

**Supplementary**

**Table S1** Overall survival analysis based on sPD-L1 levels in BALF (N=94)

	Univariate analysis			Multivariate analysis	
	Median (95% CI) (month)	Exp(B) (95% CI)	P value	Exp(B) (95% CI)	P value
<b>Age (years)</b>					
<65	18	15.35 (9.69–18.46)	1		0.488
≥65	76	13.12 (8.00–14.85)	1.261 (0.654–2.432)		
<b>Sex</b>					
Male	69	12.67 (9.22–14.77)	1		0.410
Female	25	15.23 (10.17–17.87)	0.783 (0.436–1.404)		
<b>Smoking status</b>					
Never	25	16.47 (14.03–18.08)	1	1	0.024*
Former	37	8.87 (4.82–13.96)	2.347 (1.216–4.533)	1.888 (0.934–3.819)	
Current	32	13.58 (8.83–16.60)	1.363 (0.687–2.703)	0.959 (0.457–2.012)	
<b>ECOG PS</b>					
0	18	17.38 (11.45–18.08)	1	1	0.012*
1	56	13.62 (10.07–15.23)	1.713 (0.790–3.703)	1.599 (0.711–3.598)	0.177
2	15	11.43 (4.69–16.62)	2.737 (1.126–6.651)	1.996 (0.797–5.003)	
3	5	2.53 (1.23–13.57)	5.854 (1.706–20.080)	4.079 (1.095–15.192)	
<b>Comorbidity</b>					
COPD	41	11.53 (7.58–14.30)	1.532 (0.888–2.644)		0.123
<b>Histology</b>					
AD	61	14.77 (12.33–15.98)	1		0.259
SCC	28	11.48 (7.90–14.38)	1.348 (0.780–2.330)		
Other*	5	8.83 (0.60–16.67)	2.102 (0.742–5.951)		
<b>PD-L1 expression in tumor cell</b>					
No	47	14.93 (12.67–17.87)	1	1	0.038*
Low	16	12.15 (8.00–15.83)	1.938 (0.958–3.921)	1.379 (0.660–2.879)	
High	28	8.12 (3.40–14.78)	1.983 (1.102–3.568)	1.711 (0.862–3.397)	
<b>Brain metastasis</b>					
Yes	26	13.60 (10.33–15.37)	1.167 (0.679–2.005)		0.577
No	67	15.00 (7.27–16.81)	1		
<b>sPD-L1 in BALF (pg/mL)</b>					
<7.35	71	16.47 (11.15–21.79)	1	1	0.001*
≥7.35	23	8.87 (0.0–19.88)	2.349 (1.368–4.033)	1.798 (1.000–3.235)	0.04*

\*, P<0.05. ECOG PS, Eastern Cooperative Oncology Group performance status; COPD, chronic obstructive pulmonary disease; AD, adenocarcinoma; SCC, squamous cell carcinoma; PD-L1, programmed death ligand 1; TPS, tumor proportion score; BALF, bronchoalveolar lavage fluid; sPDL1, soluble programmed death ligand 1.

**Table S2** Response based on tumor PD-L1 expression and sPD-L1 levels in BALF

Response	Low tumor PD-L1 <sup>†</sup> (N=21)			High tumor PD-L1 (N=10)		
	Low BALF sPD-L1 <sup>‡</sup> (N=15)	High BALF sPD-L1 (N=6)	P value	Low BALF sPD-L1 (N=8)	High BALF sPD-L1 (N=2)	P value
Response			0.193			0.258
PR	9 (60%)	1 (16.7%)		5 (62.5%)	0 (0%)	
SD	4 (26.7%)	3 (50%)		1 (12.5%)	1 (50%)	
PD	2 (13.3%)	2 (33.3%)		2 (25%)	1 (50%)	
ORR	60%	16.7%	0.072	62.5%	0%	0.114

<sup>†</sup>, tumor PD-L1 expression classified by the results of the 22C3 pharmDx assay (low <50%, high ≥50%); <sup>‡</sup>, sPD-L1 in BALF classified by 7.35 pg/mL. PD-L1, programmed death ligand 1; sPD-L1, soluble programmed death ligand 1; BALF, bronchoalveolar lavage fluid; CR, complete response; PR, partial response; SD, stable disease; PD, progressive disease; ORR, objective response rate.