

Article

The Lung Immune Prognostic Index Discriminates Survival Outcomes in Patients with Solid Tumors Treated with Immune Checkpoint Inhibitors

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Table S1. Baseline clinical and demographic information in the non-small cell lung cancer (NSCLC), renal cell carcinoma (RCC) and melanoma cohorts.

Parameter	NSCLC Cohort (N = 302)	RCC Cohort (N = 145)	Melanoma Cohort (N = 131)
LIPI Group—n (%)			
Good (0)	124 (41.1)	90 (55.9)	59 (41.3)
Intermediate (1)	124 (41.1)	46 (28.6)	51 (35.7)
Poor (2)	54 (17.8)	9 (5.6)	21 (14.7)
ECOG PS—n (%)			
<2	191 (63.2)	123 (84.8)	111 (84.7)
≥2	107 (35.4)	19 (13.1)	19 (14.5)
unknown	4 (1.3)	3 (2.1)	1 (0.8)
Age at start of Treatment			
Median	65.9	64.2	63.4
Range	32–90	36–86	20–90
<70—no. (%)	184 (60.9)	107 (73.8)	88 (67.2)
≥70—no (%)	118 (39.1)	38 (26.2)	43 (32.8)
Treatment Line—n (%)			
1	85 (28.1)	12 (8.3)	50 (38.2)
≥2	217 (71.9)	133 (91.7)	81 (61.8)

ECOG PS: Eastern Cooperative Oncology Group performance status, LIPI: lung immune prognostic index

Table S2. Overall survival (OS) and progression-free survival (PFS) based on Lung Immune Prognostic Index (LIPI) group in the non-small cell lung cancer (NSCLC), renal cell carcinoma (RCC) and melanoma cohorts.

Cohort	Median OS *	Median PFS *
	(95% CI)	(95% CI)
NSCLC		
Total	8.4 (6.9–10.0)	4.3 (3.4–5.1)
LIPI Good (0)	15.7 (13.2–21.6)	9.7 (6.9–11.7)
LIPI Intermediate (1)	7.1 (5.7–9.0)	3.7 (2.5–5.0)
LIPI Poor (2)	2.1 (1.4–3.0)	1.4 (1.1–2.0)
RCC		
Total	12.8 (7.6–19.2)	5.8 (4.1–7.8)
LIPI Good (0)	35.1 (14.3–78.0)	7.2 (5.0–11.3)
LIPI Intermediate (1)	16.1 (9.2–30.0)	4.6 (2.8–8.1)
LIPI Poor (2)	4.6 (1.2–26.5)	2.3 (0.92–4.6)
Melanoma		
Total	12.8 (7.6–19.2)	3.3 (2.6–6.0)
LIPI Good (0)	32.3 (24.8–NR)	14.0 (6.0–24.8)
LIPI Intermediate (1)	7.2 (3.6–12.1)	2.6 (1.9–4.1)
LIPI Poor(2)	2.4 (0.69–3.7)	1.4 (0.70–2.5)

CI: confidence interval, LIPI: lung immune prognostic index, OS: overall survival, PFS: progression-free survival; * Values expressed in months.

Table S3. Multivariate analysis of factors associated with overall survival (OS) and progression-free survival (PFS) in the non-small cell lung cancer (NSCLC) cohort.

Parameter	OS		PFS	
	HR (95% CI)	p Value	HR (95% CI)	p Value
LIPI Group				
Good (0)	1.0 (reference)		1.0 (reference)	
Intermediate (1)	1.6 (1.1–2.1)	0.005	1.4 (1.0–1.8)	0.037
Poor (2)	4.1(2.8–6.0)	<0.001	3.0 (2.1–4.4)	<0.001
ECOG PS				
<2	1.0 (reference)		1.0 (reference)	
≥2	2.9 (2.2–3.9)	<0.001	2.3 (1.7–3.0)	<0.001
Age				
<70	1.0 (reference)		1.0 (reference)	
≥70	0.9 (0.7–1.2)	0.59	1.0 (0.8–1.4)	0.75
Treatment Line				
1	1.0 (reference)		1.0 (reference)	
≥2	1.2 (0.9–1.6)	0.24	1.4 (1.0–1.8)	0.035

CI: confidence interval, ECOG PS: Eastern Cooperative Oncology Group performance status HR: hazard ratio, LIPI: lung immune prognostic index, OS: overall survival, PFS: progression-free survival.

Table S4. Multivariate analysis of factors associated with overall survival (OS) and progression-free survival (PFS) in the renal cell carcinoma (RCC) cohort.

Parameter	OS		PFS	
	HR (95% CI)	p value	HR (95% CI)	p Value
LIPI Group				
Good (0)	1.0 (reference)		1.0 (reference)	
Intermediate (1)	1.4 (0.8–2.4)	0.25	1.2 (0.8–1.9)	0.33
Poor (2)	3.1 (1.4–6.8)	0.004	3.8 (1.8–7.9)	<0.001
ECOG PS				

<2	1.0 (reference)		1.0 (reference)	
≥2	2.6 (1.4–4.9)	0.003	2.3 (1.3–3.9)	0.002
Age				
<70	1.0 (reference)		1.0 (reference)	
≥70	0.9 (0.5–1.5)	0.66	0.7 (0.4–1.1)	0.17
Treatment Line				
1	1.0 (reference)		1.0 (reference)	
≥2	4.0 (0.9–16.8)	0.056	1.3 (0.6–2.8)	0.44

CI: confidence interval, ECOG PS: Eastern Cooperative Oncology Group performance status HR: hazard ratio, LIPI: lung immune prognostic index, OS: overall survival, PFS: progression-free survival.

Table S5. Multivariate analysis of factors associated with overall survival (OS) and progression-free survival (PFS) in the melanoma cohort.

Parameter	OS		PFS	
	HR (95% CI)	p Value	HR (95% CI)	p Value
LIPI Group				
Good (0)	1.0 (reference)		1.0 (reference)	
Intermediate (1)	3.3 (2.0–5.3)	<0.001	2.2 (1.4–3.4)	<0.001
Poor (2)	7.9 (4.1–15.2)	<0.001	5.6 (3.0–10.1)	<0.001
ECOG PS				
<2	1.0 (reference)		1.0 (reference)	
≥2	1.4 (0.8–2.5)	0.25	1.3 (0.7–2.2)	0.39
Age				
<70	1.0 (reference)		1.0 (reference)	
≥70	0.6 (0.4–1.0)	0.034	0.7 (0.4–1.0)	0.070
Treatment Line				
1	1.0 (reference)		1.0 (reference)	
≥2	1.5 (1.0–2.4)	0.072	1.1 (0.7–1.6)	0.72

CI: confidence interval, ECOG PS: Eastern Cooperative Oncology Group performance status HR: hazard ratio, LIPI: lung immune prognostic index, OS: overall survival, PFS: progression-free survival.

Table S6. Multivariate analysis of factors associated with objective response rate (ORR) in the non-small cell lung cancer (NSCLC), renal cell carcinoma (RCC) and melanoma cohorts.

Parameter	ORR					
	NSCLC		RCC		Melanoma	
	OR (95% CI)	P Value	OR (95% CI)	p Value	OR (95% CI)	p Value
LIPI Group						
Good (0)	1.0 (reference)		1.0 (reference)		1.0 (reference)	
Intermediate (1)	1.1 (0.59–2.0)	0.80	1.3 (0.52–3.2)	0.59	5.3 (2.1–13.5)	<0.001
Poor (2)	9.1 (2.1–40.5)	0.004	*	*	11.2 (2.2–57.6)	0.004
ECOG PS						
<2	1.0 (reference)		1.0 (reference)		1.0 (reference)	
≥2	2.3 (0.95–5.75)	0.064	1.2 (0.46–3.1)	0.72	4.0 (1.5–10.7)	0.006
Age						
<70	1.0 (reference)		1.0 (reference)		1.0 (reference)	
≥70	0.92 (0.51–1.7)	0.78	0.75 (0.30–1.9)	0.54	0.52 (0.20–1.4)	0.19
Treatment Line						
1	1.0 (reference)		1.0 (reference)		1.0 (reference)	
≥2	2.9 (1.6–5.2)	<0.001	1.6 (0.38–7.1)	0.66	1.9 (0.77–4.6)	0.17

CI: confidence interval, ECOG PS: Eastern Cooperative Oncology Group performance status, LIPI: lung immune prognostic index, OR: odds ratio, ORR: objective response rate; * OR was not reportable for Poor LIPI (RCC) due to insufficient sample size.