



Figure S1 Immunohistochemistry analysis of the protein expression of prognosis-related genes in the Human Protein Atlas database. (A) The protein expression of CD40 in the normal tissue. Antibody: CAB072868. Intensity: Moderate in macrophages (image available from <https://www.proteinatlas.org/ENSG00000101017-CD40/tissue/lung#img>). (B) The protein expression of CD40 in the tumor tissue. Antibody: CAB072868. Intensity: Negative (image available from <https://www.proteinatlas.org/ENSG00000101017-CD40/pathology/lung+cancer#img>). (C) The protein expression of DLGAP5 in the normal tissue. Antibody: HPA005546. Intensity: Weak in alveolar cells; Moderate in macrophages (image available from <https://www.proteinatlas.org/ENSG00000126787-DLGAP5/tissue/lung#img>). (D) The protein expression of DLGAP5 in the tumor tissue. Antibody: HPA005546. Intensity: strong in tumor cells (image available from <https://www.proteinatlas.org/ENSG00000126787-DLGAP5/pathology/lung+cancer#img>). (E) The protein expression of HHIPL2 in the normal tissue. Antibody: HPA059673. Intensity: Negative (image available from <https://www.proteinatlas.org/ENSG00000143512-HHIPL2/tissue/lung#img>). (F) The protein expression of HHIPL2 in the tumor tissue. Antibody: HPA059673. Intensity: Negative (image available from <https://www.proteinatlas.org/ENSG00000143512-HHIPL2/pathology/lung+cancer#img>). (G) The protein expression of ID1 in the normal tissue. Antibody: CAB025915. Intensity: Moderate in alveolar cells; Moderate in macrophages (image available from <https://www.proteinatlas.org/ENSG00000125968-ID1/tissue/lung#img>). (H) The protein expression of ID1 in the tumor tissue. Antibody: CAB025915. Intensity: Moderate in tumor cells (image available from <https://www.proteinatlas.org/ENSG00000125968-ID1/pathology/lung+cancer#img>). (I) The protein expression of TSPAN7 in the normal tissue. Antibody: CAB068245. Intensity: Negative (image available from <https://www.proteinatlas.org/ENSG00000156298-TSPAN7/tissue/lung#img>). (J) The protein expression of TSPAN7 in the tumor tissue. Antibody: CAB068245. Intensity: Negative (image available from <https://www.proteinatlas.org/ENSG00000156298-TSPAN7/pathology/lung+cancer#img>). Magnification, $\times 125$.

Table S1 Summarization of clinical features

	Level	CS1 (N=77)	CS2 (N=146)	CS3 (N=125)	CS4 (N=89)
Fustat (%)	0	34 (44.2)	93 (63.7)	92 (73.6)	60 (67.4)
	1	43 (55.8)	53 (36.3)	33 (26.4)	29 (32.6)
Futime, median [IQR]		624.00	654.00	629.00	626.00
		[336.00, 1072.00]	[408.75, 1026.25]	[435.00, 929.00]	[426.00, 1194.00]
Age, median [IQR]		63.00 [57.25, 72.00]	62.00 [56.00, 72.00]	69.00 [61.00, 75.00]	65.00 [60.00, 71.00]
Gender (%)	Female	34 (44.2)	83 (56.8)	86 (68.8)	32 (36.0)
	Male	43 (55.8)	63 (43.2)	39 (31.2)	57 (64.0)
Race (%)	Asian	0 (0.0)	2 (1.5)	3 (2.6)	1 (1.3)
	Others	10 (13.9)	17 (12.8)	11 (9.5)	12 (15.4)
	White	62 (86.1)	114 (85.7)	102 (87.9)	65 (83.3)
Pack_years_smoked, median [IQR]		40.00	40.00	30.00	39.00
		[28.00, 51.25]	[25.00, 54.00]	[20.00, 43.00]	[20.75, 50.00]
Histology (%)	Lung acinar adenocarcinoma	0 (0.0)	3 (2.1)	7 (5.6)	8 (9.0)
	Lung adenocarcinoma (NOS)	61 (79.2)	103 (70.5)	57 (45.6)	44 (49.4)
	Lung adenocarcinoma mixed subtype	11 (14.3)	26 (17.8)	28 (22.4)	25 (28.1)
	Lung bronchioloalveolar carcinoma mucinous	0 (0.0)	0 (0.0)	5 (4.0)	0 (0.0)
	Lung bronchioloalveolar carcinoma nonmucinous	0 (0.0)	6 (4.1)	11 (8.8)	1 (1.1)
	Lung clear cell adenocarcinoma	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)
	Lung micropapillary adenocarcinoma	0 (0.0)	1 (0.7)	1 (0.8)	0 (0.0)
	Lung mucinous adenocarcinoma	0 (0.0)	0 (0.0)	2 (1.6)	0 (0.0)
	Lung papillary adenocarcinoma	0 (0.0)	4 (2.7)	9 (7.2)	8 (9.0)
	Lung signet ring adenocarcinoma	0 (0.0)	0 (0.0)	1 (0.8)	0 (0.0)
	Lung solid pattern predominant adenocarcinoma	3 (3.9)	2 (1.4)	0 (0.0)	0 (0.0)
	Mucinous (colloid) carcinoma	1 (1.3)	1 (0.7)	4 (3.2)	3 (3.4)
	Anatomy (%)	L-lower	11 (14.7)	16 (11.0)	28 (22.4)
L-upper		22 (29.3)	40 (27.6)	24 (19.2)	15 (17.6)
Other (please specify)		1 (1.3)	1 (0.7)	2 (1.6)	0 (0.0)
R-lower		12 (16.0)	27 (18.6)	24 (19.2)	18 (21.2)
R-middle		1 (1.3)	6 (4.1)	6 (4.8)	5 (5.9)
R-upper		28 (37.3)	55 (37.9)	41 (32.8)	33 (38.8)
pStage (%)	Stage I	37 (48.7)	73 (50.7)	82 (66.7)	45 (50.6)
	Stage II	15 (19.7)	45 (31.2)	24 (19.5)	22 (24.7)
	Stage III	18 (23.7)	22 (15.3)	13 (10.6)	16 (18.0)
	Stage IV	6 (7.9)	4 (2.8)	4 (3.3)	6 (6.7)
EGFR (%)	Mutated	7 (9.1)	18 (12.3)	32 (25.6)	0 (0.0)
	Wild	70 (90.9)	128 (87.7)	93 (74.4)	89 (100.0)
KRAS (%)	Mutated	12 (15.6)	42 (28.8)	33 (26.4)	49 (55.1)
	Wild	65 (84.4)	104 (71.2)	92 (73.6)	40 (44.9)

IQR, interquartile range.