Table S1 Survival of the patients with stage I NSCLC by clinicopathological variables

Variables	Categories	Wald	HR (95% CI)[a]	P value
Age		13.608	1.036 (1.017–1.056)	<0.001
Gender	Men	3.510	1	0.061
	Women		0.696 (0.476–1.017)	
Smoking habit	Never	0.297	1	0.586
	Ever		1.107 (0.767–1.598)	
ECOG performance status	0–1	0.313	1	0.576
	2 or more		0.752 (0.278–2.039)	
CCIS	0	4.613	1	0.100
	1		1.167 (0.800–1.702)	
	2 or more		1.803 (1.052–3.092)	
Histology	SCC	0.180	1	0.671
	Non-SCC		1.070 (0.784–1.460)	
Tumor size, cm		7.658	1.124 (1.034–1.222)	0.006
T stage	1	12.203	1	<0.001
	2		1.865 (1.315–2.647)	
Lymphatic invasion	No	1.048	1	0.306
	Yes		1.211 (0.839–1.747)	
Vascular invasion	No	2.047	1	0.153
	Yes		1.296 (0.908–1.850)	
Type of surgery	Lobectomy	1.416	1	0.493
	Bilobectomy		0.854 (0.472–1.543)	
	Pneumonectomy		1.298 (0.783–2.153)	
Adjuvant chemotherapy	No	0.154	1	0.694
	Yes		1.096 (0.693–1.736)	

[a], hazard ratio and 95% CI by Cox regression test. ECOG, Eastern Cooperative Oncology Group; CCIS, Charlson comorbidity index score; NA, not applicable; SCC, squamous cell carcinoma.

Table S2 Information on antibodies for proteins involved in necroptosis and DNA damage response

Antibody	Clonality	Dilution	Source
RIPK3	Rabbit polyclonal	1:300	Abcam ab72106
MLKL (EPR17514)	Rabbit monoclonal	1:40	Abcam ab184718
PELI1 (F-7)	Mouse monoclonal	1:20	Santa Cruz sc-271065
p53 (DO-7)	Mouse monoclonal	1:1,000	Dako M7001
ATMpS1981 (7C10D8)	Mouse monoclonal	1:600	Rockland 200-301-500
γH2AXpS139 (JBW301)	Mouse monoclonal	1:100	Millipore 05-636
Chk2pT68	Rabbit polyclonal	1:30	Cell Signaling 2661s
BRCA1pS1423	Rabbit polyclonal	1:100	Abcam ab47325
ERCC1 (8F1)	Mouse monoclonal	1:100	GeneTex GTX22356

Table S3 Proteins involved in necroptosis and DNA damage response and survival of patients with stage I NSCLC according to histology: univariate Cox model
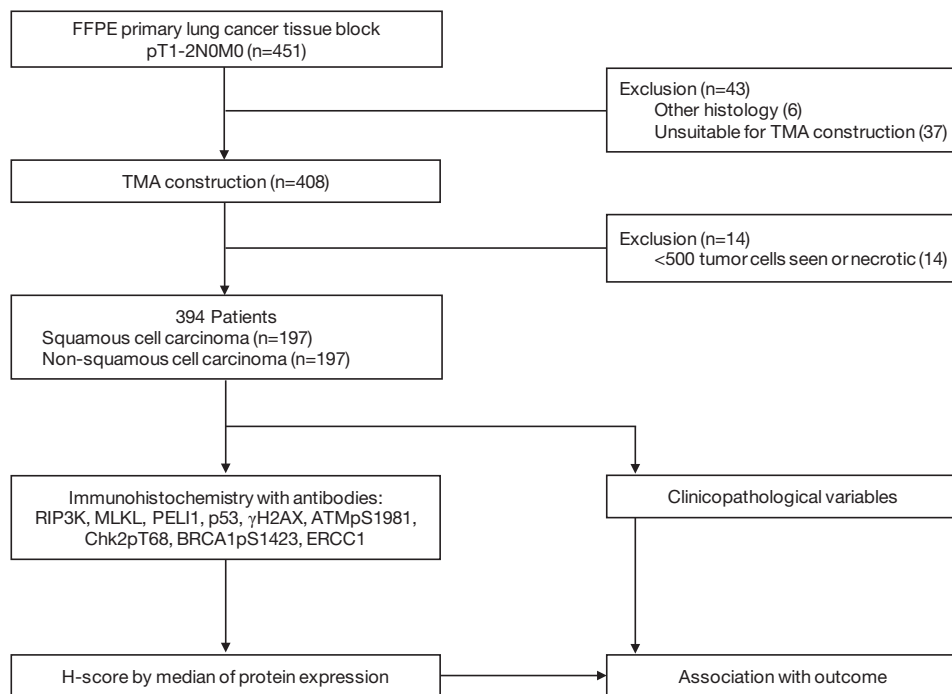
Proteins	Level	Total			SCC			Non-SCC		
		Wald	HR (95% CI)[a]	P value	Wald	HR (95% CI)[a]	P value	Wald	HR (95% CI)[a]	P value
RIPK3	Low vs. high	2.797	1.306 (0.955–1.787)	0.094	6.387	1.773 (1.137–2.765)	0.011	0.138	0.920 (0.591–1.431)	0.710
MLKL	Low vs. high	0.169	0.937 (0.686–1.279)	0.681	0.449	1.170 (0.740–1.849)	0.503	1.281	0.771 (0.491–1.210)	0.258
PELI1	Low vs. high	1.524	1.217 (0.891–1.662)	0.217	5.535	1.768 (1.100–2.843)	0.019	0.478	0.853 (0.544–1.338)	0.489
p53	Low vs. high	3.611	0.738 (0.540–1.010)	0.057	5.822	0.556 (0.346–0.896)	0.016	0.111	0.927 (0.595–1.445)	0.738
BRCA1	Low vs. high	3.551	1.358 (0.988–1.868)	0.060	4.746	1.648 (1.051–2.583)	0.029	0.165	1.099 (0.697–1.731)	0.685
H2AX	Low vs. high	3.253	1.347 (0.975–1.861)	0.071	3.741	1.561 (0.994–2.453)	0.053	0.210	1.116 (0.698–1.783)	0.647
ATM	Low vs. high	2.992	1.328 (0.963–1.831)	0.084	1.293	1.299 (0.828–2.039)	0.256	1.348	1.315 (0.828–2.089)	0.246
Chk2	Low vs. high	0.438	1.117 (0.805–1.549)	0.508	0.958	1.248 (0.801–1.947)	0.328	0.099	0.922 (0.556–1.530)	0.753
ERCC1	Low vs. high	0.439	1.114 (0.810–1.533)	0.508	0.780	1.223 (0.783–1.910)	0.377	0.043	0.952 (0.594–1.525)	0.837

Expression of the proteins was classified into low and high by using a criterion of median value of all mean H-scores. [a] Hazard ratio and 95% CI by Cox regression test. SCC, squamous cell carcinoma.
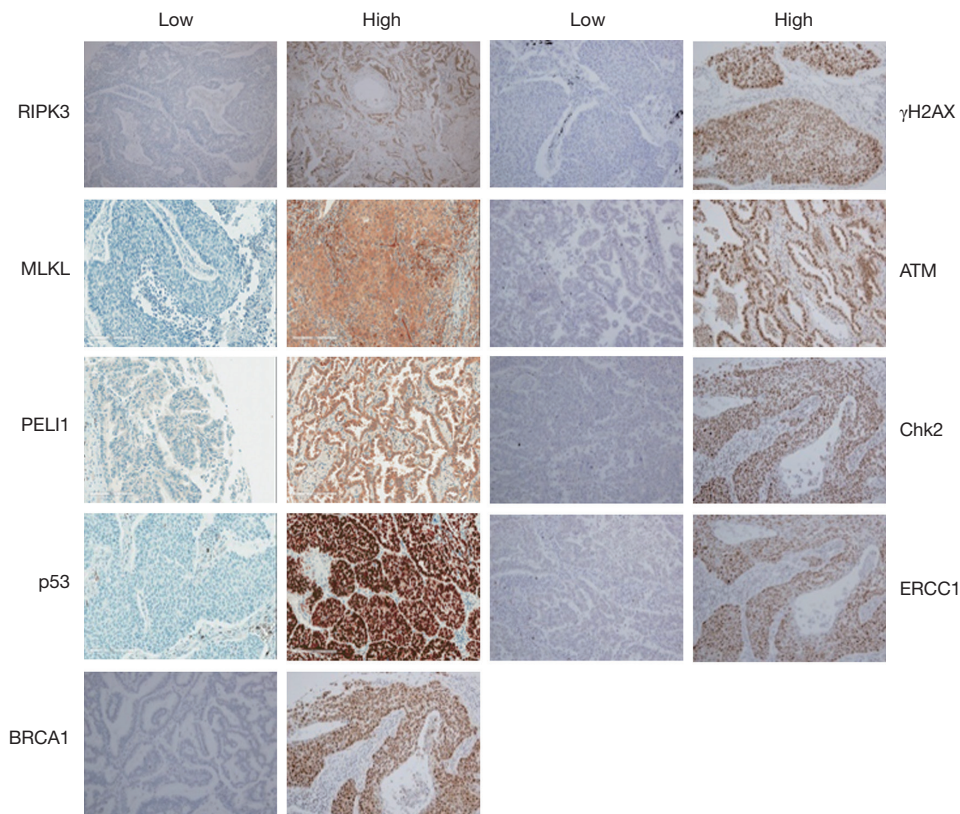
Table S4 Combined effects of proteins on survival of the patients with stage I SCC

Proteins	Level	N	Wald	aHR (95% CI)	P value	Q value*	P for interaction
RIPK3/p53	High/low	41	15.573	1	0.001	0.005	<0.001
	Low/low	42		3.981 (1.238–12.797)			
	High/high	65		4.123 (1.476–11.520)			
	Low/high	47		8.394 (2.856–24.677)			
RIPK3/BRCA1	High/high	70	9.004	1	0.029	0.048	0.003
	High/low	37		1.947 (0.857–4.421)			
	Low/high	24		2.597 (0.855–7.887)			
	Low/low	65		3.115 (1.465–6.623)			
RIPK3/PELI1	High/high	61	7.898	1	0.048	0.060	0.006
	High/low	45		1.635 (0.712–3.755)			
	Low/high	18		2.105 (0.642–6.906)			
	Low/low	71		2.927 (1.368–6.262)			
PELI1/p53	High/low	30	12.135	1	0.007	0.018	0.001
	Low/low	53		3.474 (1.049 to 11.507)			
	High/high	49		4.393 (1.370 to 14.089)			
	Low/high	63		6.760 (2.173 to 21.024)			
PELI1/BRCA1	High/high	50	7.748	1	0.052	0.052	0.007
	High/low	29		1.938 (0.720 to 5.219)			
	Low/high	43		1.902 (0.704 to 5.135)			
	Low/low	73		3.285 (1.376 to 7.845)			

*, FDR corrected p values after adjustment for multiple comparisons. Expression of the proteins was classified into low and high by using a criterion of median value of all mean H-scores. aHR, hazard ratio adjusted with age, gender, smoking habit, Eastern Cooperative Oncology Group performance status, Charlson comorbidity index score, tumor size, T stage, lymphatic or vascular invasion, type of surgery, and adjuvant chemotherapy. SCC, squamous cell carcinoma.

Figure S1 Study schema: patients' enrollment and immunohistochemistry.

Figure S2 Images for immunohistochemistry in proteins involved in necroptosis and DDR. Expression of the proteins was classified into low and high by using a criterion of median value of all mean H-scores (HE, ×200). DDR, DNA damage response.

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