

Supplemental data

Figure legend

Figure S1. Figure 1. p53 direct target genes do not correlate with prognosis in NSCLC. 994 patients were tested for association of p53 status or gene expression levels with survival by Kaplan-Meier curve. Patients with \geq median gene expression levels are taken as high expression (~50% of patients) and $<$ median are taken as low expression. High expression of *MDM2*, *CDKN1A*, or *BBC3* does not significantly (p values shown) associate with survival of the patients.

Figure S2. A. Three individual replicate of the graphs in Fig. 5B. B. Three individual replicate of the graphs in Fig. 5C. C. Representative images of colonies for the graphs in Fig. 5B. D. Representative images of colonies for the graphs in Fig. 5C.

Figure S3. A. Three individual replicate of the graphs in Fig. 6A. B. Three individual replicate of the graphs in Fig. 6B. C. Representative images of colonies for the graphs in Fig. 6A. D. Representative images of colonies for the graphs in Fig. 6B.

Figure S4. A and C. Three individual replicate of the graphs in Fig. 6E. B and D. Representative images of colonies for the graphs in Fig. 6E. E and G. Three individual replicate of the graphs in Fig. 6F. F and H. Representative images of colonies for the graphs in Fig. 6F.

Figure S5. Immunoblot images in Fig 6B and 6E.

Figure S6. A and C. Three individual replicate of the graphs in Fig. 6H. B and D. Representative images of colonies for the graphs in Fig. 6H.

Figure S1

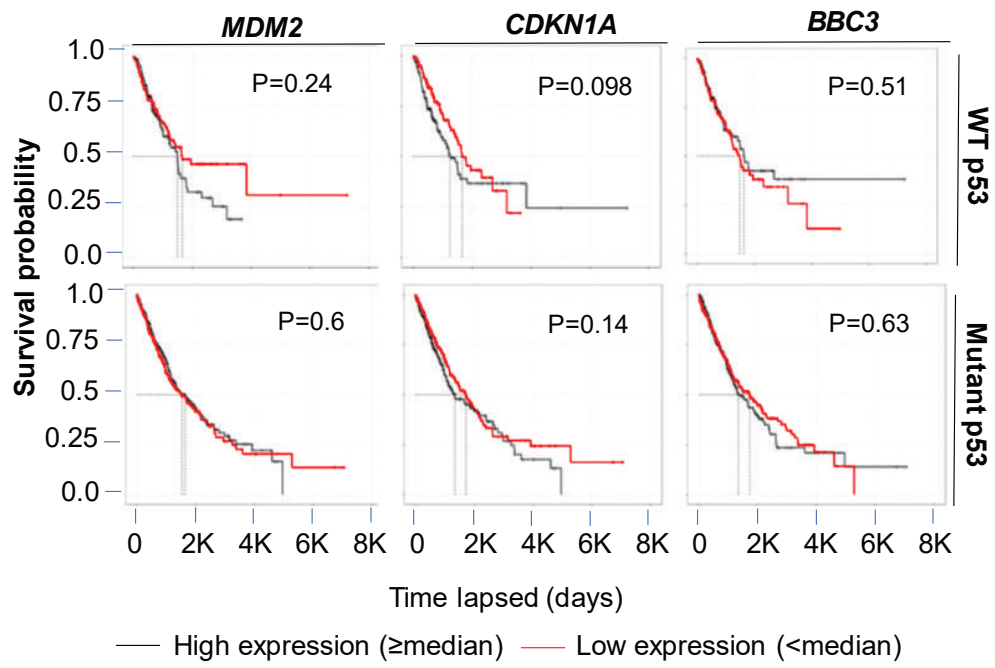
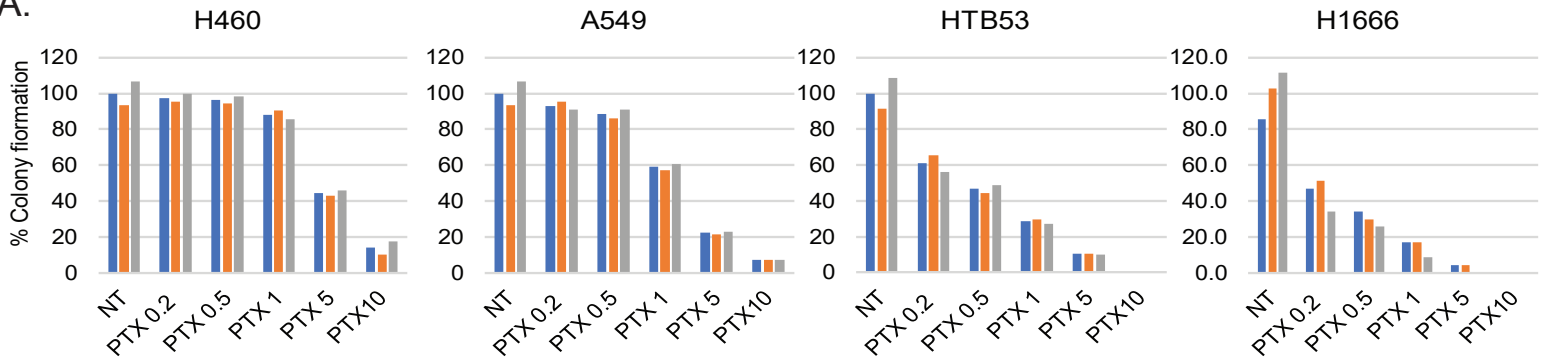
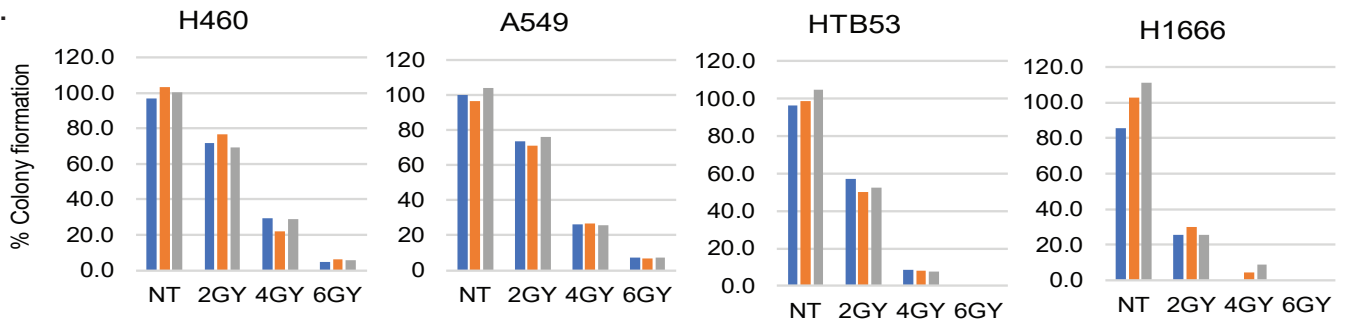


Figure S2

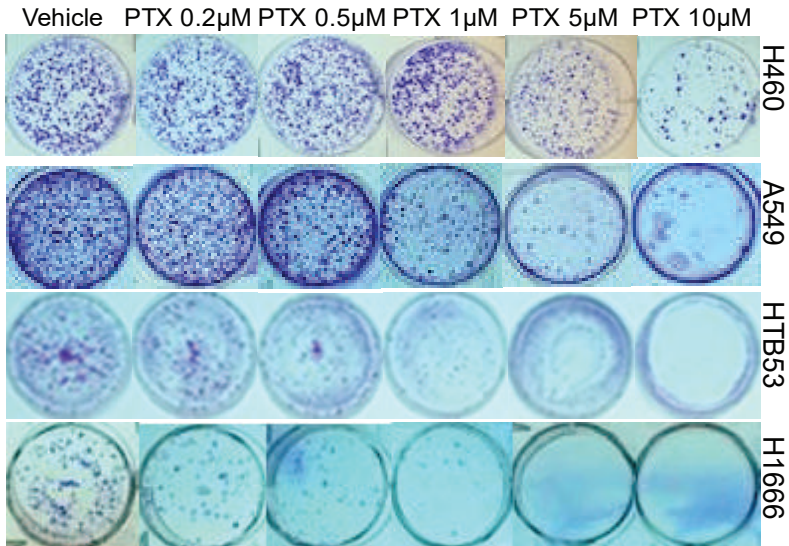
A.



B.



C.



D.

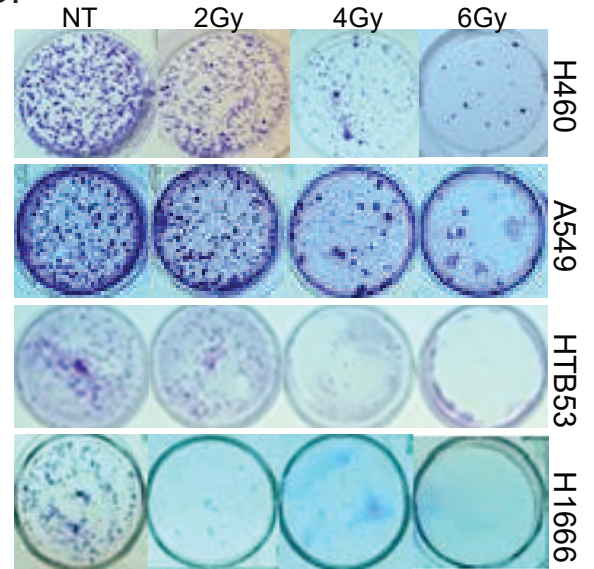


Figure S3

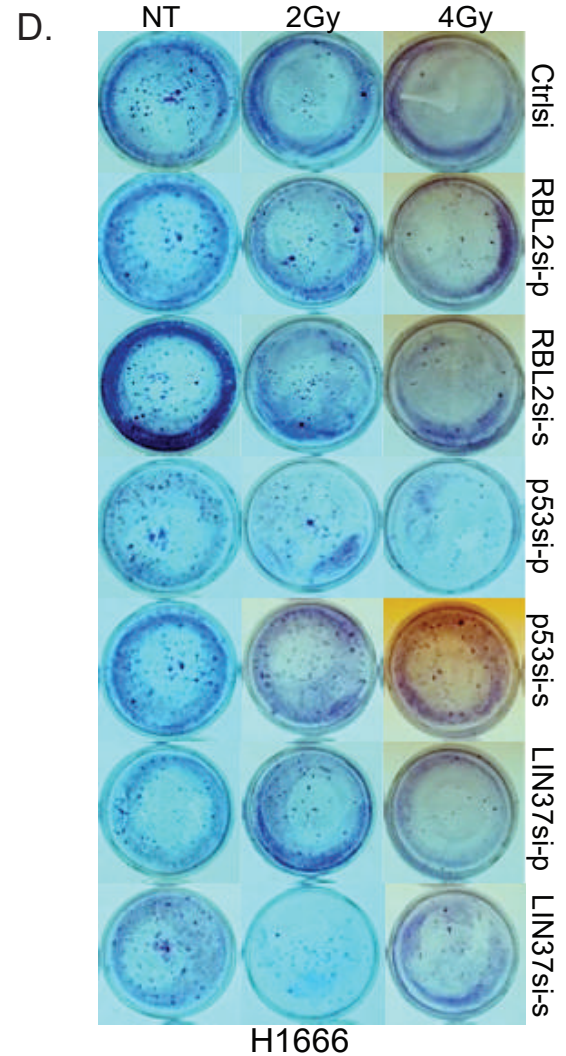
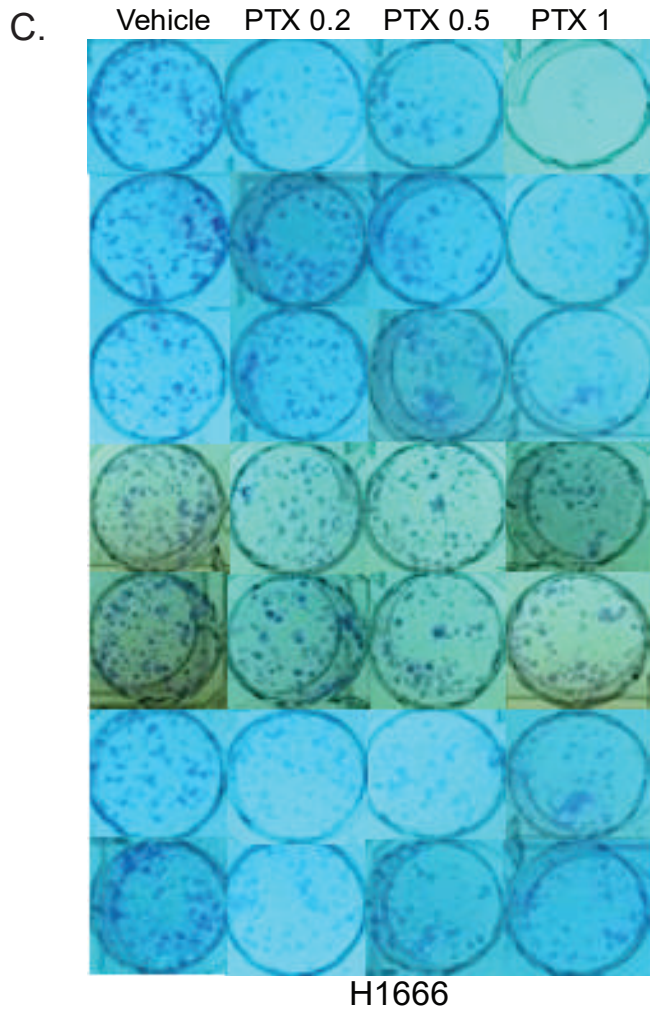
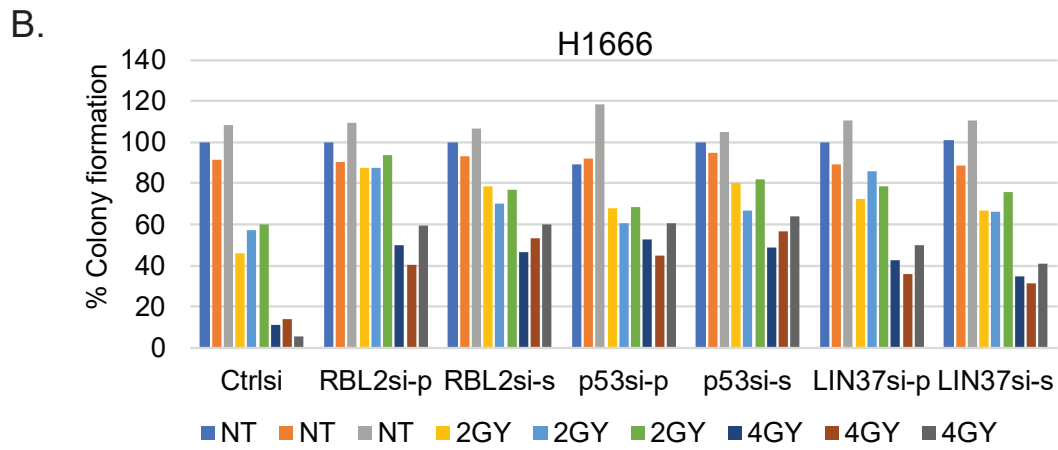
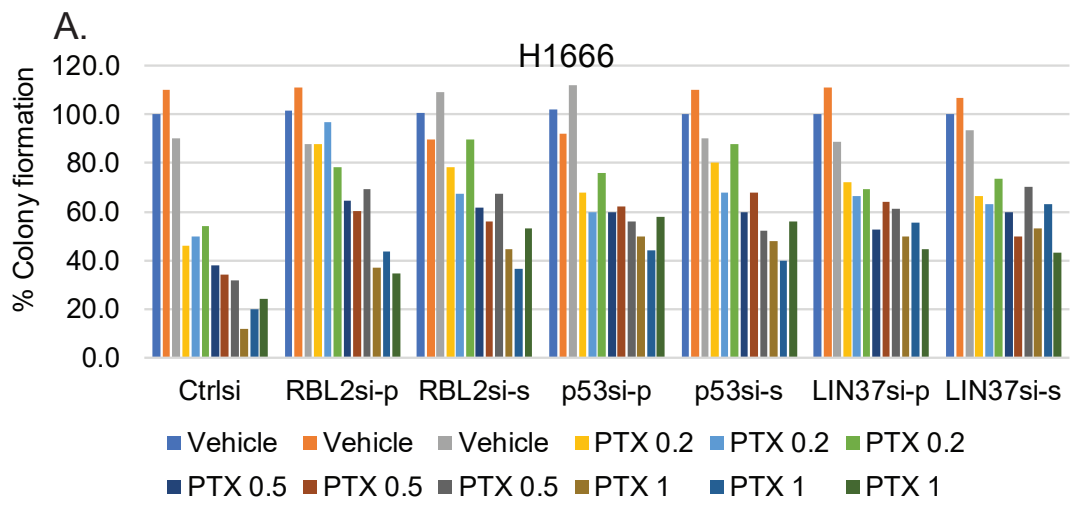
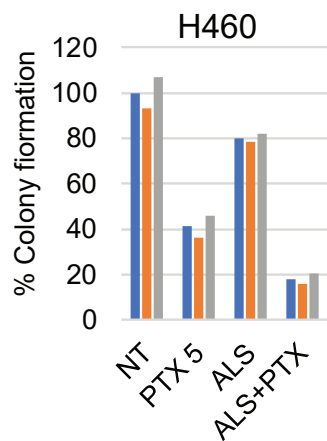
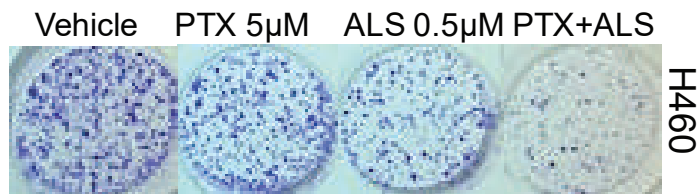


Figure S4

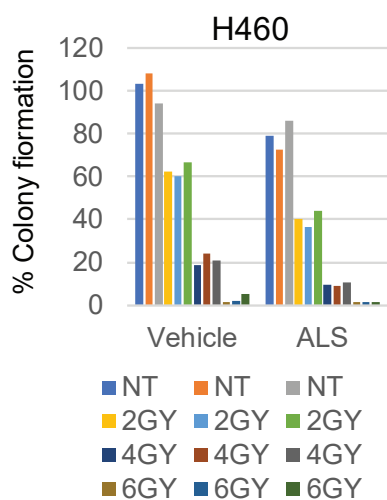
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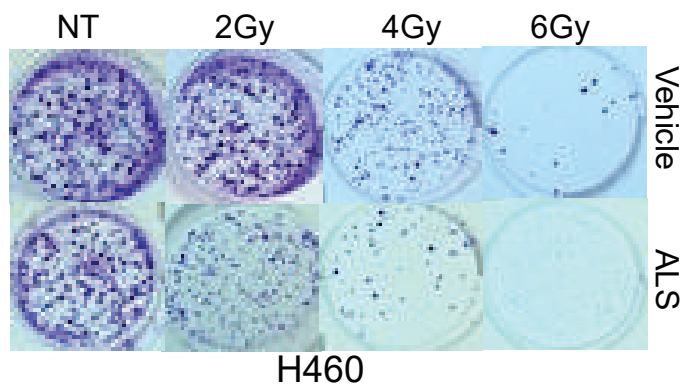
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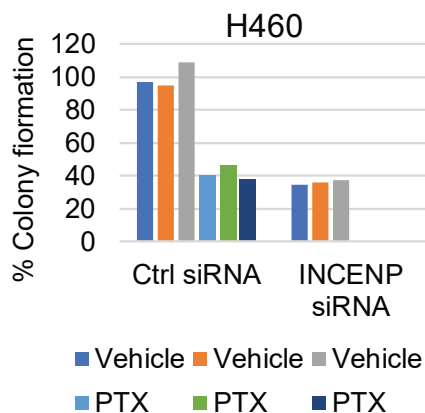
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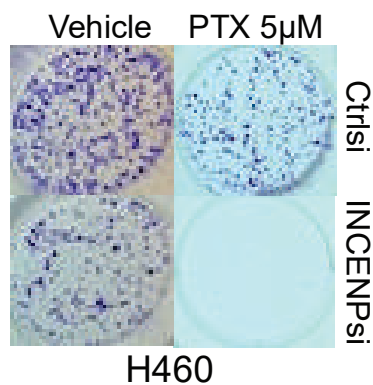
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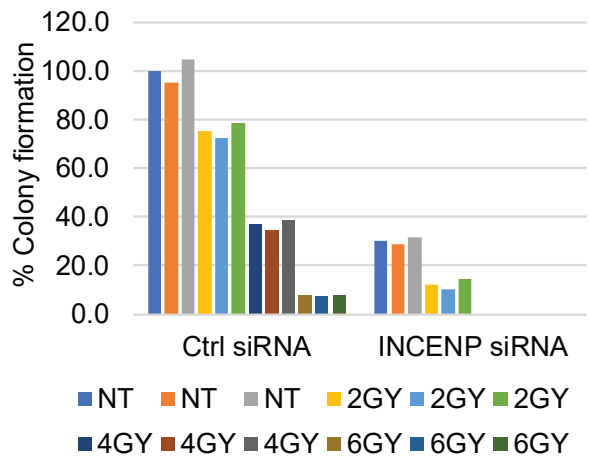
E.



F.



G.



H.

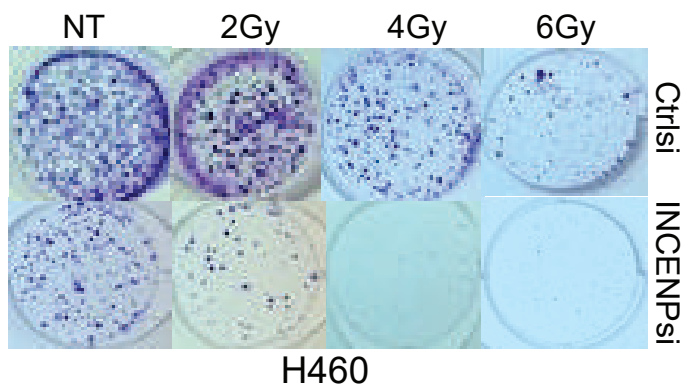
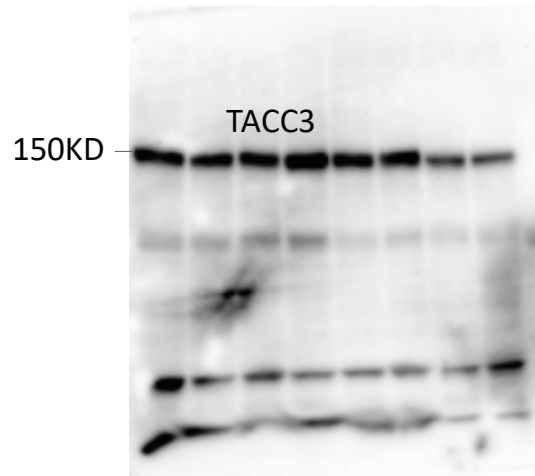
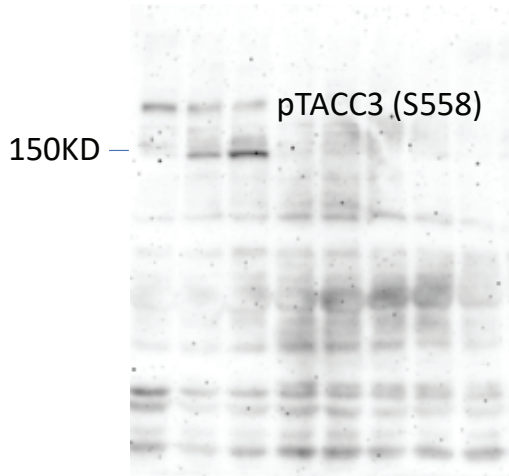
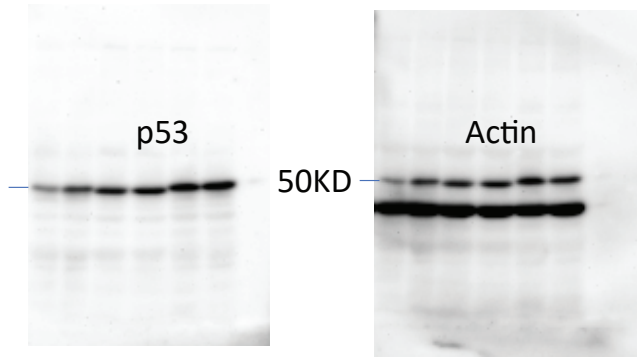


Figure S5

Original filrs for Flgure 5D



Orinial filrs for Figure 5G

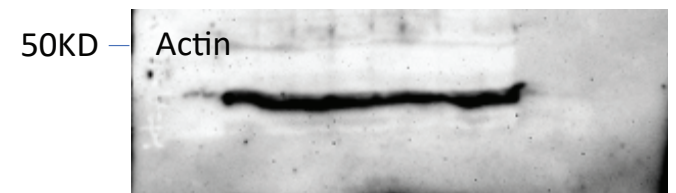
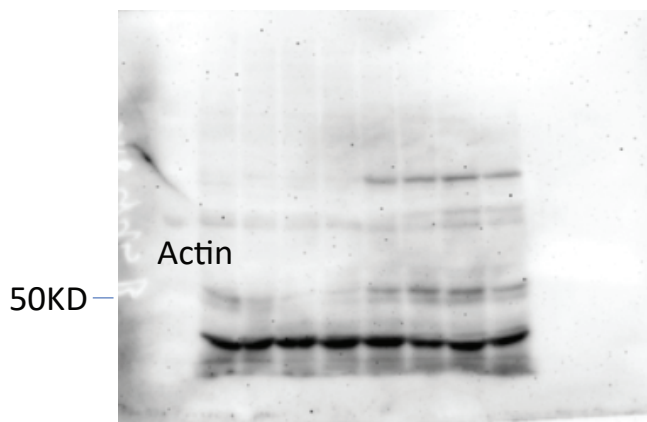
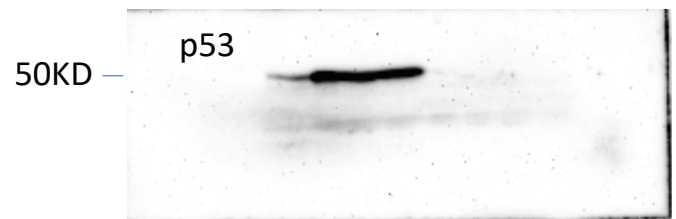
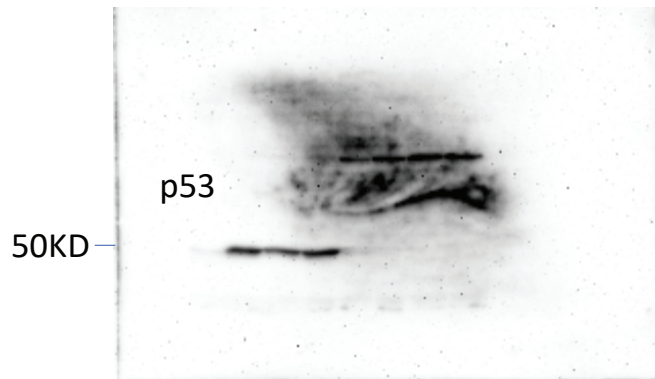


Figure S6

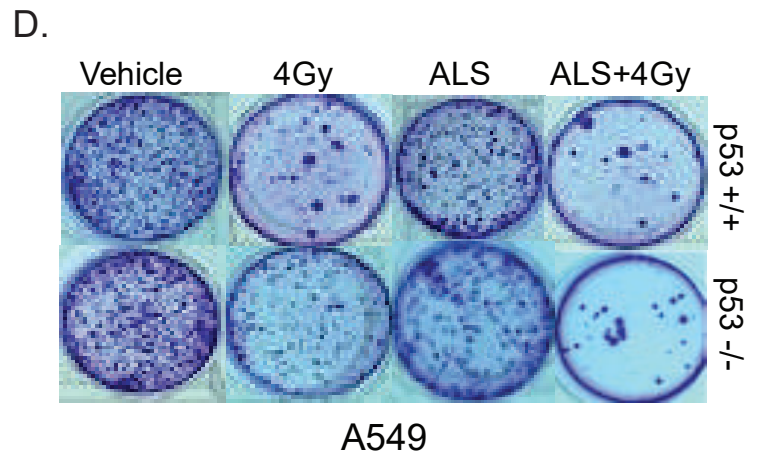
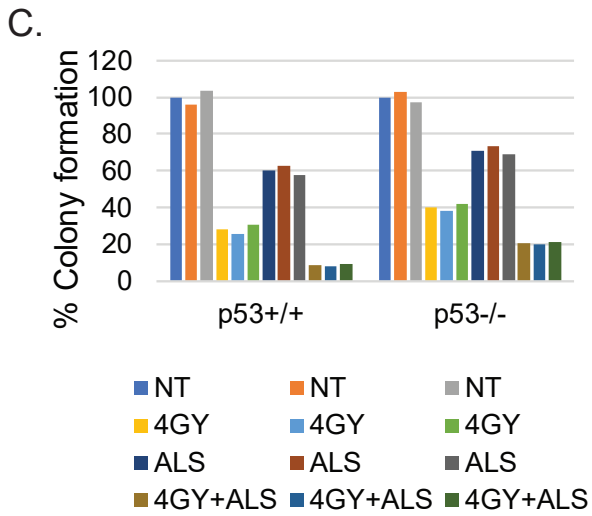
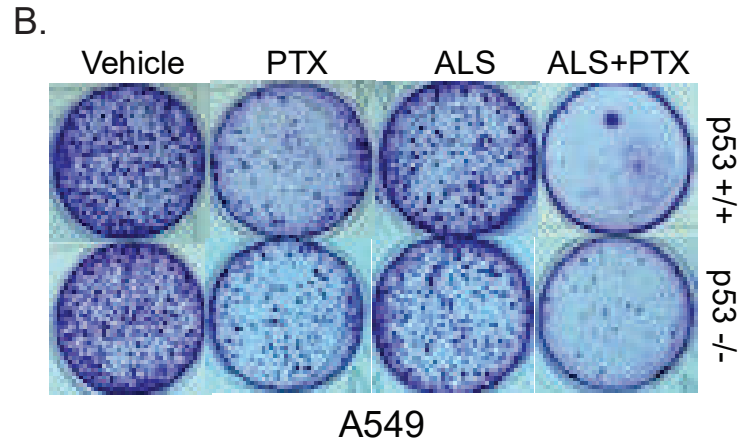
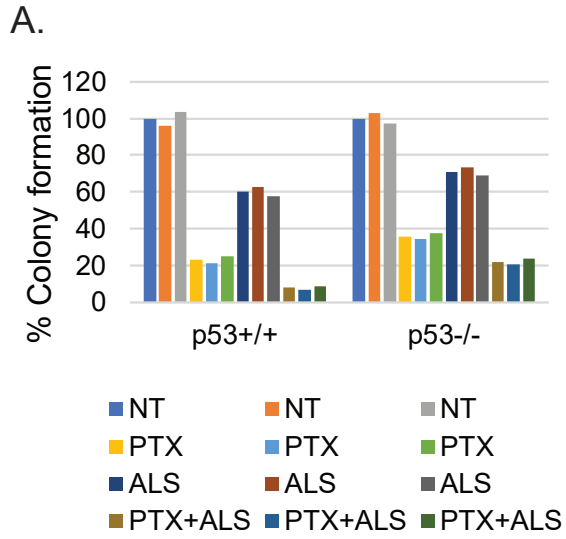


Table S1 : Genes negatively correlated with RBL2 in WT p53 tumors

	WT p53 NSCLC	Mut p53 NSCLC			WT p53 NSCLC	Mut p53 NSCLC
Gene Names	Pearson with RBL2	Pearson with RBL2		Gene Names	Pearson with RBL2	Pearson with RBL2
MKI67	-0.20	-0.04		CENPU	-0.28	-0.15
CENPE	-0.22	-0.05		DEPDC1	-0.26	-0.15
C5orf34	-0.22	-0.05		EXO1	-0.24	-0.15
CENPI	-0.2	-0.06		FOXM1	-0.23	-0.15
CENPN	-0.22	-0.07		SPAG5	-0.26	-0.16
INCENP	-0.20	-0.07		CDC45	-0.27	-0.16
FAM72A	-0.23	-0.08		CEP55	-0.28	-0.16
IQGAP3	-0.28	-0.08		MND1	-0.24	-0.16
KIF14	-0.21	-0.08		RAD51AP1	-0.2	-0.16
PLK4	-0.21	-0.08		CENPL	-0.24	-0.17
CENPF	-0.21	-0.09		CENPH	-0.24	-0.17
CDC48	-0.27	-0.1		GGH	-0.25	-0.17
KIF11	-0.23	-0.11		MCM4	-0.2	-0.17
ARHGGEF39	-0.23	-0.11		PRR11	-0.27	-0.17
FAM72B	-0.26	-0.11		UNG	-0.2	-0.17
ARHGA11A	-0.2	-0.12		CDCA2	-0.22	-0.18
DIAPH3	-0.22	-0.12		CDT1	-0.24	-0.18
HMMR	-0.25	-0.12		CHEK1	-0.24	-0.18
NEIL3	-0.23	-0.12		FAM72D	-0.31	-0.18
STIL	-0.2	-0.12		GTSE1	-0.27	-0.18
ANLN	-0.27	-0.13		MELK	-0.23	-0.18
ESCO2	-0.2	-0.14		PARPBP	-0.22	-0.18
ESPL1	-0.25	-0.14		TTK	-0.24	-0.18
CIP2A	-0.2	-0.14		ZNF714	-0.23	-0.18
KIF15	-0.2	-0.14		BUB1B	-0.24	-0.19
RAD54B	-0.22	-0.14		KIF4A	-0.28	-0.19
RAD54L	-0.23	-0.14		CDC25C	-0.33	-0.19
TONSL	-0.2	-0.14		NUF2	-0.28	-0.19
ERCC6L	-0.27	-0.15		PRC1	-0.25	-0.19

Table S2 : Genes negatively correlated with RBL2 in WT p53 tumors and in mutant p53 tumors

	WT p53 NSCLC	Mut p53 NSCLC		WT p53 NSCLC	Mut p53 NSCLC		WT p53 NSCLC	Mut p53 NSCLC
Gene Names	Pearson with RBL2	Pearson with RBL2	Gene Names	Pearson with RBL2	Pearson with RBL2	Gene Names	Pearson with RBL2	Pearson with RBL2
KIF23	-0.24	-0.20	KCNK5	-0.31	-0.22	TROAP	-0.31	-0.25
NUSAP1	-0.23	-0.20	MIS18BP1	-0.23	-0.22	CENPM	-0.3	-0.26
GINS1	-0.24	-0.2	ORC1	-0.25	-0.22	CEP295	-0.29	-0.26
KIF18B	-0.24	-0.2	PBK	-0.26	-0.22	DLGAP5	-0.3	-0.26
MIS18A	-0.24	-0.2	PKMYT1	-0.32	-0.22	H2AFZ	-0.33	-0.26
NCAPG	-0.24	-0.2	PSRC1	-0.26	-0.22	HIURP	-0.29	-0.26
NDC80	-0.3	-0.2	TRAIP	-0.27	-0.22	KIF2C	-0.33	-0.26
NEK2	-0.26	-0.2	ZNF92	-0.31	-0.22	OIP5	-0.26	-0.26
SUV39H1	-0.28	-0.2	ZWINT	-0.29	-0.22	UBE2T	-0.32	-0.26
TRIP13	-0.26	-0.2	AUNIP	-0.28	-0.23	SPC24	-0.28	-0.27
NCAPH	-0.23	-0.21	CDC25A	-0.24	-0.23	AURKB	-0.29	-0.28
PLK1	-0.29	-0.21	CDK1	-0.27	-0.23	CENPW	-0.33	-0.28
SGOL1	-0.28	-0.21	CIT	-0.23	-0.23	FEN1	-0.26	-0.28
TPX2	-0.28	-0.21	KIF20A	-0.31	-0.23	LSM5	-0.31	-0.28
ASF1B	-0.28	-0.21	KIFC1	-0.27	-0.23	PPIH	-0.24	-0.28
BUB1	-0.21	-0.21	H2AFX	-0.34	-0.24	TKI	-0.32	-0.28
TEDC1	-0.29	-0.21	MDA2L1	-0.28	-0.24	CCNB2	-0.3	-0.29
CCNA2	-0.28	-0.21	SKA3	-0.34	-0.24	CENPA	-0.29	-0.29
E2F1	-0.22	-0.21	CDCA5	-0.27	-0.25	MYBL2	-0.24	-0.29
LRR1	-0.27	-0.21	DSCC1	-0.21	-0.25	RNASEH2A	-0.28	-0.3
MCM10	-0.24	-0.21	KNSTRN	-0.25	-0.25	SPC25	-0.28	-0.3
RECQL4	-0.26	-0.21	MTFR2	-0.27	-0.25	UBE2C	-0.34	-0.3
SGO1	-0.28	-0.21	PIMREG	-0.27	-0.25	BIRC5	-0.32	-0.31
SKA1	-0.28	-0.21	POC1A	-0.36	-0.25	CDC20	-0.38	-0.33
AURKA	-0.24	-0.22	RAPGAP1	-0.24	-0.25	CKS2	-0.36	-0.33
TEDC2	-0.33	-0.22	RAD51	-0.29	-0.25	NUDT1	-0.33	-0.33
CDCA3	-0.27	-0.22	SLC25A10	-0.38	-0.25	DTYMK	-0.43	-0.37
DEPDC1B	-0.24	-0.22						

Table S3. Expression levels of AURKA/B pathway genes in WT p53 vs. mutant p53 NSCLC

	WT p53 NSCLC	Mut p53 NSCLC	
Gene Names	Median (FKPM) ± STDEV	Median (FKPM) ± STDEV	p Value
ANLN	3.7 ± 5.7	11.2 ± 9.2	2.25E-33
AURKA	5.3 ± 6.2	11 ± 8.1	1.84E-21
AURKB	3.7 ± 6.9	10.5 ± 8.3	8.69E-29
BUB1B	2.1 ± 3.3	6.3 ± 4.2	1.32E-36
CDC20	9.8 ± 17	28.9 ± 20	6.08E-35
CENPE	0.8 ± 1	1.9 ± 1.4	1.38E-32
CENPF	2.5 ± 4	6.9 ± 5.6	1.57E-30
CENPL	1.4 ± 1	2.5 ± 1.5	5.64E-29
CENPN	2.2 ± 2.6	4.8 ± 3.4	4.56E-30
ERCC6L	0.7 ± 0.9	1.8 ± 1.6	3.05E-25
INCENP	4.2 ± 3.4	7.9 ± 4.5	3.05E-32
KIF11	3.6 ± 4.7	8.8 ± 5.1	3.65E-35
KIF23	1.7 ± 2.8	5.7 ± 3.4	2.41E-44
KIF4A	2.5 ± 3.6	7.2 ± 4.2	1.46E-42
MKI67	3.6 ± 5.8	8.7 ± 6.3	1.38E-23
NCAPH	2.5 ± 3.9	8.1 ± 5.3	7.61E-43
NUSAP1	7.4 ± 9.2	17.5 ± 12	1.09E-33
PLK1	3.7 ± 5.2	9.3 ± 5.7	2.59E-31
SPAG5	3.6 ± 4.2	8.1 ± 5.9	1.83E-29
SGOL1	0.7 ± 1	1.8 ± 1.1	1.57E-30
TACC3	5.9 ± 5.3	9.7 ± 7.8	1.49E-14
TPX2	9.2 ± 15.2	28.8 ± 23	2.28E-35

Table S4. Positive correlation of AURKA with other genes in WT p53 vs. mutant p53 NSCLC

	WT p53 NSCLC	Mut p53 NSCLC
Gene Names	Pearson with AURKA	Pearson with AURKA
ANLN	0.68	0.35
AURKB	0.71	0.49
BUB1B	0.73	0.5
CDC20	0.74	0.53
CENPE	0.71	0.45
CENPF	0.67	0.42
CENPL	0.62	0.36
CENPN	0.63	0.38
ERCC6L	0.75	0.34
INCENP	0.67	0.41
KIF11	0.69	0.46
KIF23	0.73	0.49
KIF4A	0.77	0.56
MKI67	0.66	0.38
NCAPH	0.76	0.52
NUSAP1	0.72	0.49
PLK1	0.73	0.53
SPAG5	0.77	0.56
SGOL1	0.78	0.55
TACC3	0.61	0.32
TPX2	0.76	0.44

Table S5	A	B	C	t-test (A and B)	t-test (A and C)
H1666	Ctrl siRNA	p53 siRNA-p	p53 siRNA-s	p values	p values
AURKA	1	1.90	1.65	0.001	0.004
AURKB	1	1.98	1.68	0.002	0.002
CENPE	1	2.17	1.54	0.001	0.019
CENPF	1	1.71	1.78	0.002	0.006
CENPN	1	1.99	1.65	0.002	0.004
ERCC6L	1	2.09	1.79	0.001	0.003
INCENP	1	1.95	1.66	0.001	0.012
KIF4A	1	1.98	1.67	0.000	0.008
KIF23	1	1.98	1.66	0.000	0.010
MKI67	1	1.70	1.57	0.004	0.007
NCAPH	1	1.88	1.61	0.006	0.009
NUSAP1	1	2.20	1.87	0.002	0.002
PLK1	1	2.17	1.73	0.005	0.001
SGOL1	1	1.79	1.61	0.006	0.003
SPAG5	1	1.94	1.64	0.007	0.009
TACC3	1	1.63	1.42	0.005	0.049

Table S6	A	B	C	t-test (A and B)	t-test (A and C)
H1666	Ctrl siRNA	RBL2 siRNA-p	RBL2 siRNA-s	p values	p values
AURKA	1	1.80	1.72	0.001	0.001
AURKB	1	1.51	1.37	0.003	0.004
CENPE	1	1.87	1.70	0.001	0.005
CENPF	1	1.48	1.31	0.007	0.004
CENPN	1	1.39	1.37	0.014	0.012
ERCC6L	1	1.69	1.56	0.003	0.006
INCENP	1	1.61	1.42	0.004	0.007
KIF4A	1	1.61	1.77	0.007	0.007
KIF23	1	1.72	1.65	0.001	0.003
MKI67	1	1.54	1.61	0.007	0.011
NCAPH	1	1.53	1.42	0.017	0.006
NUSAP1	1	1.49	1.82	0.038	0.012
PLK1	1	1.51	1.89	0.004	0.010
SGOL1	1	1.69	1.57	0.008	0.004
SPAG5	1	1.74	1.69	0.011	0.004
TACC3	1	1.43	1.31	0.011	0.071

Table S7	A	B	C	t-test (A and B)	t-test (A and C)
H1666	Ctrl siRNA	LIN37 siRNA-p	LIN37 siRNA-s	p values	p values
AURKA	1	1.61	1.43	0.003	0.010
AURKB	1	1.87	1.63	0.001	0.008
CENPE	1	1.77	1.48	0.006	0.008
CENPF	1	1.45	1.78	0.014	0.002
CENPN	1	1.59	1.65	0.007	0.002
ERCC6L	1	1.88	1.66	0.001	0.009
INCENP	1	1.58	1.35	0.014	0.024
KIF4A	1	2.04	1.91	0.001	0.001
KIF23	1	1.85	1.87	0.003	0.011
MKI67	1	1.71	1.91	0.010	0.006
NCAPH	1	2.19	2.12	0.001	0.002
NUSAP1	1	2.11	1.87	0.002	0.004
PLK1	1	1.99	1.73	0.004	0.007
SGOL1	1	1.47	1.66	0.003	0.006
SPAG5	1	1.84	1.62	0.007	0.005
TACC3	1	1.61	1.36	0.012	0.025

Table S8	A	B	C	t-test (A and B)	t-test (A and C)
H2030	Ctrl siRNA	RBL2 siRNA-p	RBL2 siRNA-s	p values	p values
AURKA	1	1.40	1.24	0.050	0.001
AURKB	1	0.69	0.53	0.058	0.004
CENPE	1	0.87	0.78	0.335	0.005
CENPF	1	0.59	0.76	0.027	0.004
CENPN	1	0.71	0.64	0.001	0.012
ERCC6L	1	0.75	0.67	0.293	0.006
INCENP	1	0.61	0.51	0.000	0.007
KIF4A	1	0.57	0.53	0.014	0.007
KIF23	1	0.54	0.55	0.057	0.003
MKI67	1	0.95	0.66	0.562	0.011
NCAPH	1	1.56	1.27	0.006	0.006
NUSAP1	1	1.53	1.09	0.115	0.012
PLK1	1	1.66	1.30	0.001	0.010
SGOL1	1	1.45	1.33	0.007	0.004
SPAG5	1	1.27	1.15	0.185	0.004
TACC3	1	1.04	0.98	0.659	0.712

Table S9	A	B	C	t-test (A and B)	t-test (A and C)
H2030	Ctrl siRNA	LIN37 siRNA-p	LIN37 siRNA-s	p values	p values
AURKA	1	1.13	1.29	0.061	0.035
AURKB	1	1.27	0.85	0.000	0.089
CENPE	1	0.38	0.66	0.002	0.002
CENPF	1	1.03	1.26	0.790	0.054
CENPN	1	0.54	0.85	0.001	0.028
ERCC6L	1	1.50	1.17	0.091	0.017
INCENP	1	0.63	0.94	0.004	0.313
KIF4A	1	0.32	0.53	0.000	0.001
KIF23	1	0.24	0.53	0.000	0.002
MKI67	1	0.57	0.78	0.011	0.014
NCAPH	1	0.36	0.55	0.001	0.001
NUSAP1	1	0.31	0.46	0.000	0.000
PLK1	1	0.29	0.55	0.000	0.001
SGOL1	1	1.31	1.39	0.011	0.026
SPAG5	1	0.48	0.85	0.000	0.042
TACC3	1	0.83	0.71	0.181	0.001

Table S10	A	B	C	t-test (A and B)	t-test (A and C)
H460	Ctrl siRNA	p53 siRNA-p	p53 siRNA-s	p values	p values
AURKA	1	1.58	1.34	0.003	0.028
AURKB	1	1.49	1.30	0.043	0.012
CENPE	1	1.69	1.34	0.007	0.022
CENPF	1	1.32	1.23	0.024	0.038
CENPN	1	1.45	1.30	0.011	0.061
ERCC6L	1	2.13	1.83	0.011	0.001
INCENP	1	1.43	1.22	0.021	0.045
KIF4A	1	1.57	1.47	0.003	0.003
KIF23	1	1.42	1.44	0.007	0.024
MKI67	1	1.00	1.03	0.965	0.094
NCAPH	1	1.37	1.33	0.005	0.010
NUSAP1	1	1.55	1.32	0.005	0.041
PLK1	1	1.49	1.32	0.003	0.023
SGOL1	1	1.55	1.54	0.012	0.014
SPAG5	1	1.55	1.40	0.007	0.023
TACC3	1	1.24	1.31	0.046	0.016

Table S11	A	B	C	t-test (A and B)	t-test (A and C)
H460	Ctrl siRNA	RBL2 siRNA-p	RBL2 siRNA-s	p values	p values
AURKA	1	1.30	1.22	0.006	0.011
AURKB	1	1.11	1.20	0.060	0.028
CENPE	1	1.47	1.30	0.004	0.026
CENPF	1	1.11	1.18	0.060	0.096
CENPN	1	1.19	1.17	0.057	0.051
ERCC6L	1	1.45	1.32	0.008	0.018
INCENP	1	1.32	1.33	0.010	0.005
KIF4A	1	1.20	1.22	0.022	0.024
KIF23	1	1.12	1.13	0.029	0.085
MKI67	1	0.94	1.01	0.346	0.856
NCAPH	1	1.03	0.92	0.714	0.137
NUSAP1	1	1.34	1.25	0.020	0.002
PLK1	1	1.15	1.18	0.220	0.068
SGOL1	1	1.29	1.17	0.044	0.039
SPAG5	1	1.34	1.29	0.050	0.021
TACC3	1	1.13	1.19	0.105	0.028

Table S12	A	B	t-test (A and B)
A549	p53+/+	p53-/-	p values
AURKA	1	1.49	0.041
AURKB	1	1.66	0.034
CENPE	1	2.17	0.012
CENPF	1	1.21	0.066
CENPN	1	1.33	0.024
ERCC6L	1	2.33	0.007
INCENP	1	1.35	0.123
KIF4A	1	1.76	0.007
KIF23	1	1.77	0.010
MKI67	1	1.43	0.067
NCAPH	1	1.50	0.024
NUSAP1	1	1.44	0.024
PLK1	1	1.76	0.007
SGOL1	1	1.41	0.007
SPAG5	1	1.53	0.009
TACC3	1	1.19	0.042

Table S13	2GY	4GY	PTX 0.2	PTX 0.5	PTX 1
Fig. 6A and B	p values	p Values	p Values	p Values	p Values
Ctrl siRNA and RBL2 siRNA-p	0.032	0.038	0.031	0.014	0.050
Ctrl siRNA and RBL2 siRNA-s	0.011	0.018	0.038	0.023	0.034
Ctrl siRNA and p53 siRNA-p	0.053	0.027	0.046	0.005	0.017
Ctrl siRNA and p53 siRNA-s	0.048	0.019	0.033	0.029	0.026
Ctrl siRNA and LIN37 siRNA-p	0.016	0.039	0.029	0.038	0.029
Ctrl siRNA and LIN37 siRNA-s	0.047	0.041	0.016	0.061	0.046

Table S14	t test	p values
Fig.5E	NT and PTX	0.0005
Fig.5E	NT and ALS	0.0204
Fig.5E	PTX and ALS+PTX	0.0033
Fig.5E	ALS and ALS+PTX	0.0000
Fig.5E	2GY and ALS+2GY	0.0005
Fig.5E	4GY and ALS+4GY	0.0238
Fig.5E	6GY and ALS+6GY	0.2923

	Table S15	Vehicle	PTX	2GY	4GY	6GY
	t test	p Value	p Value	p Value	p Value	p Value
Fig.5F	Ctrl siRNA and INCENP siRNA	0.003582	0.003557	7.45408E-05	0.001096	0.000493

Table S16	t test	p values
Fig. 5H	p53+/+ NT and PTX	0.000
Fig. 5H	p53+/+ NT and ALS	0.008
Fig. 5H	p53+/+ PTX and PTx+ALS	0.002
Fig. 5H	p53+/+ ALS and PTX+ALS	0.001
Fig. 5H	p53-/- NT and PTX	0.002
Fig. 5H	p53-/- NT and ALS	0.000
Fig. 5H	p53-/- PTX and PTx+ALS	0.000
Fig. 5H	p53-/- ALS and PTX+ALS	0.002
Fig. 5H	p53+/+ PTX and p53-/- PTX	0.001
Fig. 5H	p53+/+ ALS and p53-/- ALS	0.000
Fig. 5H	p53+/+ PTX+ALS and p53-/- PTX+ALS	0.001
Fig. 5H	p53+/+ NT and 4GY	8E-05
Fig. 5H	p53+/+ 4GY and ALS+4GY	0.003
Fig. 5H	p53+/+ ALS and ALS+4GY	0.001
Fig. 5H	p53-/- NT and 4GY	0.002
Fig. 5H	p53-/- 4GY and ALS+4GY	0.001
Fig. 5H	p53-/- ALS and ALS+ 4GY	0.001
Fig. 5H	p53+/+ 4GY and p53-/- 4GY	0.001
Fig. 5H	p53+/+ 4GY+ALS and p53-/- 4GY+ALS	0.000