

Supplementary Information 3:

The list contains the number of shortest paths, possible shortest paths and the path lengths for the top 100 synthetic lethal pairs of Human cancer protein interaction network. The lethal pairs have varying path lengths ranging from 1 to 3.

S. no.	Gene 1	Gene 2	Path length	Shortest paths	No of shortest paths
1.	CTNNB1	TP53	2	CTNNB1-SMAD3-TP53;CTNNB1-SMAD-TP53 ;CTNNB1-CSNKB-TP53 ;CTNNB1-SMARCA4-TP53 ;CTNNB1-CSNK1D-TP53 ;CTNNB1-PLK1-TP53 ;CTNNB1-CHUK-TP53 ;CTNNB1-EP300-TP53 ;CTNNB1-TFAPA-TP53 ;CTNNB1-ESR1-TP53 ;CTNNB1-CREBBP-TP53 ;CTNNB1-GSK3B-TP53;CTNNB1-HIF1A-TP53 ;CTNNB1-PIN1-TP53 ;CTNNB1-CSNKA1-TP53;CTNNB1-CSNK1A1-TP53	16
2.	TP53	YWHAG	1	TP53-YWHAG	1
3.	CREBBP	TP53	1	CREBBP-TP53	1
4.	EP300	TP53	1	EP300-TP53	1
5.	CSNK2A1	TP53	1	CSNKA1-TP53	1
6.	SMAD3	TP53	1	SMAD3-TP53	1
7.	AR	TP53	2	AR-KAT5-TP53;AR-SMAD3-TP53;AR-HDAC1-TP53 ;AR-UBEI-TP53 ;AR-PIAS4-TP53 ;AR-SUMO1-TP53 ;AR-MDM-TP53 ;AR-SP1-TP53 ;AR-CDK1-TP53 ;AR-HMGB1-TP53 ;AR-MAPK1-TP53 ;AR-XRCC6-TP53 ;AR-RCHY1-TP53 ;AR-EP300-TP53 ;AR-KATB-TP53 ;AR-IFI16-TP53 ;AR-ESR1-TP53 ;AR-GTFH1-TP53 ;AR-CREBBP-TP53 ;AR-TSG101-TP53 ;AR-NR3C1-TP53 ;AR-BRCA1-TP53 ;AR-GSK3B-TP53 ;AR-PTEN-TP53 ;AR-HIF1A-TP53 ;AR-UBE3A-TP53 ;AR-HSP90AA1-TP53 ;AR-DAXX-TP53	28
8.	RB1	TP53	2	RB1-SMARCB1-TP53 ;RB1-HDAC3-TP53 ;RB1-ABL1-TP53 ;RB1-HDAC1-TP53;RB1-MDM4-TP53 ;RB1-MDM-TP53 ;RB1-SP1-TP53 ;RB1-SMARCA4-TP53 ;RB1-CDK-TP53 ;RB1-CDK1-TP53 ;RB1-MAPK9-TP53 ;RB1-TBP-TP53 ;RB1-HMGB1-TP53 ;RB1-MAPK1-TP53 ;RB1-TOPA-TP53 ;RB1-EP300-TP53 ;RB1-PHB-TP53 ;RB1-BRF1-TP53 ;RB1-PML-TP53 ;RB1-MNAT1-TP53 ;RB1-TFAPA-TP53 ;RB1-EF1-TP53 ;RB1-BRCA1-TP53 ;RB1-POLA1-TP53	24
9.	BRCA1	TP53	1	BRCA1-TP53	1
10	SUMO4	TP53	2	SUMO4-NR3C1-TP53 ;SUMO4-PHB-TP53 ;SUMO4-TOPA-TP53 ;SUMO4-NFKBIA-TP53	5

				;SUMO4-TFAPA-TP53	
11	BCL2	TP53	1	1:BCL2-TP53	1
12	EGFR	TP53	2	EGFR-PTK-TP53 ;EGFR-YWHAZ-TP53 ;EGFR-MAPK1-TP53 ;EGFR-UBB-TP53 ;EGFR-XRCC6-TP53 ;EGFR-ESR1-TP53	6
13	PTK2	TP53	1	PTK2-TP53	1
14	SMAD2	TP53	1	SMAD2-TP53	1
15	SRC	TP53	2	SRC-SMARCB1-TP53;SRC-PTK-TP53 ;SRC-ABL1-TP53 ;SRC-WWOX-TP53;SRC-CHUK-TP53 ;SRC-YWHAG-TP53 ;SRC-BCR-TP53 ;SRC-ESR1-TP53;SRC-NFKBIA-TP53 ;SRC-HSP90AA1-TP53	10
16	HDAC1	TP53	1	HDAC1-TP53	1
17	CDK1	TP53	1	CDK1-TP53	1
18	CASP3	TP53	2	CASP3-BCL-TP53;CASP3-MDM4-TP53 ;CASP3-MDM-TP53 ;CASP3-BRCA1-TP53 ;CASP3-PRKDC-TP53 ;CASP3-PSME3-TP53 ;CASP3-STK4-TP53 ;CASP3-CDC4-TP53 ;CASP3-RAD51-TP53 ;CASP3-TFAPA-TP53 ;CASP3-HMGB1-TP53 ;CASP3-EIFAK-TP53 ;CASP3-TOP1-TP53 ;CASP3-BLM-TP53 ;CASP3-SP1-TP53	15
19	ABL1	TP53	1	ABL1-TP53	1
20	ESR1	TP53	1	ESR1-TP53	1
21	FLNA	TP53	2	FLNA-BRCA-TP53 ;FLNA-CDC4-TP53 ;FLNA-YWHAG-TP53 FLNA-SMAD3-TP53	4
22	CAV1	TP53	2	CAV1-MAPK3-TP53 ;CAV1-MAPK1-TP53 ;CAV1-ESR1-TP53 ;CAV1-ABL1-TP53 ;CAV1-PTGS-TP53 ;CAV1-PTEN-TP53 ;CAV1-CSNKA1-TP53	7
23	TP53	UBE2I	1	TP53-UBE2I	1
24	PTCH1	TP53	2	PTCH1-CDK1-TP53 ;PTCH1-HIPK-TP53	2
25	EWSR1	TP53	2	EWSR1-YWHAG-TP53 ;EWSR1-CREBBP-TP53;EWSR1-BARD1-TP53	3
26	AKT1	TP53	2	AKT1-MDM4-TP53 ;;AKT1-MDM-TP53;AKT1-BRCA1-TP53;AKT1-PRKDC-TP53;AKT1-CHEK1-TP53 ;AKT1-ESR1-TP53 ;AKT1-NR4A1-TP53 ;AKT1-GSK3B-TP53 ;AKT1-SMAD3-TP53 ;AKT1-CHUK-TP53 ;AKT1-SMAD-TP53 ;AKT1-YBX1-TP53 ;AKT1-PTEN-TP53 ;AKT1-YWHAZ-TP53 ;AKT1-EP300-TP53 ;AKT1-PPPCA-TP53 ;AKT1-HSP90AA1-TP53	18
27	HIF1A	TP53	1	HIF1A-TP53	1
28	STAT3	TP53	2	STAT3-NR3C1-TP53 ;STAT3-BRCA1-TP53 ;STAT3-MAPK8-TP53 ;STAT3-HDAC3-TP53 ;STAT3-KAT5-TP53 ;STAT3-HDAC-TP53 ;STAT3-HDAC1-TP53 ;STAT3-MAPK3-TP53 ;STAT3-MAPK1-TP53 ;STAT3-CREBBP-TP53 ;STAT3-HIF1A-TP53;STAT3-EIFAK-TP53 ;STAT3-DAXX-TP53 ;STAT3-PML-TP53 ;STAT3-EP300-TP53	16

				;STAT3-HSP90AA1-TP53	
29	SMURF2	TP53	2	SMURF2-SMAD3-TP53;SMURF2-SMAD2-TP53	2
30	PRKCD	TP53	2	PRKCD-YWHAG-TP53 ;PRKCD-PRKDC-TP53 ;PRKCD-MAPK3-TP53 ;PRKCD-MAPK1-TP53 ;PRKCD-CREBBP-TP53 ;PRKCD-YWHAZ-TP53 ;PRKCD-EP300-TP53 ;PRKCD-PPPCA-TP53 ;PRKCD-HSP90AA1-TP53	9
31	SMAD4	TP53	2	SMAD4-BRCA1-TP53 ;SMAD4-COPS5-TP53 ;SMAD4-CHEK1-TP53 ;SMAD4-MAPK1-TP53 ;SMAD4-CREBBP-TP53 ;SMAD4-ESR1-TP53 ;SMAD4-HNF4A-TP53 ;SMAD4-SMAD3-TP53 ;SMAD4-SMAD-TP53 ;SMAD4-UBEI-TP53 ;SMAD4-SP1-TP53 ;SMAD4-EP300-TP53 ;SMAD4-PIAS4-TP53 ;SMAD4-UBB-TP53	14
32	BAT3	TP53	2	BAT3-S100A4-TP53;BAT3-EP300-TP53 BAT3-SMN1-TP53	3
33	TP53	VIM	2	TP53-CAPN1-VIM;TP53-ING5-VIM; TP53- CHD3-VIM;TP53-PIAS4-VIM;TP53-SMAD3- VIM;TP53-YWHAZ-VIM;TP53-CDK1-VIM;TP53- RAD51-VIM	8
34	RAD51	TP53	1	1:RAD51-TP53	1
35	MAGI1	TP53	2	MAGI1-TP53BP2-TP53;MAGI1-TFAP2A-TP53	2
36	JUN	TP53	2	JUN-NR3C1-TP53 ;JUN-BRCA1-TP53;JUN- TOPA-TP53 ;JUN-PRKDC-TP53 ;JUN-NFYA- TP53 ;JUN-COPS5-TP53 ;JUN-MAPK9-TP53 ;JUN-MAPK8-TP53 ;JUN-HDAC3-TP53 ;JUN- MAPK3-TP53 ;JUN-PIN1-TP53 ;JUN-CREBBP- TP53 ;JUN-ESR1-TP53 ;JUN-HIF1A-TP53 ;JUN- RFWD-TP53 ;JUN-ATF3-TP53 ;JUN-SMAD3- TP53 ;JUN-SMAD-TP53 ;JUN-TOP1-TP53 ;JUN- ABL1-TP53 ;JUN-UBEI-TP53 ;JUN-SP1-TP53 ;JUN-EGR1-TP53 ;JUN-EP300-TP53 ;JUN-TBP-TP53 ;JUN-CSNKA1-TP53 ;JUN-UBB- TP53 ;JUN-SUMO1-TP53	28
37	TP53	YWHAZ	1	TP53-YWHAZ	1
38	HMGB1	TP53	1	HMGB1-TP53	1
39	RAC1	TP53	2	RAC1-EIFAK-TP53 ;RAC1-PPPRB-TP53	2
40	CNOT7	TP53	2	CNOT7-CDK-TP53 ;CNOT7-CDK1-TP53	2
41	TGFBR1	TP53	2	TGFBR1-CSNK1A1-TP53;TGFBR1-SMAD3-TP53 ;TGFBR1-CHUK-TP53;TGFBR1-SMAD- TP53;TGFBR1-PML-TP53;TGFBR1-UBB-TP53	6
42	PPP2R1B	TP53	2	PPP2R1B-CDK1-TP53 ;PPP2R1B-PPPCA-TP53 ;PPP2R1B-HDAC1-TP53	3
43	IGF1	TP53	3	IGF1-IGF1R-YWHAG-TP53 ;IGF1-IGF1R- MDM2-TP53 ;IGF1-IGF1R-ESR1-TP53 ;IGF1- IGF1R-YWHAZ-TP53 ;IGF1-IGFBP-CSNK2A1- TP53	6
44	ERBB2	TP53	2	ERBB2-ESR1-TP53 ;ERBB2-UBB-TP53 ;ERBB2-HSP90AA1-TP53;;ERBB2-PTK2-TP53	4
45	DYNLL1	TP53	2	DYNLL1-RAB4A-TP53 ;DYNLL1-TP53BP1-TP53	3

				;DYNLL1-NFKBIA-TP53	
46	PP2CA	TP53	1	PP2CA-TP53	1
47	HSP90AA1	TP53	1	HSP90AA1-TP53	1
48	TP53	ZBTB16	2	TP53-SP1-ZBTB16 ;TP53-NR3C1-ZBTB16 ;TP53-SMAD3-ZBTB16;TP53-CDK1-ZBTB16 ;TP53-HDAC1-ZBTB16 ;TP53-PML-ZBTB16 ;TP53-EP300-ZBTB16 ;TP53-ESR1-ZBTB16	8
49	PCNA	TP53	2	PCNA-PRKDC-TP53 ;PCNA-ING1-TP53 ;PCNA- HDAC1-TP53 ;PCNA-WRN-TP53 ;PCNA- XRCC6-TP53 ;PCNA-CDK-TP53;PCNA-CDK1- TP53 ;PCNA-YBX1-TP53 ;PCNA-RPA1-TP53 ;PCNA-PARP1-TP53 ;PCNA-APEX1-TP5 3 ;PCNA-EP300-TP53 ;PCNA-UBB-TP53	13
50	MAPK3	TP53	1	MAPK3-TP53	1
51	FYN	TP53	2	FYN-NR3C1-TP53 ;FYN-PTK-TP53 ;FYN-CDK1- TP53 ;FYN-HSP90AA1-TP53	4
52	CDKN2A	TP53	2	CDKN2A-UBEA-TP53 ;CDKN2A-MDM-TP53 ;CDKN2A-HIF1A-TP53 ;CDKN2A-NCL-TP53 ;CDKN2A-WRN-TP53 ;CDKN2A-EGR1-TP53 ;CDKN2A-CDKNC-TP53 ;CDKN2A-CCNG1-TP53 ;CDKN2A-HUWE1-TP53 ;CDKN2A-EF1-TP53	10
53	IGF1R	TP53	2	IGF1R-ESR1-TP53 ;IGF1R-MDM-TP53;IGF1R- YWHAG-TP53 ;IGF1R-YWHAZ-TP53	4
54	HRAS	TP53	2	HRAS-TP73-TP53 ;HRAS-BCL-TP53;HRAS- MAPK8-TP53	3
55	APP	TP53	2	APP-ABL1-TP53 ;APP-TP53BP-TP53;APP- KAT5-TP53 ;APP-GSK3B-TP53;APP-PIN1-TP53	5
56	SP1	TP53	1	SP1-TP53	1
57	SMAD5	TP53	3	SMAD5-SMAD4-SP1-TP53 ;SMAD5-PTPN1- ABL1-TP53 ;SMAD5-SMAD4-UBB-TP53 ;SMAD5-SMAD4-PIAS4-TP53 ;SMAD5-PTPN1- PTK-TP53 ;SMAD5-SFPQ-TOP1-TP53 ;SMAD5- SMAD4-CHEK1-TP53;SMAD5-FLNA-CDC4- TP53 ;SMAD5-TOB1-MAPK1-TP53 ;SMAD5- SMAD4-MAPK1-TP53 ;SMAD5-TOB1-SMAD3- TP53 ;SMAD5-FLNA-SMAD3-TP53 ;SMAD5- ZEB-SMAD3-TP53 ;SMAD5-MEN1-SMAD3- TP53 ;SMAD5-SMAD4-SMAD3-TP53 ;SMAD5- SMURF-SMAD3-TP53 ;SMAD5-TOB1-SMAD- TP53 ;SMAD5-ZEB-SMAD-TP53 ;SMAD5-HOXD13- SMAD-TP53 ;SMAD5-SMAD4-SMAD-TP53 ;SMAD5-SMURF-SMAD-TP53 ;SMAD5-HOXA13-SMAD-TP53 ;SMAD5- SMAD4-HNF4A-TP53 ;SMAD5-SMAD4-COPS5- TP53 ;SMAD5-FLNA-YWHAG- P53 ;SMAD5-FLNA-BRCA-TP53 ;SMAD5-SMAD4- BRCA1-TP53 ;SMAD5-ACVR1- THRB-TP53 ;SMAD5-SUV39H1-HDAC3-TP53 ;SMAD5- SUV39H1-HDAC-TP53;SMAD5-SUV39H1-	38

				HDAC1-TP53 ;SMAD5-SUV39H1-PML-TP53 ;SMAD5-SUV39H1-EP300-TP53 ;SMAD5-SMAD4-EP300- P53;SMAD5-SMAD4-ESR1-TP53 SMAD5-SMAD4-UBEI-TP53 ;SMAD5-SUV39H1-CREBBP-TP53 ;SMAD5-ACVR1-CREBBP-TP53	
58	PTEN	TP53	1	PTEN-TP53	1
59	PRNP	TP53	2	PRNP-CSNKA1-TP53 ;PRNP-CSNKB-TP53	2
60	MAPK1	TP53	1	MAPK1-TP53	1
61	EEF1A1	TP53	2	EEF1A1-TP53BP-TP53 ;EEF1A1-YWHAG-TP53 ;EEF1A1-MNAT1-TP53 ;EEF1A1-SMAD-TP53	4
62	DAPK1	TP53	2	DAPK1-MAPK3-TP53 ;DAPK1-MAPK1-TP53	2
63	DACH1	TP53	2	DACH1-SMAD3-TP53 ;DACH1-CREBBP-TP53 ;DACH1-UBEI-TP53	3
64	CREBBP	EP300	1	CREBBP-EP300	1
65	CREBBP	CTNNB1	1	CREBBP-CTNNB1	1
66	ACTB	TP53	2	ACTB-RAB4A-TP53 ;ACTB-SMARCA4-TP53 ;ACTB-SMAD3-TP53 ;ACTB-CSNK1A1-TP53	4
67	TP53	XRCC6	1	TP53-XRCC6	1
68	RUNX1	TP53	2	RUNX1-HIPK-TP53 ;RUNX1-EP300-TP53	2
69	AURKA	TP53	1	AURKA-TP53	1
70	TP53	YWHAB	2	TP53-ABL1-YWHAB ;TP53-ING1-YWHAB ;TP53-HSPA1A-YWHAB ;TP53-CSNKA1-YWHAB ;TP53-YWHAG-YWHAB ;TP53-MDM4-YWHAB ;TP53-BCR-YWHAB	7
71	MET	TP53	3	MET-STAT3-KAT5-TP53;MET-CTNNB1-PIN1-TP53;MET-FAS-SUMO1-TP53;MET-STAT3-EP300-TP53;MET-CTNNB1-EP300-TP53;MET-FAS-UBEI-TP53;MET-SMC1A-ATM-TP53;MET-CTNNB1-CSNKB-TP53 ;MET-CASP3-CDC4-TP53;MET-VAV1-CDC4-TP53;MET-CASP3-TOP1-TP53;MET-CTNNB1-CSNK1D-TP53 ;MET-SMC1A-POLA1-TP53;MET-SMC1A-BLM-TP53;MET-CASP3-BLM-TP53;MET-CTNNB1-GSK3B-TP53;MET-EGFR-XRCC6-TP53 ;MET-VAV1-XRCC6-TP53;MET-DNAJA3-HSPA1A-TP53;MET-BAG1-HSPA1A-TP53;MET-RANBP9-SMAD3-TP53;MET-CTNNB1-SMAD3-TP53;MET-CBL-CAPN1-TP53;MET-RANBP9-SMAD-TP53;MET-CTNNB1-SMAD-TP53;MET-CASP3-RAD51-TP53;MET-DNAJA3-RAD51-TP53;MET-SMC1A-MDC1-TP53;MET-RANBP9-HIPK-TP53 ;MET-STAT3-CREBBP-TP53;MET-CTNNB1-CREBBP-TP53;MET-CASP3-PSME3-TP53;MET-ITGB4-PTK-TP53;MET-PTPN11-PTK-TP53;MET-SRC-PTK-TP53;MET-EGFR-PTK-TP53;MET-CTNNB1-PLK1-TP53;MET-CASP3-BCL-TP53;MET-BAG1-BCL-TP53;MET-PTPN11-BCR-TP53;MET-SRC-BCR-TP53;MET-VAV1-BCR-TP53;MET-SRC-ABL1-TP53;MET-CBL-	95

				ABL1-TP53;MET-SRC-WWOX-TP53;MET-CASP3-TFAPA-TP53;MET-CTNNB1-TFAPA-TP53;MET-STAT3-PML-TP53;MET-SRC-NFKBIA-TP53;MET-CASP3-HMGB1-TP53;MET-SRC-ESR1-TP53;MET-CTNNB1-ESR1-TP53;MET-EGFR-ESR1-TP53;MET-BAG1-ESR1-TP53;MET-STAT3-HDAC3-TP53;MET-STAT3-HDAC-TP53;MET-STAT3-HDAC1-TP53;MET-CTTN-CHD3-TP53;MET-STAT3-MAPK8-TP53;MET-STAT3-MAPK3-TP53;MET-PTPN11-MAPK3-TP53;MET-STAT3-MAPK1-TP53;MET-EGFR-MAPK1-TP53;MET-VAV1-MAPK1-TP53;MET-FAS-DAXX-TP53;MET-STAT3-DAXX-TP53;MET-CASP3-PRKDC-TP53;MET-CTNNB1-CSNKA1-TP53;MET-CASP3-SP1-TP53;MET-EGFR-YWHAZ-TP53;MET-CBL-YWHAZ-TP53;MET-EGFR-UBB-TP53;MET-SRC-YWHAG-TP53;MET-CBL-YWHAG-TP53;MET-SMC1A-BRCA1-TP53;MET-CASP3-BRCA1-TP53;MET-STAT3-BRCA1-TP53;MET-CASP3-STK4-TP53;MET-SRC-SMARCB1-TP53;MET-STAT3-HIF1A-TP53;MET-CTNNB1-HIF1A-TP53;MET-CASP3-MDM4-TP53;MET-CASP3-MDM-TP53;MET-VAV1-TEC-TP53;MET-CTNNB1-SMARCA4-TP53;MET-PTPN11-CHUK-TP53;MET-SRC-CHUK-TP53;MET-CTNNB1-CHUK-TP53;MET-CTNNB1-CSNK1A1-TP53;MET-STAT3-NR3C1-TP53;MET-BAG1-NR3C1-TP53;MET-STAT3-HSP90AA1-TP53;MET-SRC-HSP90AA1-TP53;MET-CASP3-EIFAK-TP53;MET-STAT3-EIFAK-TP53	
72	GSK3B	TP53	1	GSK3B-TP53	1
73	FN1	TP53	3	FN1-ITGB3-CAPN1-TP53 ;FN1-COL1A1-CAPN1-TP53 ;FN1-VHL-SP1-TP53 ;FN1-SMAD4-SP1-TP53 ;FN1-SMAD4-UBB-TP53 ;FN1-SKIL-XRCC6-TP53 ;FN1-SKIL-PIAS4-TP53 ;FN1-SMAD4-PIAS4-TP53 ;FN1-IGFBP3-CSNKA1-TP53 ;FN1-ITGB3-PTK-TP53 ;FN1-ITGB1-PTK-TP53 ;FN1-PKD1-PTK-TP53 ;FN1-SMAD4-CHEK1-TP53 ;FN1-SMAD4-MAPK1-TP53 ;FN1-SKIL-SMAD3-TP53 ;FN1-SMAD4-SMAD3-TP53 ;FN1-SKIL-SMAD-TP53 ;FN1-SMAD4-SMAD-TP53 ;FN1-SMAD4-HNF4A-TP53 ;FN1-SMAD4-COPS5-TP53 ;FN1-SMAD4-BRCA1-TP53 ;FN1-VHL-HIF1A-TP53 ;FN1-SMAD4-EP300-TP53;FN1-VHL-NR4A1-TP53 ;FN1-SMAD4-ESR1-TP53 ;FN1-SKIL-UBEI-TP53 ;FN1-SMAD4-UBEI-TP53;FN1-SMAD4-CREBBP-TP53	28
74	COL1A1	TP53	1	COL1A1-CAPN1-TP53	1

75	RELA	TP53	2	RELA-NR3C1-TP53 ;RELA-BRCA1-TP53;RELA-ING4-TP53 ;RELA-CHEK1-TP53;RELA-HDAC3-TP5 3 ;RELA-HDAC-TP53;RELA-HDAC1-TP53 ;RELA-KATB-TP53;RELA-PIN1-TP53 ;RELA-CREBBP-TP53;RELA-ESR1-TP53 ;RELA-KPNA-TP53;RELA-HMGB1-TP53 ;RELA-TP53BP-TP53;RELA-CHUK-TP53 ;RELA-TP53BP1-TP53 ;RELA-PARP1-TP53 ;RELA-NFKBIA-TP53;RELA-SP1-TP53 ;RELA-PML-TP53 ;RELA-SIRT1-TP53 ;RELA-EGR1-TP53 ;RELA-EP300-TP53 ;RELA-TBP-TP53 ;RELA-PPPCA-TP53 ;RELA-CSNKA1-TP53	25
76	NFKB1	TP53	2	NFKB1-NR3C1-TP53 ;NFKB1-BRCA1-TP53 ;NFKB1-E2F1-TP53 ;NFKB1-KAT5-TP53 ;NFKB1-HDAC1-TP53 ;NFKB1-ESR1-TP53 ;NFKB1-ATF3-TP53 ;NFKB1-GSK3B-TP53 ;NFKB1-HMGB1-TP53 ;NFKB1-CHUK-TP53 ;NFKB1-TP53BP1-TP53 ;NFKB1-PARP1-TP53 ;NFKB1-NFKBIA-TP53	13
77	MMP9	TP53	3	MMP9-EPHB-PTK-TP53 3;MMP9-COL1A1-CAPN1-TP53 3;MMP9-EPHB-ABL1-TP53	3
78	CEACAM1	TP53	3	CEACAM1-ANXA-S100A4-TP53 ;CEACAM1-SRC-ABL1-TP53;CEACAM1-PTPN6-ABL1-TP53 ;CEACAM1-EGFR-UBB-TP53 ;CEACAM1-ANXA-PHB-TP53 ;CEACAM1-EGFR-XRCC6-TP53 ;CEACAM1-SRC-HSP90AA1-TP53 ;CEACAM1-EGFR-PTK-TP53 ;CEACAM1-SRC-PTK-TP53 ;CEACAM1-PTPN11-PTK-TP53 ;CEACAM1-ANXA-CDC4-TP53 ;CEACAM1-FLNA-CDC4-TP53 ;CEACAM1-PTPN11-MAPK3-TP53 ;CEACAM1-EGFR-MAPK1-TP53 ;CEACAM1-FLNA-SMAD3-TP53 ;CEACAM1-EGFR-YWHAZ-TP53 ;CEACAM1-FLNA-YWHAG-TP53 CEACAM1-SRC-YWHAG-TP53 ;CEACAM1-FLNA-BRCA-TP53 ;CEACAM1-SRC-BCR-TP53 ;CEACAM1-PTPN6-BCR-TP53 ;CEACAM1-PTPN11-BCR-TP53 ;CEACAM1-SRC-CHUK-TP53 ;CEACAM1-PTPN11-CHUK-TP53 ;CEACAM1-SRC-SMARCB1-TP53 ;CEACAM1-SRC-NFKBIA-TP53 ;CEACAM1-EGFR-ESR1-TP53;CEACAM1-SRC-ESR1-TP53 ;CEACAM1-PTPN6-ESR1-TP53 ;CEACAM1-SRC-WWOX-TP53	30
79	CDKN1A	TP53	2	CDKN1A-ESR1-TP53 ;CDKN1A-CDK-TP53 ;CDKN1A-CDK1-TP53 ;CDKN1A-XRCC6-TP53 ;CDKN1A-CSNKA1-TP53;CDKN1A-TSG101-TP53 ;CDKN1A-CSNKB-TP53 ;CDKN1A-CCNA-TP53 ;CDKN1A-PARP1-TP53 ;CDKN1A-MAPK8-TP53;CDKN1A-TK1-TP53	11
80	CADM1	TP53	3	CADM1-EPB41L3-YWHAG-TP53 ;CADM1-EPB41L3-YWHAZ-TP53	2

81	TP53	TSC2	2	TP53-PTK-TSC2 ;TP53-MAPK3-TSC2;TP53-MAPK1-TSC2 ;TP53-GSK3B-TSC2;TP53-SMAD3-TSC2 ;TP53-SMAD-TSC2;TP53-YWHAZ-TSC2 ;TP53-YWHAG-TSC2;TP53-ESR1-TSC2	9
82	RASA1	TP53	2	RASA1-ABL1-TP53 ;RASA1-BCR-TP53	2
83	MAPK14	TP53	2	MAPK14-ESR1-TP53 ;MAPK14-HNF4A-TP53 ;MAPK14-CSNKB-TP53 ;MAPK14-SMAD3-TP53 ;MAPK14-BCL-TP53 ;MAPK14-MAPK8-TP53 ;MAPK14-PML-TP53 ;MAPK14-MAPK3-TP53 ;MAPK14-MAPK1-TP53	9
84	INS	TP53	3	INS-RB1-SMARCB1-TP53 ;INS-RB1-HDAC3-TP53 ;INS-RB1-ABL1-TP53 ;INS-RB1-HDAC1-TP53 ;INS-RB1-MDM4-TP53 ;INS-IGF1R-MDM-TP53 ;INS-RB1-MDM-TP53 ;INS-RB1-SP1-TP53 ;INS-RB1-SMARCA4-TP53 ;INS-RB1-CDK-TP53;INS-RB1-CDK1-TP53 ;INS-RB1-MAPK9-TP53 ;INS-IGF1R-YWHAZ-TP53 ;INS-RB1-TBP-TP53;INS-RB1-MAPK1-TP53 ;INS-RB1-HMGB1-TP53 ;INS-RB1-TOPA-TP53;INS-IGF1R-YWHAG-TP53 ;INS-RB1-EP300-TP53 ;INS-RB1-PHB-TP53 ;INS-RB1-BRF1-TP53;INS-RB1-PML-TP53 ;INS-RB1-MNAT1-TP53 ;INS-RB1-TFAPA-TP53 ;INS-RB1-EF1-TP53 ;INS-IGF1R-ESR1-TP53 ;INS-RB1-POLA1-TP53;INS-RB1-BRCA1-TP53	28
85	TP53	UBB	1	TP53-UBB	1
86	TP53	TRAF6	2	TP53-ABL1-TRAF6;TP53-UBB-TRAF6;TP53-MAPK8-TRAF6	3
87	PTPN6		2	PTPN6-ESR1-TP53;PTPN6-BCR-TP53;PTPN6-ABL1-TP53	3
88	PRKCZ	TP53	2	PRKCZ-CDC4-TP53;PRKCZ-NCL-TP53;PRKCZ-CSNKB-TP53 ;PRKCZ-GSK3B-TP53;PRKCZ-MAPK3-TP53 ;PRKCZ-MAPK1-TP53	6
89	PARP1	TP53	1	PARP1-TP53	1
90	CDK4	TP53	2	CDK4-BRCA1-TP53;CDK4-CDKN2C-TP53 ;CDK4-SMAD3-TP53;CDK4-SMAD2-TP53	4
91	BTRC	TP53	2	BTRC-HIPK-TP53;BTRC-SMAD3-TP53;BTRC-NFKBIA-TP53	3
92	TP53	VHL	2	TP53-SP1-VHL;TP53-HIF1A-VHL;TP53-NR4A1-VHL	3
93	TLR2	TP53	2	TLR2-HMGB1-TP53	1
94	SOCS1	TP53	2	SOCS1-TEC-TP53	1
95	SMARCA4	TP53	1	SMARCA4-TP53	1
96	NDRG1	TP53	2	NDRG1-NCL-TP53 ;NDRG1-DDX5-TP53;NDRG1-HSP90AA1-TP53;NDRG1-S100B-TP53	4
97	KAT2B	TP53	1	KAT2B-TP53	1
98	HSPA1A	TP53	1	HSPA1A-TP53	1
99	ETS1	TP53	2	ETS1-EP300-TP53 ;ETS1-SP1-TP53;ETS1-DAXX-TP53 ;ETS1-NR3C1-TP53;ETS1-SMAD3-	9

				TP53 ;ETS1-CREBBP-TP53;ETS1-MAPK3-TP53 ;ETS1-UBEI-TP53;ETS1-MAPK1-TP53	
10	CTNNB1	EP300	1	CTNNB1-EP300	1