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Supplementary Materials for

Allele-specific long-distance regulation dictates IL-32 isoform switching and mediates susceptibility to HIV-1

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This PDF file includes:

Supplementary Figure 1.

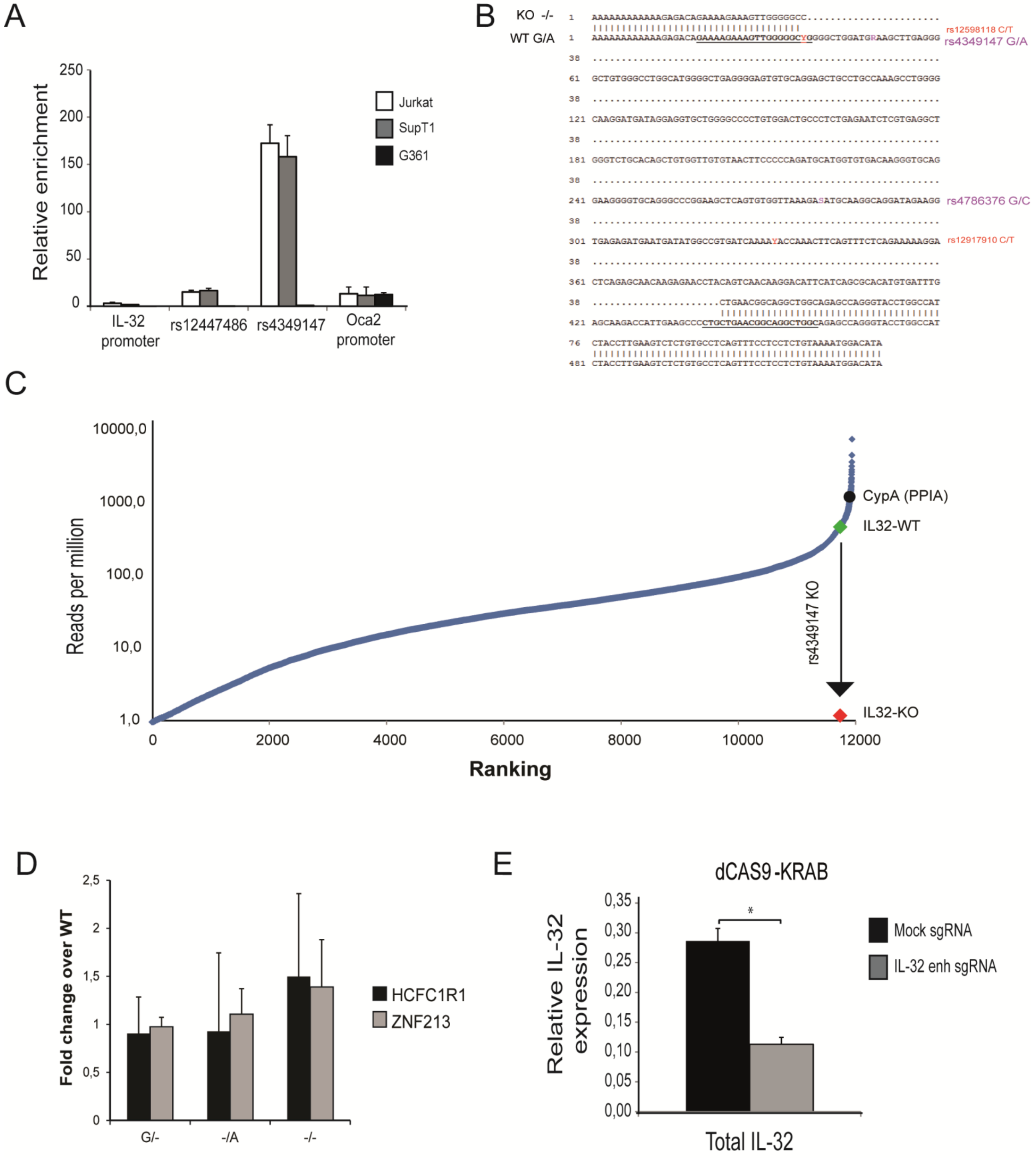
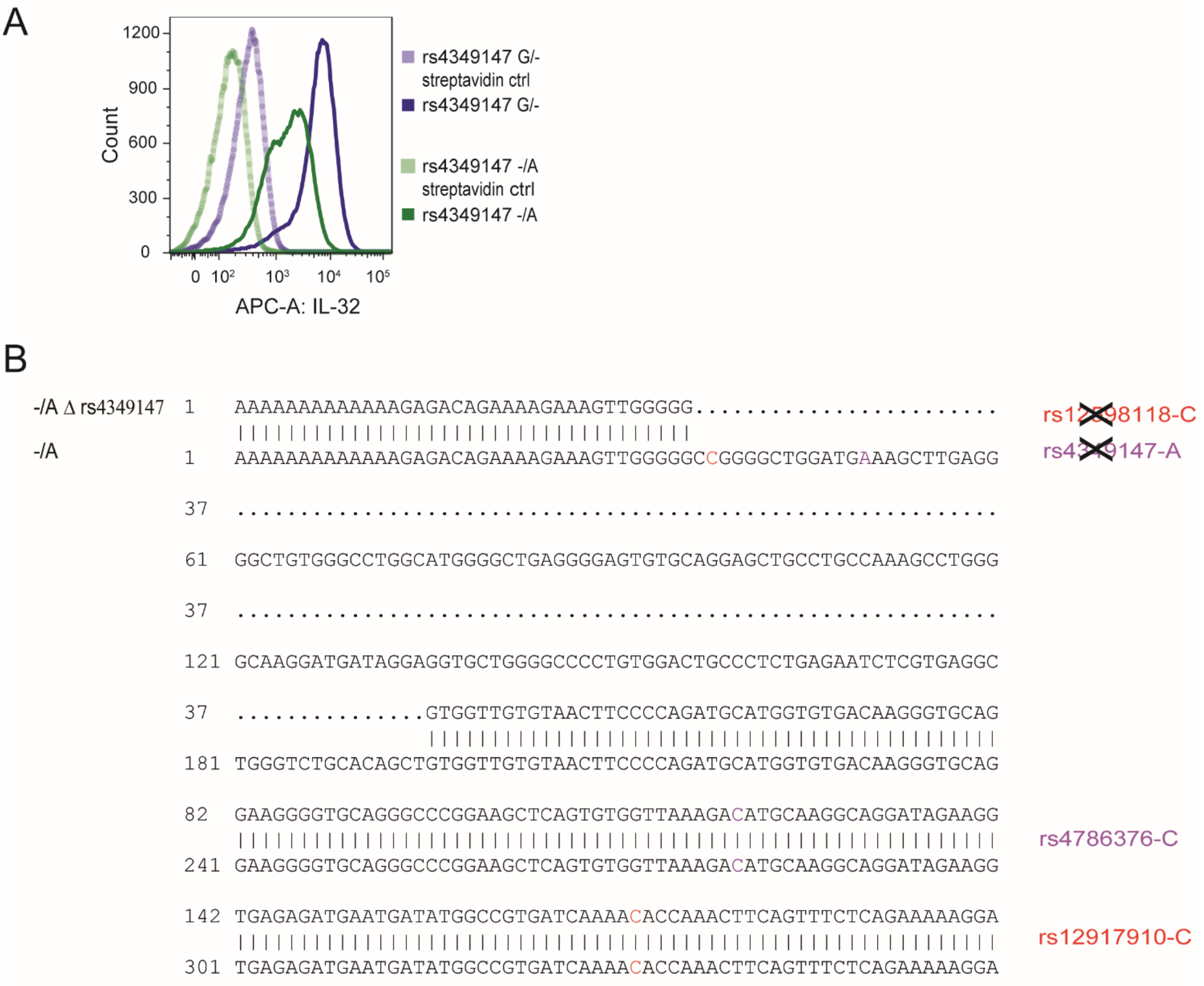


fig. S1. Characterization of the rs4349147 DHS and the rs4349147 KO clone. (**A**) FAIRE analysis of the region surrounding rs4349147 demonstrates significant increase in DNA accessibility indicating this region is depleted of histones and accessible in the T cell derived cell lines Jurkat and SupT1 but not in the melanoma cell line G361. By comparison, control regions rs12447486 and the melanocyte specific Oca2 promoter are less accessible as shown in the FAIRE analysis. (**B**) Sequencing of PCR amplicon 1 (see figure 1B) spanning the rs4349147 DHS KO(-/-) line depicts the region deleted using Crispr/CAS9. Top sequence is obtained from the IL-32 rs4349147 DHS KO(-/-) cells; bottom sequence is obtained from the WT(G/A) cells. Sequence of the sgRNA's are indicated by boldface font and underlined. Position of variants is indicated. (**C**) Reads per million of al genes expressed above 1 read per million are ranked in ascending order. In WT(G/A) Jurkat cells IL-32 expression is among the top 5% of highly expressed genes (green diamond) Upon deletion of the rs4349147 regulatory element IL-32 expression drops to the lowest 2% of expressed genes (red diamond). The CypA gene is indicated as reference (black dot). (**D**) Real-time pcr confirmation of invariable expression of surrounding genes. (**E**) Targeting of a dCAS9-KRAB domain fusion to the rs4349147 region in wild type Jurkat cells results in reduced IL-32 expression.

Supplementary Figure 2.



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-/A Δ rs4349147  1   AAAAAAAAAAAAAGAGACAGAAAAGAAAGTTGGGGG........................
                     ||||||||||||||||||||||||||||||||||||
-/A              1   AAAAAAAAAAAAAGAGACAGAAAAGAAAGTTGGGGGCCGGGGCTGGATGAAAGCTTGAGG

                37   ............................................................

                61   GGCTGTGGGCCTGGCATGGGGCTGAGGGGAGTGTGCAGGAGCTGCCTGCCAAAGCCTGGG

                37   ............................................................

               121   GCAAGGATGATAGGAGGTGCTGGGGCCCCTGTGGACTGCCCTCTGAGAATCTCGTGAGGC

                37   ...............GTGGTTGTGTAACTTCCCCAGATGCATGGTGTGACAAGGGTGCAG
                                    |||||||||||||||||||||||||||||||||||||||||||||
               181   TGGGTCTGCACAGCTGTGGTTGTGTAACTTCCCCAGATGCATGGTGTGACAAGGGTGCAG

                82   GAAGGGGTGCAGGGCCCGGAAGCTCAGTGTGGTTAAAGACATGCAAGGCAGGATAGAAGG
                     ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
               241   GAAGGGGTGCAGGGCCCGGAAGCTCAGTGTGGTTAAAGACATGCAAGGCAGGATAGAAGG

               142   TGAGAGATGAATGATATGGCCGTGATCAAAACACCAAACTTCAGTTTCTCAGAAAAAGGA
                     ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
               301   TGAGAGATGAATGATATGGCCGTGATCAAAACACCAAACTTCAGTTTCTCAGAAAAAGGA
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fig. S2. Characterization of the rs4349147 G/−, rs4349147 −/A, and −/A Δrs4349147 clones. (**A**) Intracellular staining with biotin-conjugated antibody against IL-32 followed by FACS analysis rs4349147 -/A Jurkat cells and rs4349147 G/- Jurkat cells. Streptavidin-APC only staining is shown to demonstrate specificity. (**B**) Sequencing of PCR amplicon 1 (see figure 1B) spanning the rs4349147 DHS demonstrates the 158bp deletion in the -/A Δrs4349147 clone. Top sequence is obtained from the -/A Δrs4349147 clone; bottom sequence is obtained from the parental rs4349147 -/A cells. Position of variants is indicated.

Supplementary Figure 3.

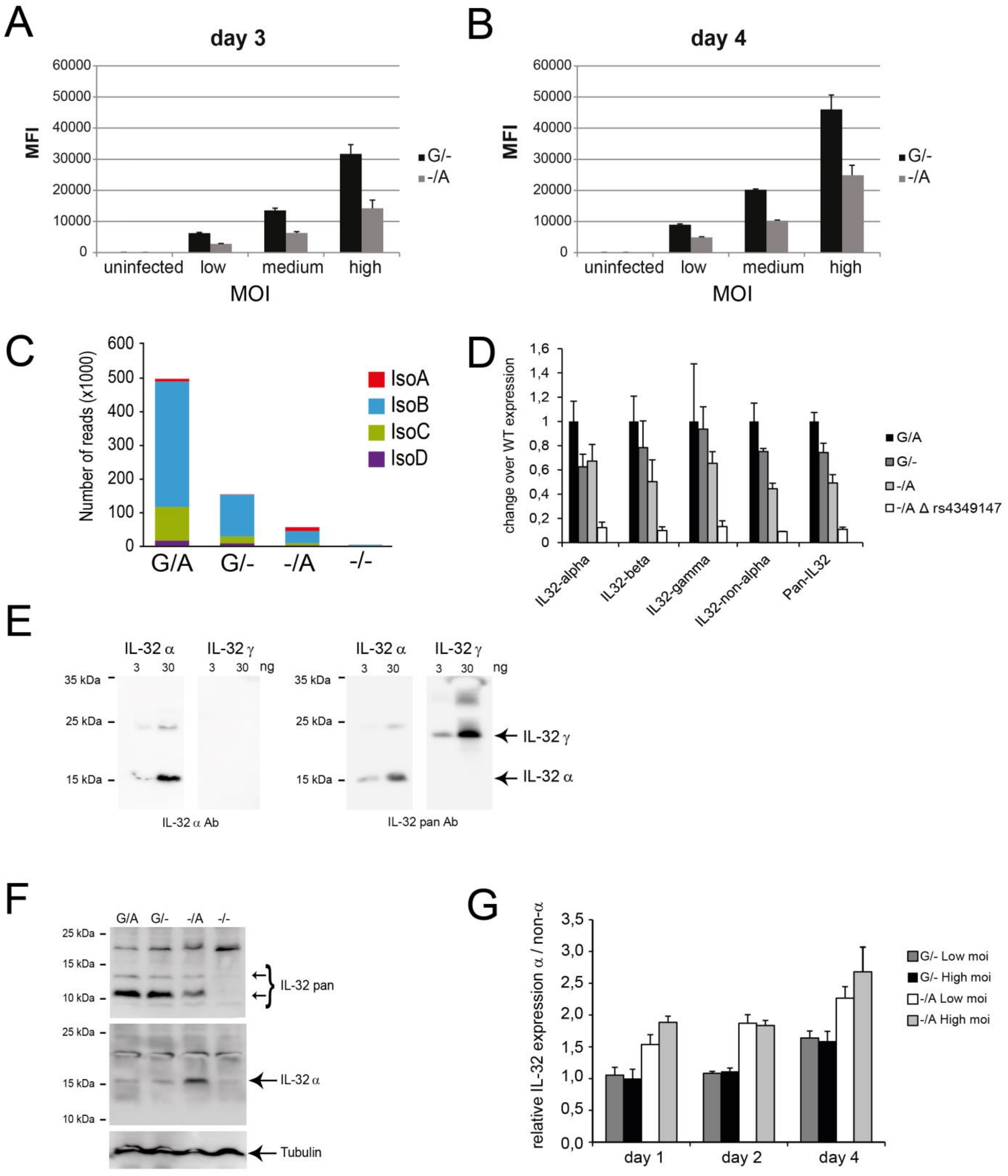

fig. S3. HIV infectability and differential expression of IL-32 isoforms between WT, rs4349147 G/−, and rs4349147 −/A clonal Jurkat cell lines. (**A**, **B**) Difference in sensitivity to HIV infection between the rs4349147 -/A and rs4349147 G/- Jurkat cells is independent of MOI and time frame. (A) depicts MFI three days after infection using different MOI and (B) depicts MFI four days after infection using different MOI. Low MOI corresponds to ~20% GFP positive cells, medium MOI to ~50% GFP positive cells and High to ~80% GFP positive cells. (**C**) IL-32 isoform A expression is relatively elevated in rs4349147 -/A cells as compared to rs4349147 G/- or WT(G/A) cells. Bar charts show the number of reads for each isoform in the high throughput RNA sequencing analysis (**D**) Relative expression of the IL-32α, IL-32β and IL-32γ in WT,rs4349147 -/A , rs4349147 G/- and the -/A Δrs4349147 Jurkat cells. The primer pair for IL-32β only recognizes the “short” Var3 isoform originating from the EPD IL32_1 promoter. (**E**) Determination of specificity of commercial anti-pan IL-32 and anti-IL-32α-specific antibodies as indicated. Western blot analysis of 3 and 30 ng each of recombinant IL-32α and IL-32γ protein is shown. (**F**) Western blot analysis using a pan-IL-32 antibody and an antibody specific to IL-32α in the rs4349147 G/A, G/-, -/A and -/- Jurkat clones. (**G**) The increased ratio of IL-32α over non-α IL-32 isoforms does not change after infection and is independent of the MOI of infection. Low MOI corresponds to ~20% GFP positive cells and High to ~80% GFP positive cells.

Supplementary Figure 4.

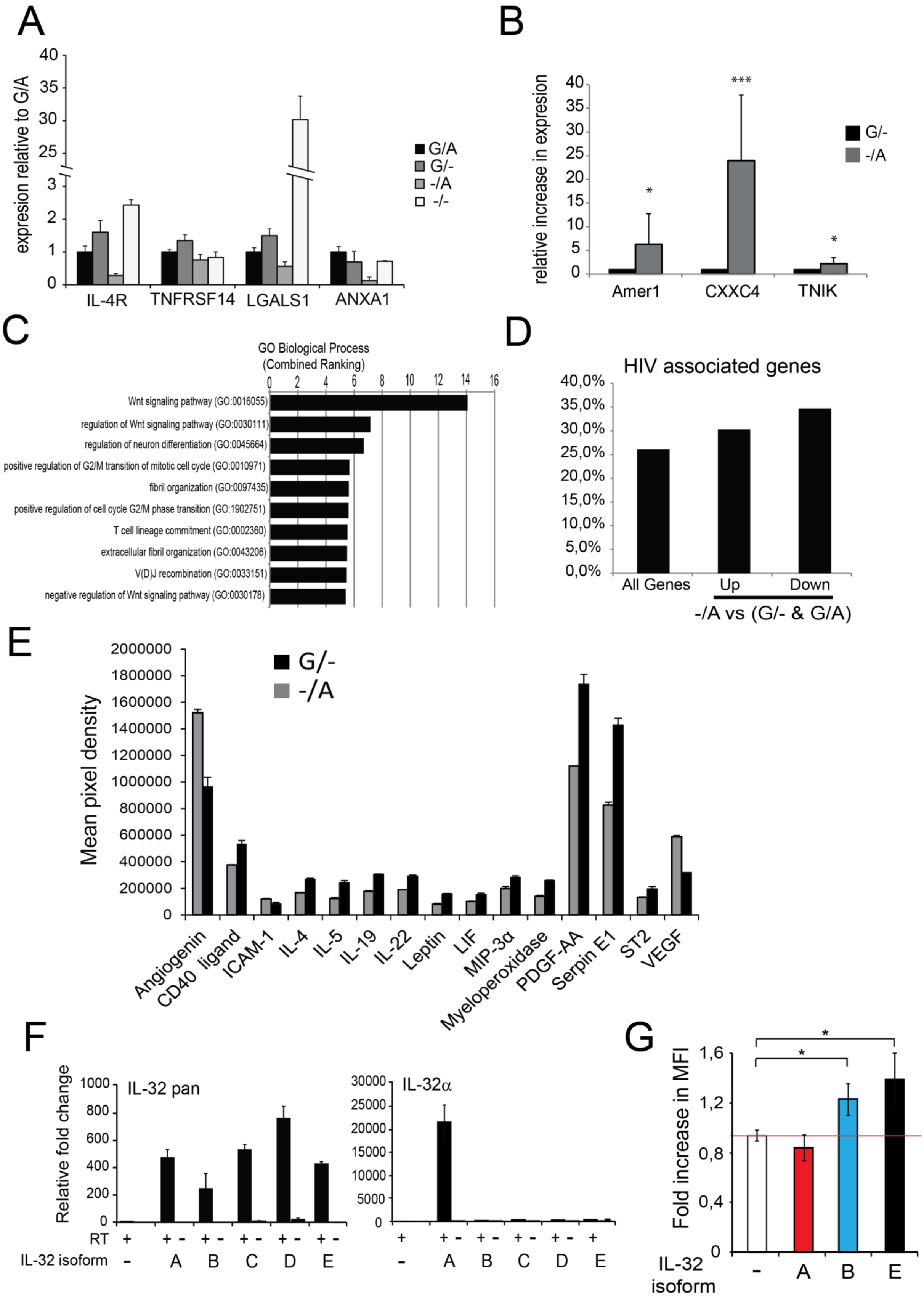

fig. S4. Analysis of genes that are at least twofold differentially expressed in rs4349147 −/A compared to rs4349147 G/− and WT clonal Jurkat cell lines. (**A**) Expression of a selection of genes downregulated between rs4349147 -/A and rs4349147 G/- as well as WT(G/A) clonal Jurkat cell lines

IL-4R, TNFRSF14, LGALS1, and ANXA1 in WT, rs4349147 -/A, rs4349147 G/- and KO Jurkat cells. (**B**) RT-PCR confirmation of a selection of genes upregulated between rs4349147 -/A and rs4349147 G/- as well as WT clonal Jurkat cell lines. (**C**) GO biological process analysis of genes upregulated between rs4349147 -/A and rs4349147 G/- as well as WT clonal Jurkat cell lines. A significant enrichment for factors involved in Wnt signaling and a slight enrichment for factors involved in neuron differentiation is found. (**D**) HIV associated genes, here defined as previously shown to interact with HIV either genetically or via protein-protein interaction (from HIV-1 Human Interaction Database; www.ncbi.nlm.nih.gov/genome/viruses/retroviruses/hiv-1/interactions/) are overrepresented in the downregulated genes when compared to all genes (> 1rpm in Jurkats) and upregulated genes. (**E**) Mean pixel identity as measured by Proteome Profiler Human XL Cytokine Array Kit (R&D systems) in supernatant of rs4349147 -/A Jurkat cells and rs4349147 G/- Jurkat cells. (**F**) RT-PCR confirmation of exogenous expression of distinct IL-32 isoforms in rs4349147 enhancer KO Jurkat cells following nucleofection. Left panel shows IL-32 mRNA expression using PCR primers that detect all isoforms of IL-32. Right panel demonstrates mRNA expression of the IL-32α isoform using PCR primers that specifically amplify the IL-32α transcript. (**G**) Levels of infection, measured as fold increase in the MFI, following exogenous expression of IL-32 isoforms A, B, and E in WT Jurkat cells. Color coding is as for Fig. 3h.

Supplementary Figure 5.

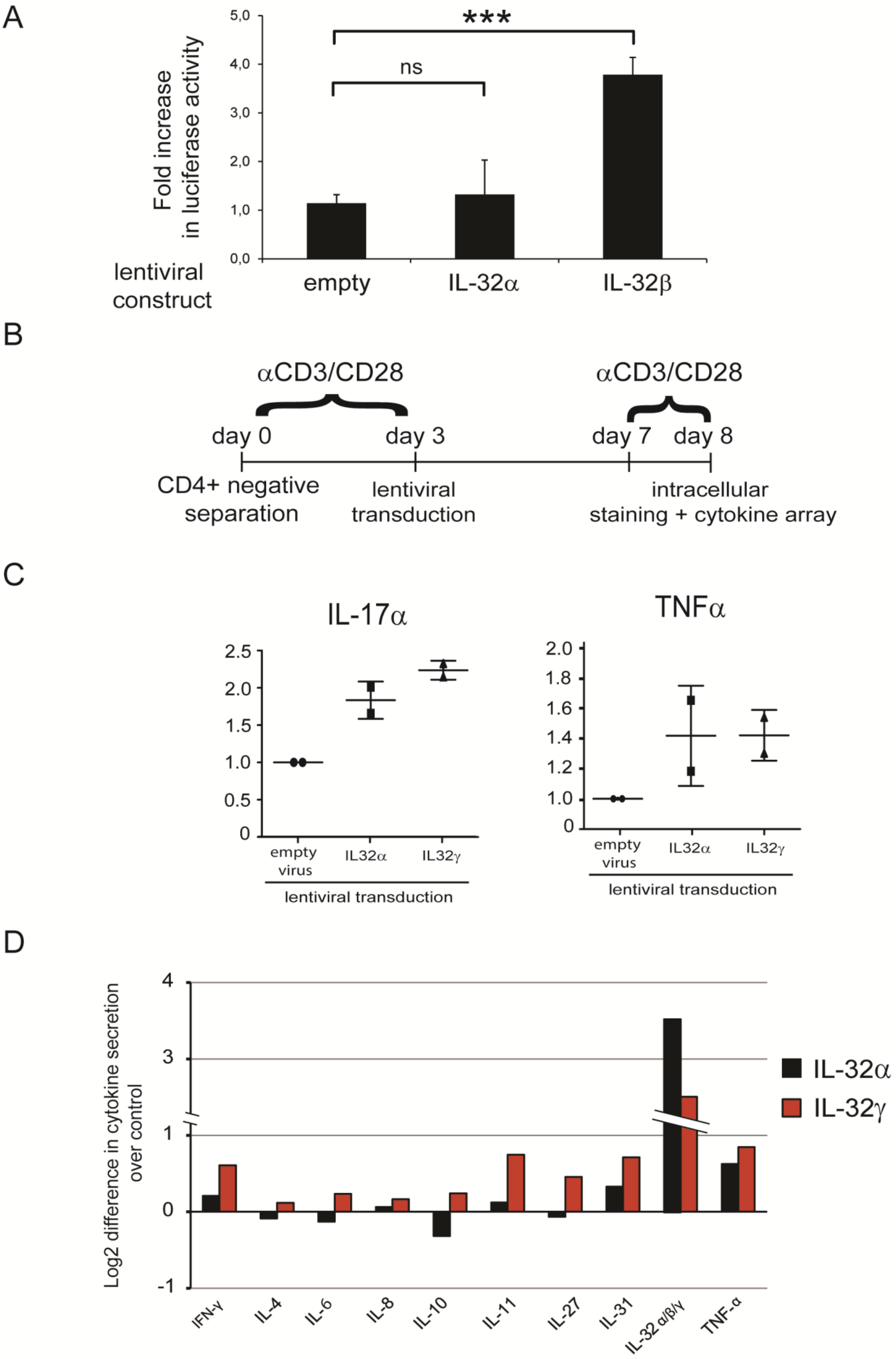

fig. S5. Endogenous lentiviral overexpression of IL-32 isoforms in CD4$^+$ cells results in altered HIV susceptibility and proinflammatory cytokine expression. (**A**) Exogenous lentiviral overexpression of IL-32β results in an increase in HIV infection as compared to CD4+ T cells overexpressing IL-32α or control cells infected with an empty lentiviral construct. (**B**) CD4+ T cells isolated from two healthy donors were stimulated with CD3-CD28 coated beads and infected with a control lentiviral vector or a lentiviral vector expressing IL-32α or IL-32γ. After 4 days the cells were re-stimulated for 24h and cytokine levels were determined by intracellular staining or measured using the Proteome Profiler Human XL Cytokine Array Kit (R&D systems) (**C**) Frequency of IFNγ or TNFα-producing live (Annexin V-negative) purified CD4+ T cells are shown from two different donors. Percentage indicate cytokine positive populations. (**D**) Cytokine secretion as measured by Proteome Profiler Human XL Cytokine Array Kit (R&D systems) demonstrates increased secretion of pro-inflammatory cytokines in the supernatant of CD4+T cells exogenously overexpressing IL-32γ as compared to CD4+ T cells that overexpress IL-32α. Values depicted are log2 fold increase of IL-32α (black bars) or IL-32γ (red bars) overexpressing cells over control cells. Note that robust overexpression of IL-32 in IL32α and IL-32γ lentiviral infected CD4+ cells is evident.

Supplementary Figure 6.

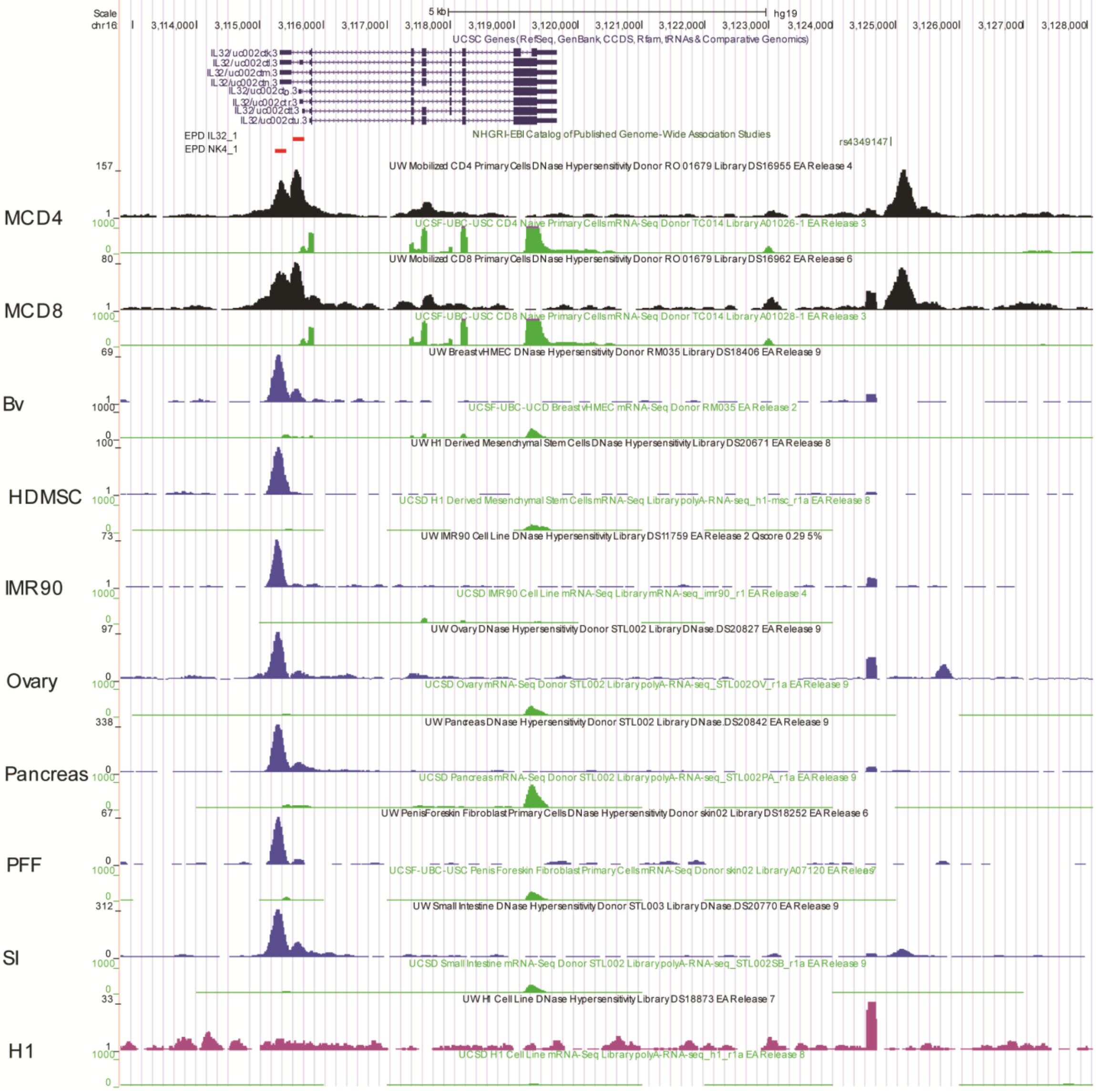

fig. S6. UCSC genome browser graphic of DNase I hypersensitivity (upper track, black, blue, purple) and mRNA sequencing (lower track, green) data obtained from the Human Epigenome Atlas. In T-cells, which express high levels of IL-32 (green tracks), a DNAseI HS peak (black tracks)is present at the location of rs4349147 and a double DNAseI HS peak is present at the IL-32 promoter region indicating the presence of two separate promoters for IL-32. In cell types that lack a DNAseI HS peak at the location of rs4349147 (blue tracks) but still express low levels of IL-32 (corresponding green tracks) a single DNAseI HS peak is present at the IL-32 promoter for the long IL-32 transcripts. In H1 human ES cells no DNAseI HS peaks are detected in the IL-32 locus and the IL-32 gene is not expressed. mRNA-seq tracks are delimited to 1000 to emphasize differences in expression levels, while DNaseI HS tracks are not delimited to emphasize IL-32 promoter region peaks. http://www.genboree.org/epigenomeatlas/index.rhtml. Promoters as defined by the Eukaryotic Promoter Database (EPD; http://epd.vital-it.ch) are indicated as red bars.

table S1. Overview of SNPs.

SNP	Celltype	Chromosome	start	end
rs2796163	Th0;Th1	chr1	234978473	234979377
rs2802978	Th1	chr1	234978473	234979377
rs62000984	Th0;Th1	chr6	26017665	26018290
rs41266783	Th0;Th1	chr6	26031942	26032652
rs2230654	Th0;Th1	chr6	26033518	26034104
rs11751732	Th0;Th1	chr6	26043567	26044256
rs9468842	Th0;Th1	chr6	30851403	30854679
rs6901464	Th0;Th1	chr6	30851403	30854679
rs1049622	Th1	chr6	30858647	30859161
rs1049628	Th1	chr6	30866998	30867470
rs2074510	Th0;Th1	chr6	30875522	30876336
rs1052693	Th0;Th1	chr6	30875522	30876336
rs3828917	Th0;Th1	chr6	31465194	31466193
rs3093661	Th1	chr6	31542110	31543783
rs9368699	Th0;Th1	chr6	31802108	31803075
rs8192583	Th0;Th1	chr6	32162969	32164095
rs6990319	Th0;Th1	chr8	66862573	66863027
rs11998618	Th0	chr8	66858410	66858738
rs12447486	Th0;Th1	chr16	3121836	3123558
rs4349147	Th0;Th1	chr16	3124834	3125437
rs2015620	Th0	chr16	3123504	3123607
GRCh37/hg19	assembly			

table S2. List of differentially regulated genes.

GENE	**WT (RPM)**	**G/- (RPM)**	**-/A (RPM)**	**-/- (RPM)**
OR3A2	1,9237	1,4648	0,0000	0,2341
RTP4	0,8630	1,2101	0,0000	0,8993
CARNS1	0,9448	0,5732	0,0000	0,9532
TNS3	0,8009	0,3821	0,0000	0,3086
NIPSNAP3B	0,6478	0,3821	0,0000	0,7406
LGR6	0,5721	0,3821	0,0000	0,2341
GCSAML	0,7887	0,2548	0,0000	0,6926
LRRTM2	0,6880	0,1911	0,0000	0,3938
ZP1	0,8630	0,1274	0,0000	0,2929
CRISPLD1	0,7266	0,0637	0,0000	0,0000
ZCCHC16	0,7206	0,0637	0,0000	0,2929
DPP6	0,6819	0,0637	0,0000	1,2676
ANO9	3,5611	4,0761	0,0622	4,0703
LARGE	3,6491	2,9297	0,0622	3,0995
FAAH2	1,3979	2,6112	0,0622	3,8195
ZNF697	2,5314	3,4392	0,1244	1,9113
C10orf107	6,5094	8,0885	0,3111	14,7982
GPR158	12,6412	7,7064	0,3111	0,3517
TMEM151B	2,0996	2,8023	0,1244	8,8842
ANGPTL6	1,2169	2,0380	0,1244	2,2473
GBGT1	2,2579	1,7833	0,1244	2,5137
TUBA4A	16,4543	31,9081	2,2399	19,5230
TMOD1	1,8556	1,5922	0,1244	1,9808
F2RL2	5,2113	6,7510	0,5600	2,6107
PIANP	4,3288	4,1398	0,3733	3,9537
FXYD2	4,7035	0,6369	0,0622	4,3849
GCA	3,5505	0,6369	0,0622	2,1630
ANXA1	232,6092	158,1394	15,8040	113,4199
PYGL	8,5059	3,6940	0,3733	11,2002
ATP2B2	3,3594	0,5732	0,0622	7,5129
ITGA6	8,0081	26,3035	2,8621	12,5178
GZMA	37,1217	19,3614	2,1155	37,1296
UBXN10	5,5305	8,8528	0,9955	12,4539
LSP1	2,9489	3,1844	0,3733	1,8485
PTCRA	1,6450	1,0190	0,1244	0,8092
TNFRSF14	9,9424	12,4193	1,6177	11,6105
SLC25A21	1,5866	1,4012	0,1867	1,8270
SIGLEC6	5,6690	2,2928	0,3111	1,3156
ITGB2-AS1	5,5804	10,8908	1,4933	5,7023
PCBP3	3,9832	3,6303	0,4978	18,6150
BCAM	1,3267	1,3375	0,1867	1,6673
GPR68	2,7633	2,9934	0,4355	4,4210
GSTM3	37,5542	22,9917	3,3599	18,8696
BST2	44,9524	104,5134	15,3685	66,2490

IER3	8,4907	7,7700	1,1822	5,5692
TRPM2	5,8159	6,4326	0,9955	10,6309
STAT5A	13,3907	17,6418	2,8621	6,8289
LOC90246	1,7427	1,1464	0,1867	0,5114
SMAP1	31,5560	21,7179	3,7955	27,1142
PI16	29,3594	49,1678	8,6487	11,7409
GFRA3	2,1927	2,1017	0,3733	1,3205
CRIM1	1,5820	0,7006	0,1244	1,0972
CD69	12,0947	12,2283	2,2399	12,0202
CTSW	36,0529	52,0338	9,5820	101,1831
EFNB3	3,6847	2,2928	0,4355	2,0768
PLCH1	21,9898	19,9346	3,9821	19,4173
CST7	26,6965	26,3035	5,3510	117,9958
PLEK	54,0085	14,5211	2,9866	106,6130
GNLY	4,6648	0,8916	0,1867	18,0264
PRKCH	198,9677	305,3880	64,2116	196,0620
ADCYAP1	20,7476	20,2531	4,2932	4,2035
CD300A	2,4352	0,5732	0,1244	0,4369
PDE9A	6,0229	8,4069	1,8666	4,0478
IFI35	12,2411	13,6931	3,0488	16,1884
USP40	17,5236	25,5392	5,7243	19,9463
GAS7	94,4084	139,4786	32,3547	101,6567
HECW1	7,2178	2,6749	0,6222	1,8535
LPCAT2	10,7652	10,8908	2,6133	17,6029
LGALS1	63,0176	4,9040	1,1822	107,6043
AKAP7	4,4551	2,8023	0,6844	4,2487
DENND2D	3,8718	3,5666	0,8711	3,7715
SMPD3	3,1254	1,7196	0,4355	0,5701
C16orf74	2,3966	2,4202	0,6222	8,1015
PCCA	11,8957	13,7568	3,5466	14,7032
TNFSF10	14,1815	15,0306	3,9199	21,9496
TDRD9	35,7427	21,4631	5,6621	28,5570
EGR1	10,0812	8,0248	2,1777	11,5017
C19orf59	1,9435	0,8916	0,2489	1,3156
LAIR1	109,1083	81,8402	23,3327	75,0209
LST1	6,2562	5,1588	1,4933	4,6297
SLC2A3	15,1188	13,6294	3,9821	9,4554
KLHL29	20,2388	24,3928	7,1554	40,9360
IL4R	8,4943	11,6551	3,4221	25,3313
BMP10	6,0146	4,0124	1,1822	6,8975
IFI30	22,0016	29,1695	8,8353	29,6365
CHRNA3	24,9003	35,7931	11,0753	52,4075
DPEP2	2,2761	1,4012	0,4355	1,0972
FAM101B	35,2872	54,8361	17,0484	39,8864
NRBP2	9,7002	5,5409	1,7422	11,6457
GPA33	12,0305	14,1389	4,4799	13,1544
SIRPB1	8,5868	5,4136	1,7422	15,4232
MSH5-SAPCD1	5,0689	4,5219	1,4933	5,7269
H6PD	52,2552	60,9502	20,3461	39,6230
HLF	6,9214	2,4202	0,8089	2,6685

SLC16A3	9,5840	9,3623	3,1732	9,0361
AIG1	64,4390	91,5846	31,1103	62,6788
GLDC	34,5223	31,8444	10,8886	23,0093
GALNT6	15,5484	18,6608	6,4709	14,8100
DHX32	22,6168	21,2084	7,4042	26,5959
PTPN3	52,0431	49,8684	17,4840	38,9746
ITGAL	26,2732	30,9528	10,8886	27,9478
KLHL35	5,5144	2,1017	0,7466	1,2725
IL32	621,6479	144,5737	53,5719	1,5067
CD244	7,0395	5,5409	2,0533	11,2276
SQRDL	35,7659	36,5574	13,5641	44,7357
RGS2	3,3898	1,3375	0,4978	1,3950
LIMD2	58,5659	42,7989	16,3640	51,4402
RAET1E	11,4925	9,1712	3,5466	17,3982
EMID1	12,1328	12,1646	4,7288	12,6283
SLA	478,0886	376,9743	146,5916	462,1445
TTC16	27,7892	29,0421	11,3241	15,9542
LACTB2	11,5229	7,0058	2,7377	8,2769
SPINK2	2,4459	0,3184	0,1244	0,4849
SKAP1	18,3071	19,4888	7,6531	20,7486
GVINP1	47,6777	45,6649	18,1062	50,8067
DNTT	37,2784	9,8718	3,9199	66,5260
FLOT1	89,8745	90,6929	36,5235	70,0579
KIAA0125	17,8081	12,9288	5,2265	17,1609
PTPN6	210,8397	164,6357	66,5760	185,7251
HES1	19,0670	16,4317	6,7820	4,6797
TSHZ3	18,5028	20,7626	8,6487	23,3220
CPA4	12,1662	3,5666	1,4933	34,1661
RMRP	19,3306	3,1208	1,3066	1,0600
ZAP70	451,6591	396,3994	166,0044	585,9785
MAL	42,5390	25,5392	10,7642	20,1643
TEX19	26,7968	8,4069	3,5466	9,1418
FAIM3	15,6537	7,6427	3,2355	10,2714
ADC	6,7821	5,8594	2,4888	6,7760
SPSB1	12,3570	10,6360	4,5421	7,0886
CCDC102B	11,6085	5,6683	2,4266	10,3204
RHBDL3	5,6440	3,5666	1,5555	6,2941
ZNF616	12,6664	11,5277	5,0399	12,0964
ABI3	8,4846	7,5153	3,3599	7,8194
JAK3	25,9808	23,6923	10,7642	21,2217
APOBEC3B	26,9777	25,2845	11,5108	25,3480
TSPAN9	9,7492	8,2796	3,7955	10,9797
ERP27	5,5296	3,3755	1,5555	3,8509
LAT	68,6253	69,2935	32,1058	70,2288
LOC100130476	6,2766	4,2035	1,9911	7,7332
CECR1	44,9476	43,6269	20,8439	62,8255
IL16	28,6884	16,8139	8,0887	27,0064
RCBTB2	25,6701	14,3937	6,9687	15,2813
NDFIP2	36,9922	14,6484	7,0931	41,5746
CD82	295,4044	198,7729	96,2552	206,1652

BIN2	78,8526	59,2943	28,8081	89,3595
LPAR5	17,7956	12,4193	6,0354	27,9518
LOC440354	3,2565	1,4012	0,6844	2,6195
MAGEB18	3,5566	0,7643	0,3733	2,2904
C1orf186	3,4482	1,5285	0,7466	3,0368
UGT3A2	5,9909	0,3821	0,1867	5,0902
GYPC	189,0652	170,5587	83,6244	244,8064
HPGD	15,1422	4,7767	2,3644	5,3419
LIMS2	4,3642	9,9355	20,0972	3,9724
ATP2B3	0,0000	2,6749	5,5998	0,1225
DNAJC12	0,0773	0,8916	1,8666	0,0960
SLC9A7	8,6081	12,9288	27,6881	13,0369
TMEM100	0,0000	0,3184	0,6844	0,5055
ZNF211	15,7289	17,2597	37,7057	10,5536
TNIK	28,6610	46,8113	102,6017	26,1868
RAG2	13,0955	17,3234	38,7012	13,9145
TGFB3	3,4467	5,2862	11,8219	4,9706
FAM84B	9,5688	11,4640	25,8837	9,0263
IKZF3	3,7142	5,2225	11,8219	28,8514
MFAP4	0,1129	5,4136	12,3197	2,9055
FKBP9L	0,0000	0,1911	0,4355	0,3194
EPHB6	44,3400	40,1877	92,5842	34,7260
HYDIN	2,5792	3,6303	8,5864	1,9485
PPP2R2B	0,4948	0,9553	2,3022	0,5858
SRGAP1	1,7366	2,8660	6,9065	5,8083
SLC12A6	19,7711	17,8329	43,1811	49,0547
MAT1A	3,5082	5,3499	13,3774	1,0717
TLE1	25,9050	25,4755	64,2738	30,8435
MIR181B1	0,0000	0,1911	0,4978	0,0852
TMEM178B	0,7175	2,1654	5,6621	1,1236
CKM	0,0000	0,4458	1,1822	0,1489
OR2C1	0,0000	0,2548	0,6844	0,0960
IFI44L	0,0386	0,3821	1,0577	0,0372
RGS4	0,0000	0,2548	0,7466	0,1225
ACTC1	0,0000	0,2548	0,7466	0,0000
AP1B1	26,9615	38,0222	113,0547	32,0132
PLEKHG1	0,9835	1,8470	5,8487	0,9640
NYNRIN	0,1531	0,9553	3,0488	0,4154
ADAMTS3	0,1546	0,3821	1,2444	1,8436
SPTLC3	1,8261	2,0380	6,8443	5,4957
ZNF83	15,6750	11,8461	40,0700	0,1969
ZBBX	0,0000	0,1274	0,4355	0,0000
LGALS3BP	0,6509	5,9868	22,7727	3,0995
PSD3	0,3819	0,6369	2,4266	0,6446
CD79A	6,0222	4,4582	17,2351	13,5326
PBX1	0,0758	0,4458	1,7422	0,5006
PRKAA2	0,0742	0,2548	1,0577	0,0000
PHLDB2	7,0419	9,5533	41,8122	19,3164
EOMES	1,3888	2,2291	10,2042	38,4467
GALC	2,0305	1,7833	8,2753	0,3674

PCED1B-AS1	0,1515	0,5732	2,7377	0,7563
CYTH4	0,1485	0,5732	2,7377	2,6549
GPC5	0,3448	0,9553	4,9154	0,0000
TLL1	2,6519	2,2291	11,5108	3,3601
ZNF385B	2,0117	1,1464	5,9732	3,4983
ZNF772	0,6478	3,2481	16,9862	1,6820
RGPD3	2,4769	2,1017	11,1997	0,3409
PRUNE2	1,0236	1,1464	6,5332	0,1440
BEST1	0,0371	0,3821	2,3022	0,6867
SMARCA1	2,1322	6,6873	41,1900	22,0886
EVPLL	0,0742	0,1911	1,1822	0,0480
AMER1	23,2847	10,6360	66,2649	29,5464
CLEC11A	1,7192	4,5219	28,2481	1,3587
SDC2	0,6448	0,3821	2,4266	8,3542
HHEX	0,0773	0,2548	1,6177	0,0000
STX1B	0,1887	0,1911	1,3066	0,3037
LIN28B	0,3864	0,5095	3,5466	0,3252
DBH	0,0000	0,0637	0,4978	0,0000
TC2N	0,1902	0,3821	3,0488	0,0000
PTPRG	0,3046	1,2101	9,8931	1,3685
C11orf74	0,0386	0,5095	4,2310	0,5065
AKR1C6P	5,4213	1,7833	15,3063	1,4538
C2orf16	0,0000	0,0637	0,5600	0,0372
ADAMTS18	2,6595	0,8280	7,2798	15,1500
RAG1	13,1222	10,9545	105,0905	9,2377
PPAP2B	0,0758	0,1911	1,8666	0,0852
RNF43	0,5319	0,3821	3,7332	0,8680
COBL	0,1129	0,3821	3,8577	0,0480
AKR1C3	0,0371	0,1274	1,3066	0,0480
TRPS1	0,0386	0,2548	2,8621	0,4526
CXXC4	0,3804	0,1911	2,3022	0,0745
PTPRD	0,0758	1,9107	23,9549	0,3781
IRF4	0,0386	0,0637	0,8089	0,0852
SORBS2	0,0000	0,5732	7,2798	0,0480
GABRB2	7,0139	3,0571	48,4076	12,4824
HLA-DOA	1,3994	0,5732	9,0842	3,3983
TRIM29	0,0000	0,0637	1,2444	0,2341
STARD13	0,0773	0,0637	1,7422	1,1501
SOX5	0,1485	0,6369	18,1684	0,0745
APP	0,1856	0,1274	3,9821	0,6495
CACNB2	0,0000	0,0637	2,0533	0,2929
TSPEAR	0,3016	0,0637	2,2399	0,0480
RASEF	0,0371	0,3184	14,1241	0,9855
GABRA3	0,0773	0,0637	3,8577	1,8270
INPP4B	0,0000	0,0000	0,4355	0,0000
FLRT3	0,0000	0,0000	0,4355	0,0000
VN1R1	0,0000	0,0000	0,4978	0,0000
PLD1	0,0000	0,0000	0,4978	0,0000
ROR2	0,0000	0,0000	0,5600	0,1225
SCEL	0,0000	0,0000	0,5600	0,0000

HCG23	0,0000	0,0000	0,6222	0,0000
LIX1	0,0758	0,0000	0,8711	0,0000
CAPN6	0,0000	0,0000	0,9333	0,0000
SDSL	0,2258	0,0000	1,5555	1,3156
CREB5	0,1144	0,0000	3,3599	0,0480

table S3. GO term analysis of −/A versus WT and G/− down-regulated genes.

Go-term analysis (http://amp.pharm.mssm.edu/Enrichr/)

-/A vs WT & G/- down regulated genes

Term	**Overlap**	**P-value**	**Adjusted P-value**	**Old P-value**	**Old Adjusted P-value**	**Z-score**	**Combined Score**	**Genes**											
negative regulation of alpha-beta T cell activation (GO:0046636)	4/19	1,14E-05	0,007110384	2,306E-05	0,008985301	-2,81977	13,94712595	IL4R	CD300A	TNFRSF14	JAK3								
regulation of cell activation (GO:0050865)	13/420	2,01E-05	0,007420925	1,946E-05	0,008985301	-2,52287	12,37074968	STAT5A	IL4R	CD300A	LST1	PLEK	ITGAL	ZAP70	LGALS1	TNFRSF14	PTPN6	HES1	JAK3	LAT	
regulation of lymphocyte activation (GO:0051249)	12/344	1,31E-05	0,007110384	1,329E-05	0,008985301	-2,50051	12,36803498	STAT5A	ZAP70	LGALS1	IL4R	CD300A	LST1	HES1	TNFRSF14	PTPN6	ITGAL	JAK3	LAT		
regulation of leukocyte activation (GO:0002694)	12/390	4,47E-05	0,007420925	4,394E-05	0,011542311	-2,513	12,32234948	STAT5A	ZAP70	LGALS1	IL4R	CD300A	LST1	TNFRSF14	PTPN6	HES1	ITGAL	JAK3	LAT		
regulation of T cell activation (GO:0050863)	11/259	4,81E-06	0,007110384	5,283E-06	0,008626579	-2,461	12,17259303	STAT5A	ZAP70	LGALS1	IL4R	CD300A	TNFRSF14	PTPN6	HES1	ITGAL	JAK3	LAT			
negative regulation of immune system process (GO:0002683)	11/311	2,67E-05	0,007420925	2,751E-05	0,008985301	-2,45097	12,01821632	BST2	STAT5A	ADCYAP1	IL4R	GPR68	CD300A	LST1	TNFRSF14	PTPN6	HES1	JAK3			
negative regulation of muscle hypertrophy (GO:0014741)	3/10	4,97E-05	0,007420925	0,0001087	0,01389582	-2,40784	11,8067472	BMP10	RGS2	PI16											
regulation of lymphocyte proliferation (GO:0050670)	8/170	4,8E-05	0,007420925	5,435E-05	0,011542311	-2,39045	11,72147707	STAT5A	ZAP70	CD300A	LST1	TNFRSF14	PTPN6	HES1	ITGAL						
regulation of mononuclear cell proliferation (GO:0032944)	8/171	5E-05	0,007420925	5,655E-05	0,011542311	-2,38645	11,7018626	STAT5A	ZAP70	CD300A	LST1	TNFRSF14	PTPN6	HES1	ITGAL						
negative regulation of cardiac muscle hypertrophy (GO:0010614)	3/9	3,5E-05	0,007420925	8,408E-05	0,01248172	-2,35276	11,53665581	BMP10	RGS2	PI16											
regulation of leukocyte proliferation (GO:0070663)	8/176	6,13E-05	0,00833752	6,866E-05	0,012458499	-2,38568	11,42020588	STAT5A	ZAP70	CD300A	LST1	TNFRSF14	PTPN6	HES1	ITGAL						
thrombin receptor signaling pathway (GO:0070493)	3/9	3,5E-05	0,007420925	8,408E-05	0,01248172	-2,31554	11,35414795	HPGD	PLEK	F2RL2											
negative regulation of leukocyte mediated immunity (GO:0002704)	4/34	0,000125	0,01234564	0,0001764	0,016949509	-2,50356	11,00176688	BST2	CD300A	PTPN6	JAK3										
regulation of B cell receptor signaling pathway (GO:0050855)	3/13	0,000116	0,01234564	0,0002094	0,018999166	-2,48029	10,89953766	PRKCH	CD300A	PTPN6											
regulation of glial cell proliferation (GO:0060251)	3/15	0,000183	0,015739091	0,0003019	0,020539492	-2,48753	10,32725119	ADCYAP1	PRKCH	HES1											
positive regulation of T cell activation (GO:0050870)	8/189	0,000101	0,01234564	0,0001106	0,01389582	-2,31267	10,16290134	STAT5A	ZAP70	LGALS1	IL4R	TNFRSF14	PTPN6	HES1	ITGAL						
negative regulation of lymphocyte activation (GO:0051250)	6/102	0,000129	0,01234564	0,0001531	0,016435011	-2,25827	9,923840189	IL4R	CD300A	LST1	TNFRSF14	PTPN6	JAK3								
negative regulation of immune response (GO:0050777)	6/103	0,000136	0,01234564	0,000161	0,016435011	-2,20343	9,682862807	BST2	ADCYAP1	IL4R	CD300A	PTPN6	JAK3								
positive regulation of cell activation (GO:0050867)	9/272	0,000241	0,01871675	0,0002474	0,019649793	-2,39548	9,530006345	STAT5A	ZAP70	LGALS1	IL4R	PLEK	TNFRSF14	PTPN6	HES1	ITGAL					
regulation of alpha-beta T cell activation (GO:0046634)	5/63	0,000117	0,01234564	0,0001496	0,016435011	-2,1497	9,446745115	ZAP70	IL4R	CD300A	TNFRSF14	JAK3									

-/A vs WT & G/- up regulated genes

Term	**Overlap**	**P-value**	**Adjusted P-value**	**Old P-value**	**Old Adjusted P-value**	**Z-score**	**Combined Score**	**Genes**								
Wnt signaling pathway (GO:0016055)	9/234	2,06E-06	0,002406062	5,877E-06	0,006864484	-2,33521	14,08078829	AMER1	RNF43	HHEX	TLE1	PRKAA2	PPAP2B	ROR2	TNIK	CXXC4
regulation of Wnt signaling pathway (GO:0030111)	7/214	8,28E-05	0,048337881	0,0001808	0,105590527	-2,36183	7,155267604	AMER1	RNF43	HHEX	TLE1	PPAP2B	ROR2	CXXC4		
regulation of neuron differentiation (GO:0045664)	9/405	0,000156	0,060574599	0,0003627	0,141229462	-2,3855	6,688663217	EOMES	PTPRD	APP	SDC2	COBL	TNIK	PBX1	SOX5	PTPRG
positive regulation of G2/M transition of mitotic cell cycle (GO:0010971)	2/14	0,00204	0,113441367	0,0032522	0,180882111	-2,60583	5,671502706	APP	PBX1							
fibril organization (GO:0097435)	2/14	0,00204	0,113441367	0,0032522	0,180882111	-2,58071	5,616844562	MFAP4	ADAMTS3							
positive regulation of cell cycle G2/M phase transition (GO:1902751)	2/14	0,00204	0,113441367	0,0032522	0,180882111	-2,56874	5,590784407	APP	PBX1							
T cell lineage commitment (GO:0002360)	2/12	0,001489	0,110363586	0,0024834	0,180882111	-2,5128	5,53815031	IRF4	RAG2							
extracellular fibril organization (GO:0043206)	2/12	0,001489	0,110363586	0,0024834	0,180882111	-2,49737	5,504152017	MFAP4	ADAMTS3							
V(D)J recombination (GO:0033151)	2/16	0,002673	0,130069855	0,0041178	0,206030672	-2,68048	5,467338683	RAG2	RAG1							
negative regulation of Wnt signaling pathway (GO:0030178)	5/126	0,000372	0,093354279	0,0006877	0,172060453	-2,27836	5,402793201	AMER1	RNF43	TLE1	ROR2	CXXC4				
response to light stimulus (GO:0009416)	7/322	0,000979	0,110363586	0,0019082	0,180882111	-2,38069	5,246975331	MFAP4	APP	SDC2	AKR1C3	GPC5	DBH	BEST1		
B cell activation (GO:0042113)	5/128	0,0004	0,093354279	0,0007366	0,172060453	-2,16852	5,142322765	CD79A	HHEX	RAG2	IKZF3	RAG1				
lymphocyte activation (GO:0046649)	7/304	0,000699	0,108841518	0,0013843	0,180882111	-2,31394	5,131990594	EOMES	CD79A	HHEX	IRF4	RAG2	IKZF3	RAG1		
leukocyte differentiation (GO:0002521)	6/251	0,001404	0,110363586	0,0025603	0,180882111	-2,32475	5,123683466	EOMES	CD79A	HHEX	IRF4	RAG2	RAG1			
leukocyte activation (GO:0045321)	7/373	0,002265	0,120226623	0,0042489	0,206030672	-2,32584	4,927011656	EOMES	CD79A	HHEX	IRF4	RAG2	IKZF3	RAG1		
lymphocyte differentiation (GO:0030098)	5/172	0,001512	0,110363586	0,002611	0,180882111	-2,22511	4,90408891	EOMES	CD79A	HHEX	RAG2	RAG1				
regulation of dendrite development (GO:0050773)	4/89	0,000926	0,110363586	0,0015626	0,180882111	-2,20161	4,852287074	PTPRD	SDC2	COBL	TNIK					
B cell differentiation (GO:0030183)	4/80	0,00062	0,108841518	0,0010709	0,180882111	-2,18121	4,83763109	CD79A	HHEX	RAG2	RAG1					
detection of visible light (GO:0009584)	4/104	0,00165	0,113382092	0,0026998	0,180882111	-2,18116	4,74837213	SDC2	AKR1C3	GPC5	BEST1					
anion transmembrane transport (GO:0098656)	5/172	0,001512	0,110363586	0,002611	0,180882111	-2,14829	4,734778726	GABRB2	PRKAA2	GABRA3	SLC12A6	BEST1				

table S4. Cytokine secretion in Jurkat cells as measured by Proteome Profiler Human XL Cytokine Array kit.

		93(G/-)							94 (-/A)						93(G/-)			94 (-/A)	
	Label	Volume	Vol + Bkgnd	Background	Norm'd Vol (percent)	Present?	Quality		Volume	Vol + Bkgnd	Background	Norm'd Vol (percent)	Present?		Average	SEM		Average	SEM
A1	Reference	11155998	14119609	2963611,5	n/a	1			12772141	15740697	2968556	n/a	1		10967391	266729,9		12655571	164855,6
A2		10778785	13742396	2963611,5	n/a	1			12539000	15507556	2968556	n/a	1						
A3	Adiponectin	363544,5	3327064	2963519,55	n/a	1			316118	3284613	2968494,97	n/a	1		301194,7	88175,85		256035,6	84969,35
A4		238845	3201459	2962614,03	n/a	1			195953,2	3163674	2967720,78	n/a	1						
A5	Aggrecan	186644,4	3148186	2961541,64	n/a	1			216506,4	3183414	2966907,62	n/a	1		184164,9	3506,472		220871,6	6173,36
A6		181685,5	3143931	2962245,54	n/a	1			225236,8	3193005	2967768,17	n/a	1						
A7	Angiogenin	1012914	3976425	2963511,5	n/a	1			1539987	4508537	2968550,4	n/a	1		963644	69677,55		1521148	26641,8
A8		914374,6	3877556	2963181,43	n/a	1			1502309	4470806	2968496,59	n/a	1						
A9	Angiopoietin-1	147344,2	3108159	2960814,76	n/a	1			122566	3087807	2965241,03	n/a	1		149389,3	2892,201		116574,6	8473,048
A10		151434,4	3112377	2960942,57	n/a	1			110583,3	3076610	2966026,73	n/a	1						
A11	Angiopoietin-2	382810,6	3345369	2962558,45	n/a	1			395178,1	3362717	2967538,95	n/a	1		387660,6	6858,936		397026,9	2614,711
A12		392510,6	3355198	2962687,45	n/a	1			398875,8	3366681	2967805,19	n/a	1						
A13	BAFF	213048,1	3174039	2960990,9	n/a	1			188545,4	3154590	2966044,65	n/a	1		209123,5	5550,223		189211,4	941,9864
A14		205198,9	3166451	2961252,1	n/a	1			189877,5	3156103	2966225,48	n/a	1						
A15	BDNF	197326,1	3158863	2961536,93	n/a	1			206952	3173952	2966999,98	n/a	1		203698,4	9011,857		205405,2	2187,534
A16		210070,8	3171154	2961083,24	n/a	1			203858,4	3170968	2967109,62	n/a	1						
A17	Complement C5/C5a	109929,7	3069837	2959907,35	n/a	1			126003,5	3092039	2966035,52	n/a	1		105586	6142,806		134364,6	11824,39
A18		101242,4	3061241	2959998,59	n/a	1			142725,7	3109514	2966788,31	n/a	1						
A19	CD14	176720,1	3138046	2961325,9	n/a	1			236807,5	3204233	2967425,49	n/a	1		174951,1	2501,793		241137	6122,781
A20		173182	3134809	2961626,97	n/a	1			245466,4	3213057	2967590,57	n/a	1						
A21	CD30	1451317	4414913	2963596,42	n/a	1			1580956	4549510	2968554,2	n/a	1		1537392	121728,4		1661835	114380,2
A22		1623467	4587078	2963611,5	n/a	1			1742714	4711265	2968551,2	n/a	1						
A23	Reference	11593433	14557044	2963611,5	n/a	1			11882972	14851528	2968556	n/a	1		11561296	45447,87		11785656	137626,3
A24		11529160	14492771	2963611,5	n/a	1			11688339	14656895	2968556	n/a	1						
B3	CD40 ligand	520112,2	3483617	2963504,79	n/a	1			376944,6	3345422	2968477,38	n/a	1		536402,2	23037,56		374501,4	3455,256
B4		552692,2	3515932	2963239,76	n/a	1			372058,2	3340064	2968005,85	n/a	1						
B5	Chitinase 3-like 1	174665	3136973	2962308,04	n/a	1			189570,7	3157237	2967666,35	n/a	1		169251,6	7655,675		188405,9	1647,248
B6		163838,2	3125524	2961685,8	n/a	1			187241,1	3154497	2967255,91	n/a	1						
B7	Complement Factor D	143563,7	3105877	2962313,34	n/a	1			190483,6	3158535	2968051,45	n/a	1		140298,6	4617,563		182909,5	10711,39
B8		137033,4	3098789	2961755,56	n/a	1			175335,4	3143440	2968104,65	n/a	1						
B9	C-Reactive Protein	227921,9	3189910	2961988,14	n/a	1			192004,6	3159120	2967115,43	n/a	1		233971,5	8555,476		193561,5	2201,796
B10		240021,1	3202546	2962524,87	n/a	1			195118,4	3162278	2967159,62	n/a	1						
B11	Cripto-1	122398	3084256	2961857,97	n/a	1			147919,3	3115749	2967829,74	n/a	1		116538,9	8286,04		144603,6	4688,988
B12		110679,8	3071959	2961279,2	n/a	1			141288	3108051	2966762,97	n/a	1						
B13	Cystatin C	322955,4	3285865	2962909,65	n/a	1			300124,6	3267879	2967754,37	n/a	1		321718,6	1749,057		303699,4	5055,517
B14		320481,8	3283299	2962817,19	n/a	1			307274,2	3275123	2967848,79	n/a	1						
B15	Dkk-1	271723,5	3234557	2962833,49	n/a	1			264643,5	3232190	2967546,52	n/a	1		251485,4	28621,02		255922,7	12333,02
B16		231247,3	3192988	2961740,73	n/a	1			247202	3214237	2967035,05	n/a	1						
B17	DPPIV	64894,34	3024541	2959646,66	n/a	1			65739,78	3030302	2964562,22	n/a	1		64694,2	283,0407		69708,76	5612,978
B18		64494,06	3024554	2960059,94	n/a	1			73677,73	3039500	2965822,27	n/a	1						
B19	EGF	340427	3303314	2962887,03	n/a	1			448589,3	3416708	2968118,68	n/a	1		322897	24791,11		429681,1	26740,26
B20		305367,1	3267839	2962471,95	n/a	1			410772,9	3379105	2968332,12	n/a	1						
B21	EMMPRIN	1354761	4318356	2963595,33	n/a	1			1442288	4410844	2968556	n/a	1		1371838	24150,4		1473932	44750,67
B22		1388915	4352526	2963611,5	n/a	1			1505575	4474131	2968556	n/a	1						
C3	ENA-78	155727,6	3118579	2962851,37	n/a	1			144755,7	3112201	2967445,32	n/a	1		150994,1	6694,222		137575,7	10154,01
C4		146260,6	3108348	2962087,43	n/a	1			130395,7	3096654	2966258,26	n/a	1						
C5	Endoglin	137007,6	3098603	2961595,4	n/a	1			162337,5	3128965	2966627,51	n/a	1		136106	1275,069		158554,4	5350,09
C6		135204,4	3096578	2961373,62	n/a	1			154771,3	3122148	2967376,68	n/a	1						
C7	Fas Ligand	176586,7	3138460	2961873,27	n/a	1			153104	3120226	2967122,02	n/a	1		169933,3	9409,442		144540,8	12110,16
C8		163279,8	3125095	2961815,23	n/a	1			135977,6	3102921	2966943,37	n/a	1						
C9	FGF basic	257607,6	3220300	2962692,45	n/a	1			225862,2	3192744	2966881,81	n/a	1		257223,1	543,7368		228733,5	4060,617
C10		256838,6	3219364	2962525,41	n/a	1			231604,8	3199684	2968079,23	n/a	1						
C11	FGF-7	114828,3	3076546	2961717,73	n/a	1			125882	3093249	2967366,97	n/a	1		110121,5	6656,357		126978,5	1550,614
C12		105414,8	3066911	2961496,24	n/a	1			128074,9	3095585	2967510,07	n/a	1						
C13	FGF-19	442539,7	3405817	2963277,31	n/a	1			463363,2	3431363	2967999,84	n/a	1		431437,7	15700,6		464337,9	1378,526
C14		420335,7	3383347	2963011,31	n/a	1			465312,7	3433469	2968156,31	n/a	1						
C15	Flt-3 Ligand	176885,5	3139369	2962483,5	n/a	1			106437,8	3072299	2965861,16	n/a	1		176570,5	445,548		105496,6	1331,093
C16		176255,4	3138172	2961916,6	n/a	1			104555,4	3069931	2965375,61	n/a	1						
C17	G-CSF	156774,4	3118584	2961809,56	n/a	1			177942	3143813	2965870,97	n/a	1		154204	3635,144		176763,2	1667,054
C18		151633,6	3113638	2962004,43	n/a	1			175584,5	3142283	2966698,54	n/a	1						
C19	GDF-15	195402,8	3157652	2962249,17	n/a	1			211358,2	3178590	2967231,81	n/a	1		184639,3	15221,95		206512,7	6852,558
C20		173875,7	3135812	2961936,26	n/a	1			201667,2	3168471	2966803,79	n/a	1						
C21	GM-CSF	325010,1	3287834	2962823,95	n/a	1			327918,3	3296191	2968272,72	n/a	1		318790,2	8796,225		326126	2534,667
C22		312570,3	3275389	2962818,69	n/a	1			324333,7	3292539	2968205,28	n/a	1						
D1	GRO-α	168662,6	3130791	2962128,38	n/a	1			123444,3	3089791	2966346,67	n/a	1		171634,3	4202,633		124766	1869,117
D2		174606	3136830	2962223,96	n/a	1			126087,7	3093068	2966980,34	n/a	1						
D3	Growth Hormone	130446,6	3092341	2961894,39	n/a	1			95109,56	3061245	2966135,44	n/a	1		116247,3	20080,9		89877,77	7398,868
D4		102047,9	3061651	2959603,07	n/a	1			84645,98	3049861	2965215,02	n/a	1						
D5	HGF	100755,5	3061446	2960690,46	n/a	1			118791,4	3085290	2966498,64	n/a	1		100126,4	889,7807		117577,3	1716,891
D6		99497,2	3060193	2960695,8	n/a	1			116363,3	3083179	2966815,69	n/a	1						
D7	ICAM-1	91513,28	3052374	2960860,72	n/a	1			117407,2	3083246	2965838,78	n/a	1		83729,28	11008,25		120166,4	3902,098
D8		75945,27	3036298	2960352,73	n/a	1			122925,6	3088970	2966044,38	n/a	1						
D9	IFN-γ	276803,3	3239298	2962494,75	n/a	1			267779,9	3234695	2966915,09	n/a	1		288805,5	16973,7		278220,8	14765,59
D10		300807,7	3263521	2962713,32	n/a	1			288661,6	3256349	2967687,39	n/a	1						
D11	IGFBP-2	2607103	5570606	2963503	n/a	1			3233825	6202381	2968556	n/a	1		2582119	35332,1		3201199	46140,13
D12		2557136	5520668	2963532,13	n/a	1			3168573	6137129	2968556	n/a	1						
D13	IGFBP-3	144815,5	3106141	2961325,48	n/a	1			170582	3137916	2967334,04	n/a	1		154780,1	14092		162832,7	10959,06
D14		164744,6	3126412	2961667,38	n/a	1			155083,5	3121690	2966606,49	n/a	1						
D15	IL-1α	301482,6	3263591	2962108,38	n/a	1			258962,8	3225837	2966874,18	n/a	1		297497,2	5636,221		259626,6	938,7691
D16		293511,8	3255915	2962403,2	n/a	1			260290,4	3227183	2966892,56	n/a	1						
D17	IL-1β	267170,2	3229752	2962581,83	n/a	1			274656,8	3241791	2967134,24	n/a	1		273909	9530,138		273037,2	2290,34
D18		280647,8	3243875	2963227,18	n/a	1			271417,7	3238731	2967313,27	n/a	1						
D19	IL-1ra	249719	3212236	2962517,03	n/a	1			189172,5	3156530	2967357,48	n/a	1		232495,4	24357,75		189180,7	11,63191
D20		215271,9	3177141	2961869,09	n/a	1			189189	3155806	2966617,03	n/a	1						
D21	IL-2	210874,7	3172518	2961643,35	n/a	1			259113,8	3226874	2967760,17	n/a	1		211879,7	1421,419		262132,8	4269,49
D22		212884,8	3175508	2962623,16	n/a	1			265151,8	3232952	2967800,2	n/a	1						
D23	IL-3	113507,6	3073992	2960484,41	n/a	1			157231,9	3124834	2967602,11	n/a	1		119266,3	8144,074		151333,6	8341,484
D24		125025,1	3085910	2960884,95	n/a	1			145435,3	3112224	2966788,75	n/a	1						
E1	IL-4	263216	3225869	2962652,98	n/a	1			167282,6	3134016	2966733,36	n/a	1		267971,9	6725,766		166942,2	481,469
E2		272727,7	3235947	2963219,31	n/a	1			166601,7	3134003	2967401,26	n/a	1						
E3	IL-5	252710,7	3216070	2963359,3	n/a	1			129345,6	3096625	2967279,42	n/a	1		241504,2	15848,33		123810,3	7828,132
E4		230297,8	3193477	2963179,23	n/a	1			118274,9	3084704	2966429,07	n/a	1						
E5	IL-6	336173,9	3298957	2962783,15	n/a	1			311704,2	3279379	2967674,76	n/a	1		335100,2	1518,385		322341,3	15043,07
E6		334026,5	3297337	2963310,47	n/a	1			332978,4	3301016	2968037,64	n/a	1						
E7	IL-8	137707,7	3099939	2962231,3	n/a	1			123417,4	3090375	2966957,58	n/a	1		134465,7	4584,817		128077,6	6590,518
E8		131223,8	3093565	2962341,21	n/a	1			132737,8	3099737	2966999,18	n/a	1						
E9	IL-10	145434,9	3108162	2962727,11	n/a	1			152646,6	3119000	2966353,45	n/a	1		141995,6	4863,926		161982,6	13203,2
E10		138556,3	3101396	2962839,74	n/a	1			171318,7	3138708	2967389,3	n/a	1						
E11	IL-11	345597,7	3309206	2963608,29	n/a	1			349558	3317966	2968407,96	n/a	1		341699,5	5512,937		341431	11493,42
E12		337801,2	3301198	2963396,76	n/a	1			333303,9	3301565	2968261,11	n/a	1						
E13	IL-12 p70	248657,7	3211936	2963278,27	n/a	1			271808,2	3239894	2968085,85	n/a	1		255777	10068,23		260895,4	15433,01
E14		262896,4	3226182	2963285,64	n/a	1			249982,6	3217877	2967894,42	n/a	1						
E15	IL-13	130662,6	3093550	2962887,45	n/a	1			107199,5	3073966	2966766,48	n/a	1		130039,9	880,5318		106974,4	318,3324
E16		129417,3	3091930	2962512,71	n/a	1			106749,3	3072307	2965557,67	n/a	1						
E17	IL-15	187098,2	3149051	2961952,8	n/a	1			175836,4	3141998	2966161,63	n/a	1		187905,4	1141,553		179737,7	5517,25
E18		188712,6	3151733	2963020,4	n/a	1			183638,9	3151197	2967558,06	n/a	1						
E19	IL-16	166926,9	3129670	2962743,08	n/a	1			152190	3119370	2967180,04	n/a	1		165797,4	1597,453		147899,8	6067,195
E20		164667,8	3126421	2961753,22	n/a	1			143609,7	3110514	2966904,35	n/a	1						
E21	IL-17A	624286,3	3587571	2963284,72	n/a	1			678098,9	3646399	2968300,11	n/a	1		620851,2	4857,873		698615,7	29015,08
E22		617416,2	3580949	2963532,79	n/a	1			719132,4	3687679	2968546,59	n/a	1						
E23	IL-18 Bpa	378539	3341691	2963152,02	n/a	1			359925,3	3328241	2968315,72	n/a	1		387973,8	13342,9		340374,4	27649,18
E24		397408,7	3360595	2963186,31	n/a	1			320823,4	3288492	2967668,57	n/a	1						
F1	IL-19	307392,2	3270380	2962987,85	n/a	1			173740,2	3140770	2967029,81	n/a	1		305632,1	2489,037		177114,8	4772,384
F2		303872,1	3267281	2963408,88	n/a	1			180489,4	3147505	2967015,64	n/a	1						
F3	IL-22	297905,1	3261131	2963225,89	n/a	1			189891,3	3157223	2967331,67	n/a	1		293011,9	6920,044		190226	473,3302
F4		288118,7	3251331	2963212,31	n/a	1			190560,7	3157883	2967322,28	n/a	1						
F5	IL-23	167438,6	3130103	2962664,37	n/a	1			138123,2	3104109	2965985,77	n/a	1		160582,1	9696,577		142732,5	6518,485
F6		153725,6	3116636	2962910,4	n/a	1			147341,8	3114419	2967077,24	n/a	1						
F7	IL-24	282292,4	3245434	2963141,6	n/a	1			314385,2	3282199	2967813,77	n/a	1		273205,3	12851,17		327115,9	18003,9
F8		264118,1	3227049	2962930,9	n/a	1			339846,6	3307627	2967780,41	n/a	1						
F9	IL-27	523539,1	3486927	2963387,88	n/a	1			464075	3431718	2967642,99	n/a	1		493889,3	41931,14		469600,5	7814,152
F10		464239,5	3427620	2963380,47	n/a	1			475125,9	3443403	2968277,11	n/a	1						
F11	IL-31	158990,1	3122245	2963254,93	n/a	1			181446,3	3149169	2967722,75	n/a	1		159507,5	731,8202		175195,5	8839,888
F12		160025	3123089	2963063,98	n/a	1			168944,8	3137140	2968195,24	n/a	1						
F13	IL-32α/β/γ	451021,3	3414573	2963551,67	n/a	1			412512,9	3380687	2968174,08	n/a	1		485027,1	48091,36		416937,1	6256,728
F14		519032,8	3482611	2963578,21	n/a	1			421361,3	3389683	2968321,73	n/a	1						
F15	IL-33	180918,7	3143976	2963057,31	n/a	1			182328,8	3150158	2967829,22	n/a	1		180107,5	1147,175		169695,1	17866,73
F16		179296,3	3142025	2962728,66	n/a	1			157061,4	3123886	2966824,59	n/a	1						
F17	IL-34	152842,8	3114662	2961819,22	n/a	1			158803,3	3125431	2966627,71	n/a	1		154358,6	2143,63		159866,2	1503,196
F18		155874,3	3118253	2962378,67	n/a	1			160929,1	3128300	2967370,87	n/a	1						
F19	IP-10	208255,1	3171039	2962783,86	n/a	1			230296,2	3198186	2967889,78	n/a	1		203821,1	6270,665		226854,2	4867,709
F20		199387,1	3161702	2962314,92	n/a	1			223412,2	3191206	2967793,76	n/a	1						
F21	I-TAC	186215,1	3148454	2962238,88	n/a	1			216991	3184708	2967716,98	n/a	1		190076,5	5460,823		221393,2	6225,594
F22		193937,9	3156731	2962793,11	n/a	1			225795,3	3193867	2968071,66	n/a	1						
F23	Kallikrein 3	232676,3	3195521	2962844,69	n/a	1			308654,5	3276825	2968170,5	n/a	1		230903,6	2506,934		293390,5	21586,63
F24		229131	3191684	2962553,03	n/a	1			278126,4	3246084	2967957,6	n/a	1						
G1	Leptin	159033,1	3121854	2962820,94	n/a	1			76477,41	3041514	2965036,59	n/a	1		160077,1	1476,474		80879,51	6225,51
G2		161121,1	3124361	2963239,89	n/a	1			85281,61	3051580	2966298,39	n/a	1						
G3	LIF	160793,7	3124001	2963207,27	n/a	1			103827,9	3070510	2966682,1	n/a	1		152496,3	11734,3		101239,7	3660,331
G4		144198,9	3107071	2962872,07	n/a	1			98651,41	3064899	2966247,59	n/a	1						
G5	Lipocalin-2	342542,9	3306001	2963458,09	n/a	1			224841,4	3191891	2967049,58	n/a	1		307596,6	49421,5		230713,1	8303,767
G6		272650,4	3235617	2962966,65	n/a	1			236584,7	3203903	2967318,28	n/a	1						
G7	MCP-1	212317,2	3175509	2963191,81	n/a	1			227766,2	3195151	2967384,85	n/a	1		214315	2825,273		227581,1	261,7285
G8		216312,7	3179347	2963034,27	n/a	1			227396	3194299	2966902,99	n/a	1						
G9	MCP-3	210311,4	3173458	2963146,6	n/a	1			194581,6	3161785	2967203,42	n/a	1		214201,8	5501,856		194664	116,5312
G10		218092,2	3181379	2963286,8	n/a	1			194746,4	3162134	2967387,62	n/a	1						
G11	M-CSF	199175,7	3162523	2963347,35	n/a	1			198918	3165888	2966970	n/a	1		203431,7	6018,978		203257,1	6136,414
G12		207687,8	3170652	2962964,23	n/a	1			207596,2	3175571	2967974,8	n/a	1						
G13	MIF	3487392	6451003	2963611,5	n/a	1			3402639	6371195	2968556	n/a	1		3571314	118684,3		3434924	45657,88
G14		3655237	6618848	2963611,5	n/a	1			3467209	6435765	2968556	n/a	1						
G15	MIG	303012,1	3266398	2963385,88	n/a	1			308246,3	3276409	2968162,7	n/a	1		288073,3	21126,72		269046,2	55437,25
G16		273134,4	3236023	2962888,57	n/a	1			229846,2	3196841	2966994,81	n/a	1						
G17	MIP-1α/MIP-1β	156025,9	3118156	2962130,14	n/a	1			138519,1	3103778	2965258,89	n/a	1		169419,1	18940,88		139248	1030,806
G18		182812,3	3145726	2962913,69	n/a	1			139976,9	3106594	2966617,11	n/a	1						
G19	MIP-3α	291114,5	3254134	2963019,48	n/a	1			209561,5	3177010	2967448,49	n/a	1		283087,5	11351,93		198679,9	15388,86
G20		275060,5	3237740	2962679,53	n/a	1			187798,4	3155032	2967233,63	n/a	1						
G21	MIP-3β	351707,5	3314074	2962366,46	n/a	1			332928,8	3300852	2967923,19	n/a	1		330907,8	29415,33		340209,2	10295,96
G22		310108	3273334	2963226,02	n/a	1			347489,5	3315828	2968338,51	n/a	1						
G23	MMP-9	234165,6	3197076	2962910,44	n/a	1			275681	3243654	2967973,04	n/a	1		227283	9733,473		262591,3	18511,65
G24		220400,4	3183293	2962892,65	n/a	1			249501,5	3216782	2967280,46	n/a	1						
H1	Myeloperoxidase	261554,7	3224893	2963338,34	n/a	1			133474,5	3099370	2965895,53	n/a	1		259779,5	2510,498		139145	8019,326
H2		258004,3	3221472	2963467,72	n/a	1			144815,5	3111356	2966540,49	n/a	1						
H3	Osteopontin	490038,6	3453534	2963495,38	n/a	1			447474,2	3415323	2967848,83	n/a	1		484410,9	7958,84		409547,9	53635,89
H4		478783,1	3442197	2963413,88	n/a	1			371621,6	3339631	2968009,44	n/a	1						
H5	PDGF-AA	1680667	4644240	2963573,17	n/a	1			1119464	4087974	2968509,78	n/a	1		1734662	76360,23		1120079	868,7372
H6		1788657	4752268	2963611,5	n/a	1			1120693	4089247	2968554,2	n/a	1						
H7	PDGF-AB/BB	113569,2	3076189	2962619,78	n/a	1			77209,45	3043208	2965998,55	n/a	1		101921,7	16472,15		79919,22	3832,186
H8		90274,08	3050727	2960452,92	n/a	1			82628,98	3048081	2965452,02	n/a	1						
H9	Pentraxin-3	426940,7	3390127	2963186,35	n/a	1			456172	3424042	2967869,99	n/a	1		426809,9	184,9367		459316,3	4446,69
H10		426679,1	3389839	2963159,89	n/a	1			462460,6	3430318	2967857,42	n/a	1						
H11	PF4	134628,5	3097335	2962706,54	n/a	1			158418,6	3125146	2966727,39	n/a	1		135800,7	1657,861		152657,9	8146,846
H12		136973	3098993	2962019,97	n/a	1			146897,2	3113966	2967068,77	n/a	1						
H13	RAGE	161303,3	3123916	2962612,75	n/a	1			167513,1	3134250	2966736,9	n/a	1		164391	4366,745		170342,2	4000,966
H14		167478,8	3130095	2962616,24	n/a	1			173171,3	3140606	2967434,68	n/a	1						
H15	RANTES	160399,1	3122668	2962268,92	n/a	1			189643,9	3157366	2967722,15	n/a	1		158899,8	2120,352		184818,8	6823,672
H16		157400,5	3119829	2962428,55	n/a	1			179993,7	3147350	2967356,28	n/a	1						
H17	RBP4	227771,5	3190381	2962609,54	n/a	1			295450,3	3263223	2967772,74	n/a	1		232754,4	7046,984		293611	2601,043
H18		237737,4	3200733	2962995,6	n/a	1			291771,8	3259517	2967745,17	n/a	1						
H19	Relaxin-2	477850,7	3441141	2963290,34	n/a	1			417526,6	3385429	2967902,41	n/a	1		463335,8	20527,08		407824	13721,48
H20		448821	3412020	2963199,02	n/a	1			398121,5	3366363	2968241,51	n/a	1						
H21	Resistin	624664,6	3588060	2963395,38	n/a	1			666556,5	3634899	2968342,55	n/a	1		612298,2	17488,73		672572,8	8508,453
H22		599931,8	3563239	2963307,18	n/a	1			678589,2	3647082	2968492,78	n/a	1						
H23	SDF-1α	286887,8	3249396	2962508,16	n/a	1			447065,1	3415356	2968290,91	n/a	1		329805,2	60694,33		428325,9	26501,19
H24		372722,6	3334777	2962054,42	n/a	1			409586,8	3377651	2968064,25	n/a	1						
I1	Serpin E1	1463788	4427399	2963611,5	n/a	1			811124,6	3779644	2968519,38	n/a	1		1427288	51618,09		826567	21838,84
I2		1390789	4354400	2963611,5	n/a	1			842009,4	3810531	2968521,59	n/a	1						
I3	SHBG	505509,6	3469117	2963607,42	n/a	1			393593,8	3362074	2968480,16	n/a	1		435933,6	98395,32		353687,8	56435,67
I4		366357,6	3329867	2963509,42	n/a	1			313781,8	3281766	2967984,25	n/a	1						
I5	ST2	183845	3147222	2963377,05	n/a	1			134529,2	3101429	2966899,76	n/a	1		195753,7	16841,49		132144,4	3372,631
I6		207662,4	3171188	2963525,59	n/a	1			129759,6	3096745	2966985,38	n/a	1						
I7	TARC	352936,9	3316390	2963453,13	n/a	1			262038,6	3229124	2967085,41	n/a	1		327572,5	35870,65		250449	16390,12
I8		302208,1	3265299	2963090,89	n/a	1			238859,5	3205601	2966741,54	n/a	1						
I9	TFF3	104913,9	3067605	2962691,08	n/a	1			113272,4	3079208	2965935,57	n/a	1		105960,3	1479,805		118634,7	7583,331
I10		107006,7	3070032	2963025,32	n/a	1			123996,9	3090826	2966829,12	n/a	1						
I11	TfR	406047,4	3369580	2963532,59	n/a	1			351496	3319558	2968062,05	n/a	1		418064,3	16994,48		355009,3	4968,627
I12		430081,2	3393380	2963298,76	n/a	1			358522,7	3326198	2967675,35	n/a	1						
I13	TGF-α	204656,7	3166959	2962302,33	n/a	1			168881,2	3134786	2965904,76	n/a	1		205950,6	1829,858		173636,4	6724,741
I14		207244,5	3170417	2963172,52	n/a	1			178391,5	3145099	2966707,54	n/a	1						
I15	Thrombospondin-1	849252,7	3812850	2963597,29	n/a	1			706564,3	3674685	2968120,67	n/a	1		858284,5	12772,85		759598,7	75001,95
I16		867316,3	3830837	2963520,75	n/a	1			812633,1	3780787	2968153,89	n/a	1						
I17	TNF-alpha	149137,6	3112250	2963112,44	n/a	1			184841,2	3151718	2966876,8	n/a	1		147540,6	2258,414		177182,8	10830,56
I18		145943,7	3108959	2963015,32	n/a	1			169524,5	3136123	2966598,53	n/a	1						
I19	uPAR	362141,8	3325459	2963317,18	n/a	1			318149,5	3285669	2967519,52	n/a	1		388996,2	37977,82		331509,4	18893,73
I20		415850,6	3379161	2963310,43	n/a	1			344869,3	3312479	2967609,75	n/a	1						
I21	VEGF	321685,4	3284892	2963206,56	n/a	1			579394,1	3547561	2968166,91	n/a	1		319192,7	3525,246		586897,9	10612
I22		316700	3280009	2963309,01	n/a	1			594401,7	3562571	2968169,28	n/a	1						
J1	Reference	12227260	15190871	2963611,5	n/a	1			9918316	12886872	2968556	n/a	1		12312007	119851,1		9973372	77860,94
J2		12396755	15360366	2963611,5	n/a	1			10028428	12996984	2968556	n/a	1						
J5	Vitamin D BP	394858,2	3358154	2963295,8	n/a	1			322487,5	3289785	2967297,52	n/a	1		376531,5	25917,91		304686,6	25174,27
J6		358204,7	3321465	2963260,26	n/a	1			286885,7	3254412	2967526,32	n/a	1						
J23	Negative	Backgrour	Background	Background	Background	Backgrour	Background		Backgrour	Background	Background	Background	Background						
J24		Backgrour	Background	Background	Background	Backgrour	Background		Backgrour	Background	Background	Background	Background						

table S5. Cytokine secretion in CD4$^+$ T cells after stimulation and infection with HIV as measured by Proteome Profiler Human XL Cytokine Array kit.

		Control	CD4+alpha	CD4+gamma	control		CD4+alpha		CD4+gamma	
	Label				Average	Stdev	Average	Stdev	Average	Stdev
A1	Reference	7771499	6401864	4397483	7790970	27537	6707330	431995	4297984	140712
A2		7810442	7012797	4198486						
A3	Adiponectin	217090	218016	134397	157971	83606	162480	78539	108766	36249
A4		98853	106945	83134						
A5	Aggrecan	93298	63192	79301	95833	3585	64560	1935	78897	571
A6		98368	65928	78494						
A7	Angiogenin	405424	450510	400685	392874	17749	433161	24536	403066	3367
A8		380324	415811	405447						
A9	Angiopoietin-1	59144	39426	48961	53938	7363	39294	187	48990	40
A10		48731	39162	49018						
A11	Angiopoietin-2	127374	159129	179731	96037	44318	157913	1720	174161	7877
A12		64699	156697	168591						
A13	BAFF	157213	115884	111920	166400	12994	114018	2639	111378	766
A14		175588	112151	110837						
A15	BDNF	151493	125057	137297	155008	4971	124954	145	132899	6219
A16		158523	124852	128502						
A17	Complement C5/C5a	17265	52758	50937	28733	16219	54402	2325	57193	8848
A18		40202	56046	63450						
A19	CD14	47713	85020	60936	38675	12781	96989	16927	72450	16283
A20		29638	108958	83963						
A21	CD30	1295264	1193721	1006936	1313330	25550	1202034	11756	1043786	52114
A22		1331397	1210347	1080636						
A23	Reference	7716766	6643130	5623772	7773729	80558	6695557	74143	5474188	211544
A24		7830692	6747984	5324603						
B3	CD40 ligand	604468	537748	412735	593137	16024	529622	11492	411882	1206
B4		581807	521496	411029						
B5	Chitinase 3-like 1	61217	51960	66935	62889	2365	58941	9873	66678	363
B6		64562	65922	66421						
B7	Complement Factor D	75537	67425	69562	71836	5235	60381	9963	69233	466
B8		68134	53336	68904						
B9	C-Reactive Protein	109458	71547	88266	102315	10101	72121	812	88411	206
B10		95173	72696	88556						
B11	Cripto-1	11629	27655	43334	5815	8223	25605	2899	40161	4487
B12		0	23555	36989						
B13	Cystatin C	69467	82309	100478	71840	3357	82911	851	102688	3125
B14		74214	83512	104897						
B15	Dkk-1	202997	164319	169843	205189	3100	161868	3467	171586	2465
B16		207381	159416	173329						
B17	DPPIV	824390	537884	412404	808676	22223	529214	12261	405452	9832
B18		792962	520544	398500						
B19	EGF	62067	78984	59744	67143	7178	90261	15948	73038	18801
B20		72219	101538	86333						
B21	EMMPRIN	1178005	1146082	1011571	1175717	3235	1150220	5853	972932	54645
B22		1173430	1154359	934292						
C3	ENA-78	54882	38939	51678	60606	8095	39951	1431	53272	2254
C4		66331	40963	54865						
C5	Endoglin	133164	101197	117952	138407	7414	106063	6881	122184	5985
C6		143650	110928	126416						
C7	Fas Ligand	312921	316845	272423	306472	9119	303628	18691	269457	4193
C8		300024	290411	266492						
C9	FGF basic	110571	82179	91619	100480	14271	79972	3120	95505	5497
C10		90388	77766	99392						
C11	FGF-7	12752	20388	40110	6376	9017	20524	192	33641	9149
C12		0	20660	27171						
C13	FGF-19	67636	131108	121847	86972	27345	133006	2683	127389	7838
C14		106308	134903	132931						
C15	Flt-3 Ligand	629631	389535	358780	647876	25802	397095	10691	354969	5390
C16		666120	404654	351158						
C17	G-CSF	94447	66530	51258	92710	2456	68628	2967	52636	1949
C18		90974	70725	54014						
C19	GDF-15	127634	85926	102418	149392	30771	128178	59753	114384	16922
C20		171150	170429	126350						
C21	GM-CSF	7972241	7638533	7036204	8133035	227398	7783702	205300	6944563	129601
C22		8293830	7928871	6852921						
D1	GRO-α	70394	67833	70607	73928	4998	64884	4170	71160	781
D2		77462	61936	71712						
D3	Growth Hormone	64124	81041	81757	66079	2765	82508	2075	75200	9274
D4		68034	83975	68642						
D5	HGF	76950	56042	56625	87979	15597	69585	19152	65169	12084
D6		99008	83127	73714						
D7	ICAM-1	422281	391279	247235	401934	28775	354335	52247	252678	7697
D8		381587	317391	258121						
D9	IFN-γ	563829	646749	712087	560984	4023	632572	20049	694427	24974
D10		558139	618395	676768						
D11	IGFBP-2	458761	393645	346809	409061	70286	397038	4799	334090	17987
D12		359361	400432	321372						
D13	IGFBP-3	10634	42953	40427	26544	22500	40413	3592	39693	1037
D14		42454	37872	38960						
D15	IL-1α	314644	228196	209112	308567	8595	225689	3544	202916	8763
D16		302489	223183	196719						
D17	IL-1β	70260	43093	39677	66964	4661	43410	449	40791	1576
D18		63669	43727	41905						
D19	IL-1ra	315274	238901	234523	321567	8900	250494	16395	254192	27816
D20		327860	262087	273861						
D21	IL-2	3372423	3723974	3049116	3483738	157423	3751096	38356	3095050	64960
D22		3595053	3778218	3140984						
D23	IL-3	156083	148567	137379	105619	71366	98885	70261	88833	68654
D24		55156	49203	40288						
E1	IL-4	72866	68343	62505	84526	16490	77701	13235	74468	16918
E2		96187	87060	86431						
E3	IL-5	4424750	4262521	3656030	4480524	78877	4308656	65245	3625191	43613
E4		4536299	4354792	3594352						
E5	IL-6	254034	232427	274178	301172	66662	269309	52159	287817	19288
E6		348309	306191	301456						
E7	IL-8	4636704	4747051	4290975	4534353	144745	4630112	165377	4125425	234122
E8		4432003	4513173	3959876						
E9	IL-10	371388	288259	367662	358768	17848	281502	9555	344637	32562
E10		346148	274745	321612						
E11	IL-11	76564	75037	106049	72557	5667	77087	2899	98865	10159
E12		68550	79137	91682						
E13	IL-12 p70	108054	146684	102639	112950	6925	147570	1253	101314	1874
E14		117847	148456	99989						
E15	IL-13	84465	76246	65845	84476	15	73536	3832	64979	1224
E16		84487	70826	64114						
E17	IL-15	Background	Background	Background	76622	#DIV/0!	50208	#DIV/0!	46713	#DIV/0!
E18		76622	50208	46713						
E19	IL-16	269127	257981	223988	268226	1274	263515	7826	225078	1542
E20		267325	269049	226168						
E21	IL-17A	1051650	1138226	835865	1041062	14973	1137172	1491	827842	11347
E22		1030475	1136118	819818						
E23	IL-18 Bpa	187262	114946	90200	172255	21223	100191	20867	79919	14539
E24		157248	85436	69638						
F1	IL-19	73311	60984	64845	73157	218	63195	3127	75739	15405
F2		73003	65406	86632						
F3	IL-22	747515	756763	891755	765034	24776	779537	32208	848270	61497
F4		782553	802312	804785						
F5	IL-23	70760	47149	60433	75250	6350	48412	1786	60118	446
F6		79739	49674	59803						
F7	IL-24	235851	167399	172843	237256	1987	177574	14390	202401	41801
F8		238661	187749	231959						
F9	IL-27	138625	124951	161243	138385	340	129202	6012	154131	10058
F10		138144	133454	147019						
F11	IL-31	56856	61304	79931	56346	722	69139	11080	74971	7015
F12		55835	76973	70010						
F13	IL-32α/β/γ	272442	6010643	2507188	271169	1801	6063937	75370	2472447	49130
F14		269896	6117232	2437707						
F15	IL-33	75579	178605	85242	78521	4160	124379	76687	74450	15261
F16		81462	70153	63659						
F17	IL-34	93660	59947	65960	94443	1107	58880	1508	64280	2375
F18		95226	57814	62601						
F19	IP-10	191916	187473	206151	188787	4424	185757	2427	206680	748
F20		185659	184041	207209						
F21	I-TAC	116478	82334	65253	116113	516	83884	2192	65236	24
F22		115748	85435	65219						
F23	Kallikrein 3	317250	213947	157582	303738	19109	202910	15608	151557	8520
F24		290226	191873	145533						
G1	Leptin	35827	35303	32920	36243	589	36137	1179	37300	6195
G2		36660	36971	41681						
G3	LIF	632180	654105	632053	630209	2786	666519	17556	623258	12438
G4		628239	678934	614463						
G5	Lipocalin-2	282173	181299	149920	292272	14281	181279	29	164650	20831
G6		302370	181259	179379						
G7	MCP-1	180637	87145	109156	173846	9604	84268	4069	111111	2766
G8		167056	81390	113067						
G9	MCP-3	81776	83579	87320	80040	2455	82854	1025	87046	387
G10		78303	82129	86773						
G11	M-CSF	261894	206756	230668	266687	6779	209369	3695	224973	8055
G12		271480	211982	219277						
G13	MIF	1489005	1344626	1126115	1489674	947	1313691	43749	1112278	19568
G14		1490344	1282756	1098441						
G15	MIG	243646	266382	228270	246999	4742	260468	8363	228262	11
G16		250353	254555	228254						
G17	MIP-1α/MIP-1β	4383217	3056111	2905185	4376509	9486	3063723	10765	2908503	4692
G18		4369802	3071335	2911821						
G19	MIP-3α	956737	823412	830853	945826	15430	819703	5244	817381	19052
G20		934916	815995	803909						
G21	MIP-3β	147217	100067	87300	146547	947	98862	1705	85343	2767
G22		145878	97657	83387						
G23	MMP-9	130319	81787	69132	125715	6511	80330	2061	65783	4736
G24		121112	78872	62434						
H1	Myeloperoxidase	195318	136375	101840	178759	23417	134819	2200	104328	3519
H2		162201	133263	106816						
H3	Osteopontin	189183	171704	135574	192024	4018	171290	586	132611	4189
H4		194864	170875	129649						
H5	PDGF-AA	341951	259037	226692	348158	8778	258006	1459	232087	7630
H6		354366	256974	237483						
H7	PDGF-AB/BB	23331	19413	16156	22917	585	18290	1589	16389	331
H8		22504	17166	16623						
H9	Pentraxin-3	327676	264298	251140	325450	3147	260473	5408	251475	474
H10		323225	256649	251810						
H11	PF4	61220	44797	48005	59756	2071	45458	934	48049	63
H12		58291	46119	48094						
H13	RAGE	81081	118766	70985	93971	18229	109766	12729	82335	16051
H14		106861	100765	93684						
H15	RANTES	3129789	2290285	2170419	3145497	22214	2308930	26368	2178914	12014
H16		3161205	2327575	2187409						
H17	RBP4	115152	71430	74076	108389	9564	70590	1188	70872	4532
H18		101626	69750	67667						
H19	Relaxin-2	121979	87493	85462	110581	16119	83540	5591	80357	7218
H20		99184	79587	75253						
H21	Resistin	226586	168563	164996	223514	4345	172578	5678	158439	9274
H22		220442	176593	151881						
H23	SDF-1α	171966	133471	124812	164647	10350	129998	4913	118635	8735
H24		157329	126524	112458						
I1	Serpin E1	274129	236177	266761	273908	313	236609	611	274195	10513
I2		273687	237041	281629						
I3	SHBG	117287	115410	108322	119023	2455	120485	7178	97584	15186
I4		120758	125561	86846						
I5	ST2	64114	60605	68888	74577	14797	57814	3947	60547	11795
I6		85039	55023	52207						
I7	TARC	382950	208331	205425	390380	10508	206985	1904	203010	3415
I8		397811	205638	200596						
I9	TFF3	32744	25751	25885	32802	81	26998	1764	27660	2510
I10		32859	28245	29435						
I11	TfR	196357	179334	188442	195883	670	181928	3669	181064	10434
I12		195409	184523	173686						
I13	TGF-α	107723	110824	87970	114401	9445	105597	7392	87349	877
I14		121080	100370	86729						
I15	Thrombospondin-1	321426	262897	226450	321477	72	264633	2456	226454	6
I16		321528	266370	226458						
I17	TNF-alpha	728846	1081973	1072650	737969	12902	1112316	42912	1077587	6982
I18		747093	1142660	1082524						
I19	uPAR	309583	284688	241254	304167	7659	268577	22786	237115	5853
I20		298751	252465	232976						
I21	VEGF	92219	67630	69927	90178	2886	67979	494	65581	6146
I22		88137	68328	61235						
J1	Reference	5816762	5506565	5220744	6060783	345098	5612201	149393	5190241	43137
J2		6304804	5717838	5159739						
J5	Vitamin D BP	214298	146686	128215	215227	1314	148338	2337	130234	2855
J6		216156	149990	132253						
J7	CD31	129321	99830	86519	129066	361	97882	2756	86224	418
J8		128811	95934	85929						
J9	TIM-3	988234	743135	650598	986796	2033	738905	5981	649402	1692
J10		985359	734676	648205						
J11	VCAM-1	95540	75622	60267	90945	6499	81103	7752	60131	193
J12		86349	86585	59995						
J23	Negative	Background	Background	Background	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
J24		Background	Background	Background						

table S6. Primer sequences used.

Primer Name	Sequence
IL-32 enhancer amplicon 1 forward	ACATGGTGAAATCCCGTCCC
IL-32 enhancer amplicon 1 reverse	CCCTAAAACCACTAGCTGAGCA
IL-32 enhancer amplicon 2 forward	TGAGAATCTCGTGAGGCTGG
IL-32 enhancer amplicon 2 reverse	ACTTCTCACCAAACCTGTCC
Total IL-32 forward	AGGACGTGGACAGGTGATGTC
Total IL-32 reverse	GTCTCCAGGTAGCCCTCTTTGA
Cyclophilin A (CypA/PPIA) forward	TCATCTGCACTGCCAAGACTG
Cyclophilin A (CypA/PPIA) reverse	CATGCCTTCTTTCACTTTGCC
β2-microglobulin (B2M)-fw	ATGAGTATGCCTGCCGTGTG
β2-microglobulin (B2M)-rev	CCAAATGCGGCATCTTCAAAC
3C primer A	CCTCTATGTGTTCTCTGGGTCG
3C primer rs4349147	GCAGGATAGAAGGTGAGAGATGAAT
3C primer B	GGGAACCTGACCTCAGACAG
3C primer C	GCACCCCTGTTGTTTCCTCA
3C primer IL32 promoter	GAGGGAAAGTCCAGACTCGG
3C primer D	TCAGCCAAGCTCAGACAGC
3C primer E	GTGGCTTCCTTCTGTCTCCC
IL4R forward	CGTGGTCAGTGCGGATAACTA
IL4R reverse	TGGTGTGAACTGTCAGGTTTC
TNFRSF14 forward	GTGCAGTCCAGGTTATCGTGT
TNFRSF14 reverse	CACTTGCTTAGGCCATTGAGG
STAT5A forward	CGACGGGACCTTCTTGTTG
STAT5A reverse	GTTCCGGGGAGTCAAACTTCC
LGALS1 forward	TCGCCAGCAACCTGAATCTC
LGALS1 reverse	GCACGAAGCTCTTAGCGTCA
ANXA1 forward	GCAGGCCTGGTTTATTGAAA
ANXA1 reverse	GCTGTGCATTGTTTCGCTTA
IL-32 enhancer gRNA 1 forward	ACCGGAAAAGAAAGTTGGGGGCCG
IL-32 enhancer gRNA 1 reverse	ACCGGCCAGCCTGCCGTTCAGCAG
IL-32 enhancer gRNA 2 forward	AAACCGGCCCCCAACTTTCTTTTC
IL-32 enhancer gRNA 2 reverse	AAACCTGCTGAACGGCAGGCTGGC
IL-32 promotor forward	GTGGAGCTGGGTCATCTCAG
IL-32 promotor reverse	CATGGCGGCCAAAAGTTCAA
rs12447486 forward	AGATCTGGCTGGATCCTGGT
rs12447486 reverse	TACTCATGCCTGCCTTCTGC
rs4349147 forward	CCTGGGGCAAGGATGATAGG
rs4349147 reverse	AGACCCAGCCTCACGAGATT
Oca2 promoter forward	TAAACCCTCCCTGCCTGTT
Oca2 promoter reverse	CCCTCTGAGTTCTTACTTCG
Mock sgRNA 1 forward	ACCGGTCAAGGTGCACTCAATCGC
Mock sgRNA 1 reverse	AAACGCGATTGAGTGCACCTTGAC
Mock sgRNA 2 forward	ACCGGCTATCATCATCAGGGGCCG
Mock sgRNA 2 reverse	AAACCGGCCCCTGATGATGATAGC
Amer1 forward	AGTACCCGTGAACAAACAGCA
Amer1 reverse	AGGCAGAGTACAGATACCCTTC
CXXC4 forward	ATGCACCACCGAAACGACTC
CXXC4 reverse	GCAGTGTTCAGGGGATAAGGT
TNIK forward	TAAGGGTCGTCATGTCAAAACG
TNIK reverse	CCATGCCTGGTGGGTTCTTT
IL-32 non-alpha forward	TCTTCATGTCCCTCTTTCCAGTCCTA
IL-32 non-alpha reverse	AAGGTGGTGTCAGTATCTTCATTTTG
IL-32 alpha forward	CTTTTGGCCGCCATGTG
IL-32 alpha reverse	GTGCATTCGGGCCTTCAG
IL-32 beta forward	GAAGACTGCGTGCAGAAGGT
IL-32 beta reverse	CTTTCTATGGCCTGGTGCAT
IL-32 gamma forward	AGGCCCGAATGGTAATGCT
IL-32 gamma reverse	CTGTCTCCAGGTAGCCCTCT