

Supplementary Table 1. Patient characteristics

Discovery cohort (n=328)

Age	Median 62 years (range 20-88)	
Gender	N	%
Male	196	59.0
Female	132	41.0
Tumor Type		
Non-small cell lung cancer	127	39.8
Soft-tissue sarcomas	46	14.2
Bladder cancer	31	9.3
Colorectal cancer	27	8.1
Head and neck	12	3.6
Renal	11	3.3
Breast	7	
Other*	67	21.7
Performance status		
≤ 1	304	92.8
> 1	24	7.2
Stage IV cancer	328	100
Microsatellite status		
MSI-H	6	1.8
MSS	221	67.4
Missing	101	30.8
Previous lines of treatment		
≤ 1	203	62.0
> 1	125	38.0
Treatment		
Anti-PD1	195	59.6
Anti-PD-L1	100	30.1
PD1 or anti-PD-L1 + another immune-checkpoint	33	10.2
Smoking status		
Never smoked	144	43.9
Current or former smoker	176	53.6
Missing data	8	2.5

Validation Cohort A (n=131)		
Age	Median 64 years (range 34-87)	
Gender		
Male	89	67.9
Female	42	32.1
Tumor Type		
Head and neck	13	9.9
Non-small cell lung cancer	105	80.1
Kidney	9	6.9
Others	4	3.1
Performance status		
≤ 1	101	77.1
> 1	30	22.9
Previous lines of treatment		
≤ 1	50	38.2
> 1	81	61.8
Treatment		
Anti-PD1	129	98.5
Anti-PD-L1	2	1.5
Validation Cohort B (n=81)		
Age	Median 63 years (range 46-83)	
Gender		
Male	51	63
Female	30	37
Tumor Type		
Bladder	24	29.6
Non-small cell lung cancer	56	69.1
Colorectal cancer	1	1.3
Performance status		
≤ 1	62	76.5
> 1	19	23.5
Treatment		
Anti-PD1	64	79
Anti-PD-L1	17	21

***Other tumors:** thyroid carcinoma, gastrointestinal stromal tumor, cholangiocarcinoma, pancreatic adenocarcinoma, anal carcinoma, cervical cancer, ovarian cancer, vulvar carcinoma, endometrial carcinoma, cervical cancer, gastric carcinoma.

Supplementary Table 2. Multivariate model for objective response in discovery cohort (n=328)

Variable	Odds ratio (95 % C.I.)	p-value
Performance status		
≤ 1	5.9 (1.2 to 28.2)	0.024
> 1	1 (referent)	
Tumor type		
NSCLC	1 (referent)	0.021
Other	0.49 (0.26 to 0.89)	
TPS code		
< 1	0.41 (0.21 to 0.81)	0.01
≥ 1	1 (referent)	
CD8 density		
Low density	0.39 (0.21 to 0.73)	0.003
High density	1 (referent)	
Presence of mature TLS		
Low density	0.34 (0.17 to 0.67)	<0.0001
High density	1 (referent)	

