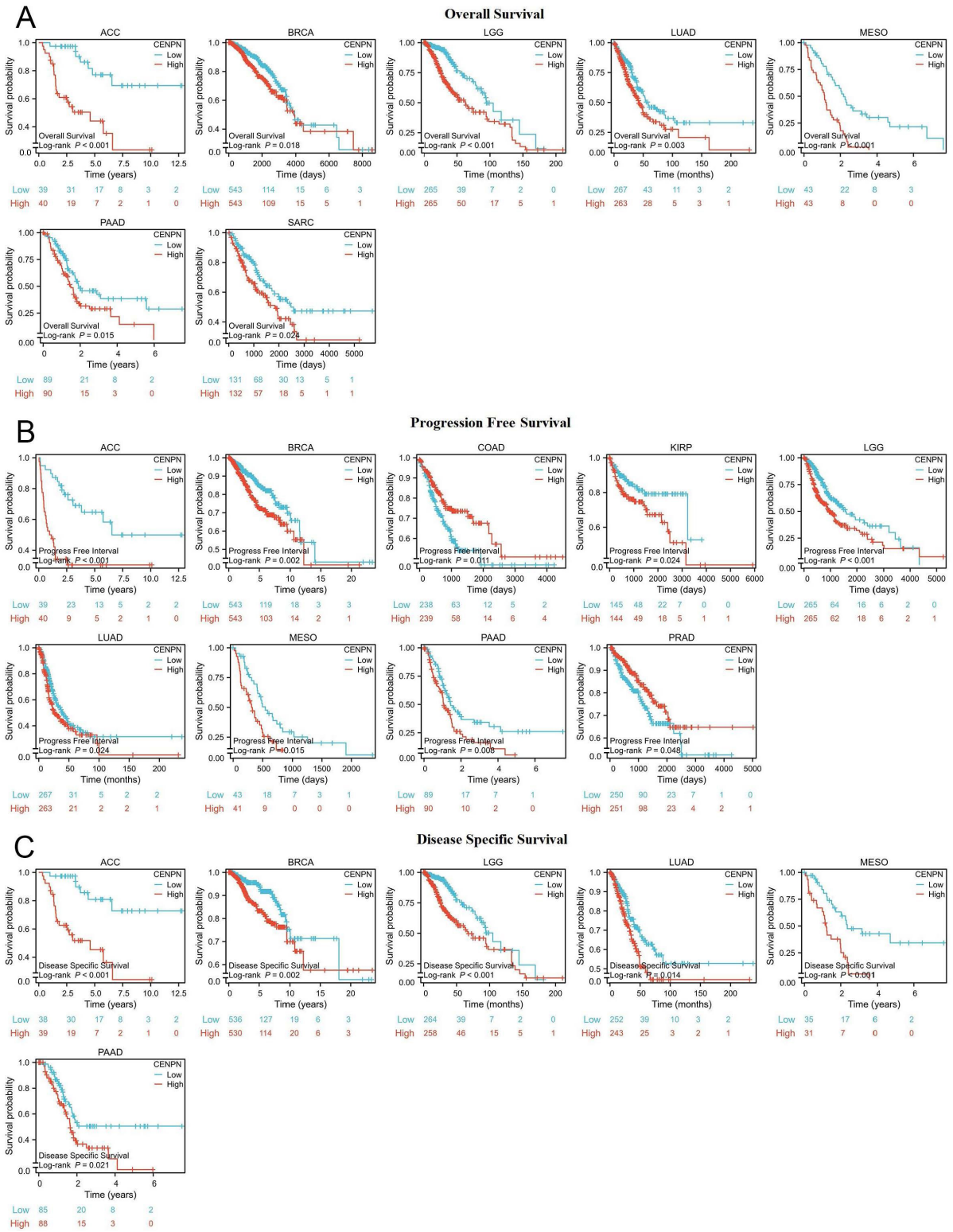

Figure S1 The Kaplan-Meier curve shows in detail the connection between CENPN expression and a cancer patient's prognosis. (A) OS in ACC, BRCA, LGG, LUAD, MESO, PAAD and SARC. (B) PFS in ACC, BRCA, COAD, KIRP, LGG, LUAD, MESO, PAAD, and PRAD. (C) DSS in ACC, BRCA, LGG, LUAD, MESO, and PAAD.

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Table S1 Univariate and multivariate Cox analyses of clinical parameters in ACC

Characteristics	Total (N)	Univariate analysis		Multivariate analysis	
		Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value
Pathologic T stage	77		<0.001*		
T1 & T2	51	Reference		Reference	
T3 & T4	26	10.286 (3.976–26.608)	<0.001*	7.054 (0.879–56.605)	0.07
Pathologic N stage	77		0.18		
N0	68	Reference			
N1	9	2.038 (0.769–5.400)	0.15		
Clinical M stage	77		<0.001*		
M0	62	Reference		Reference	
M1	15	6.150 (2.710–13.959)	<0.001*	0.705 (0.211–2.358)	0.57
Pathologic stage	77		<0.001*		
Stage I & II	46	Reference		Reference	
Stage III & IV	31	6.476 (2.706–15.498)	<0.001*	0.742 (0.071–7.757)	0.80
Primary therapy outcome	67		<0.001*		
PD & SD	20	Reference		Reference	
PR & CR	47	0.063 (0.020–0.199)	<0.001*	0.130 (0.032–0.531)	0.005
Age, years	79		0.13		
≤50	41	Reference			
>50	38	1.799 (0.846–3.824)	0.13		
Gender	79		0.99		
Female	48	Reference			
Male	31	1.001 (0.469–2.137)	0.99		
Radiation therapy	76		0.60		
No	59	Reference			
Yes	17	1.292 (0.512–3.262)	0.59		
CENPN	79		<0.001*		
Low	39	Reference		Reference	
High	40	4.911 (2.066–11.679)	<0.001*	1.820 (0.539–6.147)	0.34

*, statistical significance.

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Table S2 Univariate and multivariate Cox analyses of clinical parameters in BRCA

Characteristics	Total (N)	Univariate analysis		Multivariate analysis	
		Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value
Pathologic T stage	1,083		0.02*		
T1 & T2	908	Reference		Reference	
T3 & T4	175	1.588 (1.096–2.301)	0.02*	0.931 (0.556–1.558)	0.79
Pathologic N stage	1,067		<0.001*		
N0	516	Reference		Reference	
N1 & N2 & N3	551	2.232 (1.563–3.189)	<0.001*	1.689 (1.082–2.637)	0.02*
Pathologic M stage	925		<0.001*		
M0	905	Reference		Reference	
M1	20	4.266 (2.474–7.354)	<0.001*	2.171 (1.076–4.381)	0.03*
Pathologic stage	1,062		<0.001*		
Stage I & II	800	Reference		Reference	
Stage III & IV	262	2.367 (1.686–3.321)	<0.001*	1.750 (1.018–3.008)	0.04*
Age, years	1,086		<0.001*		
≤60	603	Reference		Reference	
>60	483	2.024 (1.468–2.790)	<0.001*	2.205 (1.526–3.186)	<0.001*
CENPN	1,086		0.02*		
Low	543	Reference		Reference	
High	543	1.471 (1.066–2.030)	0.02*	1.546 (1.079–2.214)	0.02*

*, statistical significance.

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Table S3 Univariate and multivariate Cox analyses of clinical parameters in LGG

Characteristics	Total (N)	Univariate analysis		Multivariate analysis	
		Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value
WHO grade	468		<0.001*		
G2	223	Reference		Reference	
G3	245	3.023 (2.022–4.519)	<0.001*	2.782 (1.790–4.325)	<0.001*
Primary therapy outcome	460		<0.001*		
PD & SD	257	Reference		Reference	
PR & CR	203	0.198 (0.111–0.353)	<0.001*	0.225 (0.120–0.423)	<0.001*
Gender	530		0.54		
Female	238	Reference			
Male	292	1.112 (0.791–1.563)	0.54		
Age, years	530		<0.001*		
≤40	265	Reference		Reference	
>40	265	2.898 (2.015–4.168)	<0.001*	2.708 (1.758–4.173)	<0.001*
CENPN	530		<0.001*		
Low	265	Reference		Reference	
High	265	2.303 (1.580–3.357)	<0.001*	1.308 (0.840–2.036)	0.23

*, statistical significance.

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Table S4 Univariate and multivariate Cox analyses of clinical parameters in LUAD

Characteristics	Total (N)	Univariate analysis		Multivariate analysis	
		Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value
Pathologic T stage	527		<0.001*		
T1	176	Reference		Reference	
T2	285	1.507 (1.059–2.146)	0.03*	1.354 (0.824–2.227)	0.23
T3 & T4	66	3.095 (1.967–4.868)	<0.001*	2.008 (0.988–4.081)	0.05
Pathologic N stage	514		<0.001*		
N0	345	Reference		Reference	
N1 & N2 & N3	169	2.547 (1.904–3.407)	<0.001*	1.646 (1.053–2.575)	0.03*
Pathologic M stage	381		0.01*		
M0	356	Reference		Reference	
M1	25	2.176 (1.272–3.722)	0.005*	1.266 (0.527–3.042)	0.60
Pathologic stage	522		<0.001*		
Stage I & II	415	Reference		Reference	
Stage III & IV	107	2.710 (1.994–3.685)	<0.001*	1.505 (0.829–2.731)	0.18
Primary therapy outcome	442		<0.001*		
PD & SD	109	Reference		Reference	
PR & CR	333	0.380 (0.270–0.533)	<0.001*	0.378 (0.250–0.571)	<0.001*
Gender	530		0.57		
Female	283	Reference			
Male	247	1.087 (0.816–1.448)	0.57		
Age, years	520		0.19		
≤65	257	Reference			
>65	263	1.216 (0.910–1.625)	0.19		
CENPN	530		0.003*		
Low	267	Reference		Reference	
High	263	1.540 (1.152–2.060)	0.004*	1.470 (0.989–2.186)	0.06

*, statistical significance.

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Table S5 Univariate and multivariate Cox analyses of clinical parameters in PAAD

Characteristics	Total (N)	Univariate analysis		Multivariate analysis	
		Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value
Pathologic T stage	177		0.02*		
T1 & T2	31	Reference		Reference	
T3 & T4	146	2.035 (1.079–3.838)	0.03*	1.144 (0.570–2.297)	0.70
Pathologic N stage	174		0.002*		
N0	50	Reference		Reference	
N1	124	2.161 (1.287–3.627)	0.004*	1.821 (0.983–3.372)	0.06
Pathologic M stage	85		0.71		
M0	80	Reference			
M1	5	0.773 (0.185–3.227)	0.72		
Pathologic stage	176		0.48		
Stage I & II	168	Reference			
Stage III & IV	8	0.676 (0.213–2.145)	0.51		
Primary therapy outcome	140		<0.001*		
PD & SD	59	Reference		Reference	
PR & CR	81	0.425 (0.267–0.675)	<0.001*	0.444 (0.276–0.716)	<0.001*
Gender	179		0.32		
Female	80	Reference			
Male	99	0.813 (0.541–1.222)	0.32		
Age, years	179		0.23		
≤65	94	Reference			
>65	85	1.285 (0.853–1.937)	0.23		
Radiation therapy	164		0.008*		
No	119	Reference		Reference	
Yes	45	0.507 (0.298–0.863)	0.01*	0.573 (0.318–1.034)	0.06
CENPN	179		0.02*		
Low	89	Reference		Reference	
High	90	1.670 (1.102–2.531)	0.02*	1.522 (0.940–2.465)	0.09

*, statistical significance.

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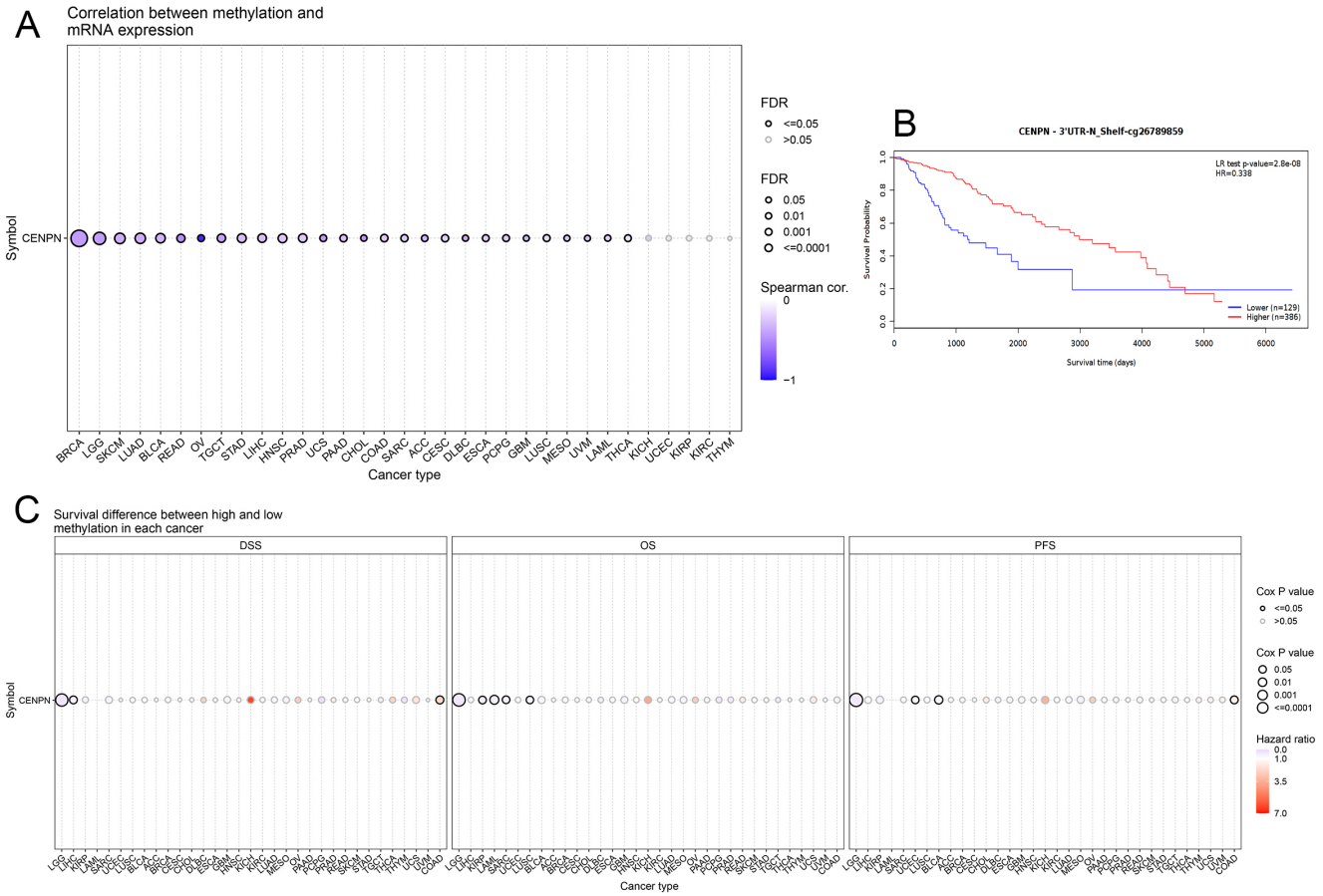

Figure S2 Analyzing the epigenetic methylation of the CENPN gene. (A) Connection between CENPN methylation level and CENPN mRNA expression. (B) Effect of CENPN methylation levels on prognosis in patients with cancer. (C) Survival of CENPN methylation in patients with cancer.

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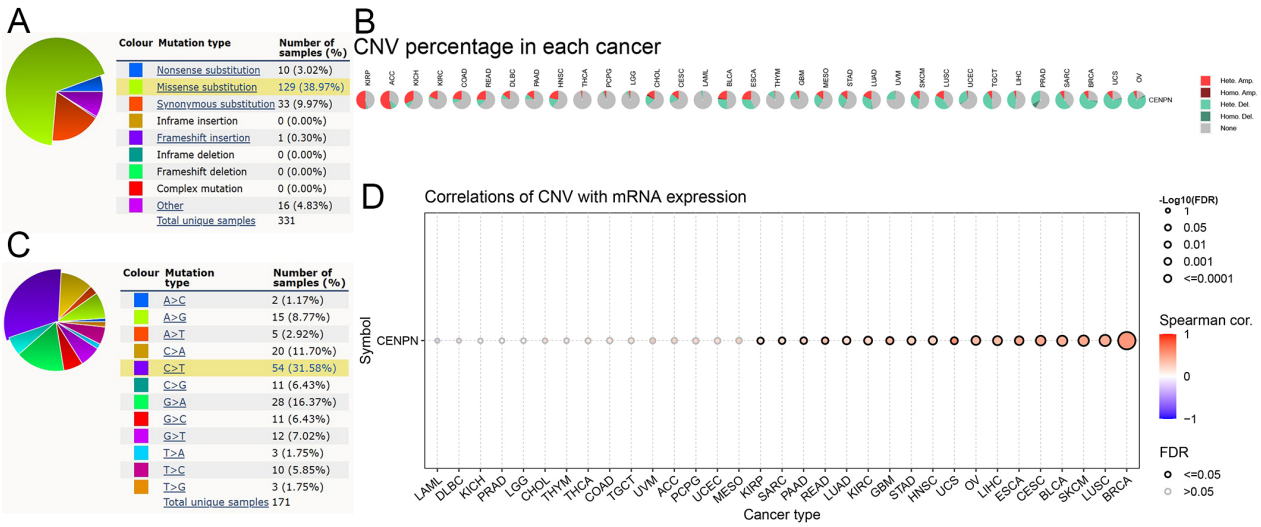

Figure S3 Mutation analysis of CENPN. (A) The main mutation type of CENPN. (B) CENPN CNV percentage in each cancer. (C) The main type of SNV of CENPN. (D) Correlation between CENPN expression and CNV.

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Table S6 The top 100 genes associated with CENPN

Gene Symbol	Gene ID	PCC	Gene Symbol	Gene ID	PCC
CCNA2	ENSG00000145386.9	0.68	*MCM10*	ENSG00000065328.16	0.61
CCNB1	ENSG00000134057.14	0.68	*AURKB*	ENSG00000178999.12	0.61
NUP37	ENSG00000075188.8	0.67	*SHCBP1*	ENSG00000171241.8	0.61
MAD2L1	ENSG00000164109.13	0.67	*TROAP*	ENSG00000135451.12	0.61
EXO1	ENSG00000174371.16	0.67	*NDC80*	ENSG00000080986.12	0.6
CCNB2	ENSG00000157456.7	0.66	*FBXO5*	ENSG00000112029.9	0.6
PLK1	ENSG00000166851.14	0.66	*CDCA8*	ENSG00000134690.10	0.6
SKA1	ENSG00000154839.9	0.66	*GINS2*	ENSG00000131153.8	0.6
NCAPG	ENSG00000109805.9	0.66	*BCL2L12*	ENSG00000126453.9	0.6
DLGAP5	ENSG00000126787.12	0.66	*PRC1*	ENSG00000198901.13	0.6
SPC25	ENSG00000152253.8	0.65	*MELK*	ENSG00000165304.7	0.6
CDK1	ENSG00000170312.15	0.65	*RFWD3*	ENSG00000168411.13	0.6
NCAPH	ENSG00000121152.9	0.65	*PSMA4*	ENSG00000041357.15	0.6
ORC6	ENSG00000091651.8	0.65	*ZWINT*	ENSG00000122952.16	0.6
RAN	ENSG00000132341.11	0.65	*DKC1*	ENSG00000130826.15	0.6
RANBP1	ENSG00000099901.16	0.65	*KIAA1524*	ENSG00000163507.13	0.59
KIF4A	ENSG00000090889.11	0.64	*CCNF*	ENSG00000162063.12	0.59
KIFC1	ENSG00000237649.7	0.64	*CENPO*	ENSG00000138092.10	0.59
CENPI	ENSG00000102384.13	0.64	*OIP5*	ENSG00000104147.8	0.59
BUB1	ENSG00000169679.14	0.64	*NUF2*	ENSG00000143228.12	0.59
TPX2	ENSG00000088325.15	0.64	*DTL*	ENSG00000143476.17	0.59
CDT1	ENSG00000167513.8	0.64	*KIF20A*	ENSG00000112984.11	0.59
HMMR	ENSG00000072571.19	0.64	*MND1*	ENSG00000121211.7	0.59
HJURP	ENSG00000123485.11	0.64	*RAD54L*	ENSG00000085999.11	0.59
CMC2	ENSG00000103121.8	0.63	*FAM72D*	ENSG00000215784.5	0.59
KIF14	ENSG00000118193.11	0.63	*PARPBP*	ENSG00000185480.11	0.59
CHEK1	ENSG00000149554.12	0.63	*PRIM1*	ENSG00000198056.13	0.59
NCAPG2	ENSG00000146918.19	0.63	*CHAF1A*	ENSG00000167670.15	0.59
MTFR2	ENSG00000146410.11	0.63	*KIAA0101*	ENSG00000166803.10	0.59
FANCI	ENSG00000140525.17	0.63	*DEPDC1*	ENSG00000024526.16	0.59
CENPA	ENSG00000115163.14	0.62	*CKS1B*	ENSG00000173207.12	0.58
CKAP2L	ENSG00000169607.12	0.62	*KIF18A*	ENSG00000121621.6	0.58
ORC1	ENSG00000085840.12	0.62	*CENPL*	ENSG00000120334.15	0.58
AURKA	ENSG00000087586.17	0.62	*MCM6*	ENSG00000076003.4	0.58
RRM2	ENSG00000171848.13	0.62	*NIP7*	ENSG00000132603.13	0.58
UBE2T	ENSG00000077152.9	0.62	*SNRPG*	ENSG00000143977.13	0.58
KIF23	ENSG00000137807.13	0.62	*GMPS*	ENSG00000163655.15	0.58
CENPH	ENSG00000153044.9	0.62	*DBF4*	ENSG00000006634.7	0.58
RAD51	ENSG00000051180.16	0.62	*PSMD7*	ENSG00000103035.10	0.58
SGOL1	ENSG00000129810.14	0.62	*CEP55*	ENSG00000138180.15	0.58
TTK	ENSG00000112742.9	0.62	*GTSE1*	ENSG00000075218.18	0.58
CDCA5	ENSG00000146670.9	0.61	*PA2G4*	ENSG00000170515.13	0.58
ARHGAP11A	ENSG00000198826.10	0.61	*RFC2*	ENSG00000049541.10	0.58
NUSAP1	ENSG00000137804.12	0.61	*TIMELESS*	ENSG00000111602.11	0.58
CDC45	ENSG00000093009.9	0.61	*MIS18A*	ENSG00000159055.3	0.58
KIF11	ENSG00000138160.5	0.61	*DSCC1*	ENSG00000136982.5	0.58
RACGAP1	ENSG00000161800.12	0.61	*CDC25A*	ENSG00000164045.11	0.58
RAD51AP1	ENSG00000111247.14	0.61	*HAT1*	ENSG00000128708.12	0.57
FEN1	ENSG00000168496.3	0.61	*CDC25C*	ENSG00000158402.18	0.57
STIL	ENSG00000123473.15	0.61	*CDC20*	ENSG00000117399.13	0.57

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