



# Multimodal single-cell datasets characterize antigen-specific CD8<sup>+</sup> T cells across SARS-CoV-2 vaccination and infection

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Supplemental Table 1

**Donors for CITE-seq / ASAP-seq (Figures 1-2)**

	<b>Donor ID</b>	<b>Age</b>	<b>Gender</b>	<b>Race</b>	<b>Ethnicity</b>
Batch 1	<b>A</b>	<b>23</b>	Female	Native American	Hispanic/Latino
Batch 1	<b>E</b>	<b>17</b>	Female	Native American	Hispanic/Latino
Batch 1	<b>F</b>	<b>26</b>	Female	Not reported	Not reported
Batch 2	<b>B</b>	<b>20</b>	Female	Not reported	Not of Hispanic origin
Batch 2	<b>J</b>	<b>21</b>	Male	Not reported	Not of Hispanic origin
Batch 2	<b>M</b>	<b>24</b>	Female	Not reported	Not of Hispanic origin

**Donors for ECCITE-Seg (Figure 3)**

	<b>Donor ID</b>	<b>Age</b>	<b>Gender</b>	<b>Race</b>	<b>Ethnicity</b>
Batch 1	<b>A</b>	<b>23</b>	Female	Native American	Hispanic/Latino
Batch 1	<b>E</b>	<b>17</b>	Female	Native American	Hispanic/Latino
Batch 1	<b>P</b>	<b>31</b>	Female	Not reported	Not reported
Batch 1	<b>D16</b>	<b>53</b>	Male	White	Not of Hispanic origin
Batch 2	<b>D40</b>	<b>29</b>	Female	White	Not of Hispanic origin
Batch 2	<b>D87</b>	<b>57</b>	Male	White	Not of Hispanic origin
Batch 2	<b>D93</b>	<b>33</b>	Female	White	Not of Hispanic origin
Batch 2	<b>D95</b>	<b>58</b>	Female	Not reported	Not reported
Batch 2	<b>P</b>	<b>31</b>	Female	Not reported	Not reported
Batch 2	<b>D16</b>	<b>53</b>	Male	White	Not of Hispanic origin

Supplementary table 2

Total-seq A	Description	Clone	Barcode	Gene Name
A0006	anti-human CD86	IT2.2	GTCTTTGTCAGTGCA	CD86
A0007	anti-human CD274 (B7-H1, PD-L1)	29E.2A3	GTTGTCCGACAATAC	CD274
A0020	anti-human CD270 (HVEM, TR2)	122	TGATAGAAACAGACC	TNFRSF14
A0023	anti-human CD155 (PVR)	SKII.4	ATCACATCGTTGCCA	PVR
A0024	anti-human CD112 (Nectin-2)	TX31	AACCTTCCGTCTAAG	NECTIN2
A0026	anti-human CD47	CC2C6	GCATTCTGTCACCTA	CD47
A0029	anti-human CD48	BJ40	CTACGACGTAGAAGA	CD48
A0031	anti-human CD40	5C3	CTCAGATGGAGTATG	CD40
A0032	anti-human CD154	24-31	GCTAGATAGATGCAA	CD40LG
A0033	anti-human CD52	HI186	CTTTGTACGAGCAAA	CD52
A0034	anti-human CD3	UCHT1	CTCATTGTAACCTCT	CD3D
A0046	anti-human CD8	SK1	GCGCAACTTGATGAT	CD8A
A0047	anti-human CD56 (NCAM)	5.1H11	TCCTTTCCTGATAGG	NCAM1
A0050	anti-human CD19	HIB19	CTGGGCAATTACTCG	CD19
A0052	anti-human CD33	P67.6	TAACTCAGGGCCTAT	CD33
A0053	anti-human CD11c	S-HCL-3	TACGCCATAAAGTTG	ITGAX
A0058	anti-human HLA-A,B,C	W6/32	TATGCGAGGCTTATC	HLA-A
A0063	anti-human CD45RA	HI100	TCAATCCTTCCGCTT	PTPRC
A0064	anti-human CD123	6H6	CTTCACTCTGTCAGG	IL3RA
A0066	anti-human CD7	CD7-6B7	TGGATTCCCGGACTT	CD7
A0070	anti-human/mouse CD49f	GoH3	TTCCGAGGATGATCT	ITGA6
A0071	anti-human CD194 (CCR4)	L291H4	AGCTTACCTGCACGA	CCR4
A0072	anti-human CD4	RPA-T4	TGTTCCCGCTCAACT	CD4
A0073	anti-mouse/human CD44	IM7	TGGCTTCAGGTCCCTA	CD44
A0081	anti-human CD14	M5E2	TCTCAGACCTCCGTA	CD14
A0083	anti-human CD16	3G8	AAGTTCACCTCTTTGC	FCGR3A
A0085	anti-human CD25	BC96	TTTGTCTGTACGCC	IL2RA
A0087	anti-human CD45RO	UCHL1	CTCCGAATCATGTTG	PTPRC
A0088	anti-human CD279 (PD-1)	EH12.2H7	ACAGCGCCGTATTTA	PDCD1
A0089	anti-human TIGIT (VSTM3)	A15153G	TTGCTTACCGCCAGA	TIGIT
A0090	Mouse IgG1, κ isotype Ctrl	MOPC-21	GCCGGACGACATTAA	
A0091	Mouse IgG2a, κ isotype Ctrl	MOPC-173	CTCCTACCTAAACTG	

A0092	Mouse IgG2b, κ isotype Ctrl	MPC-11	ATATGTATCACGCGA	
A0095	Rat IgG2b, κ Isotype Ctrl	RTK4530	GATTCTTGACGACCT	
A0100	anti-human CD20	2H7	TTCTGGGTCCCTAGA	MS4A1
A0101	anti-human CD335 (NKp46)	9E2	ACAATTTGAACAGCG	NCR1
A0124	anti-human CD31	WM59	ACCTTTATGCCACGG	PECAM1
A0127	anti-Human Podoplanin	NC-08	GGTTACTCGTTGTGT	PDPN
A0134	anti-human CD146	P1H12	CCTTGATAACATCA	MCAM
A0136	anti-human IgM	MHM-88	TAGCGAGCCCGTATA	IGHM
A0138	anti-human CD5	UCHT2	CATTAACGGGATGCC	CD5
A0140	anti-human CD183 (CXCR3)	G025H7	GCGATGGTAGATTAT	CXCR3
A0141	anti-human CD195 (CCR5)	J418F1	CCAAAGTAAGAGCCA	CCR5
A0142	anti-human CD32	FUN-2	GCTTCCGAATTACCG	FCGR2A
A0143	anti-human CD196 (CCR6)	G034E3	GATCCCTTTGTCACT	CCR6
A0144	anti-human CD185 (CXCR5)	J252D4	AATTCAACCGTCGCC	CXCR5
A0145	Hu CD103 (Integrin αE)	Ber-ACT8	GACCTCATTGTGAAT	ITGAE
A0146	anti-human CD69	FN50	GTCTCTTGGCTTAAA	CD69
A0147	anti-human CD62L	DREG-56	GTCCCTGCAACTTGA	SELL
A0149	anti-human CD161	HP-3G10	GTACGCAGTCCTTCT	KLRB1
A0151	anti-human CD152 (CTLA-4)	BNI3	ATGGTTCACGTAATC	CTLA4
A0152	anti-human CD223 (LAG-3)	11C3C65	CATTTGTCTGCCGGT	LAG3
A0153	anti-human KLRG1 (MAFA)	SA231A2	CTTATTTCCCTGCCCT	KLRG1
A0154	anti-human CD27	O323	GCACTCCTGCATGTA	CD27
A0155	anti-human CD107a (LAMP-1)	H4A3	CAGCCCACTGCAATA	LAMP1
A0156	anti-human CD95 (Fas)	DX2	CCAGCTCATTAGAGC	FAS
A0158	anti-human CD134 (OX40)	er-ACT35 (ACT3	AACCCACCGTTGTTA	TNFRSF4
A0159	anti-human HLA-DR	L243	AATAGCGAGCAAGTA	HLA-DRA
A0160	anti-human CD1c	L161	GAGCTACTTCACTCG	CD1C
A0161	anti-human CD11b	ICRF44	GACAAGTGATCTGCA	ITGAM
A0162	anti-human CD64	10.1	AAGTATGCCCTACGA	FCGR1A
A0163	anti-human CD141 (Thrombomodulin)	M80	GGATAACCGCGCTTT	THBD
A0165	Hu CD314 (NKG2D)	1D11	CGTGTTTGTTCCTCA	KLRK1
A0167	anti-human CD35	E11	ACTTCCGTCGATCTT	CR1
A0168	anti-human CD57 Recombinant	QA17A04	AACTCCCTATGGAGG	B3GAT1

A0170	anti-human CD272 (BTLA)	MIH26	GTTATTGGACTAAGG	BTLA
A0171	anti-human/mouse/rat CD278 (ICOS)	C398.4A	CGCGCACCCATTAAA	ICOS
A0172	anti-human CD275 (B7-H2, B7-RP1, ICOSL)	9F.8A4	GTTAGTGTTAGCTTG	ICOSLG
A0174	anti-human CD58 (LFA-3)	TS2/9	GTTCCCTATGGACGAC	CD58
A0176	anti-human CD39	A1	TTACCTGGTATCCGT	ENTPD1
A0179	anti-human CX3CR1	K0124E1	AGTATCGTCTCTGGG	CX3CR1
A0180	anti-human CD24	ML5	AGATTCCCTTCGTGTT	CD24
A0181	anti-human CD21	Bu32	AACCTAGTAGTTCGG	CR2
A0185	anti-human CD11a	TS2/4	TATATCCTTGTGAGC	ITGAL
A0187	anti-human CD79b (Igβ)	CB3-1	ATTCTTCAACCGAAG	CD79B
A0189	anti-human CD244 (2B4)	C1.7	TCGCTTGGATGGTAG	CD244
A0206	anti-human CD169 (Sialoadhesin, Siglec-1)	7-239	TACTCAGCGTGTTTG	SIGLEC1
A0214	anti-human/mouse integrin β7	FIB504	TCCTTGGATGTACCG	ITGB7
A0215	anti-human CD268 (BAFF-R)	11C1	CGAAGTCGATCCGTA	TNFRSF13C
A0216	anti-human CD42b	HIP1	TCCTAGTACCGAAGT	GP1BB
A0217	anti-human CD54	HA58	CTGATAGACTTGAGT	ICAM1
A0218	anti-human CD62P (P-Selectin)	AK4	CCTTCCGTATCCCTT	SELP
A0219	anti-human CD119 (IFN-γ R α chain)	GIR-208	TGTGTATTCCCTTGT	IFNGR1
A0224	anti-human TCR α/β	IP26	CGTAACGTAGAGCGA	
A0236	Rat IgG1, κ isotype Ctrl	RTK2071	ATCAGATGCCCTCAT	
A0237	Rat IgG1, λ Isotype Ctrl	G0114F7	GGGAGCGATTCAACT	
A0238	Rat IgG2a, κ Isotype Ctrl	RTK2758	AAGTCAGGTTTCGTTT	
A0240	Rat IgG2c, κ Isotype Ctrl	RTK4174	TCCAGGCTAGTCATT	
A0241	Armenian Hamster IgG Isotype Ctrl	HTK888	CCTGTCATTAAGACT	
A0242	anti-human CD192 (CCR2)	K036C2	GAGTTCCCTTACCTG	CCR2
A0246	anti-human CD122 (IL-2Rβ)	TU27	TCATTTCCCTCCGATT	IL2RB
A0247	anti-human CD267 (TACI)	1A1	AGTGATGGAGCGAAC	TNFRSF13B
A0352	anti-human FcεR1α	AER-37 (CRA-1)	CTCGTTTCCGTATCG	FCER1A
A0353	anti-human CD41	HIP8	ACGTTGTGGCCTTGT	ITGA2B
A0355	anti-human CD137 (4-1BB)	4B4-1	CAGTAAGTTCGGGAC	TNFRSF9
A0357	anti-human CD43	CD43-10G7	GATTAACCAGCTCAT	SPN
A0358	anti-human CD163	GHI/61	GCTTCTCCTTCCTTA	CD163
A0359	anti-human CD83	HB15e	CCACTCATTTCCGGT	CD83

A0364	anti-human CD13	WM15	TTTCAACGCCCTTTC	ANPEP
A0367	anti-human CD2	TS1/8	TACGATTTGTCAGGG	CD2
A0368	anti-human CD226 (DNAM-1)	11A8	TCTCAGTGTTTGTGG	CD226
A0369	anti-human CD29	TS2/16	GTATTCCCTCAGTCA	ITGB1
A0370	anti-human CD303 (BDCA-2)	201A	GAGATGTCCGAATTT	CLEC4C
A0371	anti-human CD49b	P1E6-C5	GCTTTCTTCAGTATG	ITGA2
A0372	anti-human CD61	VI-PL2	AGGTTGGAGTAGACT	ITGB3
A0373	anti-human CD81 (TAPA-1)	5A6	GTATCCTTCCTTGGC	CD81
A0383	anti-human CD55	JS11	GCTCATTACCCATTA	CD55
A0384	anti-human IgD	IA6-2	CAGTCTCCGTAGAGT	IGHD
A0385	anti-human CD18	TS1/18	TATTGGGACACTTCT	ITGB2
A0386	anti-human CD28	CD28.2	TGAGAACGACCCTAA	CD28
A0389	anti-human CD38	HIT2	TGTACCCGCTTGTGA	CD38
A0390	anti-human CD127 (IL-7R $\alpha$ )	A019D5	GTGTGTTGTCCTATG	IL7R
A0391	anti-human CD45	HI30	TGCAATTACCCGGAT	PTPRC
A0393	anti-human CD22	S-HCL-1	GGGTTGTTGTCTTTG	CD22
A0394	anti-human CD71	CY1G4	CCGTGTTCCCTCATTA	TFRC
A0396	anti-human CD26	BA5b	GGTGGCTAGATAATG	DPP4
A0398	anti-human CD115 (CSF-1R)	9-4D2-1E4	AATCACGGTCCTTGT	CSF1R
A0404	anti-human CD63	H5C6	GAGATGTCTGCAACT	CD63
A0406	anti-human CD304 (Neuropilin-1)	12C2	GGACTAAGTTTCGTT	NRP1
A0407	anti-human CD36	5-271	TTCTTTGCCTTGCCA	CD36
A0408	anti-human CD172a (SIRP $\alpha$ )	15-414	CGTGTTTAACTTGAG	SIRPA
A0419	anti-human CD72	3F3	CAGTCGTGGTAGATA	CD72
A0420	anti-human CD158 (KIR2DL1/S1/S3/S5)	HP-MA4	TATCAACCAACGCTT	KIR2DL1
A0446	anti-human CD93	VIMD2	GCGCTACTTCCTTGA	CD93
A0447	anti-human CD200 (OX2)	OX-104	CACGTAGACCTTTGC	CD200
A0575	anti-human CD49a	TS2/7	ACTGATGGACTCAGA	ITGA1
A0576	anti-human CD49d	9F10	CCATTCAACTTCCGG	ITGA4
A0577	anti-human CD73 (Ecto-5'-nucleotidase)	AD2	CAGTTCCTCAGTTCG	NT5E
A0579	anti-human CD9	HI9a	GAGTCACCAATCTGC	CD9
A0581	anti-human TCR V $\alpha$ 7.2	3C10	TACGAGCAGTATTCA	
A0582	anti-human TCR V $\delta$ 2	B6	TCAGTCAGATGGTAT	

A0586	anti-human CD354 (TREM-1)	TREM-26	TAGCCGTTTCCTTTG	TREM1
A0590	anti-human CD305 (LAIR1)	NKTA255	ATTTCCATTCCCTGT	LAIR1
A0591	anti-human LOX-1	15C4	ACCCTTTACCGAATA	OLR1
A0599	anti-human CD158e1 (KIR3DL1, NKB1)	DX9	GGACGCTTTCCTTGA	KIR3DL1
A0817	anti-human CD109	W7C5	CACTTAACCTCTGGGT	CD109
A0822	anti-human CD142	NY2	CACTGCCGTCGATTA	F3
A0830	anti-human CD319 (CRACC)	162.1	AGTATGCCATGTCTT	SLAMF7
A0845	anti-human CD99	3B2/TA8	ACCCGTCCCTAAGAA	CD99
A0853	anti-human CLEC12A	50C1	CATTAGAGTCTGCCA	CLEC12A
A0861	anti-human CD151 (PETA-3)	50-6	CTTACCTAGTCATTC	CD151
A0864	anti-human CD352 (NTB-A)	NT-7	AGTTTCCACTCAGGC	SLAMF6
A0866	anti-human CLEC1B (CLEC2)	AYP1	TGCCAGTATCACGTA	CLEC1B
A0867	anti-human CD94	DX22	CTTTCCGGTCTTACA	KLRD1
A0868	anti-human IgE	MHE-18	GGATGTACCGCGTAT	IGHE
A0870	anti-human CD150 (SLAM)	A12 (7D4)	GTCATTGTATGTCTG	SLAMF1
A0871	anti-human CD162	KPL-1	ATATGTCAGAGCACC	SELPLG
A0872	anti-human CD84	CD84.1.21	CTCCCTAGTTCCCTTT	CD84
A0894	anti-human Ig light chain κ	MHK-49	AGCTCAGCCAGTATG	IGKC
A0896	anti-human CD85j (ILT2)	GHI/75	CCTTGTGAGGCTATG	LILRB1
A0897	anti-human CD23	EBVCS-5	TCTGTATAACCGTCT	FCER2
A0898	anti-human Ig light chain λ	MHL-38	CAGCCAGTAAGTCAC	
A0902	anti-human CD328 (Siglec-7)	6-434	CTTAGCATTTCACTG	SIGLEC7
A0912	anti-human GPR56	CG4	GCCTAGTTTCCGTTT	ADGRG1
A0920	anti-human CD82	ASL-24	TCCCACTTCCGCTTT	CD82
A0923	anti-human NKp80	5D12	TATAGTTCCTCTGTG	KLRF1
A0931	anti-human CD131	1C1	CTGCATGAGACCAAA	CSF2RB
A0935	anti-human CD74	LN2	CTGTAGCATTTCCCT	CD74
A0940	anti-human CD116	4H1	ATGGACAGTTCGTGT	CSF2RA
A0941	anti-human CD37	M-B371	ACAGTCACTGGGCAA	CD37
A0944	anti-human CD101 (BB27)	BB27	CTACTTCCCTGTCAA	CD101
A1018	anti-human HLA-DR, DP, DQ	Tü39	AGCTACGAGCAGTAG	HLA-DRA
A1046	anti-human CD88 (C5aR)	S5/1	GCCGCATGAGAAACA	C5AR1
	CD110	S16017E	TGTTGTAAGATGCCA	

GP130	2E1B02	CACGAGAATTTTCAGT
CD337	P30-15	AAAGTCACTCTGCCG
CD271	ME20.4	AACCGCGCTTCAGAT
CD34	581	GCAGAAATCTCCCTT
CD117	104D2	AGACTAATAGCTGAC
CD1d	51.1	TCGAGTCGCTTATCA
CD126	UV4	TGATGGGAGCTTATC
CD307e	509f6	TCACGCAGTCCTCAA
CD307c/FcRL3	H5/FcRL3	GCCTAGTTTGAACGC



Total-seq C	Description	Clone	Barcode
C0006	anti-human CD86	IT2.2	GTCTTTGTCAGTGCA
C0007	anti-human CD274 (B7-H1, PD-L1)	29E.2A3	GTTGTCCGACAATAC
C0020	anti-human CD270 (HVEM, TR2)	122	TGATAGAAACAGACC
C0023	anti-human CD155 (PVR)	SKII.4	ATCACATCGTTGCCA
C0024	anti-human CD112 (Nectin-2)	TX31	AACCTTCCGTCTAAG
C0026	anti-human CD47	CC2C6	GCATTCTGTCACCTA
C0029	anti-human CD48	BJ40	CTACGACGTAGAAGA
C0031	anti-human CD40	5C3	CTCAGATGGAGTATG
C0032	anti-human CD154	24-31	GCTAGATAGATGCAA
C0033	anti-human CD52	HI186	CTTTGTACGAGCAAA
C0034	anti-human CD3	UCHT1	CTCATTGTAACTCT
C0046	anti-human CD8	SK1	GCGCAACTTGATGAT
C0047	anti-human CD56	5.1H11	TCCTTTCCTGATAGG
C0050	anti-human CD19	HIB19	CTGGGCAATTACTION
C0052	anti-human CD33	P67.6	TAACTCAGGGCCTAT
C0053	anti-human CD11c	S-HCL-3	TACGCCTATAACTTG
C0058	anti-human HLA-A,B,C	W6/32	TATGCGAGGCTTATC
C0063	anti-human CD45RA	HI100	TCAATCCTCCGCTT
C0064	anti-human CD123	6H6	CTTCACTCTGTCAGG
C0066	anti-human CD7	CD7-6B7	TGGATTCCCGGACTT
C0068	anti-human CD105	43A3	ATCGTCGAGAGCTAG
C0070	anti-human/mouse CD49f	GoH3	TTCCGAGGATGATCT
C0071	anti-human CD194 (CCR4)	L291H4	AGCTTACCTGCACGA
C0072	anti-human CD4	RPA-T4	TGTTCCCGCTCAACT
C0073	anti-mouse/human CD44	IM7	TGGCTTCAGGTCCTA
C0081	anti-human CD14	M5E2	TCTCAGACCTCCGTA
C0083	anti-human CD16	3G8	AAGTTCACTCTTTGC
C0085	anti-human CD25	BC96	TTTGTCTGTACGCC
C0087	anti-human CD45RO	UHL1	CTCCGAATCATGTTG
C0088	anti-human CD279	EH12.2H7	ACAGCGCCGTATTTA
C0089	anti-human TIGIT (VSTM3)	A15153G	TTGCTTACCGCCAGA
C0090	Mouse IgG1, κ isotype Ctrl	MOPC-21	GCCGACGACATTAA
C0091	Mouse IgG2a, κ isotype Ctrl	MOPC-173	CTCCTACCTAACTG
C0092	Mouse IgG2b, κ isotype Ctrl	MPC-11	ATATGTATCACGCGA
C0095	Rat IgG2b, κ Isotype Ctrl	RTK4530	GATTCTTGACGACCT
C0100	anti-human CD20	2H7	TTCTGGGTCCCTAGA
C0101	anti-human CD335 (NKp46)	9E2	ACAATTTGAACAGCG
C0124	anti-human CD31	WM59	ACCTTTATGCCACGG
C0134	anti-human CD146	P1H12	CCTTGGATAACATCA
C0136	anti-human IgM	MHM-88	TAGCGAGCCCGTATA
C0138	anti-human CD5	UCHT2	CATTAACGGGATGCC
C0140	anti-human CD183 (CXCR3)	G025H7	GCGATGGTAGATTAT
C0141	anti-human CD195 (CCR5)	J418F1	CAAAGTAAGAGCCA
C0142	anti-human CD32	FUN-2	GCTCCGAATTACCG

C0143	anti-human CD196 (CCR6)	G034E3	GATCCCTTTGCTACT
C0144	anti-human CD185 (CXCR5)	J252D4	AATCAACCGTCGCC
C0145	anti-human CD103 (Integrin $\alpha$ E)	Ber-ACT8	GACCTCATTGTGAAT
C0146	anti-human CD69	FN50	GTCTCTGGCTTAAA
C0147	anti-human CD62L	DREG-56	GTCCCTGCAACTGA
C0149	anti-human CD161	HP-3G10	GTACGCAGTCCTTCT
C0151	anti-human CD152 (CTLA-4)	BNI3	ATGGTTCACGTAATC
C0152	anti-human CD223 (LAG-3)	11C3C65	CATTTGTCTGCCGGT
C0153	anti-human KLRG1 (MAFA)	SA231A2	CTTATTTCTGCCCT
C0154	anti-human CD27	O323	GCACTCCTGCATGTA
C0155	anti-human CD107a (LAMP-1)	H4A3	CAGCCCACTGCAATA
C0156	anti-human CD95 (Fas)	DX2	CCAGCTCATTAGAGC
C0158	anti-human CD134 (OX40)	-ACT35 (ACT	AACCCACCGTTGTTA
C0159	anti-human HLA-DR	L243	AATAGCGAGCAAGTA
C0160	anti-human CD1c	L161	GAGCTACTTCACTCG
C0161	anti-human CD11b	ICRF44	GACAAGTGATCTGCA
C0162	anti-human CD64	10.1	AAGTATGCCCTACGA
C0163	anti-human CD141 (Thrombomodulin)	M80	GGATAACCGCGCTTT
C0164	anti-human CD1d	51.1	TCGAGTCGCTTATCA
C0165	anti-human CD314 (NKG2D)	1D11	CGTGTTTGTTCCTCA
C0167	anti-human CD35	E11	ACTTCCGTCGATCTT
C0168	anti-human CD57 Recombinant	QA17A04	AACTCCCTATGGAGG
C0170	anti-human CD272 (BTLA)	MIH26	GTTATTGGACTAAGG
C0171	anti-human/mouse/rat CD278 (ICOS)	C398.4A	CGCGCACCCATTAAA
C0174	anti-human CD58 (LFA-3)	TS2/9	GTTCTATGGACGAC
C0176	anti-human CD39	A1	TTACCTGGTATCCGT
C0179	anti-human CX3CR1	K0124E1	AGTATCGTCTCTGGG
C0180	anti-human CD24	ML5	AGATTCCTTCGTGTT
C0181	anti-human CD21	Bu32	AACCTAGTAGTTCGG
C0185	anti-human CD11a	TS2/4	TATATCCTTGTGAGC
C0187	anti-human CD79b (Ig $\beta$ )	CB3-1	ATTCTTCAACCGAAG
C0189	anti-human CD244 (2B4)	C1.7	TCGCTTGGATGGTAG
C0206	anti-human CD169 (Sialoadhesin, Siglec-1	7-239	TACTCAGCGTGTGTTG
C0214	anti-human/mouse integrin $\beta$ 7	FIB504	TCCTTGGATGTACCG
C0215	anti-human CD268 (BAFF-R)	11C1	CGAAGTCGATCCGTA
C0216	anti-human CD42b	HIP1	TCCTAGTACCGAAGT
C0217	anti-human CD54	HA58	CTGATAGACTTGAGT
C0218	anti-human CD62P (P-Selectin)	AK4	CCTTCCGTATCCCTT
C0219	anti-human CD119 (IFN- $\gamma$ R $\alpha$ chain)	GIR-208	TGTGTATTCCCTTGT
C0224	anti-human TCR $\alpha/\beta$	IP26	CGTAACGTAGAGCGA
C0236	Rat IgG1, $\kappa$ isotype Ctrl	RTK2071	ATCAGATGCCCTCAT
C0238	Rat IgG2a, $\kappa$ Isotype Ctrl	RTK2758	AAGTCAGGTCGTTT
C0241	Armenian Hamster IgG Isotype Ctrl	HTK888	CCTGTCATTAAGACT
C0246	anti-human CD122 (IL-2R $\beta$ )	TU27	TCATTTCTCCGATT
C0247	anti-human CD267 (TACI)	1A1	AGTGATGGAGCGAAC

C0352	anti-human FcεR1α	ER-37 (CRA-1)	CTCGTTTCCGTATCG
C0353	anti-human CD41	HIP8	ACGTTGTGGCCTTGT
C0355	anti-human CD137 (4-1BB)	4B4-1	CAGTAAGTTCGGGAC
C0358	anti-human CD163	GHI/61	GCTTCTCCTTCCTTA
C0359	anti-human CD83	HB15e	CCACTCATTTCGGT
C0363	anti-human CD124 (IL-4Rα)	G077F6	CCGTCCTGATAGATG
C0364	anti-human CD13	WM15	TTTCAACGCCCTTTC
C0367	anti-human CD2	TS1/8	TACGATTTGTCAGGG
C0368	anti-human CD226 (DNAM-1)	11A8	TCTCAGTGTGGTGG
C0369	anti-human CD29	TS2/16	GTATCCCTCAGTCA
C0370	anti-human CD303 (BDCA-2)	201A	GAGATGTCCGAATTT
C0371	anti-human CD49b	P1E6-C5	GCTTTCTTCAGTATG
C0373	anti-human CD81 (TAPA-1)	5A6	GTATCCTTCCTGGC
C0384	anti-human IgD	IA6-2	CAGTCTCCGTAGAGT
C0385	anti-human CD18	TS1/18	TATTGGGACACTTCT
C0386	anti-human CD28	CD28.2	TGAGAACGACCCTAA
C0389	anti-human CD38	HIT2	TGTACCCGCTTGTA
C0390	anti-human CD127 (IL-7Rα)	A019D5	GTGTGTTGTCCTATG
C0391	anti-human CD45	HI30	TGCAATTACCCGGAT
C0393	anti-human CD22	S-HCL-1	GGGTTGTTGTCTTTG
C0394	anti-human CD71	CY1G4	CCGTGTTCCCTCATTA
C0396	anti-human CD26	BA5b	GGTGGCTAGATAATG
C0407	anti-human CD36	5-271	TTCTTTGCCTTGCCA
C0420	anti-human CD158 (KIR2DL1/S1/S3/S5)	HP-MA4	TATCAACCAACGCTT
C0575	anti-human CD49a	TS2/7	ACTGATGGACTCAGA
C0576	anti-human CD49d	9F10	CCATTCAACTTCGGG
C0577	anti-human CD73 (Ecto-5'-nucleotidase)	AD2	CAGTTCCTCAGTTCG
C0581	anti-human TCR Vα7.2	3C10	TACGAGCAGTATTCA
C0582	anti-human TCR Vδ2	B6	TCAGTCAGATGGTAT
C0591	anti-human LOX-1	15C4	ACCCTTTACCGAATA
C0592	anti-human CD158b (KIR2DL2/L3, NKAT2)	DX27	GACCCGTAGTTTGAT
C0599	anti-human CD158e1 (KIR3DL1, NKB1)	DX9	GGACGCTTTCCTTGA
C0830	anti-human CD319 (CRACC)	162.1	AGTATGCCATGTCTT
C0845	anti-human CD99	3B2/TA8	ACCCGTCCCTAAGAA
C0853	anti-human CLEC12A	50C1	CATTAGAGTCTGCCA
C0864	anti-human CD352 (NTB-A)	NT-7	AGTTTCCACTCAGGC
C0867	anti-human CD94	DX22	CTTTCGGGTCCTACA
C0894	anti-human Ig light chain κ	MHK-49	AGCTCAGCCAGTATG
C0896	anti-human CD85j (ILT2)	GHI/75	CCTTGAGAGGCTATG
C0897	anti-human CD23	EBVCS-5	TCTGTATAACCGTCT
C0898	anti-human Ig light chain λ	MHL-38	CAGCCAGTAAGTCAC
C0902	anti-human CD328 (Siglec-7)	6-434	CTTAGCATTTCCTG
C0912	anti-human GPR56	CG4	GCCTAGTTTCCGTTT
C0918	anti-human HLA-E	3D12	GAGTCGAGAAATCAT
C0920	anti-human CD82	ASL-24	TCCCACTTCGGCTTT

C0944	anti-human CD101 (BB27)	BB27	CTACTTCCCTGTCAA
C1046	anti-human CD88 (C5aR)	S5/1	GCCGCATGAGAAACA
C1052	anti-human CD224	KF29	CTGATGAGATGTCAG

<b><u>Marker</u></b>	<b><u>Fluorescent Channel</u></b>	<b><u>Dilution</u></b>	<b><u>Antibody clone</u></b>	<b><u>Vendor</u></b>
Fixable Blue	Ultraviolet	1:400		ThermoFisher L34962
CD8	APC	2:100	SK1	Biolegend 344721
Dump CD14	BV510 / AmCyan	2:100	M5E2	Biolegend 301841
Dump CD16	BV510 / AmCyan	2:100	3G8	Biolegend 302047
Dump CD20	BV510 / AmCyan	2:100	2H7	Biolegend 302339
CD2	FITC	2:100	TS1/8	Biolegend 309205
CD71	PE-Cy7	3:100	CY1G4	Biolegend 334111
CD38	BV421 / Pacific Blue	2:100	HIT2	Biolegend 303525
CD4	PE	2:100	RPA-T4	Biolegend 300507
CD45RO	BV605	2:100	UCHL1	Biolegend 304237
CD45RA	PE-Dazzle 594	2:100	HI100	Biolegend 304145
HLA-DR	BV785	2:100	L243	Biolegend 307641
ICOS	PerCP/Cyanine5.5	2:100	C398.4A	Biolegend 313517
KLRG1	APC/Fire 750	2:100	SA231A2	Biolegend 367717
Ki-67	BUV395	3:100	B56	BD Biosciences 564071

### Supplementary table 3

#### **VI-GEM**

ACTG1  
PCLAF  
ACTB  
GAPDH  
CD38  
GZMH  
PFN1  
CORO1A  
PYCARD  
PSMB8  
TMSB10  
ARPC3  
CLIC1  
CD52  
TMSB4X  
APOBEC3H  
ADA  
SEM1  
MYL6  
GZMA  
DECR1  
ARPC2  
NOP10  
APOBEC3C  
LGALS1  
GZMB  
CFL1  
CLTA  
TWF2  
ISG15  
MXD4  
SUB1  
PSMA4  
HLA-DRA  
PPP1R18  
GSTO1  
APOBEC3G  
ARPC5  
UCP2  
PSMA5  
WDR1  
ARHGDIB

YWHAE  
CCL5  
SLC25A5  
PSMB4  
ITGB1  
DYNLL1  
ARPC4  
ATP5MC2  
FGFBP2  
GTF3C6  
RGS10  
ATP6V1D  
S1PR4  
EZH2  
ATP5F1A  
GMFG  
OSTF1  
PRF1  
ABRACL  
GLRX  
ACTR3  
SIT1  
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H3F3A  
CCDC28B  
ATP5MG  
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IDH2  
SEC11A  
FABP5  
CAPZB  
DBI  
IFI16  
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COTL1  
CNN2  
CHMP2A  
ATP5MC3  
ARPC1B  
NDUFS2  
MT1E  
MRPL28  
OAS2

SERPINB1  
CARHSP1  
TIMD4  
UBE2L6  
MYL6B  
DCTN3  
IRF4  
ANXA5  
ATP5F1B  
GIMAP4  
PSMB2  
NDUFB3  
NCOA4  
YARS  
CARD16  
COX5A  
FKBP1A  
TCEAL8  
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ATP5F1C  
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RPA3  
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LDHB  
GBP1  
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SUCLG1  
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CLIC3  
TPM4  
GBP2  
NDUFC2  
CHCHD1  
PPP1CA  
TKT  
SH3BGL3  
EIF4E2  
LAIR2



MRPL51  
TRAPPC1  
CSK  
BCL2L11  
LIMD2  
JPT1  
GTF2H5  
NDUFA12  
TROAP  
RTRAF  
ZYX  
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SRSF9  
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GIMAP1  
COPZ1  
TALDO1  
CALM3  
EIF2S2  
HLA-DMA  
POMP  
PTRHD1  
COMMD4  
GGCT  
HAVCR2  
LAP3  
FERMT3  
COPS9  
QARS  
AP2S1  
ZNHIT1  
ICA1  
HADHB  
BLOC1S1  
RABL3  
IFI27L2  
RACK1  
CD27  
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MRPL10

TXNDC9  
FIBP  
PTTG1  
PSMD8  
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PSME1  
LCP1  
ACAA2  
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NCKAP1L  
PPP4C  
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PSMB3  
LAMTOR2  
ARHGAP30  
TMEM256  
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AC010618.1  
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NT5C3A  
HMGA1  
MT-CO1  
PSMA2  
NSMCE1  
PARK7

## Supplementary table 4

DE peaks	Day2 VS Day0	Day10 VS Day0	Day28 VS Day0
CD14 Mono	106	53	30
CD16 Mono	3	9	2
CD4 Naive	3	10	17
B Naive	5	7	16
CD4 TCM	5	10	20
B Memory	2	2	7
CD8 Naive	5	9	13
Treg	5	2	1
CD4 TEM	0	1	1
CD8 TEM	8	11	13
Plasmablast	6	2	3
cDC2	0	4	2
B Intermediate	0	2	5
NK	14	33	147
gdT	2	6	1
pDC	8	4	2
HSPC	2	5	6
MAIT	3	5	6
dnT	6	8	7
CD4 CTL	0	3	1
group_A	3	3	2
NK_CD56bright	1	1	1
CD8 TCM	1	1	1
ILC	1	0	2
ASDC	0	0	1

## Supplementary table 5

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<b>Cluster</b>	<b>Genes</b>
CD4 CTL	PDGFD
CD4 CTL	CX3CR1
CD4 CTL	ADGRG1
CD4 CTL	FCRL6
CD4 CTL	C1orf21
CD4 CTL	PRSS23
CD4 CTL	TMCC3
CD4 CTL	S1PR5
CD4 CTL	ASCL2
CD4 CTL	CCL4
CD4 CTL	XCL2
CD4 CTL	FGFBP2
CD4 CTL	SLAMF7
CD4 CTL	EOMES
CD4 CTL	GZMH
CD4 CTL	CES1
CD4 CTL	TGFBR3
CD4 CTL	NKG7
CD4 CTL	GZMM
CD4 CTL	CCL5
CD4 CTL	B2M
CD4 CTL	CST7
CD4 CTL	ENC1
CD4 CTL	HCST
CD4 CTL	FGR
CD4 CTL	HBA1
CD4 CTL	MAP3K8
CD4 CTL	EFHD2
CD4 CTL	SPON2
CD4 CTL	PROK2
CD4 Naive	NOG
CD4 Naive	LRRN3
CD4 Naive	SCML1
CD4 Naive	CCR7
CD4 Naive	AIF1
CD4 Naive	TRABD2A
CD4 Naive	BCL11B
CD4 Naive	ABLIM1
CD4 Naive	TMIGD2
CD4 Naive	AK5
CD4 Naive	IL6ST
CD4 Naive	RPL11

CD4 Naive	OXNAD1
CD4 Naive	SOX4
CD4 Naive	SATB1
CD4 Naive	BACH2
CD4 Naive	LEF1
CD4 Naive	RETREG1
CD4 Proliferating	DTL
CD4 Proliferating	E2F8
CD4 Proliferating	CDC45
CD4 Proliferating	CDT1
CD4 Proliferating	DLGAP5
CD4 Proliferating	TK1
CD4 Proliferating	HJURP
CD4 Proliferating	CDCA2
CD4 Proliferating	MCM10
CD4 Proliferating	TROAP
CD4 Proliferating	RRM2
CD4 Proliferating	ANLN
CD4 Proliferating	KIF4A
CD4 Proliferating	MYBL2
CD4 Proliferating	PKMYT1
CD4 Proliferating	CDCA5
CD4 Proliferating	TYMS
CD4 Proliferating	E2F7
CD4 Proliferating	CCNB2
CD4 Proliferating	NUSAP1
CD4 Proliferating	MKI67
CD4 Proliferating	BIRC5
CD4 Proliferating	DSCC1
CD4 Proliferating	PCLAF
CD4 Proliferating	GTSE1
CD4 Proliferating	CDK1
CD4 Proliferating	UHRF1
CD4 Proliferating	KIF15
CD4 Proliferating	PCNA
CD4 Proliferating	STMN1
CD4 TCM_0	TSHZ2
CD4 TCM_0	RPS27
CD4 TCM_0	CCR7
CD4 TCM_0	PASK
CD4 TCM_0	TCF7
CD4 TCM_0	RPL32
CD4 TCM_0	IL6ST

CD4 TCM_0	ADTRP
CD4 TCM_0	FYB1
CD4 TCM_0	SELL
CD4 TCM_0	SESN3
CD4 TCM_0	MAL
CD4 TCM_0	SEC11C
CD4 TCM_0	MYH9
CD4 TCM_0	DHRS7
CD4 TCM_0	CCND2
CD4 TCM_0	PFDN2
CD4 TCM_0	SSBP4
CD4 TCM_0	PBXIP1
CD4 TCM_0	JPT1
CD4 TCM_0	ATP2B1
CD4 TCM_0	TMEM50A
CD4 TCM_0	HLA-B
CD4 TCM_0	ELOVL5
CD4 TCM_1	NEFL
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CD4 TCM_1	RCBTB2
CD4 TCM_1	GATA3
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CD4 TCM_1	LPAR6
CD4 TCM_1	LMO4
CD4 TCM_1	VIM
CD4 TCM_1	C1orf162
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CD4 TCM_1	NR3C1
CD4 TCM_1	FXYD5
CD4 TCM_1	PLP2
CD4 TCM_1	ANKRD28
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CD4 TCM_1	PTGER4
CD4 TCM_1	GLIPR1
CD4 TCM_1	INPP4B
CD4 TCM_1	ANXA1
CD4 TCM_1	ARHGAP15
CD4 TCM_1	KRT1
CD4 TCM_1	MDFIC
CD4 TCM_1	TIMP1
CD4 TCM_1	TOB1

CD4 TCM_1	AHNAK
CD4 TCM_1	ZFP36L2
CD4 TCM_1	PAG1
CD4 TCM_2	FYB1
CD4 TCM_2	GYPC
CD4 TCM_2	CORO1B
CD4 TCM_2	CNN2
CD4 TCM_2	OPTN
CD4 TCM_2	LAPTM5
CD4 TCM_2	ACTG1
CD4 TCM_2	GMFG
CD4 TCM_2	ITGB1
CD4 TCM_2	UCP2
CD4 TCM_2	C16orf87
CD4 TCM_2	TMSB10
CD4 TCM_2	LAT
CD4 TCM_2	EML4
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CD4 TCM_2	LGALS9
CD4 TCM_2	EPSTI1
CD4 TCM_2	MAF
CD4 TCM_2	SAT1
CD4 TCM_2	PPP1CC
CD4 TCM_2	MXD4
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CD4 TCM_2	COTL1
CD4 TCM_2	JAK3
CD4 TCM_2	CAPZB
CD4 TCM_2	SLC4A7
CD4 TCM_2	PBXIP1
CD4 TCM_2	OCIAD2
CD4 TCM_2	EIF3A
CD4 TCM_3	KLRB1
CD4 TCM_3	PDE4D
CD4 TCM_3	RPS19
CD4 TCM_3	USP10
CD4 TCM_3	LTB
CD4 TCM_3	DPP4
CD4 TCM_3	CMTM6
CD4 TCM_3	AQP3
CD4 TCM_3	TNFRSF4
CD4 TEM_0	ITGA4
CD4 TEM_0	KLRB1

CD4 TEM_0	TMEM156
CD4 TEM_0	DYNLT3
CD4 TEM_0	SERINC5
CD4 TEM_0	RPS6
CD4 TEM_0	TCF7
CD4 TEM_0	MGAT4A
CD4 TEM_0	LIMS1
CD4 TEM_0	INPP4B
CD4 TEM_0	EEF1B2
CD4 TEM_0	IL7R
CD4 TEM_0	GPR183
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CD4 TEM_0	ANKRD12
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CD4 TEM_0	SERINC5
CD4 TEM_0	GCC2
CD4 TEM_0	OXNAD1
CD4 TEM_0	CCL5
CD4 TEM_0	AP3M2
CD4 TEM_0	ATM
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CD4 TEM_0	FYB1
CD4 TEM_0	LEF1
CD4 TEM_0	FOXP1
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CD4 TEM_0	DNMT3A
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CD4 TEM_0	PPP2R5C
CD4 TEM_0	DHX36
CD4 TEM_0	N4BP2L2
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CD4 TEM_0	ARID5B
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CD4 TEM_0	CLEC2D

CD4 TEM_0	EMB
CD4 TEM_0	PIK3IP1
CD4 TEM_0	CBLB
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CD4 TEM_1	LYAR
CD4 TEM_1	DUSP2
CD4 TEM_1	GZMA
CD4 TEM_1	ZFP36L2
CD4 TEM_1	MT-ND3
CD4 TEM_1	ID2
CD4 TEM_1	TNFAIP3
CD4 TEM_1	XCL1
CD4 TEM_1	BTG1
CD4 TEM_1	HCST
CD4 TEM_1	PIK3R1
CD4 TEM_1	CCL5
CD4 TEM_1	GZMM
CD4 TEM_1	HOPX
CD4 TEM_1	CXCR4
CD4 TEM_1	CEBPB
CD4 TEM_1	KLRB1
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CD4 TEM_1	SYNE2
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CD4 TEM_2	JUNB
CD4 TEM_2	PLXNA4
CD4 TEM_2	CD55
CD4 TEM_2	ARL4C
CD4 TEM_2	SOCS3
CD4 TEM_2	TPT1
CD4 TEM_2	CR1
CD4 TEM_2	JUND
CD4 TEM_2	ARHGAP15
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CD4 TEM_2	TIMP1
CD4 TEM_2	NFKBIA
CD4 TEM_2	HNRNPA1
CD4 TEM_2	BCL2
CD4 TEM_2	RPS14
CD4 TEM_2	NACA
Treg	FANK1
Treg	FOXP3
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Treg	IL2RA
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Treg	STAM
Treg	LGALS3
Treg	TIGIT
Treg	HPGD
Treg	TBC1D4
Treg	SETD7
Treg	CTLA4
Treg	CCNG2
Treg	UBL3
Treg	RGS1
Treg	HLA-DQB1
Treg	TTC39C
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Treg	TCEAL4
Treg	USP15
Treg	SAMHD1
Treg	CASK
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CD8 Naive	SCML1

CD8 Naive	TMIGD2
CD8 Naive	CLEC11A
CD8 Naive	EIF3E
CD8 Naive	CCR7
CD8 Naive	RPL23
CD8 Naive	ACTN1
CD8 Naive	TRABD2A
CD8 Naive	MAL
CD8 Naive	S100B
CD8 Naive	ARMH1
CD8 Naive	FHIT
CD8 Naive	IL6ST
CD8 Naive	SATB1
CD8 Naive	AIF1
CD8 Naive	NDFIP1
CD8 Naive	KLF7
CD8 Naive	OXNAD1
CD8 Naive	ABLIM1
CD8 Naive	PDK1
CD8 Naive	LEF1
CD8 Naive	MYC
CD8 Naive	TTN
CD8 Naive	RUNX2
CD8 Naive	RETREG1
CD8 Naive	SNHG32
CD8 Naive	RCAN3
CD8 Naive	ITGA6
CD8 TCM	NT5E
CD8 TCM	SPINK2
CD8 TCM	IL7R
CD8 TCM	BIRC3
CD8 TCM	ITGA1
CD8 TCM	TMIGD2
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CD8 TCM	CDC14A
CD8 TCM	SPRY1
CD8 TCM	TTC39C
CD8 TCM	TMEM123
CD8 TCM	ITM2C
CD8 TCM	PAG1
CD8 TCM	JUN
CD8 TCM	ARHGAP15
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CD8 TCM	ODF2L
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CD8 TCM	FOSB
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CD8 TCM	RORA
CD8 TCM	MAL
CD8 TCM	TCF7
CD8 TCM	IRS2
CD8 TCM	FOS
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CD8 TEM_0	FGFBP2
CD8 TEM_0	PROK2
CD8 TEM_0	SPON2
CD8 TEM_0	GZMH
CD8 TEM_0	B2M
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CD8 TEM_0	ADGRG1
CD8 TEM_0	ITGAL
CD8 TEM_0	PRSS23
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CD8 TEM_0	LAIR2
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CD8 TEM_0	CD3G
CD8 TEM_0	ADRB2
CD8 TEM_0	VCL
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CD8 TEM_0	PLEKHF1
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CD8 TEM_1	CD160
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CD8 TEM_1	GZMM
CD8 TEM_1	KLRF1
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CD8 TEM_1	STAT4
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CD8 TEM_2	NCAM1
CD8 TEM_2	GNLY
CD8 TEM_2	TYROBP
CD8 TEM_2	HOPX
CD8 TEM_2	CD63
CD8 TEM_2	COL6A2
CD8 TEM_2	AC005747.1
CD8 TEM_2	KLRC2
CD8 TEM_2	MXRA7
CD8 TEM_2	AHNAK
CD8 TEM_2	RRBP1
CD8 TEM_2	TBX21

CD8 TEM_2	IFITM2
CD8 TEM_2	GSAP
CD8 TEM_2	MT-ND5
CD8 TEM_2	AGPAT4
CD8 TEM_2	ITGB1
CD8 TEM_2	ITGAM
CD8 TEM_2	TNFRSF18
CD8 TEM_2	CTSW
CD8 TEM_2	FAM129A
CD8 TEM_2	DSTN
CD8 TEM_2	SYTL3
CD8 TEM_2	KIR2DL1
CD8 TEM_2	MATK
CD8 TEM_2	ZBTB7A
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CD8 TEM_2	CD247
CD8 TEM_3	GZMK
CD8 TEM_3	DUSP2
CD8 TEM_3	RGS1
CD8 TEM_3	CMC1
CD8 TEM_3	CXCR4
CD8 TEM_3	YBX3
CD8 TEM_3	PHACTR2
CD8 TEM_3	SELENOM
CD8 TEM_3	BTG1
CD8 TEM_3	CRTAM
CD8 TEM_3	DNAJB1
CD8 TEM_3	FCRL3
CD8 TEM_3	TENT5C
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CD8 TEM_3	PIK3R1
CD8 TEM_3	MAP3K8
CD8 TEM_3	CD160
CD8 TEM_3	PDE4B
CD8 TEM_3	IFNGR1
CD8 TEM_3	CD69
CD8 TEM_3	FYN
CD8 TEM_3	CD74
CD8 TEM_3	TSPYL2

CD8 TEM_3	JUNB
CD8 TEM_3	LYST
CD8 TEM_3	GPR183
CD8 TEM_3	CD84
CD8 TEM_3	SH2D1A
CD8 TEM_4	SOX4
CD8 TEM_4	SPINT2
CD8 TEM_4	IGHD
CD8 TEM_4	RTKN2
CD8 TEM_4	IFITM3
CD8 TEM_4	IRF2BP2
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CD8 TEM_4	IER2
CD8 TEM_4	PABPC1
CD8 TEM_4	BEX4
CD8 TEM_4	RALGPS2
CD8 TEM_4	FXD2
CD8 TEM_4	AREG
CD8 TEM_4	MAP3K1
CD8 TEM_4	JUNB
CD8 TEM_4	NCF1
CD8 TEM_4	BTG2
CD8 TEM_4	LYAR
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CD8 TEM_4	LEF1
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CD8 TEM_4	LTB
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CD8 TEM_4	SOCS3
CD8 TEM_4	XCL1
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CD8 TEM_5	PRF1

CD8 TEM_5	IFITM2
CD8 TEM_5	GZMH
CD8 TEM_5	TBX21
CD8 TEM_5	ZEB2
CD8 TEM_5	CYBA
CD8 TEM_5	CD63
CD8 TEM_5	SYNE1
CD8 TEM_5	KLRD1
CD8 TEM_5	S1PR5
CD8 TEM_5	CTSW
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CD8 TEM_5	FGFBP2
CD8 TEM_5	IKZF2
CD8 TEM_5	KLRC2
CD8 TEM_5	CCL5
CD8 TEM_5	MYO1F
CD8 TEM_5	CAST
CD8 TEM_5	KANSL1
CD8 TEM_5	PRSS23
CD8 TEM_5	ABHD17A
CD8 TEM_5	C1orf21
CD8 TEM_5	ASCL2
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CD8 TEM_5	NKG7
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CD8 TEM_5	COX6B1
CD8 TEM_5	PET100
CD8 TEM_5	CSGALNACT2
CD8 TEM_6	NELL2
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CD8 TEM_6	FOXP1
CD8 TEM_6	CCR7
CD8 TEM_6	JUNB
CD8 TEM_6	TCF7

CD8 TEM_6	RPS23
CD8 TEM_6	RCAN3
VI-A	GMFG
VI-A	CD27
VI-A	ACTG1
VI-A	LIMD2
VI-A	CD74
VI-A	ARHGDIB
VI-A	GZMA
VI-A	COTL1
VI-A	ATP5F1A
VI-A	ARPC3
VI-A	HLA-DRA
VI-A	SUB1
VI-A	CORO1A
VI-A	RTRAF
VI-A	WDR1
VI-A	ATP5MC2
VI-A	ACTB
VI-A	PSMB8
VI-A	CNN2
VI-A	ATP5MG
VI-A	HIGD2A
VI-A	PSMA5
VI-A	TMSB4X
VI-A	PYCARD
VI-A	MYL6
VI-A	ARPC1B
VI-A	HINT1
VI-A	CCL5
VI-A	ACTR3
VI-A	PSMA4
VI-B	PKMYT1
VI-B	E2F7
VI-B	SPC25
VI-B	CCNB2
VI-B	CDC45
VI-B	FAM111B
VI-B	MYBL2
VI-B	DTL
VI-B	CLSPN
VI-B	MND1
VI-B	TYMS



VI-B	CDK1
VI-B	DLGAP5
VI-B	CDCA5
VI-B	CDC6
VI-B	HIST1H3G
VI-B	TK1
VI-B	CKAP2L
VI-B	ASF1B
VI-B	CDT1
VI-B	MKI67
VI-B	CENPF
VI-B	ZWINT
VI-B	PCLAF
VI-B	KNL1
VI-B	RRM2
VI-B	CENPU
VI-B	PBK
VI-B	MCM10
VI-B	CEP55
NK Proliferating	TK1
NK Proliferating	CDK1
NK Proliferating	ESCO2
NK Proliferating	SPC25
NK Proliferating	E2F7
NK Proliferating	DTL
NK Proliferating	TYMS
NK Proliferating	E2F1
NK Proliferating	FAM111B
NK Proliferating	UHRF1
NK Proliferating	CDT1
NK Proliferating	PCLAF
NK Proliferating	HJURP
NK Proliferating	CHEK1
NK Proliferating	DIAPH3
NK Proliferating	POLQ
NK Proliferating	CLSPN
NK Proliferating	ZWINT
NK Proliferating	RRM2
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NK Proliferating	CKAP2L
NK Proliferating	RAD51AP1
NK Proliferating	MCM4
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NK Proliferating	MCM10
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NK Proliferating	CKS1B
NK Proliferating	STMN1
NK Proliferating	DUT
NK Proliferating	HMGB2
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NK_0	PPP2R5C
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NK_0	F2R
NK_0	AHNAK
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NK_0	GZMH
NK_0	PATL2
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NK_0	SUN2
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NK_1	HELZ
NK_1	GSAP

NK_1	EIF3G
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NK_1	ARHGAP9
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NK_1	TIGIT
NK_1	ZFP36
NK_1	JUNB
NK_1	CMC1
NK_1	TLE1
NK_1	SH2D2A
NK_1	SIRT2
NK_1	TENT5C
NK_1	IL2RB
NK_1	BTG2
NK_1	IRS2
NK_1	TRIM22
NK_1	PTPN12
NK_1	B3GNT7
NK_2	FGFBP2
NK_2	PTPRA
NK_2	S1PR5
NK_2	GNPTAB
NK_2	FCRL6
NK_2	KIR2DL3
NK_2	NKG7
NK_2	PTGDS
NK_2	MAF
NK_2	ITGB7
NK_2	CEBPB
NK_2	MTSS1
NK_2	RAPGEF1
NK_2	CST7
NK_2	KIR3DL1
NK_2	S100A4
NK_2	S100A6
NK_2	GZMH
NK_2	ZEB2
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NK_3	SH2D2A
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NK_3	PTPN12
NK_CD56bright	KIT
NK_CD56bright	PACSIN1
NK_CD56bright	IGFBP4

NK_CD56bright	SPINK2
NK_CD56bright	SPTSSB
NK_CD56bright	AFF3
NK_CD56bright	TNFRSF11A
NK_CD56bright	MAML3
NK_CD56bright	PPP1R9A
NK_CD56bright	GAB1
NK_CD56bright	RUNX2
NK_CD56bright	XCL1
NK_CD56bright	HAPLN3
NK_CD56bright	GPR183
NK_CD56bright	SELL
NK_CD56bright	TPT1
NK_CD56bright	CMC1
NK_CD56bright	CAPG
NK_CD56bright	IL7R
NK_CD56bright	IL18
NK_CD56bright	GZMK
HSPC	SMIM24
HSPC	DDAH2
HSPC	ARMH1
HSPC	BCL11A
HSPC	PRSS57
HSPC	CYTL1
HSPC	DPPA4
HSPC	SPINK2
HSPC	SOX4
HSPC	LAPTM4B
HSPC	HACD1
HSPC	CD74
HSPC	STMN1
HSPC	HLA-DRB1
HSPC	CD34
HSPC	NPR3
HSPC	GATA2
HSPC	MYB
HSPC	BAALC
HSPC	RAB34
HSPC	LMO2
HSPC	IL18
HSPC	RPS24
HSPC	MYL6B
HSPC	AIF1

HSPC	EREG
HSPC	HLA-DRA
HSPC	TXN
HSPC	ALDH1A1
HSPC	MGST2
ILC	IL32
ILC	KLRB1
ILC	TXNIP
ILC	CD48
ILC	GATA3
ILC	S100A4
ILC	NCR3
ILC	LTB
ILC	NFKBIA
ILC	BTG1
ILC	TRDC
ILC	IL7R
ILC	FXYD7
ILC	CD69
ILC	CD52
ILC	IFITM2
ILC	CD7
ILC	JUNB
ILC	S100A6
ILC	RPLP2
ILC	FAM107B
ILC	TNFRSF25
ILC	IL2RA
ILC	IER2
ILC	ETS1
ILC	XCL1
ILC	FXYD1
ILC	RORA
ILC	MAF
ILC	EMP3
Platelet	PF4
Platelet	TUBB1
Platelet	TREML1
Platelet	TMEM40
Platelet	PF4V1
Platelet	CTTN
Platelet	CLEC1B
Platelet	PPBP

Platelet	GP9
Platelet	F13A1
Platelet	CMTM5
Platelet	GNAZ
Platelet	NRGN
Platelet	PTCRA
Platelet	MYL9
Platelet	CLDN5
Platelet	SELP
Platelet	MPIG6B
Platelet	CD9
Platelet	CA2
Platelet	ITGB3
Platelet	BEND2
Platelet	ABCC3
Platelet	MFAP3L
Platelet	OSBP2
Platelet	CAVIN2
Platelet	SMOX
Platelet	GNG11
Platelet	SH3BGRL2
Platelet	ACRBP
dnT	COTL1
dnT	ACTG1
dnT	F5
dnT	SMCO4
dnT	LYST
dnT	ACTB
dnT	GPR183
dnT	SESTD1
dnT	LAYN
dnT	FXD2
dnT	MYB
dnT	CD68
dnT	TIMD4
dnT	PGM2L1
dnT	HLA-DRA
dnT	CAPG
dnT	EVI2B
dnT	PSMB8
dnT	CD27
dnT	POU2F2
dnT	SAT1

dnT	AIF1
dnT	DENND2D
dnT	RGS10
dnT	PCBP1
dnT	DUSP6
dnT	CD74
dnT	CALM3
dnT	FYB1
dnT	CTLA4
gdT_0	TRDV2
gdT_0	KLRC1
gdT_0	TRGC1
gdT_0	DUSP2
gdT_0	XCL2
gdT_0	CD160
gdT_0	TRGV9
gdT_0	MAP3K8
gdT_0	IL18RAP
gdT_0	KLRG1
gdT_0	PIK3R1
gdT_0	TC2N
gdT_0	CD300A
gdT_0	CD69
gdT_0	TNFAIP3
gdT_0	KLRB1
gdT_0	FKBP11
gdT_0	PDE4B
gdT_0	TLE1
gdT_0	TENT5C
gdT_0	TGFBR3
gdT_0	GABARAPL1
gdT_0	TBX21
gdT_0	TRDC
gdT_0	ALOX5AP
gdT_0	CCL4
gdT_0	RORA
gdT_0	IFNGR1
gdT_0	SYTL2
gdT_0	CEBPD
gdT_1	ADGRG1
gdT_1	GZMH
gdT_1	CLIC3
gdT_1	PLAAT3



gdT_1	SERPINB6
gdT_1	ZEB2
gdT_1	NKG7
gdT_1	CYBA
gdT_1	SSBP3
gdT_1	GZMM
gdT_1	LILRB1
gdT_1	IFITM2
gdT_1	PRSS23
gdT_1	GZMB
gdT_1	PDGFD
gdT_1	FCRL6
gdT_1	EFHD2
gdT_1	PRF1
gdT_1	AHNAK
gdT_1	F2R
gdT_1	PDIA3
gdT_1	ITGB1
gdT_1	GNLY
gdT_1	CD320
gdT_1	CST7
gdT_1	DHRS7
gdT_1	ITGAL
gdT_1	FGFBP2
gdT_1	ABHD17A
gdT_1	CTSW
gdT_2	MME
gdT_2	RTKN2
gdT_2	SOX4
gdT_2	MAP3K1
gdT_2	MAL
gdT_2	LEF1
gdT_2	CDC14A
gdT_2	EPHA4
gdT_2	BEX3
gdT_2	ITGA6
gdT_2	CAMK4
gdT_2	TRABD2A
gdT_2	ITPKB
gdT_2	JUN
gdT_2	CR1
gdT_2	HSPB1
gdT_2	RCAN3

gdT_2	NUCB2
gdT_2	TCF7
gdT_2	IRF2BP2
gdT_2	CD79A
gdT_2	ATXN7L3B
gdT_2	SCML4
gdT_2	SPINT2
gdT_2	LEPROTL1
gdT_2	NELL2
gdT_2	SINHCAF
gdT_2	BCL11B
gdT_2	LTB
gdT_2	AC092338.1
gdT_3	FGFBP2
gdT_3	GNLY
gdT_3	EFHD2
gdT_3	NKG7
gdT_3	CST7
gdT_3	CCL5
gdT_3	GZMB
gdT_3	KIR3DL1
gdT_3	CD3G
gdT_3	PRSS23
gdT_3	IFITM2
gdT_3	TRDC
gdT_3	ZEB2
gdT_3	GZMH
gdT_3	CD247
gdT_3	CD99
gdT_3	ITGB2
gdT_3	KLRD1
gdT_3	FCGR3A
gdT_3	CALR
gdT_3	SPON2
gdT_3	CD63
gdT_3	HOPX
gdT_3	PRF1
gdT_3	ABHD17A
gdT_3	PYHIN1
gdT_3	LGALS1
gdT_3	C1orf21
gdT_3	DSTN
gdT_3	RASSF1

MAIT	TSPAN15
MAIT	ADAM12
MAIT	LTK
MAIT	SCART1
MAIT	CCR6
MAIT	SLC4A10
MAIT	DPP4
MAIT	SPRY1
MAIT	COLQ
MAIT	KIF5C
MAIT	KLRB1
MAIT	CD8A
MAIT	NCR3
MAIT	TMIGD2
MAIT	IL7R
MAIT	NFKBIA
MAIT	PHACTR2
MAIT	MAF
MAIT	ZBTB16
MAIT	SLAMF1
MAIT	PLXND1
MAIT	APOL3
MAIT	GPR171
MAIT	AQP3
MAIT	TLE1
MAIT	RORA
MAIT	TNFRSF25
MAIT	HSP90AB1
MAIT	IL18RAP
MAIT	NR1D1
B Intermediate	CIB1
B Intermediate	HSPB1
B Intermediate	LRRK2
B Intermediate	SOX5
B Intermediate	TFEC
B Intermediate	CD1C
B Intermediate	GPR183
B Intermediate	SYK
B Intermediate	PARP15
B Intermediate	FCRL2
B Intermediate	CCDC50
B Intermediate	MPP6
B Intermediate	ZEB2

B Intermediate	MPEG1
B Intermediate	RALGPS2
B Intermediate	PTPRJ
B Intermediate	ARHGAP24
B Intermediate	IL10RA
B Intermediate	CNFN
B Intermediate	EMP3
B Intermediate	HCK
B Intermediate	RIN3
B Intermediate	ARF6
B Intermediate	ENC1
B Intermediate	ZDHHC21
B Intermediate	FGR
B Intermediate	TNFRSF1B
B Intermediate	ITGAX
B Intermediate	ZFP36
B Intermediate	AKAP13
B Memory	SHISA8
B Memory	LYPLAL1
B Memory	DAAM1
B Memory	NAP1L1
B Memory	CRIP2
B Memory	COCH
B Memory	TEX9
B Memory	SCIMP
B Memory	SINHCAF
B Memory	GSTK1
B Memory	TCF7
B Memory	BLK
B Memory	S100A10
B Memory	MARCKS
B Memory	PLP2
B Memory	LTB
B Memory	ARID5B
B Memory	NFKBIA
B Memory	CR1
B Memory	AIM2
B Memory	SSPN
B Memory	HOPX
B Memory	RILPL2
B Memory	NCOA7
B Memory	CD82
B Memory	CAPG

B Memory	PIM3
B Memory	ANXA4
B Memory	CPNE5
B Memory	AHNAK
B Naive	TCL1A
B Naive	CD200
B Naive	IGHD
B Naive	IL4R
B Naive	BACH2
B Naive	COL19A1
B Naive	TSPAN13
B Naive	CD69
B Naive	BIRC3
B Naive	ITPR1
B Naive	NCK2
B Naive	CXCR4
B Naive	YBX3
B Naive	TCTN1
B Naive	SESTD1
B Naive	FCRL1
B Naive	TAPT1
B Naive	STK17A
B Naive	PLEKHA1
B Naive	FCER2
B Naive	BCL7A
B Naive	BTG1
B Naive	ATF7IP
B Naive	PLEKHA2
B Naive	AFF3
B Naive	CD37
B Naive	PNRC1
B Naive	APLP2
B Naive	MEF2C
B Naive	CCR7
Plasmablast	MZB1
Plasmablast	JCHAIN
Plasmablast	SEC11C
Plasmablast	SDF2L1
Plasmablast	PPIB
Plasmablast	PRDX4
Plasmablast	OSTC
Plasmablast	SEC61B
Plasmablast	SSR4

Plasmablast	TMED9
Plasmablast	ERLEC1
Plasmablast	SPCS2
Plasmablast	SPCS1
Plasmablast	SUB1
Plasmablast	CLPTM1L
Plasmablast	TMBIM6
Plasmablast	SSR1
Plasmablast	SELENOS
Plasmablast	TRAM1
Plasmablast	PRDX5
Plasmablast	MYDGF
Plasmablast	P4HB
Plasmablast	LMAN2
Plasmablast	SRGN
Plasmablast	UBE2J1
Plasmablast	PDIA6
Plasmablast	RABAC1
Plasmablast	TMEM208
Plasmablast	PRDX1
Plasmablast	TMEM258
ASDC	SIGLEC6
ASDC	AXL
ASDC	LTK
ASDC	PPP1R14A
ASDC	OTULINL
ASDC	APEX1
ASDC	S100A10
ASDC	CALM1
ASDC	UPK3A
ASDC	MYL12A
ASDC	FCGRT
ASDC	SCT
ASDC	HINT1
ASDC	PTPRE
ASDC	DAB2
ASDC	SOX4
ASDC	ALDH2
ASDC	ANXA2
ASDC	CCND3
ASDC	TNNI2
ASDC	VASH1
ASDC	KIF2A

ASDC	C20orf27
ASDC	PHB
ASDC	LGMN
ASDC	SNRNP25
ASDC	SULF2
ASDC	RAB11FIP1
ASDC	DPYSL2
CD14 Mono	STEAP4
CD14 Mono	S1PR3
CD14 Mono	CLEC4D
CD14 Mono	MCEMP1
CD14 Mono	CRISPLD2
CD14 Mono	F5
CD14 Mono	CYP27A1
CD14 Mono	PROK2
CD14 Mono	DYSF
CD14 Mono	AQP9
CD14 Mono	ALDH1A1
CD14 Mono	CYP1B1
CD14 Mono	PLA2G7
CD14 Mono	DSC2
CD14 Mono	NRG1
CD14 Mono	CATSPER1
CD14 Mono	HOMER3
CD14 Mono	CD163
CD14 Mono	RBP7
CD14 Mono	HPSE
CD14 Mono	FCAR
CD14 Mono	THBS1
CD14 Mono	NLRP12
CD14 Mono	CLEC4E
CD14 Mono	CDA
CD14 Mono	CR1
CD14 Mono	NRGN
CD14 Mono	VNN2
CD14 Mono	STAB1
CD14 Mono	PLPPR2
CD16 Mono	LYPD2
CD16 Mono	PPP1R17
CD16 Mono	CASP5
CD16 Mono	IGFBP6
CD16 Mono	L1TD1
CD16 Mono	CEACAM3

CD16 Mono	TNFRSF8
CD16 Mono	TMTC1
CD16 Mono	ABCC3
CD16 Mono	CTSL
CD16 Mono	C1QB
CD16 Mono	C5AR2
CD16 Mono	C1QA
CD16 Mono	CDKN1C
CD16 Mono	HES4
CD16 Mono	CHST7
CD16 Mono	HEG1
CD16 Mono	ADGRE1
CD16 Mono	FCGR3A
CD16 Mono	VMO1
CD16 Mono	MRAS
CD16 Mono	PPM1N
CD16 Mono	KCNMA1
CD16 Mono	SPRED1
CD16 Mono	NEURL1
CD16 Mono	MSR1
CD16 Mono	TCF7L2
CD16 Mono	MTSS1
CD16 Mono	TESC
CD16 Mono	CKB
cDC1	CADM1
cDC1	CLEC9A
cDC1	CPNE3
cDC1	SNX3
cDC1	CLNK
cDC1	GSTP1
cDC1	ENPP1
cDC1	MZT2A
cDC1	CPVL
cDC1	RGS10
cDC1	CD74
cDC1	HLA-DPA1
cDC1	GYPC
cDC1	HLA-DPB1
cDC1	HLA-DRA
cDC1	BATF3
cDC1	HLA-DQB1
cDC1	C1orf54
cDC1	BASP1



cDC1	SUB1
cDC1	CST3
cDC1	WDFY4
cDC1	MCUR1
cDC1	HLA-DOB
cDC1	NDUFV2
cDC1	RAB32
cDC1	CYB5R3
cDC1	FNBP1
cDC1	HDAC9
cDC1	HLA-DQA1
cDC2	CD1E
cDC2	IL1R2
cDC2	CD1C
cDC2	FCGR2B
cDC2	ID3
cDC2	FCER1A
cDC2	RTN1
cDC2	CACNA2D3
cDC2	CLEC10A
cDC2	PKIB
cDC2	ENHO
cDC2	TMEM273
cDC2	LMNA
cDC2	GPAT3
cDC2	PID1
cDC2	CCND2
cDC2	CST7
cDC2	ID1
cDC2	IL13RA1
cDC2	CD33
cDC2	IL18
cDC2	ATP1B1
cDC2	RCC2
cDC2	FAM102B
cDC2	TOB1
cDC2	F13A1
cDC2	LY86
cDC2	MAT2A
cDC2	EMP1
cDC2	VEGFA
pDC	COL26A1
pDC	SHD

pDC	CRYM
pDC	ASIP
pDC	CYP46A1
pDC	AJAP1
pDC	LRRC26
pDC	SLC12A3
pDC	KRT5
pDC	PACSIN1
pDC	CUX2
pDC	TTC24
pDC	MAP1A
pDC	SLITRK5
pDC	TTC39A
pDC	PTCRA
pDC	RBMS3
pDC	CHPF
pDC	WNT10A
pDC	TCL1A
pDC	AEBP1
pDC	DPPA4
pDC	LCNL1
pDC	MYBL2
pDC	AR
pDC	PTPRS
pDC	CYR1
pDC	PALD1
pDC	EPHA2
pDC	PHEX