Table S1:GEO datasets information

GEO ID	Platform	Organism	Tissue	Expression Profiling	Samples size	Recipent age (mean ± SD)	Recipent gender (M/F)	Donor source					Nephrectomies	PGF	DGF	IGF	Average follow-up time
								LD	DBD	DCD	AKI	non-AKI					
GSE21374	GPL570	Homo sapieNM	kidney biopsy	Microarray	282	NM	65/40	NM	NM	NM	NM	NM	NM	NM	NM	NM	774
GSE43974	GPL10558	Homo sapieNM	kidney biopsy	Microarray	554	NM	NM	27	82	38	NM	NM	NM	NM	NM	NM	NM
GSE37838	GPL570	Homo sapieNM	kidney biopsy	Microarray	78	53±13	43/27	NM	53	NM	NM	NM	8	NM	NM	NM	NM
GSE10419	GPL887	Homo sapieNM	kidney biopsy	Microarray	30	48±11	NM	15	NM	14	NM	NM	NM	NM	NM	NM	NM
GSE90861	GPL18573	Homo sapieNM	kidney biopsy	RNA-Seq	46	54±10	16/7	NM	16	7	NM	NM	NM	NM	11	12	NM
GSE53769	GPL16686	Homo sapieNM	kidney biopsy	Microarray	36	48±11	12/22	NM	NM	NM	16	NM	NM	20	NM	NM	NM
GSE61739	GPL13158	Homo sapieNM	kidney biopsy	Microarray	96	53±13	NM	NM	NM	NM	48	48	NM	NM	NM	NM	NM
GSE30718	GPL570	Homo sapieNM	kidney biopsy	Microarray	47	NM	NM	NM	NM	NM	28	NM	8	NM	NM	NM	NM

DBD, donors after brain death; DCD, donors after cardiac death; LD, living donors; AKI, acute kidney injury; PGF, primary graft function; DGF, delayed graft function; IGF, immediate graft function; NM, not mentioned

Table S2: GEO datasets information of four subclasses

	GSE10419	GSE21374	GSE30718	GSE37838	GSE43974	GSE53769	GSE61739	GSE90861
PCD-A	7	114	6	15	48	12	32	11
PCD-B	8	23	0	17	92	0	13	14
PCD-C	7	49	3	21	23	2	16	4
PCD-D	7	96	2	17	40	4	35	17

Table S3:The RiskScore formula

PCD pattern	Formula
Lysosome-dependent cell death	-0.959*CTNS+1.475*CTSO+1.22*DNASE2+0.855*GGA3+1.033*HEXB+1.596*STXBP1
Autophagy	-1.407*CPTP+1.45*FEZ2+-0.788*KLHL3+1.931*NOD1+-1.444*ORMDL3
Apoptosis	3.41*ITGA6+0.862*ITM2C+-1.895*MADD+2.592*POLB+0.869*TGFB1+1.363*TNFRSF12A
Anoikis	0.844*BAX+-1.128*BRAF+3.244*ITGA6+1.182*ATF4+1.817*PIK3R3+0.703*MUC1+ -0.426*NQO1+3.089*EEF1A1+1.003*RHOB
Entosis	-0.241*PCK2+-1.426*MTOR+0.269*GZMB+1.606*CTNNA1
Methuosis	1.984*RAC1+-1.108*GIT1+-1.597*MTOR
Paraptosis	-1.41*TAAR5+2.074*NT5C+-0.794*SSTR3+-0.814*ATP23+0.287*CFD+0.538*XBP1+0.881*TNFRSF19
Immunogenic cell death	1.318*BAX+0.639*CD8A+0.757*EIF2AK3+3.642*HMGB1+ -0.922*IFNG+0.947*IL1B+-0.791*IL6+1.095*NT5E
NETosis	1.393*HMGB1+-1.132*AGER+0.556*TGFB1
Oxeiptosis	-1.305*KEAP1+-0.415*AIFM1
Entoticcelldeath	1.797*CTNNA1+0.377*CYBB
Parthanatos	-0.847*MIF+-0.551*OGG1
Cuproptosis	-0.655*GLS+0.976*DBT
Necroptosis	-1.385*FTH1+1.234*BAX+1.983*CAPN2+0.78*IL1B+1.796*STAT6+ -1.886*VDAC2+-3.169*CHMP7
Ferroptosis	1.85*FANCD2+1.533*G6PD+-0.421*NQO1+-1.363*PCBP2+-0.954*PEBP1+-2.775*PGD+-0.964*TFRC
Pyroptosis	0.827*BAX+1.258*CHMP4C+-4.006*CHMP7+2.663*HMGB1+-1.059*IL1A+1.983*NOD1+2.086*PLCG1+-0.836*PRKACA+1.205*TNF