

Supplementary

Table S1 Antibodies used for western blotting

Antibody	Company	Cat#	Dilution ratio
GAPDH	Abcam	ab8245	1/5000
Rb	Abcam	ab181616	1/2000
p-Rb	Abcam	ab184796	1/1000
CDK1	CST	9116	1/1000
p-CDK1 (Tyr15)	CST	4539	1/1000
CDK4	CST	12790	1/1000
CDK6	CST	3136	1/2000
PLK1	CST	4513	1/1000
Rad51	Abcam	ab133534	1/10000
CHK1	Proteintech	25887-1-AP	1/1000
p-CHK1 (Ser345)	CST	2348	1/1000
ATR	Proteintech	19787-1-AP	1/1000
p-ATR (Ser428)	CST	2853	1/1000
p- γ H2AX (Ser139)	CST	9718	1/1000
TBK1	CST	3504	1/1000
p-TBK1 (Ser172)	CST	5483	1/1000
IRF3	CST	4302	1/1000
p-IRF3 (Ser396)	CST	4947	1/1000
STING	CST	13647	1/1000
Anti-rabbit IgG, HRP-linked Antibody	Bio X cell	BX-2301	1/5000
Anti-mouse IgG, HRP-linked Antibody	Bio X cell	BX-2305	1/5000

Rb, retinoblastoma; p-, phospho-; PLK1, polo-like kinase 1; HRP, horseradish peroxidase.

Table S2 Antibodies used for immunofluorescence and histological staining

Antibody	Company	Cat#	Dilution ratio
ds-DNA	Abcam	ab27156	1/500 (IF), 1/200 (IHC)
Anti-mouse IgG, CoralLite594-conjugated Antibody	Proteintech	SA00013-4	1/200
p- γ H2AX	CST	9718	1/500
Anti-rabbit IgG, AlexFluor594-conjugated Antibody	PlantChemMed	PC-80009G	1/500
p-TBK1	Bioss	bs-3440R	1/100
p-IRF3	CST	4947	1/100
CD3	Abcam	ab16669	1/150
CD8	CST	98941	1/100

ds-DNA, double-strand DNA; IF, immunofluorescence; IHC, immunohistochemistry.

Table S3 Primer sequences

Gene	Sense	Antisense
<i>IFN-β</i>	CTTGGATTCTACAAAGAAGCAGC	TCCTCCTTCTGGAAGTCTGCA
<i>CCL5</i>	CCTGCTGCTTTGCCTACATTGC	ACACACTTGGCGGTTCTTTCCG
<i>CXCL10</i>	GGTGAGAAGAGATGTCTGAATCC	GTCCATCCTTGAAGCACTGCA
<i>GAPDH</i>	GTCTCCTCTGACTTCAACAGCG	ACCACCCTGTTGCTGTAGCCAA
<i>IFN-β</i> murine	CGTGGGAGATGTCCTCAACT	CCTGAAGATCTCTGCTCGGAC
<i>CCL5</i> murine	CCACTTCTTCTCTGGGTTGG	GTGCCACGTCAAGGAGTAT
<i>CXCL10</i> murine	GCCGTCATTTTCTGCCTCA	CGTCCTTGCGAGAGGGATC
<i>GAPDH</i> murine	CATCACTGCCACCCAGAAGACTG	ATGCCAGTGAGCTTCCCCTTCAG

Table S4 Antibodies used for flow cytometry

Antibody	Fluorochrome/label	Company	Cat#	Clone
CD45	BV510	BioLegend	103138	30-F11
CD3	APC-Cy7	BioLegend	100330	145-2C11
CD8	PE	BioLegend	100708	53-6.7
CD44	PE-Cy7	BD Biosciences	560569	IM7
CD62L	BV605	BioLegend	104438	MEL-14
7AAD	PE-Cy5	BioLegend	420404	/

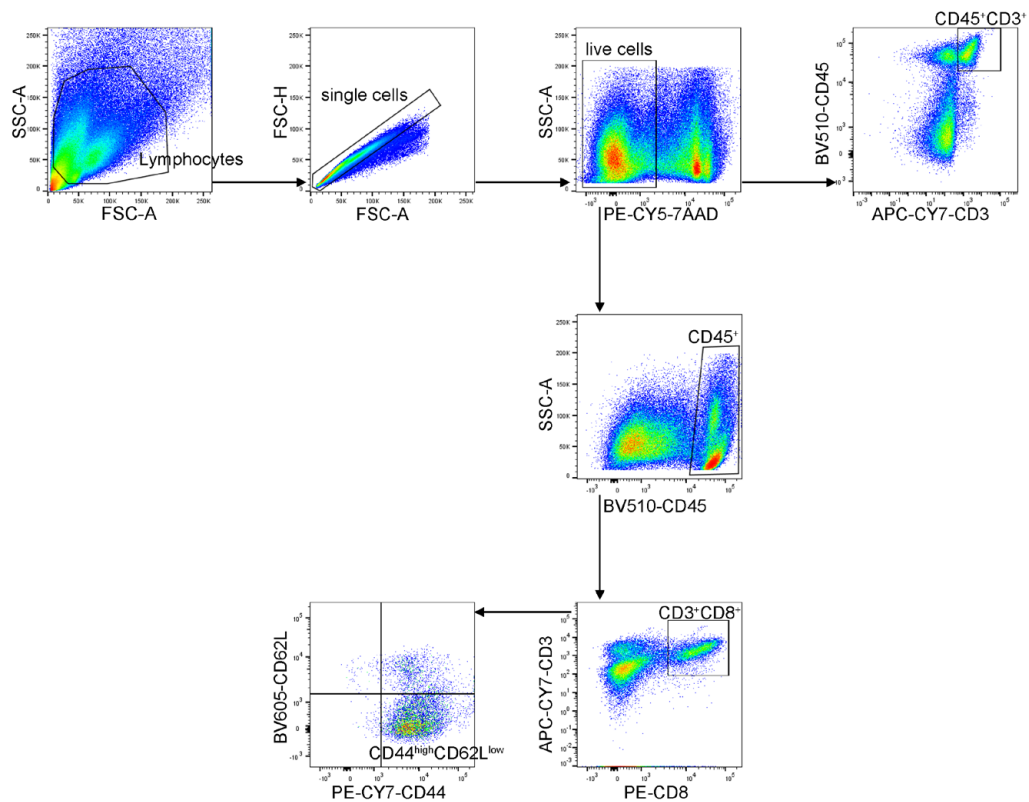


Figure S1 Representative dot plots of gating strategy. Cells were incubated with 7AAD staining to detect live cells, and CD45, CD3, CD8, CD44 and CD62L antibodies to analysis CD45⁺CD3⁺ total T-cells, CD45⁺CD3⁺CD8⁺ cytotoxic T cells, and CD45⁺CD3⁺CD8⁺CD44^{high}CD62L^{low} memory/effector T cells.

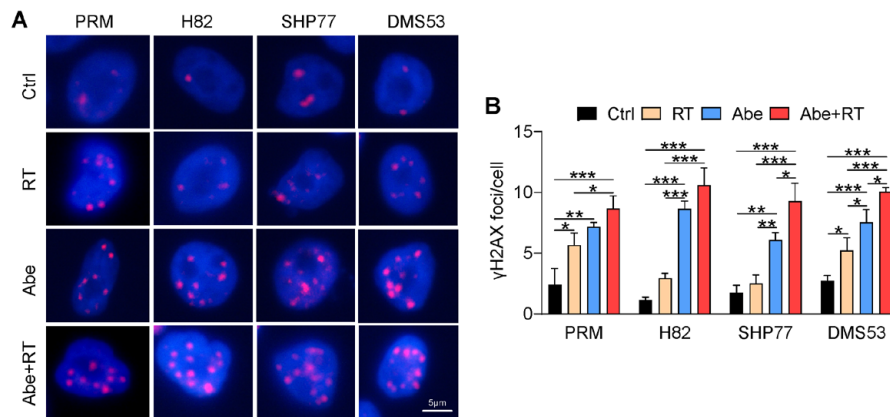


Figure S2 Combination of abemaciclib and RT induced ds-DNA damage and activated the STING pathway in SCLC. (A) Representative images of p- γ H2AX staining (red) in SCLC cells treated with RT (10 Gy), abemaciclib (1 μ M) and their combination for 24 h. (B) Quantification of γ H2AX foci/cell based on foci counts in SCLC cells. The statistical analysis was performed using one-way ANOVA with Tukey's multiple comparisons test. P values are shown and error bars indicate mean \pm SD. *, P<0.05; **, P<0.01; ***, P<0.001. RT, radiotherapy; ds-DNA, double-strand DNA; SCLC, small cell lung cancer; Abe, abemaciclib; ctrl, control; ANOVA, analysis of variance; SD, standard deviation.

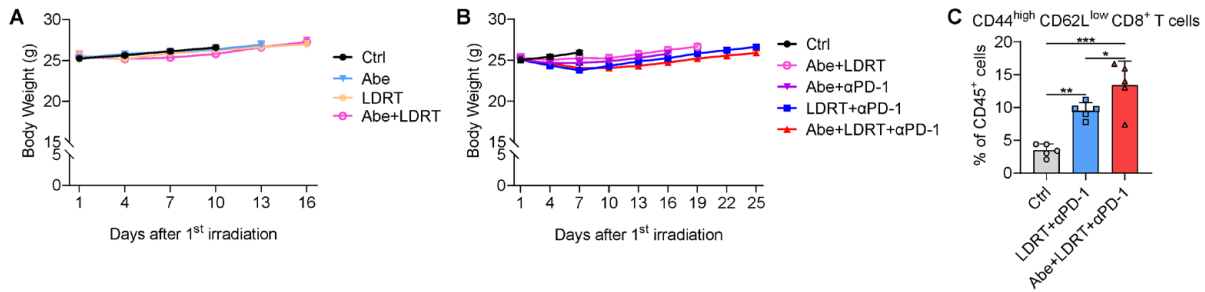


Figure S3 Abemaciclib combined with LDRT enhanced anti-tumor immune responses of anti-PD-1 immunotherapy in Rb- SCLC mouse model. (A,B) Body weight curves of mice with different treatments. (C) Proportion of CD44^{high} CD62L^{low} memory/effector T cells in tumors resected at day 8 (n=5). The statistical analysis was performed using two-way ANOVA (A,B) and one-way ANOVA (C) with Tukey's multiple comparisons test. P values are shown and error bars indicate mean ± SEM (A,B) or ± SD (C). *, P<0.05; **, P<0.01; ***, P<0.001. LDRT, low-dose radiotherapy; Rb-, retinoblastoma-deficient; SCLC, small cell lung cancer; Abe, abemaciclib; αPD-1, anti-programmed cell death protein-1 antibody; ANOVA, analysis of variance; SEM, standard error of mean; SD, standard deviation.

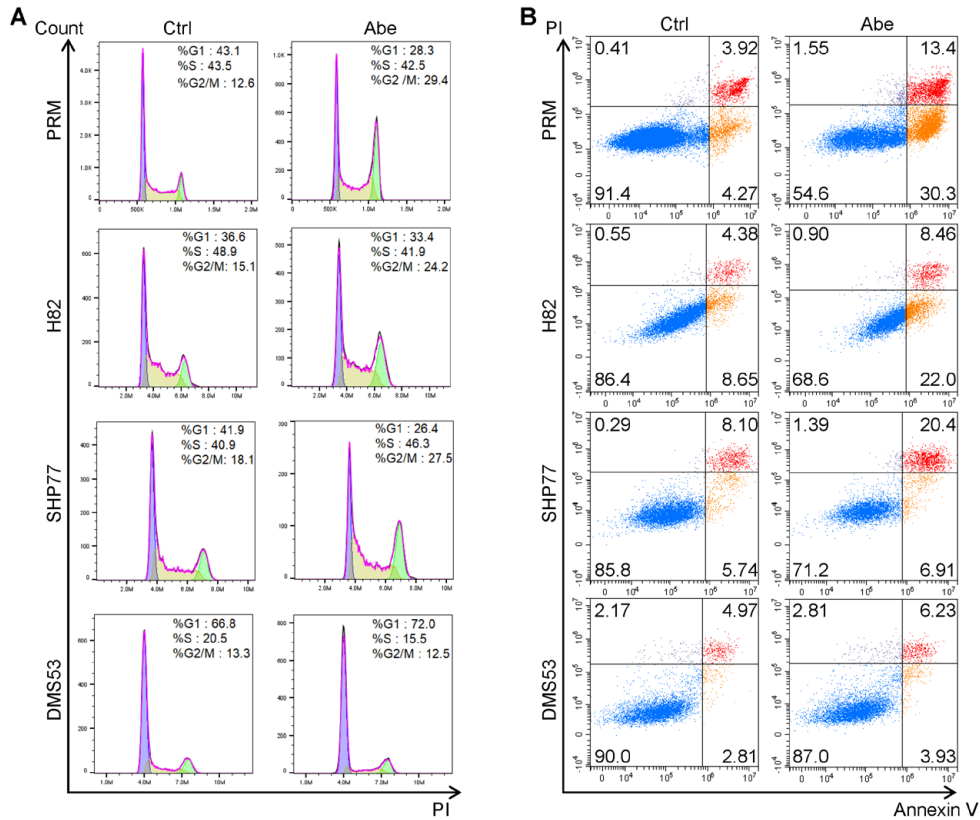


Figure S4 The anti-tumor effects of abemaciclib in SCLC cells. (A) Representative flow cytometric analysis of cell cycle in SCLC cells treated with 1 μM abemaciclib for 24 hours. (B) Representative flow cytometry plots of annexin V-PI staining in SCLC cells treated with 1 μM abemaciclib for 24 hours. SCLC, small cell lung cancer; Abe, abemaciclib; ctrl, control; PI, propidium iodide.