

**A radio-pathological fusion model for predicting PD-L1
expression and immunotherapy response in non-small cell
lung cancer**

ELECTRONIC SUPPLEMENTARY MATERIAL

- I. CT image acquisition**
- II. Table S1 Scanning parameters and CT specifications**
- III. Table S2 The selected radiomics features**
- IV. Figure S1 Performance of Fusion Model for predicting
PD-L1 TPS $\geq$ 50% on the test set**
- V. Figure S2 Stratified analysis for high-score and low-
score groups in different subgroups**

I. CT image acquisition

All patients underwent chest CT examination, and the CT equipment and scanning parameters are shown in Supplementary Table S1. For contrast-enhanced scans, non-ionic contrast agents (Ultravist 300 or Ultravist 370, Bayer; or Ioversol 320, Hengrui) were administered intravenously at a dose of 1.2 mL/kg body weight and an injection rate of 2.2 to 3 mL/s. Bolus tracking technology was utilized, initiating the arterial phase scan 8 seconds after the CT value in the descending aorta reached 100 HU. All CT scans were reconstructed using standard reconstruction kernels at the mediastinal window settings with a thickness of ≤ 2 mm. CT data were retrieved from the picture archiving and communication system (PACS) for further feature extraction.

II. Table S1 Scanning parameters and CT specifications

Brand		Siemens		Siemens		Siemens		Siemens		GE		GE	
Machine type		SOMATOM Definition Flash		SOMATOM Force		SOMATOM Definition AS		SOMATOM go. Top		Lightspeed VCT		Optima CT620	
Tube	voltage	120		100/120		120		120		120		120	
(KV)													
Tube	current	smart		smart		smart		smart		smart		smart	
(mAs)													
Rotation	time	0.5		0.5		0.5		0.5		0.4、0.5		0.5	
(s)													
Image	matrix	512	×	512	×	512	×	512	×	512	×	512	×
(mm)		512		512		512		512		512		512	
Field	of view	350		350		350		350		350		350	
(mm)													
Reconstruction		2 mm/2		2 mm/2		1 mm/1		2 mm/2		1.25		2 mm/2	
slice thickness		mm		mm		mm		mm		mm/		mm	
and spacing						2 mm/2				1.25			
						mm				mm			
Reconstruction		B41f		B41f		B41f		B41f		Standar		Standar	
algorithm										d		d	
										resolutio		resolutio	
										n		n	

III. Table S2 The selected radiomics features

Feature types	No.	Feature name
Original	1	original_GLCM_Autocorrelation
texture	2	original_GLCM_ClusterShade
features	3	original_GLCM_InverseVariance
High-order	4	log-sigma-1-0-mm-3D_GLCM_ClusterShade
features of	5	log-sigma-1-0-mm-
Log		3D_GLSZM_GrayLevelNonUniformityNormalized
transformation	6	log-sigma-3-0-mm-3D_GLCM_ClusterShade
	7	log-sigma-3-0-mm-3D_GLCM_Imc2
	8	log-sigma-3-0-mm-3D_GLSZM_GrayLevelVariance
	9	log-sigma-3-0-mm-
		3D_GLSZM_SmallAreaLowGrayLevelEmphasis
High-order	10	wavelet-
features of		LLH_GLSZM_LargeAreaLowGrayLevelEmphasis
Wavelet	11	wavelet-
transformation		LLH_GLDM_LargeDependenceHighGrayLevelEmphasis
	12	wavelet-
		LHH_GLSZM_LargeAreaLowGrayLevelEmphasis
	13	wavelet-HLH_firstorder_Mean
	14	wavelet-HLH_firstorder_Skewness
	15	wavelet-HLH_GLCM_Imc1

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- 16 wavelet-
HLH_GLDM_LargeDependenceHighGrayLevelEmphasis
 - 17 wavelet-HHH_GLCM_ClusterShade
 - 18 wavelet-HHH_GLCM_Imc2
 - 19 wavelet-LLL_firstorder_Kurtosis
-

IV. Figure S1 Performance of Fusion Model for predicting PD-L1 TPS $\geq$ 50% on the test set

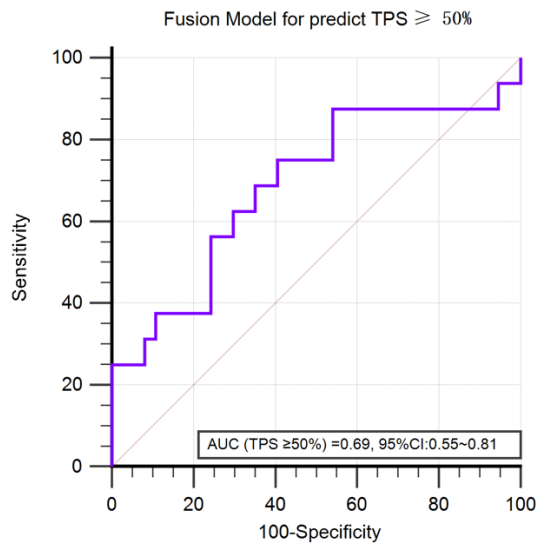
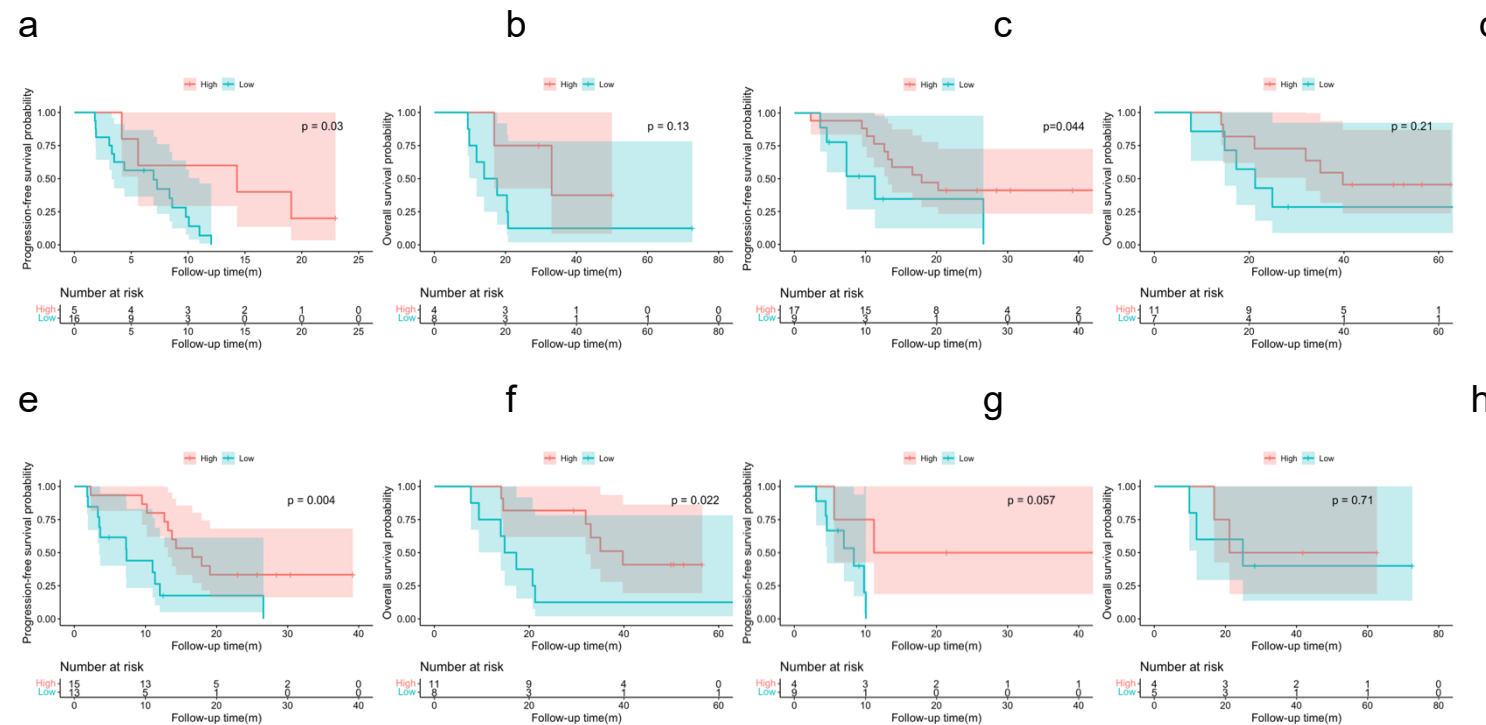


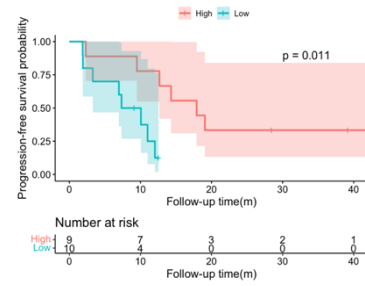
Figure S1

Performance of Fusion Model for predicting PD-L1 TPS $\geq$ 50% on the test set (number of TPS $\geq$ 50% cases: $n = 13$). Achieving an AUC of 0.69 (95% CI: 0.55-0.81), with a sensitivity of 75.0% and specificity of 59.5%.

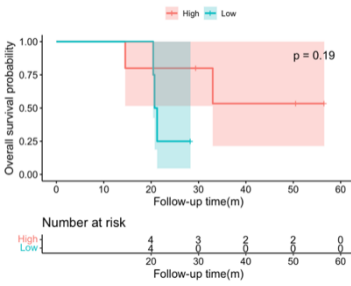
IV. Figure S2 Stratified analysis for high-score and low-score groups in different subgroups



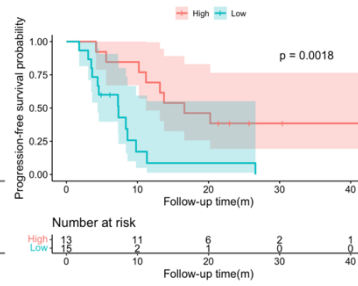
i



j



k



l

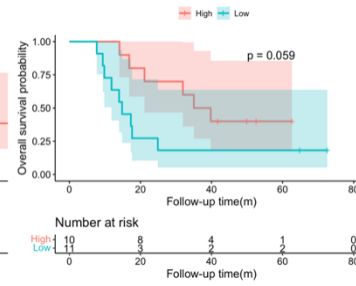


Figure S2

(a~d) Subgroup analysis for different treatment regimens. (a, c) PFS of the high-score group was significantly higher than that of the low-score group whether patients received monotherapy with ICIs or combination immunochemotherapy. (b, d) For OS, there was no significant difference between the two groups.

(e~h) Subgroup analysis for different histologies. (e~f) PFS and OS of the high-score group in squamous carcinoma patients were significantly better than that of the low-score group. (g~h) For adenocarcinoma patients, there were no significant difference in PFS and OS between the high-score group and low-score group.

(i~l) Subgroup analysis for different tumor stages. (i, k) PFS of the high-score group was significantly higher than that of the low-score group for both stage III and stage IV NSCLC patients. (j, l) For OS, there was no significant difference between the two groups.