-1.5646639	0.001744279
KIR3DL3	NM_153443	-1.572157617	0.001032863
HPSE2	NM_001166245	-1.577652547	0.000352797
HPSE2	NM_021828	-1.577652547	0.000352797
HPSE2	NM_001166244	-1.577652547	0.000352797
WWC2	NM_024949	-1.579304965	0.000888099
HHEX	NM_002729	-1.579711803	0.000496745
TCEA3	NM_003196	-1.586649481	0.000388157
HEPH	NM_138737	-1.588411933	0.000234304
HPSE2	NM_001166246	-1.589973037	0.000298715
TEC	NM_003215	-1.591601763	2.23537E-05
KLRC3	NM_007333	-1.592860888	1.94577E-07
VSIG4	NM_007268	-1.594805711	0.000204356
CR2	NM_001006658	-1.596965657	0.001277204
HEPH	NM_001130860	-1.611596473	0.000163438
C1orf162	NM_174896	-1.617746111	7.57327E-06
HEPH	NM_014799	-1.635319925	0.000126123
CR2	NM_001877	-1.642169833	0.000853407
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VSIG4	NM_001100431	-1.663754259	8.92435E-05
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KLRC2	NM_002260	-1.710882955	3.06886E-11
ANKRD57	NM_023016	-1.758974386	0.000157573

PTK2	NM_005607	-1.825479905	6.77191E-05
SDK2	NM_001144952	-1.827838139	3.88001E-07
PTK2	NM_153831	-1.835867619	6.07375E-05
LOC646762	NR_024278	-1.8396264	8.29507E-05
RGMB	NM_001012761	-1.955717732	2.41449E-07
PI16	NM_153370	-1.969224381	1.42926E-05
CNN3	NM_001839	-2.098238444	2.38875E-06
KIR3DL1	NM_013289	-2.317274389	5.52046E-09
SEPT10	NM_144710	-2.326631084	6.85384E-08
SEPT10	NM_178584	-2.326631084	6.85384E-08
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