

Figure S1 The disease-free survival of each systemic immune biomarkers in limited-stage SCLC cohort. (A) The Kaplan-Meier analysis of the neutrophil level. (B) The Kaplan-Meier analysis of the eosinophil level. (C) The Kaplan-Meier analysis of the monocyte level. (D) The Kaplan-Meier analysis of the lymphocyte level. (E) The Kaplan-Meier analysis of the NLR level. (F) The Kaplan-Meier analysis of the PNI level. DFS, disease-free survival; Neu, neutrophil; Eosino, eosinophil; Mono, monocyte; Lymph, lymphocyte; NLR, neutrophil-lymphocyte ratio; PNI, prognostic nutritional index; SCLC, small-cell lung cancer.

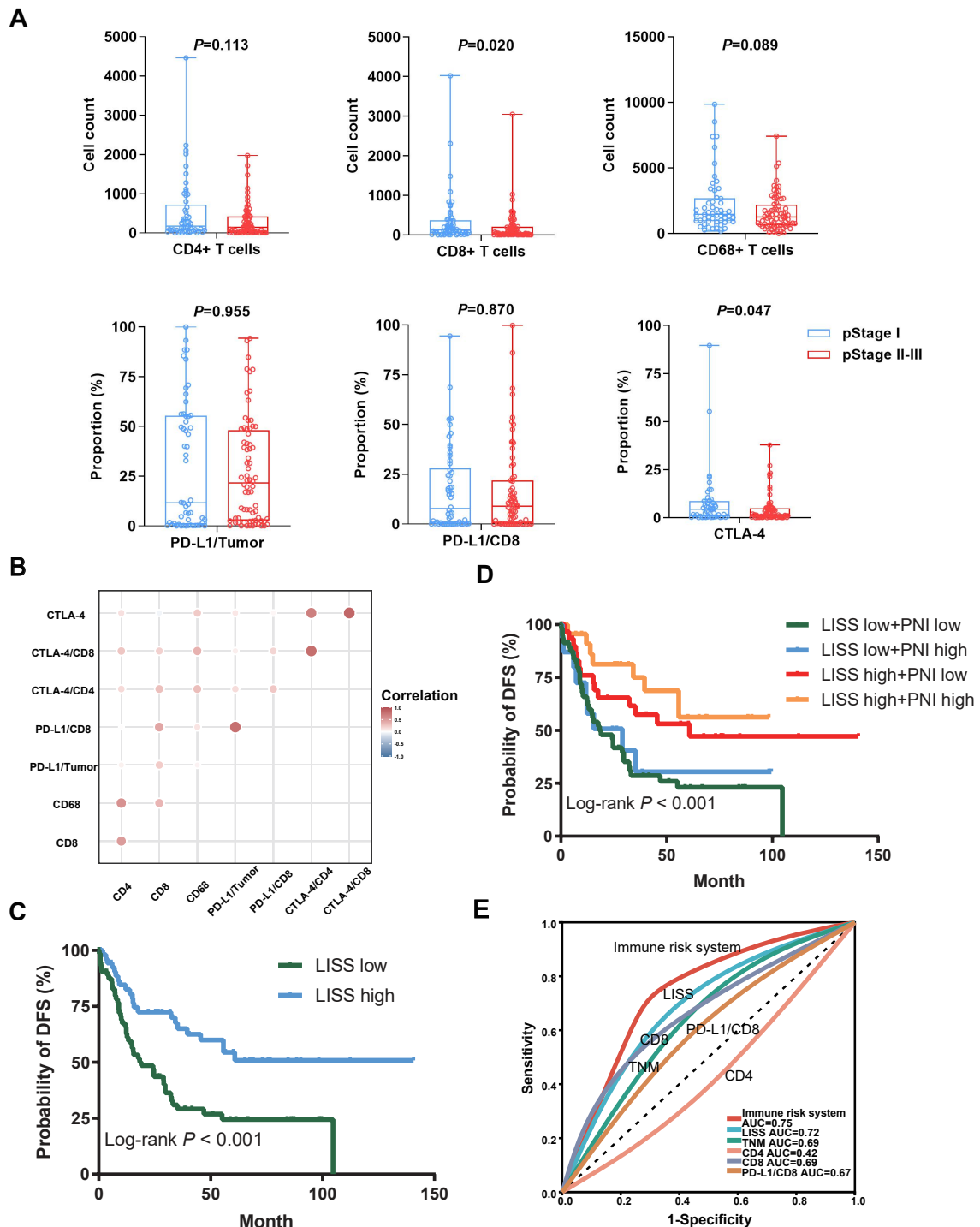


Figure S2 The prognostic performance of the integrated immune risk system in limited-stage SCLC cohort. (A) The correlation between several local immune markers and pathological TNM stages. (B) The correlation between several local immune markers. (C) The DFS stratified by LISS. (D) The DFS stratified by four groups based on PNI and LISS. (E) Validation of the integrated immune risk system performance by time-dependent ROC curve analysis. PD-L1, programmed cell death 1 ligand 1; CTLA-4, cytotoxic T-lymphocyte associated protein 4; LISS, local immune score system; PNI, prognostic nutritional index; DFS, disease-free survival; TNM, Tumor Node Metastasis; AUC, area under curve; ROC, receiver operating characteristic; SCLC, small-cell lung cancer.

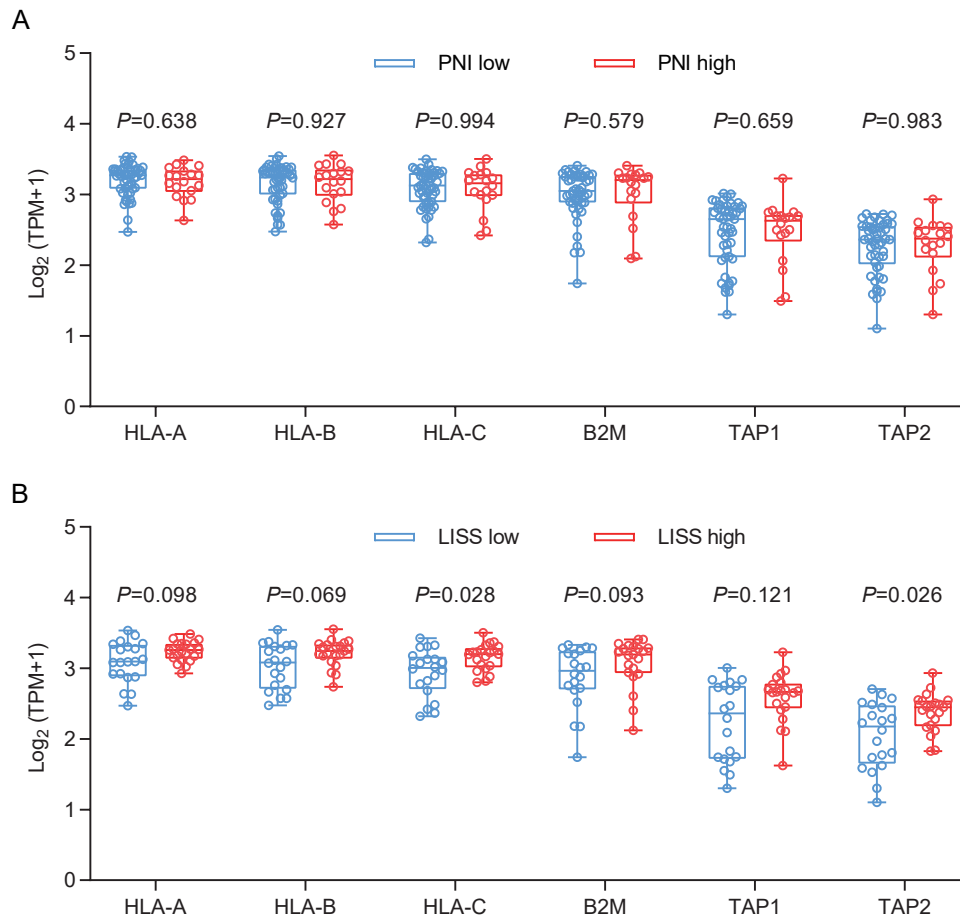


Figure S3 The correlations between antigen presentation machinery related gene expressions and PNI (A) and LISS (B) in limited-stage SCLC cohort. PNI, prognostic nutritional index; LISS, local immune score system; SCLC, small-cell lung cancer.

Table S1 The cutoff points of immune cells and markers

No.	Marker	Cutoff point
1	PNI (for OS)	55.5
2	PNI (for PFS)	56.5
3	NLR	1.8
4	Neutrophil count ($\times 10^9/L$)	3.1
5	Eosinophil count ($\times 10^9/L$)	0.2
6	Monocyte count ($\times 10^9/L$)	0.3
7	Lymphocyte count ($\times 10^9/L$)	1.1
8	CD4 ⁺ T (cell/mm ²)	223.5
9	CD8 ⁺ T (cell/mm ²)	40.7
10	CD68 ⁺ (cell/mm ²)	1,275.8
11	PD-L1 ⁺ tumor cell (%)	10.0
12	PD-L1 ⁺ CD8 ⁺ cell (%)	8.0
13	CTLA-4 ⁺ cell (%)	5.8
14	CTLA-4 ⁺ CD4 ⁺ cell (%)	4.5
15	CTLA-4 ⁺ CD8 ⁺ cell (%)	9.6
16	LISS score	0.13

PNI, prognostic nutritional index; OS, overall survival; PFS, progression-free survival; NLR, neutrophil-lymphocyte ratio; PD-L1, programmed death-ligand 1; CTLA-4, cytotoxic T-lymphocyte associated protein 4; LISS, local immune score system.

Table S2 Multivariate Cox regression analysis for integrated immune risk system

Variables	Univariable		Multivariate (model 1)	
	HR (95% CI)	P	HR (95% CI)	P
Age (year) (≥ 60 vs. < 60)	1.165 (0.713, 1.905)	0.542		
Gender (female vs. male)	0.256 (0.093, 0.706)	0.008	0.220 (0.052, 0.940)	0.041
Smoking history (ever vs. never)	2.840 (1.351, 5.967)	0.006	0.924 (0.275, 3.102)	0.899
Operative procedure (sublobar vs. lobectomy)	0.595 (0.187, 1.895)	0.380		
p-TNM stage (II-III vs. I)	2.378 (1.387, 4.078)	0.002	3.108 (1.462, 6.606)	0.003
LVI (presence vs. absence)	1.921 (1.129, 3.267)	0.016	1.436 (0.654, 3.150)	0.367
VPI (presence vs. absence)	2.463 (1.369, 4.431)	0.003	2.495 (1.137, 5.473)	0.023
ACT (presence vs. absence)	0.324 (0.197, 0.532)	< 0.001	0.239 (0.114, 0.503)	< 0.001
Immune risk system (low vs. high)	1.737 (1.320, 2.285)	< 0.001	1.429 (1.028, 1.986)	0.034

HR, hazard ratio; CI, confidence interval; TNM, Tumor Node Metastasis; LVI, lymphovascular invasion; VPI, visceral pleural invasion; ACT, adjuvant chemotherapy.

Table S3 Relationship between clinicopathologic characteristics and PNI in immunotherapy cohort

Variables	Total Patients	PNI		P
	N=91	Low (≤ 47) N=17	High (> 47) N=74	
Age (year)				0.051
Median	63	66	63	
IQR	57-66	63-72	60-64	
Gender				0.111
Male	73 (80.2)	16 (94.1)	57 (77.0)	
Female	18 (19.8)	1 (5.9)	17 (23.0)	
Smoking history				0.556
Never	21 (23.1)	3 (17.6)	18 (24.3)	
Ever	70 (76.9)	14 (82.4)	56 (75.7)	
Immunotherapy				0.848
Atezolizumab	79 (86.8)	15 (88.2)	64 (86.5)	
Durvalumab	12 (13.2)	2 (11.8)	10 (13.5)	

PNI, prognostic nutritional index; IQR, interquartile range.