Supplementary

Table S1 Patient cohort used in this study

Cohort	Number patients	NSCLC type	Source
E-MTAB-6149	5	–	PMID: 29988129
WCH	44	–	PMID: 35027529
GSE154826	27	LUAD used	PMID: 34767762
GSE179994	8	LUAD used	PMID: 35121991
Bulk LUAD			
TCGA-LUAD	320	LUAD used	PMID: 25079552
SU2C-MARK	47	LUAD used	PMID: 37024582
Others			
GSE111907	36	–	PMID: 32381040
GSE184398	Variable	–	PMID: 34963056
Meta-12 cohorts	–	LUAD used	PMID: 31242643

NSCLC, non-small cell lung cancer; WCH, west China hospital; LUAD, lung adenocarcinoma; TCGA, The Cancer Genome Atlas; SU2C-MARK, Stand Up to Cancer-Mark Foundation.

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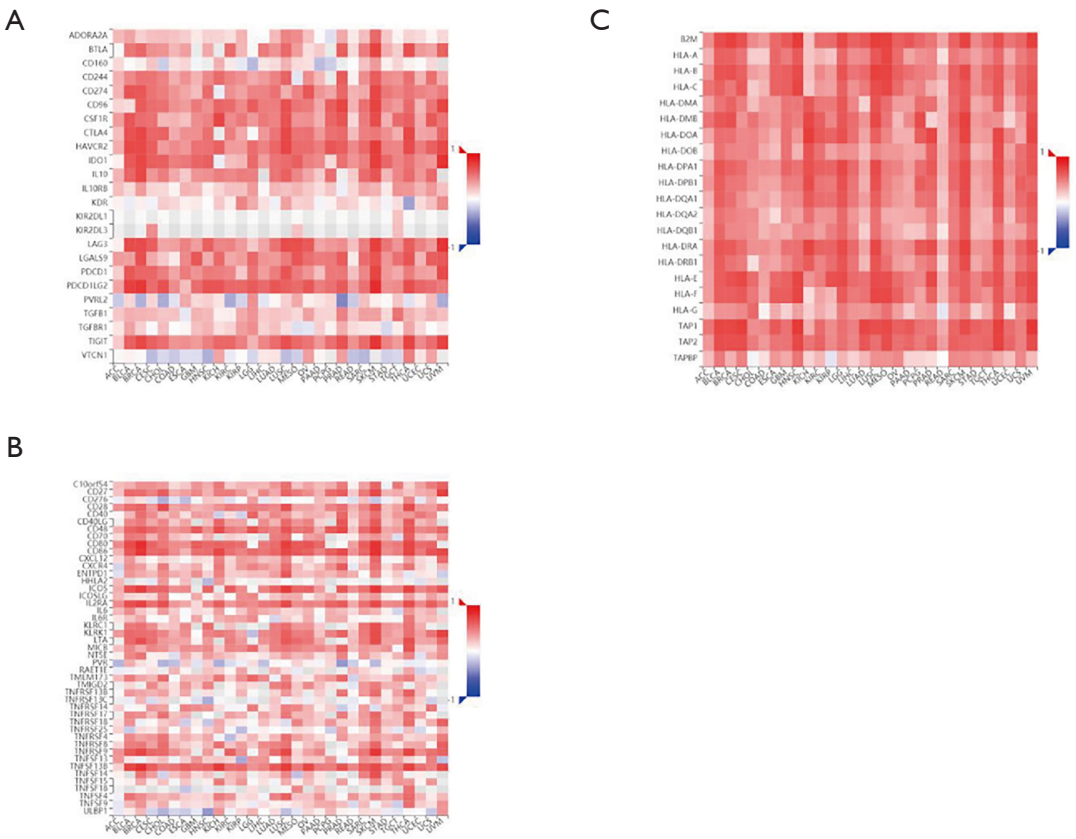

Figure S1 *EPSTI1*-related immunomodulators at TISIDB website. Pan-cancer based spearman correlation between *EPSTI1* RNA expression and (A) immunoinhibitor, (B) immunostimulator, and (C) major histocompatibility complex molecule. The X-axis is the type of cancer and the Y-axis is the RNA expression of the immune signature. TISIDB, Tumor-Immune System Interactions and Drug Bank.

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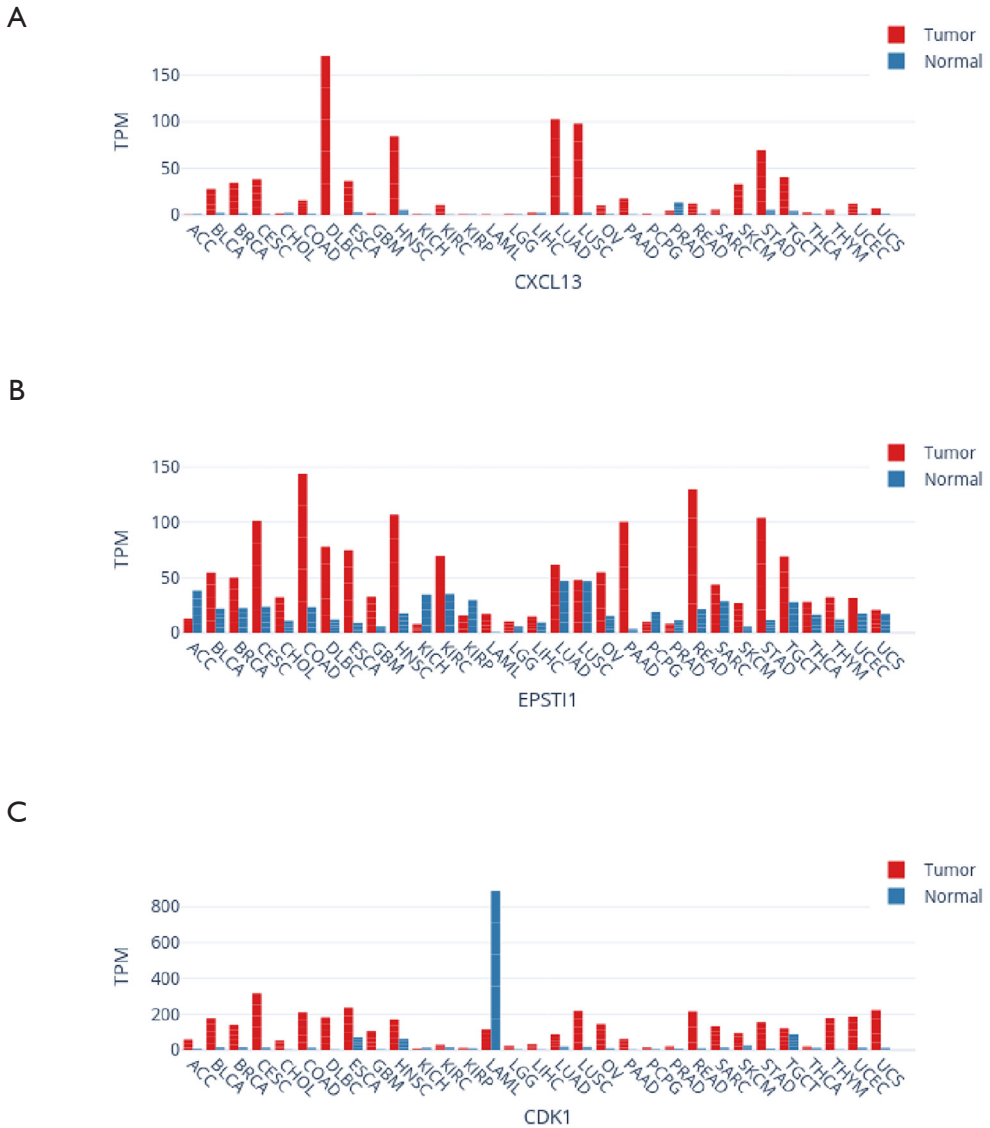

Figure S2 RNA expression of three-gene at GEPIA2 website. (A-C) RNA expression of *CXCL13*, *EPSTI1*, and *CDK1* in TCGA and GTEx projects. Red represents cancer, while blue represents normal tissue. The horizontal axis is cancer type and the vertical axis is the expression in the form of TPM. TPM, transcripts per million; GEPIA2, Gene Expression Profiling Interactive Analysis; TCGA, The Cancer Genome Atlas; GTEx, genotype-tissue expression.

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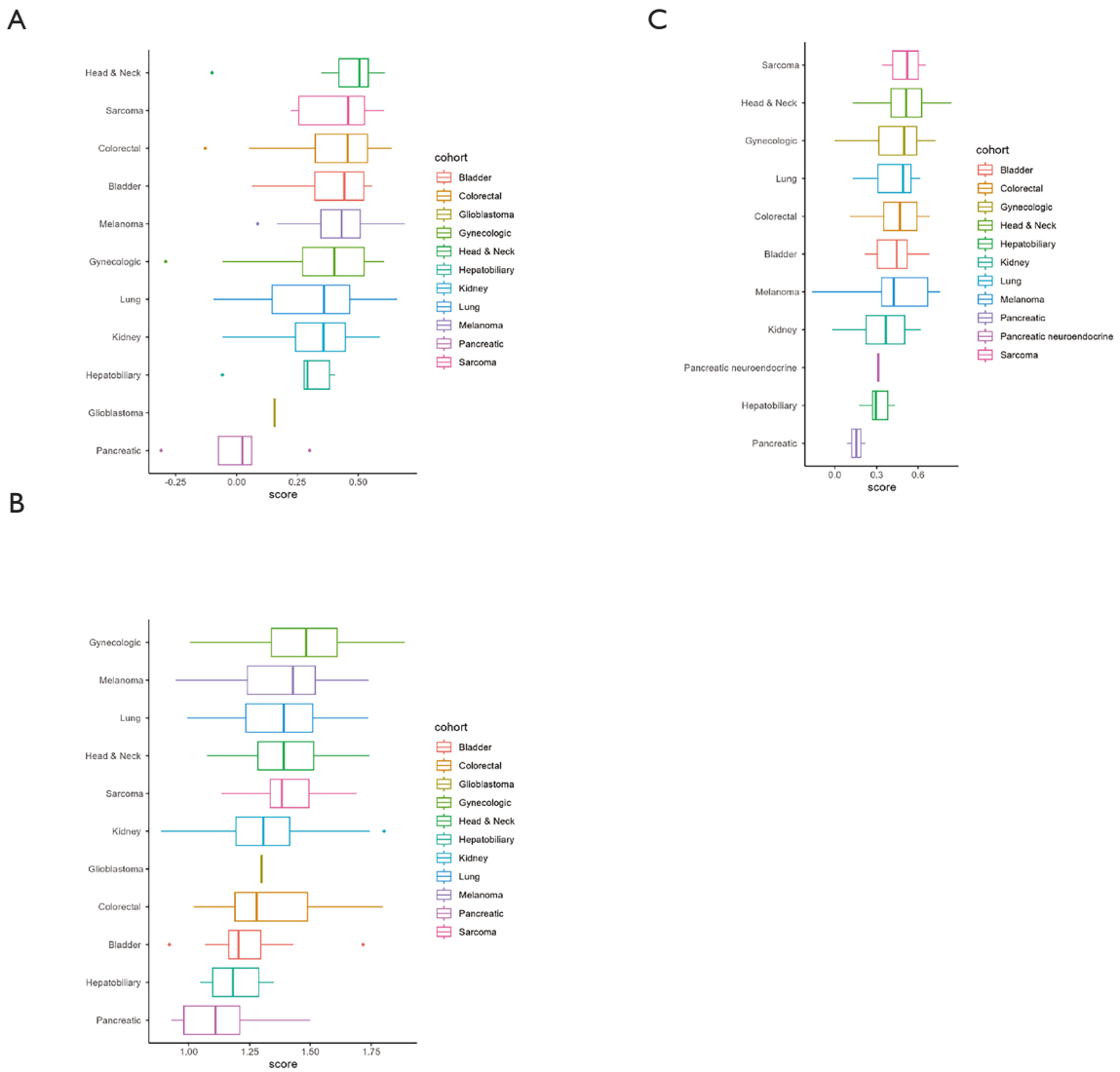

Figure S3 Three-gene quantified by the ssgsea method at GSE184398 cohort. (A-C) Box plot showing single sample score measured by *CXCL13*, *EPSTI1*, and *CDK1* in the GSE184398 cohort with $CD3^+$, $HLA\text{-}DR^+$, and $CD25^+$ $CD4^+$ FACS. FACS, fluorescence-activated cell sorting.

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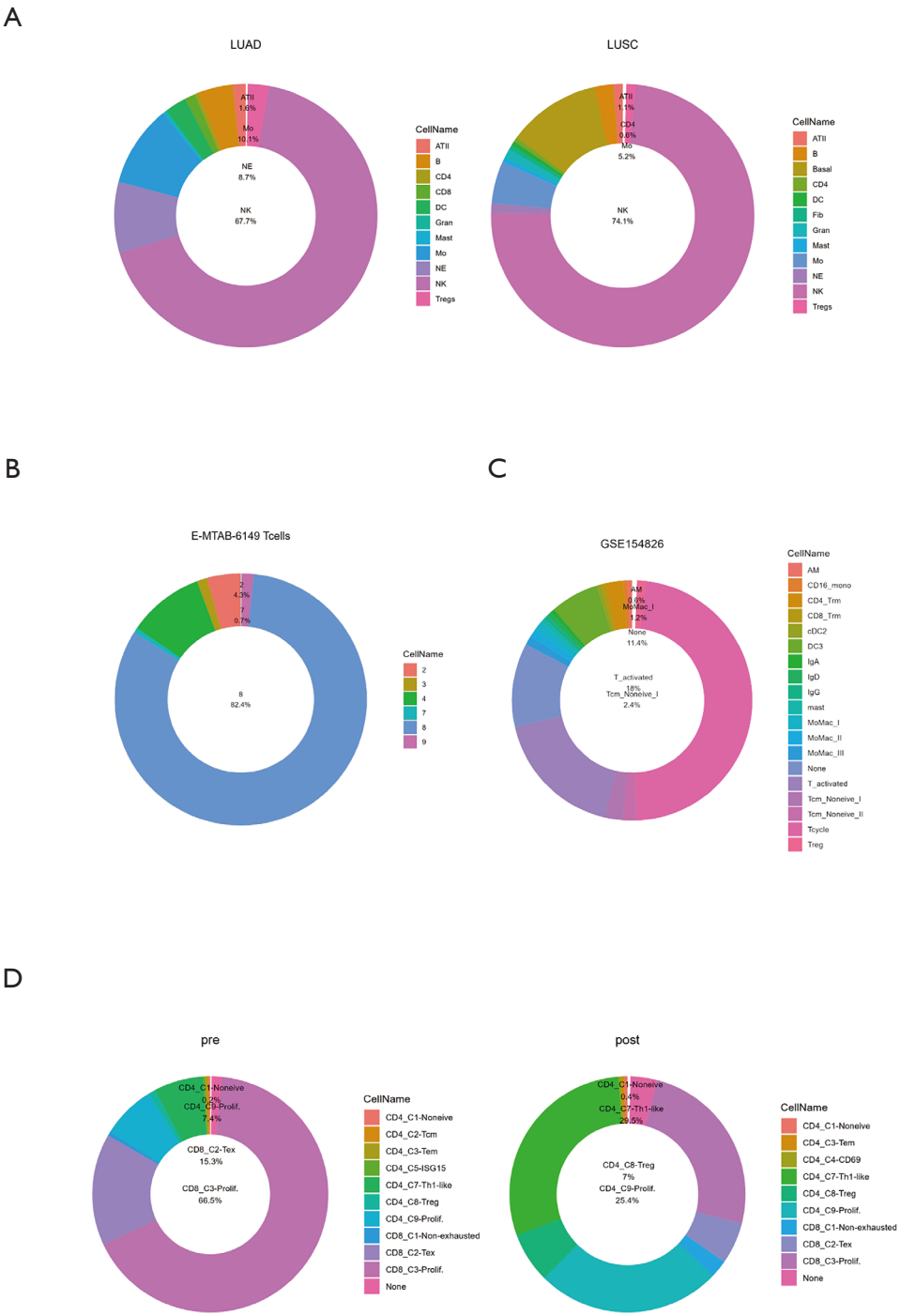

Figure S4 Overlap of CXCL13$^+$ EPSTI1$^+$ CDK1$^+$ subpopulation in four NSCLC cohorts. (A-D) Pie chart depicting the proportion of CXCL13$^+$ EPSTI1$^+$ CDK1$^+$ subpopulation belongs to the author-defined cell types in West China Hospital, E-MTAB-6149 T cells, GSE154826, and GSE179994 cohorts. In particular, GSE154826 and GSE179994 only included patients with LUAD. LUAD, lung adenocarcinoma; LUSC, lung squamous cell carcinoma; NSCLC, non-small cell lung cancer.

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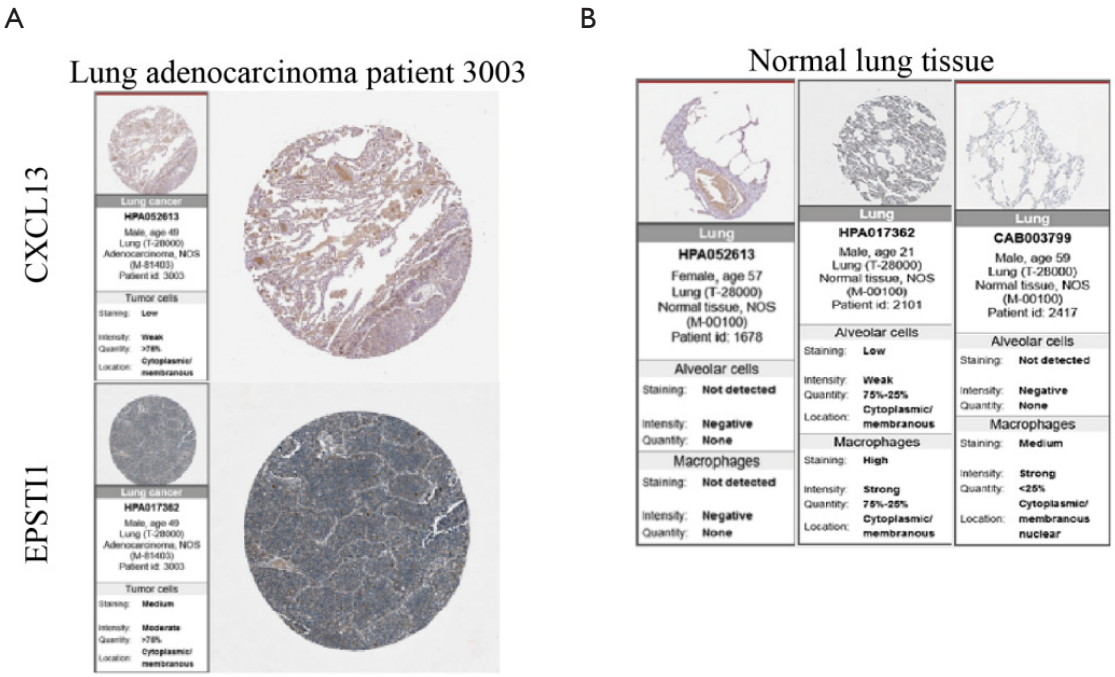

Figure S5 Antibody information of three-gene at HPA website. (A) Protein levels and sublocalization of CXCL13 and EPSTI1 in the LUAD patient ID: 3003 at HPA website (https://www.proteinatlas.org/). (B) Quantification of anti-CXCL13 (HPA052613), anti-EPSTI1 (HPA017362), and anti-CDK1 (CAB003799) in normal alveolar and macrophage cells. HPA, Human Protein Atlas; LUAD, lung adenocarcinoma.

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Table S2 Cell count of CXCL13$^+$ EPSTI1$^+$ CDK1$^+$ subpopulation in GSE179994

CD8$^+$ T cells		Total T cells		
Sample	Cell_sum	Sample	Cell_sum	Timepoint
P1.post.1	5	P1.post.1	29	Post
P1.post.2	8	P1.post.2	22	Post
P1.post.3	13	P1.post.3	27	Post
P1.pre	15	P1.pre	45	Pre
P10.post.1	3	P10.post.1	4	Post
P10.pre	61	P10.pre	81	Pre
P13.post.1	14	P13.post.1	80	Post
P13.post.2	4	P13.post.2	37	Post
P19.pre	210	P13.pre	1	Pre
P29.post.1	3	P19.post.1	3	Post
P29.pre	1	P19.pre	291	Pre
P30.post.1	5	P29.post.1	8	Post
P30.pre	26	P29.pre	5	Pre
P33.post.1	6	P30.post.1	16	Post
P33.pre	1	P30.pre	41	Pre
P35.pre	20	P33.post.1	18	Post
		P33.pre	3	Pre
		P35.post.1	0	Post
		P35.pre	35	Pre

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