

Table S1. The Cancer Genome Atlas pan-cancer abbreviations and noun comparisons.

Abbreviation	Full name	Abbreviation	Full name
BLCA	Bladder urothelial carcinoma	BRCA	Breast invasive carcinoma
CHOL	Cholangiocarcinoma	CESC	Cervical squamous cell carcinoma
ESCA	Esophageal carcinoma	COAD	Colon adenocarcinoma
HNSC	Head and neck squamous cell carcinoma	GBM	Glioblastoma multiforme
KIRC	Kidney renal clear cell carcinoma	KICH	Kidney chromophobe
LIHC	Liver hepatocellular carcinoma	KIRP	Kidney renal papillary cell carcinoma
LUSC	Lung squamous cell carcinoma	LUAD	Lung adenocarcinoma
PCPG	Pheochromocytoma and paraganglioma	PAAD	Pancreatic adenocarcinoma
READ	Rectal adenocarcinoma	PRAD	Prostate adenocarcinoma
SKCM	Skin cutaneous melanoma	SARC	Sarcoma
THYM	Thymoma	STAD	Stomach adenocarcinoma
UCEC	Uterine corpus endometrial carcinoma	THCA	Thyroid carcinoma

Table SII. Top 50 positive genes related to CDCA5.

Query	Statistic	P-value	FDR (BH)	Event_SD	Event_TD
BIRC5	0.864838	9.98012604599318e-322	9.999987484956e-319	1093	1093
CCNB2	0.871072	9.98012604599318e-322	9.999987484956e-319	1093	1093
CDCA5	1	9.98012604599318e-322	9.999987484956e-319	1093	1093
CDCA8	0.864119	9.98012604599318e-322	9.999987484956e-319	1093	1093
CENPA	0.866851	9.98012604599318e-322	9.999987484956e-319	1093	1093
FOXM1	0.865191	9.98012604599318e-322	9.999987484956e-319	1093	1093
KIF2C	0.895261	9.98012604599318e-322	9.999987484956e-319	1093	1093
KIFC1	0.864107	9.98012604599318e-322	9.999987484956e-319	1093	1093
MYBL2	0.866705	9.98012604599318e-322	9.999987484956e-319	1093	1093
PLK1	0.887421	9.98012604599318e-322	9.999987484956e-319	1093	1093
RAD54L	0.861854	9.98012604599318e-322	9.999987484956e-319	1093	1093
TPX2	0.866864	9.98012604599318e-322	9.999987484956e-319	1093	1093
CDC45	0.860325	1.48219693752374e-321	2.29797342865451e-318	1093	1093
AURKB	0.857087	1.54441403142575e-316	2.22340462883446e-313	1093	1093
UBE2C	0.856798	4.28056222617511e-316	5.75164877790396e-313	1093	1093
MCM10	0.855651	2.37052695886499e-314	2.98612317849512e-311	1093	1093
RAD51	0.855389	5.917996349484e-314	7.01630684846188e-311	1093	1093
CDC20	0.854926	2.95355827986925e-313	3.30716484059806e-310	1093	1093
HJURP	0.853572	3.153686569499e-311	3.35E-308	1093	1093
ORC1L	0.851392	5.28E-308	5.32E-305	1093	1093
KIF4A	0.848759	3.53E-304	3.38E-301	1093	1093
NCAPH	0.848603	5.91E-304	5.41E-301	1093	1093
CCNA2	0.845226	3.68E-299	3.23E-296	1093	1093
MELK	0.842471	2.47E-295	2.08E-292	1093	1093
KIF18B	0.841213	1.31E-293	1.05E-290	1093	1093
SKA1	0.840558	1.02E-292	7.90E-290	1093	1093
TROAP	0.837104	4.38E-288	3.27E-285	1093	1093

CEP55	0.833159	6.36E-283	4.58E-280	1093	1093
GTSE1	0.831427	1.07E-280	7.41E-278	1093	1093
C15orf42	0.830835	6.05E-280	4.06E-277	1093	1093
NCAPG	0.830457	1.83E-279	1.19E-276	1093	1093
CDC25A	0.828627	3.71E-277	2.34E-274	1093	1093
BUB1	0.826403	2.17E-274	1.32E-271	1093	1093
FEN1	0.82525	5.71E-273	3.38E-270	1093	1093
CDCA3	0.825164	7.27E-273	4.19E-270	1093	1093
AURKA	0.823999	1.92E-271	1.08E-268	1093	1093
FAM83D	0.822502	1.25E-269	6.80E-267	1093	1093
EXO1	0.822069	4.16E-269	2.20E-266	1093	1093
MAD2L1	0.820522	2.94E-267	1.52E-264	1093	1093
TRIP13	0.817657	7.07E-264	3.56E-261	1093	1093
FAM64A	0.814416	4.00E-260	1.97E-257	1093	1093
ESPL1	0.813667	2.87E-259	1.38E-256	1093	1093
E2F1	0.812585	4.90E-258	2.29E-255	1093	1093
NDC80	0.809885	5.32E-255	2.44E-252	1093	1093
E2F2	0.807177	5.30E-252	2.37E-249	1093	1093
DLGAP5	0.804761	2.28E-249	9.99E-247	1093	1093
SGOL1	0.804482	4.57E-249	1.96E-246	1093	1093
OIP5	0.802515	5.94E-247	2.49E-244	1093	1093
ORC6L	0.802444	7.09E-247	2.91E-244	1093	1093
PTTG1	0.800666	5.49E-245	2.21E-242	1093	1093

Table SIII. Top 50 negative genes related to CDCA5.

Query	Statistic	P-value	FDR (BH)	Event_SD	Event_TD
KLHDC1	-0.6494	6.57E-132	7.23E-130	1093	1093
ZBTB4	-0.64548	7.71E-130	8.26E-128	1093	1093
NOSTRIN	-0.64516	1.14E-129	1.21E-127	1093	1093
CYBRD1	-0.62809	5.38E-121	5.29E-119	1093	1093
C7orf63	-0.62715	1.56E-120	1.52E-118	1093	1093
APH1B	-0.61343	5.68E-114	5.23E-112	1093	1093
C5orf53	-0.61048	1.33E-112	1.20E-110	1093	1093
TENC1	-0.60083	3.22E-108	2.78E-106	1093	1093
C14orf45	-0.58888	5.36E-103	4.32E-101	1093	1093
PDGFD	-0.58836	8.92E-103	7.16E-101	1093	1093
CALCOCO1	-0.58691	3.69E-102	2.93E-100	1093	1093
C5orf36	-0.58093	1.21E-99	9.46E-98	1093	1093
CRY2	-0.57474	4.28E-97	3.25E-95	1093	1093
KIF13B	-0.57421	7.05E-97	5.33E-95	1093	1093
DNAH7	-0.5676	3.19E-94	2.33E-92	1093	1090
LRRC48	-0.56627	1.08E-93	7.80E-92	1093	1093
C9orf68	-0.56028	2.39E-91	1.70E-89	1093	1093
CX3CR1	-0.5586	1.06E-90	7.45E-89	1093	1092
NEK10	-0.55745	2.95E-90	2.04E-88	1093	1084
FAM47E	-0.55673	5.59E-90	3.84E-88	1093	1093
UBXN10	-0.5558	1.26E-89	8.58E-88	1093	1091
C10orf32	-0.55235	2.58E-88	1.73E-86	1093	1093
RAI2	-0.55183	4.06E-88	2.70E-86	1093	1093
CASC1	-0.54786	1.24E-86	8.08E-85	1093	1090
NTN4	-0.54599	6.09E-86	3.92E-84	1093	1093
CCNDBP1	-0.54575	7.51E-86	4.82E-84	1093	1093
MEIS3P1	-0.53852	3.25E-83	2.02E-81	1093	1093

ITM2B	-0.53631	2.01E-82	1.24E-80	1093	1093
GTF2IRD2P1	-0.53504	5.71E-82	3.50E-80	1093	1093
RAPGEF3	-0.53426	1.09E-81	6.61E-80	1093	1093
FMO5	-0.53155	9.84E-81	5.87E-79	1093	1093
CAPN8	-0.52997	3.53E-80	2.08E-78	1093	1065
GTF2IRD2	-0.5298	4.05E-80	2.39E-78	1093	1093
NEK11	-0.52816	1.51E-79	8.85E-78	1093	1093
C10orf26	-0.52815	1.52E-79	8.87E-78	1093	1093
CYB5D2	-0.52775	2.09E-79	1.21E-77	1093	1093
CPEB2	-0.52652	5.57E-79	3.19E-77	1093	1093
ZNF763	-0.5265	5.66E-79	3.23E-77	1093	1093
FBXL17	-0.5256	1.17E-78	6.62E-77	1093	1093
ABCG2	-0.52366	5.37E-78	3.01E-76	1093	1093
CACNA1D	-0.52358	5.76E-78	3.22E-76	1093	1093
FRY	-0.52328	7.30E-78	4.06E-76	1093	1093
FANK1	-0.52245	1.40E-77	7.74E-76	1093	1092
HNMT	-0.52239	1.47E-77	8.10E-76	1093	1093
EFCAB6	-0.52226	1.62E-77	8.95E-76	1093	1090
TIGD6	-0.52161	2.71E-77	1.49E-75	1093	1093
PRICKLE2	-0.52152	2.89E-77	1.58E-75	1093	1093
ABAT	-0.52124	3.60E-77	1.97E-75	1093	1093
CBX7	-0.52086	4.88E-77	2.66E-75	1093	1093
LZTFL1	-0.51842	3.26E-76	1.75E-74	1093	1093