Supplementary Methods

Immunofluorescence

The following antibodies were used: Six2 (11562-1-AP7, Proteintech), γH2Ax (Ab11174, Abcam), GFP (ab13970, Abcam), Cited1 (RB9219P1, Neomarkers, 1:50), Pax2 (71-6000, Invitrogen), Amphiphysin (13379-1-AP, Proteintech), BrdU (SC-32323, Santa Cruz), Meis1/2 (39795, Active Motif), Laminin (L9393, Sigma), cytokeratin (C2562, Sigma) and NCAM (C9672, Sigma); DAPI or Hoechst (Invitrogen) were used to stain nuclei. Primary antibodies were used at a 1:200 dilution. Whole-mount staining was done on E12.5-13.5 kidneys as previously described (Saifudeen et al, 2009). The immunofluorescent images were captured using a 3D or deconvolution scope (Leica DMRXA2) and staining intensity was quantified using Intelligent Imaging Innovations SlideBook software.

RNA-Seq

The read quality codes (SamFlag codes “83”, “99”, “147” and “163”) which identified the reads that were paired and mapped in proper pairs were applied to control the quality for paired reads. Read Quality of paired-end RNA-Seq on Hi-Seq system was determined by the FastQC report of the raw readouts. Paired-end sequencing for each sample had a Phred Q30 score over 87%, indicating that over 87% of reads having a 99.9% base-calling accuracy (Table SI). Over x250 depth of coverage relative to GRCm38/mm10 transcriptome (61.4Mb, Illumina iGenome) was obtained. ~84% of ~200M total reads were successfully aligned for both genotypes. SamFlag filters were applied to ensure that reads were paired and mapped in proper pairs. Only properly paired reads from both ends were included for further analysis.

Nanostring nCounter expression analysis

Overnight hybridization occurred for 22 hours at 65°C. Removal of excess probes with magnetic bead purification was performed on the nCounter Prep Station (software v4.0.11.2) on the Standard assay. Briefly, the probe-mRNA structure was affinity purified by its 3' end to remove excess reporter probes, then by its 5' end to remove excess capture probes. Once unbound probes were washed away, the tripartite structure was bound to the streptavidin-coated cartridge by the biotin capture probe, aligned by an electric current and immobilized. Photobleaching and flurophore degradation was prevented with the addition of SlowFade. The cartridge containing immobilized samples was transferred to the nCounter Digital Analyzer (software v3.0.1.1) and scanned at 280 FOV. An epi-fluorescent microscope and CCD camera identified sets of fluorescent spots, which were tabulated for data output. Quality control metrics were recorded using the nSolver Analysis Software v1.1.

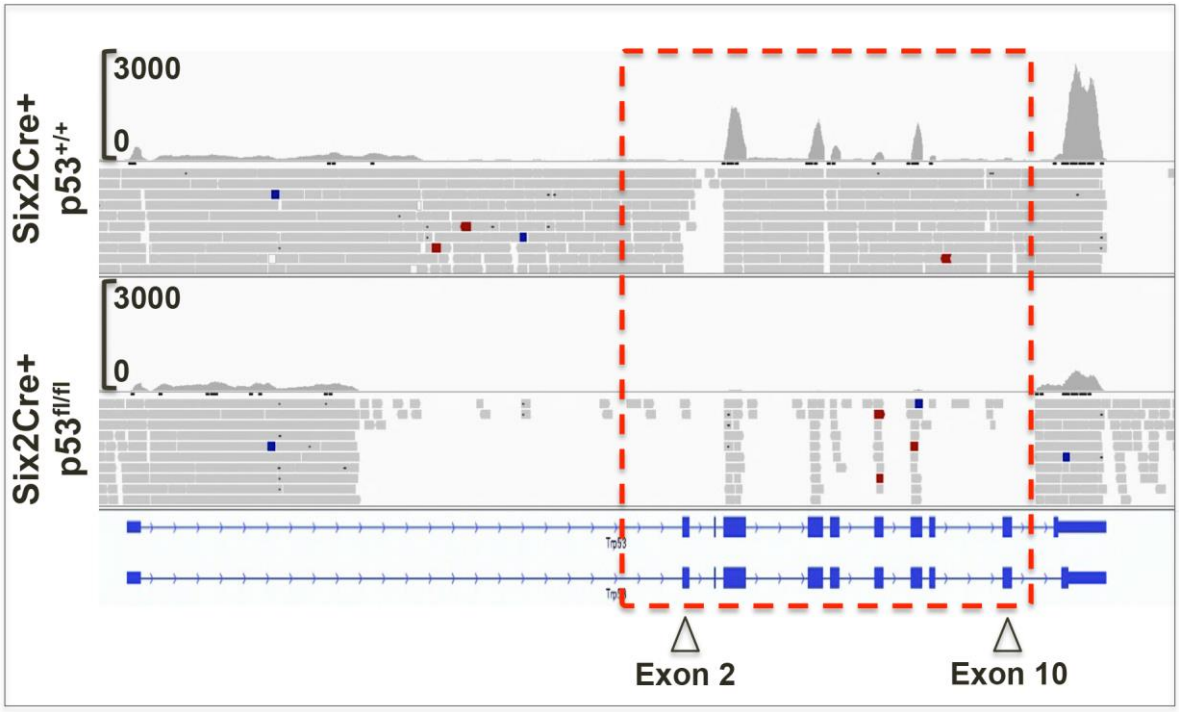

Figure S1. RNASeq shows loss of expression of exons 2-10 of p53 in Six2+ cells isolated from *Six2Cre+;p53*$^{fl/fl}$ kidneys.

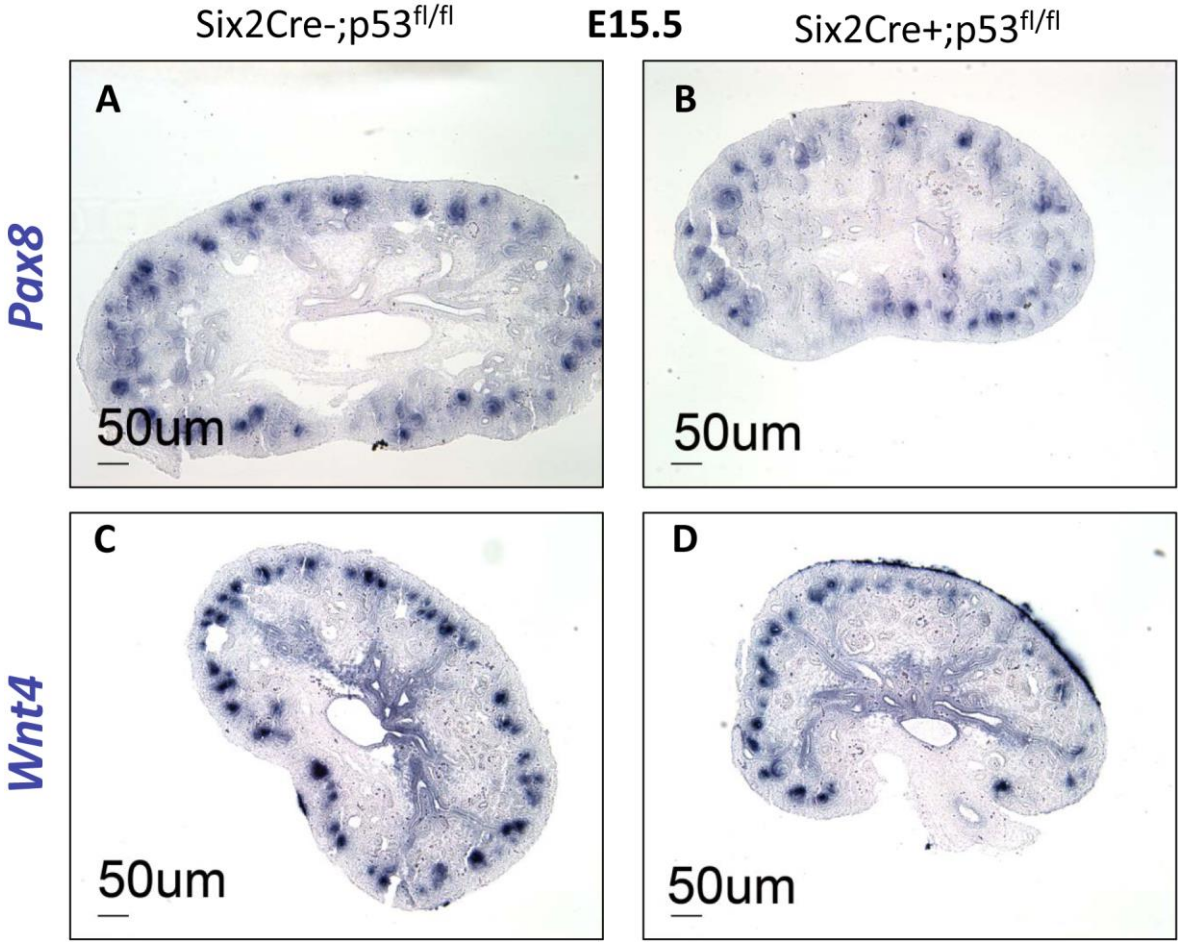

Figure S2. Expression of nephrogenesis regulators Pax8 and Wnt4 in E15.5 *Six2Cre+;p53$^{fl/fl}$* kidneys is unchanged from that in littermate *Six2Cre-;p53$^{fl/fl}$* wild-type kidneys.

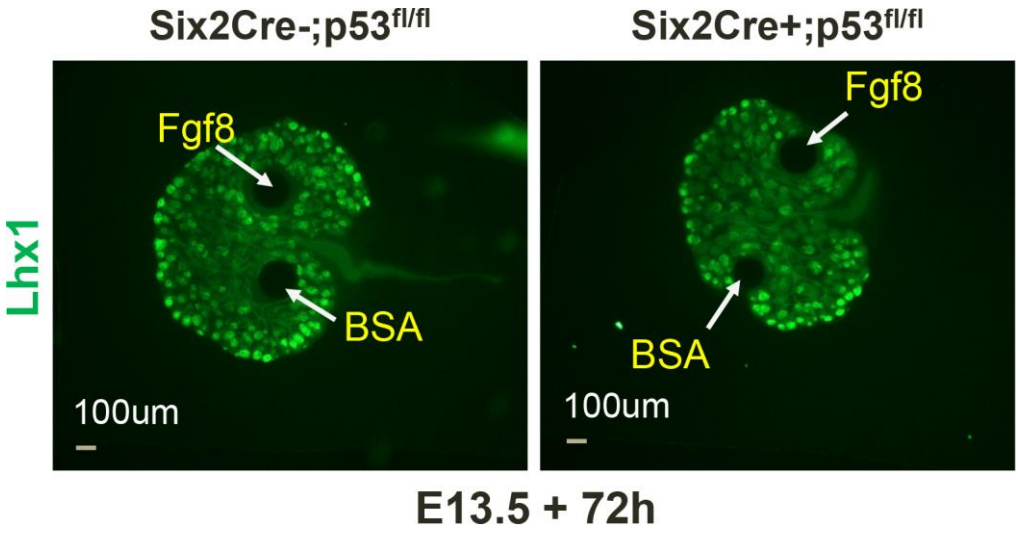

Figure S3. Fgf8 treatment does not rescue nephrogenesis in *Six2Cre+;p53*$^{fl/fl}$ kidneys. Fgf8 induces Lhx1+ structures around the bead (white arrow) in the littermate *Six2Cre-;p53*$^{fl/fl}$ wild-type kidney. No induction is observed around the control BSA-soaked bead. No induction of Lhx1+ nascent nephrons is observed around the Fgf8 bead in the mutant kidney.

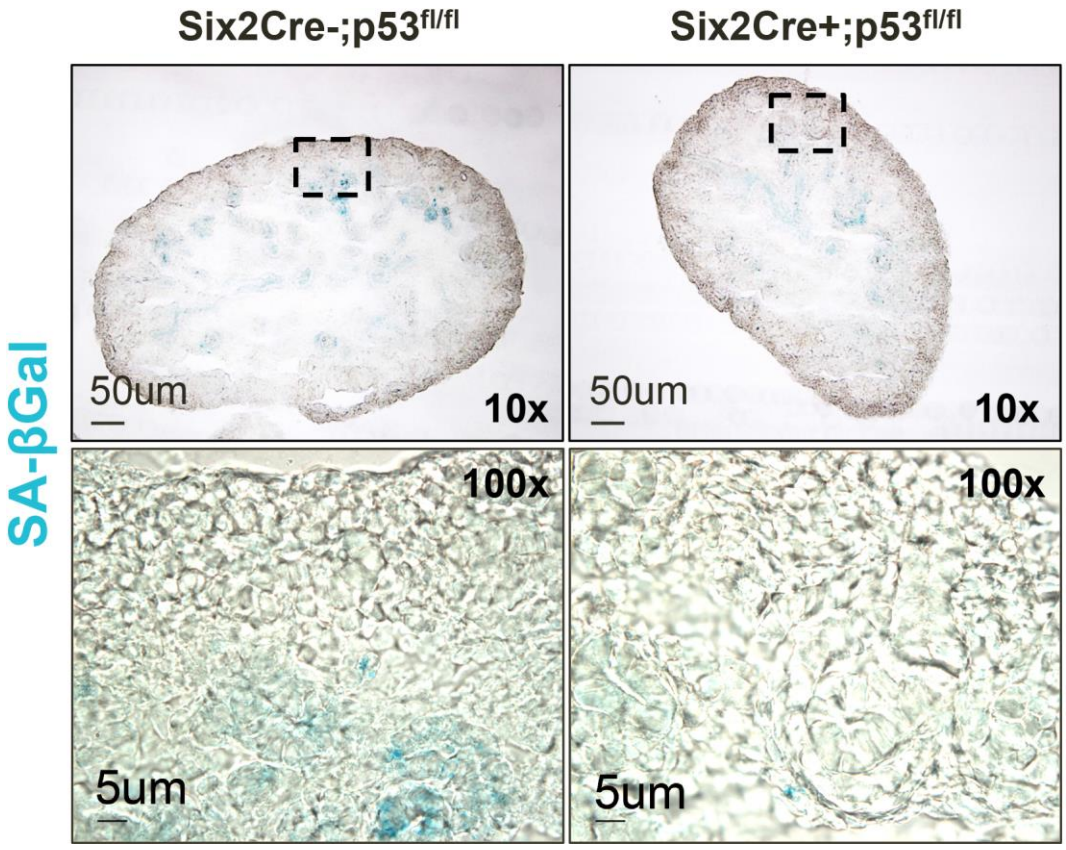

Fig. S4. Senescence-associated–βgal staining is not increased in Six2 p53-null CM in E15.5 kidneys.

Table S1. RNA-Seq coverage and read quality

	p53 wild-type		p53 conditional knockout	
	Paired Read 1	**Paired Read 2**	**Paired Read 1**	**Paired Read 2**
	Read Quality (FastQC)			
Phred Q>=30	88.93%	87.78%	89.36%	88.06%
Depth of Coverage	X275		X257	
	Statistics of Reads			
Aligned Reads	167,343,999		156,500,187	
Total Reads	200,116,046		187,658,886	
Aligned/Total	83.62%		83.40%	

Table S2. Differential expression of genes in Six2$^{p53-/-}$ CM determined by RNA-Seq

Gene Name	FC	Gene Name	FC
41705	1.420244	4930481A15Rik	0.219831
41886	0.582736	4930570G19Rik	2.16717
0610005C13Rik	0.486587	4930578N16Rik	1.683792
0610010O12Rik	0.412917	4933439C10Rik	0.581051
0610040J01Rik	0.559685	5430407P10Rik	1.463373
1190007I07Rik	0.685226	6030408B16Rik	0.554225
1200009I06Rik	0.461455	6230427J02Rik	0.556519
1300014I06Rik	0.530526	8430408G22Rik	0.096555
1700007K13Rik	0.309722	8430419K02Rik	0.154966
1700009P17Rik	0.444861	9030617O03Rik	0.230407
1700011H14Rik	0.25172	9030624G23Rik	1.666503
1700019G17Rik	0.662864	A1cf	0.171713
1700029I01Rik	2.088414	A230056P14Rik	0.609644
1700047I17Rik2	0.585562	A430110N23Rik	0.521801
1700048O20Rik	1.522537	A4galt	0.361717
1700106J16Rik	0.366094	A530054K11Rik	1.44095
1810013D15Rik	0.164123	A730015C16Rik	1.910716
1810019D21Rik	0.096555	A830007P12Rik	0.483069
1810019J16Rik	0.335371	A930015D03Rik	1.843482
2200002D01Rik	0.286467	AA987161	1.481875
2210404O07Rik	0.525108	Aadac	0.128328
2310007B03Rik	0.138581	Aadat	0.170576
2310014L17Rik	1.499262	Abcc2	0.126913
2410066E13Rik	1.472279	Abcc9	0.492775
2410127L17Rik	0.685248	Abhd1	1.771899
2610018G03Rik	1.593468	Abhd14b	0.544077
2610021K21Rik	0.514458	Abi3	0.218803
2610028E06Rik	0.694036	AC027184.1	0.230935
2610035D17Rik	0.486011	AC114588.1	15949.91
2610042L04Rik	8.418214	AC122837.1	1.725297
2610301B20Rik	1.583862	AC124113.1	7.81E-07
2610528J11Rik	0.148425	AC125170.1	39772.54
2810008D09Rik	0.579027	AC147549.1	0.000178
2900052L18Rik	0.510526	AC151712.1	0.16152
3110047P20Rik	0.166722	AC151712.4	1.415855
3632451O06Rik	2.333353	AC158220.1	1.442914
4632428N05Rik	0.290443	AC159308.1	2.494694
4930426D05Rik	1.476645	AC159637.1	4285.82

AC159748.1	0.61808
AC162391.1	7.719727
AC175032.1	0.226203
AC175831.1	0.080114
AC214054.1	0.379746
AC242398.1	0.200394
Acaa1b	0.322874
Acap1	0.196744
Ace	0.142716
Ace2	0.376628
Acot3	0.323877
Acot4	0.379518
Acsm1	0.00027
Acsm2	0.145645
Acta2	0.289546
Acvrl1	0.405725
Acy3	0.517337
Adam23	1.522263
Adamts17	2.130809
Adamts18	0.582717
Adamts2	0.494441
Adamts4	0.642124
Adamts5	0.41089
Adamts6	0.424333
Adamtsl1	0.380561
Adamtsl4	0.337455
Adamtsl5	0.357444
Adap2	0.088834
Adarb2	1.97317
Adat2	1.568749
Adc	0.662555
Adcy2	0.398618
Adcy5	0.556695
Adcyap1r1	0.395385
Adh1	0.566101
Adnp	1.38001
Adra1d	0.196297
Adra2b	0.196041
Adssl1	0.369738
Afm	0.125064
Afp	0.131826
Agmat	0.058712
Agtr2	0.329282
Agxt2	0.052147
Ahcy	0.520814
Ahnak	0.327126
Ahr	1.659363
AI314831	0.657616
AI317395	0.06427
AI480526	0.513133
AI504432	1.617158
AI593442	2.406154
AI606181	0.625479
AI607873	0.181018
AI661453	0.496858
Aim1	0.464726
Ajap1	0.711667
Ak1	0.686032
Akap12	0.479368
Akd1	0.339257
Akr1b8	0.614084
Akr1c19	0.151578
Akr1c21	0.100942
AL807777.1	2.913382
Alas2	0.034809
Alcam	0.680501
Aldh1a7	0.261928
Aldh1l1	0.271216
Aldh3b1	0.550317
Aldh8a1	0.037392
Aldob	0.095223
Aldoc	0.595111
Alg10b	1.401737
Alox5	0.113637
Alx1	0.323073
Ambp	0.000438
Amd2	5.810391
Amdhd1	0.061698
Amn	0.187173
Ang	0.319215
Angpt2	0.445883
Angptl4	0.682373
Ankrd33b	0.397027
Anks1b	2.362429
Anks4b	0.280143
Ano3	0.292722

Ano4	0.171046
Anpep	0.35175
Anxa1	0.210728
Anxa2	0.386137
Anxa6	0.707751
Anxa7	0.670599
Aoah	0.000362
Aoc3	0.32529
Aox3	0.292077
Ap1m2	0.532172
Ap4e1	1.388435
Apba1	0.579156
Apbb1ip	0.266313
Aplnr	0.210044
Apoe	0.503739
Apom	0.451686
Apoo-ps	0.000632
Aqp1	0.15131
Aqp11	0.53262
Aqp2	0.239686
Arap1	0.463131
Arap3	0.590795
Arhgap15	0.088834
Arhgap24	0.550238
Arhgap5	1.484783
Arhgdib	0.519466
Arhgef16	0.469289
Arhgef19	0.545877
Arid5b	1.797882
Arsb	0.692416
Arsi	0.517659
Arsj	0.286737
Art1	0.308246
Art4	0.250177
Asb4	0.437849
Asb9	0.115451
Aspa	0.138253
Aspn	0.417494
Ass1	0.131981
Astn2	0.588495
Atp11c	1.549265
Atp13a3	1.401094
Atp13a4	0.234038
Atp1a2	1.409504
Atp1b1	0.459165
Atp6v0a4	0.170827
Atp6v1b1	0.265506
AW551984	0.596002
AY036118	0.379026
B230217C12Rik	0.588341
B3gat2	0.513021
B3gnt5	1.531558
B3gnt8	0.552838
B3gnt9-ps	0.488709
B430203G13Rik	3.003008
B4galnt1	0.576173
B630005N14Rik	1.422563
Baiap2l2	0.273696
BC002163	50246.43
BC007180	5.724659
BC020535	0.154481
BC021785	0.287069
BC023719	0.000231
BC025446	0.203977
BC035947	1.953777
BC049730	2419.426
Bcl11a	2.098543
Bcl11b	1.754652
Bcl2l14	0.242894
Bcl3	0.114536
Bcl6	1.454214
Bcl6b	0.439362
Bglap-rs1	5.66054
Bgn	0.349965
Bhmt2	0.389305
Bmi1	1.515573
Bmp2	1.662084
Bmp3	0.338027
Bnc2	1.435832
Brwd3	1.446577
Bst2	0.410872
Btbd17	0.512205
Btg2	0.671052
Btg3	0.649695
C130050O18Rik	0.164123
C130074G19Rik	0.238485

C1qa	0.13913
C1qb	0.151624
C1qc	0.107337
C1qtnf2	0.27531
C1qtnf3	0.456027
C1qtnf5	0.150897
C1ra	0.438363
C1s	0.390301
C230034O21Rik	1.666562
C2cd4a	0.61151
C3ar1	0.207479
C530008M17Rik	1.386137
C530028O21Rik	4.715738
CAAA01064128.1	2.009603
Cacna1c	0.383788
Cacna1g	0.623255
Cacna2d1	1.414279
Cacna2d2	0.477912
Cacna2d3	0.226777
Cacnb4	1.450815
Cacng7	0.647208
Cadps2	1.41742
Cage1	2.046642
Calb1	0.571724
Calml4	0.243147
Capg	0.679281
Car15	0.454054
Car2	0.439774
Car3	0.387017
Car4	0.497071
Car8	1.782047
Card10	0.475526
Casp12	0.342019
Casq1	0.570041
Cav1	0.577321
Cbl	1.63482
Cblb	1.704284
Ccdc141	0.600008
Ccdc3	0.32991
Ccdc80	0.493755
Cck	0.201278
Cckar	0.293799
Ccl11	0.280407
Ccl21a	0.355142
Ccl21b	0.197657
Ccl24	0.000701
Ccl3	0.145714
Ccl6	0.092533
Ccng1	0.587236
Cd109	0.402081
Cd248	0.266653
Cd36	0.154877
Cd44	1.940089
Cd52	0.044645
Cd53	0.130343
Cd5l	0.000339
Cd74	0.534004
Cd82	0.654409
Cd93	0.220396
Cd97	0.492639
Cdc42ep1	0.406277
Cdc42ep2	0.498523
Cdc42ep5	0.462653
Cdca3	0.679387
Cdcp1	0.522119
Cdh1	0.482804
Cdh16	0.329273
Cdh22	0.667187
Cdh5	0.172096
Cdh9	0.000404
Cdhr1	0.427592
Cdhr2	0.14272
Cdhr5	0.310083
Cdkl1	0.437346
Cdkn1a	0.609561
Cdkn1c	0.597934
Cds1	0.648749
Cela1	0.244203
Celf2	1.456435
Celf4	0.594361
Cep170	1.479832
Cep290	1.639849
Cfb	0.344737
Cfh	0.296624
Cfi	0.372366
Cftr	0.677482

Chdh	0.167769	Col1a1	0.222326
Chml	1.561846	Col1a2	0.281412
Chn2	1.425813	Col23a1	0.368655
Chrd	0.566934	Col24a1	0.653336
Chrdl1	1.527899	Col25a1	0.586564
Chst11	1.392081	Col2a1	1.469911
Chst8	0.585351	Col3a1	0.258405
Cisd3	0.513622	Col4a4	0.544978
Cited4	0.409457	Col5a1	0.66666
Clca1	0.413244	Col5a2	0.461858
Clcnka	0.305968	Col5a3	0.209399
Clcnkb	0.336517	Col6a1	0.337963
Cldn1	0.398866	Col6a2	0.301147
Cldn10	0.32844	Col6a3	0.319327
Cldn19	0.337896	Col6a5	0.145018
Cldn2	0.113482	Col6a6	0.581014
Cldn4	0.440081	Col7a1	0.661209
Cldn5	0.555266	Col8a2	0.419615
Cldn6	0.467583	Col9a2	0.483053
Cldn7	0.401535	Colq	0.678051
Cldn8	0.473883	Comt	0.610094
Clec18a	0.584466	Corin	0.517703
Clec2d	0.393873	Cox6b2	0.54963
Clec4n	0.100942	Cpa1	0.284412
Clec7a	0.000618	Cpa2	0.420253
Clic5	0.540265	Cpb2	0.191263
Clic6	0.357417	Cpn1	0.34796
Clock	1.50128	Cpne8	0.435993
Clrn3	0.128886	Cpt1c	0.707605
Cmah	1.621424	Crabp1	0.597674
Cmbl	0.497169	Crb3	0.389979
Cml1	0.318712	Creb3l1	0.339279
Cmtm5	0.409569	Crhbp	23.71135
Cndp1	0.26551	Crip2	1.462117
Cnksr1	0.529492	Crispld2	0.513495
Cnn2	0.525144	Cryab	0.552838
Cntn4	0.427093	Csdc2	0.606672
Cntn6	0.093394	Csf1r	0.159596
Cntnap5b	0.03188	Csf2rb	0.05921
Col12a1	0.409008	Csrnp3	0.507187
Col14a1	0.383558	Csrp1	0.506929
Col15a1	0.271552	CT030661.1	1.478381
Col16a1	0.26923	CT573034.1	1.510953

Ctgf	0.665549
Cth	0.611235
Ctsc	0.70331
Ctse	0.13304
Ctsh	0.215119
Ctsk	0.294358
Ctsl	0.702502
Ctss	0.104925
CU463325.1	22.23686
Cubn	0.152785
Cx3cr1	0.229794
Cxcr2	2.33872
Cyb561	0.694226
Cyba	0.635399
Cybb	0.188374
Cygb	0.439456
Cyp1b1	0.629375
Cyp24a1	0.017437
Cyp26b1	0.353235
Cyp27a1	0.54612
Cyp27b1	0.153601
Cyp2d26	0.062814
Cyp2j11	0.145714
Cyp2j13	0.138307
Cyp2j5	0.056174
Cyp2j9	0.47729
Cyp2s1	0.440397
Cyp4a10	0.113518
Cyp4a31	0.178409
Cyp7b1	0.61106
Cys1	0.335063
Cyth4	0.242019
D14Abb1e	1.43125
D14Ertd449e	0.452665
D430041D05Rik	1.72415
D630003M21Rik	0.429293
D630023F18Rik	0.201278
D630042F21Rik	0.423937
Daam2	0.498886
Dach1	1.425868
Dact1	0.663165
Dact2	0.489904
Dao	0.210299
Dapp1	0.43586
Dbc1	0.27178
Dcdc2a	0.521637
Dclk1	1.437842
Dcn	0.316844
Dctn3	0.683516
Dcxr	0.627649
Ddn	0.097111
Ddr2	0.348327
Ddx3x	1.437855
Ddx3y	0.650675
Dennd1c	0.417155
Depdc1a	1.449802
Depdc1b	1.860391
Dkk1	0.539144
Dkk3	0.689676
Dlk1	0.384593
Dll4	0.272917
Dmxl1	1.382333
Dnajb9	1.518211
Dnm1	0.678286
Dnm3os	0.325515
Doc2g	0.681417
Dock8	0.368602
Dok2	0.576194
Dpep1	0.167652
Dpf3	1.405438
Dpp4	0.244934
Dpt	0.053123
Dsel	1.419074
Dusp14	0.537513
Dusp15	0.504063
Dusp23	0.632788
Dusp5	1.55656
Duxbl	0.532765
Dynlt1-ps1	1.791898
Dysf	0.434084
Dzip3	1.383978
E130203B14Rik	0.609874
Ebf1	0.502832
Ebf3	0.41739
Echdc3	0.596649
Ecm1	0.293921

Ecscr	0.266965	Erbb4	0.501343
Eda2r	0.197733	Esam	0.458467
Edil3	0.4202	Esrp1	0.395562
Edn3	0.578057	Esrp2	0.500717
Ednrb	0.533239	Esrrg	0.616486
Egfr	0.497674	Exoc5	1.43221
Egln3	0.550142	F13a1	0.236314
Egr2	1.527387	F2r	1.425565
Egr3	1.570561	F2rl1	0.224028
Ehbp1l1	0.668276	Fa2h	1.655575
Ehd2	0.477317	Fabp3	0.219597
Ehf	0.456735	Fabp4	0.285084
Eif2s3y	0.668057	Fads3	0.570796
Eif3j	0.70747	Fam107a	1.569504
Eif3s6-ps2	1588.749	Fam126b	1.488882
Elf4	0.685044	Fam129c	1.535244
Elmo1	0.57706	Fam176b	0.6417
Elmod1	0.489557	Fam198b	0.509042
Eln	0.413969	Fam199x	1.505068
Elovl7	0.340703	Fam19a4	2.061009
Eltd1	0.289057	Fam38b	0.595002
Emcn	0.388693	Fam46a	1.731218
Emilin1	0.433936	Fam65c	0.320576
Emilin3	0.505704	Fam70a	0.337928
Emp1	0.363413	Fam83h	0.680901
Emp2	0.688964	Fam84a	0.279188
Emp3	0.625456	Fap	0.210757
Emr1	0.112915	Fat2	1.515105
Emx2	0.618405	Fbln2	0.539665
Eng	0.34286	Fbln5	0.305788
Enho	0.688695	Fbp1	0.016281
Enpep	0.389558	Fbp2	0.107434
Enpp3	0.383372	Fcer1g	0.121599
Enpp4	1.437831	Fcgr1	0.09504
Entpd8	0.13184	Fcgr3	0.075494
Epas1	0.589109	Fcho2	1.528213
Epb4.9	0.391818	Fcna	0.033812
Epha1	0.489924	Fcrls	0.141523
Epha3	0.433593	Fermt1	0.417717
Ephx2	0.650044	Fez1	0.503153
Eps8l1	0.344733	Fga	0.100942
Eps8l2	0.450048	Fgd5	0.65208
Erbb3	0.627815	Fgf1	0.720848

Fgfr4	0.512374	Gca	0.495047
Fggy	0.558625	Gcnt2	1.482566
Fhl2	0.631347	Gcnt4	0.399954
Fibin	0.496276	Gdf7	0.523423
Figf	0.251648	Gem	2.665016
Filip1l	0.442268	Gfra2	0.470258
Fli1	0.456222	Ggt1	0.135326
Flnc	0.660726	Ggt5	0.435026
Flt1	0.257802	Gimap4	0.264868
Fmo2	0.454005	Gimap5	0.158263
Fmod	0.28715	Gimap6	0.268746
Fmr1	1.387139	Gipc2	0.290347
Fn1	0.685793	Gja4	0.245821
Folr1	0.204099	Gjb1	0.12706
Fosb	1.716378	Glb1l2	0.600775
Foxd1	0.69756	Glcci1	1.68267
Foxp2	0.400269	Gli1	0.720559
Frzb	1.462604	Glipr2	0.534854
Fut9	0.290558	Glt8d2	0.371499
Fxyd2	0.112032	Glyat	0.23892
Fxyd7	0.148191	Glyctk	0.423876
Fzd3	1.40013	Gm10020	2.179812
G0s2	0.539889	Gm10039	0.000594
G6pc	0.038474	Gm10073	1.861478
G6pc2	1.47734	Gm10093	16.59042
Gabra3	0.470505	Gm10138	1453.107
Gabrb2	1.606158	Gm10159	1.41477
Gal	5.744289	Gm10171	5532.887
Gal3st1	0.305968	Gm10184	4.978838
Galnt13	7.887014	Gm10221	1.454328
Galnt2	1.403524	Gm10243	536.0705
Galnt3	0.333581	Gm10254	0.221514
Galnt5	1.466516	Gm10263	3.261562
Galntl1	0.487603	Gm10282	1.587845
Gap43	0.436308	Gm10340	3.473412
Gapdh	0.545098	Gm10393	0.199074
Gas6	0.252574	Gm10394	0.532322
Gata2	0.469638	Gm10395	0.623915
Gata3	0.497851	Gm10409	1.920626
Gata5	0.471436	Gm10433	3.908029
Gata6	0.432456	Gm10476	3.048923
Gatm	0.476187	Gm10479	2.401953
Gbgt1	0.293406	Gm10593	0.222717

Gm10639	0.050984	Gm13841	10.4507
Gm10654	0.380502	Gm13855	0.144408
Gm10704	7.049909	Gm13889	0.472166
Gm10705	1.86927	Gm14022	4.218421
Gm10709	17.82323	Gm14121	4429.874
Gm11007	0.000526	Gm14150	4.340172
Gm11131	2.398637	Gm14292	3.207734
Gm11222	0.000619	Gm14308	0.511144
Gm11361	6.169029	Gm14419	0.389721
Gm11585	1844.261	Gm14492	0.619879
Gm11766	0.261159	Gm14549	0.000183
Gm11847	1.703767	Gm14822	0.13284
Gm11868	9.223152	Gm15318	0.128322
Gm12054	0.338934	Gm15427	0.670909
Gm12070	0.000162	Gm15431	16.68832
Gm12108	0.299726	Gm15442	0.000707
Gm12177	3.137365	Gm15478	0.504782
Gm12191	827454.9	Gm15487	5.511118
Gm12355	39.75356	Gm15583	63.79762
Gm12576	0.221308	Gm15645	2.980428
Gm12586	1954.668	Gm15662	0.528569
Gm12663	23304.11	Gm15681	27.36355
Gm12671	7.81E-07	Gm15772	0.000702
Gm12678	0.00035	Gm15899	2213.334
Gm12840	0.666147	Gm15920	21.65356
Gm12892	17.47805	Gm15975	2.137834
Gm13086	9.423475	Gm15996	0.225805
Gm13111	0.26024	Gm16010	0.151366
Gm13135	2.827393	Gm16197	0.202364
Gm13139	1.759266	Gm16241	0.624955
Gm13152	1.71967	Gm16425	3.781926
Gm13157	1.474231	Gm16589	2184.944
Gm13212	1.692822	Gm17060	2.325035
Gm13225	2.707573	Gm17131	1.609378
Gm13248	1.680571	Gm17132	2.194174
Gm13251	1.569269	Gm17143	6.390233
Gm13298	0.184518	Gm17209	0.000633
Gm13331	0.000229	Gm17352	7.296088
Gm13394	6.939504	Gm17383	3.754819
Gm13443	532.5634	Gm17709	5.419666
Gm13470	0.153807	Gm18202	0.01376
Gm13699	3.421018	Gm2007	0.000526
Gm13712	11.72961	Gm20474	2.389438

Gm20486	2.139381	Gm5776	21640.66
Gm20689	1758.039	Gm5784	1.608821
Gm20708	0.194622	Gm5796	3.203009
Gm22	0.18907	Gm5806	45.26252
Gm221	0.36289	Gm5812	5.116046
Gm2223	2.117192	Gm5819	9.53916
Gm2237	0.585505	Gm5828	3172.293
Gm2574	9.221256	Gm5859	0.084551
Gm2897	2.317442	Gm5874	13983.71
Gm2974	2.044953	Gm5887	0.340301
Gm3005	4.096747	Gm5898	133.0455
Gm3020	1.921175	Gm6061	0.000265
Gm3095	3.87936	Gm6136	21.31045
Gm3149	4.362216	Gm6158	0.196041
Gm3173	5.186403	Gm6206	2.462538
Gm3200	7.81E-07	Gm6257	7.746929
Gm3298	50.6685	Gm6356	6.416952
Gm3376	0.000671	Gm6505	7.77778
Gm3468	0.430382	Gm6594	12.76843
Gm3512	0.588887	Gm6645	63.5368
Gm3555	2719.101	Gm6685	11.53173
Gm3558	4.747521	Gm6838	2.181132
Gm3591	2.420748	Gm6851	0.491687
Gm3604	1.835636	Gm6969	21356.75
Gm3608	7.721863	Gm6984	0.698192
Gm3629	8.626232	Gm7092	0.138487
Gm3636	0.509267	Gm7125	1431.026
Gm3667	1.825048	Gm7224	2279.578
Gm3739	3.528825	Gm7278	5.885935
Gm3752	0.349546	Gm7293	6.82328
Gm3892	0.222717	Gm7332	1.838109
Gm4294	0.000119	Gm7334	1.700686
Gm4353	0.000284	Gm7340	2.899994
Gm4433	3.832545	Gm7367	2.218669
Gm4459	5.115185	Gm7666	0.282675
Gm4737	2788.813	Gm7809	2.114187
Gm4788	0.228522	Gm7879	52145.42
Gm4875	8.242876	Gm7887	32.97358
Gm5077	2.817316	Gm8108	6.347821
Gm5506	3.637123	Gm8113	0.55597
Gm5514	42.5916	Gm8116	7.686379
Gm5537	8171.074	Gm8159	2084.001
Gm5665	1.911302	Gm8203	0.000356

Gm8210	10.4507
Gm872	4.104311
Gm8778	6100.691
Gm8841	17.49051
Gm9008	1.937608
Gm9531	1.379267
Gm9746	0.623915
Gm9747	0.511141
Gm9755	0.288643
Gm9766	1.636148
Gm9770	16.91601
Gm9781	1.746197
Gm9800	1.667543
Gm9855	38.68615
Gm9885	0.30365
Gm9887	1.82459
Gm9923	17278.02
Gm996	0.000173
Gna14	0.474704
Gnb3	0.569974
Gng11	0.527134
Gng8	0.254258
Gpc4	0.544509
Gpd1	0.457702
Gpihbp1	0.227004
Gpr116	0.467393
Gpr160	0.351102
Gpr56	0.606599
Gprc5a	0.48266
Gpsm3	0.621777
Gpx3	0.702604
Grap	0.333907
Grb14	0.643038
Grb7	0.659373
Gria1	0.161853
Gria4	0.352189
Grik1	0.201278
Grm7	0.209736
Gsdmd	0.506775
Gsn	0.669954
Gsta2	0.035118
Gsta4	0.720861
Gstk1	0.66749
Gstm6	0.167558
Gstt1	0.297812
Gstt3	0.473133
Gvin1	0.054478
Gypa	0.203889
H2-Ab1	0.512622
H2-Ea-ps	1367.936
H2-Eb1	0.562578
H6pd	0.688974
Haao	0.038474
Habp2	0.282639
Hao2	0.14097
Hapln1	0.379111
Hba-a1	0.039933
Hba-a2	0.039607
Hba-x	0.000553
Hbb-b1	0.040923
Hbb-b2	0.029894
Hbb-y	0.027426
Hck	0.284359
Hcls1	0.221228
Hcn1	2.270663
Hdc	0.123899
Hddc3	2.325347
Hemk1	1.453001
Hey1	1.397292
Hgd	0.076362
Hhip	1.557706
Hic1	0.379867
Hist1h2ag	0.631001
Hist1h2ah	2.265216
Hist1h2an	3.592356
Hist1h2ao	1352.164
Hist1h2bj	0.540648
Hist1h2bp	3.591706
Hist1h4c	0.35713
Hist1h4i	0.42808
Hlx	0.208766
Hmga1-rs1	960.1706
Hmha1	0.621544
Hmox1	0.646786
Hnf1a	0.229968
Hnf1b	0.558363

Hnf4a	0.21811
Hoga1	0.42076
Homer1	1.443376
Hopx	0.36052
Hoxc11	0.719582
Hp	0.268109
Hpn	0.227429
Hsd17b2	0.000404
Hsd17b7	1.711203
Hsd3b4	0.034764
Hsd3b7	0.694604
Hspa12a	0.698473
Hspb1	0.608527
Hsph1	1.407901
Htr2b	0.448739
Ica1l	0.542215
Icam1	0.272611
Icam2	0.136974
Ifi204	10.75492
Ifi44	0.119904
Ifih1	0.182461
Ifit2	1.555983
Ifitm1	0.428673
Ifitm3	0.341906
Ifltd1	0.071488
Igf1	0.341854
Igfbp3	0.539014
Igfbp6	0.356933
Igfbp7	0.296686
Ihh	0.18282
Ikbke	0.6229
Ikzf3	1.711652
Il11ra1	0.715898
Il1r1	0.420015
Il20rb	0.567464
Il2rg	0.389664
Inpp4b	1.683354
Inpp5d	0.192376
Iqgap2	1.663025
Irgm2	0.280481
Irx1	0.503156
Irx3	0.451038
Isg20	0.209398
Islr	0.486194
Itga1	0.593377
Itgb6	0.200448
Itm2a	0.67746
Itpr3	0.461063
Iyd	0.141979
Izumo4	0.568078
Jdp2	0.56126
Jmy	1.428256
Kalrn	1.41633
Kank3	0.673909
Kank4	0.633932
Kcnd2	0.210355
Kcne1	0.443909
Kcnf1	1.802893
Kcnh1	0.418941
Kcnj15	0.100562
Kcnj16	0.275423
Kcnj2	0.389742
Kcnj8	0.31656
Kcnk6	0.47845
Kcnq5	1.558065
Kcnt2	0.443972
Kctd14	0.399343
Kdelr3	0.691137
Kdm5d	0.579185
Kdm6a	1.534633
Kdr	0.249175
Keg1	0.187799
Kif12	0.223641
Kif21a	1.489591
Kif26a	0.631032
Kif27	1.862277
Kifc3	0.641657
Kirrel3	0.277426
Kitl	3.24938
Kl	0.157108
Klf11	1.446428
Klf14	0.571004
Klf2	0.659139
Klf4	1.646098
Klhdc4	0.707352
Klhl11	1.437052

Klhl14	1.540971	Lrrc17	0.489106
Klhl4	0.465339	Lrrc25	0.123189
Klk8	0.627934	Lrrc32	0.356996
Kng2	0.172295	Lrrc4c	1.749794
Kpna2	0.385024	Lrrc8b	1.410053
Krt15	0.582832	Lrrk2	0.645775
Krt18	0.6262	Lrrtm1	0.350891
Krt7	0.358601	Ltbp4	0.671764
Krt8	0.345516	Lum	0.284989
Kynu	0.195236	Ly6a	0.190116
Lactb2	0.444552	Ly6e	0.675821
Lad1	0.457265	Ly6h	0.259693
Lama2	0.496503	Ly86	0.248964
Laptm5	0.511109	Lyn	0.533447
Lbh	0.609496	Lynx1	0.459603
Lcor	1.407981	Lyplal1	1.445971
Lcorl	1.425344	Lysmd3	1.400981
Lcp1	0.32374	Lyve1	0.407419
Ldb2	0.422153	Lyz2	0.096655
Leprel1	0.470471	Madcam1	0.102548
Lfng	0.526307	Mal	0.283407
Lgals1	0.52151	Manba	0.521509
Lgals12	0.165991	Map3k2	1.445587
Lgals9	0.261397	Mapkapk3	0.587247
Lgi2	0.619102	Mapt	0.511486
Lgi3	0.569936	Marco	0.000478
Lgr6	2.098297	Matn1	0.375444
Lif	0.309033	Matn2	0.272649
Lilrb4	0.000618	Mbnl3	1.490899
Limch1	1.39016	Mcam	0.658785
Lin7c	1.382191	Mcf2	0.321983
Lin9	1.421914	Mdga2	1.463649
Llgl2	0.709182	Med1	1.410307
Lmbrd2	1.441672	Mef2c	1.61261
Lmo2	0.467414	Meg3	0.388097
Lnp	1.403424	Megf11	0.426568
Lox	0.499428	Megf6	1.515947
Loxl1	0.54205	Megf9	1.375464
Loxl3	0.703795	Meis1	0.602673
Loxl4	0.39383	Mep1a	0.086893
Lrfn5	0.527132	Mep1b	0.064516
Lrp1	0.724899	Mertk	0.51784
Lrp2	0.317035	Met	1.410368

Metap1d	0.656286
Mettl7b	0.051982
Mfap5	0.193004
Mfng	0.4061
Mgam	0.356709
Mgll	0.502324
Mid1	0.42863
Miox	0.032195
Mme	0.487551
Mmp17	0.575316
Mmp23	0.62849
Mmp9	0.227749
Mmrn2	0.492826
Mn1	0.501732
Mogat2	0.383104
Mpeg1	0.375628
Mrc1	0.275328
Mrpl48-ps	6.462573
Mrvi1	0.381029
Ms4a6d	0.000457
Ms4a7	0.076585
Mst1r	0.534808
Mt1	0.470057
Mt2	0.401998
Mtap1b	1.484257
Mtap9	1.445692
mt-Atp8	2.57382
mt-Co2	0.665909
mt-Co3	0.721
mt-Nd3	1.712039
Myadm	0.710139
Myh11	0.389716
Myh7b	1.724628
Myl9	0.417315
Mylk	0.595608
Myo15b	0.248522
Myo1f	0.16396
Myo5b	0.661056
Myo7a	0.324881
Myo7b	0.482495
N28178	0.248866
Naa16	1.40571
Naa30	1.405086
Naa50	1.410801
Naalad2	0.372366
Nanp	0.629018
Naprt1	0.549647
Napsa	0.109251
Nav2	1.476047
Nav3	0.628389
Ncald	0.524825
Ncapd2	0.577265
Ncf1	0.430836
Nckap1l	0.276498
Ncrna00085	0.70084
Ndp	0.321969
Ndrg1	0.525332
Ndufa4l2	0.264868
Neat1	0.195965
Nefl	2.173514
Neurl1b	0.638748
Nfia	0.427533
Nfib	0.398175
Nfix	0.515393
Nhlrc1	1.560536
Nid1	0.502785
Nkain4	0.590846
Nmnat3	0.562668
Nos3	0.354652
Notch4	0.651789
Nphs1	0.090248
Nphs2	0.020926
Npr1	0.477426
Npr3	0.389328
Nr1d2	1.429673
Nr1h5	3891.511
Nr2f1	0.700334
Nrcam	0.5685
Nrip2	0.639655
Nrp2	0.65606
Nsg2	0.492132
Nt5c1b	8.174121
Ntm	0.456748
Ntn1	0.213233
Ntrk1	0.558029
Ntrk3	0.479373

Nts	0.172571
Ntsr1	0.610931
Nuak1	1.389598
Nudt8	0.67936
Nxph1	47.97987
Oasl1	0.110875
Oasl2	0.40349
Ocln	0.486747
Odz4	1.405986
Ogn	0.382769
Olfml2a	0.490716
Olfml3	0.329528
Ooep	0.423237
Osgin1	0.056953
Osr2	0.572302
P2ry6	0.251458
P4ha3	1.38675
Pabpc1l2a-ps	0.147683
Padi2	1.415719
Pah	0.060031
Pak1	1.439918
Pak3	1.668871
Palm3	0.603245
Pappa	0.444448
Paqr5	0.324858
Paqr6	0.403304
Paqr9	0.526203
Park2	0.562963
Pcdh12	0.365224
Pcdh17	1.519127
Pcdh9	0.260015
Pcdhb11	2.119191
Pcdhb13	2.013636
Pcdhb14	1.681442
Pcdhb16	1.501423
Pcdhb6	1.709589
Pcdhb7	1.515512
Pck1	0.058793
Pcolce	0.402722
Pcolce2	4.92252
Pcp4l1	12.59975
Pcsk9	0.419583
Pctp	0.364
Pde1a	0.430861
Pde3a	0.600259
Pde3b	1.427612
Pde4b	0.464393
Pde4c	0.493329
Pdgfb	0.164186
Pdgfra	0.319062
Pdgfrb	0.460361
Pdk4	1.720191
Pdlim2	0.481758
Pdlim5	0.655672
Pdyn	2.298188
Pdzd3	0.389801
Pdzk1	0.147575
Pdzk1ip1	0.151021
Pdzrn3	0.368455
Pecam1	0.338289
Peg10	0.688224
Penk	0.336179
Perp	0.398482
Pf4	0.211492
Pgbd1	1.506044
Pggt1b	1.389947
Pgm2	0.706056
Phf15	0.384637
Phf6	1.447921
Phlda3	0.440431
Phyhd1	0.278636
Pi15	0.430023
Pid1	0.6062
Pik3c2a	1.417955
Pik3cg	0.231599
Pipox	0.212674
Pisd-ps1	0.606374
Pitx2	0.033658
Pkhd1	0.291636
Pklr	0.148596
Pla1a	0.125339
Pla2r1	0.615798
Plac8	0.324007
Plagl1	0.646777
Plau	0.242627
Plcb4	1.599046

Plcd4	0.492683
Plcl1	0.536228
Plcxd1	0.662154
Plekha6	0.483053
Pls1	1.502513
Plscr2	0.35256
Plvap	0.478507
Plxna4	2.832738
Plxnd1	0.672755
Pmm1	0.666677
Pmp22	0.638142
Pnp2	2.83266
Podn	0.147567
Podxl	0.19051
Pop4	0.671967
Postn	0.194664
Pou2f1	1.85788
Pou3f1	1.530834
Pou3f3	0.47882
Ppargc1b	1.586663
Ppp1r13b	0.691418
Ppp1r14a	0.518857
Ppp1r15a	1.383268
Ppp1r1b	0.542207
Ppp1r3b	0.640196
Ppp1r3c	0.581656
Ppp1r3e	0.514107
Ppwd1	1.716686
Prdm16	0.452329
Prickle2	0.576953
Prkcdbp	0.564064
Prl8a1	0.63316
Prlr	0.121684
Procr	0.362305
Prodh2	0.099947
Prox1	2.06981
Prr15l	0.199686
Prrg1	1.557627
Prss12	0.573311
Prss8	0.403575
Psg16	0.682999
Pter	0.660031
Ptgfr	0.277994
Ptgis	0.440759
Ptgs1	0.55446
Ptk2b	0.287705
Ptp4a1	1.387858
Ptpn4	1.458396
Ptprb	0.14431
Ptrf	0.462713
Ptx3	0.37678
Pycard	0.635091
Pyroxd2	0.400336
Qprt	0.358606
R3hdml	0.021568
Rab17	0.427244
Rab20	0.240622
Rab32	0.298123
Rab37	0.552834
Rab3d	0.675836
Rab6b	0.261596
Rabggtb	1.431836
Rac2	0.192115
Radil	0.472098
Rai2	1.476466
Rapgef3	0.399269
Rapgef6	1.417936
Rarg	0.479359
Rarres2	0.66837
Rasgef1b	1.702018
Rasgrp2	0.476906
Rasgrp3	0.496211
Rasip1	0.623976
Rbm12b	1.892129
Rbm41	1.540565
Rbm47	0.491194
Rbpsuh-rs3	0.112434
Rdh19	0.059257
Rdh9	32.27477
Rec8	0.107474
Reln	0.465194
Ren1	0.113478
Rfk	1.523279
Rftn1	0.521786
Rftn2	0.510525
Rgl1	0.66162

Rgs1	0.173026
Rgs5	0.272134
Rhbdl3	0.388947
Rhoj	0.399769
Rif1	1.668781
Rnase12	0.520468
Rnf138	1.405967
Rnf152	1.49251
Robo4	0.181169
Ror1	0.666489
Rorc	0.558616
RP23-388P16.2	0.000378
RP23-71I22.6	1.999369
RP23-97D14.5	3317.398
Rpl29	0.654309
Rpl30-ps9	0.000438
Rpl34-ps1	1720.841
Rpl35a	0.686417
Rpl35a-ps2	536.0705
Rpl35a-ps3	536.0705
Rpl35a-ps4	536.0705
Rpl35a-ps6	536.0705
Rpl38-ps2	3714.861
Rpl3-ps1	3929973
Rprm	0.469461
Rps13	0.694759
Rps13-ps1	43.77014
Rps18	0.656357
Rps2	0.58335
Rps27a-ps2	1937.844
Rps2-ps13	2.290787
Rps4y2	0.717697
Rps6ka3	1.428395
Rps7	0.509835
Rpsa-ps10	0.22043
Rras	0.581664
Rsad2	0.134414
Rtn2	0.636197
Rtn4rl1	0.396923
Rxfp2	0.297303
S100a10	0.48036
S100a16	0.63099
S100a6	0.280642
S1pr3	0.419117
Samd4	0.637126
Samd8	1.395227
Samd9l	0.185349
Sat1	0.685835
Scai	1.425601
Scarf1	0.620158
Scarf2	0.680105
Scd1	0.67438
Scin	0.409569
Scn8a	0.557412
Scn9a	0.216498
Scnn1g	0.292194
Sdk1	0.662802
Sdpr	0.223889
Selm	0.514734
Sema3a	0.456135
Sema3e	0.40955
Sema4a	0.557301
Sema5b	0.445827
Sepp1	0.582153
Serpina1a	0.124325
Serpina1b	0.105355
Serpina3g	0.120063
Serpinb6b	0.309711
Serpinb9	0.580276
Serpine2	0.560956
Serpinf2	0.10385
Serping1	0.50807
Sertad4	0.537084
Sesn2	0.670437
Sfpi1	0.291086
Sfrp1	0.650289
Sgce	0.279516
Sgk1	1.448187
Sgk2	0.056511
Sgpp2	0.560323
Sh2d3c	0.511365
Sh2d4a	0.535462
Sh3bgrl	1.377109
Sh3gl3	1.680586
Sh3tc1	0.190903
Sigirr	0.155611

Sim1	0.576258	Slc52a3	0.294474
Sim2	0.47679	Slc5a1	0.143427
Six4	1.398249	Slc5a11	0.281975
Skap1	0.64905	Slc5a2	0.126466
Skil	1.407185	Slc5a3	1.671867
Slc10a5	0.074058	Slc5a8	0.111492
Slc11a1	0.177845	Slc5a9	0.13184
Slc12a1	0.477244	Slc6a18	0.105116
Slc13a2	0.100841	Slc6a20b	0.052196
Slc13a3	0.085117	Slc7a11	2.365173
Slc15a2	2.770441	Slc7a12	0.035992
Slc16a12	0.476975	Slc7a13	0.117494
Slc16a2	0.38557	Slc7a7	0.451875
Slc16a4	0.339836	Slc7a8	0.251
Slc16a5	0.293482	Slc7a9	0.337896
Slc17a1	0.054246	Slc8a1	0.67015
Slc17a3	0.138317	Slc8a2	0.711831
Slc17a8	0.210145	Slc9a3r2	0.677579
Slc18a1	0.20215	Slco1a4	0.370106
Slc22a1	0.105633	Slco1a6	0.435774
Slc22a12	0.099001	Slco2a1	0.402441
Slc22a13	0.043936	Slco2b1	0.205796
Slc22a19	0.049195	Slfn9	1.439356
Slc22a2	0.131779	Slitrk5	0.276543
Slc22a22	0.075605	Slitrk6	0.225969
Slc22a3	0.225805	Smagp	0.361641
Slc22a6	0.045032	Smarca1	0.711959
Slc22a8	0.081332	Smoc1	0.310652
Slc23a1	0.177017	Smoc2	0.381455
Slc25a45	0.161871	Sned1	0.476436
Slc27a2	0.123336	Snhg11	0.586139
Slc2a2	0.200616	Sntb2	1.450047
Slc34a1	0.085867	Snx32	0.518469
Slc35f4	1578.234	Socs2	0.436408
Slc39a5	0.147433	Sod3	0.156716
Slc3a1	0.174773	Sorcs2	0.624537
Slc40a1	0.454733	Sos1	1.45129
Slc44a3	0.207566	Sostdc1	0.312483
Slc44a4	0.230085	Sox11	1.40164
Slc47a1	0.181392	Sox17	0.196297
Slc4a1	0.124708	Sox18	0.395766
Slc4a7	1.559199	Sp4	1.43524
Slc4a9	0.145714	Sp5	1.469796

Sparcl1	0.443764	Tagln2	0.634796
Spink3	0.119777	Tap1	0.564384
Spint1	0.480419	Tbk1	1.420587
Spint2	0.684321	Tbx10	0.324547
Spock1	0.596187	Tbx18	0.291622
Spon2	0.234359	Tbx2	0.356062
Spopl	1.988224	Tbx3	0.327296
Spp1	0.048119	Tbxa2r	0.435596
Spp2	0.063989	Tcea3	0.471298
Spry2	1.393867	Tcerg1l	0.177074
Spty2d1	1.42	Tcf15	0.324187
Srp54c	0.597931	Tcf21	0.67356
Srpx	0.489233	Tchh	0.459059
Srpx2	0.29413	Tcn2	0.665269
Sstr1	2.155827	Tdg	0.707539
St14	0.321507	Tek	0.295462
St8sia1	0.479926	Tekt1	0.511966
Stab1	0.241832	Tekt2	0.422392
Stab2	0.097835	Tfap2b	0.415344
Stac2	1.912514	Tfcp2l1	0.375437
Stard10	0.471581	Tfec	0.127026
Stard8	0.450192	Tgfb1	0.512055
Stbd1	0.538312	Tgfb1i1	0.535602
Steap2	0.617073	Tgfbr3	0.622022
Stk32b	0.460834	Tgm1	0.36289
Stmn2	0.089563	Tgm2	0.310717
Stx3	0.53274	Tgm5	0.253397
Sucnr1	0.089775	Thbs2	0.407013
Sult1d1	0.160387	Thnsl2	0.618407
Sult1e1	0.1582	Thoc2	1.473461
Sult5a1	0.500557	Thsd1	0.444708
Susd2	0.215702	Thsd7a	0.313302
Susd3	0.188945	Thy1	0.244127
Svop	0.260301	Tie1	0.188759
Synm	2.03849	Timp3	0.575016
Synpo	0.387996	Tinag	0.109072
Synpo2	0.52871	Tinagl1	0.416637
Syt13	0.405901	Tlr12	0.273746
Syt4	2.637069	Tm4sf1	0.574085
Sytl2	0.499563	Tmem119	0.255156
Tacstd2	0.433455	Tmem125	0.417751
Tagap	2.358344	Tmem132e	0.26343
Tagln	0.279027	Tmem150a	0.588138

Tmem171	0.411469
Tmem174	0.108252
Tmem204	0.479689
Tmem229a	0.337996
Tmem27	0.117955
Tmem45a	0.600436
Tmem45b	0.136435
Tmem54	0.092401
Tmem82	0.470097
Tmem88	0.463177
Tmf1	1.428854
Tmigd1	0.08747
Tmprss2	0.312934
Tmsb4x	0.668622
Tmtc1	0.312741
Tnfaip6	1.843677
Tnfrsf19	1.428597
Tnfrsf1b	0.440162
Tnfsf13b	0.314308
Tnik	0.611163
Tnni1	0.513067
Tnnt1	0.440064
Tnnt2	0.433639
Tnxb	0.211805
Tpd52l1	0.662608
Traf1	0.662009
Trf	0.158177
Trh	0.344051
Trib1	1.41565
Trim10	0.061972
Trim23	1.500682
Trim25	2.129457
Trim30a	0.000325
Trim47	0.428136
Trim61	0.442321
Trove2	1.428028
Trp53	0.083839
Trpm5	0.278376
Trpv2	0.31176
Trpv4	0.515981
Tshz3	0.367821
Tsix	5.572138
Tspan11	0.551842
Tspan4	0.68639
Tspan8	0.350102
Ttc30b	1.520198
Ttc36	0.153766
Ttll10	0.256804
Ttr	0.07078
Ttyh2	0.623855
Tuba1c	1.875959
Tuba4a	0.261494
Tubb2a	0.523931
Tubb6	0.558864
Twist1	0.375791
Twist2	0.376421
Tyrobp	0.186987
Uba6	1.388395
Ube2l6	0.528864
Ube3a	1.532744
Uggt2	1.412995
Ugt1a10	0.139918
Ugt1a2	0.133743
Ugt1a6a	0.216477
Ugt1a7c	0.268222
Ugt1a9	0.125045
Ugt2b34	0.17669
Ugt2b37	0.071075
Ugt2b5	0.073897
Ugt8a	0.376455
Ulbp1	4.209251
Unc5a	0.455085
Unc93b1	0.515615
Ush1c	0.316664
Ushbp1	0.401012
Uty	0.64086
Vamp5	0.373625
Vav1	0.076585
Vcam1	0.328185
Vcp-rs	1390.018
Veph1	0.407773
Vil1	0.227654
Vim	0.634358
Vps13a	1.611094
Vsig8	2.169307
Vstm2b	0.463928

Vwc2	3.461467
Wdr86	0.584216
Wfdc2	0.678233
Wisp1	0.520938
Wnt2b	0.521706
Wnt5a	0.567408
Wnt7b	0.418057
Wscd2	0.50695
Xist	4.568266
Xlr3a	1.723447
Xlr3c	4.848238
Xpnpep2	0.280703
Xylt1	1.683866
Ybx2	0.537671
Zbtb7c	0.678776
Zcchc5	0.327117
Zdhhc2	1.429555
Zfhx4	1.770981
Zfp141	1.465079
Zfp239	1.766179
Zfp280d	1.446253
Zfp322a	1.554896
Zfp36	0.659788
Zfp458	1.780415
Zfp459	2.716278
Zfp503	1.383221
Zfp536	0.365049
Zfp663	0.061972
Zfp781	9911.289
Zfp808	1.813655
Zfp874a	0.625563
Zfp934	1.686057
Zfp942	1.637666
Zfp949	1.559408
Zfpm2	0.516776
Zmat3	0.711961
Zxdb	1.46981

Table S3. Expression of Cell Cycle genes in *Six2*$^{p53-/-}$ CM

Gene	Fold Change	[WT] FPKM	[KO] FPKM	Function
p21 (Cdkn1a)	-1.7	22.5	12.7	G1/S regulation, Senescence
p27 (Cdkn1b)	1.2	11.8	13.3	G1 arrest
p57 (Cdkn1c)	-1.6	291.3	170.4	G1 arrest
p16 (Cdkn2a)	/	0.1	0.0	Regulation of G1/S Transition
p15 (Cdkn2b)	/	/	/	G1 arrest
Cdc27	1.2	18.6	21.4	APC Complex, the exit of mitosis
Ccnb1	1.4	13.0	17.3	G2/M transition
Ccnd2	-1.3	51.9	38.1	G1/S Transition
Ccng1	-1.7	15.3	8.8	G1 phase arrest
Ccng2	1.2	18.2	20.9	G1/S arrest

Table S4. Nanostring nCounter probe target sequences

Gene Name	Accession	Target Region	Target Sequence
Aldob	NM_144903.2	1307-1406	ttgaaacccaagaatgagcatgtcacccaatagtctctcaacacttccagttccctatgttccagaacattcatccaagaaaagaacaggccacgactga
B2m	NM_009735.3	178-277	ctgaactgctacgtaacacagttccacccgcctcacattgaaatccaaatgctgaagaacgggaaaaaaattcctaaagtagagatgtcagatatgtcct
Col1a1	NM_007742.3	216-315	caatggtgagacgtggaaacccgaggtatgcttgatctgtatctgccacaatggcacggctgtgtgcgatgacgtgcaatgcaatgaagaactggactgt
Col1a2	NM_007743.2	4026-4125	gctgtgcttctgcagggttccaacgatgttgaacttgttgctgagggcaacagcaggttcacctactctgtcctagtcgatggctgctccaaaaagacaa
Col6a1	NM_009933.4	2345-2444	acctctcagtgtgctctgtggtgcagacattcaggtagtttctgtgggaatcaaggatgtgtttggctttgtggcgggctccgaccagctcaatgtcatt
Col6a2	NM_146007.2	2059-2158	tggtcttcgtcatcgacagttctgagagtattggctacaccaacttcaccttggagaagaactttgtcatcaatgtggtcaacaggctaggtgccattgc
Col6a3	NM_001243008.1	4555-4654	tcgtctttctgattgacagctctgatgccgtcaagcccgatggcatcgctcatatccgagactttgtcagcaggatcgttcgcagactcaacattggtcc
Fbp1	NM_019395.3	1281-1380	agcagagctcaagtgacgctactccattctgcatgttgtacattcctagaaacaaacctaacagcgtggatagtttcacagcttaatgctttgcaatgcc
Gapdh	NM_008084.1	756-855	atgtgtccgtcgtggatctgacgtgccgcctggagaaacctgccaagtatgatgacatcaagaaggtggtgaagcaggcatctgagggcccactgaaggg
Gm5506 (Eno1)	NM_001025388.1	17-116	acacagacactgctagaaactattgtggtttggtctaatgcttgaattatgttaatcgggttcctcaaattgcatgagaatctgcatgtaagaagcgatc
Gpd1	NM_010271.2	2065-2164	gccctttccttttgcccaagtcgttctcacccagcctggaaggccacccggcatctgtaggcttagaactaaggagcagctcaaaggttcagtaggtttc
Gpd2	NM_010274.3	559-658	tccagaaggctatcatgaacttggatgttgagcagtataggatggtgaaagaagcccttcacgaacgtgccaactactagaaatcgctcctcatttatc
H6pd	NM_173371.3	825-924	tctcagcccagcagctggcttcagaacttgggagctttttccaggaggaggagatgtaccgtgtggatcattacctcggcaagcaggcggtggctcagat
Ndufs5	NM_001030274.1	111-210	tcagcctggaccggcactttatgttcctaagcgcagaacagccctataagaacgccgctcggtgccacgcatttgaaaaagagtggatagagtgtgcaca
Pck1	NM_011044.2	2125-2224	gaaaagcacctttaatagtcagttgagtagcacagagaacaggctaggggcaaataagattgggaggggaaatcaccgcatagtctctgaagtttgcat
Pck2	NM_028994.2	1663-1762	tccactgccgctgcggagcacaaaggaaagaccattatgcatgatccctttgccatgcggccttttttggctataactttggacgctacctggaacact
Pfkl	NM_008826.4	3171-3270	agaggagactgtcattgtcagtatagtgttcttggctgattgctgcccttcaggaggttcttgaggtcgggacgttggctcctcagagaagtttatgaag
Pgk1	NM_0088	37-136	ccggcattctgcacgcttcaaaagcgcacgtctgccgcgctgttctcctcttcctcatctccgggcctttcgacctcac

	28.2		ggtgttgccaaaatgtcgctt
Pgm1	NM_025700.2	1149-1248	aagatcaaagtaacctcaaagacacatacatgctgtccagcactgtttcctccaaaatcttgcgggccatagccctgaaggaaggctttcatttcgagga
Pklr	NM_013631.2	2381-2480	tagtcttactttcttactgactccacaaaccatggagccgagcttacgagccactaatctggctgttctcttgcccactgatctgctgggtcagatgaaa
Tbp	NM_013684.3	1-170	gtggcgggtatctgctggcggtttggctaggtttctgcggtcgcgtcattttctccgcagtgcccagcatcactatttcatggtgtgtgaagataaccca
Trp53	NM_011640.3	221-320	ttttcaggcttatggaaactacttcctccagaagatatcctgccatcacctcactgcatggacgatctgttgctgccccaggatgttgaggagtttttg