

Supplementary Table 1: TCGA patients with known mutations in *TP53*, *EGFR*, and *PTEN* genes.

Patient ID	<i>TP53</i>	<i>EGFR</i>	<i>PTEN</i>
TCGA-06-0129-01	R248Q	WT	WT
TCGA-06-0128-01	S313Afs*32	WT	WT
TCGA-06-0142-01	WT	A289V	WT
TCGA-06-0189-01	R175H	WT	WT
TCGA-06-0137-01	WT	P596L	WT
TCGA-19-1390-01	L194R,L130F	WT	WT
TCGA-06-0184-01	R158H	WT	G36E
TCGA-02-0006-01	WT	WT	WT
TCGA-76-6661-01	WT	H304Y	H272P
TCGA-76-6662-01	A138T	WT	R233*
TCGA-76-6663-01	R248L	WT	WT
TCGA-76-6664-01	R248W	WT	X85_splice
TCGA-06-0213-01	WT	WT	R335*
TCGA-06-5417-01	R196*,I255S	WT	WT
TCGA-06-6389-01	Y220C	WT	WT
TCGA-06-0185-01	WT	V651M	WT
TCGA-06-0241-01	R248Q	WT	WT
TCGA-06-2570-01	Q136E	WT	WT
TCGA-12-0616-01	WT	G598V	WT
TCGA-76-4935-01	WT	WT	T319Kfs*24
TCGA-06-0168-01	WT	WT	A328*
TCGA-06-0238-01	N239_S241del	WT	WT
TCGA-14-1456-01	Y220C	A289V	WT
TCGA-06-0188-01	X307_splice	WT	N323Mfs*21
TCGA-06-0192-01	WT	WT	Y315*
TCGA-76-6191-01	WT	C620W	L25V
TCGA-76-6282-01	WT	C571S	WT
TCGA-76-6192-01	WT	WT	X268_splice
TCGA-06-0154-01	WT	R222C	WT
TCGA-06-0158-01	WT	R108K,P596S,G598A	WT
TCGA-06-5412-01	WT	WT	A328Qfs*16
TCGA-02-0033-01	R248Q	WT	WT
TCGA-06-0166-01	WT	WT	T167S
TCGA-06-5413-01	WT	V843L	WT
TCGA-12-3650-01	WT	A289V,R427L	WT
TCGA-19-2624-01	WT	G63K	WT
TCGA-76-6193-01	T155N,G244S,R156C	WT	WT
TCGA-76-4926-01	WT	R222C	WT
TCGA-06-0649-01	WT	G331R	R130G

TCGA-14-0789-01	WT	C628Y	WT
TCGA-76-4934-01	R273H	WT	Y88H
TCGA-02-0003-01	H178Q,R282W	C620Y	WT
TCGA-06-0190-02	G245S	WT	D92E
TCGA-76-6656-01	WT	C240Y	WT

Supplementary Table 2: TP53 regulated genes and their expression fold change in *TP53* mutant vs WT analysis.

Gene Symbol	Fold Change ( <i>TP53</i> mutant vs WT)	p-value
ACSL3	-2.285919495	0.025394921
ACTN1	-2.614479614	0.01119776
ADD3	2.235683112	0.042191562
CD97	-2.780388873	0.015596881
AMOTL2	2.824723826	0.019396121
ANTXR1	3.203498153	0.0019996
ANXA1	-2.199399113	0.041191762
ANXA2	-2.425040444	0.016796641
ATP1A1	-2.404396965	0.031793641
BBC3	-2.915645279	0.00759848
BHLHB2	-2.170743262	0.048390322
C9orf116	-3.243564615	0.00979804
CAMK2B	-4.639728855	0.00059988
CAPNS1	-2.486643155	0.017396521
CAT	2.291855586	0.022795441
CCL4	3.299427933	0.00239952
CD44	-2.15074474	0.045390922
CDC7	2.366179064	0.029194161
CDC2	2.420800718	0.020995801
CDKN1A	-3.008690075	0.00759848
CHEK2	2.022856349	0.038392322
CLU	-2.601573157	0.004999
COL9A1	2.192399188	0.022395521
CSRP1	-2.267699565	0.022595481
DCLRE1A	2.245231271	0.021595681
DDB2	-2.810294262	0.016796641
DKK3	-2.559013531	0.015996801
DLC1	-2.939445965	0.0069986
DUSP4	-3.319560089	0.004999
EGFR	-3.137113429	0.018396321
EPS8	2.405965517	0.043191362
F3	-3.476184172	0.00259948
C1orf183	2.088791281	0.047390522
FDFT1	2.406773683	0.028394321
FDXR	-3.023689152	0.01239752
PLEKHC1	-2.07588678	0.034193161
FOSL1	-2.785883361	0.020795841
FRMD4A	2.009055503	0.033993201
GABPA	3.128864082	0.00379924
GADD45A	-2.779385457	0.00759848
GART	2.093171117	0.038792242
GNA14	-2.288671535	0.040991802
GNAI1	2.465851828	0.030593881
GPI	-2.473823549	0.01219756
H2AFY2	2.347633662	0.025194961

HDAC2	2.359043529	0.032993401
HRAS	-2.152130097	0.025594881
HRASLS	2.601055589	0.015996801
HSPB1	-3.53423492	0.00239952
IGFBP2	-2.394850698	0.013197361
IGFBP3	-2.465073791	0.017596481
IL27RA	-2.389606311	0.026194761
ILK	-2.64359854	0.0119976
KCNJ4	-2.778842436	0.015996801
LAMB2	-2.63969001	0.015196961
LGALS3	-2.608794068	0.016196761
MAD2L1	2.279124567	0.042391522
MAP2K6	3.244418545	0.0039992
MAP4K2	-3.146759758	0.00579884
MTMR11	-2.380667239	0.029394121
PBEF1	-2.274325425	0.041391722
NEDD8	-2.329151093	0.035192961
NPTX1	-3.09163211	0.00839832
OAT	2.073354604	0.049990002
PDGFA	-2.831740636	0.0039992
PGM3	2.397733669	0.028994201
PHLDA3	-3.581273794	0.0019996
PLXNB2	-2.578868713	0.020195961
PPP1R13B	-2.387128226	0.035192961
PRIM1	2.907645486	0.00819836
PSRC1	-2.27692516	0.00719856
PTCH1	2.309241364	0.014397121
PPP2R4	-2.089894496	0.040591882
SERPINA3	-2.190559166	0.00519896
SERPINB6	-2.441319251	0.01119776
SERPINE1	-2.328293313	0.033393321
SGK	2.995594431	0.004999
SLC2A1	-2.840166816	0.0069986
SOCS2	-2.592730099	0.021195761
SREBF1	-2.939332475	0.012797441
SFRS3	2.530006208	0.017996401
STMN1	2.14362038	0.047590482
SUMO1	2.735640002	0.019996001
TAGLN2	-2.197013401	0.030993801
TFAM	2.398780994	0.018996201
TGFB2	-2.360288855	0.036392721
TGFBR1	2.01327967	0.047590482
TNFRSF10B	-2.946157779	0.00779844
TTK	2.447191907	0.023195361
UPP1	-2.157148513	0.040991802
VCAN	2.441948767	0.033393321
WNT7A	-4.539703641	0.0009998
XRCC5	3.576308592	0.0029994

Supplementary Table 3: PTEN regulated genes and their expression fold change in *PTEN* mutant vs WT analysis.

Gene Symbol	Fold Change ( <i>PTEN</i> mutant vs WT)	p-value
BCL3	2.156713753	0.039192162
C3	2.637273986	0.032593481
CDKN1B	-2.427779561	0.016196761
CEBPA	2.29420606	0.049190162
CTSB	2.212253726	0.032993401
CTSZ	4.219885895	0.00319936
EGFR	-4.247239724	0.0059988
FDFT1	-3.084397406	0.01159768
FOXO1	-2.677219461	0.022195561
IGFBP6	3.361639075	0.00279944
IL4R	2.630349827	0.012997401
KLHL24	-3.454062524	0.00279944
RAD51B	2.606246334	0.01139772
RUNX1	2.778442517	0.013997201
SOCS3	2.321623578	0.025394921
TAF10	2.733818972	0.038992202
ZBTB16	-2.223212965	0.029994001

Supplementary Table 4: EGFR regulated genes and their expression fold change in *EGFR* mutant vs WT analysis.

Gene Symbol	Fold Change ( <i>EGFR</i> mutant vs WT)	p-value
BTC	-2.464601923	0.0317936
CST3	2.269495709	0.0421916
DSC2	-2.780472844	0.0165967
DUSP4	2.246164902	0.0261948
EGFR	6.705430388	0.0002
GFAP	2.54949414	0.0105979
IL6	-2.671598208	0.0229954
MATN2	2.381614171	0.0277944
PLA2G4A	-2.31737271	0.0319936
PLCG1	2.356276128	0.0303939
SOX9	2.546680818	0.014997
SPRY2	2.819223652	0.014997
TWIST1	2.189158148	0.0369926

Supplementary Table 5: Angiogenesis related genes and their expression fold change in *TP53* mutant vs WT analysis.

Gene Symbol	Fold Change ( <i>TP53</i> mutant vs WT)	p-value
ABI1	2.278176698	0.0361928
ADAMTS6	2.350490806	0.0269946
AGT	-2.259149838	0.0015997
ALCAM	2.711432192	0.0229954
ANTXR1	3.203498153	0.0019996
ANXA2	-2.425040444	0.0167966
CENTD3	-2.204265169	0.0385923
ARNTL	-2.500215456	0.0245951
BMP2	2.083749839	0.0445911
BMP4	2.064427072	0.0223955
CALCRL	2.718554164	0.0085983
CAPNS1	-2.486643155	0.0173965
CAT	2.291855586	0.0227954
CBL	2.145145987	0.0335933
CD151	-3.1449486	0.004799
CD44	-2.15074474	0.0453909
CD63	-3.823129916	0.0027994
CDKN1A	-3.008690075	0.0075985
CHI3L1	-3.313510568	0.0019996
CITED1	-2.549169689	0.0155969
LECT1	-2.218123071	0.0433913
CNR1	-2.23203637	0.0473905
CST3	-3.340532152	0.0013997
CXCL14	-3.424078607	0.0041992
EFEMP2	-3.454651494	0.0007998
EGFR	-3.137113429	0.0183963
F3	-3.476184172	0.0025995
PLEKHC1	-2.07588678	0.0341932
FOSL1	-2.785883361	0.0207958
GADD45A	-2.779385457	0.0075985
GPC1	-2.322971826	0.0195961
GPC3	2.622970523	0.0065987
HES1	-3.223661916	0.0043991
HOXD3	3.485212017	0.0027994
HRAS	-2.152130097	0.0255949
HRH1	-3.374215239	0.0021996
HSPB1	-3.53423492	0.0023995
IGFBP3	-2.465073791	0.0175965
ILK	-2.64359854	0.0119976
ITGA7	-3.384362156	0.0025995
JAK2	2.30072941	0.0239952
LGALS1	-2.808324938	0.0089982
LGALS3	-2.608794068	0.0161968
LIPA	2.873183885	0.0189962
LMO2	-2.625914129	0.0031994

MAP2K6	3.244418545	0.0039992
MEOX2	-2.923125966	0.0095981
MYB	2.095504172	0.0233953
NPTX1	-3.09163211	0.0083983
NR2E1	-3.399811199	0.0023995
PDE3B	2.884544863	0.0017996
PDGFA	-2.831740636	0.0039992
PLA2G4A	2.572601932	0.0233953
PLA2G7	2.091509599	0.030194
PLOD3	-2.08089199	0.029994
PPP1R16B	2.026483923	0.0413917
PTGIR	2.135968139	0.0425915
PTX3	-2.952370297	0.0075985
RAMP1	-4.073950378	0.0011998
SCG2	-4.722590298	0.0002
SDC4	-2.320790458	0.0295941
SEMA3E	2.900404806	0.0031994
SERPINA3	-2.190559166	0.005199
SERPINE1	-2.328293313	0.0333933
SPRY2	-2.886663201	0.0033993
TFPI	2.59539073	0.0145971
TGFB2	-2.360288855	0.0363927
TGFBR1	2.01327967	0.0475905
THBS4	-2.537202323	0.0325935
TIMP1	-2.26244782	0.0277944
TNC	-2.247177986	0.0061988
TNFRSF12A	-2.860784104	0.0041992
TNFRSF1A	-3.083352028	0.0043991
TNFSF12	-2.78244406	0.0129974
VAV3	-3.495292988	0.0055989
WNT7A	-4.539703641	0.0009998

Supplementary Table 6: Invasion related genes and their expression fold change in *PTEN* mutant vs WT analysis.

Gene Symbol	Fold Change ( <i>PTEN</i> mutant vs WT)	p-value
ABL2	2.636285039	0.0039992
ARHGAP4	2.598181631	0.009798
BMPR2	-2.569840785	0.0369926
CCL2	2.645094224	0.0195961
CCNB1IP1	-3.109560351	0.0107978
CCR1	2.509039248	0.0267946
CD14	2.739575851	0.0171966
CDKN1B	-2.427779561	0.0161968
CHI3L1	3.159086715	0.0321936
CTSB	2.212253726	0.0329934
CTSL1	2.309099054	0.0315937
CTSZ	4.219885895	0.0031994
EGFR	-4.247239724	0.0059988
EIF3E	-2.796862618	0.0125975
FHOD1	3.320177564	0.0077984
FOXO1	-2.677219461	0.0221956
GAB1	-2.585765885	0.040192
GALNT2	2.25947635	0.04979
GATA3	2.021558674	0.0255949
GLI1	-2.243031373	0.0273945
GRB2	2.775276975	0.0063987
HBP1	-3.199743671	0.0037992
HMOX1	2.795080359	0.0143971
ITGA5	2.23455148	0.0423915
LGALS1	2.701150835	0.0281944
LOXL2	2.474330004	0.0327934
MAP4K1	2.262533955	0.0325935
MST1	-2.490067194	0.0419916
NANOG	-2.872657742	0.0315937
NF1	-2.647577303	0.0243951
NQO1	2.905906278	0.0059988
NRG1	2.372004999	0.0257948
PKM2	2.06144561	0.0469906
PLA2R1	2.999249772	0.0107978
PLAUR	2.516127782	0.0187962
PRKCE	-2.409589285	0.0495901
RGS4	2.825602801	0.0035993
RPS6KA1	2.746673097	0.0095981
S100A11	2.743491595	0.0323935
SERPINA1	2.596075057	0.0267946
SPHK1	2.081632704	0.0369926
SPI1	2.226303917	0.024795
ST14	2.391146521	0.0207958
SYK	2.299076705	0.0307938
TCIRG1	2.412904974	0.0233953



THBD	2.257518805	0.0325935
TIMP1	2.655740371	0.0267946
TRPV2	2.361178937	0.0205959
WAS	2.696393462	0.009798
ZBTB16	-2.223212965	0.029994

Supplementary Table 7: Immune response related genes and their expression fold change in *EGFR* mutant vs WT analysis.

Gene Symbol	Fold Change ( <i>EGFR</i> mutant vs WT)	p-value
ABL2	-2.261445119	0.048790242
ANXA5	2.170962121	0.042391522
AQP4	2.073586478	0.046390722
CCR7	-2.083351078	0.035792841
CD1D	-2.293432429	0.044791042
CD244	-2.500278487	0.019796041
CD36	-2.347258622	0.016196761
CST3	2.269495709	0.042191562
EGFR	6.705430388	0.00019996
FOXO1	2.618086544	0.016396721
GULP1	-3.463249888	0.00459908
IL6	-2.671598208	0.022995401
LTF	2.5138482	0.023195361
MSR1	-2.465887094	0.022195561
OTUB2	-2.461761351	0.027994401
PLA2G4A	-2.31737271	0.031993601
PLCG1	2.356276128	0.030393921
RORA	2.133721934	0.044391122
SGK	-3.094596683	0.00619876
SPRY1	2.31412034	0.037792442
SPRY2	2.819223652	0.014997001
TLR8	-2.001599825	0.030393921
TNFSF10	-2.749936026	0.01059788
TNPO1	2.308019517	0.032993401
USE1	2.457261056	0.022995401
XRCC1	2.365609124	0.026394721