

Supplementary Table S1. The clinical features of the 185 CRC patients

Characteristics	No. of patients (%) (n =185)
Age (years)	
Median(IQR)	66 (27-90)
Mean(sd)	65.03 (11.17%)
< 60, n, %	53 (28.6%)
≥ 60, n, %	131 (70.9%)
Unknown, n, %	1 (0.05%)
Sex, n, %	
Female	81 (43.7%)
Male	104 (56.3%)
Tumor location, n, %	
Colon	111 (60.0%)
Rectum	74 (40.0%)
Histological grade, n, %	
Well differentiated	35 (19.2%)
Moderately differentiated	116 (62.7%)
Poorly differentiated	34 (18.1%)
Local invasion, n, %	
T1–T2	31 (17.0%)
T3–T4	154 (83.0%)
Lymph node metastasis, n, %	
N0	115 (62.1%)
N1	47 (25.8%)
N2	23 (12.1%)
Distant metastasis, n, %	
M0	179 (96.7%)
M1	6 (3.3%)
TNM stage, n, %	
I	24 (12.9%)
II	90 (48.4%)
III	65 (35.1%)
IV	6 (3.6%)

Lymph node count		
	Median(IQR)	6 (1-19)
	Mean(sd)	6.69 (3.84)
Lymph node ratio		
	Median(IQR)	0 (0-9)
	Mean(sd)	1.13 (1.94)
Tumor volume(cm3)		
	Median(IQR)	0 (0-9)
	Mean(sd)	1.13 (1.94)
Folllow-up(months)		
	Median(IQR)	26.25 (1.5-576)
	Mean(sd)	43.58 (57.62)
Survival status, n, %		
	Alive	104 (56.2%)
	Dead	81 (43.8%)

Supplementary Table S2. The primer sequence of genes in this study.

Gene	Primer Sequence	Product Lengths
PRDX1	R: 5'- CCACGGAGATCATTGCTTTCA -3'	150bp
	F: 5'- AGGTGTATTGACCCATGCTAGAT-3'	
CD44	R: 5'- ATCATCTTGGCATCCCTCTTG -3'	177bp
	F: 5'- CACCATTTCCTGAGACTTGCTG -3'	
CD133	R: 5'- ACAATCCTGTTATGACAAGCCCA -3'	126bp
	F: 5'- GGAAAGTCCTTGTAGACCCAGAAA -3'	
EPCAM	R: 5'- CAAGGACACTGAAATAACCTGCTC -3'	124bp
	F: 5'- CTCCTTCTGAAGTGCAGTCCG -3'	
PHLPP2	R: 5'- CTTACATCTCGTCCTTTGCACT -3'	135bp
	F: 5'- GGTCGTTTCAGTAGGTTCCAGTC-3'	
GCLC	R: 5'- GGGAGGAAACCAAGCGCCAT -3'	79bp

	F: 5'- CTTGACGGCGTGGTAGATGT -3'	
TXN	R: 5'- GTGAAGCAGATCGAGAGCAAG -3'	87bp
	F: 5'- CGTGGCTGAGAAGTCAACTACTA -3'	
GPX2	R: 5'- GAATGGGCAGAACGAGCATC -3'	164bp
	F: 5'- CCGGCCCTATGAGGAACTTC -3'	
GCLM	R: 5'- CAAGGACACTGAAATAACCTGCTC -3'	96bp
	F: 5'- CTCCTTCTGAAGTGCAGTCCG -3'	
SRXN1	R: 5'- CAGGGAGGTGACTACTTCTACTC -3'	126bp
	F: 5'- CAGGTACACCCTTAGGTCTGA -3'	

Supplementary Table S3. Association between the expression of PHLPP2 and clinicopathologic characteristics of patients with CRC

Characteristics	No. of patients (%) n =185	PHLPP2 expression		t/ χ^2	p value ^a
		Low(%) n=82	High(%) n=103		
Age (years)					
Median(IQR)	66 (27-90)	66 (27-90)	61 (30-85)		
Mean \pm sd	65.03 \pm 11.17	68.03 \pm 10.05	62.61 \pm 9.34	3.971	<0.0001 ^d
< 60, n, %	85 (45.9%)	27 (31.7%)	58 (56.3%)		
\geq 60, n, %	99 (53.5%)	55 (68.3%)	44 (42.7%)		0.001 ^e
Unknown, n, %	1 (0.06%)	0 (0.00%)	1 (0.10%)		

Sex, n, %

Female	81 (43.7%)	41 (50.0%)	40 (38.8%)	1.881	0.170 ^b
Male	104 (56.3%)	41 (50.0%)	63 (61.2%)		

Tumor location, n, %

Colon	111 (60.0%)	56 (68.2%)	55 (53.3%)	3.622	0.057 ^b
Rectum	74 (40.0%)	26 (31.8%)	48 (46.7%)		

Histological grade, n, %

Well	35 (19.2%)	15 (17.6%)	20 (19.4%)	9.446	0.008 ^b
Moderately	116 (62.7%)	44 (53.6%)	72 (69.9%)		
Poorly	34 (18.1%)	23 (28.8%)	11 (10.7%)		

Local invasion, n, %

T1–T2	31 (17.0%)	13 (16.2%)	18 (17.4%)	0.009	0.924 ^b
T3–T4	154 (83.0%)	69 (83.8%)	85 (82.6%)		
Lymph node metastasis, n, %					
N0	115 (62.1%)	39 (47.5%)	76 (62.1%)	<0.0001 ^c	
N1	47 (25.8%)	22 (26.8%)	25 (25.8%)		
N2	23 (12.1%)	21 (25.7%)	2 (12.1%)		
Distant metastasis, n, %					
M0	179 (96.7%)	78 (95.1%)	101 (98.0%)	0.405 ^c	
M1	6 (3.3%)	4 (4.9%)	2 (2.0%)		
TNM stage, n, %					
I	24 (12.9%)	8 (9.7%)	16 (15.5%)	0.001 ^c	

II	90 (48.4%)	30 (36.5%)	60 (58.2%)		
III	65 (35.1%)	40 (48.7%)	25 (24.2%)		
IV	6 (3.6%)	4 (5.1%)	2 (2.1%)		
Lymph node count					
Median(IQR)	6 (1-19)	6 (1-19)	5(1-17)		
Mean(sd)	6.69 (3.84)	7.28±3.84	6.21±3.73	1.915	0.056 ^d
Lymph node ratio					
Median(IQR)	0 (0-9)	0.17 (0-9)	0 (0-0.67)		
Mean(sd)	1.13 (1.94)	0.33±0.36	0.06±0.12		
Tumor volume(cm3)					
Median(IQR)	26.25 (1.5-576)	36.00 (4.5-576)	22.57 (1.5-256)		
Mean(sd)	43.58 (57.62)	49.89±67.96	38.54±1.94	7.134	<0.0001 ^d

Folllow-up(months)					
Median(IQR)	66 (1.0-97)	26.25 (1.0-97)	75 (1.0-97)		
Mean(sd)	64.95 (57.62)	49.26±31.20	65.36±24.93	3.901	<0.0001 ^d
Survival status, n, %					
Alive	104 (56.2%)	33 (40.2%)	71 (68.9%)		
Dead	81 (43.8%)	49 (59.8%)	32 (31.1%)	14.122	<0.0001 ^b

^a Pearson chi-square test(^b), Fisher exact test(^c) and t test(^d) was used for comparison between subgroups.

Bold type indicates statistical significance.

Supplementary Table S4. Univariate and multivariate analyses of PHLPP2 expression and overall survival of patients in the study cohort

Variables	Categories	Univariate analysis			Multivariate analysis				
		HR	95% CI	P value	HR	95% CI	P value		
Age(≥ 60 / < 60 years)		1.008	0.987	1.029	0.453				
Sex (Female/male)		0.965	0.621	1.498	0.873				
Tumor site(Colon/Rectal)		0.803	0.51	1.262	0.341				
Local invasion(T1-T2/T3-T4)		1.884	0.942	3.771	0.073				
Lymph node metastasis(ref, N0)						1.618	1.135	2.307	0.008
	N1	2.685	1.623	4.441	0				
	N2	4.659	2.653	8.185	0				
Distant metastasis(M0/M1)		4.435	1.907	10.311	0.001	1.412	1.019	1.956	0.038
TNM stage(ref, I)						1.705	1.19	2.444	0.004
	II	1.749	0.677	4.522	0.248				

	III	4.964	1.958	12.583	0.001				
	IV	11.493	3.467	38.103	0				
Histological grade(ref, Well)						1.114	0.778	1.597	0.555
	Moderately	1.575	0.822	3.018	0.171				
	Poorly	2.257	1.065	4.782	0.034				
Lymph node ratio(+)		6.252	3.469	11.269	0	1.193	0.862	1.651	0.288
Tumor volume(cm3,≥Median)		1.426	0.92	2.212	0.113				
PHLPP2(Low/High)		0.426	0.272	0.667	0	0.663	0.476	0.924	0.015
