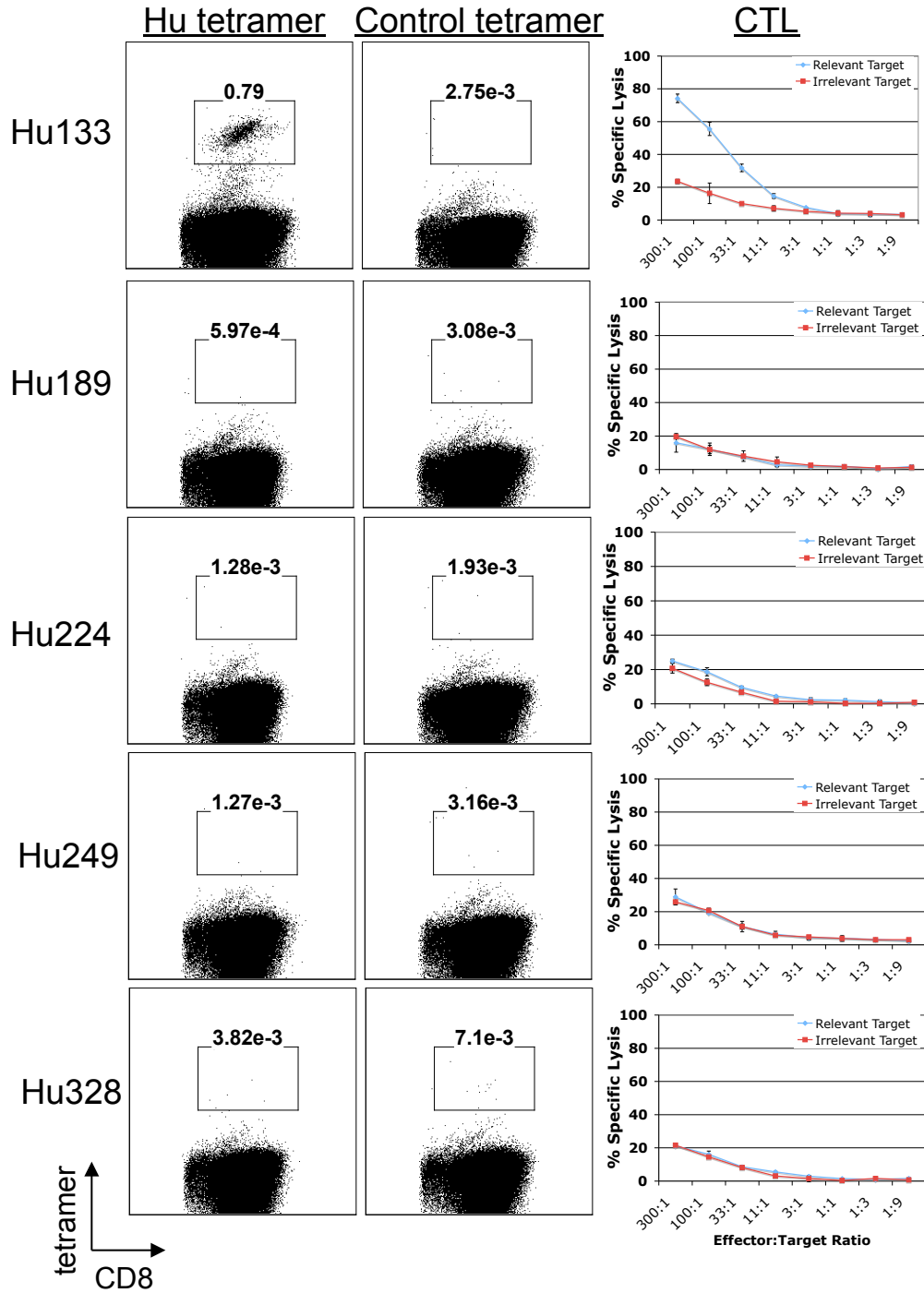


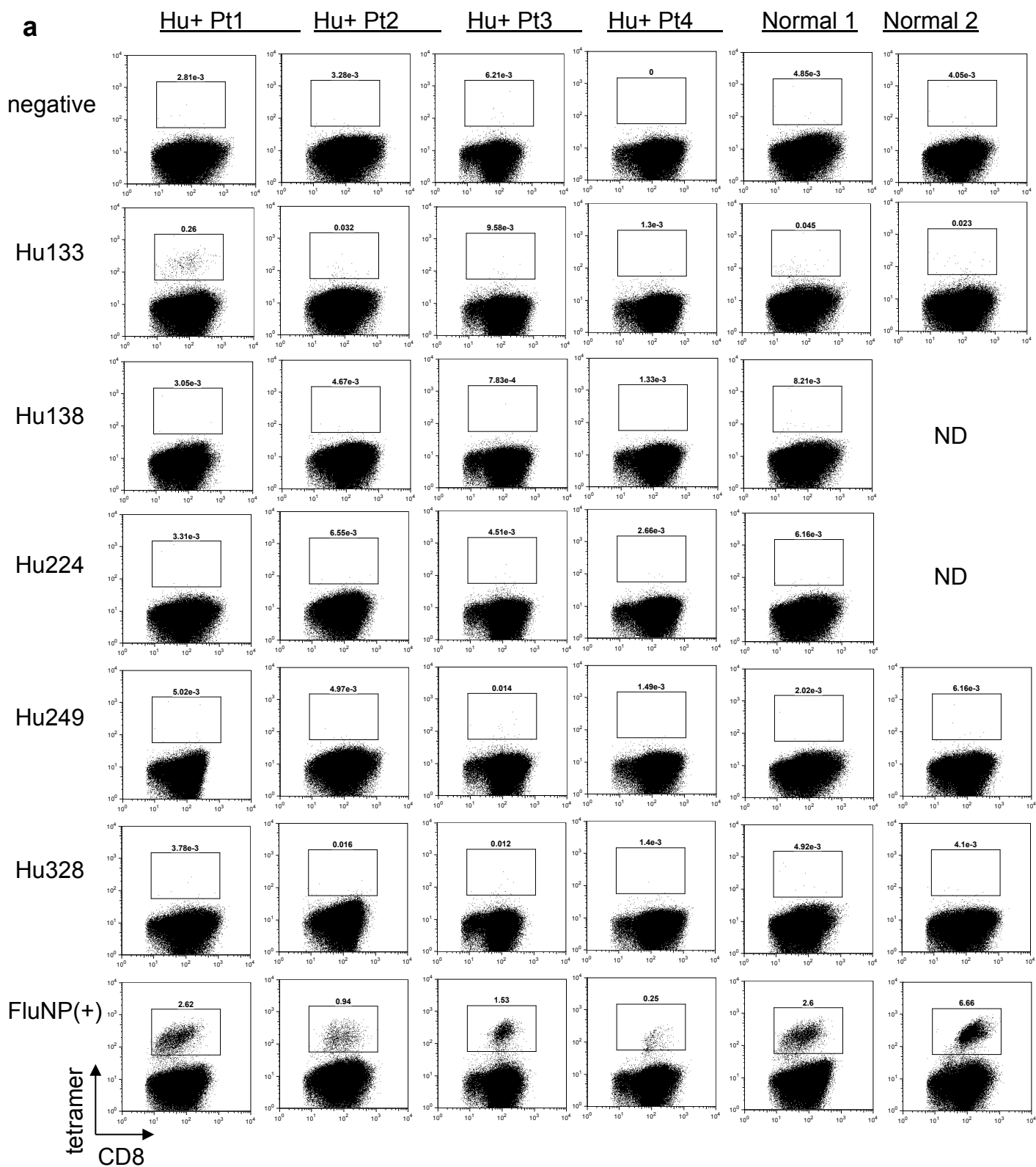
Roberts, et al., Supplemental Figure 1.

		10	20	30	40	50	60	70	
HuA	-- -- -- -- -- -- -- -- --	M	S	N	G	Y	E	D	H
HuB	-- -- -- -- -- -- -- -- --	M	E	T	Q	L	S	N	G
HuC	-- -- -- -- -- -- -- -- --	M	E	S	Q	V	G	G	G
HuD	M	E	W	N	G	L	K	M	I
		80	90	100	110	120	130	140	
HuA	I	G	E	V	E	S	A	K	L
HuB	I	G	E	I	E	S	C	K	L
HuC	I	G	D	I	E	S	C	K	L
HuD	I	G	E	I	E	S	C	K	L
		150	160	170	180	190	200	210	220
HuA	M	T	Q	K	D	V	E	D	M
HuB	M	T	Q	K	E	L	E	Q	L
HuC	M	S	Q	K	E	M	E	Q	L
HuD	M	T	Q	K	E	L	E	Q	L
		230	240	250	260	270	280	290	
HuA	K	N	V	A	L	L	S	Q	L
HuB	T	N	Q	A	I	L	S	Q	L
HuC	T	G	Q	A	L	L	T	H	L
HuD	S	S	Q	A	L	L	S	Q	L
		300	310	320	330	340	350	360	370
HuA	G	N	A	S	S	G	W	C	I
HuB	G	H	P	G	T	G	W	C	I
HuC	G	A	L	Q	A	G	W	C	I
HuD	G	H	T	G	T	G	W	C	I
		380							
HuA	D	K	I	L	Q	V	S	F	K
HuB	D	R	V	L	Q	V	S	F	K
HuC	E	R	V	L	Q	V	S	F	K
HuD	D	R	V	L	Q	V	S	F	K

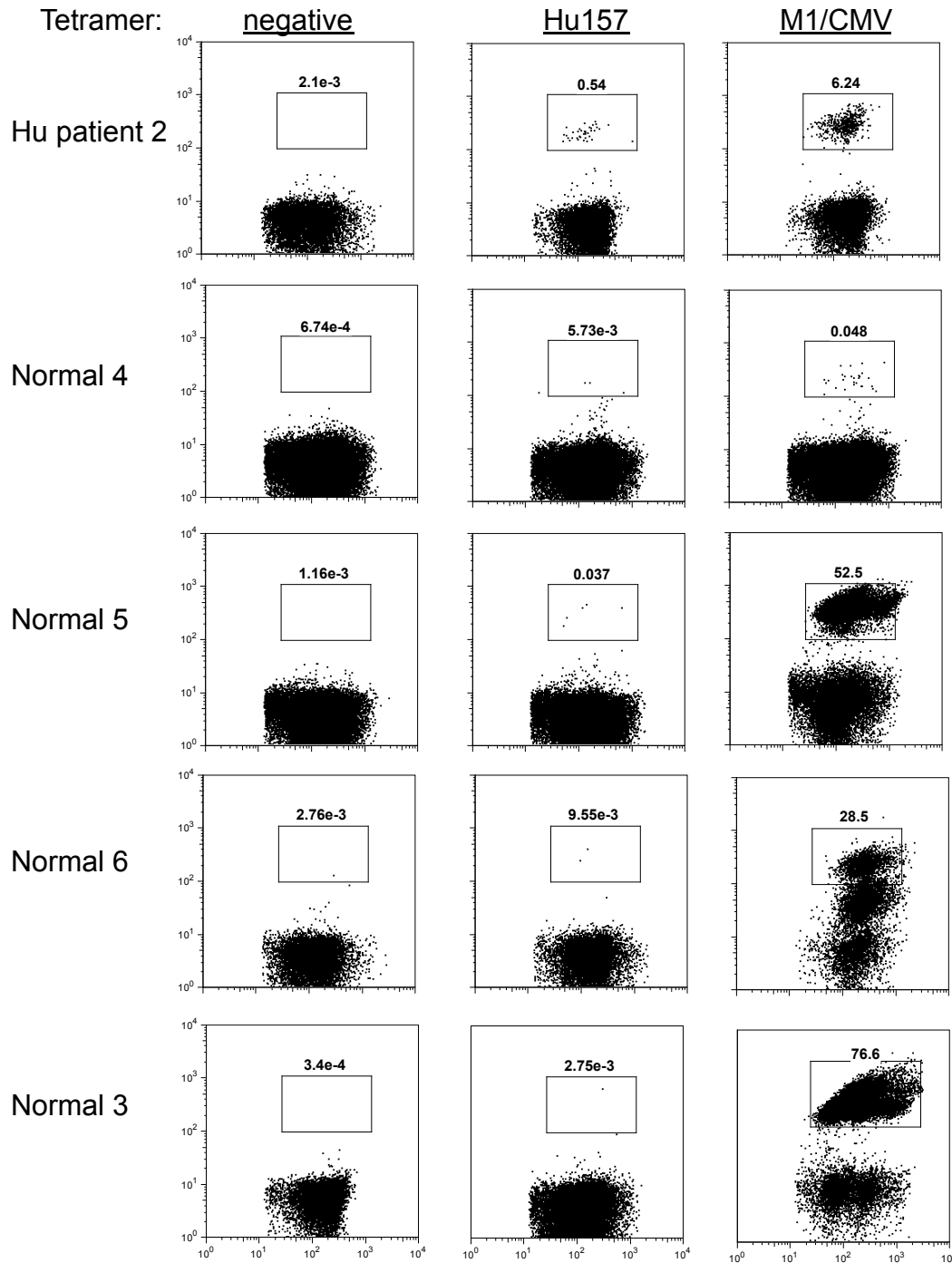
**Supplemental Figure 1.** Alignment of the protein sequences of the Hu family members. The peptide sequences used in the patient experiments are boxed.



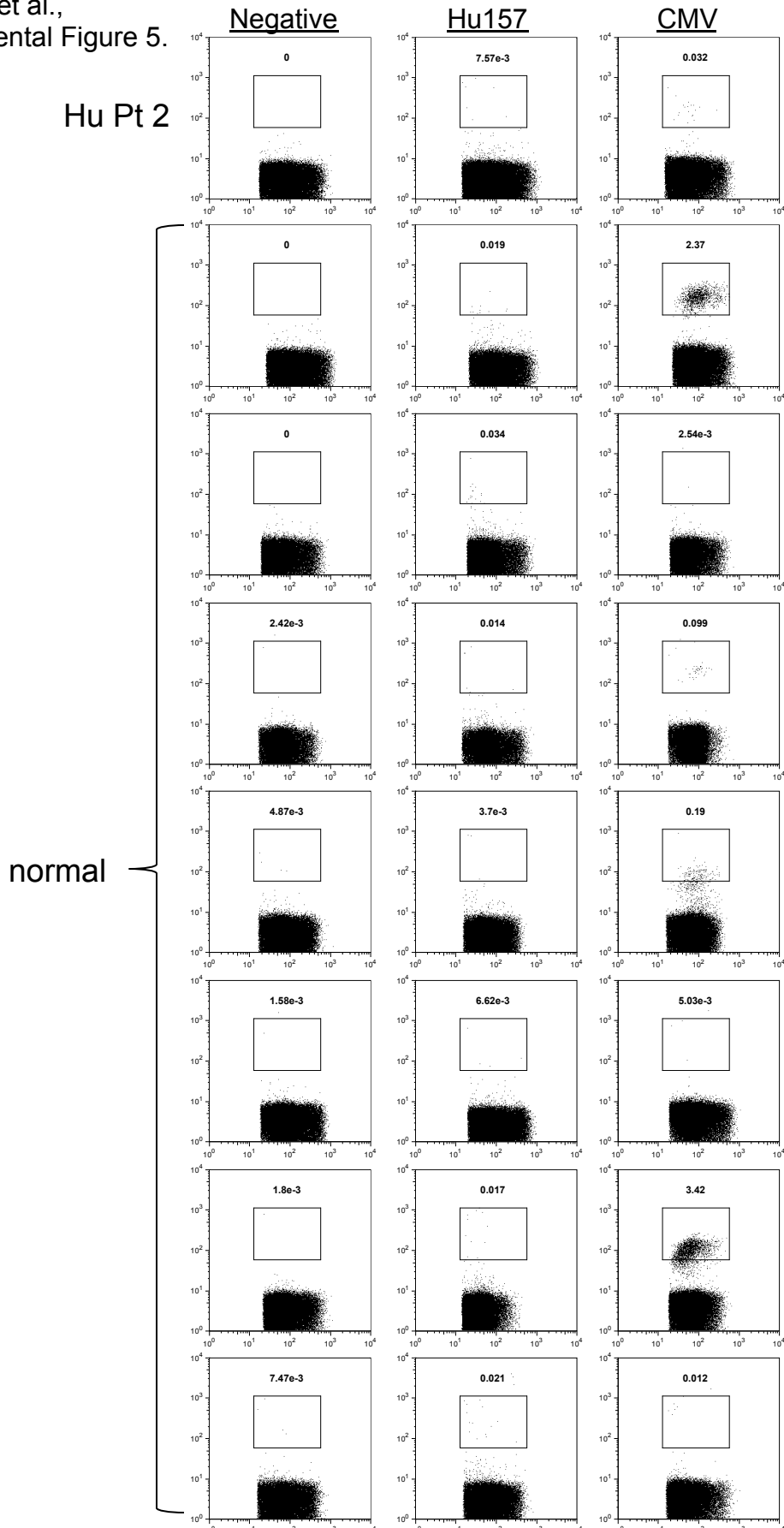
**Supplemental Figure 2.** Screening of predicted HLA-A0301 peptides by tetramer staining of cells from Hu patient 1 showing additional peptides. Cells were tetramer stained after one round of *in vitro* expansion with the corresponding A0301 predicted peptides. The expanded T cells were also tested for functional activity in a CTL assay (right panels).



**Supplemental Figure 3.** Tetramer staining of T cells from four different HLA0301 patients (including three chronic) and two controls after expansion with A0301 Hu peptides. CD8+ T cells were expanded once as described in Methods. Negative control (top row) is an irrelevant tetramer, and positive control (bottom row) is the HLA-A0301-restricted epitope of influenza nucleoprotein (NP).

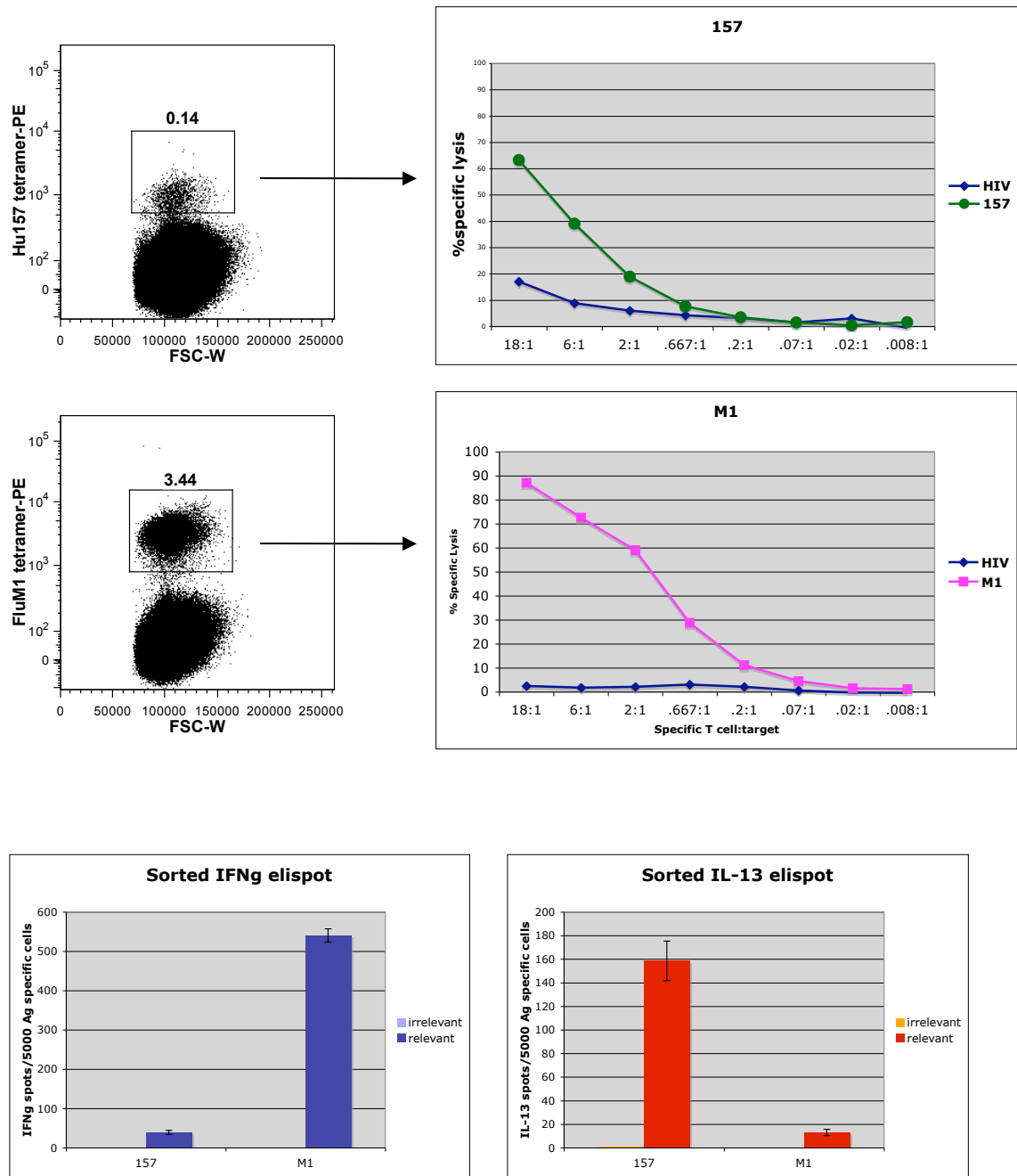


**Supplemental Figure 4.** Tetramer staining of peripheral blood cells from an A0201 Hu patient and normal donors after one *in vitro* stimulation with Hu157 peptide (same as Figure 2c, showing additional control donors). Cells were stained with negative control (irrelevant) tetramer, HuD157 tetramer, influenza M1 tetramer (positive control) or CMV tetramer (positive control) and CD8 as described in Methods. Cells are gated on the CD8+ topo3+ population. None of four neurologically normal patients (one of whom had small cell lung cancer but no detectable HuD antibodies, three healthy A0201 donors, one healthy A0206 donor) harbored Hu157-specific CD8+ T cells in this re-stimulation assay, demonstrating that the tetramer positive population in the Hu patients was not due to *in vitro* priming. Each control patient harbored T cells specific for at least one of two positive control HLA-A0201 tetramers (influenza M1 or CMV specific).



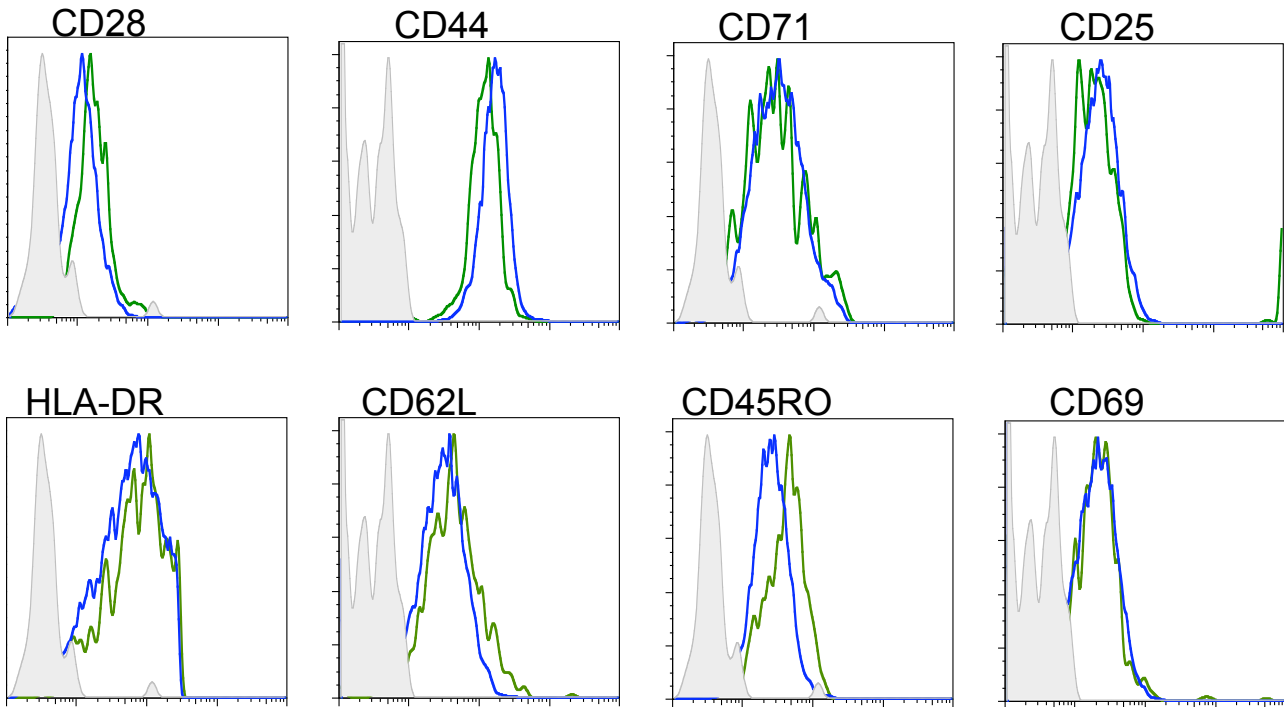
**Supplemental Figure 5.** Ex vivo tetramer staining of T cells from an HLA0201 Hu patient and seven HLAA0201 controls. Negative control (first column) is an irrelevant tetramer, and positive control (right column) is tetramer of the HLA-A0201 restricted epitope of CMV.

Roberts, et al., Supplemental Figure 6.

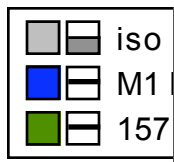


**Supplemental Figure 6.** Sorting and function of Hu157-specific T cells from patient 3. The same experiment as in Figure 3, with T cells from Hu patient 3.

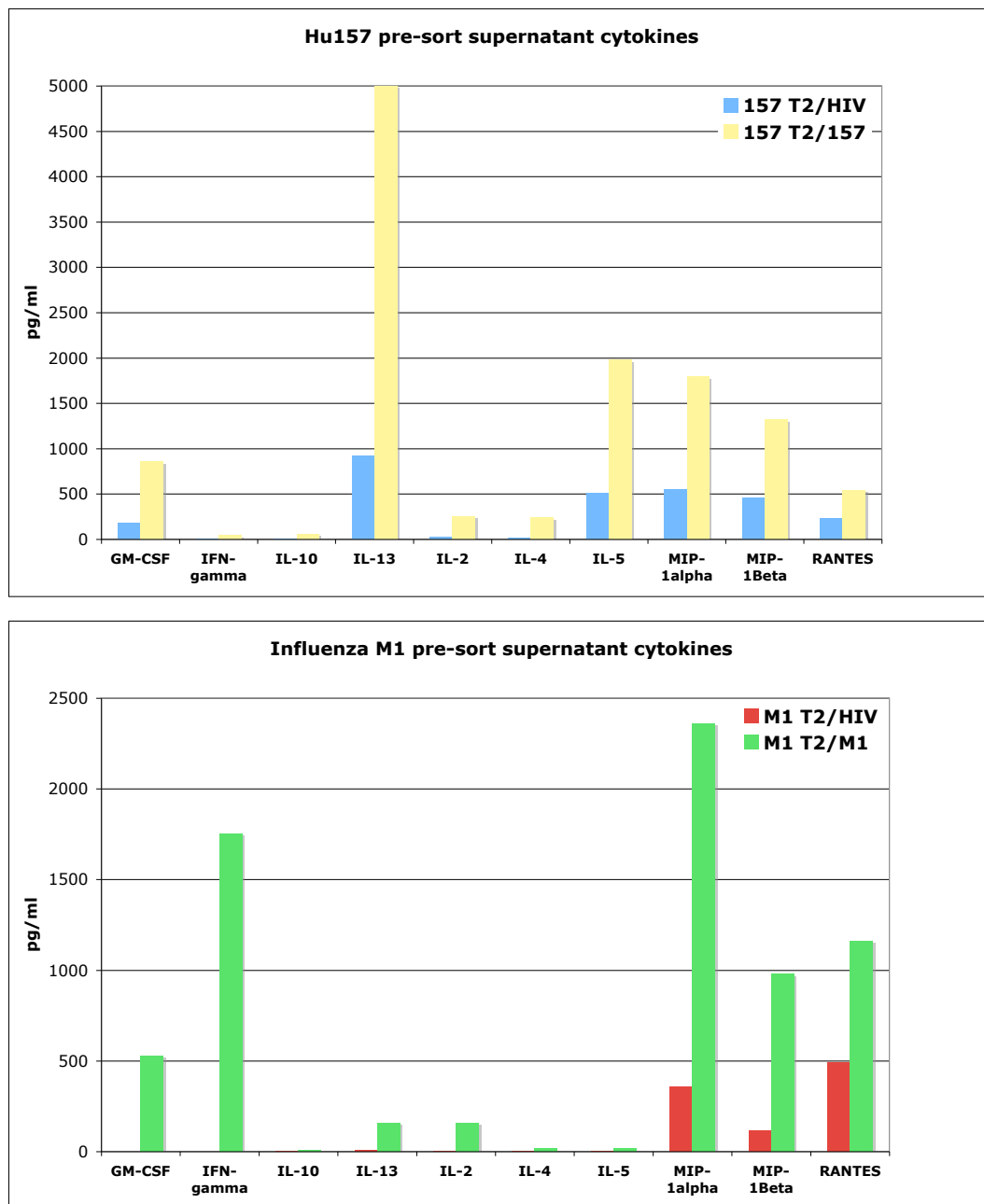
Surface staining of tetramer+ cells



(gated on tetramer+ cells)



**Supplemental Figure 7.** Surface staining of Hu157 and influenza M1 tetramer+ cells.



**Supplemental Figure 8.** Cytokines in culture supernatants of unsorted cultures of influenza M1 and Hu157 T cells from Patient 1. Supernatants from pre-tetramer sort T cell cultures (10-fold fewer M1 T cells to account for lower percentage of Hu157 tetramer+ T cells) stimulated with T2 pulsed with HIV, Hu157 or M 1 peptide, demonstrating that the production of IL-13 in response to Hu157 is not due to the effects of tetramer sorting. The average value of duplicate samples is shown.



Roberts, et al., Supplemental Table 1.

Supplementary Table 1. Results of *in vitro* peptide screen

**HLA-A0101**

<b>peptide</b>	<b>sequence*</b>	<b>binding %</b>	<b>ED50</b>	<b>t1/2</b>	<b>score</b>
127	ASIRDANLY	79	5.8 E-6	1.49	0.264
147	ELEQLFSQY	63.6	7.6 E-6	0.85	0.159
277	TIDGMTSLV	50.7	3.1 E-5	0.55	0.084

These three positive, but low-scoring A0101 peptides were tested with patient cells as for other alleles, but no responses were detected (data not shown).

**HLA-A0201**

<b>peptide</b>	<b>sequence*</b>	<b>binding %</b>	<b>ED50</b>	<b>t1/2</b>	<b>score</b>
4	IISTMEPQV	53.3	6.4 E-6	2.03	0.22
40	TTDDSKTNL	36.3	1.1 E-5	2.22	0.154
64	SLFGSIGEI	76.9	4.1E -7	5.52	0.791
150	<b>QLFSQYGRI</b>	63.8	2.9 E-7	1.63	0.392
157	RIITSRILV	39.9	1.9E -7	5.86	0.548
163	<b>ILVDQVTGV</b>	66	1.2 E-6	19.16	1.081
167	QVTGVSRGV	43.2	1.1E -6	4.57	0.382
220	<b>ALLSQLYQS</b>	67.9	2.6 E-7	8.34	0.951
245	<b>RLDNLLNMA</b>	63.6	3.5 E-7	5.94	0.724
248	<b>NLLNMAYGV</b>	73	1.8 E-7	10.56	1.208
249	<b>LLNMAYGVK</b>	57.5	4.7 E-7	5.65	0.618
259	<b>LMSGPVPPS</b>	71.2	2.4 E-7	1.77	0.463
260	<b>MSGPVPPSA</b>	74.6	2.6 E-7	2.14	0.52
276	<b>ITIDGMTSL</b>	64	3.90E-07	4.56	0.366
277	<b>TIDGMTSLV</b>	72	5.90E-07	3.07	0.525
315	<b>QLFGPFGAV</b>	76.1	2.1 E-7	3.53	0.705
362	<b>RLGDRVLQV</b>	51.5	1.2 E-6	9.01	0.611
376	<b>YGVKRFSPi</b>	54.3	4.3 E-6	4.89	0.373

\*bold in peptide sequence represents differences from HuA sequence

**HLA-A0301**

<b>peptide</b>	<b>sequence*</b>	<b>binding %</b>	<b>ED50</b>	<b>t1/2</b>	<b>score</b>
115	KTIKVSyar	76.8	7.2 E-6	2.78	0.339
133	NLYVSGLPK	105.6	1.9 E-6	3.23	0.596
138	GLPKTMTQK	98.5	3.7 E-6	5.55	0.656
189	AIKGLNGQK	63.3	9.4 E-6	4.62	0.358
224	QLYQSPNRR	113.7	2.1 E-6	7.9	0.973
249	LLNMAYGVK	57.5	4.7 E-7	5.65	0.618
328	VIRDFNTNK	61.2	3.8 E-6	5.85	0.458
368	LQVSFKTNK	62.6	2.0 E-6	2.49	0.342

Supplementary Table 2.

HLA types of patients and controls

<b>Patient</b>	<b>HLA-A type</b>	
Patient 1	0101	0301
Patient 2	0201	0301
Patient 3	0201	0301
Patient 4	0301	2402
Normal 1	0101	0301
Normal 2	0201	0301
Normal 3	0201	2902
Normal 4	0201	
Normal 5	0201	2402
Normal 6	0206	2402

























Supplemental Table 3

241843_at	0.151	EIF5	1558273_a_at	0.0895	TYRO3
206637_at	0.151	P2RX14	216284_at	0.0893	CDC14B
237497_at	0.15		1559494_at	0.0892	TMEM22
239645_at	0.149	CCM2	235418_at	0.0889	LOC285014
243739_at	0.149	RANBP9	207231_at	0.0879	DZIP2
239840_at	0.148		230712_at	0.0879	FLJ20719
242874_at	0.147		229073_at	0.0878	LOC145786
1563860_at	0.143	LOC400965	230876_at	0.0874	LOC169834
240538_at	0.139		203693_s_at	0.0874	E2F3
239278_at	0.139		214808_at	0.0868	
240339_at	0.139	CNNM3	1569935_at	0.0866	LOC91431
233369_at	0.137	SOS2	1568706_s_at	0.0864	
213280_at	0.136	GARNL4	22371_at	0.0859	PIAS1
226863_at	0.135		226720_at	0.0858	KIAA1935
1556942_at	0.134	KIAA1126	225163_at	0.0857	FRMD4A
1558711_at	0.13	FAM13A1OS	226683_at	0.0856	SNAG1
205771_s_at	0.129	AKAP7	229021_at	0.0854	MCTP2
237201_at	0.124		1560512_at	0.0852	
204446_s_at	0.122	ALOX5	244103_at	0.0852	C1orf55
215029_at	0.12		236703_at	0.0845	
243496_at	0.119		205445_at	0.084	PRL
207623_at	0.117	ABCF2	225666_at	0.0829	FLJ14624
1558732_at	0.116		234082_at	0.0826	
235782_at	0.113		233369_at	0.0823	SOS2
213800_at	0.105	CFH	236938_at	0.0821	
230707_at	0.101	SORL1	213894_at	0.082	KIAA0960
228908_s_at	0.101	C21orf86	226939_at	0.0819	CPEB2
233430_at	0.0912	TBC1D22B	211703_s_at	0.0818	TM2D1
212761_at	0.0893	TCF7L2	1557553_at	0.0817	PPP1R12B
220030_at	0.0854	STYK1	225685_at	0.0813	CDC42EP3
240019_at	0.0838		227897_at	0.0802	RAP2B
1569652_at	0.078	MLLT3	239179_at	0.0802	CAMK2G
206114_at	0.0733	EPHA4	237796_at	0.0801	MSRA
243020_at	0.0711	FAM13A1	1555634_a_at	0.08	LILRA5
235925_at	0.0693	TCF12	227980_at	0.0797	HCG12
237291_at	0.0684	LOC344405	242194_at	0.0796	CUL4A
236656_s_at	0.0529		232196_at	0.0793	C21orf13
237953_at	0.0215	DPF4	239096_at	0.0793	C14orf32
			237700_at	0.0792	
			1570143_at	0.0791	
			243960_x_at	0.0788	DKFZP434A0131
			234599_at	0.0786	
			232144_at	0.0785	PBX1
			1563521_at	0.0781	MOBK12B
			239783_at	0.078	TRERF1
			205110_s_at	0.0779	FGF13
			1563876_at	0.0773	FLJ35530
			203814_at	0.0772	GRM3
			220091_at	0.0769	SLC2A6
			217550_at	0.0767	ATF6
			219712_s_at	0.0764	TRPV1 ; CARKL
			202421_at	0.0764	IGSF3
			218226_s_at	0.0763	NDUFB4
			223243_s_at	0.0762	C1orf22
			229049_at	0.076	
			203615_x_at	0.0759	SULT1A1
			214774_x_at	0.0752	TNRC9
			234244_at	0.0745	BXDC5
			235419_at	0.0735	MIG-6
			215108_x_at	0.0735	TNRC9
			1564391_at	0.0731	ABCD3
			207790_at	0.0722	LRRC1
			1558371_a_at	0.0721	
			1554933_at	0.0721	PSIP1
			239638_at	0.0719	
			238100_at	0.0718	
			224651_at	0.0716	C10orf9
			233793_at	0.0711	SIAT7E
			234069_at	0.0711	
			2151969_at	0.071	GA17
			224999_at	0.0708	EGFR
			211949_s_at	0.0707	NOLC1
			205966_at	0.0707	TAF13
			235676_at	0.0704	SEC11L3
			244737_at	0.0703	DKFZP434I116
			234236_at	0.0702	FLJ20294
			202606_s_at	0.0692	TLK1
			1560104_at	0.069	
			228827_at	0.0689	RUNX1T1
			237864_at	0.0684	RAB22A
			236908_at	0.0679	ACPL2
			206088_at	0.0679	
			205990_s_at	0.0678	WNT5A
			1564658_at	0.0672	FLJ39237
			239550_at	0.0671	
			226905_at	0.0667	MGC45871
			235379_at	0.0664	
			237183_at	0.0664	
			1556735_at	0.0662	
			240267_at	0.0662	SYT6
			1555889_at	0.0661	MAP3K7IP2
			207756_at	0.066	
			244094_at	0.0657	C9orf93
			215268_at	0.0654	KIAA0754
			235061_at	0.0648	PPM1K
			219115_s_at	0.0645	IL20RA
			216770_at	0.0644	
			206374_at	0.0641	DUSP8
			229390_at	0.0641	LOC441168
			244248_at	0.0641	FLJ20272
			244169_x_at	0.0638	
			233637_at	0.0637	WDR42A
			1559044_at	0.0636	EXOSC1
			218196_at	0.0635	OSTM1
			228273_at	0.0633	FLJ11029
			220893_at	0.0632	LOC57399
			224933_s_at	0.0631	JMID1C
			243691_at	0.063	KIAA0276
			242989_at	0.063	
			216933_x_at	0.063	APC
			232527_at	0.0629	
			238695_s_at	0.0628	RAB39B
			238415_at	0.0622	UBE4B
			203881_s_at	0.0621	DMD
			1555827_at	0.062	CCNL1
			1564851_at	0.0619	
			218303_x_at	0.0618	LOC51315
			231589_at	0.0615	347512 ; LOC442467
			213747_at	0.0614	
			228920_at	0.0612	ZFP260
			1554026_a_at	0.0609	MYO10
			205511_at	0.0609	FLJ10038
			227626_at	0.0608	PAQR8
			204184_s_at	0.0606	ADRBK2
			1560237_at	0.0606	

Supplemental Table 3

1555643_s_at	0.0604	LILRA5
232881_at	0.0602	SANG
231111_at	0.0601	PACE-1
1568807_a_at	0.0598	NDFIP2
222288_at	0.0593	
219642_s_at	0.0592	PEX5L
244406_at	0.059	LOC388508
208070_s_at	0.059	REV3L
236131_at	0.0589	COPG2
218238_at	0.0589	GTPBP4
212341_at	0.0586	YIPF6
201810_s_at	0.0585	SH3BP5
217534_at	0.0583	FAM49B
1558308_at	0.0581	FLJ33297
1566115_at	0.058	NEED4L
226875_at	0.0579	DOCK11
227260_at	0.0579	ANKRD10
226877_at	0.0574	LOC132241
209486_at	0.057	SAS10
237165_at	0.0565	
232050_at	0.0564	JC283874 ; PDPK1
215156_at	0.0562	REC14
1553944_at	0.0561	MIA2
239679_at	0.0556	ACTR6
219598_s_at	0.0556	RWDD1
223977_s_at	0.0556	CL80F2
1557586_s_at	0.0555	ATP6V1H
1561286_a_at	0.0554	C21orf106
243706_at	0.0554	CDO1
219022_at	0.0554	FLJ12448
219791_s_at	0.0553	NBLA00301
239476_at	0.055	PIK3R1
237626_at	0.0549	RB1CC1
241276_at	0.0542	
217620_s_at	0.0538	PIK3CB
236645_at	0.0526	HBP1
48808_at	0.0521	DHFR
1554418_s_at	0.052	SPOCK3
220030_at	0.052	STYK1
237498_at	0.0519	
237436_at	0.0518	
1556051_a_at	0.0514	BICD1
242446_at	0.0514	C6orf163
1561944_at	0.0511	
244144_at	0.0511	SYNE1
204851_s_at	0.051	DCX
1561215_at	0.0507	
215889_at	0.0507	SKIL
240594_at	0.0506	CDYL
237263_at	0.0505	
207750_at	0.0504	EPS15L2
232606_at	0.0504	ANK2
221191_at	0.0498	DKFZP434A0131
217678_at	0.0496	SLC7A11
1561165_a_at	0.0494	DEFB108B
229994_at	0.0492	
230528_s_at	0.0491	MGC2752
215299_x_at	0.049	SULT1A1
1569353_at	0.0484	CP110
230690_at	0.0483	TUBB1
234235_at	0.0483	
231904_at	0.0479	
237189_at	0.0475	UZAF1
239742_at	0.0474	TULP4
244005_at	0.0474	GPC5
207264_at	0.0473	KDEL3
227208_at	0.0468	DLNB14
215658_at	0.0467	
1566897_at	0.0465	SPPL3
241970_at	0.0465	PVRL3
202534_x_at	0.0464	DHFR
1562988_at	0.0463	
240896_at	0.0461	
1554140_at	0.046	WDR78
241567_at	0.046	
1570120_at	0.0456	
238021_s_at	0.0455	LOC388279
1558903_at	0.045	
214306_at	0.0446	OPA1
241872_at	0.0445	DKFZp761D221
228411_at	0.0442	ALS2CR19
235511_at	0.0441	RBM30
226725_at	0.044	
235570_at	0.044	RBMS3
244040_at	0.0439	
1559949_at	0.0437	TRPS1
231227_at	0.0435	WNT5A
1561474_at	0.0434	
240709_at	0.0433	SEZ6L
234588_at	0.0432	
235208_at	0.0425	MGC39633
243940_at	0.0421	ZNF218
231513_at	0.0421	KCNJ2
1555219_at	0.042	RGR
242496_at	0.0419	
1558369_at	0.0417	MPHOSPH9
242323_at	0.0414	
231101_at	0.0413	PPP2R5E
231235_at	0.0407	NKTR
240977_at	0.0403	LRCH1
220645_at	0.0401	FAM55D
237135_at	0.0401	
244459_at	0.0397	LOC112885
226382_at	0.0392	LOC283070
230232_at	0.039	KIAR0746
205031_at	0.039	EFNB3
241376_at	0.0386	
233614_at	0.0384	CBLB
206858_s_at	0.0381	HOXC6
239875_at	0.0381	
224095_at	0.038	
1557828_a_at	0.0379	FLJ32363
232542_at	0.0377	
239600_at	0.0377	
1555301_a_at	0.0371	C21orf106
1562065_at	0.037	
1553706_at	0.0368	
232128_s_at	0.0366	CLCN5
210227_at	0.0366	DLGAP2
233604_at	0.0366	FLJ22763
235757_at	0.0366	C10orf18
239815_at	0.0364	NCOA5
237545_at	0.0364	CAMTA1
1563679_at	0.0363	LOC150577
241029_at	0.0362	

Supplemental Table 3

220406_at	0.0361	TGFB2
231940_at	0.036	ZNF529
235875_at	0.036	SLC1A4
1570415_at	0.0357	DDX52
220410_s_at	0.0357	CAMSAP1
1556053_at	0.0356	DNAJC7
233995_at	0.0356	KIAA0372
222326_at	0.0356	PDE4B
240384_at	0.0345	WWP2
220201_at	0.0344	MNAB
241668_s_at	0.0342	
213133_s_at	0.0342	GCSH
226225_at	0.0342	MCC
243054_at	0.034	ZMYND11
241237_at	0.0338	
242428_at	0.0335	DCUN1D1
1568698_at	0.0333	
215968_at	0.0333	MGC15606
237984_x_at	0.0332	TRPM7
1566603_s_at	0.0331	RPUSD3
239965_at	0.0328	LOC151878
242680_at	0.0328	
203819_s_at	0.0327	IMP-3
241228_at	0.0326	
243352_at	0.0324	ALPK1
242801_at	0.0323	
243819_at	0.032	GNG2
217290_at	0.032	
234276_at	0.0319	USP6NL
226767_s_at	0.0311	FAHD1
244564_at	0.0311	
1553873_at	0.031	RP11-450P7.3
240200_at	0.031	SULT1C1
1569449_a_at	0.0307	CRSP2
217659_at	0.0303	KIAA0261
233692_at	0.0302	THADA
240479_at	0.0299	HS3ST5
1564093_at	0.0296	NEK1
223885_at	0.0295	CALN1
1562447_a_at	0.0294	
243846_x_at	0.0293	FLJ32810
237442_at	0.0291	APBB1IP
201690_s_at	0.0288	TPD52
238028_at	0.0278	FLJ90086
1558428_at	0.0276	ALS2CR11
232098_at	0.0275	DST
237594_at	0.0268	MS12
240386_at	0.0267	TRPM1
244655_at	0.0266	
1555675_at	0.0264	BRCC2
220576_at	0.0263	PGAP1
240438_at	0.0254	U2AF1L2
231523_at	0.0253	FGF14
1561877_at	0.025	
57703_at	0.0246	SENP5
238735_at	0.0246	TCF12
1557543_at	0.0242	NOTCH2
239504_at	0.0242	BCLAF1
214235_at	0.024	CYP3A5
231316_at	0.0239	NEK9
1556288_at	0.0239	LOC284274
207693_at	0.0236	CACNB4
241186_at	0.0236	
241226_at	0.0236	CDA08
240990_at	0.0232	
212677_s_at	0.023	KIAA0582
232439_at	0.0226	
239486_at	0.0222	
236142_at	0.0219	
223281_s_at	0.0219	COX15
242837_at	0.0215	SFRS4
1559695_a_at	0.0211	DLGAP1
1552947_x_at	0.021	ZNF114
237628_at	0.0207	WARS2
241940_at	0.0197	ABHD3
232023_at	0.0197	TMEM67
223598_at	0.0196	RAD23B
220551_at	0.0189	SLC17A6
237459_at	0.0186	PCTK2
1552582_at	0.0186	ABCC13
219789_at	0.0182	NPR3
230967_s_at	0.018	USP7
237469_at	0.0162	TOP2A
1570125_at	0.0162	
241295_at	0.0161	
220157_x_at	0.0151	.EKHA9 ; PLEKH8
1552946_at	0.0146	ZNF114
230689_at	0.0132	
242233_at	0.0125	KIAA1219
235112_at	0.0115	KIAA1958
1565329_at	0.0113	POLE4
1561556_at	0.0111	
213245_at	0.0105	ADCY1
244187_at	0.0101	SATL1
229461_x_at	0.00911	NEGR1
1563022_at	0.00828	LOC347475