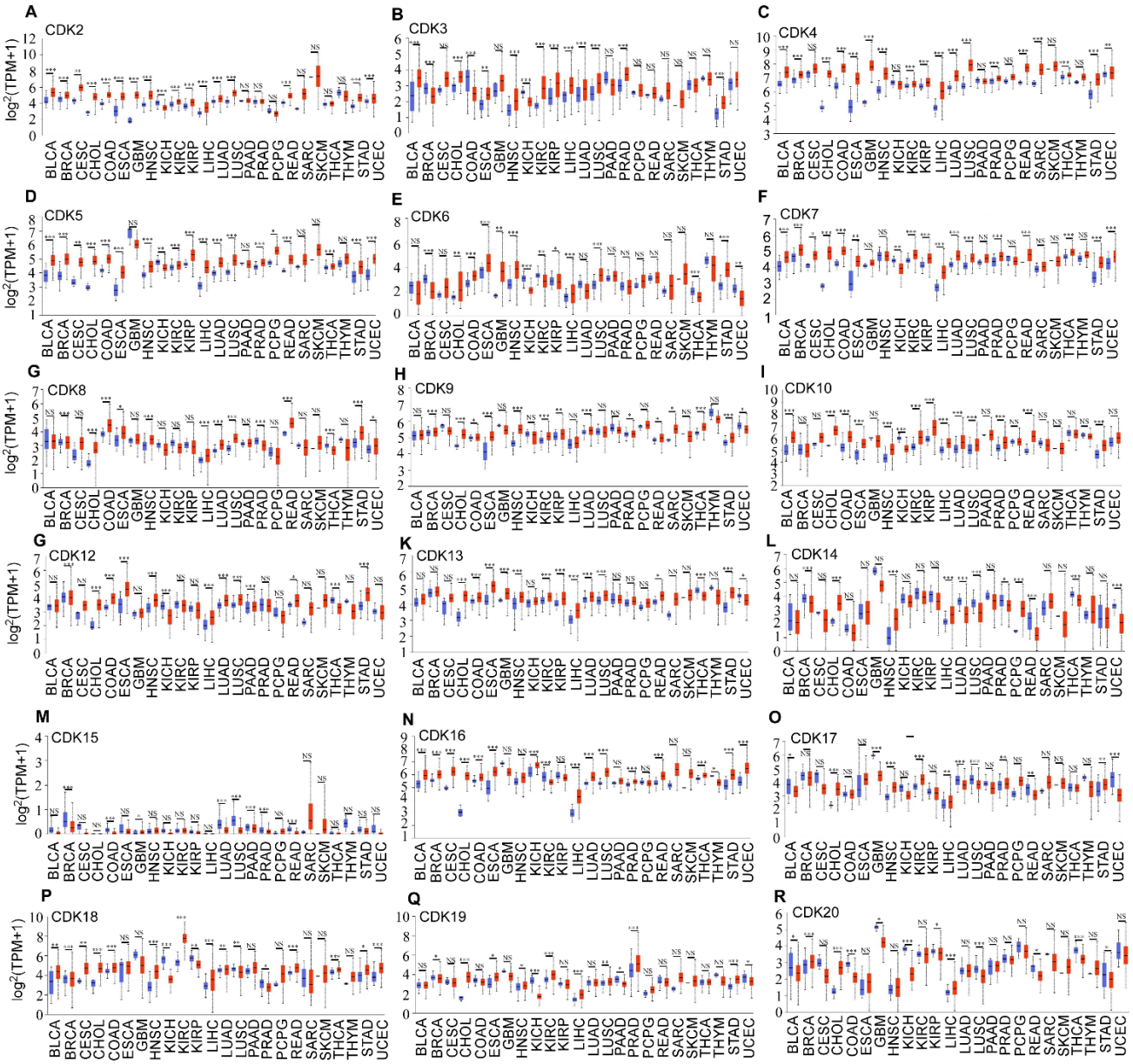


Supplementary Fig. 1. Expression levels of CDKs in various cancers. Comparison of the expression of CDKs between tumor (red) and normal (blue) tissues. For the boxplots, the center line of the box indicates the median. The upper boundary of the box represents the upper quantile, while the bottom boundary of the box represents the lower quartile. The top and bottom ends of the whiskers indicate the maximum and minimum values, respectively. (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, NS: no significant difference).

Supplementary Table 1. Expression and overall survival rate of patients expressing various CDKs in diverse cancers

Cancer type	**Acronym**	**Specific CDK(s) overexpressed ($p < 0.05$)**	**Specific CDKs affecting overall survival rate ($p < 0.05$)**
adrenocortical carcinoma	ACC	no data	CDK1, CDK2, CDK3, CDK6, CDK10, CDK17
acute myeloid leukemia	LAML	no data	CDK14, CDK18
bladder urothelial carcinoma	BLCA	CDK1, CDK2, CDK3, CDK4, CDK5, CDK7, CDK10, CDK16, CDK17, CDK18, CDK20	CDK2, CDK6, CDK10, CDK15, CDK17
brain lower grade glioma	LGG	no data	CDK1, CDK,2, CDK3, CDK6, CDK7, CDK8, CDK12, CDK13, CDK16, CDK20
breast invasive carcinoma	BRCA	CDK1, CDK2, CDK3, CDK4, CDK5, CDK6, CDK7, CDK8, CDK9, CDK12, CDK14, CDK15, CDK16, CDK18, CDK19, CDK20	CDK8
cervical squamous cell carcinoma	CESC	CDK1, CDK2, CDK5, CDK7, CDK13, CDK16, CDK18,	-
cholangiocarcinoma	CHOL	CDK2, CDK3, CDK4, CDK5, CDK6, CDK7, CDK8, CDK9, CDK10, CDK12,	CDK15

		CDK13, CDK14, CDK16, CDK17, CDK18, CDK19, CDK20	
colon adenocarcinoma	COAD	CDK1, CDK2, CDK3, CDK4, CDK5, CDK6, CDK7, CDK8, CDK9, CDK10, CDK12, CDK13, CDK15, CDK16, CDK18, CDK20	CDK10
esophageal carcinoma	ESCA	CDK1, CDK2, CDK3, CDK4, CDK5, CDK6, CDK7, CDK8, CDK9, CDK10, CDK12, CDK13, CDK16, CDK19,	-
glioblastoma multiforme	GBM	CDK1, CDK2, CDK4, CDK6, CDK13, CDK15, CDK17, CDK20	CDK5, CDK7
head and neck squamous cell carcinoma	HNSC	CDK1, CDK2, CDK3, CDK4, CDK5, CDK6, CDK8, CDK9, CDK10, CDK12, CDK14, CDK17, CDK18, CDK19,	CDK3, CDK19
kidney chromophobe	KICH	CDK2, CDK3, CDK5, CDK6, CDK7, CDK10, CDK12, CDK13, CDK16, CDK18, CDK19, CDK20	CDK1, CDK2, CDK4, CDK5, CDK7, CDK8, CDK12
kidney renal clear cell carcinoma	KIRC	CDK1, CDK2, CDK3, CDK4, CDK5, CDK6, CDK7, CDK9, CDK10, CDK13, CDK16, CDK17, CDK18, CDK19,	CDK1, CDK3, CDK4, CDK**5,** CDK9, CDK10, CDK12 CDK14, CDK15 CDK17, CDK19, CDK20

kidney renal papillary cell carcinoma	KIRP	CDK1, CDK2, CDK3, CDK4, CDK5, CDK6, CDK7, CDK9, CDK10, CDK13, CDK18, CDK20	CDK1, CDK2, CDK3, CDK4, CDK7, CDK12 CDK18, CDK19
liver hepatocellular carcinoma	LIHC	CDK1, CDK2, CDK3, CDK4, CDK5, CDK6, CDK7, CDK8, CDK10, CDK12, CDK13, CDK14, CDK16, CDK17, CDK18, CDK19, CDK20	CDK1, CDK2, CDK4, CDK5, CDK7, CDK8 CDK13, CDK16, CDK19, CDK20
lung adenocarcinoma	LUAD	CDK1, CDK2, CDK3, CDK4, CDK5, CDK7, CDK8, CDK9, CDK10, CDK12, CDK13, CDK14, CDK15, CDK16, CDK17, CDK18,	CDK1, CDK6
lung squamous cell carcinoma	LUSC	CDK1, CDK2, CDK3, CDK4, CDK5, CDK6, CDK7, CDK8, CDK10, CDK12, CDK14, CDK15, CDK16, CDK17, CDK18, CDK19, CDK20	-
lymphoid neoplasm diffuse large B-cell lymphoma	DLBC	no data	-
mesothelioma	MESO	no data	CDK1, CDK2, CDK4, CDK6, CDK8, CDK16, CDK19
ovarian serous cystadenocarcinoma	OV	no data	CDK8, CDK14, CDK15, CDK19

pancreatic adenocarcinoma	PAAD	CDK12, CDK15, CDK19,	CDK1, CDK2 CDK3, CDK6, CDK7, CDK10
prostate adenocarcinoma	PRAD	CDK1, CDK3, CDK4, CDK4, CDK5, CDK7, CDK8, CDK9, CDK10, CDK14, CDK15, CDK16, CDK17, CDK18, CDK19,	CDK7
pheochromocytoma and paraganglioma	PCPG	CDK5, CDK13, CDK14,	CDK1, CDK3, CDK16, CDK19
rectum adenocarcinoma	READ	CDK1, CDK2, CDK4, CDK5, CDK7, CDK8, CDK9, CDK10, CDK12, CDK14, CDK15, CDK16, CDK17, CDK18, CDK20	CDK12
sarcoma	SARC	CDK4, CDK9,	CDK6, CDK9, CDK14, CDK18
skin cutaneous melanoma	SKCM	CDK13,	CDK1, CDK2, CDK4
testicular germ cell tumors	TGCT	no data	-
thyroid carcinoma	THCA	CDK4, CDK5, CDK6, CDK7, CDK8, CDK9, CDK12, CDK14, CDK16, CDK18, CDK20	CDK15, CDK20
thymoma	THYM	CDK16,	CDK2, CDK7, CDK14, CDK18
stomach adenocarcinoma	STAD	CDK1, CDK2, CDK3, CDK4, CDK6, CDK7, CDK8, CDK9, CDK10, CDK12,	no data

		CDK13, CDK16, CDK17, CDK18, CDK19, CDK20	
UCEC and uveal melanoma	UVM	no data	CDK2, CDK5, CDK10, CDK15
uterine corpus endometrial carcinoma	UCEC	CDK1, CDK2, CDK4, CDK6, CDK7, CDK8, CDK9, CDK13, CDK14, CDK16, CDK17, CDK18, CDK19,	CDK6, CDK14 CDK16, CDK19, CDK20
uterine carcinosarcoma	UCS	no data	CDK7

Supplementary Table 2. Upstream mediators of CDK1			
Positive mediators of CDK1			
Mediator	**Function**	**Mechanism**	**Ref**
CDK7	Activates CDK1	Increases phosphorylation of CDK1 at Thr161	[27]
LAR	Activates CDK1	LAR protein tyrosine phosphatase mediates focal adhesion by enhancing phosphorylation of CDK1 at Thr161	[28]
NOL11	Activates CDK1	Depletion of NOL11 delays entry into the M phase owing to increased inhibitory phosphorylation of CDK1 at Tyr15	[29]
C53	Activates CDK1	C53 promotes CDK1 activation and mitotic entry in both unperturbed cell cycle progression and DNA damage response	[30]
CDC25A	Activates CDK1	CDC25A mediates the activity of CDK1–2/cyclin A and CDK1/cyclin B in G2 phase	[27 32]
CDC25B	Activates CDK1	CDC25B activates human CDK1 kinase by dephosphorylating both Thr14 and Tyr15	[33]
CDC25C	Activates CDK1	CDC25C positively mediates activation of CDK1/cyclin B	[34,35]
CDK2	Activates CDK1	Cyclin A/CDK2 complexes are key mediators of CDK1 activation in human cells	[36]

BECN1	Activates CDK1	BECN1 promotes radiation-induced G2/M arrest through mediation of CDK1 activity: a potential role for autophagy at the G2/M checkpoint	[40]
KCTD12	Activates CDK1	KCTD12 binds to CDC25B and activates CDK1 and Aurora kinase A to facilitate the G2/M transition and promote tumorigenesis	[41]
NPM	Activates CDK1	Phosphorylation at Ser10 and Ser70 of NPM plays a role in mediating CDK1 kinase activity during the G2/M transition	[42]
MCM10	Activates CDK1	MCM10 activates CDK1 in G2 phase	[43]
AURKA	Activates CDK1	Aurora kinase A is required for initial activation of CDK1 at centrosomes	[39] [44,194]
PFKFB3	Activates CDK1	PFKFB3 promotes cell cycle progression and suppresses apoptosis through CDK1-mediated phosphorylation of p27	[45]
UCH-L1	Activates CDK1	UCH-L1 physically interacts with CDK1 enhancing its kinase activity and promoting cell proliferation	[46]
MASTL	Activates CDK1	MASTL enhances cyclin B1/CDK1-dependent mitotic phosphorylation events, directing mitotic entry, anaphase and cytokinesis in human cells	[47]
TSPY	Activates CDK1	TSPY enhances the cyclin B1-CDK1 phosphorylation activity in modulating cell-cycle progression at the G2/M stage	[48]
KPNB1	Activates CDK1	KPNB1 promotes CDK1/cyclin B1 translocation from the cytoplasm to the nucleus	[49]
SIL	Activates CDK1	Knockdown of SIL in cancer cells *in vitro* delays entrance into mitosis and decreases activation of the CDK1/cyclin B complex	[50]

E2F1-3	Promote CDK1 transcription	E2F1, E2F2, and E2F3 bind to the CDK1 promoter promoting its transcription	[51]
MRG15	Promotes CDK1 transcription	MRG15 acts in a HAT complex involving Tip60 to modify chromatin through the acetylation of histone H4 at the CDK1 promoter to activate transcription	[52]
LIN54	Promotes CDK1 transcription	LIN54 is an essential core subunit of the DREAM/LINC complex that binds to the CDK1 promoter and promotes CDK transcription	[53]
CENPE	Promotes CDK1 transcription	Overexpression of CENPE significantly increases CDK1 promoter activity	[54]
SP1	Promotes CDK1 transcription	Overexpression of SP1 significantly decreases G2/M arrest in cervical cancer cells, which is related to upregulation of CDK1 expression	[56]
RPS9	Promotes CDK1 transcription	Knockdown of RPS9 inhibits the growth of human colon cancer cells at the G2/M phase by downregulating CDK1 expression at the promoter level	[57]
CHPF	Enhances CDK1 expression	CHPF promotes development of malignant melanoma through mediation of CDK1	[58]
CD276	Enhances CDK1 expression	CD276 maintains proliferation and increases differentiation by enhancing CDK1 expression in endothelial progenitor cells	[59]
NSUN2	Enhances CDK1 translation	NSUN2 methylates *CDK1* mRNA enhancing CDK1 translation	[60,61]

DAP5	Enhances CDK1 translation	The translation initiation factor DAP5 is a mediator of cell survival during mitosis by enhancing CDK1 translation	[62]
RBM7	Stabilizes *CDK1* mRNA	Oncogenic action of the exosome cofactor RBM7 by stabilization of *CDK1* mRNA in breast cancer	[63]
HDAC3	Stabilizes CDK1 expression	HDAC3 controls G2/M phase progression mainly through post translational stabilization of CDK1	[64]
DNMT3A	Enhances CDK1 expression	DNMT3A mutation-induced CDK1 overexpression promotes leukemogenesis	[66]
RPS15A	Enhances CDK1 expression	RPS15A overexpression induces CDK1 expression	[195]
TPX2	Enhances CDK1 expression	Knocking down TPX2 inhibits CDK1 expression and represses phosphorylation of the ERK/GSK3β/SNAIL signaling pathway, thereby inhibiting the tumor epithelial-mesenchymal transition	[196]
MYC	Enhances CDK1 expression	MYC regulates the CDK1/cyclin B1 dependent-G2/M cell cycle progression	[197]
ZIC5	Enhances CDK1 expression	ZIC5 promotes colorectal cancer cell proliferation and cell cycle progression by enhancing CDK1 signaling	[198]
KPNA2	Enhances CDK1 expression	KPNA2 promotes tumor cell proliferation by increasing the expression of CDK1	[199]

UBAP2L	Enhances CDK1 expression	UBAP2L knockdown decreases CDK1 expression and plays an oncogenic role in HCC	[200]
NUSAP1	Enhances CDK1 expression	NUSAP1 enhances proliferation, migration and invasion in breast cancer cells by increasing CDK1 expression	[201]
PLK1	Enhances CDK1 expression	Activation of PLK1 enhanced CDK1 expression in cells	[202,203]
IFITM3	Enhances CDK1 expression	IFITM3 activates the STAT3/CDK1 pathway	[204]
KLF8	Enhances CDK1 expression	KLF8 knockdown induces cell phase arrest decreasing the expression of CDK1	[205]
LOX	Enhances CDK1 expression	LOX knockdown reduces CDK1 expression in cancer cell mitosis	[206]
RTKN	Enhances CDK1 expression	Knockdown of RTKN affects proliferation and metastasis of colon cancer by reducing expression of CDK1	[207]
PTTG1	Enhances CDK1 expression	Overexpression of PTTG1 causes upregulation of CDK1 expression resulting in enhanced proliferation	[208]
Negative mediators of CDK1			
Mediator	**Function**	**Mechanism**	**Ref**
WEE1	Inactivates CDK1	WEE1 kinase phosphorylates the CDK1-cyclin B complex and suppresses the CDK1-cyclin B kinase activity	[67-69]

MYT1	Inactivates CDK1	The human MYT1 kinase preferentially phosphorylates CDK1 (Thr14) and localizes to the endoplasmic reticulum and Golgi complex	[70] [71] [72]
PTEN	Inhibits CDK1 activation	PTEN decreases phosphorylation of CDK1 (Tyr15), resulting in decreased G2/M cell cycle arrest	[74]
DYRK1A	Inactivates CDK1	Inhibition of DYRK1A results in massive cyclin B accumulation and saturation of CDK1 activity	[75]
USP7	Inactivates CDK1	USP7 limits CDK1 activity throughout the cell cycle	[209]
p17	Inactivates CDK1	p17 suppresses CDK1 action and disrupts vimentin phosphorylation, causing G2/M cell cycle arrest	[210]
IFI27	Inactivates CDK1	IFI27 knockdown increases CDK1 phosphorylation (Tyr15) involved in cell proliferation.	[211]
CDKN3	Inactivates CDK1	CDKN3 controls mitosis by inhibiting CDK1 activation by dephosphorylation of CDK1 (Thr161)	[212]
BUBR1	Inhibits CDK1 activation	Deletion of BURR1 activates cyclin B/CDK1 kinase, leading to premature mitotic entry	[213]
CDH1	Inhibits CDK1 activation	UV-induced degradation of CDH1 results in accumulation of cyclin B1 and thus increased CDK1 activity	[214]
CSNK2B	Inhibits CDK1 activation	Knockdown of CSNK2B causes stabilization of WEE1 and increases phosphorylation of CDK1 (Tyr15)	[215]

PRKCD	Inactivates CDK1	PRKCD induces phosphorylation of CDK1 (Tyr15), a critical event in the G2/M checkpoint	[216]
BDNF	Inhibits both CDK1 expression & activity	Inhibition of both CDK1 expression and activity through a BDNF-dependent mechanism contributes to the maintenance of tetraploid RGCs in a G2-like state	[217]
DEDD	Inactivates CDK1	DEDD is an inhibitor of mitotic CDK1/cyclin B1	[79,80]
CHEK1	Inhibits CDK1 activation	CHEK1 prevents entry into mitosis by inhibiting CDK1 activity	[76,77]
KIF22	Inactivates CDK1	Inhibition of KIF22 increases CDC25C expression and CDK1 activity, resulting in delayed mitotic exit	[78]
p21	Inactivates CDK1	Loss of p21CIP1 unleashes CDK1 activity	[218] [219]
SET	Inactivates CDK1	SET inhibits cyclin B/CDK1 activity	[220,221]
DUX4	Inactivates CDK1	DUX4 functions as a direct inhibitor of CDK1, and decreases colon cancer cell proliferation	[222]
ESR2	Inactivates CDK1	Unliganded ESR2 causes a G2 cell cycle arrest by inactivating CDK1	[223]
PP4C	Inactivates CDK1	Loss of PP4C leads to an unscheduled activation of CDK1 in interphase	[224]
CDC14B	Inhibits CDK1 activation	CDC14B counteracts CDK1 action and causes mitotic arrest in mouse pre-implantation embryo models	[225]
HDAC4	Inhibits CDK1 activation	HDAC4 inhibits the CDK1 activity and the progression of proliferating HEK293T and HT22 cells through the cell cycle.	[226]

TSPX	Inhibits CDK1 activation	TSPX represses the cyclin B1/CDK1 phosphorylation activity	[48]
p57	Inhibits CDK1 activation	p57 is required to trigger endoreduplication by inhibiting CDK1	[227]
SUMO1	Inhibits CDK1 activation	Inhibits CDK1 activity by SUMOylation	[228]
FGF1	Inhibits CDK1 activation	FGF1 inhibits the cyclin B1/CDK1 kinase activity to induce a transient G2 arrest	[229]
CDC6	Inhibits CDK1 activation	Phosphorylation of CDC6 promotes the interaction of CDC6 and CDK1, leading to attenuated CDK1 activity	[230]
PKR	Induces CDK1 degradation	PKR mediates Tyr4 phosphorylation facilitating CDK1 ubiquitination and triggering CDK1 downregulation	[82]
BTRC	Induces CDK1 degradation	CDK1 accumulation in patients' tumors shows a negative correlation with BTRC and a positive correlation with the degree of tumor malignancy	[83]
HDAC6; p62	Induces CDK1 degradation	p62/SQSTM1/HDAC6-dependent autophagy mediates CDK1 degradation in human breast cancer	[87]
TWEAK	Induces CDK1 degradation	TWEAK induces CDK1 phosphorylation and degradation, resulting in the arrest of cell growth at the G2/M phase	[231]
HEI10	Inhibits CDK1 expression	HEI10 negatively mediates cell invasion by inhibiting cyclin B/CDK1 expression	[89]

SFN	Inhibits CDK1 nuclear translocation	SFN is required to sequester CDK1/cyclin B1 complexes in the cytoplasm and prevent mitotic catastrophes	[90]

Supplementary Table 3. Downstream substrates of CDK1			
CDK1 tumor promotor substrates			
Target substrate	**Phosphorylation site**	**Biological function**	**Ref**
BRAF	Ser144	CDK1/cyclin B directly phosphorylates BRAF at Ser144, which is required for mitotic activation of BRAF and subsequent activation of the MAPK cascade	[91]
ERK3	Thr698	CDK1 phosphorylates ERK3 at Thr698, which operates in a cell-cycle-dependent manner	[92]
AR	Ser81, Ser 515	CDK1 phosphorylates the AR at Ser81 and leads to AR-mediated transactivation in prostate cancer; phosphorylation of AR at Ser515 by CDK1 may be an independent prognostic marker	[93-95]
HIF1A	Ser668	CDK1 stabilizes HIF1A through direct phosphorylation of Ser668 to promote tumor growth	[98]
YAP	Thr119, Ser289, Ser367	CDK1 phosphorylates YAP, promoting mitotic defects and cell motility	[99]
TAZ	Ser90, Ser105, Thr326, Thr346	CDK1 phosphorylation of TAZ in mitosis inhibits its oncogenic activity	[100]
AJUBA	Ser119, Ser175	Adaptor protein AJUBA is phosphorylated by CDK1 at Ser119 and Ser175 during the G2/M phase of the cell cycle, which promotes cell proliferation and tumorigenesis.	[101]

BCL9	Thr172	CDK1-mediated BCL9 phosphorylation in controlling mitotic Wnt signaling to promote cell division and growth	[232]
PBK	Thr24, Ser32, Se59	CDK1-mediated mitotic phosphorylation of PBK is involved in cytokinesis and inhibits its oncogenic activity	[233]
SRC	Thr34, Thr46, Ser72	SRC phosphorylation by CDK1 has been demonstrated to increase SRC kinase activity	[234]
NET1	Ser131, Thr146	CDK1 phosphorylation mediates the activity of NET1 towards RhoA during mitosis.	[235]
FOXM1B	Thr596, Ser251	CDK1 phosphorylates FOXM1B, which is essential for recruitment of CREB binding protein coactivator proteins.	[102,236]
ISL1	Ser269	Phosphorylation of ISL1 at Ser269 by CDK1 increases its transcriptional activity and promotes cell proliferation in gastric cancer	[103]
4E-BP1	Ser83	CDK1 phosphorylation of mRNA translation regulator 4E-BP1 at Ser83, which contributes to cell transformation	[104]
ATF7	Thr51, Thr53	CDK1-mediated phosphorylation of human ATF7 at Thr51 and Thr53 promotes cell-cycle progression into M phase	[106]
RUNX1	Ser48, Ser303, Ser424	Phosphorylation of RUNX1 by CDK1 reduces direct interaction with HDAC1 and HDAC3	[107]
RUNX2	Ser451	Mediates G2 and M phases and promotes tumor angiogenesis	[108] [237]

RXRA	Ser265	CDK1 phosphorylates RXRA by activating c-Jun NH_2-terminal kinases	[109]
CEBPA	Ser21	CDK1 phosphorylates CEBPA on Ser21, which inhibits its differentiation-inducing function	[110]
OCT4	Ser229	CDK1 interplays with OCT4 to repress differentiation of embryonic stem cells into trophectoderm	[113]
TFCP2L1	Thr177	TFCP2L1 is phosphorylated at Thr177 by CDK1, which affects embryonic stem cell cycle progression, pluripotency and differentiation	[111]
BCL2	Ser70	Mediates BCL2 phosphorylation and link the coupling of mitotic arrest and apoptosis	[114,115,117,118]
BCL2L1	Ser62	Mediates BCL2L1 phosphorylation and links coupling mitotic arrest and apoptosis	[114,116,118]
DRP1	Ser585; Ser616	DRP1 is specifically phosphorylated in mitosis by CDK1/cyclin B on Ser585; DRP1 mediates mitochondrial fusion and apoptosis in human cancer cells	[119-121]
CPD	Thr176	The CPD kinase can mediate CDK phosphorylation at Thr176	[123]
FBXO28	Ser344	CDK1 mediates activation of the FBXO28 ubiquitin ligase promoting MYC-driven transcription and tumorigenesis in breast cancer	[122]
EIF4G1	Ser1232	Phosphorylation of EIF4G1 (Ser1232) in the mitotic translation initiation shift	[238]

CEP55	Ser425, Ser428	CEP55 is triggered by CDK1-dependent phosphorylation at Ser425 and Ser428, which is required for its recruitment to midbody and cytokinesis	[239]
MDM2	Thr216	MDM2 is phosphorylated by cyclin A/CDK2 or cyclin A/CDK1 at Thr216, which is most prevalent at the onset of S phase	[240]
SIRT3	Thr150, Ser159	SIRT3 enzymatic activity is further enhanced through of Thr150/Ser159 phosphorylation by cyclin B1-CDK1, which is also induced by radiation and relocated to mitochondria together with SIRT3	[241]
NCOA3	Ser728, Ser867	Phosphorylation of NCOA3 at mitosis is mediated by CDK1	[242]
EZH2	Thr487	CDK1-dependent phosphorylation of EZH2 suppresses methylation of H3K27 and promotes osteogenic differentiation of human mesenchymal stem cells	[243]
CDK1 tumor suppressor substrates			
Target substrate	**Phosphorylation site**	**Biological function**	**Ref**
p53	Ser315	Anti-apoptotic function of mitochondrial p53 mediated by cyclin B1/CDK1 Ser315 phosphorylation in p53-wildtype tumor cells	[125]
p73	Thr86	p73 proteins are targets of CDK complexes and phosphorylation on Thr86 by CDK1 mediates p73 functions	[126]

FOXO1	Ser249	CDK1 contributes to tumorigenesis by promoting cell proliferation and survival through phosphorylation and inhibition of FOXO1	[127,128]
CASP8	Ser387	Inhibits apoptosis during mitosis and contributes to tumorigenesis	[129,244]
CASP9	Thr125	Cyclin/CDK1 phosphorylates CASP9 on Thr125 and protects mitotic cells from apoptosis	[130]
EMI1	Ser145, Ser149	EMI1 is phosphorylated by CDK1 providing a delay for APC activation	[132]
DLG1	Ser158, Ser442	DLG1 is phosphorylated by CDK1 on Ser158 and Ser442, which affect the nuclear localization of DLG1.	[131]
P62	Thr269, Ser272	Phosphorylation of p62 by CDK1 controls the timely transit of cells through mitosis and tumor cell proliferation	[133]
EPHA2	Ser897	EPHA2 phosphorylation on Ser897 by the CDK1/MEK/ERK/RSK pathway mediates M-phase progression by maintaining cortical rigidity.	[245]
VGLL4	Ser58, Ser155, Thr159, Ser280	CDK1 mediates mitotic phosphorylation of the transcriptional co-repressor VGLL4 and inhibits its tumor-suppressing activity	[136]
RAP80	Ser677	CDK1 mediates phosphorylation of RAP80 at Ser677 and modulates DNA damage-induced G2/M checkpoint and cell survival	[137]
ING1	Ser126	CDK1 phosphorylates Ser126 of ING1, which plays a key role in mediating the expression of cyclin B1 and proliferation of melanoma cells	[246]

EML2	Thr84	CDK1 phosphorylates EML2, modulating cell proliferation and migration.	[138]
CDK1 cell cycle substrates			
Target substrate	**Phosphorylation site**	**Biological function**	**Ref**
BORA	Thr12, Thr15, Ser25, Ser41, Thr52, Ser112, Ser137, Ser183, Thr243, Ser252, Ser271, Ser274, Ser278, Thr287, Ser375, Thr381	Phosphorylation of the N terminus of BORA for PLK1 activation and mitotic entry	[140]
MLL5	Thr912	Phosphorylation of MLL5 by CDK1 affects its cellular distribution and is required for mitotic entry	[141]
GWL	T193, T206	CDK1 phosphorylates GWL during mitotic entry	[142]
KIF4A	Ser1186	CDK1-dependent KIF4A phosphorylation at Ser1186 is a trigger for chromosomal organization during early mitosis	[247]
VCIP135	Ser130	In early mitosis, phosphorylation of VCIP135 by CDK1 at a single residue, Ser130, is sufficient to inactivate the enzyme and inhibit p97/p47-mediated Golgi membrane fusion	[248]

CDC5	Thr242	Mitotic exit function of Polo-like kinase CDC5 is dependent on sequential activation by CDK1	[143]
PP1	Thr320	CDK1 inhibits PP1-mediated dephosphorylation at mitotic exit	[249]
CENPA	Ser68	Eliminates the binding of CENPA to the assembly factor HJURP, thus preventing the premature loading of CENPA to the centromere prior to mitotic exit	[144]
STAT3	Ser727	Phosphorylation of STAT3 (Ser727) by CDK1 is critical for nocodazole-induced mitotic arrest	[250]
MCL1	Thr92	Phosphorylation of MCL1 by CDK1-cyclin B1 during mitotic arrest	[251]
CAPD3	Thr1415	Thr1415 of the CAP-D3 subunit is a CDK1 phosphorylation site, which is required for timely chromosome condensation during prophase	[145]
NEK9	Thr210	CDK1 is necessary for NEK9 activation for centrosome separation during mitosis.	[252]
CHK2	Ser774	CDK1 phosphorylates CHK2 kinase in metaphase, influencing cellular morphogenesis	[146]
SKA3	T358, T360	SKA3 is phosphorylated by CDK1 in mitosis to promote anaphase onset	[148]
LBR	Ser71, Ser86	CDK1 activity prevents premature nuclear envelope assembly and phosphorylation of the inner nuclear membrane protein LBR by CDK1 contributes to the temporal control	[253]

LMN1	Ser22, Ser392	The nuclear envelope is a dynamic structure that completely disassembles in response to CDK1 activity in mitosis	[254]
EML3	Thr881	CDK1 phosphorylates EML3 regulating mitotic spindle assembly and the kinetochore-microtubules connection	[255]
CLASP2	Ser1234	CDK1 mediates CLASP2 stabilizing kinetochore-microtubule attachments	[256]
NUMA	Thr2055	CDK1-mediated phosphorylation at T2055 negatively modulates NUMA cortical localization mediating mitotic progression with proper spindle function.	[257]
DIAPH1	Ser629, Ser640, Ser665	CDK1-mediated DIAPH1 phosphorylation maintains metaphase cortical tension and inactivates the spindle assembly checkpoint at anaphase	[258]
CRM1	Ser391	Phosphorylation of CRM1 by CDK1/cyclin B promotes Ran-dependent mitotic spindle assembly	[259]
TIAM1	Ser1466	S1466 of TIAM1 is a novel CDK1 site for which phosphorylation is required for the mitotic function of TIAM1 to promote mitotic spindle formation	[260]
KIF11	Thr926	CDK1 phosphorylates KIF11 at Thr926 during mitosis, which is crucial for the mitotic function of KIF11	[261]

NDEL1	Thr219	Silencing of CDK1 clearly suppresses the phosphorylation of NDEL1 at Thr219 mediating microtubule organization	[224]
NEDD1	Thr550	Promotes the interaction of NEDD1 with the γTuRC component γ-tubulin during mitosis	[262]
TUBB	Ser172	Mediation of microtubule dynamics during mitosis.	[263]
TPPP1	Thr14, Ser18, Ser45, Ser160	CDK1 phosphorylation of TPPP1 inhibits its modulation of cell cycle to increase cell proliferation	[264]
CEP169	Ser451	Mediates microtubule dynamics of mitotic spindle	[265]
TMAP	Thr622	CDK1/cyclin B1-mediated phosphorylation of TMAP contributes to proper regulation of microtubule dynamics and establishment of functional bipolar spindles during mitosis	[266]
RPL12	Ser38	Phosphorylation of the ribosomal protein RPL12 by CDK1 affects translation during mitosis	[267]
CREB	Ser270, Ser271	CDK1-dependent phosphorylation of CREB at Ser270 and Ser271 facilitates its dissociation from chromatin during mitosis by reducing its intrinsic DNA binding potential	[268]
SP1	Ser720, Thr723, Thr737	CDK1-mediated SP1 phosphorylation facilitates cell cycle progression during mitosis	[269]

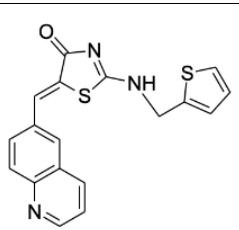
CUX1	Ser1237, Ser1270	Hyperphosphorylation of CUX1 by CDK1/cyclin B inhibits its DNA binding activity in mitosis	[270]
TOP1	Ser112, Ser394	TOP1 is phosphorylated during mitosis by CDK1, which enhances DNA relaxation activity	[271]
NCAPG	Thr308, Thr332	Phosphorylation of NCAPG is required for its chromosomal DNA localization during mitosis	[272]
XIAP	Ser40	Phosphorylation of XIAP by CDK1-cyclin-B1 controls mitotic cell death	[273]
UBC9	Ser71	Phosphorylation of UBC9 by CDK1 enhances SUMOylation activity in cell cycle mediation	[274]
EBP50	Ser279, Ser301	CDK1/cyclin B-mediated EBP50 phosphorylation plays a role in the modulation of various cell functions by affecting actin cytoskeleton reorganization	[275]
FLNa	Ser1436	CDK1/cyclin B1 phosphorylates Ser1436 of FLNa mediating actin remodeling	[276]
cGAS	Ser305 (human) Ser291 (mouse)	DNA sensor cGAS is post-translationally modulated by cell cycle-dependent enzymes to ensure its proper activation for host defense of cytosolic DNA in interphase and is inert to self-DNA in mitosis	[277]
ARHGAP19	Thr404, Thr476	Phosphorylation of ARHGAP19 by CDK1 mediates its subcellular localization and function during mitosis	[278]

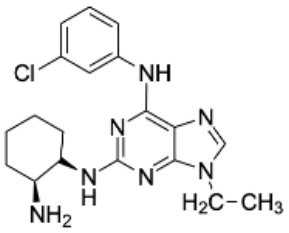
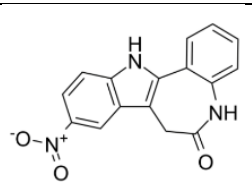
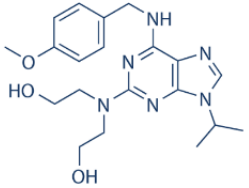
ARHGEF12	Ser190, Ser1176	CDK1 phosphorylates ARHGEF12 at Ser190 and Ser1176 during mitosis	[279]
CHK1	Ser286, Ser301	CHK1 is phosphorylated at Ser286 and Ser301 by CDK1 during mitosis	[76]
CC2D1A	Ser208	CDK1 is a kinase of CC2D1A during mitosis and its phosphorylation of CC2D1A mediates mitotic function	[280]
GM130	Ser25	GM130 is phosphorylated in early mitosis on Ser25 by CDK1/cyclin B.	[281]
CENPA	Ser68	Dynamic phosphorylation of CENPA at Ser68 by CDK1 orchestrates its cell-cycle-dependent deposition at centromeres	[144]
MCM3	Ser112	CDK1-dependent phosphorylation of Ser112 triggers the assembly of MCM3 with the remaining MCM subunits and subsequent chromatin loading of MCMs	[282]
CDCA5	Ser21, Thr48, Ser75, Ser79, Ser83, Thr111, Thr115, Thr159, Ser181, Ser209	phosphorylation of CDCA5 by CDK1 influences sister chromatid cohesion	[283,284]
S6K1	Ser371, Ser411, Thr421, Ser424	CDK1 triggers inactivation of S6K1 in mitosis, serving to spare energy for costly mitotic processes at the expense of ribosomal protein synthesis	[285]

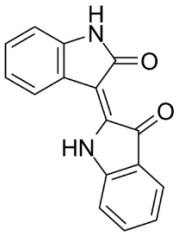
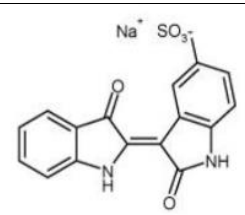
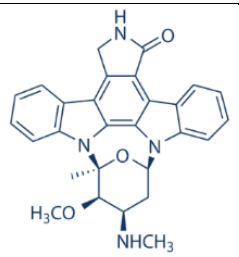
NIPA	Ser395	CDK1/cyclin B1 amplifies phosphorylation of NIPA, which may contribute to the regulation of its own abundance in early mitosis	[286]
SEPT9	Thr24	Mitotic regulation of SEPT9 by CDK1 is important for the completion of cytokinesis	[287]
FAR1	Ser87	Phosphorylation by CDK1 primes FAR1 for ubiquitin-mediated proteolysis	[149]
WRN	Ser1133	CDK1 phosphorylates WRN at collapsed replication forks	[150]
CDC7	Ser16, Ser302, Thr376, Thr472, Thr503	CDK1-mediated phosphorylation of CDC7 suppresses DNA re-replication	[151]
BRCA1	Ser1497, Ser1189, Ser1191	CDK1 participates in BRCA1-dependent S phase checkpoint control in response to DNA damage	[152]
RAD9	Ser11	Dynamics of RAD9 chromatin binding and checkpoint function are mediated by CDK1 activity	[153]
SLBP	Thr61	Phosphorylation of Thr61 by cyclin A/CDK1 triggers degradation of stem-loop binding protein at the end of S phase	[288]
TRF1	Thr371	CDK1 phosphorylates TRF1, which is recruited to sites of DNA damage to facilitate homologous recombination and checkpoint activation	[154]

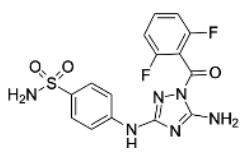
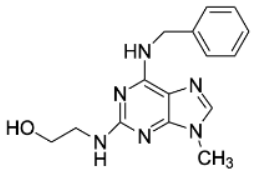
ELAVL1	Ser202	CDK1 phosphorylates ELAVL1 during G2, thereby helping to retain it in the nucleus hindering its post-transcriptional function and anti-apoptotic influence	[155]
VIM	Ser55	Mediates proliferation of mammalian cell lines	[289]
EZH2	Thr350	Link between the cell-cycle machinery and epigenetic gene silencing	[290]
CLIP1	Thr287	CDK1-mediated phosphorylation of CLIP1is essential for the normal function of this protein during cell cycle progression	[291]
VPS34	Thr159	Negative regulation of VPS34 by CDK1 mediates cell-cycle progression	[292]
CDC25A	Ser17, Ser115 Ser115, Ser320	Mitotic stabilization of CDC25A reflects its phosphorylation on Ser17 and Ser115 by CDK1/cyclin B, which is required to uncouple CDC25A from its ubiquitin-proteasome-mediated turnover	[293,294]
SIRT1	Thr530, Ser540	Mutation of these two residues phosphorylated by CDK1/cyclin B disturbs normal cell cycle progression and fails to rescue proliferation defects in SIRT1-deficient cells	[295,296]
HHR6A	Ser120	CDK1-mediated phosphorylation of HHR6A, which is an important regulatory event in the control of cell cycle progression	[297]
PRKAR2A	Thr54	Thr54 phosphorylation of PRKAR2A by CDK1 might serve to mediate PRKACA during cell cycle	[298]

CDC25C	Ser214	The cell cycle control protein CDC25C is present, and phosphorylated on Ser214 by CDK1 in the transition from germinal vesicle to metaphase II in human oocyte meiosis	[299]

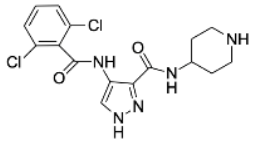
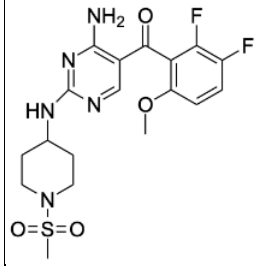
Supplementary Table 4. CDK1 inhibitors in preclinical studies					
Compound name	**Structure**	**Target (IC_{50})**	**Cell base potency (IC_{50} or effective inhibitory dose)**	**Animal model (type and dose and route of administration)**	**Ref**
RO-3306		CDK1 (35 nM)	*$IC_{50:}$* WAC2 (1.8 μM) SHEP (1.3 μM) NB69 (2.3 μM) SK-N-FI (4 μM) NLF (3.8 μM) RH-41 (> 8 μM) IMR32 (1.6 μM) IMR-32 LV-h-p53 (2.4 μM) NGP (4 μM) HDMB-3 (1.8 μM)	Patient derived xenograft (PDX) tumor model– RO3306 4 mg/kg every 2 days, oral gavage administration	[157-159]

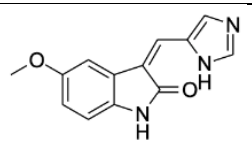
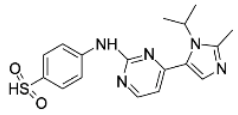
CGP-74514A		CDK1 (25 nM)	*IC_{50}:* MCF-7 (5 μM) T47D (5 μM) SK-BR-3 (5 μM) NCl-H720 (2.2 μM) NCl-H727 (3.2 μM) BON-1 (1.9 μM) hTERT-RPE1 (13 μM)	NA	[160,161]
Alsterpaullone		CDK1 (35 nM) CDK2 (15 nM) CDK5 (40 nM)	*Effective inhibitory dose* D425 (5 μM) D458 (5 μM)	D458 cerebellar xenograft model– alsterpaullone 30 mg/kg, SC, daily for 2 weeks;	[300,301]
CVT-313		CDK1 (4.2 μM) CDK2 (500 nM) CDK4 (215 μM)	A2058 (16 μM) Caco-2 (4.5 μM) Capan-1 (10 μM) L1210 (4.2 μM) MCF-7 (6.25 μM) MRC-5 (20 μM) Neonatal (5 μM) RVSMC (1.25 μM)	Rat restenosis model—Rats were injected with CBT-313 (0.75 and 0.25 mg/kg) intraperitoneally	[302,303]

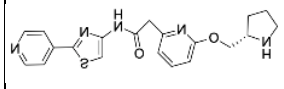
			P-388D1 (4 μM) Panc1 (8 μM)		
Indirubin		CDK1 (10 μM) CDK2 (2.2 μM) CDK4 (12 μM) CDK5 (5.5 μM)	*Effective inhibitory dose:* HaCaT (100 nM)	Full-thickness wounds were created on the dorsal skin of BALB/c mice, which were then treated with vaseline containing DMSO (1%) or indirubin (262.26 ng/g vaseline).	[304,305]
Indirubin-5-sulfonic acid.		CDK1 (55 nM) CDK2 (35 nM) CDK4 (300 nM) CDK5 (65 nM)	*Effective inhibitory dose:* HUVEC (25 μM)	Human prostate xenograft mouse model–indirubin solution was intralesional injected at a dose of 10 mg/kg daily	[304]
Staurosporine		CDK1 (5 nM) CDK2 (7 nM) CDK4 (<10 μM) CDK5 (4 nM)	*IC_{50}:* Primary hOB (11.63 μM) U2OS (6.69 μM) HOS (6 μM) Saos-2 (6.16 μM) T-24 (0.029 μM)	Bladder T-24 xenograft model–athymic nude mice were treated with staurosporine 0.1 mg/kg daily by intraperitoneal injection	[306-308]

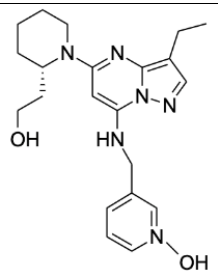
			HL-60 (0.13 μM) CEC (0.022 μM)		
JNJ-7706621		CDK1 (9 nM) CDK2 (4 nM)	*IC_{50}:* WAC2 (10.6 μM) SHEP (1 μM) NB69 (2.3 μM) SK-N-FI (4.1 μM) NLF (3.4 μM) RH-41 (2.8 μM) IMR-32 (1.3 μM) IMR-32 LV-h-p53 (2.1 μM) NGP (3.1 μM) HDMB-3 (1.6 μM)	A375 melanoma human tumor xenograft model– JNJ-7706621 was administered to mice orally at 100 or 125 mg/kg daily	[158,309]
Olomoucine		CDK1 (7 μM) CDK2 (7 μM) CDK5 (3 μM)	*IC_{50}:* HL-60 (40 μM) A2780 (30 μM) A2780Cis^{R} (45 μM)	HCT116 colon xenograft model– Olomoucine was administered in a volume	[310,311]

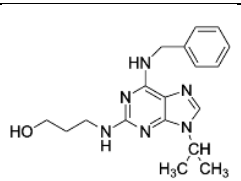
			CH1 (48 μM) CH1Cis^{R} (78 μM) CH1Cox^{R} (86 μM) SKOV-3 (> 50 μM) BE (> 50 μM) HT29 (58 μM) Mawi (> 50 μM) Lovo (> 50 μM) SW620 (> 50 μM) HCT116 (52 μM) COLO-205 (41 μM) KM12 (90 μM) SA-OS2 (78 μM) U2-OS (101.5 μM) MCF 7 (64 μM) MB-MDA231 (101.5 μM) A549 (54.5 μM) MOR (66 μM) HX147 (106.5 μM) CORL23 (54 μM)	of 0.1 mL/10 g bodyweight in 50 mmol/L by IV	

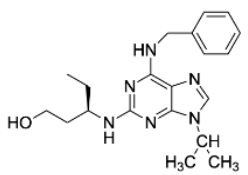
			GCT (27 μM)		
AT-7519		CDK1 (220 nM) CDK2 (44 nM) CDK4 (67 nM) CDK5 (11 nM)	*IC_{50}:* HeLa (0.325 μM) ME-180 (0.599 μM)	Xenograft tumor model–AT7519 was administrated at 15 mg/kg body weight once a day for 5 days for a 2-week duration by IV.	[312,313]
R547		CDK1 (0.001 μM) CDK2 (0.003 μM) CDK4 (0.001 μM)	*IC_{50}:* MDA-MB-468 (0.11 μM) MDA-MB-435 (0.08 μM) MCF-7 (0.06 μM) HCT116 (0.08 μM) SW480 (0.07 μM) RKO (0.05 μM) HT-29 (0.17 μM) HCT15 (0.61 μM) H460a (0.06 μM) C33A (0.32 μM) DU145 (0.08 μM) OSA-CL (0.19 μM)	Xenograft models–R547 was administered at 40, 60 or 80 mg/kg with formulated as a suspension in Klucel LF/Tween 80 or R547 was formulated as a solution in hydroxylpropyl h-cyclodextrin, sodium hydroxide, and water for IV injection at 3.75, 7.5, 15, or 30 mg/kg.	[314]

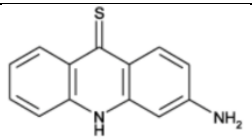
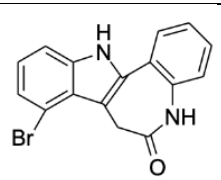
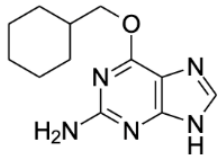
			LOX (0.05 μM) JEKO-1 (0.08 μM) REC-1 (0.09 μM)		
SU9516		CDK1 (0.04 μM) CDK2 (0.022 μM)	*IC_{50}:* A431 (2.2 μM) H460 (3.6 μM) Colo-205 (2.6 μM) RKO (5.6 μM) SW480 (6.4 μM)	Duchenne muscular dystrophy mouse model– mice were administered 5 mg/kg SU9516 by oral gavage from 3 to 10 weeks of age	[315,316]
AZD5438		CDK1 (16 nM) CDK2 (6 nM) CDK9 (20 nM)	*IC_{50}:* MCF-7 (0.22 μM) MCF-7Adr (0.31 μM) MDA-MB-23 (0.46 μM) HCT-116 (0.32 μM) HCT-15 (1.13 μM) HT29 (1.05 μM) LoVo (0.63 μM) SW620 (0.58 μM) Colo-205 (0.7 μM) A549 (0.57 μM)	BT474c, CoLo-205, HX147, PC-3, SW620 cell line xenografts– The mice were orally administered AZD5438 at 25, 50, or 100 mg/kg, daily	[317]

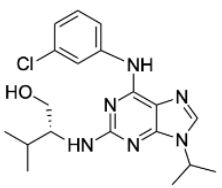
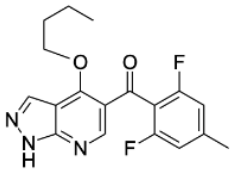
			H322 (0.4 μM) H460 (0.87 μM) PC-3 (0.2 μM) DU145 (0.42 μM) A2780 (1.26 μM) HeLa (1.1 μM) IM-9 (1 μM) MOLP-8 (1.1 μM) AMO-1 (1 μM) ARH-77 (1.7 μM) KARPAS-620 (0.74 μM) JJN-3 (0.94 μM) L-363 (0.5 μM)		
CDKi277		CDK1 (0.008 μM) CDK2 (0.004 μM) CDK5 (0.005 μM) CDK6 (0.051 μM)	*IC_{50}:* Daudi (0.171 μM) HL60 (0.129 μM) K562 (0.438 μM) Jurkat (0.14 μM) HS294 (0.221 μM) A375 (0.12 μM)	Colo205 and PC-3 xenograft models–mice were administered CDKi277 at 25 or 12.5 mg/kg for 4 days on and 1 day off, for three	[318]

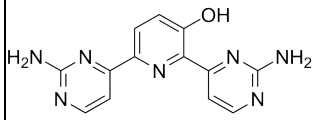
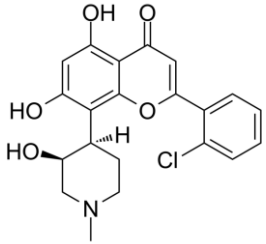
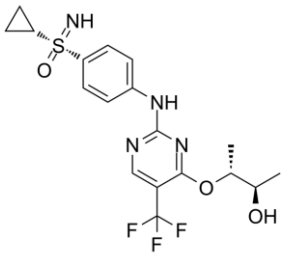
			MiaPaca2 (0.116 μM) PC-3 (0.251 μM) SaSO2 -Rb (0.32 μM) U2OS+Rb (0.28 μM) Colo205 (0.278 μM) Colo320 (0.241 μM) HCT116 $p53^{+}$ (0.29 μM, HCT116 $p53^{-}$ (0.31 μM) MDA-MB-231 (0.137 μM) MCF-7 p53(+) (0.18 μM) MCF-7 p53(-) (0.14 μM)	consecutive cycles by IP injection	
Dinaciclib		CDK1 (3 nM) CDK2 (1 nM) CDK5 (1 nM) CDK9 (4 nM)	*Effective inhibitory dose:* BT474 (10 nM) MCF7 (1 nM) T47D (1 nM)	PDX mouse model– Dinaciclib alone was administered by intraperitoneal injection at a dose of 50 mg/kg/day, 5 days a week for total of 4 weeks	[319,320]

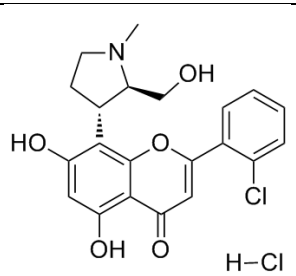
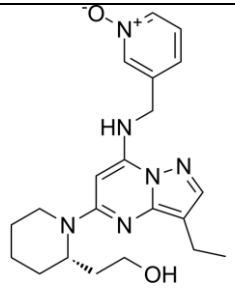
Bohemine		CDK1 (3.89 μM) CDK2 (4.6 μM) CDK9 (2.7 μM)	*IC_{50}:* A2780 (12.5 μM), CH1 (21.5 μM) $CH1Cis^R$ (22 μM) $CH1Cox^R$ (19 μM) SKOV-3 (81 μM) BE (25 μM) HT29 (27.7 μM) Mawi (28.5 μM) Lovo (25 μM) SW620 (27 μM) HCT116 (17 μM) COLO-205 (21 μM) KM12 (32 μM) SA-OS2 (38 μM) U2-OS (36 μM) MCF 7 (21.5 μM) MB-MDA231 (40 μM) A549 (20 μM) MOR (36 μM)	HCT116 xenograft model– Bohemine were given i.v. in a volume of 0.1 mL/10 g bodyweight in 50 mM HCl/saline at 50 mg/kg	[311,321]

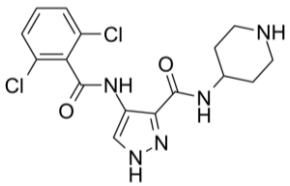
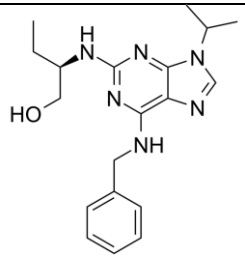
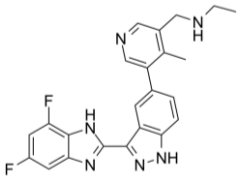
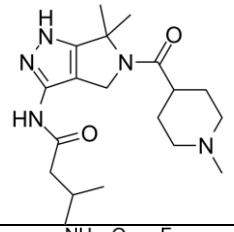
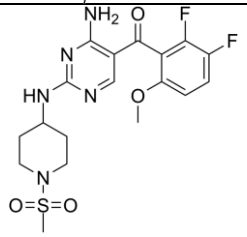
			HX147 (38 μM) CORL23 (29.5 μM) GCT (14.5 μM)		
CYC202		CDK1 (0.65 μM) CDK2 (0.7 μM) CDK5 (0.16 μM) CDK7 (0.46 μM) CDK9 (0.6 μM)	*IC_{50}:* A2780 (4.9 μM) A2780Cis^{R} (8.4 μM) CH1 (7.7 μM) CH1Cis^{R} (9.3 μM) CH1Cox^{R} (7.4 μM) SKOV-3 (31 μM) BE (17.5 μM) HT29 (20.3 μM) Mawi (18 μM) Lovo (20 μM) SW620 (23 μM) HCT116 (6.9 μM) COLO-205 (8.5 μM) KM12 (15 μM) SA-OS2 (16.5 μM) U2-OS (15 μM)	HCT116 tumor xenograft–mice were orally administered CYC202 at 50, 500, or 2,000 mg/kg, daily	[311,322]

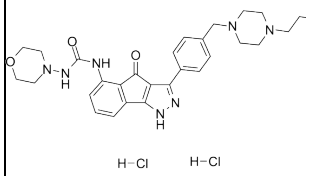
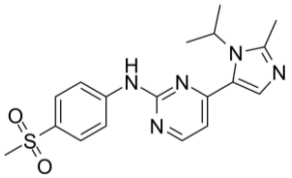
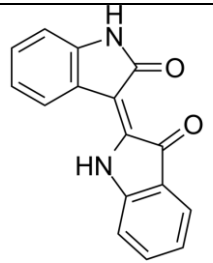
			MCF 7 (7.8 μM) MB-MDA231 (15 μM) A549 (9.3 μM) MOR (12.5 μM) HX147 (19 μM) CORL23 (10.5 μM) GCT (5.2 μM)		
3-ATA		CDK1 (88 μM) CDK2 (>100 μM) CDK4 (3.1 μM)	*Effective inhibitory dose:* cerebellar granule neurons (10 μM)	NA	[323,324]
Kenpaullone		CDK1 (0.4 μM) CDK2 (0.7 μM) CDK5 (0.9 μM)	*Effective inhibitory dose:* MDA-MB-231 (5 μM)	NA	[12,325]
NU2058		CDK1 (26 μM) CDK2 (17 μM)	IC_{50}: LNCaP (15 μM) LNCaP-cdxR (17 μM) LNCaP-AI (10 μM) PC3 (38 μM)	NA	[326,327]

			DU145 (14 μM) CWR22Rv1 (16 μM)		
Purvalanol A		CDK1 (4 μM) CDK2 (35 μM) CDK4 (850 μM) CDK5 (75 μM)	*Effective inhibitory dose:* MCF-7 (25 μM) MDA-MB-231 (25 μM) HCT 116 (10 μM) HT29 (5 μM) SW480 (5 μM)	NA	[328-332]
BMS-265246		CDK1 (6 nM) CDK2 (9 nM)	*IC_{50}:* Hep-3B (2.84 μM) Hep-G2 (1.73μM)	NA	[333]

Supplementary Table 5. CDK inhibitors in clinical development						
Drug Name	**Structure**	**Major Targets**	**Phase**	**Clinical Trial ID**	**Cancer type**	**Ref**
BEY1107		CDK1	1, 2	NCT03579836	Locally Advanced or Metastatic Pancreatic Cancer	[162]
Flavopiridol		CDK1/2/4/7/9	1, 2	NCT02520011 NCT00112723 NCT00005974 NCT00098579 NCT00007917 NCT00324480	Leukemia, Multiple Myeloma, Sarcoma, Gastrointestinal Stromal Tumor, Lymphoma, Solid Tumors	[163,164]
Roniciclib		CDK1/2/3/4/7/9	1, 2	NCT01188252 NCT02047890 NCT01335256 NCT02161419 NCT01573338	Neoplasms, Lung Cancer	[170,171]

P276-00		CDK1/4/9	1, 2	NCT00408018 NCT00407498 NCT00835419 NCT01333137 NCT00824343 NCT00882063	Neoplasm, Melanoma, Breast Cancer, Multiple Myeloma, Advanced Head and Neck Cancer, Lymphoma	173 334 13 174
Dinaciclib		CDK1/2/5/9	1, 2, 3, 4	NCT01783171 NCT00732810 NCT03484520 NCT01624441 NCT01676753 NCT01096342 NCT02684617 NCT01711528 NCT01650727 NCT00937937 NCT01515176 NCT01434316 NCT01624441	Pancreatic cancer, Non-Small-Cell Lung cancer, Neoplasms, Leukemia, Breast cancer, Myeloma, Lymphoma, Melanoma	176-178

AT7519		CDK1/2/4/6/9	1, 2	NCT00390117 NCT01652144 NCT01627054 NCT01183949	Lymphoma, Unspecified Adult Solid Tumor, Multiple Myeloma, Lymphoma	181,182,312
Seliciclib		CDK1/2/5/7	1,2	NCT00999401 NCT00372073 NCT01333423	Non-small Cell Lung Cancer, Breast Cancer, Advanced Solid Tumors	335
AG-024322		CDK1/2/4	1	NCT00147485	Neoplasms, Non-Hodgkin Lymphoma,	13
PHA-793887		CDK1/2/4/5	1	NCT00996255	Advanced/Metastatic Solid Tumors	334
R547		CDK1/2/4/7	1	NCT00400296	Neoplasms	13

RGB-286638		CDK1/2/3/4/5/9	1	NCT01168882	Hematological Malignancies	
AZD-5438		CDK1/2/9	1	NCT00088790	Neoplasms	
Indirubin		CDK1/2/4/5	4	NCT02200978	Childhood Acute Promyelocytic Leukemia	[336]