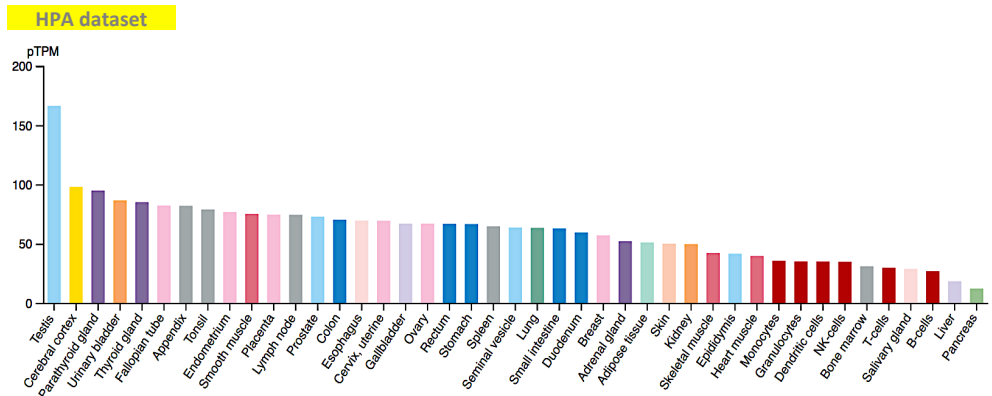
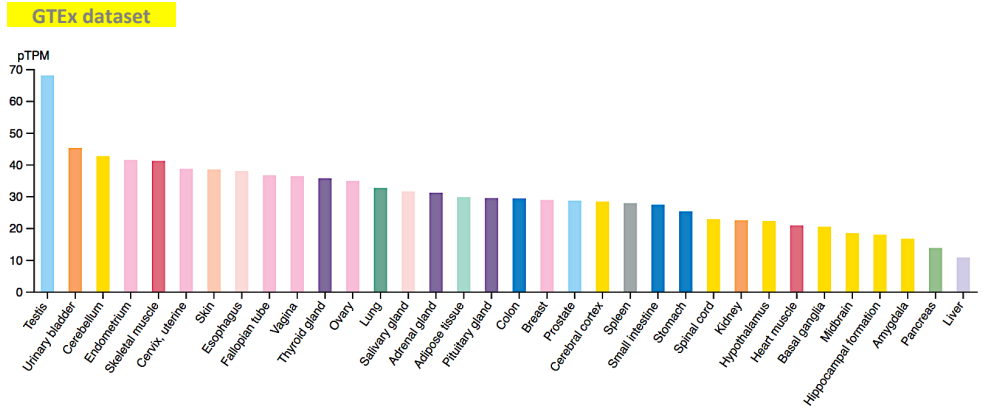


FIGURE S1. Flow chart of this study. TCGA, the cancer genome atlas; TIICs, tumor-infiltrating immune cells; TMB, tumor mutation burden; MSI, microsatellite instability; PPI, protein-protein interaction; GSEA, gene set enrichment analysis; IHC, Immunohistochemistry; LIHC, liver hepatocellular carcinoma; SYSUCC, Sun Yat-sen Cancer Center of Sun Yat-sen University.

A



B



C

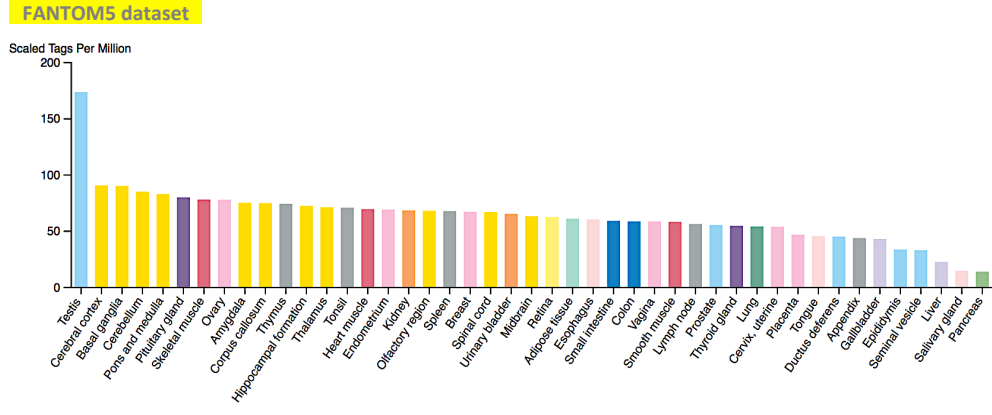


FIGURE S2. Expression level of CSNK2A1 in different normal tissues in datasets. (A) HPA database, (B) GTEx dataset, (C) FANTOM5 database. CSNK2A1, casein kinase 2 alpha protein 1; HPA, human protein atlas; GTEx, genotype-tissue expression; FANTOM5, function annotation of the mammalian genome.

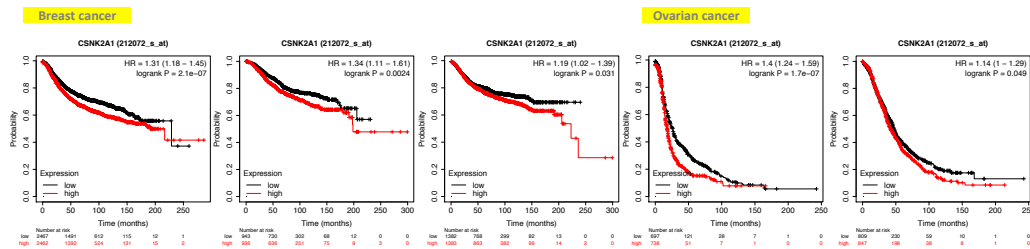
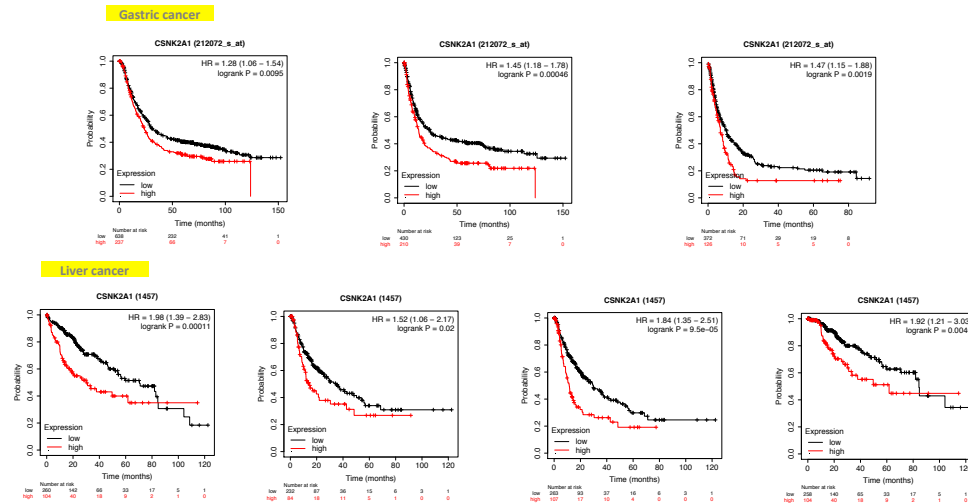
A**B**

FIGURE S3. Kaplan-Meier plots comparing high and low expression of CSNK2A1 in different cancers using Kaplan-Meier Plotter online tool. (A) Analysis of RFS, OS and DMFS in breast cancer, and analysis of PFS, OS in ovarian cancer. (B) Analysis of OS, FP and PPS in gastric cancer, and analysis of OS, RFS, PFS and DSS in liver cancer. CSNK2A1, casein kinase 2 alpha protein 1; RFS, relapse-free survival; OS, overall survival; DMFS, distant metastasis-free survival; PFS, progression-free survival; FP, first progression; PPS, post-progression survival; DSS, disease-specific survival.

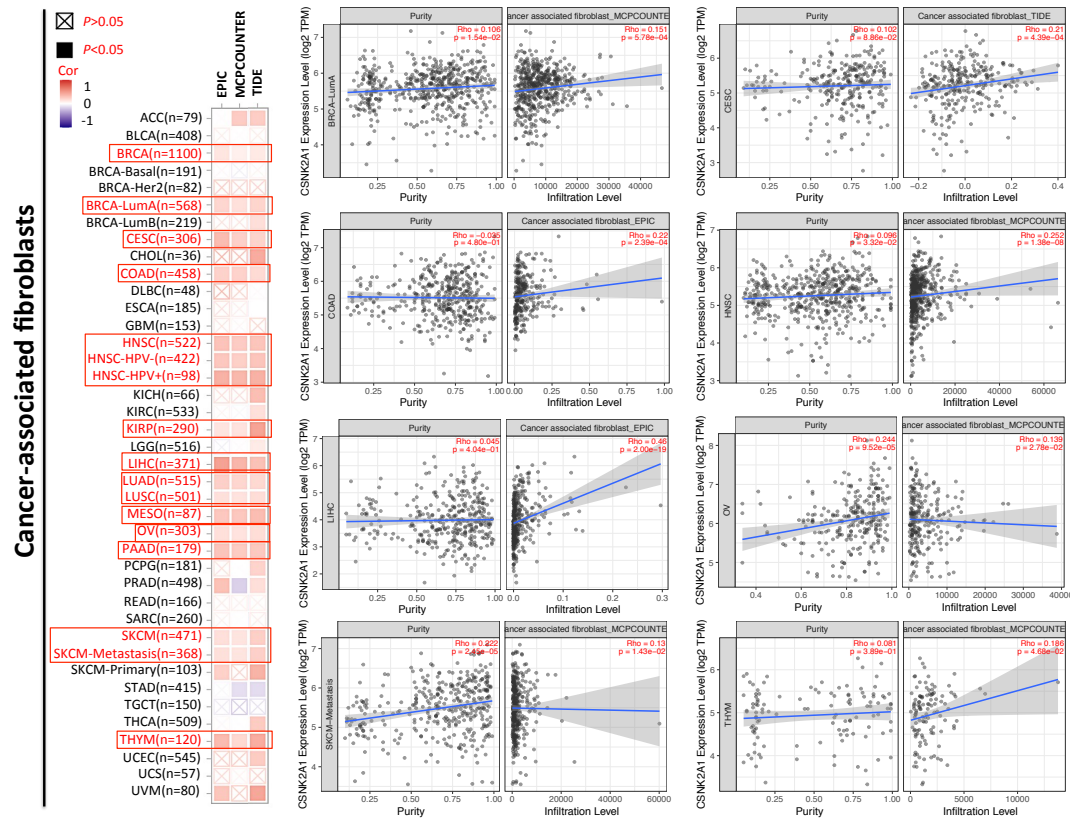


FIGURE S4. Correlation analysis between CSNK2A1 expression and immune infiltration of cancer-associated fibroblasts. Different algorithms were used to analyze the potential correlations between the expression level of CSNK2A1 and the infiltration levels of cancer-associated fibroblasts across all types of tumors in TCGA, and parts of correlations with significant results in purity ($P < 0.05$) and infiltration level ($P < 0.05$) were displayed in the right of figure. CSNK2A1, casein kinase 2 alpha protein 1; TCGA, the cancer genome atlas.

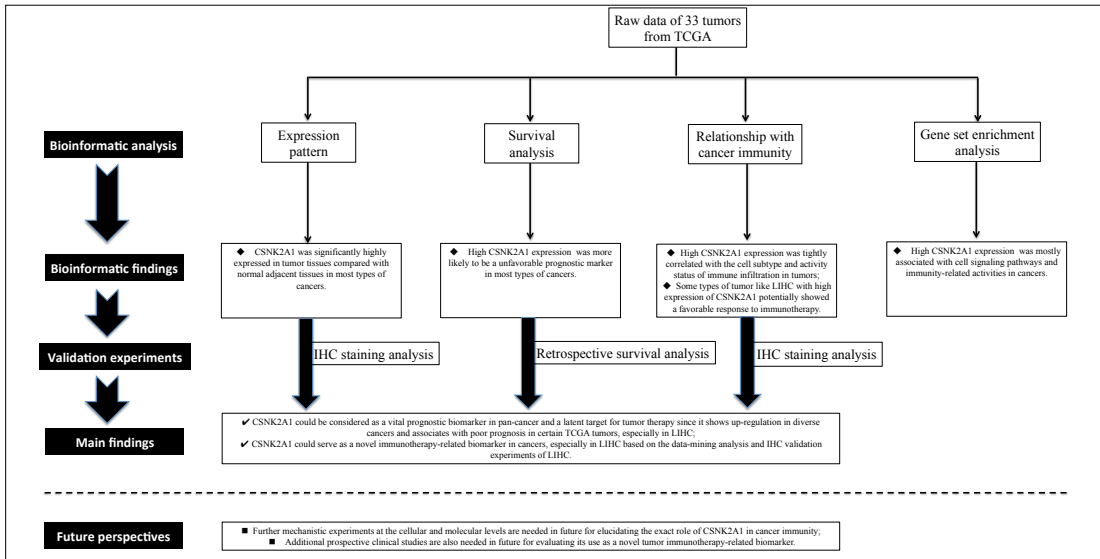


FIGURE S5. Schematic diagram of main findings and future perspectives of the study. TCGA, the cancer genome atlas; CSNK2A1, casein kinase 2 alpha protein 1; IHC, Immunohistochemistry; LIHC, liver hepatocellular carcinoma.