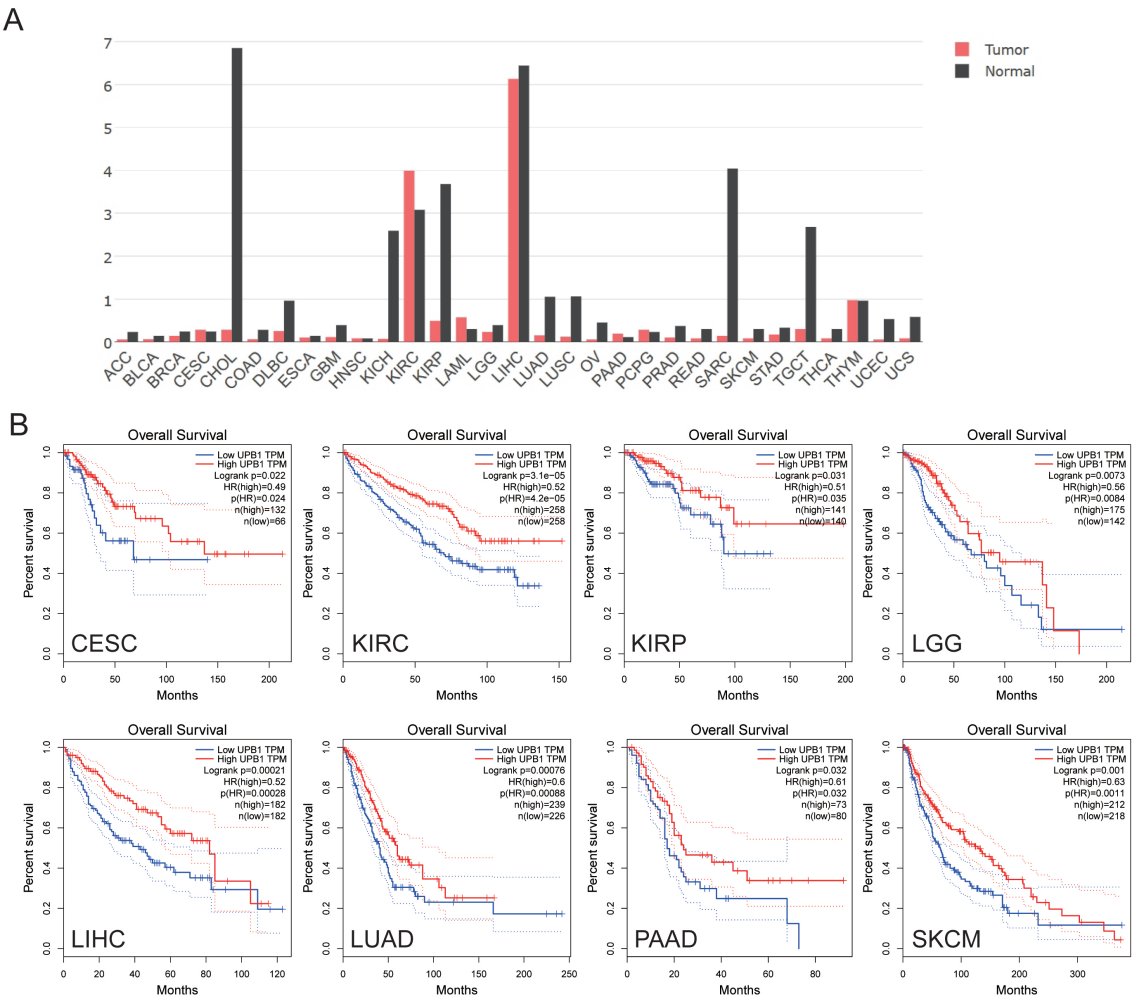
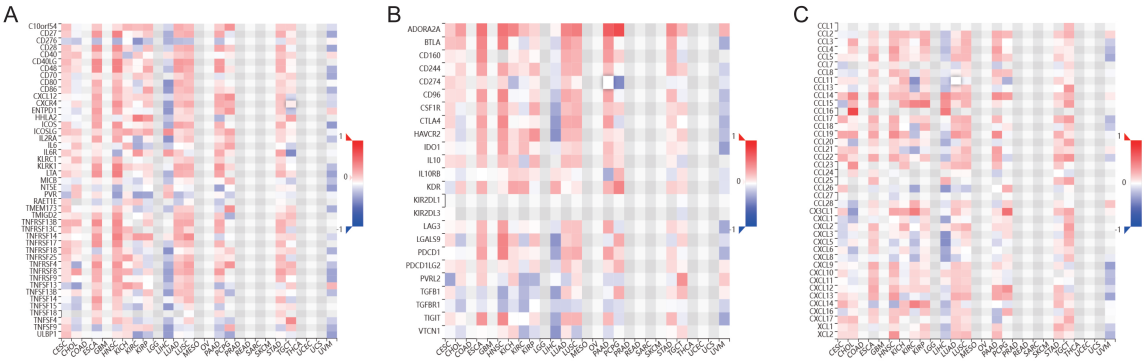
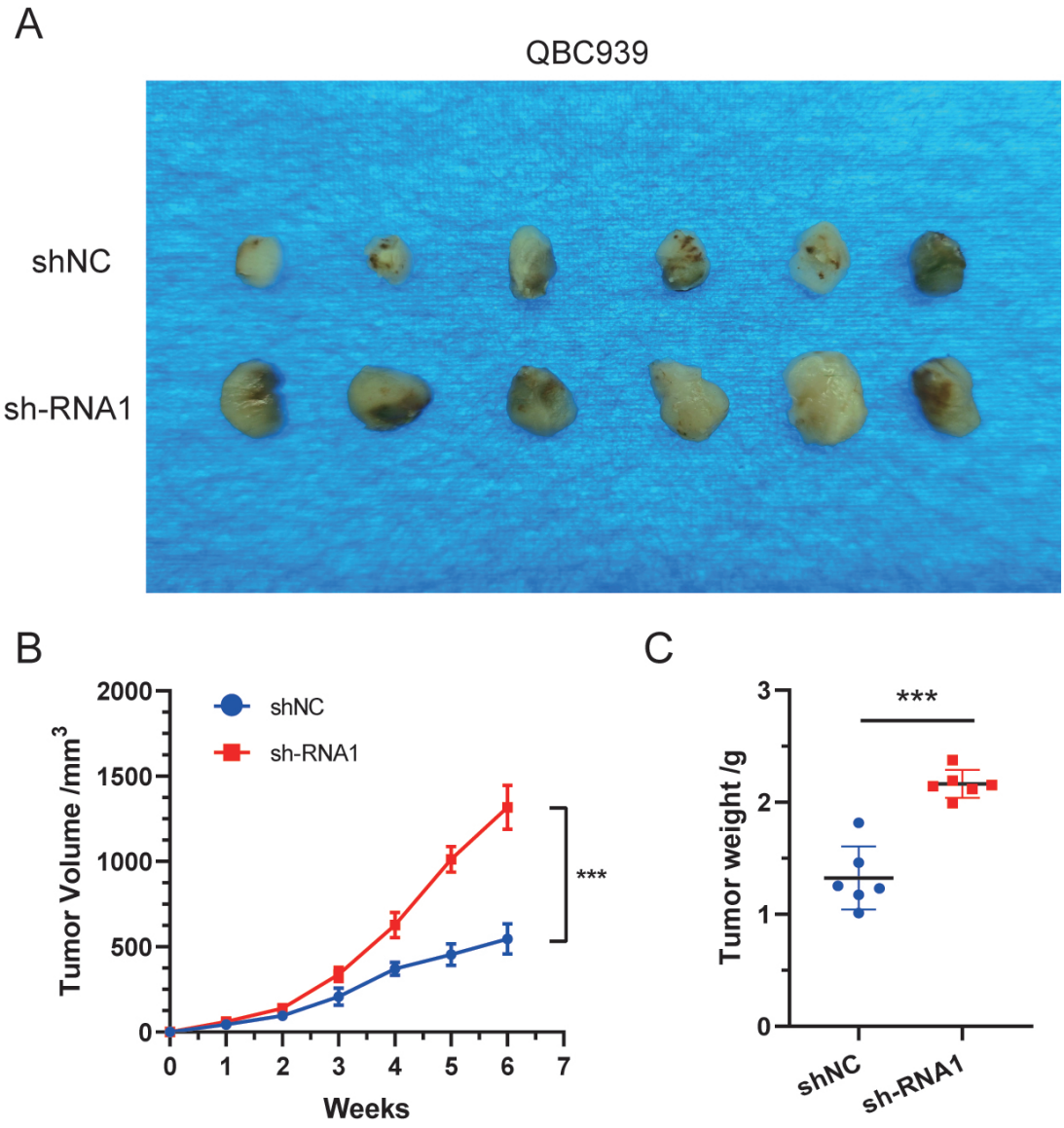


Supplementary Figure 1 UPB1 expressions in pan-cancer. (A) The analyses of UPB1 expression in several cancer types in GEPIA database. **(B)** Kaplan-Meier analyses showed patients with low UPB1 expression had inferior overall survival in cervical squamous cell carcinoma and endocervical adenocarcinoma (CESC), kidney clear cell carcinoma (KIRC), kidney papillary cell carcinoma (KIRP), lower grade glioma (LGG), liver hepatocellular carcinoma (LIHC), Lung adenocarcinoma (LUAD), pancreatic adenocarcinoma (PAAD) and skin cutaneous melanoma (SKCM).



Supplementary Figure 2 Correlations of UPB1 with immunomodulators in CCA. (A) Correlations between immunostimulators and UPB1 expression shown by TISIDB database. (B) Correlations between immunoinhibitors and UPB1 expression shown by TISIDB database. (C) Correlations between chemokines and UPB1 expression shown by TISIDB database.



Supplementary Figure 3 The deletion of UPB1 enhances tumor growth in vivo. (A) BALB/c-nudes (n=6 per group) were sacrificed 6 weeks after the injection and tumors dissected from respective groups were shown. **(B)** Tumor growth curves after the injection of QBC939/sh-RNA1 and control cells. Tumor volume was calculated every week. **(C)** Tumor weight was measured in UPB1-KD and control groups.

Supplementary Table 1 Sequences of primer oligonucleotide for Real-time quantitative polymerase chain reaction

Target		Sequence (5′- 3′)
UPB1	Forward Primer	GCGCGTTCTCTATGGCAAG
	Reverse Primer	CCGCTGCTTCAAAGGCATATC
BCL-2	Forward Primer	GGTGGGGTCATGTGTGTGG
	Reverse Primer	CGGTTCAGGTACTCAGTCATCC
BIRC5	Forward Primer	AGGACCACCGCATCTCTACAT
	Reverse Primer	AAGTCTGGCTCGTTCTCAGTG
CDK2	Forward Primer	GTACCTCCCCTGGATGAAGAT
	Reverse Primer	CGAAATCCGCTTGTTAGGGTC
CCNA2	Forward Primer	CGCTGGCGGTACTGAAGTC
	Reverse Primer	GAGGAACGGTGACATGCTCAT

Supplementary Table 2 The antibodies used in the study

Antibody/ Agent	Assay	Catalog	Origin	Dilution/ Concentration	Incubation period
UPB1	WB	H00051733-M09	Novus Biologicals (Centennial, USA)	1/1000	overnight, 4°C
	IHC			1/200	overnight, 4°C
CD25	WB	ab231441	Abcam (Cambridge,	1/500	overnight, 4°C

CD44	WB	ab254530	UK)	1/1000	overnight, 4°C
CD69	WB	ab233396		1/1000	overnight, 4°C
BCL-2	WB	ab182858		1/2000	overnight, 4°C
CDK2	WB	ab32147		1/2000	overnight, 4°C
CCNA2	WB	ab185619		1/1000	overnight, 4°C
Survivin	WB	ab76424		1/2000	overnight, 4°C
Ki-67	IHC	ab15580		1/1000	overnight, 4°C
E-Cad	IHC	ab40772		1/500	overnight, 4°C
CD31	IHC	ab28364		1/100	overnight, 4°C
CXCL10	IHC	Ab306587		1/1000	overnight, 4°C
GAPDH	WB	#5174	Cell Signaling Technology	1/1000	overnight, 4°C
Rabbit IgG, HRP	WB	#7074	(Danvers, USA)	1/2000	1h, 25°C
Mouse IgG, HRP	WB	#7076		1/2000	1h, 25°C

Supplementary Table 3 Correlation between UPB1 expression with clinicopathological characteristics of patients with cholangiocarcinoma

Clinicopathological variables	Patients(n=84)	UPB1 expression		P Value
		High (42)	Low (42)	
Gender				
Male	48	21	27	0.27
Female	36	21	15	
Age				
≧60	50	28	22	0.27
<60	34	14	20	
Differentiation				
Poor	52	20	32	**<0.05**
Well	32	22	10	
Lymphnodes metastasis				
Positive	40	14	26	**<0.05**
Negative	44	28	16	
Lymphovascular invasion				
Positive	30	13	17	0.49
Negative	54	29	25	
CA19-9				
≧300 ng/ml	51	29	22	0.18
< 300 ng/ml	33	13	20	
TNM stage				
Advanced (III & IV)	49	18	31	**<0.01**
Early (I & II)	35	24	11	

Supplementary Table 4 Univariate and multivariate Cox regression analysis of risk factors associated with overall survival

Clinicopathological variables	Univariate analysis	Multivariate analysis

	HR	95% CI	P Value	HR	95% CI	P Value
UPB1 expression (Low)	6.29	5.11-7.47	**<0.01**	4.82	3.51-6.13	**<0.01**
Gender (Male)	1.28	0.33-2.23	0.73			
Age (≧60)	1.38	0.35-2.41	0.68			
Differentiation (Poor)	2.13	1.04-3.22	**<0.05**	1.53	0.61-2.45	0.56
Lymphovascular invasion (Positive)	1.74	0.69-2.79	0.44			
Lymphnodes metastasis (Positive)	3.56	2.43-4.69	**<0.01**	2.64	1.47-3.81	**<0.05**
CA19-9 (≧300 ng/ml)	2.42	2.26-2.58	**<0.05**	2.09	0.96-3.22	0.08
TNM stage (Advanced)	4.92	3.79-6.05	**<0.01**	4.01	2.97-5.05	**<0.01**

Supplementary Table 5 Univariate and multivariate Cox regression analysis of risk factors associated with disease-free survival

Clinicopathological variables	Univariate analysis			Multivariate analysis		
	HR	95% CI	P Value	HR	95% CI	P Value
UPB1 expression (Low)	6.02	4.91-7.13	<0.01	4.21	3.16-5.26	<0.01
Gender (Male)	1.11	0.30-1.92	0.82			
Age (≧60)	1.32	0.41-2.23	0.69			
Differentiation (Poor)	2.61	1.48-3.74	<0.05	1.5	0.52-2.5	0.41

				3	4	
Lymphovascular invasion (Positive)	2.26	1.31-3.21	<0.05	1.78	0.72-2.84	0.23
Lymphnodes metastasis (Positive)	3.52	2.41-4.63	<0.01	2.26	1.14-3.38	<0.05
CA19-9 (≧300 ng/ml)	2.02	0.96-3.08	0.09			
TNM stage (Advanced)	4.57	3.34-5.80	<0.01	3.45	2.33-4.57	<0.01