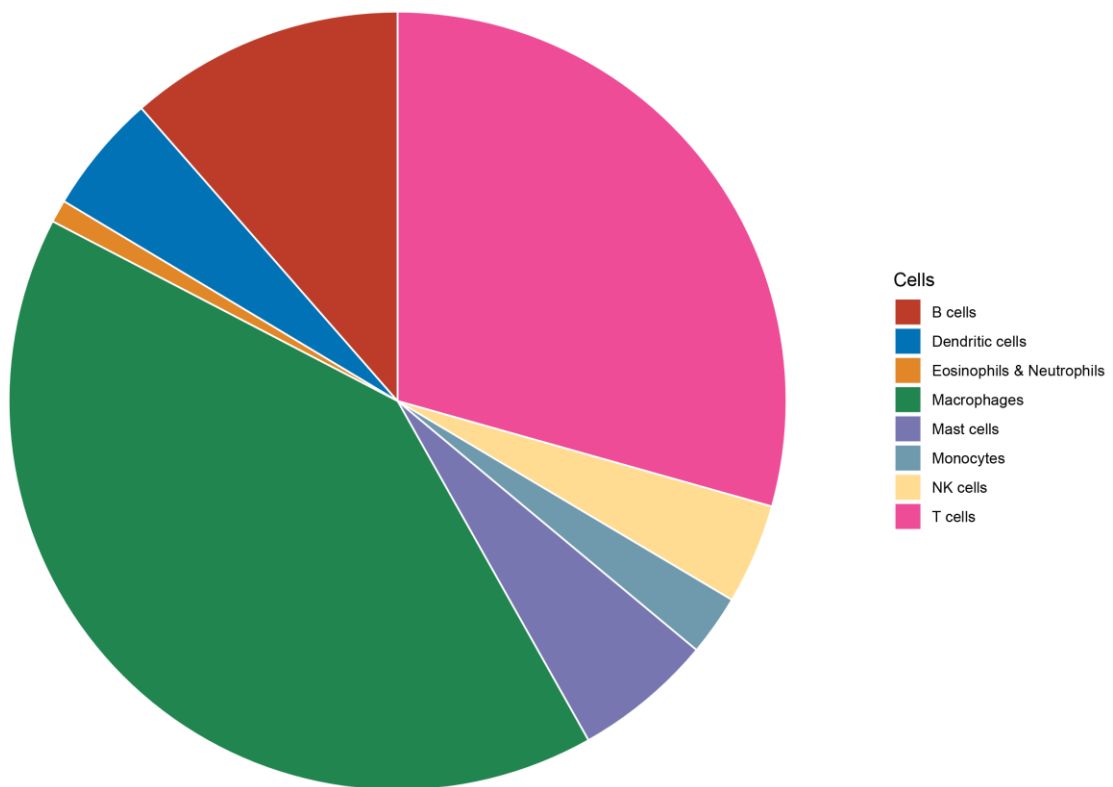
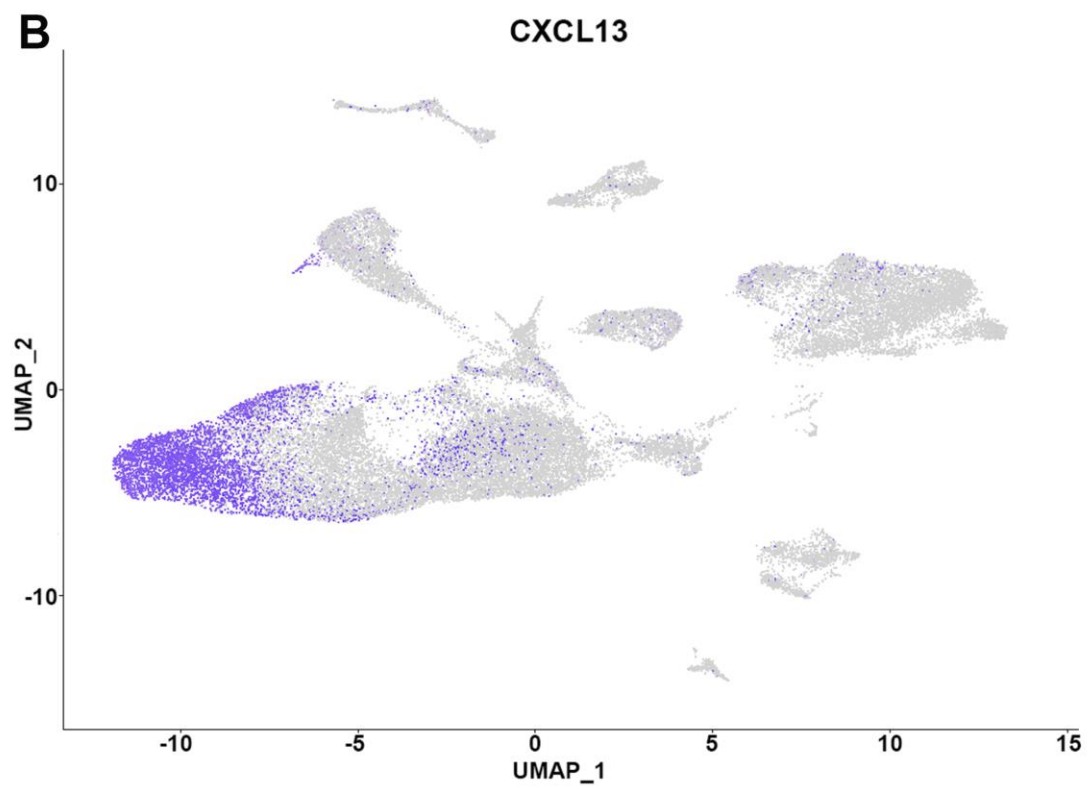
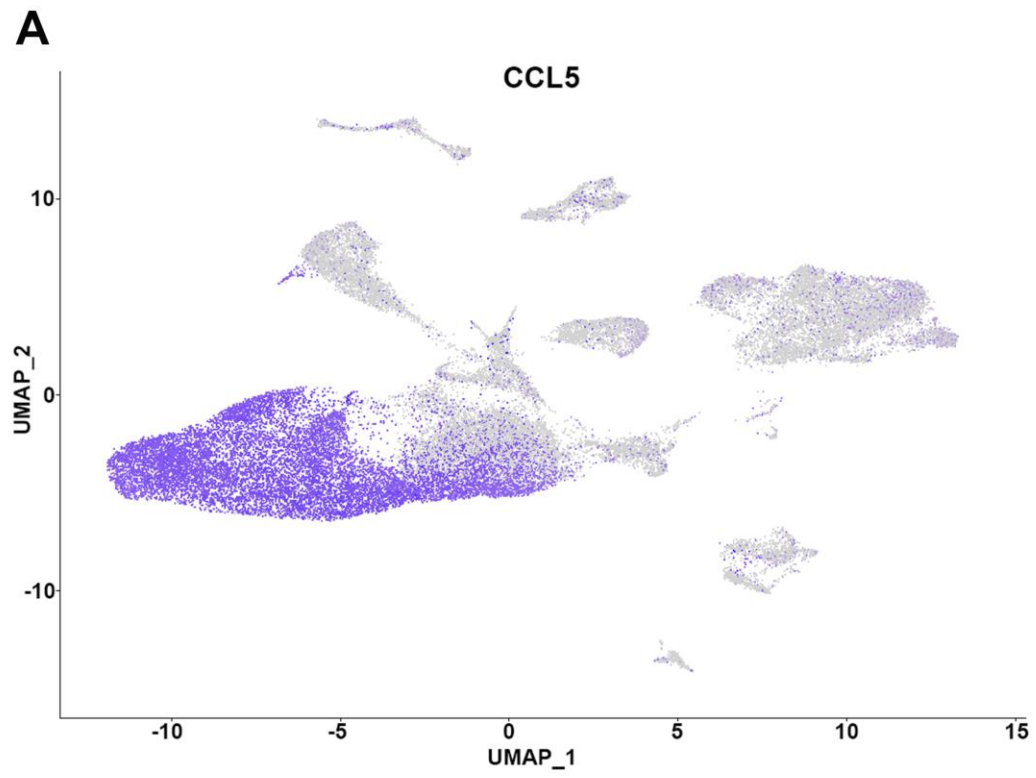


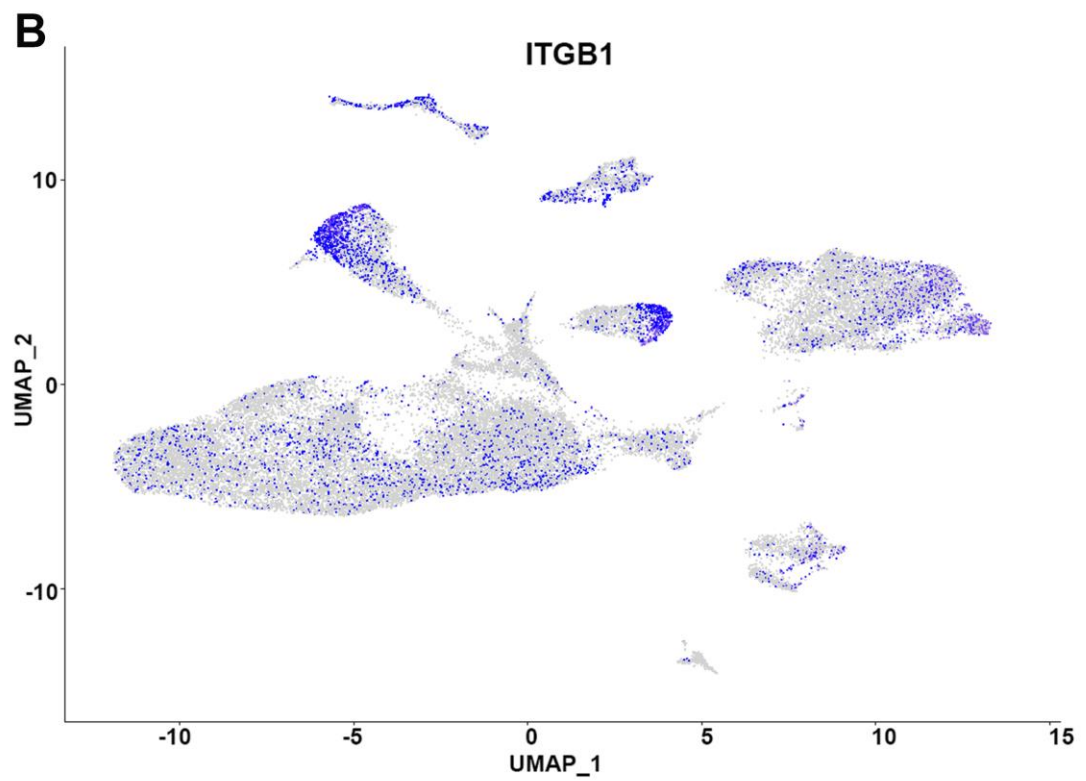
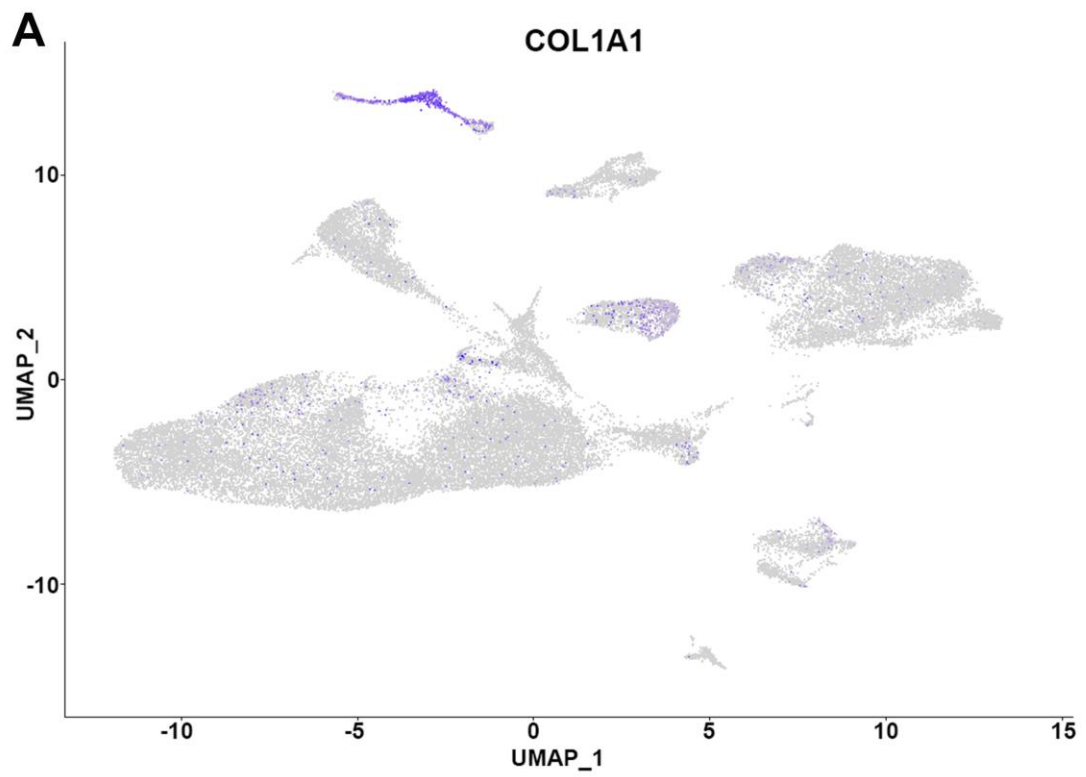
**Supplementary Figure 1.** Quality control of scRNA-seq for all cell sub-populations.



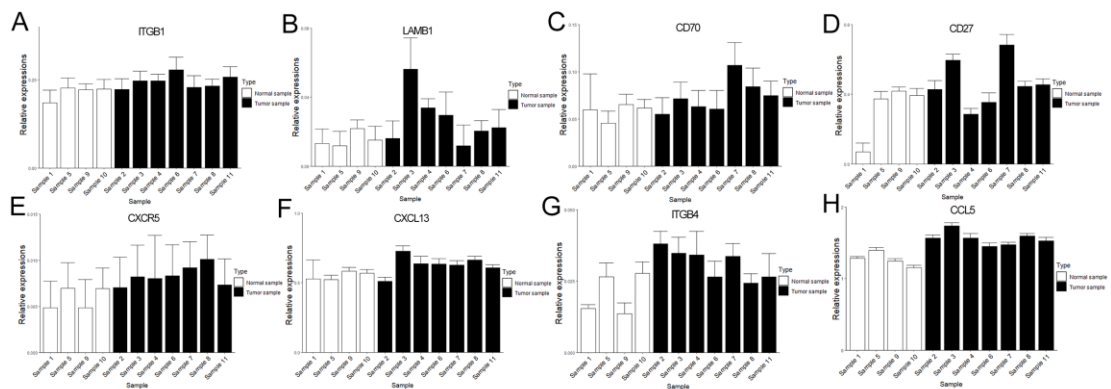
**Supplementary Figure 2.** Result of CIBERSORT analysis.



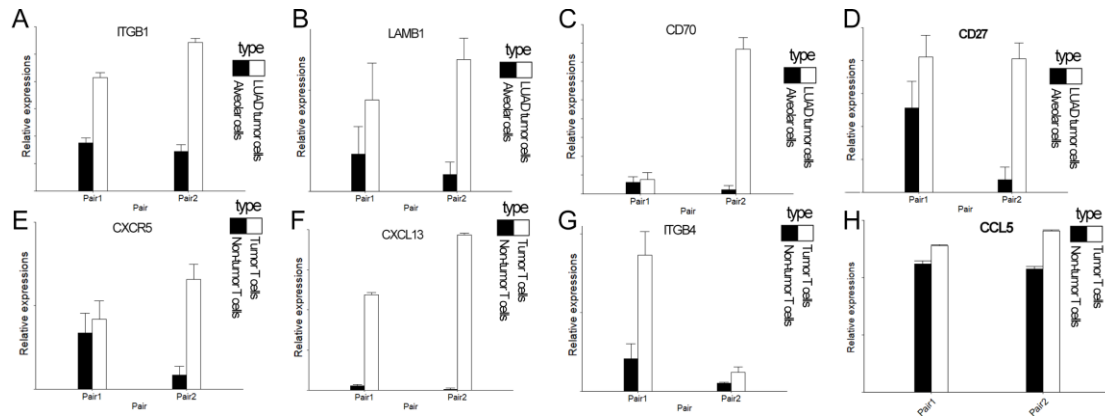
**Supplementary Figure 3.** Feature plot of CCL5 and CXCL13.



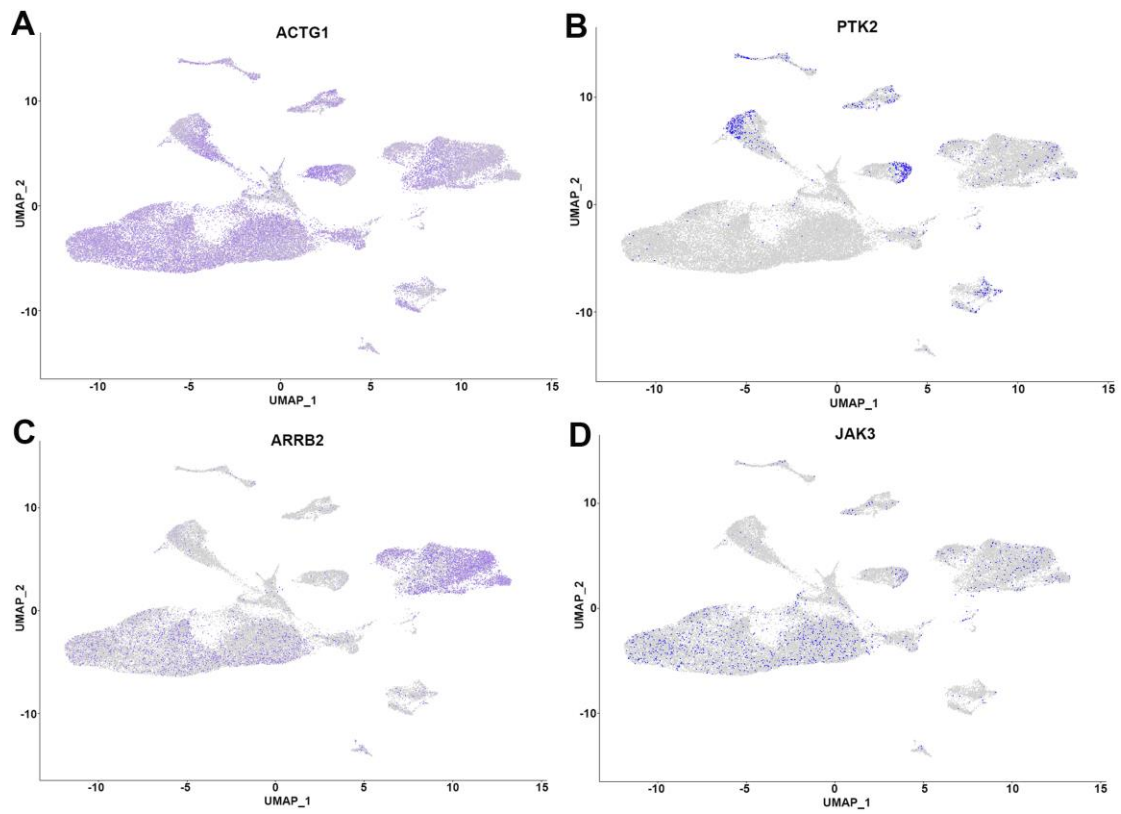
**Supplementary Figure 4.** Feature plot of COL1A1 and ITGB1.



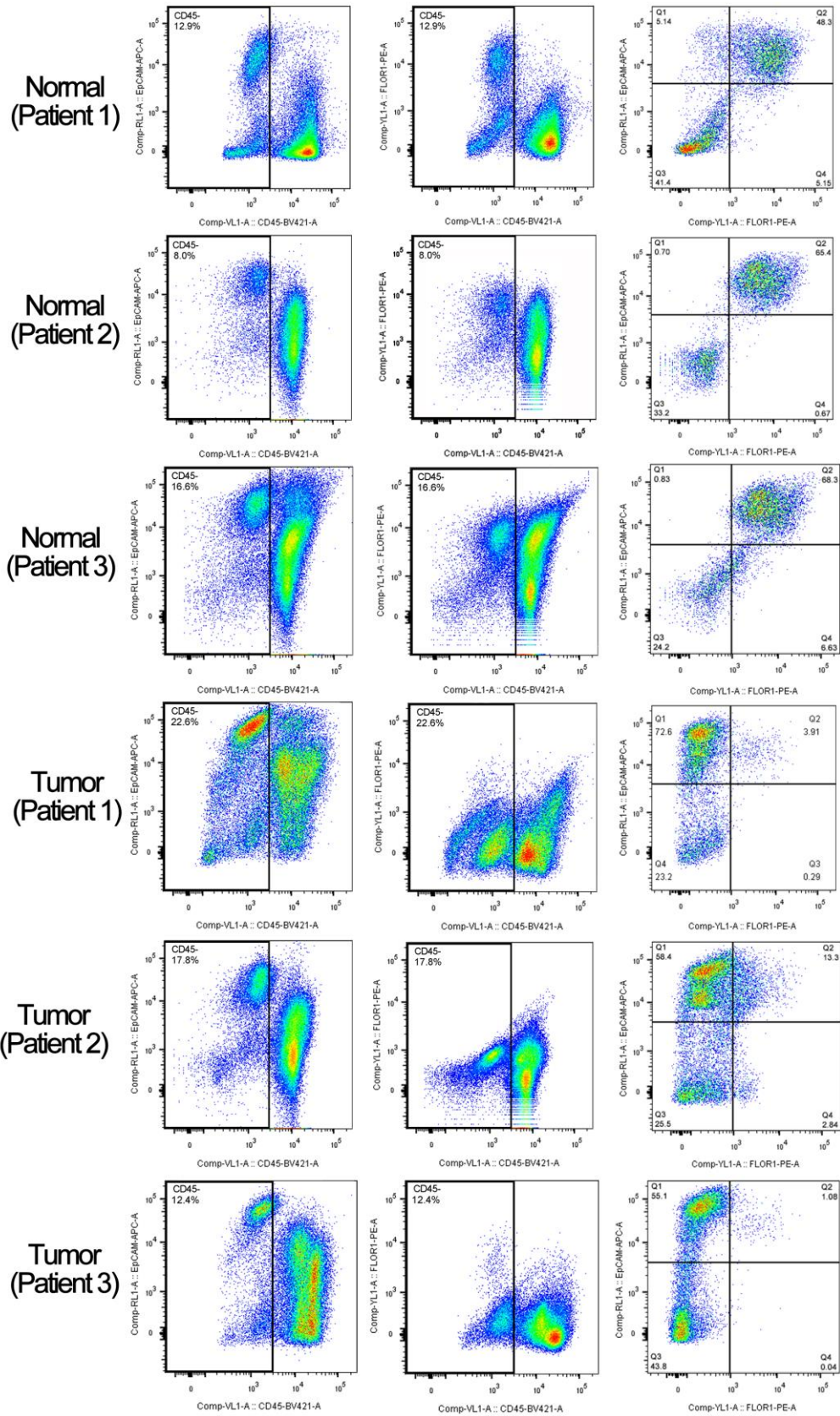
**Supplementary Figure 5.** Compared the key genes expression in epithelial cells (LUAD tumor cells and Alveolar cells) and T cells (Tumor T cells and Non-tumor T cells) among different samples. (A-D) Compared the expression level of ITGB1, LAMB1, CD70, and CD27 in LUAD tumor cells; (E-H) Compared the expression level of CXCR5, CXCL13 ( $P < 0.01$ ), ITGB4, and CCL5 in T cells.



**Supplementary Figure 6.** Compared the expression of ITGB1, LAMB1, CD70, CD27, CXCR5, CXCL13, ITGB4, and CCL5 in the pairs of tumor and corresponding normal samples. (A-D) Compared the expression level of ITGB1, LAMB1, CD70, and CD27 in LUAD tumor cells; (E-H) Compared the expression level of CXCR5, CXCL13 ( $P < 0.01$ ), ITGB4, and CCL5 in T cells.



**Supplementary Figure 7.** Feature plot of ACTG1, PTK2, ARRB2, and JAK3.



**Supplementary Figure 8.** Three pairs of normal/ tumor LUAD samples in double-positive cells in FACS analysis (Left: CD45-EPCAM+ cells, Middle: CD45-FOLR1+ cells, Right: EPCAM+FOLR1+ cells).

**Table I Characteristics of the 5 patients included in this study for scRNA-seq analysis**

	<b>Age</b>	<b>Sex</b>	<b>Stage</b>	<b>Location</b>	<b>TNM</b>	<b>Smoking status</b>	<b>COPD/GOLD</b>
1	86	Male	IB	RUL	pT2bN0M0	Former	Yes (2)
2	68	Male	IIIB	RUL	pT4N2M0	Former	No
3	64	Female	IIB	LUL	pT2aN1M0	Former	Yes (2)
4	60	Male	IA3	LUL	pT1cN0M0	Former	Yes (2)
5	65	Male	IIIA	LUL	pT4N1M0	Former	Yes (2)

**Tables II Characteristics of the 11 lung tissue samples included in this study**

<b>Sample</b>	<b>Patient</b>	<b>Sample Type</b>
1	1	Normal
2	2	LUAD
3	2	LUAD
4	2	LUAD
5	2	Normal
6	3	LUAD
7	3	LUAD
8	3	LUAD
9	3	Normal
10	4	Normal
11	5	LUAD

**LUAD:** Lung adenocarcinoma

**RUL:** Right upper lobe

**RLL:** Right lower lobe

**RML:** Right middle lobe

**LLL:** Left lower lobe

**LUL:** Left upper lobe



## Primers used in this study

ITGB1-forward: 5'-TTGACCCTAATACCAACCTTCCT-3';

ITGB1-reverse: 5'-CCCATAGTACAGCCCTTGATGTT-3';

LAMB1-forward: 5'-AGGAACCCGAGTTCAGCTAC-3';

LAMB1-reverse: 5'-CACGTCGAGGTCACCGAAAG-3';

CXCR5-forward: 5'-CACGTTGCACCTTCTCCCAA-3';

CXCR5-reverse: 5'-GGAATCCCGCCACATGGTAG-3';

CXCL13-forward: 5'-GCTTGAGGTGTAGATGTGTCC-3';

CXCL13-reverse: 5'-CCCACGGGGCAAGATTTGAA-3';

CD70-forward: 5'-GCTTTGGTCCCATTGGTCG-3';

CD70-reverse: 5'-CGTCCCACCCAAGTGA CTC-3';

CD27-forward: 5'-CAGAGAGGCACTACTGGGCT-3';

CD27-reverse: 5'-CGGTATGCAAGGATCACACTG-3';

CCL5-forward: 5'-CCAGCAGTCGTCTTTGTAC-3';

CCL5-reverse: 5'-CTCTGGGTTGGCACACACTT-3';

ITGB4-forward: 5'-GCAGCTTCCAAATCACAGAGG-3';

ITGB4-reverse: 5'-CCAGATCATCGGACATGGAGTT-3'.