Table S1 List of pan-cancer analyzed in this study.

TCGA code	Cancer type	Histology	Body location
ACC	Adrenocortical carcinoma	Carcinomas	Endocrine
BLCA	Bladder urothelial carcinoma	Carcinomas	Genitourinary
BRCA	Breast invasive carcinoma	Carcinomas	Breast
CESC	Cervical squamous cell carcinoma and endocervical adenocarcinoma	Carcinomas	Gynecology
CHOL	Cholangiocarcinoma (bile duct)	Carcinomas	Digestive
COAD	Colon adenocarcinoma	Carcinomas	Digestive
DLBC	Lymphoid Neoplasm Diffuse Large B-cell Lymphoma	lymphoma	Lymphoma
ESCA	Esophageal carcinoma	Carcinomas	Digestive
GBM	Glioblastoma multiforme	Sarcomas	Neurologic
HNSC	Head and neck squamous cell carcinoma	Carcinomas	Head and neck
KICH	Kidney chromophobe	Carcinomas	Genitourinary
KIRC	Kidney renal clear cell carcinoma	Carcinomas	Genitourinary
KIRP	Kidney renal papillary cell carcinoma	Carcinomas	Genitourinary
LAML	Acute myeloid leukemia	Leukemia	Hematologic
LGG	Brain lower grade glioma	Sarcoma	Neurologic
LIHC	Liver hepatocellular carcinoma	Carcinomas	Digestive
LUAD	Lung adenocarcinoma	Carcinomas	Respiratory
LUSC	Lung squamous cell carcinoma	Carcinomas	Respiratory
OV	Ovarian serous cystadenocarcinoma	Carcinomas	Gynecology
PAAD	Pancreatic adenocarcinoma	Carcinomas	Digestive
PCPG	Pheochromocytoma and paraganglioma (adrenal gland)		Endocrine
PRAD	Prostate adenocarcinoma	Carcinomas	Genitourinary
READ	Rectum adenocarcinoma	Carcinomas	Digestive
SARC	Sarcoma	Sarcoma	Gynecology
SKCM	Skin cutaneous melanoma		Skin
STAD	Stomach adenocarcinoma	Carcinomas	Digestive
TGCT	Testicular germ cell tumors	Carcinomas	Genitourinary
THCA	Thyroid carcinoma	Carcinomas	Endocrine
THYM	Thymoma	Lymphoma	Respiratory
UCEC	Uterine corpus endometrial carcinoma	Carcinomas	Gynecology
UCS	Uterine carcinosarcoma	Mixed type	Gynecology
UVM	Uveal melanoma	Carcinomas	Eye

Table S2 Univariate and Multivariate Cox regression analysis for the overall survival in the AML

| Characteristics	Total (N)	Univariate analysis		Multivariate analysis	
		Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value
Gender	140				
Female	63	Reference			
Male	77	1.030 (0.674–1.572)	0.892		
Age	140				
≤60	79	Reference			
>60	61	3.333 (2.164–5.134)	<0.001	2.498 (1.579–3.950)	<0.001
WBC count (x10^9/L)	139				
≤20	75	Reference			
>20	64	1.161 (0.760–1.772)	0.490		
BM blasts (%)	140				
≤20	59	Reference			
>20	81	1.165 (0.758–1.790)	0.486		
Cytogenetic risk	138				
Favorable	31	Reference			
Intermediate	76	2.957 (1.498–5.836)	0.002	1.719 (0.827–3.573)	0.147
Poor	31	4.157 (1.944–8.893)	<0.001	2.271 (1.016–5.074)	0.046
FLT3 mutation	136				
Negative	97	Reference			
Positive	39	1.271 (0.801–2.016)	0.309		
RAS mutation	139				
Negative	131	Reference			
Positive	8	0.643 (0.235–1.760)	0.390		
NPM1 mutation	139				
Negative	106	Reference			
Positive	33	1.137 (0.706–1.832)	0.596		
LPCAT3	140				
Low expression	70	Reference			
High expression	70	2.991 (1.908–4.688)	<0.001	2.183 (1.336–3.567)	0.002
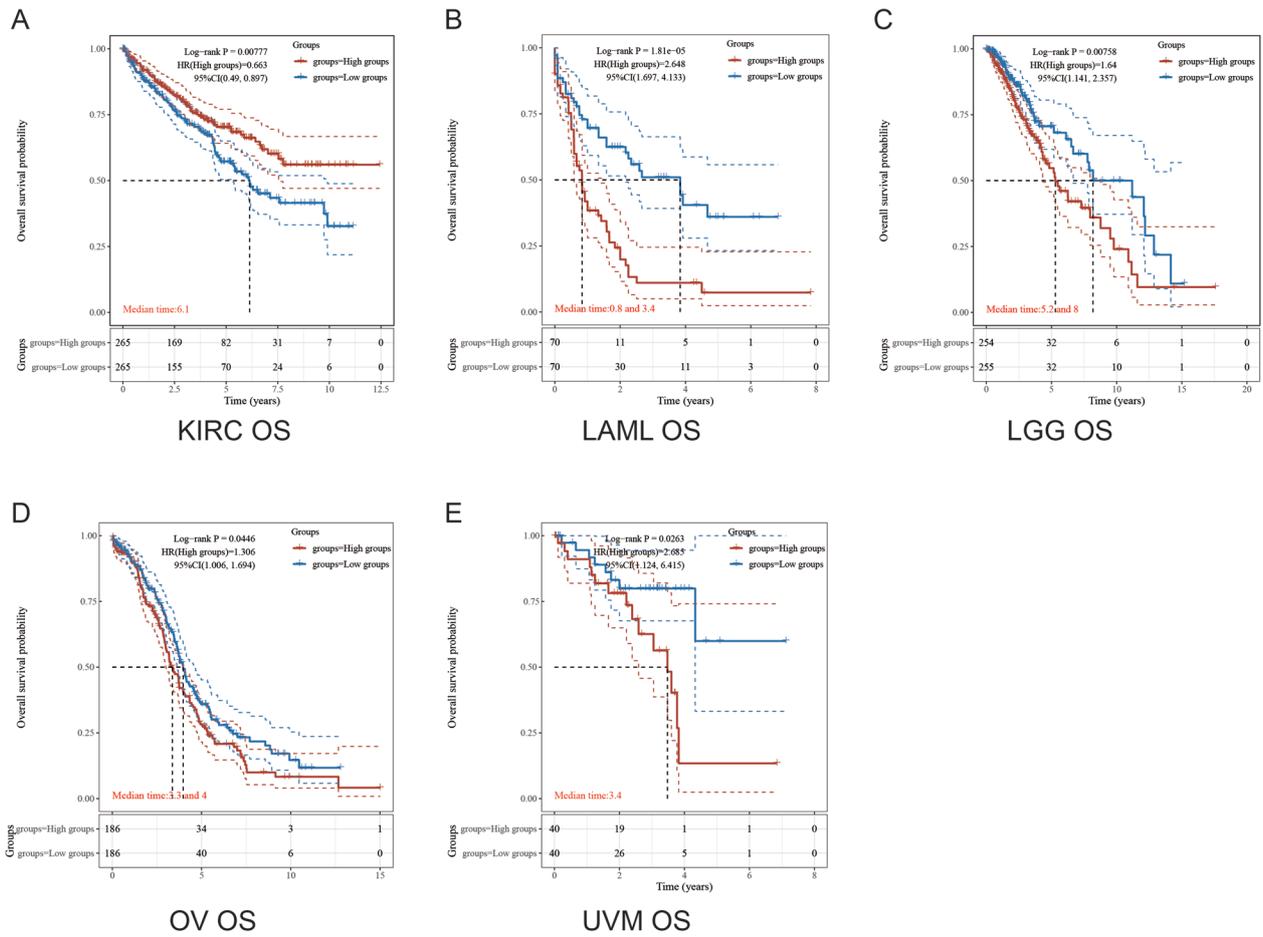
Figure S1 Kaplan-Meier survival analysis of the *LPCAT3* signature from TCGA dataset, comparison among different groups was made by log-rank test. HR (95%CI), the median survival time (LT50) for different groups. (A) OS in KIRC (B) OS in LAML (C) OS in LGG (D) OS in OV (E) OS in UVM.
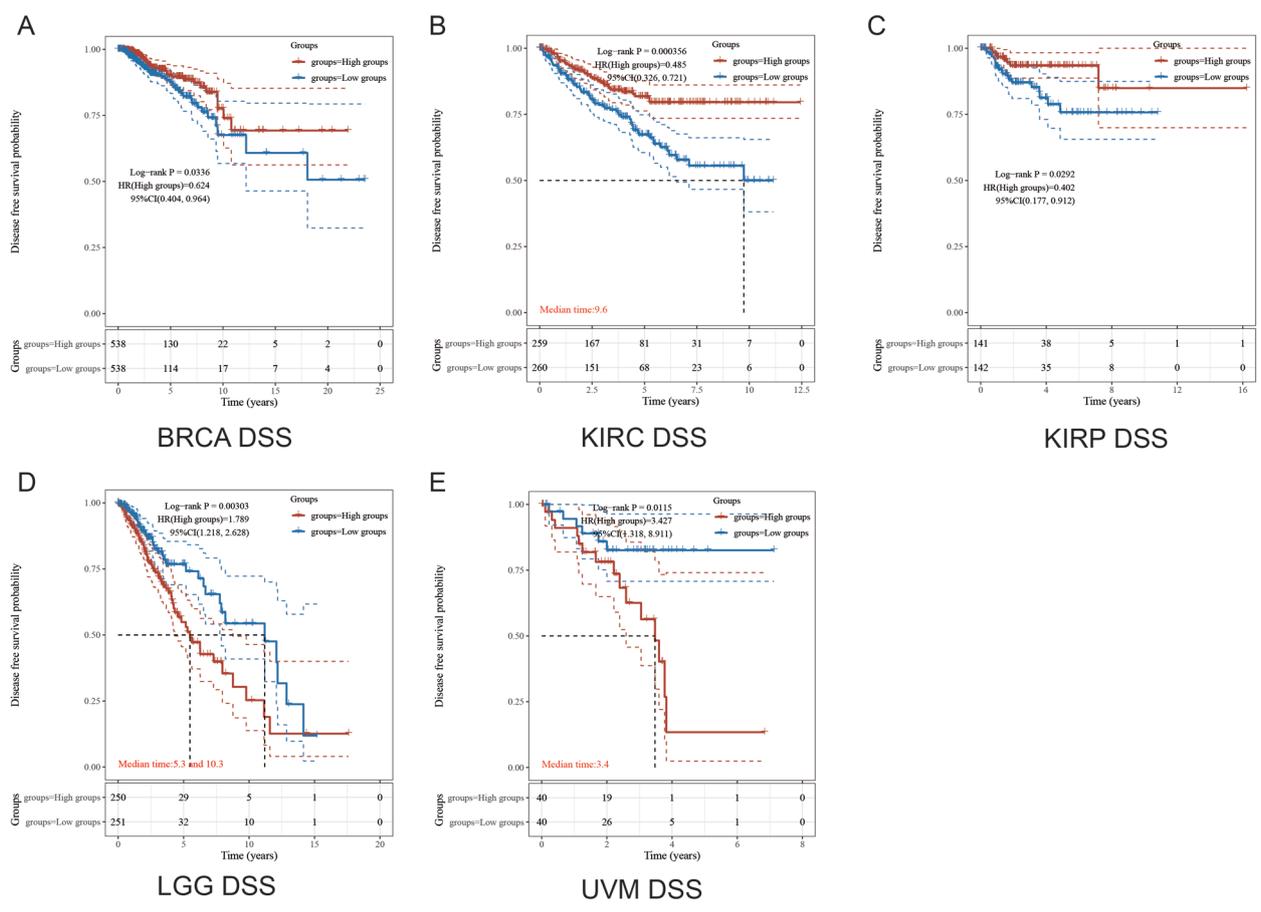
Figure S2 Kaplan-Meier survival analysis of the *LPCAT3* signature from TCGA dataset, comparison among different groups was made by log-rank test. HR (95%Cl), the median survival time (LT50) for different groups. (A) DSS in BRCA (B) DSS in KIRC (C) DSS in KIRP (D) DSS in LGG (E) DSS in UVM.
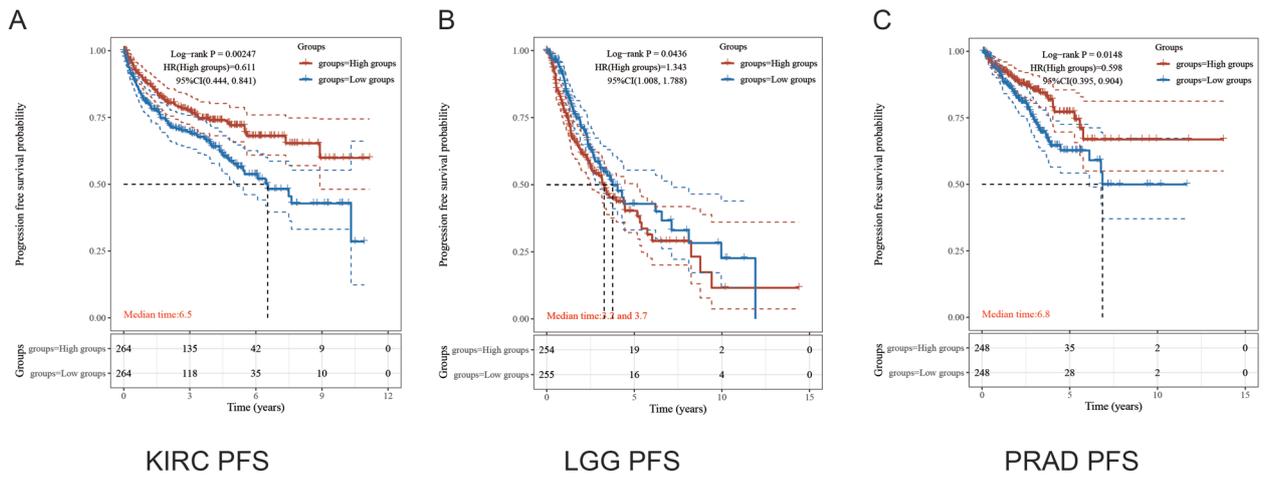
Figure S3 Kaplan-Meier survival analysis of the *LPCAT3* signature from TCGA dataset, comparison among different groups was made by log-rank test. HR (95%Cl), the median survival time (LT50) for different groups. (A) PFS in KIRC (B) PFS in LGG (C) PFS in PRAD.