

Table S1. Clinical characteristics of ccRCC tumors

Sex	
Male	33
Female	14
NA	7
Age (in years)	
Median	60
Range	31-86
Clear cell histology	54
Tumor size (largest dimension, in cm)	
Median	6
Range	2-14
Stage at Diagnosis	
I	25
II	8
III	16
IV	1
NA	4
Grade at Diagnosis	
1	2
2	20
3	25
4	0
NA	7

Grade is the Fuhrman grade of the tumor and Stage is from the TNM stage classification. NA - not available.

Table S2. Genes determined to be gained and overexpressed in the Penn Data

Gene	Segment	Expression fold change
EEF1D	8_144719785_145348219	681
RPLP2	11_492013_1405948	286
VCAN	5_82429444_83404045	246
GTF2I	7_71542285_73758949	129
ATP6V0E1	5_171206830_172607425	96
EPB41L4A	5_111505154_111922638	88
AP3D1	19_1877027_2257574	72
HNRNPH1	5_178965094_179393918	70
HAVCR1	5_153318241_156728896	70
ELL2	5_95185578_96572060	68
ZFR	5_31825436_34192908	67
TPM4	19_15966270_17119827	67
ITGB8	7_20267666_20410154	62
PRRC1	5_126472912_127898523	60
CDH6	5_31118743_31275604	60
LOX	5_121379525_121463477	60
C5orf13	5_109028224_111491735	59
RAPGEF6	5_130783666_130814765	58
ERAP1	5_95185578_96572060	56
YTHDC2	5_112703850_113188388	47
SCAMP1	5_77424969_79064481	47
AP3B1	5_76396572_77394843	44
C7orf25	7_34509633_43546690	44
POLR3G	5_89715117_90038886	43
LOC100132832	7_75852517_76583054	43
RHEB	7_150769315_150816588	41
APC	5_111922639_112678649	39
GADD45B	19_2303639_2434712	37
AFF4	5_132093779_133869573	37
ST8SIA4	5_99896738_100307187	34
PRKAA1	5_38914975_40803153	34
CACNA2D1	7_79232817_81720844	33
SNX13	7_17701437_17798330	33
POLR2J4	7_43546691_44301066	32
SSBP2	5_80472997_80863775	31
CDC2L5	7_34509633_43546690	30
XRCC4	5_82377867_82413321	30
SLC36A1	5_150387976_151495148	29
UBE2I	16_37354_1504823	29
TMED2	12_121405862_124283213	27
HSPA4	5_132093779_133869573	26
ZCCHC10	5_132093779_133869573	24
G3BP1	5_150387976_151495148	24
FEM1C	5_114787094_117418456	23

PMS2L2	7_71542285_73758949	23
TMCO6	5_137965436_142619254	22
ZDHHC11	5_80564_1460115	22
CD36	7_79232817_81720844	22
KIAA0415	7_4443550_5856693	22
PKD2L2	5_137033572_137695243	22
SEMA3A	7_82670591_83502083	22
CANX	5_178965094_179393918	21
AEBP1	7_43546691_44301066	21
SFRS8	12_130064055_132349534	21
TCTN2	12_121405862_124283213	20
LRRTM2	5_137965436_142619254	19
LIFR	5_36083295_38914974	18
FBXO38	5_147704279_148125330	18
SLC1A3	5_36083295_38914974	18
MCCC2	5_1464412_1547908	18
PDGFA	7_295765_814722	17
CNOT8	5_153318241_156728896	17
FYB	5_38914975_40803153	17
WWC1	5_167299915_168516543	17
OCLN	5_80564_1460115	17
FABP6	5_158186648_159550735	16
LOC202181	5_175848855_177323654	16
EDIL3	5_82429444_83404045	16
AMACR	5_31825436_34192908	15
LSM4	19_17510791_19739813	15
NPR3	5_31825436_34192908	15
NAIP	5_80564_1460115	15
PMS2L3	7_74127825_75521516	15
C16orf42	16_37354_1504823	14
NPY6R	5_137033572_137695243	14
NOP16	5_174398116_175825668	14
HGF	7_79232817_81720844	13
AURKA	20_54246466_54448572	13
ZNF195	11_3335218_3349320	13
RPS21	20_60211696_60452531	13
OSMR	5_36083295_38914974	13
NPM1	5_169013893_171206829	13
SEMA3C	7_79232817_81720844	12
CSNK1A1	5_148125331_149600863	12
PDPK1	16_2497499_2582218	12
NIPBL	5_36083295_38914974	12
RNASEN	5_31379854_31520986	12
SBNO1	12_121405862_124283213	12
DHFR	5_79066094_80038105	12
HSPA9	5_137741660_137923116	12
POM121	7_71542285_73758949	12

ANKHD1	5_137965436_142619254	12
MAP1B	5_71090060_73266816	12
KIR2DS5	19_217034_569158	12
PGGT1B	5_113972101_114787065	12
CETN3	5_89715117_90038886	12
PSMA7	20_59810422_60201891	11
TMED7	5_114787094_117418456	11
ARL4A	7_12513732_13700054	11
STK17A	7_43546691_44301066	11
RAB22A	20_56098218_56737667	11
WDR41	5_76396572_77394843	11
PMS2	7_5894482_6154308	11
SEMA6A	5_114787094_117418456	11
XRCC2	7_151748390_155325075	10
FAF2	5_174398116_175825668	10
MCTP1	5_93800373_94108870	10
NPTX2	7_97491747_98142731	10
ETV1	7_13701250_13970996	10
HUS1	7_45146403_49291382	9
ATHL1	11_238181_280232	9
PDIA4	7_148251514_148521023	9
LPCAT1	5_1464412_1547908	9
DMXL1	5_117428678_119347308	9
SMN1	5_80564_1460115	9
NR3C1	5_142619255_142995861	9
DNAJB6	7_155325076_158821424	9
DPY19L1	7_34509633_43546690	9
TNPO1	5_71090060_73266816	9
NUP155	5_36083295_38914974	8
PRKAG2	7_150880365_151624640	8
SAP30L	5_153318241_156728896	8
SLC12A2	5_126472912_127898523	8
TMEM106B	7_10945597_12396012	8
B4GALT7	5_175848855_177323654	8
SKP2	5_36083295_38914974	8
CARS	11_2353242_3198798	8
TRIM52	5_179412778_180857866	8
SERPINE1	7_99477381_101064053	8
SNX2	5_121463478_122532464	8
MFAP3	5_153318241_156728896	8
MSH3	5_79066094_80038105	8
STX16	20_56098218_56737667	8
STC2	5_172627142_172911788	8
RAE1	20_55323457_55373335	7
BBS9	7_32770713_34509632	7
SMAD5	5_133869574_135609557	7
FAM153A	5_175848855_177323654	7

CDK10	16_86889141_88827254	7
BAZ1B	7_71542285_73758949	7
SETD8	12_121405862_124283213	7
IK	5_137965436_142619254	7
VPS41	7_34509633_43546690	7
FBXW11	5_171206830_172607425	7
EZH2	7_147743920_148251513	7
CLK4	5_177541901_178236473	7
ANKRD11	16_86889141_88827254	7
INHBA	7_34509633_43546690	7
SLMO2	20_56752189_57794009	7
PRPF6	20_60513032_62435964	7
FAM134B	5_15838038_17095203	7
PDCD6	5_80564_1460115	6
KLHDC4	16_86213716_86327204	6
SFXN1	5_174398116_175825668	6
MEF2C	5_85233946_88114765	6
AGGF1	5_75196222_76378584	6
SPRY4	5_137965436_142619254	6
TMED9	5_175848855_177323654	6
LRRC17	7_102318547_102358948	6
HSD17B4	5_117428678_119347308	6
FPR3	19_56951383_57293210	6
TSPAN13	7_16606140_17082725	6
CYP3A5	7_98804470_99452248	6
SLCO4C1	5_100368305_103112032	6
RALA	7_34509633_43546690	6
FAM169A	5_74004814_74111113	6
ZNF268	12_130064055_132349534	6
RSRC2	12_121405862_124283213	6
ZNF12	7_6174894_6908993	6
FASTKD3	5_7595316_8756147	6
IGFBP3	7_45146403_49291382	5
YIPF5	5_142995862_144127403	5
PMS2L11	7_75852517_76583054	5
ANKLE2	12_130064055_132349534	5
HN1L	16_1504824_1747780	5
KIF3A	5_131895601_132064150	5
VDAC1	5_132093779_133869573	5
C5orf15	5_132093779_133869573	5
CLTB	5_174398116_175825668	5
LUC7L	16_37354_1504823	5
TGFBI	5_133869574_135609557	5
ATG12	5_114787094_117418456	5
SRD5A1	5_6613041_6745052	5
SNX24	5_121463478_122532464	5
KIR2DS1	19_217034_569158	5

BTF3	5_71090060_73266816	5
RHOBTB3	5_94108871_95185577	5
GM2A	5_150387976_151495148	5
LNPEP	5_95185578_96572060	5
TCERG1	5_145777678_145959815	5
ARHGAP26	5_137965436_142619254	5
ZNF205	16_3077262_3143035	5
NSUN5B	7_74127825_75521516	5
POP7	7_99477381_101064053	5
WDR70	5_36083295_38914974	5
GOLGA3	12_130064055_132349534	5
ZNF350	19_56951383_57293210	5
PNPLA2	11_492013_1405948	4
C7orf26	7_6174894_6908993	4
LOC100170939	5_80564_1460115	4
DIDO1	20_60513032_62435964	4
NUDT1	7_814723_2985487	4
FOXF1	16_84978771_85883412	4
TTC37	5_94108871_95185577	4
ARSB	5_77424969_79064481	4
MYOT	5_137033572_137695243	4
C19orf6	19_685851_1501649	4
LCP2	5_169013893_171206829	4
UBE2D2	5_137965436_142619254	4
FBN2	5_126472912_127898523	4
ZNF140	12_130064055_132349534	4
ERAP2	5_95185578_96572060	4
GTF2H2	5_80564_1460115	4
THG1L	5_156728897_158181852	4
WDR60	7_155325076_158821424	4
WIPI2	7_4443550_5856693	4
APRT	16_86889141_88827254	4
GCNT4	5_74111114_74971580	4
MPHOSPH9	12_121405862_124283213	4
CAST	5_95185578_96572060	4
YTHDF1	20_60513032_62435964	4
BRD8	5_137033572_137695243	4
NDUFS6	5_1819736_3580763	4
ICA1	7_8116121_8299179	4
MYO10	5_15838038_17095203	4
CSNK1G3	5_122532465_123412098	4
ADCY2	5_6955045_7595315	4
TRRAP	7_98142732_98539906	4
PPIC	5_121463478_122532464	4
GABRA1	5_160850531_161385662	4
RBM22	5_149608837_150339149	4
GTF2H2B	5_80564_1460115	4

MED7	5_153318241_156728896	4
GNAI1	7_79232817_81720844	4
MTRR	5_7595316_8756147	4
SKP1	5_132093779_133869573	4
FTSJ2	7_814723_2985487	4
NFIC	19_3207206_3806976	4
MKNK2	19_1877027_2257574	4
GIN1	5_100368305_103112032	4
LECT2	5_133869574_135609557	4
MUM1	19_685851_1501649	4
ABCF2	7_150298143_150766389	3
SRP19	5_111922639_112678649	3
UBE2B	5_132093779_133869573	3
STX2	12_129659406_130053993	3
CDK2AP1	12_121405862_124283213	3
ABLIM3	5_148125331_149600863	3
CHD1	5_98143728_99896737	3
ZNF354A	5_177541901_178236473	3
PURA	5_137965436_142619254	3
ZMIZ2	7_44393674_44926447	3
SF4	19_17510791_19739813	3
C7orf28A	7_5894482_6154308	3
TCF25	16_86889141_88827254	3
ADAM19	5_156728897_158181852	3
ZFYVE16	5_79066094_80038105	3
HAPLN1	5_82429444_83404045	3
GNAS	20_56752189_57794009	3
CUL1	7_147743920_148251513	3
CTSZ	20_56752189_57794009	3
RASA1	5_85233946_88114765	3
PMCHL1	5_18839558_22719712	3
HARS2	5_137965436_142619254	3
GRB10	7_49804234_51368211	3
ZNF84	12_130064055_132349534	3
RNF14	5_137965436_142619254	3
ZNF394	7_98804470_99452248	3
SNRNP35	12_121405862_124283213	3
TNFAIP8	5_117428678_119347308	3
INSIG1	7_151748390_155325075	3
VPS33A	12_120868840_121368593	3
ALDH7A1	5_124312152_126219449	3
HEXB	5_74004814_74111113	3
TCF3	19_1531334_1876941	3
TRIO	5_13360088_14372070	3
PDLIM4	5_131528076_131643864	3
ZNF10	12_130064055_132349534	3
CCNJL	5_159560586_159794152	3

ARL6IP4	12_121405862_124283213	3
MAPK9	5_179412778_180857866	3
NCAPG2	7_155325076_158821424	3
ABCA3	16_2203147_2269261	3
AHR	7_17204515_17372242	3
CTNNA1	5_137965436_142619254	3
DEF8	16_86889141_88827254	3
SAR1B	5_133869574_135609557	3
SYNPO	5_149608837_150339149	3
TTC33	5_38914975_40803153	3
ZNF3	7_99477381_101064053	3
KBTBD2	7_32770713_34509632	3
C19orf24	19_685851_1501649	3
LHFPL2	5_77424969_79064481	3
GTPBP3	19_17140752_17510790	3
CKMT2	5_80472997_80863775	3
PCDHGB5	5_137965436_142619254	3
CLIP1	12_120868840_121368593	3
DAB2	5_38914975_40803153	3
RNF126	19_580303_681234	3
DENR	12_121405862_124283213	3
BIRC7	20_60513032_62435964	3
HINT1	5_130446033_130549011	3
TARP	7_34509633_43546690	3
PPIA	7_44393674_44926447	3
C5orf4	5_153318241_156728896	3
SFRS14	19_17510791_19739813	3
CREBBP	16_3703180_3938630	3
HNRNPA0	5_137033572_137695243	3
TWIST1	7_19115372_19389587	3
PTCD1	7_98804470_99452248	2
TARS	5_31825436_34192908	2
FAM172A	5_92130734_93021232	2
POLR2J2	7_101853878_102303979	2
AOAH	7_34509633_43546690	2
TCOF1	5_149608837_150339149	2
IL7R	5_35072475_35904253	2
LMTK2	7_97491747_98142731	2
TICAM1	19_4383973_5333471	2
PSMD13	11_188510_237985	2
USE1	19_17140752_17510790	2
CD74	5_149608837_150339149	2
F2R	5_75196222_76378584	2
FER	5_107885704_108507649	2
GALNT10	5_153318241_156728896	2
FLJ11235	5_111505154_111922638	2
ZNF434	16_3143036_3553004	2

GRAMD3	5_124312152_126219449	2
CNOT6	5_179412778_180857866	2
MRPS27	5_71090060_73266816	2
KIAA0947	5_4811455_5909814	2
GAL3ST4	7_99477381_101064053	2
PTTG1	5_159560586_159794152	2
GNA12	7_814723_2985487	2
PMEPA1	20_55378086_56088765	2
THSD7A	7_10945597_12396012	2
GNG7	19_2439172_2475684	2
FAM114A2	5_153318241_156728896	2
C9	5_38914975_40803153	2
SLC22A5	5_131643865_131833633	2
LMNB1	5_124312152_126219449	2
SNCAIP	5_121463478_122532464	2
ZNF783	7_148544578_149115991	2
AP3S1	5_114787094_117418456	2
ZCCHC8	12_121405862_124283213	2
TBXA2R	19_3207206_3806976	2
DIAPH1	5_137965436_142619254	2
DDX49	19_17510791_19739813	2
BLVRA	7_43546691_44301066	2
GALNT11	7_150880365_151624640	2
EFNA5	5_106017378_107620202	2

Table S3. Genes determined to be lost and underexpressed in the Penn Data

Gene	Segment	Expression fold change
ALDOB	9_103206143_103225078	1070
ALDH6A1	14_73538366_75214580	227
UQCRC1	3_44897145_49188640	170
SLC7A8	14_22048600_22665560	128
ACY1	3_49220649_53001753	120
SERPINA5	14_91904853_94123764	116
PTH1R	3_44897145_49188640	93
ASS1	9_132265469_132463966	91
FBP1	9_95018086_97600430	79
GLDC	9_5171467_6962164	72
FOS	14_73538366_75214580	63
PLG	6_159653684_161058906	52
ADD3	10_111599600_112749597	52
NP	14_19722395_21117922	47
RGS3	9_115037070_115782034	44
LPA	6_159653684_161058906	36
DCTN3	9_34490610_35516604	34
DALRD3	3_44897145_49188640	33
ACOX2	3_58186123_58682005	31
KIAA0284	14_103638225_104746745	31
MPDZ	9_13054793_13313467	30
AMT	3_49220649_53001753	29
TM9SF1	14_23452745_23973123	29
P4HTM	3_44897145_49188640	28
NR4A3	9_101056712_102392837	26
PABPN1	14_22668792_23199978	26
PTPN3	9_110686804_112024713	25
PLAU	10_73715923_76042042	25
SLC1A1	9_4428585_4696365	24
ACOT1	14_72413330_73197695	24
DHRS4	14_23452745_23973123	23
SF3B5	6_144123302_144707049	23
SUCLG2	3_66911946_67923826	23
CLEC3B	3_44897145_49188640	22
CISH	3_49220649_53001753	22
FKBP15	9_114950812_115037069	21
CAMK2G	10_73715923_76042042	21
GPX1	3_49220649_53001753	20
UNC13B	9_34490610_35516604	20
SPTAN1	9_130329421_131084190	20
FBLN5	14_91313036_91496974	20
DHRS1	14_23452745_23973123	20
SDR39U1	14_23973124_24015170	20
NISCH	3_49220649_53001753	19

PRKAR2A	3_44897145_49188640	19
RNASE1	14_19722395_21117922	19
TBC1D13	9_130329421_131084190	19
AQP3	9_33069023_34267052	18
TNFAIP2	14_100344336_102698490	18
RNF123	3_49220649_53001753	17
CCDC51	3_44897145_49188640	17
FAM102A	9_129662767_130209348	17
PLXNB1	3_44897145_49188640	17
CRAT	9_130329421_131084190	17
THTPA	14_22668792_23199978	17
C14orf159	14_90234219_91313035	17
LMBRD1	6_70369272_70785392	17
KIAA0913	10_73715923_76042042	17
SCAP	3_44897145_49188640	17
C9orf16	9_129662767_130209348	17
IFRD2	3_49220649_53001753	16
MYD88	3_37967544_38537395	16
TMEM30B	14_60386017_61188235	16
XPC	3_12915346_14322584	16
MTHFD1	14_63745851_64141947	16
RPL29	3_49220649_53001753	16
PSAT1	9_79879810_80205963	16
VGLL4	3_11040807_12450087	16
RBM23	14_22048600_22665560	16
CTNNAL1	9_110686804_112024713	16
SLC7A7	14_22048600_22665560	15
NTRK2	9_85941187_87593031	15
CKB	14_102698491_103162541	15
BAP1	3_49220649_53001753	15
HSPA2	14_63745851_64141947	15
ACO1	9_32372071_32379397	15
MST1	3_49220649_53001753	15
VCP	9_34490610_35516604	15
WBSCR16	7_73758950_74127824	15
RABEPK	9_126751142_127009605	14
PRMT5	14_22048600_22665560	14
ALS2CL	3_44897145_49188640	14
LRP10	14_22048600_22665560	14
IFI27	14_91904853_94123764	14
APEH	3_49220649_53001753	14
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CDC14B	9_97608364_98577589	13

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SETD5	3_9287536_9531913	13
ALAS1	3_49220649_53001753	13
CNIH	14_53873515_54481493	13
TCF21	6_133557295_134979912	13
CITED2	6_139666937_140225385	13
IMPDH2	3_44897145_49188640	12
ENDOG	9_130329421_131084190	12
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NINJ1	9_94395540_95002934	12
NDRG2	14_19722395_21117922	12
WARS	14_99602955_100344335	12
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KIAA1539	9_34490610_35516604	12
SEC24C	10_73715923_76042042	12
URM1	9_129662767_130209348	12
TRMT61A	14_102698491_103162541	12
DLST	14_73538366_75214580	11
PLCD1	3_37967544_38537395	11
SEMA3B	3_49220649_53001753	11
DNAJC12	10_69061112_69234950	11
AKT1	14_103638225_104746745	11
ABHD4	14_22048600_22665560	11
CRTAP	3_30861158_34026328	11
FAM107A	3_58186123_58682005	11
TUSC4	3_49220649_53001753	11
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CLMN	14_94128490_96240501	11
PNN	14_38425213_39179815	11
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GOLGA4	3_36902550_37385707	10

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GMPR2	14_23452745_23973123	8
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PDHB	3_58186123_58682005	8
AQP7	9_33069023_34267052	8
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DAD1	14_22048600_22665560	8
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UBAP2	9_33069023_34267052	8
ABHD6	3_58186123_58682005	8
PSMB5	14_22048600_22665560	8
AHSA1	14_75364277_77059690	8
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BTD	3_15026132_16085669	7
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ACAA1	3_37967544_38537395	7
ZBTB5	9_37085008_38426991	7
SPCS1	3_49220649_53001753	7
SFRS5	14_68301617_69955784	7
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HYAL2	3_49220649_53001753	7
TFG	3_101331030_102077329	7
KTN1	14_55049506_57672302	7
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GPC5	13_90843580_90863093	7
AMIGO3	3_49220649_53001753	7
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MITF	3_68763613_70127023	7
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C14orf101	14_55049506_57672302	7
INF2	14_103638225_104746745	7
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ARG2	14_66925080_67888728	6
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GOLGA1	9_126285350_126728434	6
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PCBP4	3_49220649_53001753	5
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FYN	6_109168061_112756362	5
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PARP2	14_19722395_21117922	4
GNE	9_35523348_37085007	4
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NCKIPSD	3_44897145_49188640	4
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AKAP2	9_110686804_112024713	4
FBXL2	3_30861158_34026328	4
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AP1G2	14_22668792_23199978	4
TJP2	9_70233709_71617302	4
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ARF6	14_49275523_49764448	4
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NR1D2	3_23001825_24269384	4
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FLRT2	14_84926602_85186475	4
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SETD2	3_44897145_49188640	4
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CCNC	6_97422999_100838999	4
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NPC2	14_73538366_75214580	4
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NEK4	3_49220649_53001753	3
RAD54L2	3_49220649_53001753	3
CACNA2D2	3_49220649_53001753	3
SERPINA6	14_91904853_94123764	3
LARS2	3_44897145_49188640	3
C14orf147	14_32812162_34288375	3
AK1	9_129662767_130209348	3
DLC1	8_12777448_13063924	3
PTPRD	9_8270950_8423044	3
KLHL9	9_20807835_21445813	3
TRAF3	14_100344336_102698490	3
KCNK10	14_87688655_87991468	3
STRN3	14_30349237_31352314	3
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CASP8AP2	6_90135121_91423459	3
CLASP2	3_30861158_34026328	3
SAMD4A	14_53873515_54481493	3
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CX3CR1	3_39227673_39883848	3
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NEDD8	14_23452745_23973123	3
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RAGE	14_100344336_102698490	3
WBP11	12_14813007_14834182	3
C14orf169	14_72413330_73197695	3
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KATNA1	6_149315857_149992906	3
ANKRD6	6_90135121_91423459	3
CIZ1	9_129662767_130209348	3
KLF9	9_71621900_72807090	3
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EDEM1	3_4640228_5379903	3
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MGAT2	14_48594272_49275522	3
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BCLAF1	6_136317780_136692186	3
ABCD4	14_73538366_75214580	3
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PLAGL1	6_144123302_144707049	2
SMAP1	6_70796754_71812194	2
USP20	9_131111946_132261748	2
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RPL35	9_126285350_126728434	2
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RUFY2	10_69739239_69867524	2
TATDN2	3_9737595_11040806	2
DNAJA1	9_32973442_33041684	2
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LCN2	9_129662767_130209348	2
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LSM3	3_12915346_14322584	2
IQSEC1	3_12903762_12915345	2
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CCDC28A	6_138842339_139665700	2
GPHN	14_65941325_66596885	2
CHD8	14_19722395_21117922	2
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EZR	6_158518568_159302317	2
HNRNPC	14_19722395_21117922	2
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MTO1	6_73918251_74266789	2
PPP2R5C	14_100344336_102698490	2
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SLC31A2	9_114950812_115037069	2
SESN1	6_109168061_112756362	2
PTGES	9_131111946_132261748	2
PNRC1	6_89266711_90133403	2
MOAP1	14_91904853_94123764	2
C14orf79	14_103638225_104746745	2
PRRX2	9_131111946_132261748	2
RPP14	3_58186123_58682005	2
RPS6	9_19280143_19432557	2
USP19	3_44897145_49188640	2
CHL1	3_135814_442156	2
SH3GLB2	9_130329421_131084190	2
GMFB	14_53873515_54481493	2
TWF2	3_49220649_53001753	2
ARIH2	3_44897145_49188640	2
CHMP5	9_33069023_34267052	2
CALM1	14_88531099_90228621	2
PRSS3	9_33069023_34267052	2
FHIT	3_59641041_60037675	2
VPS13A	9_78471939_79873671	2

SVEP1	9_112150601_112599891	2
MAX	14_64373004_64780332	2
SYNE1	6_152461219_152577227	2
GTF2H5	6_158508690_158518567	2
DDX21	10_70380444_70445086	2
ZFAND5	9_74011070_74616808	2
BRPF1	3_9737595_11040806	2
MLH3	14_73538366_75214580	2
SLC22A14	3_37967544_38537395	2

Table S4. Genes determined to be gained and overexpressed in the Broad Data

Gene	Segment	Expression fold change
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FBXO28	1_221533939_222651345	2
INTS3	1_150450773_152014239	2
PAXIP1	7_151892825_154577581	2
SETDB1	1_148246034_150281108	2
NXT1	20_23209339_24210649	2
C1orf77	1_150450773_152014239	2
PYGB	20_25150508_25437691	2
DUSP10	1_219895299_220400295	2
ZNF277	7_110986533_118055283	2

Table S5. Genes determined to be lost and underexpressed in the Broad Data

Gene	Segment	Expression fold change
ALDOB	9_102663484_103429072	3302
SFRP1	8_41063273_41698554	500
ALB	4_73663471_76224711	401
CYP4A11	1_46674133_48629899	366
LPA	6_158136847_161856223	258
PLG	6_158136847_161856223	248
CYP4A22	1_46674133_48629899	144
SERPINA5	14_93396982_95686082	140
CLCNKA	1_15686773_22424511	134
C4orf31	4_120452569_122282234	107
TACSTD2	1_57875598_59121115	88
PTH1R	3_46444018_47260430	87
DIO1	1_50946918_56866612	82
SLC7A8	14_22352539_23671157	79
MSTP9	1_15686773_22424511	79
AFM	4_73663471_76224711	74
DSP	6_6983787_7639261	71
FBP1	9_93245196_98133539	60
CLCNKB	1_15686773_22424511	59
HPGD	4_172505733_177565763	57
PTGER3	1_71016067_71827276	48
SLC17A3	6_25679405_26855016	47
DEFB1	8_5758247_6777063	46
SLC17A1	6_25679405_26855016	46
ANGPTL3	1_61398707_63150680	40
TRPM3	9_71640847_73014928	38
LRRC19	9_24933020_27532408	36
EGF	4_104359353_111388245	35
ALDH4A1	1_15686773_22424511	30
STAP1	4_66919436_73663470	30
TYRP1	9_12183278_12766839	29
NR3C2	4_148742883_150503367	29
ADH6	4_92137112_101656701	28
ZNF204	6_26855017_28440431	27
PTPRD	9_10496028_12183277	26
CHL1	3_260580_1343475	26
TCF21	6_132285229_134265256	25
FBLN5	14_87472574_91740937	25
ARG2	14_64339460_71326335	24
PDGFRA	4_53355418_56283605	24
ACOX2	3_58196862_58582663	23
TMEM30B	14_58884793_63484496	23
ANK2	4_111388246_115924197	20
ASS1	9_128950028_132878591	20

ACY1	3_51255115_53045501	20
EPHX2	8_26497479_28338843	20
SLC44A4	6_31650287_32453160	19
TFAP2A	6_10359319_13178675	19
SEMA3B	3_47260431_50416574	19
ALDH6A1	14_73418572_74900873	19
EPB41L4B	9_110487487_114014428	19
TPD52L1	6_125566417_129839944	19
APOM	6_31650287_32453160	18
ALDH8A1	6_134440866_139197369	18
RASL11B	4_53355418_56283605	18
PTGDS	9_135768997_140273252	18
PCK2	14_22352539_23671157	17
ADH1B	4_92137112_101656701	17
PACRG	6_162832504_164136229	16
EMCN	4_101656702_103403674	16
GLDC	9_6132948_6660061	15
MAN1C1	1_22424512_26139846	14
SIM1	6_100648291_101160446	14
PSAT1	9_78558807_80263106	14
UGT2B28	4_66919436_73663470	14
MSRA	8_9844234_10883890	13
MOXD1	6_132285229_134265256	13
IL17RB	3_53045502_54717947	13
SLC16A10	6_110609524_111976782	13
RALGPS1	9_128950028_132878591	12
SH3GL2	9_17522840_18132659	12
KIT	4_53355418_56283605	12
VNN1	6_132285229_134265256	12
FGFR3	4_1058778_2016544	12
C4orf19	4_37238176_37280964	12
TSPAN1	1_46407796_46674132	12
TEK	9_24933020_27532408	12
BPHL	6_2755768_5403145	12
AK3L1	1_65302702_66916347	11
NQO2	6_2755768_5403145	11
AGXT2L1	4_104359353_111388245	11
ANXA3	4_79729997_82431193	11
ENTPD5	14_73418572_74900873	11
PIP5K1B	9_70234710_70936991	10
HSPA2	14_63484497_64339459	10
TGFBR3	1_91392051_95193902	10
F11	4_187441441_188051102	10
MAPK10	4_86736078_88561173	10
SEMA3G	3_51255115_53045501	10
TRIM2	4_154123216_154946306	10
FCN3	1_27048706_27721886	10

CEL	9_134370616_135768996	9
NROB2	1_27048706_27721886	9
MST1	3_47260431_50416574	9
ASPA	17_2508845_3495195	9
PLAT	8_42154137_42971600	9
SLC4A4	4_66919436_73663470	9
KLKB1	4_186002571_187441440	9
LAMA2	6_129839945_129879694	9
GAS1	9_88530367_89149420	9
NTRK2	9_83399968_87758063	9
ADH1C	4_92137112_101656701	9
MTTP	4_92137112_101656701	8
ACAA1	3_36652490_39170967	8
HADH	4_104359353_111388245	8
DNASE1L3	3_57586277_58196861	8
ZNF165	6_26855017_28440431	8
TDGF1	3_46444018_47260430	8
RAP1GAP	1_15686773_22424511	8
PLXNB1	3_47260431_50416574	8
CLMN	14_93396982_95686082	8
ALAD	9_114263119_116127884	8
TNNC1	3_51255115_53045501	8
LTF	3_46444018_47260430	8
SLC7A7	14_22352539_23671157	8
FABP3	1_30514083_33994396	8
PER1	17_6860981_8232348	8
CDS1	4_84520712_86736077	7
TCL6	14_93396982_95686082	7
HDHD3	9_114263119_116127884	7
BDH2	4_103864128_104359352	7
CFI	4_104359353_111388245	7
PAPPA	9_116141066_118287665	7
GPD1L	3_30742814_34295257	7
AMY1A	1_101337173_109048825	7
TPMT	6_17637386_19325515	7
GPHN	14_64339460_71326335	7
TBC1D1	4_37643572_38708373	6
AKR7A3	1_15686773_22424511	6
KIF13B	8_28711850_29940701	6
DHRS4	14_22352539_23671157	6
FOS	14_73418572_74900873	6
CTNNAL1	9_110487487_114014428	6
F3	1_91392051_95193902	6
ACOT1	14_73035327_73418571	6
CTH	1_68238520_71016066	6
OGG1	3_9530423_10218277	6
PECI	6_2755768_5403145	6

KCNK10	14_87472574_91740937	6
SLC22A13	3_36652490_39170967	6
MFAP3L	4_169962502_172505732	6
MYH10	17_8232349_10479170	6
BCKDHB	6_81056932_85567673	6
ALPL	1_15686773_22424511	6
AQP3	9_33026981_37481279	6
AK2	1_30514083_33994396	5
CLDN7	17_6860981_8232348	5
GCH1	14_54206517_56137447	5
PTPN3	9_110487487_114014428	5
ARHGAP24	4_86736078_88561173	5
DIRAS3	1_68238520_71016066	5
PEX7	6_134440866_139197369	5
ETFDH	4_158210879_161774809	5
BRP44L	6_165559698_167747797	5
TBC1D13	9_128950028_132878591	5
SLC26A6	3_47260431_50416574	5
NBL1	1_15686773_22424511	5
GRHPR	9_33026981_37481279	5
CAMK2N1	1_15686773_22424511	5
CXCL2	4_73663471_76224711	5
SLC1A1	9_2386248_4838874	5
NP	14_19487234_20715172	5
CMAH	6_25076052_25679404	5
FAM184A	6_119363250_119977194	5
AMT	3_47260431_50416574	5
SOBP	6_107742149_108278919	5
NPY1R	4_164283640_164884832	5
CTSL2	9_98590290_101187345	5
CKB	14_101426228_106368585	5
INADL	1_61398707_63150680	5
RGS3	9_114263119_116127884	5
ENPP1	6_132160377_132285228	5
HYAL1	3_47260431_50416574	5
LRRC16A	6_25679405_26855016	5
DLGAP2	8_1171057_1736816	5
PTCH1	9_93245196_98133539	5
C17orf91	17_614127_2216518	5
PTPN13	4_86736078_88561173	5
CPT2	1_50946918_56866612	5
ERMP1	9_5698176_6132947	5
ALS2CL	3_46444018_47260430	5
PELI2	14_54206517_56137447	5
FRAS1	4_77900982_79729996	4
ACADM	1_74744745_76795860	4
FHIT	3_61182117_61825173	4

GSTZ1	14_75999141_77187926	4
HSD17B8	6_33129170_33924910	4
AUH	9_92794541_93245195	4
BDKRB2	14_95686083_95782529	4
RERE	1_8088206_9327279	4
CTGF	6_132285229_134265256	4
MYH8	17_8232349_10479170	4
UGT2A1	4_66919436_73663470	4
BEND5	1_48629900_50703689	4
TRPV1	17_2508845_3495195	4
ARHGEF10L	1_15686773_22424511	4
EPM2A	6_143035547_149361903	4
ECHDC2	1_50946918_56866612	4
UNC13B	9_33026981_37481279	4
DAAM1	14_58884793_63484496	4
NUDT6	4_122282235_124420645	4
BSPRY	9_114263119_116127884	4
GMPR	6_14751281_16584906	4
SLC35D1	1_67217551_68238519	4
NELF	9_135768997_140273252	4
UST	6_149361904_150491643	4
EGR3	8_19651941_25049586	4
FAM107A	3_58196862_58582663	4
GRIK2	6_101501741_103932567	4
PDZRN3	3_73516776_73888656	4
FDFT1	8_11500453_12651679	4
MPP5	14_64339460_71326335	4
ABHD14A	3_51255115_53045501	4
SLC25A4	4_186002571_187441440	4
MRPS2	9_135768997_140273252	4
ZNF839	14_101426228_106368585	4
LRRC2	3_46444018_47260430	4
SUCLG2	3_67694975_68692362	4
SLC25A11	17_4530785_4843681	4
SLC22A2	6_158136847_161856223	4
MFHAS1	8_8678669_9179977	4
PINK1	1_15686773_22424511	4
PDSS2	6_107742149_108278919	4
ID4	6_19325516_22859474	4
FAAH	1_46407796_46674132	4
CBR4	4_169962502_172505732	4
GLRX5	14_93396982_95686082	4
CISH	3_50619138_51255114	4
FLRT2	14_82987390_86058173	4
ACOT7	1_5234274_7008096	4
C5	9_121211372_124547280	4
PDZK1IP1	1_46674133_48629899	4

APEH	3_47260431_50416574	4
EPB49	8_19651941_25049586	4
GNA14	9_78558807_80263106	4
PEX3	6_143035547_149361903	4
DLST	14_73418572_74900873	4
GADD45A	1_67217551_68238519	4
FLJ13197	4_37643572_38708373	4
HLA-DQB1	6_32453161_32937691	4
DHRS3	1_11192383_15337023	4
DNAJC6	1_65302702_66916347	4
HEMK1	3_50416575_50619137	3
NDRG2	14_19487234_20715172	3
GALT	9_33026981_37481279	3
ADRA2C	4_2016545_4210963	3
RNF186	1_15686773_22424511	3
KIF1C	17_4843682_5610519	3
FARS2	6_5714705_6983786	3
MEG3	14_99615311_101426227	3
AKR1A1	1_44693918_46407795	3
C14orf132	14_93396982_95686082	3
TMEM53	1_44693918_46407795	3
CTNNBIP1	1_9327280_11192382	3
ESR1	6_152278572_152529522	3
DHRS1	14_23671158_26484064	3
C9orf3	9_93245196_98133539	3
STAC	3_36034756_36652489	3
PHF17	4_129691789_130292029	3
ENPEP	4_111388246_115924197	3
L2HGDH	14_48824296_49922977	3
LETM1	4_1058778_2016544	3
MYO6	6_73517512_77532406	3
PRKD1	14_29270452_31946685	3
SRR	17_614127_2216518	3
WDFY3	4_84520712_86736077	3
HDCC2	6_125566417_129839944	3
GPR177	1_68238520_71016066	3
CLEC3B	3_42167330_45192646	3
C6orf155	6_71624762_73517511	3
HMGCL	1_22424512_26139846	3
CTDSPL	3_36652490_39170967	3
ACO1	9_32156137_33026980	3
HS3ST3A1	17_12946452_13560670	3
ABCD3	1_91392051_95193902	3
UQCRC1	3_47260431_50416574	3
FOXC1	6_669502_2004108	3
ACADVL	17_6860981_8232348	3
JUN	1_57875598_59121115	3

PABPN1	14_22352539_23671157	3
RDH11	14_64339460_71326335	3
XPO7	8_19651941_25049586	3
PALLD	4_169962502_172505732	3
KANK1	9_235706_2386247	3
FAM102A	9_128950028_132878591	3
ACSL1	4_185833196_186002570	3
ABCG2	4_88561174_90727362	3
TRIM26	6_30062343_31650286	3
IGFBP7	4_56867718_59055919	3
TRIM10	6_30062343_31650286	3
PGRMC2	4_129367365_129691788	3
PROSC	8_37278312_38706199	3
SGSM2	17_2216519_2508844	3
SHPK	17_2508845_3495195	3
VPS13D	1_11192383_15337023	3
ODAM	4_66919436_73663470	3
AQP7	9_33026981_37481279	3
SORBS2	4_186002571_187441440	3
PPP2CB	8_30338652_31528878	3
CDKN2AIP	4_184522083_185833195	3
CAND2	3_11696793_16432447	3
SLC25A38	3_39170968_40103461	3
PPA2	4_104359353_111388245	3
SFPQ	1_34932499_35626743	3
SPTAN1	9_128950028_132878591	3
SURF1	9_134370616_135768996	3
ENTPD3	3_40268801_42167329	3
CCDC25	8_26497479_28338843	3
CLN8	8_1171057_1736816	3
TCP1	6_158136847_161856223	3
C3orf14	3_62159447_63026381	3
DNAJC16	1_15686773_22424511	3
TSPYL1	6_114872044_118823010	3
SYNE2	14_63484497_64339459	3
TBC1D9	4_141712454_142983019	3
BCL2L2	14_22352539_23671157	3
CACNA1D	3_53045502_54717947	3
MAN1A1	6_119363250_119977194	3
KLF9	9_71640847_73014928	3
EXOSC7	3_42167330_45192646	3
HLA-DQA1	6_32453161_32937691	3
NFIB	9_14031071_16025485	3
GMNN	6_24317865_25076051	3
CDC14B	9_98133540_98590289	3
C1orf175	1_50946918_56866612	3
HIGD1A	3_42167330_45192646	3

COQ3	6_96909533_100648290	3
ERLIN2	8_37278312_38706199	3
ARHGEF3	3_56623403_57303906	3
ALDH5A1	6_24317865_25076051	3
SDR39U1	14_23671158_26484064	3
SMARCA2	9_235706_2386247	3
USP46	4_52393393_53355417	3
COQ4	9_128950028_132878591	3
SYNE1	6_152529523_155868712	3
CCNG2	4_77900982_79729996	3
TMEM39B	1_30514083_33994396	3
PPP1R10	6_30062343_31650286	3
CALM1	14_87472574_91740937	3
DBT	1_100481889_101337172	3
NPY5R	4_164283640_164884832	3
CCDC90A	6_13582256_14751280	3
MAP7	6_134440866_139197369	3
SC4MOL	4_165160988_166501453	3
TJP2	9_71020013_71421560	3
ATP1B2	17_6860981_8232348	3
HSPA4L	4_127679018_129120851	3
KIAA0664	17_2508845_3495195	3
LRBA	4_150792340_153850509	3
NUDT9	4_88561174_90727362	3
TCEB3	1_22424512_26139846	3
GPM6A	4_172505733_177565763	3
VDAC3	8_42154137_42971600	3
CRYZ	1_74744745_76795860	3
SGPP1	14_58884793_63484496	3
C14orf105	14_56313752_57267969	3
TTRAP	6_24317865_25076051	3
WDR6	3_47260431_50416574	3
AKR7A2	1_15686773_22424511	3
PDHB	3_58196862_58582663	3
BSDC1	1_30514083_33994396	3
C6orf26	6_31650287_32453160	3
COQ6	14_73418572_74900873	3
CIDEB	14_23671158_26484064	3
PLA2G12A	4_104359353_111388245	3
SNCA	4_90727363_91299620	3
PLCL2	3_16432448_20354080	3
KIAA0317	14_73418572_74900873	3
RPH3AL	17_6888_595981	3
HMBOX1	8_28711850_29940701	3
NRG1	8_31953465_33012862	3
DDR1	6_30062343_31650286	3
SSBP3	1_50946918_56866612	3

BTD	3_11696793_16432447	3
SCAP	3_47260431_50416574	3
DDO	6_110609524_111976782	3
SERPINA4	14_93396982_95686082	3
C14orf159	14_87472574_91740937	3
FERMT2	14_51083761_52877458	3
SRPK1	6_35815668_37651501	3
POMT1	9_132878592_134370615	3
HECTD3	1_44693918_46407795	3
RGP1	9_33026981_37481279	3
CRAT	9_128950028_132878591	3
THTPA	14_22352539_23671157	3
RNF146	6_125566417_129839944	3
CCL19	9_33026981_37481279	3
BAG1	9_33026981_37481279	3
ZNF184	6_26855017_28440431	3
UBE4B	1_9327280_11192382	3
GMPR2	14_23671158_26484064	3
ADH5	4_92137112_101656701	3
NISCH	3_51255115_53045501	3
RRAGD	6_87310214_90201824	3
MYL3	3_46444018_47260430	3
LARS2	3_45192647_46036843	3
TEX264	3_51255115_53045501	3
IL11RA	9_33026981_37481279	3
DAG1	3_47260431_50416574	3
IFT74	9_24933020_27532408	3
ECHDC1	6_125566417_129839944	3
CCL21	9_33026981_37481279	3
SETMAR	3_4214325_7558057	3
MAP9	4_156214823_158210878	3
MYOM2	8_1736817_2536923	3
CASP9	1_15686773_22424511	3
ZBTB40	1_22424512_26139846	3
EFS	14_22352539_23671157	3
GK3P	4_165160988_166501453	3
C14orf1	14_74900874_75787875	3
LMO4	1_87484343_88294003	3
EVI5	1_91392051_95193902	2
LRRC8D	1_89330691_91276782	2
ZBTB43	9_125110448_128950027	2
KIF1B	1_9327280_11192382	2
ZDHHC3	3_42167330_45192646	2
LAMC3	9_132878592_134370615	2
ICMT	1_5234274_7008096	2
RPAP2	1_91392051_95193902	2
RAB15	14_64339460_71326335	2

HSDL2	9_114263119_116127884	2
MGST2	4_140832070_141712453	2
PDLIM5	4_92137112_101656701	2
ATP5S	14_48824296_49922977	2
DNAJC11	1_5234274_7008096	2
DACT1	14_57267970_58282421	2
SRGAP3	3_9136375_9530422	2
MAPKAP1	9_125110448_128950027	2
UBR4	1_15686773_22424511	2
THAP1	8_42154137_42971600	2
CTAGE5	14_38581192_39249068	2
SYNJ2BP	14_64339460_71326335	2
MUTYH	1_44693918_46407795	2
TNFSF15	9_116141066_118287665	2
PIGH	14_64339460_71326335	2
MAP3K7IP2	6_149361904_150491643	2
EXTL2	1_100481889_101337172	2
CRK	17_614127_2216518	2
PAFAH2	1_26139847_27048705	2
ATXN7	3_63312900_63995486	2
COX16	14_64339460_71326335	2
BTBD7	14_92414584_93396981	2
CACNA2D2	3_50416575_50619137	2
CDKL1	14_49922978_50527462	2
CYP46A1	14_97993083_99353000	2
CCDC28A	6_134440866_139197369	2
SFN	1_27048706_27721886	2
RNF38	9_33026981_37481279	2
SPEN	1_15686773_22424511	2
GOLGA7	8_41063273_41698554	2
GORASP1	3_36652490_39170967	2
TNXA	6_31650287_32453160	2
NOL7	6_13582256_14751280	2
CDA	1_15686773_22424511	2
MUDENG	14_56313752_57267969	2
TSPYL4	6_114872044_118823010	2
XYLB	3_36652490_39170967	2
STX18	4_4210964_4783650	2
CCNC	6_96909533_100648290	2
CCDC51	3_47260431_50416574	2
DHRS7	14_58884793_63484496	2
PPT2	6_31650287_32453160	2
ATPIF1	1_27721887_29059445	2
CDC37L1	9_2386248_4838874	2
ZKSCAN3	6_28440432_29834024	2
FBXO34	14_54206517_56137447	2
HIST1H4A	6_25679405_26855016	2

PET112L	4_150792340_153850509	2
HABP4	9_98133540_98590289	2
NUP210	3_11696793_16432447	2
BAP1	3_51255115_53045501	2
KIAA0562	1_3395156_3980623	2
SMARCC1	3_47260431_50416574	2
VAV3	1_101337173_109048825	2
PPP1R13B	14_101426228_106368585	2
FZD3	8_28371790_28711849	2
C6orf123	6_167747798_168350056	2
SAV1	14_49922978_50527462	2
NAT1	8_18110406_18165709	2
LRPAP1	4_2016545_4210963	2
PRKCD	3_53045502_54717947	2
ABCA11P	4_234361_1058777	2
DDAH2	6_31650287_32453160	2
APITD1	1_9327280_11192382	2
NUP88	17_4843682_5610519	2
KLHDC2	14_48824296_49922977	2
LGSN	6_62844345_67065774	2
VAMP2	17_6860981_8232348	2
KIAA0494	1_46674133_48629899	2
XPC	3_11696793_16432447	2
SFRS4	1_29095964_29845135	2
KLHL2	4_165160988_166501453	2
CCBL2	1_88618082_89330690	2
PIGV	1_26139847_27048705	2
SARDH	9_134370616_135768996	2
ANKS1A	6_33924911_35815667	2
MTMR9	8_10883891_11500452	2
TUSC2	3_47260431_50416574	2
ARID1A	1_26139847_27048705	2
SLC22A3	6_158136847_161856223	2
BRD3	9_135768997_140273252	2
TCTA	3_47260431_50416574	2
ABHD4	14_21962301_22172808	2
ATP6V1D	14_64339460_71326335	2
SLC22A17	14_22352539_23671157	2
MAPK1IP1L	14_54206517_56137447	2
PDLIM2	8_19651941_25049586	2
PARK2	6_162832504_164136229	2
ENG	9_128950028_132878591	2
C9orf9	9_134370616_135768996	2
CCBL1	9_128950028_132878591	2
TRAK1	3_42167330_45192646	2
LMBRD1	6_69793498_71624761	2
SEPT11	4_77900982_79729996	2

DAPK1	9_89156787_90443785	2
LSM1	8_37278312_38706199	2
TSC1	9_134370616_135768996	2
SFRS18	6_96909533_100648290	2
RNMTL1	17_614127_2216518	2
ITPK1	14_92414584_93396981	2
RNF170	8_42154137_42971600	2
SLC17A5	6_73517512_77532406	2
PAFAH1B1	17_2508845_3495195	2
KIAA0284	14_101426228_106368585	2
SF3B5	6_143035547_149361903	2
ALAS1	3_51255115_53045501	2
GSR	8_30338652_31528878	2
IQSEC1	3_11696793_16432447	2
EIF5	14_101426228_106368585	2
CHD3	17_6860981_8232348	2
BRD2	6_33009912_33129169	2
ZER1	9_128950028_132878591	2
CCNB1IP1	14_19487234_20715172	2
FAM86B1	8_11500453_12651679	2
C14orf147	14_33309047_38581191	2
DHX16	6_30062343_31650286	2
FANCC	9_93245196_98133539	2
SH3GLB2	9_128950028_132878591	2
SLC25A20	3_47260431_50416574	2
ADD1	4_2016545_4210963	2
PRPF4B	6_2755768_5403145	2
ZNF232	17_4843682_5610519	2
PPM1A	14_58884793_63484496	2
SETD3	14_97993083_99353000	2
ACAT2	6_158136847_161856223	2
C1orf144	1_15686773_22424511	2
DIO2	14_77194224_82987389	2
CPNE6	14_22352539_23671157	2
LYPLA2	1_22424512_26139846	2
STK38	6_35815668_37651501	2
SPP1	4_88561174_90727362	2
NAT2	8_18165710_18350096	2
PLEKHG3	14_63484497_64339459	2
IPP	1_44693918_46407795	2
MTHFD1	14_63484497_64339459	2
PLCD1	3_36652490_39170967	2
GAK	4_234361_1058777	2
PHACTR4	1_27721887_29059445	2
GABBR1	6_28440432_29834024	2
NACC2	9_135768997_140273252	2
C6orf120	6_168350057_170290623	2

COX7A2	6_73517512_77532406	2
SEC16A	9_135768997_140273252	2
C14orf2	14_101426228_106368585	2
PITPNA	17_614127_2216518	2
TMEM158	3_45192647_46036843	2
CTNS	17_3495196_4530784	2
SCP2	1_50946918_56866612	2
AHDC1	1_27721887_29059445	2
LSM3	3_11696793_16432447	2
HSP90AA1	14_101426228_106368585	2
BCAR3	1_91392051_95193902	2
SURF2	9_134370616_135768996	2
TSR1	17_614127_2216518	2
NRN1	6_5714705_6983786	2
P4HTM	3_47260431_50416574	2
GPBP1L1	1_44693918_46407795	2
MEGF9	9_121211372_124547280	2
MBIP	14_33309047_38581191	2
PRPF8	17_614127_2216518	2
MDC1	6_30062343_31650286	2
RAB14	9_121211372_124547280	2
OSBPL9	1_50946918_56866612	2
PKD2	4_88561174_90727362	2
LTB	6_31650287_32453160	2
GLOD4	17_614127_2216518	2

Table S6. Genes determined to be gained and overexpressed in both the Penn Data and Broad Data

Gene	Segment	Expression fold change
NPTX2	7_97491747_98142731	158
FABP6	5_158186648_159550735	39
LOX	5_121379525_121463477	32
EZH2	7_147743920_148251513	26
TGFBI	5_133869574_135609557	26
LPCAT1	5_1464412_1547908	25
STC2	5_172627142_172911788	20
VCAN	5_82429444_83404045	19
HAPLN1	5_82429444_83404045	18
PTTG1	5_159560586_159794152	13
SLC1A3	5_36083295_38914974	12
CD36	7_79232817_81720844	12
FYB	5_38914975_40803153	11
HAVCR1	5_153318241_156728896	11
LCP2	5_169013893_171206829	11
ERAP2	5_95185578_96572060	10
LHFPL2	5_77424969_79064481	10
CDH6	5_31118743_31275604	10
SERPINE1	7_99477381_101064053	9
OSMR	5_36083295_38914974	9
ADCY2	5_6955045_7595315	8
NCAPG2	7_155325076_158821424	7
IL7R	5_35072475_35904253	6
TNFAIP8	5_117428678_119347308	6
GM2A	5_150387976_151495148	5
ERAP1	5_95185578_96572060	5
TRIO	5_13360088_14372070	5
LMNB1	5_124312152_126219449	5
SEMA6A	5_114787094_117418456	4
MAP1B	5_71090060_73266816	4
PDIA4	7_148251514_148521023	4
FAM134B	5_15838038_17095203	4
ARHGAP26	5_137965436_142619254	4
FEM1C	5_114787094_117418456	4
MCTP1	5_93800373_94108870	4
PDCD6	5_80564_1460115	4
NAIP	5_80564_1460115	4
HEXB	5_74004814_74111113	3
PRRC1	5_126472912_127898523	3
THG1L	5_156728897_158181852	3
TMED9	5_175848855_177323654	3
NR3C1	5_142619255_142995861	3
ELL2	5_95185578_96572060	3
ABLIM3	5_148125331_149600863	3

FAF2	5_174398116_175825668	3
UBE2D2	5_137965436_142619254	3
POLR3G	5_89715117_90038886	3
CD74	5_149608837_150339149	3
ATG12	5_114787094_117418456	3
DNAJB6	7_155325076_158821424	3
NPM1	5_169013893_171206829	3
RHEB	7_150769315_150816588	3
CSNK1A1	5_148125331_149600863	3
POP7	7_99477381_101064053	3
CAST	5_95185578_96572060	2
TCERG1	5_145777678_145959815	2
AP3S1	5_114787094_117418456	2
KIF3A	5_131895601_132064150	2
SLC36A1	5_150387976_151495148	2
MTRR	5_7595316_8756147	2
RAPGEF6	5_130783666_130814765	2
BAZ1B	7_71542285_73758949	2
PRKAA1	5_38914975_40803153	2
NOP16	5_174398116_175825668	2
YIPF5	5_142995862_144127403	2
MFAP3	5_153318241_156728896	2
GTF2H2B	5_80564_1460115	2
CSNK1G3	5_122532465_123412098	2
LNPEP	5_95185578_96572060	2
PDLIM4	5_131528076_131643864	2
ABCF2	7_150298143_150766389	2
SKP2	5_36083295_38914974	2

Table S7. Genes determined to be lost and underexpressed in both the Penn Data and Broad Data

Gene	Segment	Expression fold change
ALDOB	9_103206143_103225078	3302
LPA	6_159653684_161058906	258
PLG	6_159653684_161058906	248
SERPINA5	14_91904853_94123764	140
PTH1R	3_44897145_49188640	87
SLC7A8	14_22048600_22665560	79
FBP1	9_95018086_97600430	60
TRPM3	9_71621900_72807090	38
LRRC19	9_26297529_27664431	36
TYRP1	9_12500515_12697860	29
PTPRD	9_8270950_8423044	26
CHL1	3_135814_442156	26
TCF21	6_133557295_134979912	25
FBLN5	14_91313036_91496974	25
ARG2	14_66925080_67888728	24
ACOX2	3_58186123_58682005	23
TMEM30B	14_60386017_61188235	23
ASS1	9_132265469_132463966	20
ACY1	3_49220649_53001753	20
SEMA3B	3_49220649_53001753	19
ALDH6A1	14_73538366_75214580	19
EPB41L4B	9_110686804_112024713	19
TPD52L1	6_124730454_126264765	19
ALDH8A1	6_134990236_136274372	18
PCK2	14_23452745_23973123	17
GLDC	9_5171467_6962164	15
PSAT1	9_79879810_80205963	14
IL17RB	3_53179885_54098050	13
RALGPS1	9_128580791_129662766	12
SH3GL2	9_16855699_17606192	12
VNN1	6_132861486_133539012	12
TEK	9_26297529_27664431	12
PIP5K1B	9_70233709_71617302	10
HSPA2	14_63745851_64141947	10
MST1	3_49220649_53001753	9
GAS1	9_87649884_89304565	9
NTRK2	9_85941187_87593031	9
ACAA1	3_37967544_38537395	8
DNASE1L3	3_57884298_58173754	8
TDGF1	3_44897145_49188640	8
PLXNB1	3_44897145_49188640	8
CLMN	14_94128490_96240501	8
ALAD	9_115037070_115782034	8
SLC7A7	14_22048600_22665560	8

HDHD3	9_115037070_115782034	7
GPD1L	3_30861158_34026328	7
GPHN	14_65941325_66596885	7
DHRS4	14_23452745_23973123	6
FOS	14_73538366_75214580	6
CTNNAL1	9_110686804_112024713	6
ACOT1	14_72413330_73197695	6
OGG1	3_9737595_11040806	6
KCNK10	14_87688655_87991468	6
BCKDHB	6_79436179_81341225	6
AQP3	9_33069023_34267052	6
GCH1	14_53873515_54481493	5
PTPN3	9_110686804_112024713	5
PEX7	6_136867990_137635448	5
BRP44L	6_165958177_167074864	5
TBC1D13	9_130329421_131084190	5
SLC26A6	3_44897145_49188640	5
GRHPR	9_37085008_38426991	5
SLC1A1	9_4428585_4696365	5
NP	14_19722395_21117922	5
FAM184A	6_117963452_119451227	5
AMT	3_49220649_53001753	5
SOBP	6_107556334_108718558	5
CTSL2	9_98591458_99015826	5
CKB	14_102698491_103162541	5
RGS3	9_115037070_115782034	5
ENPP1	6_131763569_132304683	5
HYAL1	3_49220649_53001753	5
ALS2CL	3_44897145_49188640	5
FHIT	3_59641041_60037675	4
GSTZ1	14_75364277_77059690	4
AUH	9_92877674_93702294	4
BDKRB2	14_94128490_96240501	4
CTGF	6_132307358_132574240	4
UNC13B	9_34490610_35516604	4
BSPRY	9_115037070_115782034	4
FAM107A	3_58186123_58682005	4
ABHD14A	3_49220649_53001753	4
ZNF839	14_100344336_102698490	4
SUCLG2	3_66911946_67923826	4
GLRX5	14_94128490_96240501	4
CISH	3_49220649_53001753	4
FLRT2	14_84926602_85186475	4
C5	9_122162008_124248881	4
APEH	3_49220649_53001753	4
GNA14	9_78471939_79873671	4
DLST	14_73538366_75214580	4

HEMK1	3_49220649_53001753	3
NDRG2	14_19722395_21117922	3
GALT	9_34490610_35516604	3
DHRS1	14_23452745_23973123	3
C9orf3	9_95018086_97600430	3
L2HGDH	14_49764449_50156136	3
CLEC3B	3_44897145_49188640	3
CTDSPL	3_37419138_37957464	3
ACO1	9_32372071_32379397	3
UQCRC1	3_44897145_49188640	3
PABPN1	14_22668792_23199978	3
RDH11	14_66925080_67888728	3
FAM102A	9_129662767_130209348	3
AQP7	9_33069023_34267052	3
SLC25A38	3_39227673_39883848	3
SPTAN1	9_130329421_131084190	3
C3orf14	3_61813487_62538927	3
SYNE2	14_62827859_63745850	3
BCL2L2	14_22668792_23199978	3
KLF9	9_71621900_72807090	3
EXOSC7	3_44897145_49188640	3
CDC14B	9_97608364_98577589	3
HIGD1A	3_42343012_43143225	3
SDR39U1	14_23973124_24015170	3
SMARCA2	9_1477108_2200546	3
COQ4	9_129662767_130209348	3
SYNE1	6_152461219_152577227	3
CALM1	14_88531099_90228621	3
TJP2	9_70233709_71617302	3
PDHB	3_58186123_58682005	3
KIAA0317	14_73538366_75214580	3
BTD	3_15026132_16085669	3
SCAP	3_44897145_49188640	3
DDO	6_109168061_112756362	3
C14orf159	14_90234219_91313035	3
POMT1	9_132994733_133426100	3
CRAT	9_130329421_131084190	3
THTPA	14_22668792_23199978	3
BAG1	9_33069023_34267052	3
GMPR2	14_23452745_23973123	3
NISCH	3_49220649_53001753	3
RRAGD	6_89266711_90133403	3
LARS2	3_44897145_49188640	3
TEX264	3_49220649_53001753	3
DAG1	3_49220649_53001753	3
C14orf1	14_73538366_75214580	3
ZDHC3	3_44897145_49188640	2

LAMC3	9_132476485_132985779	2
RAB15	14_64373004_64780332	2
MAPKAP1	9_127035418_127435933	2
PIGH	14_66925080_67888728	2
COX16	14_68301617_69955784	2
CACNA2D2	3_49220649_53001753	2
CCDC28A	6_138842339_139665700	2
RNF38	9_35523348_37085007	2
GORASP1	3_38618283_39223855	2
MUDENG	14_55049506_57672302	2
CCNC	6_97422999_100838999	2
CCDC51	3_44897145_49188640	2
DHRS7	14_59453438_60386016	2
FBXO34	14_54579863_55048577	2
NUP210	3_12915346_14322584	2
BAP1	3_49220649_53001753	2
SMARCC1	3_44897145_49188640	2
KLHDC2	14_49275523_49764448	2
XPC	3_12915346_14322584	2
TUSC2	3_49220649_53001753	2
TCTA	3_49220649_53001753	2
ABHD4	14_22048600_22665560	2
ATP6V1D	14_66874128_66925079	2
MAPK1IP1L	14_54579863_55048577	2
ENG	9_128580791_129662766	2
CCBL1	9_130329421_131084190	2
TRAK1	3_40062985_42196550	2
LMBRD1	6_70369272_70785392	2
SLC17A5	6_74286513_74830132	2
KIAA0284	14_103638225_104746745	2
SF3B5	6_144123302_144707049	2
ALAS1	3_49220649_53001753	2
IQSEC1	3_12903762_12915345	2
EIF5	14_102698491_103162541	2
ZER1	9_130329421_131084190	2
CCNB1IP1	14_19722395_21117922	2
C14orf147	14_32812162_34288375	2
SH3GLB2	9_130329421_131084190	2
SLC25A20	3_44897145_49188640	2
PPM1A	14_59453438_60386016	2
PLEKHG3	14_64141948_64362422	2
MTHFD1	14_63745851_64141947	2
PLCD1	3_37967544_38537395	2
COX7A2	6_74875451_77396866	2
C14orf2	14_103218092_103635871	2
LSM3	3_12915346_14322584	2
P4HTM	3_44897145_49188640	2

MEGF9	9_122162008_124248881	2
RAB14	9_122162008_124248881	2

Table S8. Genes determined to be gained and overexpressed specifically in the H1H2 tumors

Gene	Segment	Expression fold change
TPM4	19_15966270_17119827	110
AP3D1	19_1877027_2257574	67
GADD45B	19_2303639_2434712	40
UBE2I	16_37354_1504823	30
C16orf42	16_37354_1504823	16
LSM4	19_17510791_19739813	13
PDPK1	16_2497499_2582218	13
PSMA7	20_59810422_60201891	13
RPS21	20_60211696_60452531	12
RAB22A	20_56098218_56737667	12
AURKA	20_54246466_54448572	12
KIR2DS5	19_217034_569158	10
FPR3	19_56951383_57293210	9
SLMO2	20_56752189_57794009	8
STX16	20_56098218_56737667	8
CDK10	16_86889141_88827254	7
ANKRD11	16_86889141_88827254	7
KLHDC4	16_86213716_86327204	7
RAE1	20_55323457_55373335	7
HN1L	16_1504824_1747780	6
PRPF6	20_60513032_62435964	6
MUM1	19_685851_1501649	5
LUC7L	16_37354_1504823	4
FOXF1	16_84978771_85883412	4
YTHDF1	20_60513032_62435964	4
APRT	16_86889141_88827254	4
C19orf6	19_685851_1501649	4
KIR2DS1	19_217034_569158	4
ZNF350	19_56951383_57293210	4
DIDO1	20_60513032_62435964	4
NFIC	19_3207206_3806976	3
GNAS	20_56752189_57794009	3
CTSZ	20_56752189_57794009	3
TCF25	16_86889141_88827254	3
MKNK2	19_1877027_2257574	3
C19orf24	19_685851_1501649	3
SF4	19_17510791_19739813	3
USE1	19_17140752_17510790	3
DEF8	16_86889141_88827254	3
TICAM1	19_4383973_5333471	3
ABCA3	16_2203147_2269261	3
BIRC7	20_60513032_62435964	2
GTPBP3	19_17140752_17510790	2
PMEPA1	20_55378086_56088765	2

SFRS14	19_17510791_19739813	2
RMND5B	5_177328806_177539024	2
DDX49	19_17510791_19739813	2
RNF126	19_580303_681234	2

Table S9. Genes determined to be lost and underexpressed specifically in the H1H2 tumors

Gene	Segment	Expression fold change
ALDOB	9_103206143_103225078	1328
GLDC	9_5171467_6962164	80
ADD3	10_111599600_112749597	56
PLG	6_159653684_161058906	52
LPA	6_159653684_161058906	36
NR4A3	9_101056712_102392837	30
SLC1A1	9_4428585_4696365	29
ALDH8A1	6_134990236_136274372	28
PTPN3	9_110686804_112024713	23
SF3B5	6_144123302_144707049	22
NTRK2	9_85941187_87593031	21
LMBRD1	6_70369272_70785392	17
TPD52L1	6_124730454_126264765	16
PSAT1	9_79879810_80205963	16
CTNNAL1	9_110686804_112024713	15
KLF4	9_108878798_110682355	14
TCF21	6_133557295_134979912	12
DUSP5	10_111599600_112749597	12
CITED2	6_139666937_140225385	11
MAP3K4	6_161064719_162208527	10
CDC2L6	6_109168061_112756362	10
IFIT3	10_90957073_91340766	10
PEX7	6_136867990_137635448	9
TCTN3	10_95422852_97564644	9
SNX3	6_107556334_108718558	9
GNA14	9_78471939_79873671	9
C9orf46	9_5171467_6962164	8
TRPM3	9_71621900_72807090	7
ZDHHC6	10_114129886_115474189	6
EPB41L4B	9_110686804_112024713	6
AIM1	6_107027893_107082228	6
PTPRD	9_8270950_8423044	6
C9orf95	9_76597456_77301249	6
SH3GL2	9_16855699_17606192	6
AKAP12	6_150013780_151967069	6
SYNJ2	6_157357403_158508689	6
RPS12	6_132861486_133539012	6
AKAP7	6_130174709_131753350	6
FAM184A	6_117963452_119451227	5
SMARCA2	9_1477108_2200546	5
MOXD1	6_132576345_132753999	5
ABCA1	9_106576716_106585723	5
VNN1	6_132861486_133539012	5
C5	9_122162008_124248881	5

NDUFA8	9_122162008_124248881	5
DENND4C	9_19280143_19432557	5
PDE10A	6_164518210_165829451	4
SMPD2	6_109168061_112756362	4
FYN	6_109168061_112756362	4
PIP5K1B	9_70233709_71617302	4
SASH1	6_148191120_148971559	4
RNGTT	6_89266711_90133403	4
XPNPEP1	10_111599600_112749597	4
SLC17A5	6_74286513_74830132	4
RAB14	9_122162008_124248881	4
QRSL1	6_107087017_107515277	4
FIG4	6_109168061_112756362	4
KLHL9	9_20807835_21445813	4
ALDH18A1	10_95422852_97564644	4
KIAA0020	9_2559655_2952417	4
DDO	6_109168061_112756362	4
LRRC19	9_26297529_27664431	3
CCNC	6_97422999_100838999	3
COX7A2	6_74875451_77396866	3
CASP8AP2	6_90135121_91423459	3
CDC40	6_109168061_112756362	3
TJP2	9_70233709_71617302	3
VLDLR	9_2559655_2952417	3
EEF1A1	6_74266790_74286512	3
TCF7L2	10_114129886_115474189	3
BCKDHB	6_79436179_81341225	3
KATNA1	6_149315857_149992906	3
ANKRD6	6_90135121_91423459	3
GABRR2	6_89266711_90133403	3
SOBP	6_107556334_108718558	3
C9orf82	9_26297529_27664431	3
TEK	9_26297529_27664431	3
TRAF3IP2	6_109168061_112756362	3
KLF9	9_71621900_72807090	3
BCLAF1	6_136317780_136692186	3
SYNE1	6_152461219_152577227	3
ABLIM1	10_115676858_116409310	3
AKAP2	9_110686804_112024713	2
FBXW2	9_122162008_124248881	2
RRAGA	9_18979696_19197364	2
PLAGL1	6_144123302_144707049	2
ENPP1	6_131763569_132304683	2
UGCG	9_113597296_113747728	2
MTO1	6_73918251_74266789	2
LOH3CR2A	3_8440869_9285534	2
EZR	6_158518568_159302317	2

SEC61B	9_100899897_101056711	2
SMAP1	6_70796754_71812194	2
KIAA1009	6_84017058_84994248	2
HDDC2	6_124730454_126264765	2
VPS13A	9_78471939_79873671	2
PNRC1	6_89266711_90133403	2
CCDC28A	6_138842339_139665700	2
KIAA1797	9_20454928_20801420	2
TMEM38B	9_106593345_107511705	2
GTF2H5	6_158508690_158518567	2
PCMT1	6_150013780_151967069	2
RPS6	9_19280143_19432557	2
SMPDL3A	6_121484855_124378649	2
TSPYL4	6_114391946_117317093	2
SRGAP3	3_8440869_9285534	2

Table S10. Genes determined to be gained and overexpressed specifically in the H2 tumors

Gene	Segment	Expression fold change
HAVCR1	5_153318241_156728896	90
EPB41L4A	5_111505154_111922638	84
ELL2	5_95185578_96572060	80
RAPGEF6	5_130783666_130814765	60
C5orf13	5_109028224_111491735	56
YTHDC2	5_112703850_113188388	52
PRRC1	5_126472912_127898523	52
POLR3G	5_89715117_90038886	51
ERAP1	5_95185578_96572060	50
ST8SIA4	5_99896738_100307187	47
LOX	5_121379525_121463477	45
AFF4	5_132093779_133869573	41
RHEB	7_150769315_150816588	38
APC	5_111922639_112678649	33
ZCCHC10	5_132093779_133869573	31
SLC36A1	5_150387976_151495148	31
G3BP1	5_150387976_151495148	25
HSPA4	5_132093779_133869573	24
LRRTM2	5_137965436_142619254	23
PKD2L2	5_137033572_137695243	23
CNOT8	5_153318241_156728896	22
FBXO38	5_147704279_148125330	21
FEM1C	5_114787094_117418456	20
PGGT1B	5_113972101_114787065	17
FABP6	5_158186648_159550735	17
ANKHD1	5_137965436_142619254	15
TMCO6	5_137965436_142619254	15
XRCC2	7_151748390_155325075	14
NPY6R	5_137033572_137695243	13
CETN3	5_89715117_90038886	12
CSNK1A1	5_148125331_149600863	12
HSPA9	5_137741660_137923116	11
SLC12A2	5_126472912_127898523	11
SEMA6A	5_114787094_117418456	10
DMXL1	5_117428678_119347308	9
MEF2C	5_85233946_88114765	9
TMED7	5_114787094_117418456	9
NR3C1	5_142619255_142995861	9
SMAD5	5_133869574_135609557	9
MCTP1	5_93800373_94108870	9
SAP30L	5_153318241_156728896	8
MFAP3	5_153318241_156728896	8
TGFBI	5_133869574_135609557	8
SNX2	5_121463478_122532464	8

IK	5_137965436_142619254	8
MYOT	5_137033572_137695243	7
DNAJB6	7_155325076_158821424	7
FBN2	5_126472912_127898523	6
HSD17B4	5_117428678_119347308	6
WDR60	7_155325076_158821424	6
C5orf15	5_132093779_133869573	6
UBE2D2	5_137965436_142619254	6
GABRA1	5_160850531_161385662	6
RHOBTB3	5_94108871_95185577	6
TCERG1	5_145777678_145959815	5
ARHGAP26	5_137965436_142619254	5
VDAC1	5_132093779_133869573	5
GM2A	5_150387976_151495148	5
ATG12	5_114787094_117418456	5
BRD8	5_137033572_137695243	5
SPRY4	5_137965436_142619254	5
ERAP2	5_95185578_96572060	5
RBM22	5_149608837_150339149	5
KIF3A	5_131895601_132064150	5
SLCO4C1	5_100368305_103112032	5
SNX24	5_121463478_122532464	4
TTC37	5_94108871_95185577	4
PRKAG2	7_150880365_151624640	4
YIPF5	5_142995862_144127403	4
THG1L	5_156728897_158181852	4
LECT2	5_133869574_135609557	4
INSIG1	7_151748390_155325075	4
MED7	5_153318241_156728896	4
CAST	5_95185578_96572060	4
CSNK1G3	5_122532465_123412098	4
ABLIM3	5_148125331_149600863	4
SKP1	5_132093779_133869573	3
ABCF2	7_150298143_150766389	3
GIN1	5_100368305_103112032	3
CHD1	5_98143728_99896737	3
SRP19	5_111922639_112678649	3
UBE2B	5_132093779_133869573	3
NCAPG2	7_155325076_158821424	3
PPIC	5_121463478_122532464	3
ADAM19	5_156728897_158181852	3
LNPEP	5_95185578_96572060	3
HARS2	5_137965436_142619254	3
RNF14	5_137965436_142619254	3
SAR1B	5_133869574_135609557	3
SYNPO	5_149608837_150339149	3
ALDH7A1	5_124312152_126219449	3

PURA	5_137965436_142619254	3
PCDHGB6	5_137965436_142619254	3
CTNNA1	5_137965436_142619254	3
PCDHGB5	5_137965436_142619254	3
C5orf4	5_153318241_156728896	3
TCOF1	5_149608837_150339149	3
FAM172A	5_92130734_93021232	3
HNRNPA0	5_137033572_137695243	3
FLJ11235	5_111505154_111922638	3
CD74	5_149608837_150339149	3
TNFAIP8	5_117428678_119347308	3
SPINK5	5_146792840_147620910	3
CCNJL	5_159560586_159794152	3
GRAMD3	5_124312152_126219449	3
FAM114A2	5_153318241_156728896	2
CDKL3	5_132093779_133869573	2
RASA1	5_85233946_88114765	2
SPARC	5_150387976_151495148	2
COMMD10	5_114787094_117418456	2
PTTG1	5_159560586_159794152	2
SLC22A5	5_131643865_131833633	2
SNCAIP	5_121463478_122532464	2
FER	5_107885704_108507649	2
LMNB1	5_124312152_126219449	2
GNB2L1	5_179412778_180857866	2
PAXIP1	7_151748390_155325075	2
PCDHGA8	5_137965436_142619254	2
GALNT11	7_150880365_151624640	2
GALNT10	5_153318241_156728896	2
SGCD	5_153318241_156728896	2

Table S11. Genes determined to be lost and underexpressed specifically in the H2 tumors

Gene	Segment	Expression fold change
ALDH6A1	14_73538366_75214580	273
FOS	14_73538366_75214580	41
ACOT1	14_72413330_73197695	24
C14orf1	14_73538366_75214580	15
WBSCR16	7_73758950_74127824	15
TMEM30B	14_60386017_61188235	14
MTHFD1	14_63745851_64141947	14
HSPA2	14_63745851_64141947	13
PNN	14_38425213_39179815	12
CNIH	14_53873515_54481493	12
C14orf45	14_73538366_75214580	12
KIAA0391	14_34641402_35194085	11
DLST	14_73538366_75214580	11
PLEKHG3	14_64141948_64362422	11
ACTR10	14_57676004_58185200	10
ARG2	14_66925080_67888728	10
RAB15	14_64373004_64780332	10
GSTZ1	14_75364277_77059690	10
PRKCH	14_60386017_61188235	10
AHSA1	14_75364277_77059690	9
RDH11	14_66925080_67888728	9
COX16	14_68301617_69955784	8
NFKBIA	14_34641402_35194085	8
PSEN1	14_72413330_73197695	7
ANGEL1	14_75364277_77059690	7
ZNF410	14_73238184_73538365	7
TMED10	14_73538366_75214580	7
KLHDC2	14_49275523_49764448	7
KTN1	14_55049506_57672302	7
ACTN1	14_68301617_69955784	7
C14orf101	14_55049506_57672302	6
ERH	14_68301617_69955784	6
SFRS5	14_68301617_69955784	6
SYNE2	14_62827859_63745850	6
GPC5	13_90843580_90863093	6
RPS29	14_48594272_49275522	6
MUDENG	14_55049506_57672302	6
ATP6V1D	14_66874128_66925079	6
FAM179B	14_43988150_44610615	5
VTI1B	14_66925080_67888728	5
PNMA1	14_73238184_73538365	5
DHRS7	14_59453438_60386016	5
ALKBH1	14_77059691_77387656	5
KIAA0317	14_73538366_75214580	5

ARF6	14_49275523_49764448	4
NPC2	14_73538366_75214580	4
ARHGAP5	14_31415386_32765672	4
YLPM1	14_73538366_75214580	4
PIGH	14_66925080_67888728	4
SEL1L	14_79355997_81577951	4
FBXO34	14_54579863_55048577	4
GPHN	14_65941325_66596885	3
SAMD4A	14_53873515_54481493	3
FLRT2	14_84926602_85186475	3
STRN3	14_30349237_31352314	3
UBA7	3_49220649_53001753	3
C14orf169	14_72413330_73197695	3
WBP11	12_14813007_14834182	3
PPM1A	14_59453438_60386016	3
C14orf147	14_32812162_34288375	3
EAPP	14_32812162_34288375	3
MAX	14_64373004_64780332	3
EIF2B2	14_73538366_75214580	3
ABCD4	14_73538366_75214580	3
LTF	3_44897145_49188640	3
LSM3	3_12915346_14322584	2
MAP4	3_44897145_49188640	2
GNAI2	3_49220649_53001753	2
L2HGDH	14_49764449_50156136	2
SEC13	3_9737595_11040806	2
MAPK1IP1L	14_54579863_55048577	2
GCH1	14_53873515_54481493	2
LMCD1	3_8440869_9285534	2
RPP14	3_58186123_58682005	2
QRICH1	3_44897145_49188640	2
EIF2S1	14_66874128_66925079	2
ARIH2	3_44897145_49188640	2
IQSEC1	3_12903762_12915345	2
BRPF1	3_9737595_11040806	2