

Figure S1. *BORIS* knockdown efficiencies in NSCLC cells. *BORIS* siRNA-1 knockdown efficiencies were detected in H460 and A549 cells using RT-qPCR. *BORIS*, Brother of Regulator of Imprinted Sites; NSCLC, non-small cell lung cancer; RT-q, reverse transcription-quantitative; si, small interfering; nc, negative siRNA control.

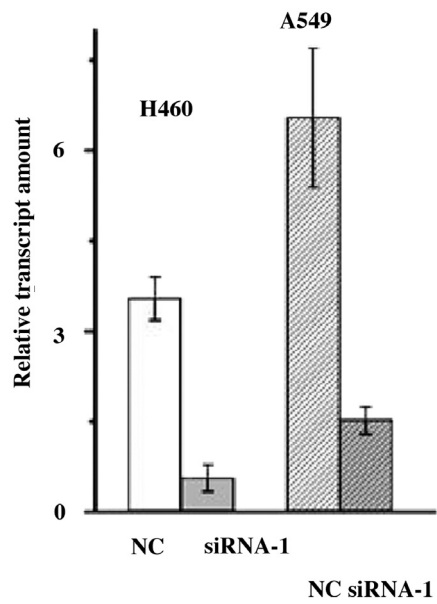


Table SI. siRNA sequences used in this study.

siRNA	Sense siRNA sequence (5' to 3')	Antisense siRNA sequence (5' to 3')
Negative (NC)	UUCUCCGAACGUGUCACGUtt	ACGUGACACGUUCGGAGAAtt
BORIS siRNA-1 9	GGAAAUACCACGAUGCAAAtt	UUUGCAUCGUGGUAUUUCctt
BORIS siRNA-2	GGAUCAACCUACAGCUGGUtt	ACCAGCUGUAGGUUGAUCCtt

Table III. Gene primer sequences used in this study.

Gene name	Forward primer sequence (5' to 3')	Reverse primer sequence (5' to 3')
MLH1	GCAAACCCCTGTCCAGTCAG	CTGGGAGTTCAAGCATCTCCT
MSH6	CCAAGGCGAAGAACCTCAAC	ACCAGGGGTAAACCCTCCATC
MSH2	AGGCATCCAAGGAGAATGATTG	GGAATCCACATACCCAACCTCAA
POLH	GCTACTGGACAGGATCGAGTG	CACCACCCTTCCATGATTGTA
REV7	TGGCTGTGCATCTCATCCTCT	GCGGTGCTCTTTATCCAAAATCA
XPA	CCAGGACCTGTTATGGAATTTGA	GCTTCTTGACTACCCCAAACCTC
RRM1	GCCGCCAAGAACGAGTCAT	AGCAGCCAAAGTATCTAGTTCCA
ERCC1	CTACGCCGAATATGCCATCTC	GTACGGGATTGCCCTCTG
XRCC4	ATGGCTCCTCAGGAGAATCAGC	GAGGTCTTCTGGGCTGCTGTTT
RPA3	AGCTCAATTCATCGACAAGCC	TCTTCATCAAGGGGTCCATCA
BRCA1	ACTCTGAGGACAAAGCAGCG	CATCCCTGGTTCCTTGAGGG
CMYC	GCTGCTTAGACGCTGGATTT	CACCGAGTCGTAGTCGAGGT
BORIS	CAGGCCCTACAAGTGTAACGACTGCAA	GCATTCGTAAGGCTTCTCACCTGAGTG
GAPDH	CCCACTCCTCCACCTTTGAC	TGTTGCTGTAGCCAAATTCGT
Actin	AAAATCTGGCACCACACCTTC	TAGCACAGCCTGGATAGCAA

Table SIII. Clinical information of lung cancer cases obtained from The Cancer Genome Atlas.

ID	Race	Sex	Age, days	Stage	Time as a smoker, years	Overall survival, days	Survival status	CTCFL, FPKM
TCGA-92-8064	White	Male	21417	Not reported	30	160	Alive	0.003706529
TCGA-46-3769	White	Male	20941	Not reported	Unknown	135	Alive	0.003745556
TCGA-73-7498	White	Female	21527	Stage IA	28	1189	Alive	0.004273033
TCGA-38-7271	White	Female	26440	Stage IA	28	800	Deceased	0.01137023
TCGA-43-8118	White	Female	20224	Stage IA	Unknown	89	Deceased	0.05032881
TCGA-86-8669	White	Male	23443	Stage IA	Unknown	938	Alive	0.009903544
TCGA-85-7698	White	Male	17651	Stage IA	Unknown	952	Alive	0
TCGA-86-8076	White	Male	15605	Stage IA	Unknown	993	Alive	0.003796628
TCGA-60-2715	White	Male	18990	Stage IA	23	1075	Deceased	1.601311
TCGA-71-6725	AsIAN	Female	17793	Stage IB	Unknown	256	Alive	0
TCGA-05-4390	Not reported	Female	21430	Stage IB	30	1126	Alive	0
TCGA-64-5781	White	Female	20219	Stage IB	25	1559	Alive	0
TCGA-44-8117	White	Female	19855	Stage IB	36	385	Alive	0
TCGA-67-6215	White	Female	19310	Stage IB	Unknown	174	Alive	0.002790337
TCGA-69-7973	White	Female	15355	Stage IB	Unknown	230	Alive	0.00720269
TCGA-97-8175	White	Female	20206	Stage IB	Unknown	551	Alive	0.006768008
TCGA-NC-A5HI	White	Female	24981	Stage IB	Unknown	1743	Alive	0
TCGA-97-7547	White	Female	24737	Stage IB	Unknown	1965	Alive	0.003934357
TCGA-44-4112	White	Female	22106	Stage IB	20	808	Deceased	0
TCGA-86-8075	White	Female	24402	Stage IB	Unknown	694	Deceased	0.001534132
TCGA-55-7576	Black or African American	Male	19917	Stage IB	Unknown	670	Alive	0.006405735
TCGA-66-2758	Not reported	Male	26209	Stage IB	56	639	Alive	0
TCGA-63-A5ML	Not reported	Male	24947	Stage IB	Unknown	1386	Alive	0.01142347
TCGA-63-A5MB	Not reported	Male	22930	Stage IB	Unknown	3123	Alive	0.0141921
TCGA-18-3415	Not reported	Male	28430	Stage IB	Unknown	2803	Deceased	0.005438079
TCGA-85-6561	White	Male	24234	Stage IB	25	1224	Alive	0.002726988
TCGA-94-7033	White	Male	26948	Stage IB	Unknown	640	Alive	0.6420819
TCGA-86-7955	White	Male	22772	Stage IB	Unknown	1072	Alive	0
TCGA-60-2713	White	Male	23630	Stage IB	Unknown	1731	Alive	4.736141
TCGA-MF-A522	White	Male	20051	Stage IB	43	360	Deceased	0.3120991
TCGA-18-3412	White	Male	19025	Stage IB	Unknown	345	Deceased	0
TCGA-56-7222	White	Male	22097	Stage IB	Unknown	562	Deceased	0.01616647
TCGA-78-7535	White	Male	16571	Stage IB	Unknown	949	Deceased	0.003086465
TCGA-55-7910	Black or African American	Female	18289	Stage iIA	15	1040	Alive	0.004372795
TCGA-69-8253	Black or African American	Female	21771	Stage iIA	39	426	Alive	0.001308101
TCGA-55-8508	Black or African American	Female	22159	Stage iIA	Unknown	617	Alive	0
TCGA-92-7340	White	Female	16447	Stage iIA	15	82	Alive	0
TCGA-78-7539	White	Female	27445	Stage iIA	28	791	Alive	0

Table SIII. Continued.

ID	Race	Sex	Age, days	Stage	Time as a smoker, years	Overall survival, days	Survival status	CTCFL, FPKM
TCGA-56-7823	White	Female	21344	Stage iIA	40	1011	Alive	0.4384901
TCGA-60-2710	White	Female	24669	Stage iIA	42	2024	Alive	0.004927271
TCGA-86-8280	White	Female	19977	Stage iIA	Unknown	701	Alive	0
TCGA-J2-8192	White	Female	23892	Stage iIA	Unknown	739	Alive	0.001401751
TCGA-44-7670	White	Female	17392	Stage iIA	Unknown	882	Alive	0.0016534
TCGA-53-7626	White	Female	28024	Stage iIA	35	929	Deceased	0.006126425
TCGA-MP-A4TF	White	Female	21387	Stage iIA	40	336	Deceased	0.003759098
TCGA-90-A59Q	White	Female	22420	Stage iIA	Unknown	322	Deceased	0.005833581
TCGA-L9-A7SV	Black or African American	Male	25298	Stage iIA	31	565	Alive	0.0511623
TCGA-L9-A743	Black or African American	Male	20780	Stage iIA	Unknown	664	Alive	0.004927484
TCGA-95-7562	Black or African American	Male	26000	Stage iIA	10	87	Deceased	0.001675048
TCGA-44-7669	Black or African American	Male	21893	Stage iIA	Unknown	574	Deceased	0.06290768
TCGA-05-5428	Not reported	Male	21061	Stage iIA	24	670	Alive	0
TCGA-63-A5MV	Not reported	Male	25505	Stage iIA	50	1100	Alive	0.03064842
TCGA-63-7023	Not reported	Male	Unknown	Stage iIA	56	1682	Alive	6.111711
TCGA-43-5670	White	Male	25652	Stage iIA	10	849	Alive	0.03004427
TCGA-86-8674	White	Male	18479	Stage iIA	30	806	Alive	0.01150986
TCGA-56-8629	White	Male	23346	Stage iIA	33	481	Alive	0.007528424
TCGA-98-A53I	White	Male	23502	Stage iIA	35	565	Alive	0.004600293
TCGA-53-A4EZ	White	Male	23201	Stage iIA	40	1071	Alive	0.01002955
TCGA-85-6560	White	Male	21768	Stage iIA	41	1259	Alive	0.04771326
TCGA-85-A512	White	Male	16811	Stage iIA	Unknown	465	Alive	0
TCGA-85-A50Z	White	Male	20941	Stage iIA	Unknown	493	Alive	0
TCGA-85-8351	White	Male	26437	Stage iIA	Unknown	510	Alive	0.007058051
TCGA-J1-A4AH	White	Male	25893	Stage iIA	Unknown	581	Alive	0.07276112
TCGA-96-A4JK	White	Male	23974	Stage iIA	Unknown	589	Alive	0
TCGA-90-A4EE	White	Male	19676	Stage iIA	Unknown	688	Alive	0.002356203
TCGA-86-8279	White	Male	17032	Stage iIA	Unknown	949	Alive	0.001543741
TCGA-85-8276	White	Male	22707	Stage iIA	Unknown	1050	Alive	0
TCGA-86-7713	White	Male	25791	Stage iIA	Unknown	1157	Alive	0.004191116
TCGA-39-5037	White	Male	23868	Stage iIA	Unknown	1690	Alive	0.001924692
TCGA-97-8174	White	Male	24725	Stage iIA	20	164	Deceased	0.01262879
TCGA-73-4676	White	Male	16746	Stage iIA	32	281	Deceased	0.00795811
TCGA-86-A4D0	White	Male	17607	Stage iIA	Unknown	116	Deceased	0.0328592
TCGA-60-2697	White	Male	14984	Stage iIA	Unknown	372	Deceased	0.02515059
TCGA-86-6562	White	Male	19301	Stage iIA	Unknown	376	Deceased	0
TCGA-58-8387	White	Male	21952	Stage iIA	Unknown	403	Deceased	0.007360205

Table SIII. Continued.

ID	Race	Sex	Age, days	Stage	Time as a smoker, years	Overall survival, days	Survival status	CTCFL, FPKM
TCGA-49-6742	White	Male	25839	Stage IA	Unknown	488	Deceased	0.02494241
TCGA-22-5483	White	Male	27109	Stage IA	Unknown	573	Deceased	0.2620126
TCGA-86-7711	White	Male	25719	Stage IA	Unknown	1046	Deceased	0.001483221
TCGA-69-A59K	Black or African American	Female	22093	Stage IIB	13	522	Alive	0.002268292
TCGA-05-4427	Not reported	Female	23893	Stage IIB	15	791	Alive	0
TCGA-63-A5MM	Not reported	Female	25348	Stage IIB	Unknown	456	Deceased	0
TCGA-75-6212	Not reported	Female	Unknown	Stage IIB	Unknown	1516	Deceased	0.01065148
TCGA-44-2659	White	Female	23808	Stage IIB	38	1367	Alive	0.001578634
TCGA-60-2714	White	Female	24169	Stage IIB	45	1531	Alive	0
TCGA-43-A475	White	Female	24680	Stage IIB	50	296	Alive	0.002137467
TCGA-NC-A5HK	White	Female	21531	Stage IIB	Unknown	128	Alive	15.12191
TCGA-86-8671	White	Female	26448	Stage IIB	Unknown	839	Alive	0.002800628
TCGA-86-8278	White	Female	23117	Stage IIB	Unknown	944	Alive	0
TCGA-44-2665	White	Female	20349	Stage IIB	Unknown	1301	Alive	0.0019941
TCGA-34-5240	White	Female	26735	Stage IIB	Unknown	1541	Alive	0.001759984
TCGA-78-7161	White	Female	25294	Stage IIB	37	291	Deceased	0.008313055
TCGA-L3-A524	White	Female	16765	Stage IIB	Unknown	490	Deceased	0.002482588
TCGA-63-A5MP	Not reported	Male	20818	Stage IIB	41	769	Alive	0.03874546
TCGA-63-A5MT	Not reported	Male	27263	Stage IIB	50	498	Alive	0
TCGA-05-4432	Not reported	Male	24350	Stage IIB	Unknown	761	Alive	0.08690919
TCGA-63-A5MJ	Not reported	Male	20018	Stage IIB	Unknown	1824	Alive	0.001576362
TCGA-NC-A5HE	White	Male	22179	Stage IIB	20	2336	Alive	0.002160821
TCGA-94-A5I6	White	Male	22949	Stage IIB	40	538	Alive	9.689448
TCGA-95-7567	White	Male	22437	Stage IIB	41	568	Alive	0.001514921
TCGA-46-6025	White	Male	26168	Stage IIB	Unknown	324	Alive	0
TCGA-91-7771	White	Male	22926	Stage IIB	Unknown	492	Alive	0
TCGA-44-6146	White	Male	23378	Stage IIB	Unknown	728	Alive	0.02594052
TCGA-90-6837	White	Male	23511	Stage IIB	Unknown	758	Alive	0.001803253
TCGA-51-4081	White	Male	20261	Stage IIB	Unknown	911	Alive	0.01108768
TCGA-85-7697	White	Male	17921	Stage IIB	Unknown	1063	Alive	0.01039483
TCGA-50-8459	White	Male	24859	Stage IIB	Unknown	1119	Alive	0.009810654
TCGA-86-8054	White	Male	22584	Stage IIB	Unknown	1148	Alive	0.008745673
TCGA-62-A471	White	Male	23689	Stage IIB	Unknown	1246	Alive	0
TCGA-18-4083	White	Male	23125	Stage IIB	Unknown	188	Deceased	0.4162064
TCGA-60-2698	White	Male	22800	Stage IIB	Unknown	311	Deceased	0.003617621
TCGA-NC-A5HJ	White	Male	21730	Stage IIB	Unknown	418	Deceased	0.1504026
TCGA-69-7974	White	Female	20021	Stage IIIA	30	184	Alive	0.001508818
TCGA-95-A4VK	White	Female	27040	Stage IIIA	30	651	Alive	0

Table SIII. Continued.

ID	Race	Sex	Age, days	Stage	Time as a smoker, years	Overall survival, days	Survival status	CTCFL, FPKM
TCGA-43-2576	White	Female	22805	Stage IIIA	35	1223	Alive	0
TCGA-44-6774	White	Female	20462	Stage IIIA	Unknown	658	Alive	0
TCGA-86-A4P8	White	Female	21738	Stage IIIA	Unknown	805	Alive	0
TCGA-43-2581	White	Female	17447	Stage IIIA	Unknown	1176	Alive	0.005546505
TCGA-34-8454	White	Female	22913	Stage IIIA	Unknown	1180	Alive	0
TCGA-50-5941	White	Female	20350	Stage IIIA	Unknown	1474	Alive	0.003292149
TCGA-49-6743	White	Female	29807	Stage IIIA	Unknown	1621	Alive	0.005645223
TCGA-64-1679	White	Female	21310	Stage IIIA	Unknown	2488	Alive	0.001385408
TCGA-MP-A4T9	White	Female	19767	Stage IIIA	24	1265	Deceased	0
TCGA-56-8625	White	Female	24188	Stage IIIA	Unknown	315	Deceased	0.005569762
TCGA-49-4490	White	Female	16634	Stage IIIA	Unknown	385	Deceased	0.00412023
TCGA-62-A46Y	White	Female	25905	Stage IIIA	Unknown	414	Deceased	0.002380326
TCGA-55-6970	White	Female	24773	Stage IIIA	Unknown	464	Deceased	0.003391175
TCGA-NJ-A7XG	Black or African American	Male	18127	Stage IIIA	Unknown	617	Alive	0
TCGA-LA-A7SW	Black or African American	Male	26116	Stage IIIA	50	408	Deceased	0
TCGA-05-4384	Not reported	Male	24411	Stage IIIA	24	426	Alive	0.003277499
TCGA-63-A5MI	Not reported	Male	24040	Stage IIIA	Unknown	1784	Alive	0.03163827
TCGA-MP-A4T8	Not reported	Male	25069	Stage IIIA	15	161	Deceased	0.004389524
TCGA-60-2724	White	Male	17462	Stage IIIA	30	717	Alive	0.001786079
TCGA-64-5779	White	Male	22305	Stage IIIA	40	864	Alive	0.01960708
TCGA-NC-A5HG	White	Male	21608	Stage IIIA	40	1963	Alive	0.002221102
TCGA-91-6848	White	Male	21829	Stage IIIA	Unknown	224	Alive	1.482618
TCGA-55-8505	White	Male	22676	Stage IIIA	Unknown	440	Alive	0.006001402
TCGA-33-6738	White	Male	29368	Stage IIIA	Unknown	1927	Alive	0
TCGA-73-4659	White	Male	24253	Stage IIIA	12	711	Deceased	0.004158494
TCGA-MP-A4TC	White	Male	28471	Stage IIIA	32	74	Deceased	0.002328795
TCGA-85-7699	White	Male	26965	Stage IIIA	37	1001	Deceased	0.001531999
TCGA-39-5040	White	Male	21790	Stage IIIA	41	519	Deceased	0.01101034
TCGA-73-4675	White	Male	21614	Stage IIIA	41	922	Deceased	0.004158244
TCGA-39-5029	White	Male	24713	Stage IIIA	48	740	Deceased	0.0860438
TCGA-85-6798	White	Male	20837	Stage IIIA	Unknown	195	Deceased	0
TCGA-50-5072	White	Male	27036	Stage IIIA	Unknown	250	Deceased	0.02501661
TCGA-MP-A4TD	White	Male	25983	Stage IIIA	Unknown	307	Deceased	0.007501256
TCGA-66-2778	Not reported	Female	25080	Stage IIIB	37	578	Alive	0
TCGA-53-7813	White	Female	18875	Stage IIIB	35	424	Alive	0.009517636
TCGA-55-A48Z	White	Female	22056	Stage IIIB	40	651	Alive	0.002505422
TCGA-66-2783	Not reported	Male	24686	Stage IIIB	43	759	Alive	0
TCGA-05-4425	Not reported	Female	25902	Stage IV	Unknown	669	Alive	0.00299322

Table SIII. Continued.

ID	Race	Sex	Age, days	Stage	Time as a smoker, years	Overall survival, days	Survival status	CTCFL, FPKM
TCGA-78-7145	White	Female	19080	Stage IV	25	826	Deceased	0.002695597
TCGA-53-7624	White	Female	14794	Stage IV	Unknown	1043	Deceased	0.01903924
TCGA-18-3417	Not reported	Male	24019	Stage IV	26	1097	Deceased	0
TCGA-86-7701	White	Male	24209	Stage IV	Unknown	947	Alive	0
TCGA-NC-A5HP	White	Male	25286	Stage IV	Unknown	770	Deceased	0.01535616

TCGA, The Cancer Genome Atlas.

Table SIV. Clinical information of 23 cases who have records of treatment outcomes.

ID	ID shown in Fig. 1B	Response on therapy	Sex	Age, days	Overall survival time, days	Survival status	CTCFL, FPKM	Tissue collection indicator
TCGA-69-A59K	69-A59K	Stable disease	Female	22093	522	Alive	0.002268292	Prospective
TCGA-95-A4VK	95-A4VK	Stable disease	Female	27040	651	Alive	0	Prospective
TCGA-NJ-A7XG	NJ-A7XG	Stable disease	Male	18127	617	Alive	0	Prospective
TCGA-44-8117	44-8117	Complete remission/response	Female	19855	385	Alive	0	Prospective
TCGA-55-8508	55-8508	Complete remission/response	Female	22159	617	Alive	0	Prospective
TCGA-86-8280	86-8280	Complete remission/response	Female	19977	701	Alive	0	Prospective
TCGA-86-A4P8	86-A4P8	Complete remission/response	Female	21738	805	Alive	0	Prospective
TCGA-86-8278	86-8278	Complete remission/response	Female	23117	944	Alive	0	Prospective
TCGA-86-8279	86-8279	Complete remission/response	Male	17032	949	Alive	0.001543741	Prospective
TCGA-86-8671	86-8671	Complete remission/response	Female	26448	839	Alive	0.002800628	Prospective
TCGA-L9-A743	L9-A743	Complete remission/response	Male	20780	664	Alive	0.004927484	Prospective
TCGA-55-8505	55-8505	Complete remission/response	Male	22676	440	Alive	0.006001402	Prospective
TCGA-97-8175	97-8175	Complete remission/response	Female	20206	551	Alive	0.006768008	Prospective
TCGA-86-8674	86-8674	Complete remission/response	Male	18479	806	Alive	0.01150986	Prospective
TCGA-L9-A7SV	L9-A7SV	Complete remission/response	Male	25298	565	Alive	0.0511623	Prospective
TCGA-50-8459	50-8459	Progressive disease	Male	24859	1119	Alive	0.009810654	Prospective
TCGA-62-A471	62-A471	Complete remission/response	Male	23689	1246	Alive	0	Retrospective
TCGA-MP-A4T9	MP-A4T9	Complete remission/response	Female	19767	1265	Deceased	0	Retrospective
TCGA-MP-A4TC	MP-A4TC	Complete remission/response	Male	28471	74	Deceased	0.002328795	Retrospective
TCGA-62-A46Y	62-A46Y	Complete remission/response	Female	25905	414	Deceased	0.002380326	Retrospective
TCGA-73-7498	73-7498	Complete remission/response	Female	21527	1189	Alive	0.004273033	Retrospective
TCGA-MP-A4TD	MP-A4TD	Complete remission/response	Male	25983	307	Deceased	0.007501256	Retrospective
TCGA-MP-A4TF	MP-A4TF	Partial remission/response	Female	21387	336	Deceased	0.003759098	Retrospective

TCGA, The Cancer Genome Atlas.