



*Research article*

**An integrative prognostic and immune analysis of PTPRD in cancer**

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**Supplementary**

**Table S1.** Differential expression levels of PTPRD in pan-cancer by the TIMER database.

Tumor	Normal	p
LUAD.Tumor (n = 515)	LUAD.Normal (n = 59)	3.86E-18
UCEC.Tumor (n = 545)	UCEC.Normal (n = 35)	6.46E-11
KIRC.Tumor (n = 533)	KIRC.Normal (n = 72)	8.67E-09
BLCA.Tumor (n = 408)	BLCA.Normal (n = 19)	1.35E-08
HNSC-HPV+.Tumor (n = 97)	HNSC-HPV-.Tumor (n = 421)	2.51E-06
LIHC.Tumor (n = 371)	LIHC.Normal (n = 50)	2.64E-06
LUSC.Tumor (n = 501)	LUSC.Normal (n = 51)	1.58E-05
GBM.Tumor (n = 153)	GBM.Normal (n = 5)	1.96E-04
THCA.Tumor (n = 501)	THCA.Normal (n = 59)	3.40E-04
PRAD.Tumor (n = 497)	PRAD.Normal (n = 52)	1.90E-03
CESC.Tumor (n = 304)	CESC.Normal (n = 3)	0.006
HNSC.Tumor (n = 520)	HNSC.Normal (n = 44)	0.010

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Tumor	Normal	p
STAD.Tumor (n = 415)	STAD.Normal (n = 35)	0.017
COAD.Tumor (n = 457)	COAD.Normal (n = 41)	0.079
SKCM.Tumor (n = 103)	SKCM.Metastasis (n = 368)	0.097
BRCA.Tumor (n = 1093)	BRCA.Normal (n = 112)	0.100
PCPG.Tumor (n = 179)	PCPG.Normal (n = 3)	0.139
PAAD.Tumor (n = 178)	PAAD.Normal (n = 4)	0.207
ESCA.Tumor (n = 184)	ESCA.Normal (n = 11)	0.392
KICH.Tumor (n = 66)	KICH.Normal (n = 25)	0.673
READ.Tumor (n = 166)	READ.Normal (n = 10)	0.766
CHOL.Tumor (n = 36)	CHOL.Normal (n = 9)	0.878

**Table S2.** the relationship between PTPRD expression and prognosis of patients with different cancers using the PrognScan database.

Dataset	Cancer type	Endpoint	Array type	Probe ID	N	P	HR
GSE3494-GPL96	Breast cancer	DSS	HG-U133A	214043_at	236	0.003	0.64 [0.48–0.86]
GSE2034	Breast cancer	DMFS	HG-U133A	214043_at	286	0.030	1.31 [1.03–1.67]
GSE2034	Breast cancer	DMFS	HG-U133A	205712_at	286	0.165	1.23 [0.92–1.66]
GSE4922-GPL96	Breast cancer	DFS	HG-U133A	214043_at	249	0.353	0.88 [0.68–1.15]
GSE30929	Liposarcoma	DRFS	HG-U133A	214043_at	140	0.003	1.42 [1.13–1.78]
GSE30929	Liposarcoma	DRFS	HG-U133A	205712_at	140	0.012	1.83 [1.14–2.95]
GSE8894	NSCLC	RFS	HG-U133_Plus_2	242493_at	138	0.029	0.00 [0.00–0.56]
GSE8894	NSCLC	RFS	HG-U133_Plus_2	205712_at	138	0.365	1.10 [0.89–1.35]
GSE8894	NSCLC	RFS	HG-U133_Plus_2	214043_at	138	0.576	1.04 [0.90–1.21]
GSE9891	Ovarian cancer	OS	HG-U133_Plus_2	214043_at	278	0.001	1.27 [1.10–1.46]
GSE26712	Ovarian cancer	OS	HG-U133_Plus_2	214043_at	185	0.002	1.38 [1.13–1.69]
GSE9891	Ovarian cancer	OS	HG-U133_Plus_2	205712_at	278	0.017	1.40 [1.06–1.85]
GSE9891	Ovarian cancer	OS	HG-U133_Plus_2	242493_at	278	0.510	1.86 [0.29–11.86]

\*Note: OS: Overall survival; DSS: Disease-specific survival; DFS: Disease-free survival; RFS: Relapse-free survival; DMFS: Distant metastasis-free survival; NSCLC: Non-small cell lung cancer.

**Table S3.** A combined study containing 10,967 samples from 32 studies was extracted from the TCGA database for the genetic alteration analysis in pan-cancer.

Cancer study	Sample number
Acute Myeloid Leukemia (TCGA, PanCancer Atlas)	200
Adrenocortical Carcinoma (TCGA, PanCancer Atlas)	92
Bladder Urothelial Carcinoma (TCGA, PanCancer Atlas)	411
Brain Lower Grade Glioma (TCGA, PanCancer Atlas)	514
Breast Invasive Carcinoma (TCGA, PanCancer Atlas)	1084

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Cancer study	Sample number
Cervical Squamous Cell Carcinoma (TCGA, PanCancer Atlas)	297
Cholangiocarcinoma (TCGA, PanCancer Atlas)	36
Colorectal Adenocarcinoma (TCGA, PanCancer Atlas)	594
Diffuse Large B-Cell Lymphoma (TCGA, PanCancer Atlas)	48
Esophageal Adenocarcinoma (TCGA, PanCancer Atlas)	182
Glioblastoma Multiforme (TCGA, PanCancer Atlas)	592
Head and Neck Squamous Cell Carcinoma (TCGA, PanCancer Atlas)	523
Kidney Chromophobe (TCGA, PanCancer Atlas)	65
Kidney Renal Clear Cell Carcinoma (TCGA, PanCancer Atlas)	512
Kidney Renal Papillary Cell Carcinoma (TCGA, PanCancer Atlas)	283
Liver Hepatocellular Carcinoma (TCGA, PanCancer Atlas)	372
Lung Adenocarcinoma (TCGA, PanCancer Atlas)	566
Lung Squamous Cell Carcinoma (TCGA, PanCancer Atlas)	487
Mesothelioma (TCGA, PanCancer Atlas)	87
Ovarian Serous Cystadenocarcinoma (TCGA, PanCancer Atlas)	585
Pancreatic Adenocarcinoma (TCGA, PanCancer Atlas)	184
Pheochromocytoma and Paraganglioma (TCGA, PanCancer Atlas)	178
Prostate Adenocarcinoma (TCGA, PanCancer Atlas)	494
Sarcoma (TCGA, PanCancer Atlas)	255
Skin Cutaneous Melanoma (TCGA, PanCancer Atlas)	448
Stomach Adenocarcinoma (TCGA, PanCancer Atlas)	440
Testicular Germ Cell Tumors (TCGA, PanCancer Atlas)	149
Thymoma (TCGA, PanCancer Atlas)	123
Thyroid Carcinoma (TCGA, PanCancer Atlas)	500
Uterine Carcinosarcoma (TCGA, PanCancer Atlas)	57
Uterine Corpus Endometrial Carcinoma (TCGA, PanCancer Atlas)	529
Uveal Melanoma (TCGA, PanCancer Atlas)	80

**Table S4.** A combined cohort of 2185 immune checkpoint blockade (ICB)-treated samples.

Cancer study	Sample number
TMB and Immunotherapy (MSKCC, Nat Genet 2019)	1661
MSS Mixed Solid Tumors (Broad/Dana-Farber, Nat Genet 2018)	249
Non-Small Cell Lung Cancer (MSKCC, J Clin Oncol 2018)	240
Lung Adenocarcinoma (MSKCC, Science 2015)	35

**Table S5.** The top 50 PTPRD-related genes in the protein-protein interaction network using the STRING database.

#Node1	Node2	Node1_string_id	Node2_string_id	Combined score
PTPRD	SLITRK1	9606.ENSP00000370593	9606.ENSP00000366288	0.96
IL1RAPL1	PTPRD	9606.ENSP00000368278	9606.ENSP00000370593	0.811
PTPRD	SLITRK2	9606.ENSP00000370593	9606.ENSP00000359521	0.809
IRS1	PTPRD	9606.ENSP00000304895	9606.ENSP00000370593	0.521
PPFIA1	PTPRD	9606.ENSP00000253925	9606.ENSP00000370593	0.52
BMX	PTPRD	9606.ENSP00000350224	9606.ENSP00000370593	0.45
EPHA8	PTPRD	9606.ENSP00000166244	9606.ENSP00000370593	0.45
PTPRD	TBK1	9606.ENSP00000370593	9606.ENSP00000329967	0.45
PTPRD	STAT3	9606.ENSP00000370593	9606.ENSP00000264657	0.413
PPFIA2	PTPRD	9606.ENSP00000450337	9606.ENSP00000370593	0.412
PPFIA3	PTPRD	9606.ENSP00000335614	9606.ENSP00000370593	0.412
MTSS1	PTPRD	9606.ENSP00000322804	9606.ENSP00000370593	0.379
NFASC	NRCAM	9606.ENSP00000344786	9606.ENSP00000368314	0.379
PTPRD	PTPRS	9606.ENSP00000370593	9606.ENSP00000349932	0.379
PTPRD	TSSK2	9606.ENSP00000370593	9606.ENSP00000382544	0.378
PTPRD	SMTNL2	9606.ENSP00000370593	9606.ENSP00000373964	0.378
ABLIM1	PTPRD	9606.ENSP00000277895	9606.ENSP00000370593	0.373
AURKA	PTPRD	9606.ENSP00000216911	9606.ENSP00000370593	0.373
CSNK1D	PTPRD	9606.ENSP00000324464	9606.ENSP00000370593	0.373
CSNK1E	PTPRD	9606.ENSP00000380044	9606.ENSP00000370593	0.373
DDX54	PTPRD	9606.ENSP00000323858	9606.ENSP00000370593	0.373
MARK2	PTPRD	9606.ENSP00000385751	9606.ENSP00000370593	0.373
NEK1	PTPRD	9606.ENSP00000424757	9606.ENSP00000370593	0.373
NEK2	PTPRD	9606.ENSP00000355966	9606.ENSP00000370593	0.373
NEK6	PTPRD	9606.ENSP00000362702	9606.ENSP00000370593	0.373
PLK1	PTPRD	9606.ENSP00000300093	9606.ENSP00000370593	0.373
PTPRD	SLAIN2	9606.ENSP00000370593	9606.ENSP00000264313	0.373
LRRC4B	PTPRD	9606.ENSP00000471502	9606.ENSP00000370593	0.299
PTPRA	PTPRD	9606.ENSP00000369756	9606.ENSP00000370593	0.294
PTPRD	PTPRE	9606.ENSP00000370593	9606.ENSP00000254667	0.294
PTPRD	PTPRF	9606.ENSP00000370593	9606.ENSP00000353030	0.294
FN1	PTPRD	9606.ENSP00000346839	9606.ENSP00000370593	0.29
IRS2	PTPRD	9606.ENSP00000365016	9606.ENSP00000370593	0.268
IRS4	PTPRD	9606.ENSP00000361202	9606.ENSP00000370593	0.268
LRRK2	PTPRD	9606.ENSP00000298910	9606.ENSP00000370593	0.267
PTPRD	USH2A	9606.ENSP00000370593	9606.ENSP00000305941	0.267
DSC3	PTPRD	9606.ENSP00000353608	9606.ENSP00000370593	0.265
CHL1	PTPRD	9606.ENSP00000256509	9606.ENSP00000370593	0.264
CNTN1	PTPRD	9606.ENSP00000447006	9606.ENSP00000370593	0.264

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#Node1	Node2	Node1_string_id	Node2_string_id	Combined score
CNTN2	PTPRD	9606.ENSP00000330633	9606.ENSP00000370593	0.264
CNTN3	PTPRD	9606.ENSP00000263665	9606.ENSP00000370593	0.264
CNTN4	PTPRD	9606.ENSP00000380602	9606.ENSP00000370593	0.264
CNTN5	PTPRD	9606.ENSP00000435637	9606.ENSP00000370593	0.264
CNTN6	PTPRD	9606.ENSP00000407822	9606.ENSP00000370593	0.264
L1CAM	PTPRD	9606.ENSP00000359077	9606.ENSP00000370593	0.264
NFASC	PTPRD	9606.ENSP00000344786	9606.ENSP00000370593	0.264
NRCAM	PTPRD	9606.ENSP00000368314	9606.ENSP00000370593	0.264
ARRDC1	PTPRD	9606.ENSP00000360475	9606.ENSP00000370593	0.262
ARRDC2	PTPRD	9606.ENSP00000222250	9606.ENSP00000370593	0.262
ARRDC3	PTPRD	9606.ENSP00000265138	9606.ENSP00000370593	0.262
ARRDC4	PTPRD	9606.ENSP00000268042	9606.ENSP00000370593	0.262

**Table S6.** The top 100 genes related to PTPRD expression in the GEPIA2 database.

Gene Symbol	Gene ID	PCC
PTPRD-AS1	ENSG00000225706.1	0.75
QKI	ENSG00000112531.16	0.59
NRXN1	ENSG00000179915.20	0.58
RP11-566E18.1	ENSG00000279348.1	0.58
GATS	ENSG00000239521.7	0.58
KIF1B	ENSG00000054523.16	0.57
KLHL32	ENSG00000186231.16	0.57
PURG	ENSG00000172733.11	0.57
AMER2	ENSG00000165566.12	0.57
WDFY3-AS2	ENSG00000180769.8	0.57
ID2-AS1	ENSG00000235092.5	0.57
SOGA3	ENSG00000255330.8	0.57
APC	ENSG00000134982.16	0.57
TMOD2	ENSG00000128872.9	0.57
SYT11	ENSG00000132718.8	0.56
SPAG9	ENSG00000008294.20	0.56
SEPT8	ENSG00000164402.13	0.56
GPM6A	ENSG00000150625.16	0.56
ADAM22	ENSG00000008277.14	0.56
PRKCA	ENSG00000154229.11	0.56
PCYT1B	ENSG00000102230.13	0.56
NKAIN3	ENSG00000185942.11	0.55
FAM168A	ENSG00000054965.10	0.55
RFTN2	ENSG00000162944.10	0.55
GPM6B	ENSG00000046653.14	0.55
ADCYAP1R1	ENSG00000078549.14	0.55

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Gene Symbol	Gene ID	PCC
UG0898H09	ENSG00000274956.2	0.55
NCAM1	ENSG00000149294.16	0.55
PHYHIPL	ENSG00000165443.11	0.55
NRXN2	ENSG00000110076.18	0.54
FUT9	ENSG00000172461.10	0.54
DCLK2	ENSG00000170390.14	0.54
MAP2	ENSG00000078018.19	0.54
OTUD7A	ENSG00000169918.9	0.54
FMNL2	ENSG00000157827.19	0.54
PEA15	ENSG00000162734.12	0.54
CLASP2	ENSG00000163539.15	0.54
LRRTM3	ENSG00000198739.10	0.54
SCHIP1	ENSG00000151967.18	0.54
GPR75	ENSG00000119737.5	0.54
AP000708.1	ENSG00000255537.1	0.54
RP11-9G1.3	ENSG00000250241.5	0.54
KCNJ10	ENSG00000177807.6	0.54
GABBR1	ENSG00000204681.10	0.54
CTNND2	ENSG00000169862.18	0.54
CADM2	ENSG00000175161.13	0.53
TMEM257	ENSG00000221870.2	0.53
TMX2-CTNND1	ENSG00000254462.1	0.53
APC2	ENSG00000115266.11	0.53
WASF3	ENSG00000132970.12	0.53
PKI55	ENSG00000260804.3	0.53
THRA	ENSG00000126351.12	0.53
CDH10	ENSG00000040731.10	0.53
NLGN2	ENSG00000169992.9	0.53
MAPK10	ENSG00000109339.18	0.53
SLITRK2	ENSG00000185985.8	0.53
LINC00320	ENSG00000224924.6	0.53
NAP1L3	ENSG00000186310.9	0.53
DENND5A	ENSG00000184014.7	0.53
SCD5	ENSG00000145284.11	0.52
GNAO1	ENSG00000087258.13	0.52
CDH20	ENSG00000101542.9	0.52
NACC2	ENSG00000148411.7	0.52
JAKMIP2	ENSG00000176049.15	0.52
LINC00461	ENSG00000245526.8	0.52
GAREML	ENSG00000157833.12	0.52
APBB1	ENSG00000166313.18	0.52

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Gene Symbol	Gene ID	PCC
C8orf46	ENSG00000169085.11	0.52
BBS2	ENSG00000125124.11	0.52
CACNG7	ENSG00000105605.7	0.52
ADGRB3	ENSG00000135298.13	0.52
PNMA2	ENSG00000240694.8	0.52
RAB41	ENSG00000147127.8	0.52
APBA2	ENSG00000034053.14	0.52
SH3GL2	ENSG00000107295.9	0.52
NTRK2	ENSG00000148053.15	0.52
ASTN1	ENSG00000152092.15	0.52
RP11-731J8.2	ENSG00000260918.1	0.52
MTURN	ENSG00000180354.15	0.52
ADGRL3	ENSG00000150471.15	0.52
ARHGEF26-AS1	ENSG00000243069.7	0.52
FAM219A	ENSG00000164970.14	0.52
AC004158.3	ENSG00000260664.2	0.52
SNN	ENSG00000184602.5	0.52
RP11-266K4.14	ENSG00000275367.1	0.52
RP11-441F2.5	ENSG00000272372.1	0.52
LDOC1L	ENSG00000188636.3	0.51
BDNF-AS	ENSG00000245573.7	0.51
HEPACAM	ENSG00000165478.6	0.51
MTSS1L	ENSG00000132613.14	0.51
TRIM9	ENSG00000100505.13	0.51
B3GAT1	ENSG00000109956.12	0.51
SHISA7	ENSG00000187902.11	0.51
POU6F1	ENSG00000184271.15	0.51
ABAT	ENSG00000183044.11	0.51
ATP6V1G2	ENSG00000213760.10	0.51
TMEM178B	ENSG00000261115.5	0.51
C6orf3	ENSG00000255389.1	0.51
ZEB1	ENSG00000148516.21	0.51
ZHX3	ENSG00000174306.21	0.51



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