Supplementary

Table S1 List of HCC-causing HubGs-sets that were published in different articles

References	*In vivo* and *in vitro* experimentally validated (yes/no)	HubGs-sets	HubGs that were published in at least nine articles
(23)	Yes	*CCNB1*, *CDK1*, *CDC20*, *PTTG1*, *CCNA2*, *TTK*	*CCNB1*, *CDK1*, *CDC20*, *TOP2A*, *CCNB2*, *BUB1B*, *CCNA2*, *PRC1*
(111)	Yes	*PPAT*, *YWHAB*, *NOL10*	
(112)	No	*TOP2A*, *NDC80*, *CDK1*, *CCNB1*, *KIF11*, *BUB1*, *CCNB2*, *CCNA2*, *TTK*	
(113)	No	*BIRC5*, *FOXM1*, *CENPA*, *KIF4A*, *DTYMK*, *PRC1*, *IGF2BP3*, *KIF2C*, *TRIP13*, *TPX2*	
(101)	Yes	*JUN*, *PIK3R1*, *STAT3*, *E2F2*, *E2F3*, *NRAS*	
(114)	Yes	*AURKA*, *KIF5B*, *RHOA*	
(115)	No	*MCM6*, *MCM3*, *UBE2C*, *RRM2*, *RFC4*, *TOP2A*, *MCM2*, *CDK1*, *PRIM1*, *CCNB1*, *HMMR*, *CDC20*, *CCNA2*, *NEK2*, *NDC80*, *DLGAP5*, *KIF11*	
(116)	No	*CDK1*, *CCNB1*, *AURKA*, *CCNA2*, *KIF11*, *BUB1B*, *TOP2A*, *TPX2*, *HMMR*, *CDC45*	
(94)	No	*TOP2A*, *NDC80*, *FOXM1*, *HMMR*, *KNTC1*, *PTTG1*, *FEN1*, *RFC4*, *SMC4*, *PRC1*	
(16)	No	*FOXM1*, *AURKA*, *CCNA2*, *CDKN3*, *MKI67*, *EZH2*, *CDC6*, *CDK1*, *CCNB1*, *TOP2A*	
(117)	Yes	*SPINK1*, *TXNRD1*, *LCAT*, *PZP*	
(95)	No	*CDC20*, *CCNB2*, *NCAPG*, *ASPM and NUSAP1*	
(118)	No	*TOP2A*, *CCNB2*, *PRC1*, *RACGAP1*, *AURKA*, *CDKN3*, *NUSAP1*, *CDCA5*, *ASPM*, *NCAPG*	
(119)	Yes	*CCNB2*, *NUSAP1*, *TK1*	
(20)	No	*CDK1*, *CCNB1*, *CCNB2*, *MAD2L1*, *TOP2A*	
(120)	No	*CYP3A4*, *UGT1A6*, *AOX1*, *UGT1A4*, *UGT2B15*, *CDK1*, *CCNB1*, *MAD2L1*, *CCNB2*, *CDC20*	
(71)	Yes	*CDK1*, *CCNB1*, *CDC20*, *BUB1*, *MAD2L1*, *MCM3*, *BUB1B*, *MCM2*, *RFC4*	
(121)	No	*DTL*, *CDK1*, *CCNB1*, *RACGAP1*, *ECT2*, *NEK2*, *BUB1B*, *PBK*, *TOP2A*, *ASPM*, *HMMR*, *RRM2*, *CDKN3*, *PRC1*, *ANLN*	
(122)	No	*CDKN3*, *CDK1*, *CCNB1*, *TOP2A*, *CCNA2*, *CCNB2*, *PRC1*, *RRM2*	
(123)	No	*TTK*, *NCAPG*, *TOP2A*, *CCNB1*, *CDK1*, *PRC1*, *RRM2*, *UBE2C*, *ZWINT*, *CDKN3*, *AURKA*, *RACGAP1*	
(124)	Yes	*CDC20*, *TOP2A*, *RRM2*, *UBE2C*, *AOX1*	
(72)	No	*CCNB1*, *CDC20*, *CDK1*, *BUB1B*, *CCNA2*, *NUSAP1*, *UBE2C*, *ZWINT*	
(21)	No	*CDC20*, *CDK1*, *MAD2L1*, *BUB1*, *BUB1B*, *CCNB1*, *CCNA2*	
(125)	No	*CHGA*, *RAET1E*, *FGF9*, *GIP*, *NR0B1*, *IL20RA*, *ESRRG and GNRH2*	
(22)	No	*CCNB1*, *CCNA2*, *CCNB2*, *NCAPG*, *PBK*, *NUSAP1*, *AURKA*, *ZWINT*, *PRC1*, *KIF4A*	
(126)	No	*CDC20*, *BUB1B*, *KIF11*, *TTK*, *EZH2*, *ZWINT*, *NDC80*, *TPX2*, *MELK*, *KIF20A*	
(127)	No	*CCNB1*, *CDK1*, *RRM2*, *BUB1B*	
(128)	Yes	*CNIH4*, *SOX4*, *SPP1*, *SORBS2*, *CCL19*	
(129)	No	*CSE1L*, *CSTB*, *MTHFR*, *DAGLA*, *MMP10*, *GYS2*	
(130)	Yes	*CD163*, *EHHADH*, *KIAA0101*, *SLC16A2*, *SPP1*, *THBS4*	
(131)	No	*HAO1*, *SCL27A2*, *DAO*, *ABAT*, *PCK2*	
(132)	No	*PLK1*, *CDC20*, *HSP90AA1*, *CHEK1*, *HDAC1*, *NDC80*	
(133)	No	*CDK1*, *CCNB1*, *CCNB2*, *BUB1*, *KIF11*	
(134)	Yes	*BIRC5*, *CDC20*, *CCNB1*, *BUB1B*, *MAD2L1*, *CDK1*	
(135)	No	*CDC45*, *CENPA*, *MCM10*, *MELK*, *CDC20*, *ASF1B*, *FANCD2*, *NCAPH*	
(136)	No	*HDAC1*, *BIRC5*, *SPP1*, *STC2*, *NR6A1*	
(137)	Yes	*UBE2T*, *CYP3A4*	
(138)	No	*MCM3*, *TRMT6*, *AURKA*, *CDC20*, *TOP2A*, *ECT2*, *TK1*, *MCM2*, *FEN1*, *NCAPD2*, *KPNA2*	
(139)	No	*SOX4*, *STK39*, *TARBP1*, *TDRKH*	
(140)	No	*OIP5*, *ASPM*, *NUSAP1*, *UBE2C*, *CCNA2*, *KIF20A*	
(141)	No	*CDKN3*, *ZWINT*, *KIF20A*, *NUSAP1*, *HMMR*, *DLGAP5*	
(142)	No	*CDK1*, *CDC20*, *CCNB1*, *CENPF*, *MAD2L*	
(143)	No	*GMPS*, *ACACA*, *ALB*, *TGFB1*, *KRAS*, *ERBB2*, *BCL2*, *EGFR*, *STAT3*, *CD8A*	
(144)	Yes	*SERPINA1*, *IGFBP1*, *KNG1*, *TIMP1*, *APOA1*, *SPP1*, *IGFBP3*, *FBN1*, *VCAN*, *MATN3*, *STC2*, *SERPINC1*, *APOB*	
(145)	No	*CDKN3*, *CYP2C9*, *LCAT*	
(146)	Yes	*RELN*, *KCNJ10*, *NCAM1*	
(147)	No	*ZWINT*, *CENPA*, *RACGAP1*, *PLK1*, *NCAPG*, *OIP5*, *CDCA8*, *PRC1*, *CDK1*	
(148)	No	*CEP55*, *DEPDC1*, *KIF23*, *CLSPN*, *MYBL2*, *RACGAP1*	
(149)	No	*BMP4*, *PLCB1*, *PRKG2ITGA2*, *KDM6B*, *SPINK6*, *POU3F4 GLI1*, *MYC*, *CSNK2A1*, *POTEF*, *HSF1*, *SCNN1A*	
(150)	No	*TTK*, *BUB1*, *CYP3A4*, *NR1I2*, *CYP8B1*	
(151)	No	*CDK1*, *HMMR*, *PTTG1*, *TTK*	
(70)	Yes	*BUB1B*, *CCNB1*, *CCNB2*, *CDC20*, *CDK1*, *MAD2L1*, *RRM2*	
(152)	No	*AURKA*, *BUB1B*, *TOP2A*, *MAD2L1*, *CCNA2*, *CCNB1*, *BUB1*, *KIF11*, *CDK1*, *CCNB2*, *TPX2*	
(153)	No	*TOP2A*, *CDC20*, *PTTG1*, *CDCA5*, *CCNB2*, *PRC1*, *KIF20A*, *SF3B4*, *HSP90AB1*, *FOXD2*, *PLOD3*, *CCT3*, *SETDB1*, *VPS45*, *SPDL1*, *RACGAP1*, *MED24*, *KIAA0101*, *ZNF282*, *USP21*	
(154)	Yes	*OP2A*, *ESR1*, *AURKA*, *KMO*, *CDKN3*, *ALDH8A1*, *CYP2C8*, *PRC1*, *NCAPG*, *CCNB*	
(155)	No	*HES5*, *KITLG*, *METTL3*, *PSMD1*, *RAB10*, *TCOF1*, *YTHDF2*, *ZC3H13*	
(156)	Yes	*BASP1*, *SRD5A2*	
(157)	Yes	*MCM7*, *UBE2L3*, *PPIA*, *CXCL12*, *ASS*	
(158)	Yes	*ADAR*, *PSMD4*, *D9SVA*, *CCT3*, *GBAP*, *RDBP*, *CSRP2*, *IL7R*	

HCC, hepatocellular carcinoma; HubGs, hub differentially expressed genes.

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Table S2 List of anti-HCC related 157 meta-drug agents

List of anti-HCC related meta-drug agents	References
Acriflavine	Suggested by Lee *et al.* (159)
Cisplatin, etoposide, bleomycin, cisplatin, vincristine, methotrexate, bleomycin, dactinomycin, cyclophosphamide, etoposide	Suggested by Whelan *et al.* (25)
CA4-P, vincristine	Suggested by Aboubakr *et al.* (160)
ε-viniferin, vincristine	Suggested by Özdemir *et al.* (161)
Tacrolimus, mycophenolate, sirolimus	Suggested by Chinnakotla *et al.* (162)
Mycophenolate mofetil, sirolimus, tacrolimus	Suggested by Lee *et al.* (163)
Sirolimus	Suggested by Wang *et al.* (164)
Paclitaxel, tamoxifen, fluorouracil, ethinyl estradiol, doxorubicin, vorinostat, dabrafenib, sulfinpyrazone, teniposide, etoposide, vincristine, doxorubicin, norfloxacin, valrubicin, levofloxacin, enoxacin, daunorubicin, ofloxacin, pefloxacin, amsacrine, podofilox, dexrazoxane, mitoxantrone, lomefloxacin, epirubicin, dactinomycin, finafloxacin, idarubicin, hydroquinone	Suggested by Chen *et al.* (16)
Atezolizumab, avastin (bevacizumab), bevacizumab, cabometyx (cabozantinib-S-malate), cabozantinib-S-malate, cyramza (ramucirumab), infigratinib phosphate, keytruda (pembrolizumab), lenvatinib mesylate, lenvima (lenvatinib mesylate), nexavar (sorafenib tosylate), nivolumab, opdivo (nivolumab), pemazyre (pemigatinib), pembrolizumab, pemigatinib, ramucirumab, regorafenib, sorafenib tosylate, stivarga (regorafenib), tecentriq (atezolizumab), truseltiq (infigratinib phosphate)	Suggested on the NCI webpage (165)
3-Cl-AHPC, ABT-199, ABT-737, AT13387, AZD1480, AZD7762, BI-2536, BIX-01294, BRD-K01737880, BRD-K66453893, RD-K70511574, CAY10618, CCT036477, CD-437, CHM-1, COL-3, FQI-1, GMX-1778, GSK-J4, SK461364, SK525762A, GW-843682X, HLI 373, I-BET151, JQ-1, KPT185, KU-60019, LRRK2-IN-1, LY-2157299, LY-2183240, ML239, ML311, MST-312, Merck60, NSC48300, NSC632839, NSC95397, NVP-231, NVP-BSK805, OSI-930, PF-184, PF-573228, PL-DI, PRIMA-1, PX-12, RITA, SB-225002, SB-743921, SCH-79797, SNX-2112, STF-31, TG-101348, TW-37, YK 4-279, alisertib, alvocidib, apicidin, avrainvillamide, axitinib, barasertib, bardoxolone methyl, belinostat, brivanib, ceranib-2, chlorambucil, ciclopirox, clofarabine, crizotinib, cucurbitacin I, curcumin, cytarabine hydrochloride, daporinad, decitabine, dinaciclib, docetaxel, doxorubicin, elocalcitol, entinostat, epigallocatechin-3-monogallate, etoposide, fluorouracil, gemcitabine, indisulam, isoevodiamine, isoliquiritigenin, leptomycin B, linifanib, manumycin A, marinopyrrole A, masitinib, methotrexate, methylstat, mitomycin, nakiterpiosin, narciclasine, navitoclax, necrosulfonamide, neopeltolide, nutlin-3, obatoclax, omacetaxine mepesuccinate, ouabain, paclitaxel, panobinostat, parbendazole, pazopanib, pevonedistat, phloretin, pifithrin-mu, piperlongumine, rigosertib, serdemetan, sotrastaurin, tacedinaline, teniposide, tivantinib, topotecan, tozasertib, triazolothiadiazine, tubastatin A, vincristine, vorinostat	Detected by the GSCALite: a web server based on the proposed tHubGs (166)

HCC, hepatocellular carcinoma; NCI, National Cancer Institute.

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Table S3 The top 20 significantly ($P_{adj.}$ value <0.05) enriched GO functions by HubGs involving tHubGs with HCC

Term ID	Term name	$P_{adj.}$ value	Count	HubGs
MF				
GO:0097367	Carbohydrate derivative binding	2.69E−10	58	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *HMMR*, *KIF20A*, *RFC4*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ACACA*, *APOB*, *ASS*, *BMP4*, *CDC6*, *CHEK1*, *CSNK2A1*, *DTYMK*, *EGFR*, *ERBB2*, *FBN1*, *FGF9*, *GMPS*, *HAO1*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *KNG1*, *KRAS*, *MCM6*, *MCM7*, *MKI67*, *NRAS*, *PCK2*, *PPIA*, *PRIM1*, *RAB10*, *RHOA*, *SERPINC1*, *SMC4*, *STK39*, *THBS4*, *TK1*, *TRIP13*, *UBE2L3*, *VCAN*
GO:0036094	Small molecule binding	1.74E−09	59	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *AOX1*, *CCT3*, *CYP3A4*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ABAT*, *ACACA*, *ALB*, *APOA1*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *CYP8B1*, *DAO*, *DTYMK*, *EGFR*, *EHHADH*, *ERBB2*, *GMPS*, *HAO1*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *KRAS*, *MCM6*, *MCM7*, *MKI67*, *MTHFR*, *NRAS*, *PCK2*, *PLOD3*, *PRIM1*, *RAB10*, *RHOA*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *TXNRD1*, *UBE2L3*
GO:0005515	Protein binding	1.74E−09	174	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *PRC1*, *AURKA*†, *CDKN3*, *RRM2*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *HMMR*, *NDC80*, *ASPM*, *KIF20A*, *PTTG1*, *SPP1*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *RFC4*, *AOX1*, *CCT3*, *CDC45*, *CDCA5*, *CYP3A4*, *DLGAP5*, *EZH2*, *HDAC1*, *KIF4A*, *LCAT*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *OIP5*, *PBK*, *PLK1*†, *SOX4*, *STAT3*, *STC2*, *ABAT*, *ACACA*, *ADAR*, *ALB*, *ANLN*, *APOA1*, *APOB*, *ASF1B*, *ASS*, *BASP1*, *BCL2*, *BMP4*, *CCL19*, *CD163*, *CD8A*, *CDC6*, *CDCA8*, *CENPF*, *CEP55*, *CHEK1*, *CLSPN*, *CNIH4*, *CSE1L*, *CSNK2A1*, *CSRP2*, *CSTB*, *CXCL12*, *DAGLA*, *DAO*, *DEPDC1*, *DTL*, *E2F2*, *E2F3*, *ECT2*, *EGFR*, *EHHADH*, *ERBB2*, *ESRRG*, *FANCD2*, *FBN1*, *FEN1*, *FGF9*, *FOXD2*, *GIP*, *GNRH2*, *HES5*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *IGF2BP3*, *IGFBP1*, *IGFBP3*, *IL20RA*, *IL7R*, *JUN*, *KCNJ10*, *KDM6B*, *KIF23*, *KIF2C*, *KIF5B*, *KITLG*, *KNG1*, *KNTC1*, *KRAS*, *MATN3*, *MCM10*, *MCM6*, *MCM7*, *MED24*, *METTL3*, *MKI67*, *MYBL2*, *MYC*, *NCAM1*, *NCAPH*, *NOL10*, *NR0B1*, *NR1I2*, *NR6A1*, *NRAS*, *PCK2*, *PIK3R1*, *PLCB1*, *PLOD3*, *POTEF*, *PPIA*, *PRIM1*, *PSMD1*, *PSMD4*, *PZP*, *RAB10*, *RAET1E*, *RELN*, *RHOA*, *SCNN1A*, *SERPINA1*, *SERPINC1*, *SETDB1*, *SF3B4*, *SMC4*, *SORBS2*, *SPDL1*, *SPINK1*, *SPINK6*, *SRD5A2*, *STK39*, *TCOF1*, *TDRKH*, *TGFB1*, *THBS4*, *TIMP1*, *TK1*, *TRIP13*, *TXNRD1*, *UBE2L3*, *UGT1A4*, *UGT1A6*, *USP21*, *VCAN*, *VPS45*, *YTHDF2*, *YWHAB*, *ZC3H13*
GO:0043168	Anion binding	1.83E−09	57	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *RACGAP1*, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *AOX1*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ABAT*, *ACACA*, *ALB*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *DAO*, *DTYMK*, *EGFR*, *EHHADH*, *ERBB2*, *GMPS*, *HAO1*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *KRAS*, *MCM6*, *MCM7*, *MKI67*, *MTHFR*, *NRAS*, *PCK2*, *PLCB1*, *PLOD3*, *RAB10*, *RHOA*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *TXNRD1*, *UBE2L3*
GO:0019899	Enzyme binding	1.83E−09	52	*CCNB1*, *CDC20*†, *TOP2A*†, *CCNA2*, *PRC1*, *AURKA*†, *RACGAP1*, *KIF11*, *UBE2C*, *KIF20A*, *TPX2*, *BIRC5*†, *FOXM1*, *CYP3A4*, *HDAC1*, *MCM2*, *NEK2*, *PLK1*†, *STAT3*, *STC2*, *ABAT*, *APOA1*, *APOB*, *BCL2*, *CDC6*, *CSE1L*, *CSTB*, *ECT2*, *EGFR*, *EHHADH*, *ERBB2*, *FANCD2*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *JUN*, *KNTC1*, *MCM10*, *PIK3R1*, *PLCB1*, *PSMD1*, *PZP*, *RHOA*, *SERPINA1*, *SERPINC1*, *SPDL1*, *STK39*, *TIMP1*, *UBE2L3*, *UGT1A4*, *UGT1A6*, *YWHAB*
GO:1901265	Nucleoside phosphate binding	2.46E−09	53	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *AOX1*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ACACA*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *DAO*, *DTYMK*, *EGFR*, *EHHADH*, *ERBB2*, *GMPS*, *HAO1*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *KRAS*, *MCM6*, *MCM7*, *MKI67*, *MTHFR*, *NRAS*, *PCK2*, *PRIM1*, *RAB10*, *RHOA*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *TXNRD1*, *UBE2L3*
GO:0000166	Nucleotide binding	2.46E−09	53	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *AOX1*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ACACA*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *DAO*, *DTYMK*, *EGFR*, *EHHADH*, *ERBB2*, *GMPS*, *HAO1*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *KRAS*, *MCM6*, *MCM7*, *MKI67*, *MTHFR*, *NRAS*, *PCK2*, *PRIM1*, *RAB10*, *RHOA*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *TXNRD1*, *UBE2L3*
GO:0032553	Ribonucleotide binding	1.30E−08	48	*CDK1*†, *TOP2A*†, *BUB1B*,† *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ACACA*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *DTYMK*, *EGFR*, *ERBB2*, *GMPS*, *HAO1*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *KRAS*, *MCM6*, *MCM7*, *MKI67*, *NRAS*, *PCK2*, *PRIM1*, *RAB10*, *RHOA*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *UBE2L3*
GO:0005524	ATP binding	2.12E−08	41	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ACACA*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *DTYMK*, *EGFR*, *ERBB2*, *GMPS*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *MCM6*, *MCM7*, *MKI67*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *UBE2L3*
GO:0035639	Purine ribonucleoside triphosphate binding	2.57E−08	46	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ACACA*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *DTYMK*, *EGFR*, *ERBB2*, *GMPS*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *KRAS*, *MCM6*, *MCM7*, *MKI67*, *NRAS*, *PCK2*, *RAB10*, *RHOA*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *UBE2L3*
GO:0032559	Adenyl ribonucleotide binding	5.94E−08	41	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ACACA*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *DTYMK*, *EGFR*, *ERBB2*, *GMPS*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *MCM6*, *MCM7*, *MKI67*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *UBE2L3*
GO:0042802	Identical protein binding	6.04E−08	49	*TOP2A*†, *PRC1*, *RRM2*, *MAD2L1*, *TTK*, *NDC80*, *BIRC5*†, *AOX1*, *OIP5*, *PLK1*†, *STAT3*, *STC2*, *ABAT*, *ACACA*, *ALB*, *APOA1*, *ASS*, *BCL2*, *CENPF*, *CEP55*, *CSNK2A1*, *DAO*, *ECT2*, *EGFR*, *ERBB2*, *ESRRG*, *FBN1*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *JUN*, *KIF5B*, *KRAS*, *MCM10*, *MCM6*, *NR0B1*, *NR6A1*, *PLCB1*, *PSMD4*, *SERPINA1*, *SERPINC1*, *SORBS2*, *TGFB1*, *TK1*, *TRIP13*, *TXNRD1*, *UGT1A4*, *UGT1A6*, *YWHAB*
GO:0030554	Adenyl nucleotide binding	6.04E−08	41	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ACACA*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *DTYMK*, *EGFR*, *ERBB2*, *GMPS*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *MCM6*, *MCM7*, *MKI67*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *UBE2L3*
GO:0032555	Purine ribonucleotide binding	6.04E−08	46	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ACACA*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *DTYMK*, *EGFR*, *ERBB2*, *GMPS*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *KRAS*, *MCM6*, *MCM7*, *MKI67*, *NRAS*, *PCK2*, *RAB10*, *RHOA*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *UBE2L3*
GO:0017076	Purine nucleotide binding	7.12E−08	46	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *RFC4*, *CCT3*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ACACA*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *DTYMK*, *EGFR*, *ERBB2*, *GMPS*, *HSP90AA1*, *HSP90AB1*, *KCNJ10*, *KIF23*, *KIF2C*, *KIF5B*, *KRAS*, *MCM6*, *MCM7*, *MKI67*, *NRAS*, *PCK2*, *RAB10*, *RHOA*, *SMC4*, *STK39*, *TK1*, *TRIP13*, *UBE2L3*
GO:0098772	MF regulator activity	1.22E−07	46	*CCNB1*, *CDC20*†, *CCNB2*†, *CCNA2*, *RACGAP1*, *PTTG1*, *SPP1*, *TPX2*, *BIRC5*†, *STC2*, *APOA1*, *BCL2*, *BMP4*, *CCL19*, *CSTB*, *CXCL12*, *DEPDC1*, *ECT2*, *EGFR*, *FBN1*, *FGF9*, *GIP*, *GNRH2*, *HSP90AA1*, *HSP90AB1*, *IGFBP3*, *JUN*, *KITLG*, *KNG1*, *KRAS*, *NRAS*, *PIK3R1*, *PLCB1*, *PSMD1*, *PZP*, *RAB10*, *RHOA*, *SERPINA1*, *SERPINC1*, *SPINK1*, *SPINK6*, *TGFB1*, *THBS4*, *TIMP1*, *UBE2L3*, *YWHAB*
GO:0043167	Ion binding	6.56705E−06	90	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *RRM2*, *RACGAP1*, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *BIRC5*†, *RFC4*, *AOX1*, *CCT3*, *CYP3A4*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *OIP5*, *PBK*, *PLK1*†, *ABAT*, *ACACA*, *ADAR*, *ALB*, *APOA1*, *ASS*, *CDC6*, *CHEK1*, *CSNK2A1*, *CSRP2*, *CYP2C9*, *CYP8B1*, *DAGLA*, *DAO*, *DTYMK*, *EGFR*, *EHHADH*, *ERBB2*, *ESRRG*, *FBN1*, *FEN1*, *GMPS*, *HAO1*, *HSP90AA1*, *HSP90AB1*, *IGFBP3*, *KCNJ10*, *KDM6B*, *KIF23*, *KIF2C*, *KIF5B*, *KNG1*, *KRAS*, *MATN3*, *MCM10*, *MCM6*, *MCM7*, *METTL3*, *MKI67*, *MMP10*, *MTHFR*, *NR1I2*, *NR6A1*, *NRAS*, *PCK2*, *PLCB1*, *PLOD3*, *PPAT*, *PRIM1*, *RAB10*, *RELN*, *RHOA*, *SETDB1*, *SMC4*, *STK39*, *THBS4*, *TIMP1*, *TK1*, *TRIP13*, *TXNRD1*, *UBE2L3*, *USP21*, *VCAN*, *ZC3H13*, *ZNF282*
GO:0008017	Microtubule binding	1.27186E−05	14	*PRC1*, *NUSAP1*, *RACGAP1*, *KIF11*, *KIF20A*, *TPX2*, *BIRC5*†, *DLGAP5*, *KIF4A*, *PLK1*†, *CENPF*, *KIF23*, *KIF2C*, *KIF5B*
GO:0097159	Organic cyclic compound binding	1.93853E−05	103	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *NUSAP1*, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *CENPA*, *FOXM1*, *RFC4*, *AOX1*, *CCT3*, *CDC45*, *CYP3A4*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *SOX4*, *STAT3*, *STC2*, *ABAT*, *ACACA*, *ADAR*, *ALB*, *APOA1*, *ASS*, *BASP1*, *BCL2*, *CDC6*, *CHEK1*, *CLSPN*, *CSNK2A1*, *CSTB*, *CYP2C9*, *CYP8B1*, *DAO*, *DTYMK*, *E2F2*, *E2F3*, *EGFR*, *EHHADH*, *ERBB2*, *ESRRG*, *FEN1*, *FOXD2*, *GMPS*, *HAO1*, *HES5*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *IGF2BP3*, *JUN*, *KCNJ10*, *KDM6B*, *KIF23*, *KIF2C*, *KIF5B*, *KRAS*, *MCM10*, *MCM6*, *MCM7*, *METTL3*, *MKI67*, *MTHFR*, *MYBL2*, *MYC*, *NOL10*, *NR0B1*, *NR1I2*, *NR6A1*, *NRAS*, *PCK2*, *PLOD3*, *PPIA*, *PRIM1*, *PSMD4*, *RAB10*, *RHOA*, *SETDB1*, *SF3B4*, *SMC4*, *SORBS2*, *STK39*, *TARBP1*, *TCOF1*, *TDRKH*, *TK1*, *TRIP13*, *TXNRD1*, *UBE2L3*, *YTHDF2*, *ZC3H13*, *ZNF282*
GO:1901363	Heterocyclic compound binding	2.27949E−05	102	*CDK1*†, *TOP2A*†, *BUB1B*†, *AURKA*†, *NUSAP1*, *TTK*, *KIF11*, *UBE2C*, *BUB1*, *KIF20A*, *CENPA*, *FOXM1*, *RFC4*, *AOX1*, *CCT3*, *CDC45*, *CYP3A4*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *SOX4*, *STAT3*, *STC2*, *ABAT*, *ACACA*, *ADAR*, *ALB*, *ASS*, *BASP1*, *BCL2*, *CDC6*, *CHEK1*, *CLSPN*, *CSNK2A1*, *CSTB*, *CYP2C9*, *CYP8B1*, *DAO*, *DTYMK*, *E2F2*, *E2F3*, *EGFR*, *EHHADH*, *ERBB2*, *ESRRG*, *FEN1*, *FOXD2*, *GMPS*, *HAO1*, *HES5*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *IGF2BP3*, *JUN*, *KCNJ10*, *KDM6B*, *KIF23*, *KIF2C*, *KIF5B*, *KRAS*, *MCM10*, *MCM6*, *MCM7*, *METTL3*, *MKI67*, *MTHFR*, *MYBL2*, *MYC*, *NOL10*, *NR0B1*, *NR1I2*, *NR6A1*, *NRAS*, *PCK2*, *PLOD3*, *PPIA*, *PRIM1*, *PSMD4*, *RAB10*, *RHOA*, *SETDB1*, *SF3B4*, *SMC4*, *SORBS2*, *STK39*, *TARBP1*, *TCOF1*, *TDRKH*, *TK1*, *TRIP13*, *TXNRD1*, *UBE2L3*, *YTHDF2*, *ZC3H13*, *ZNF282*
BP				
GO:1903047	Mitotic cell cycle process	4.70E−41	64	*CCNB1*, *CDK1*†, *CDC20*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *PRC1*, *AURKA*†, *CDKN3*, *RRM2*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *KIF20A*, *PTTG1*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *CDC45*, *CDCA5*, *DLGAP5*, *EZH2*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PLK1*†, *ANLN*, *BCL2*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CEP55*, *CHEK1*, *CLSPN*, *DTL*, *E2F3*, *ECT2*, *EGFR*, *FANCD2*, *KIF23*, *KIF2C*, *KNTC1*, *MCM6*, *MKI67*, *MYBL2*, *MYC*, *NCAPH*, *PLCB1*, *RHOA*, *SMC4*, *SPDL1*, *TGFB1*, *TRIP13*
GO:0000278	Mitotic cell cycle	1.47E−38	66	*CCNB1*, *CDK1*†, *CDC20*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *PRC1*, *AURKA*†, *CDKN3*, *RRM2*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *KIF20A*, *PTTG1*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *CDC45*, *CDCA5*, *DLGAP5*, *EZH2*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PBK*, *PLK1*†, *ANLN*, *BCL2*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CEP55*, *CHEK1*, *CLSPN*, *DTL*, *E2F3*, *ECT2*, *EGFR*, *FANCD2*, *HSF1*, *KIF23*, *KIF2C*, *KNTC1*, *MCM6*, *MKI67*, *MYBL2*, *MYC*, *NCAPH*, *PLCB1*, *RHOA*, *SMC4*, *SPDL1*, *TGFB1*, *TRIP13*
GO:0022402	Cell cycle process	3.20E−36	71	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *PRC1*, *AURKA*†, *CDKN3*, *RRM2*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *ASPM*, *KIF20A*, *PTTG1*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *CDC45*, *CDCA5*, *DLGAP5*, *EZH2*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PLK1*†, *ANLN*, *BCL2*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CEP55*, *CHEK1*, *CLSPN*, *CSNK2A1*, *DTL*, *E2F3*, *ECT2*, *EGFR*, *FANCD2*, *FEN1*, *KIF23*, *KIF2C*, *KNTC1*, *MCM6*, *MKI67*, *MYBL2*, *MYC*, *NCAPH*, *PLCB1*, *RHOA*, *SMC4*, *SPDL1*, *TDRKH*, *TGFB1*, *TRIP13*, *UBE2L3*, *YTHDF2*
GO:0007049	Cell cycle	1.10E−33	80	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *PRC1*, *AURKA*†, *CDKN3*, *RRM2*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *ASPM*, *KIF20A*, *PTTG1*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *CDC45*, *CDCA5*, *DLGAP5*, *EZH2*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *OIP5*, *PBK*, *PLK1*†, *STAT3*, *ANLN*, *BCL2*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CEP55*, *CHEK1*, *CLSPN*, *CSNK2A1*, *DTL*, *E2F2*, *E2F3*, *ECT2*, *EGFR*, *FANCD2*, *FEN1*, *HSF1*, *HSP90AB1*, *JUN*, *KIF23*, *KIF2C*, *KNTC1*, *MCM6*, *MCM7*, *METTL3*, *MKI67*, *MYBL2*, *MYC*, *NCAPH*, *PLCB1*, *RHOA*, *SMC4*, *SPDL1*, *TDRKH*, *TGFB1*, *TRIP13*, *UBE2L3*, *YTHDF2*
GO:0051726	Regulation of cell cycle	4.72E−32	64	*CCNB1*, *CDK1*†, *CDC20*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *PRC1*, *AURKA*†, *CDKN3*, *RRM2*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *ASPM*, *KIF20A*, *PTTG1*, *TPX2*, *BIRC5*†, *FOXM1*, *CDC45*, *CDCA5*, *DLGAP5*, *EZH2*, *NEK2*, *PLK1*†, *STAT3*, *ANLN*, *BCL2*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *CLSPN*, *CSNK2A1*, *DTL*, *E2F2*, *ECT2*, *EGFR*, *FANCD2*, *FEN1*, *HSF1*, *HSP90AB1*, *JUN*, *KIF23*, *KNTC1*, *METTL3*, *MKI67*, *MYC*, *NCAPH*, *PLCB1*, *RHOA*, *SMC4*, *SPDL1*, *TGFB1*, *TRIP13*, *YTHDF2*
GO:0000280	Nuclear division	2.02E−31	46	*CCNB1*, *CDC20*†, *TOP2A*†, *CCNB2*†, *BUB1B*†, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *ASPM*, *PTTG1*, *TPX2*, *BIRC5*†, *CDCA5*, *DLGAP5*, *KIF4A*, *NEK2*, *PLK1*†, *ANLN*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *FANCD2*, *KIF23*, *KIF2C*, *KNTC1*, *MKI67*, *MYBL2*, *NCAPH*, *PLCB1*, *RHOA*, *SMC4*, *SPDL1*, *TDRKH*, *TGFB1*, *TRIP13*
GO:0010564	Regulation of cell cycle process	2.53E−31	53	*CCNB1*, *CDK1*†, *CDC20*†, *BUB1B*†, *PRC1*, *AURKA*†, *RRM2*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *KIF20A*, *PTTG1*, *TPX2*, *BIRC5*†, *CDC45*, *CDCA5*, *DLGAP5*, *EZH2*, *NEK2*, *PLK1*†, *ANLN*, *BCL2*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *CLSPN*, *CSNK2A1*, *DTL*, *ECT2*, *EGFR*, *FANCD2*, *FEN1*, *KIF23*, *KNTC1*, *MKI67*, *MYC*, *NCAPH*, *PLCB1*, *RHOA*, *SMC4*, *SPDL1*, *TGFB1*, *TRIP13*, *YTHDF2*
GO:0140014	Mitotic nuclear division	2.64E−31	40	*CCNB1*, *CDC20*†, *BUB1B*†, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *PTTG1*, *TPX2*, *BIRC5*†, *CDCA5*, *DLGAP5*, *KIF4A*, *NEK2*, *PLK1*†, *ANLN*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *KIF23*, *KIF2C*, *KNTC1*, *MKI67*, *MYBL2*, *NCAPH*, *RHOA*, *SMC4*, *SPDL1*, *TGFB1*, *TRIP13*
GO:0048285	Organelle fission	8.05E−30	46	*CCNB1*, *CDC20*†, *TOP2A*†, *CCNB2*†, *BUB1B*†, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *ASPM*, *PTTG1*, *TPX2*, *BIRC5*†, *CDCA5*, *DLGAP5*, *KIF4A*, *NEK2*, *PLK1*†, *ANLN*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *FANCD2*, *KIF23*, *KIF2C*, *KNTC1*, *MKI67*, *MYBL2*, *NCAPH*, *PLCB1*, *RHOA*, *SMC4*, *SPDL1*, *TDRKH*, *TGFB1*, *TRIP13*
GO:0051276	Chromosome organization	3.56E−29	48	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *BUB1B*†, *PRC1*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *PTTG1*, *BIRC5*†, *CENPA*, *RFC4*, *CCT3*, *CDC45*, *CDCA5*, *DLGAP5*, *EZH2*, *KIF4A*, *MCM2*, *MCM3*, *NEK2*, *OIP5*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *FANCD2*, *FEN1*, *HSP90AA1*, *HSP90AB1*, *KIF23*, *KIF2C*, *KNTC1*, *MCM6*, *MCM7*, *MYC*, *NCAPH*, *SETDB1*, *SMC4*, *SPDL1*, *TRIP13*
GO:0051301	Cell division	8.85E−28	48	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *ASPM*, *KIF20A*, *PTTG1*, *TPX2*, *BIRC5*†, *CENPA*, *CDCA5*, *KIF4A*, *NEK2*, *OIP5*, *PLK1*†, *ANLN*, *CDC6*, *CDCA8*, *CENPF*, *CEP55*, *ECT2*, *FGF9*, *KIF23*, *KIF2C*, *KNTC1*, *MYC*, *NCAPH*, *RAB10*, *RHOA*, *SMC4*, *SPDL1*, *TGFB1*, *THBS4*, *YTHDF2*
GO:0000819	Sister chromatid segregation	2.12E−26	32	*CCNB1*, *CDC20*†, *TOP2A*†, *BUB1B*†, *PRC1*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *PTTG1*, *BIRC5*†, *CDCA5*, *DLGAP5*, *KIF4A*, *NEK2*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *FEN1*, *KIF23*, *KIF2C*, *KNTC1*, *NCAPH*, *SMC4*, *SPDL1*, *TRIP13*
GO:0007059	Chromosome segregation	1.38E−25	37	*CCNB1*, *CDC20*†, *TOP2A*†, *BUB1B*†, *PRC1*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *PTTG1*, *BIRC5*†, *CDCA5*, *DLGAP5*, *KIF4A*, *NEK2*, *OIP5*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *CSNK2A1*, *ECT2*, *FANCD2*, *FEN1*, *KIF23*, *KIF2C*, *KNTC1*, *MKI67*, *NCAPH*, *SMC4*, *SPDL1*, *TRIP13*
GO:0000070	Mitotic sister chromatid segregation	1.38E−25	30	*CCNB1*, *CDC20*†, *BUB1B*†, *PRC1*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *PTTG1*, *BIRC5*†, *CDCA5*, *DLGAP5*, *KIF4A*, *NEK2*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *KIF23*, *KIF2C*, *KNTC1*, *NCAPH*, *SMC4*, *SPDL1*, *TRIP13*
GO:0098813	Nuclear chromosome segregation	1.25E−24	34	*CCNB1*, *CDC20*†, *TOP2A*†, *BUB1B*†, *PRC1*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *PTTG1*, *BIRC5*†, *CDCA5*, *DLGAP5*, *KIF4A*, *NEK2*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *ECT2*, *FANCD2*, *FEN1*, *KIF23*, *KIF2C*, *KNTC1*, *NCAPH*, *SMC4*, *SPDL1*, *TRIP13*
GO:0051983	Regulation of chromosome segregation	3.22E−24	25	*CCNB1*, *CDC20*†, *BUB1B*†, *MAD2L1*, *TTK*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *PTTG1*, *BIRC5*†, *DLGAP5*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *CSNK2A1*, *KIF2C*, *KNTC1*, *MKI67*, *NCAPH*, *SMC4*, *SPDL1*, *TRIP13*
GO:0044772	Mitotic cell cycle phase transition	8.12E−24	38	*CCNB1*, *CDK1*†, *CDC20*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *AURKA*†, *CDKN3*, *RRM2*, *MAD2L1*, *TTK*, *ZWINT*, *UBE2C*, *BUB1*, *NDC80*, *BIRC5*†, *FOXM1*, *CDCA5*, *DLGAP5*, *EZH2*, *MELK*, *PLK1*†, *ANLN*, *BCL2*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *CLSPN*, *DTL*, *E2F3*, *EGFR*, *KNTC1*, *MYC*, *PLCB1*, *SPDL1*, *TGFB1*, *TRIP13*
GO:0044770	Cell cycle phase transition	9.41E−24	41	*CCNB1*, *CDK1*†, *CDC20*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *AURKA*†, *CDKN3*, *RRM2*, *MAD2L1*, *TTK*, *ZWINT*, *UBE2C*, *BUB1*, *NDC80*, *BIRC5*†, *FOXM1*, *CDC45*, *CDCA5*, *DLGAP5*, *EZH2*, *MELK*, *PLK1*†, *ANLN*, *BCL2*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *CLSPN*, *DTL*, *E2F3*, *EGFR*, *FANCD2*, *KNTC1*, *MYC*, *PLCB1*, *SPDL1*, *TGFB1*, *TRIP13*, *UBE2L3*
GO:1905818	Regulation of chromosome separation	4.66E−23	23	*CCNB1*, *CDC20*†, *BUB1B*†, *MAD2L1*, *TTK*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *PTTG1*, *BIRC5*†, *DLGAP5*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *CSNK2A1*, *KNTC1*, *NCAPH*, *SMC4*, *SPDL1*, *TRIP13*
GO:0033044	Regulation of chromosome organization	6.77E−23	30	*CCNB1*, *CDC20*†, *TOP2A*†, *BUB1B*†, *MAD2L1*, *TTK*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *PTTG1*, *BIRC5*†, *CCT3*, *CDCA5*, *DLGAP5*, *MCM2*, *NEK2*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *FEN1*, *KNTC1*, *MYC*, *NCAPH*, *SETDB1*, *SMC4*, *SPDL1*, *TRIP13*
GO:0051304	Chromosome separation	1.65E−22	24	*CCNB1*, *CDC20*†, *TOP2A*†, *BUB1B*†, *MAD2L1*, *TTK*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *PTTG1*, *BIRC5*†, *DLGAP5*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *CSNK2A1*, *KNTC1*, *NCAPH*, *SMC4*, *SPDL1*, *TRIP13*
CC				
GO:0005694	Chromosome	8.87E−18	61	*CCNB1*, *CDK1*†, *TOP2A*†, *BUB1B*†, *PRC1*, *MAD2L1*, *NUSAP1*, *TTK*, *ZWINT*, *NCAPG*, *BUB1*, *NDC80*, *BIRC5*†, *CENPA*, *FOXM1*, *RFC4*, *CDC45*, *CDCA5*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *NEK2*, *OIP5*, *PLK1*†, *SOX4*, *STAT3*, *ASF1B*, *BASP1*, *CDCA8*, *CENPF*, *CHEK1*, *CSNK2A1*, *DTL*, *E2F2*, *E2F3*, *ESRRG*, *FANCD2*, *FEN1*, *FOXD2*, *HES5*, *HSF1*, *JUN*, *KIF2C*, *KNTC1*, *MCM10*, *MCM6*, *MCM7*, *MKI67*, *MYC*, *NCAPH*, *NR0B1*, *NR1I2*, *NR6A1*, *PLCB1*, *PRIM1*, *SETDB1*, *SMC4*, *SPDL1*, *TRIP13*
GO:0098687	Chromosomal region	1.73E−17	30	*CCNB1*, *CDK1*†, *TOP2A*†, *BUB1B*†, *MAD2L1*, *TTK*, *ZWINT*, *NCAPG*, *BUB1*, *NDC80*, *BIRC5*†, *CENPA*, *CDCA5*, *EZH2*, *MCM2*, *MCM3*, *NEK2*, *OIP5*, *PLK1*†, *CDCA8*, *CENPF*, *CHEK1*, *FEN1*, *HSF1*, *KIF2C*, *KNTC1*, *MCM6*, *MCM7*, *SMC4*, *SPDL1*
GO:0005819	Spindle	1.56E−15	29	*CCNB1*, *CDK1*†, *CDC20*†, *BUB1B*†, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *KIF11*, *HMMR*, *ASPM*, *KIF20A*, *TPX2*, *BIRC5*†, *DLGAP5*, *KIF4A*, *NEK2*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *ECT2*, *HSF1*, *KIF23*, *KIF2C*, *KNTC1*, *SPDL1*
GO:0070013	Intracellular organelle lumen	3.37E−15	113	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNA2*, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *KIF20A*, *SPP1*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *RFC4*, *CDC45*, *CDCA5*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *NEK2*, *OIP5*, *PLK1*†, *SOX4*, *STAT3*, *STC2*, *ABAT*, *ACACA*, *ADAR*, *ALB*, *ANLN*, *APOA1*, *APOB*, *ASF1B*, *ASS*, *BASP1*, *BCL2*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *CLSPN*, *CSE1L*, *CSNK2A1*, *CSTB*, *DAO*, *DTL*, *E2F2*, *E2F3*, *ECT2*, *EGFR*, *EHHADH*, *ESRRG*, *FANCD2*, *FBN1*, *FEN1*, *GIP*, *HAO1*, *HES5*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *IGFBP1*, *IGFBP3*, *IL7R*, *JUN*, *KDM6B*, *KIF23*, *KNG1*, *MATN3*, *MCM10*, *MCM6*, *MCM7*, *MED24*, *METTL3*, *MKI67*, *MYBL2*, *MYC*, *NCAPH*, *NOL10*, *NR0B1*, *NR1I2*, *NR6A1*, *PCK2*, *PLCB1*, *PLOD3*, *PPIA*, *PRIM1*, *PSMD1*, *PSMD4*, *SERPINA1*, *SERPINC1*, *SETDB1*, *SF3B4*, *SMC4*, *STK39*, *TCOF1*, *TIMP1*, *TXNRD1*, *UBE2L3*, *USP21*, *VCAN*, *ZC3H13*
GO:0043233	Organelle lumen	3.37E−15	113	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNA2*, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *KIF20A*, *SPP1*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *RFC4*, *CDC45*, *CDCA5*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *NEK2*, *OIP5*, *PLK1*†, *SOX4*, *STAT3*, *STC2*, *ABAT*, *ACACA*, *ADAR*, *ALB*, *ANLN*, *APOA1*, *APOB*, *ASF1B*, *ASS*, *BASP1*, *BCL2*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *CLSPN*, *CSE1L*, *CSNK2A1*, *CSTB*, *DAO*, *DTL*, *E2F2*, *E2F3*, *ECT2*, *EGFR*, *EHHADH*, *ESRRG*, *FANCD2*, *FBN1*, *FEN1*, *GIP*, *HAO1*, *HES5*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *IGFBP1*, *IGFBP3*, *IL7R*, *JUN*, *KDM6B*, *KIF23*, *KNG1*, *MATN3*, *MCM10*, *MCM6*, *MCM7*, *MED24*, *METTL3*, *MKI67*, *MYBL2*, *MYC*, *NCAPH*, *NOL10*, *NR0B1*, *NR1I2*, *NR6A1*, *PCK2*, *PLCB1*, *PLOD3*, *PPIA*, *PRIM1*, *PSMD1*, *PSMD4*, *SERPINA1*, *SERPINC1*, *SETDB1*, *SF3B4*, *SMC4*, *STK39*, *TCOF1*, *TIMP1*, *TXNRD1*, *UBE2L3*, *USP21*, *VCAN*, *ZC3H13*
GO:0031974	Membrane-enclosed lumen	3.37E−15	113	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNA2*, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *KIF20A*, *SPP1*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *RFC4*, *CDC45*, *CDCA5*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *NEK2*, *OIP5*, *PLK1*†, *SOX4*, *STAT3*, *STC2*, *ABAT*, *ACACA*, *ADAR*, *ALB*, *ANLN*, *APOA1*, *APOB*, *ASF1B*, *ASS*, *BASP1*, *BCL2*, *BMP4*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *CLSPN*, *CSE1L*, *CSNK2A1*, *CSTB*, *DAO*, *DTL*, *E2F2*, *E2F3*, *ECT2*, *EGFR*, *EHHADH*, *ESRRG*, *FANCD2*, *FBN1*, *FEN1*, *GIP*, *HAO1*, *HES5*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *IGFBP1*, *IGFBP3*, *IL7R*, *JUN*, *KDM6B*, *KIF23*, *KNG1*, *MATN3*, *MCM10*, *MCM6*, *MCM7*, *MED24*, *METTL3*, *MKI67*, *MYBL2*, *MYC*, *NCAPH*, *NOL10*, *NR0B1*, *NR1I2*, *NR6A1*, *PCK2*, *PLCB1*, *PLOD3*, *PPIA*, *PRIM1*, *PSMD1*, *PSMD4*, *SERPINA1*, *SERPINC1*, *SETDB1*, *SF3B4*, *SMC4*, *STK39*, *TCOF1*, *TIMP1*, *TXNRD1*, *UBE2L3*, *USP21*, *VCAN*, *ZC3H13*
GO:0000775	Chromosome, centromeric region	3.37E−15	23	*CCNB1*, *TOP2A*†, *BUB1B*†, *MAD2L1*, *TTK*, *ZWINT*, *NCAPG*, *BUB1*, *NDC80*, *BIRC5*†, *CENPA*, *CDCA5*, *EZH2*, *NEK2*, *OIP5*, *PLK1*†, *CDCA8*, *CENPF*, *HSF1*, *KIF2C*, *KNTC1*, *SMC4*, *SPDL1*
GO:0000793	Condensed chromosome	2.02E−14	23	*CCNB1*, *TOP2A*†, *BUB1B*†, *MAD2L1*, *TTK*, *ZWINT*, *NCAPG*, *BUB1*, *NDC80*, *BIRC5*†, *CENPA*, *NEK2*, *PLK1*†, *CENPF*, *CHEK1*, *FANCD2*, *HSF1*, *KIF2C*, *KNTC1*, *MKI67*, *NCAPH*, *SMC4*, *SPDL1*
GO:0005654	Nucleoplasm	1.33E−13	84	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNA2*, *PRC1*, *AURKA*†, *MAD2L1*, *RACGAP1*, *ZWINT*, *UBE2C*, *BUB1*, *NDC80*, *KIF20A*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *RFC4*, *CDC45*, *CDCA5*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *NEK2*, *OIP5*, *PLK1*†, *SOX4*, *STAT3*, *ADAR*, *ANLN*, *ASF1B*, *ASS*, *BASP1*, *BCL2*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *CLSPN*, *CSE1L*, *CSNK2A1*, *DTL*, *E2F2*, *E2F3*, *ECT2*, *ESRRG*, *FANCD2*, *FEN1*, *HES5*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *IL7R*, *JUN*, *KDM6B*, *KIF23*, *MCM10*, *MCM6*, *MCM7*, *MED24*, *METTL3*, *MKI67*, *MYBL2*, *MYC*, *NCAPH*, *NR0B1*, *NR1I2*, *NR6A1*, *PLCB1*, *PRIM1*, *PSMD1*, *PSMD4*, *SETDB1*, *SF3B4*, *SMC4*, *STK39*, *TCOF1*, *TXNRD1*, *UBE2L3*, *USP21*, *ZC3H13*
GO:0000779	Condensed chromosome, centromeric region	1.20E−11	17	*CCNB1*, *BUB1B*†, *MAD2L1*, *TTK*, *ZWINT*, *NCAPG*, *BUB1*, *NDC80*, *BIRC5*†, *CENPA*, *NEK2*, *PLK1*†, *CENPF*, *HSF1*, *KIF2C*, *KNTC1*, *SPDL1*
GO:0000776	Kinetochore	5.84E−11	16	*CCNB1*, *BUB1B*†, *MAD2L1*, *TTK*, *ZWINT*, *BUB1*, *NDC80*, *BIRC5*†, *CENPA*, *NEK2*, *PLK1*†, *CENPF*, *HSF1*, *KIF2C*, *KNTC1*, *SPDL1*
GO:0015630	Microtubule cytoskeleton	6.32E−11	41	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNB2*†, *BUB1B*†, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *KIF11*, *HMMR*, *NDC80*, *ASPM*, *KIF20A*, *TPX2*, *BIRC5*†, *CCT3*, *CDC45*, *DLGAP5*, *KIF4A*, *MCM3*, *NEK2*, *PLK1*†, *CDC6*, *CDCA8*, *CENPF*, *CEP55*, *CHEK1*, *DTL*, *ECT2*, *HSF1*, *KIF23*, *KIF2C*, *KIF5B*, *KNTC1*, *NR0B1*, *SPDL1*, *YTHDF2*
GO:0000922	Spindle pole	8.57E−11	16	*CCNB1*, *CDC20*†, *PRC1*, *AURKA*†, *MAD2L1*, *KIF11*, *ASPM*, *TPX2*, *DLGAP5*, *NEK2*, *PLK1*†, *CDC6*, *CENPF*, *HSF1*, *KNTC1*, *SPDL1*
GO:0030496	Midbody	1.21E−10	17	*CDK1*†, *PRC1*, *AURKA*†, *RACGAP1*, *ASPM*, *KIF20A*, *BIRC5*†, *KIF4A*, *NEK2*, *PLK1*†, *ANLN*, *CDCA8*, *CENPF*, *CEP55*, *ECT2*, *KIF23*, *RHOA*
GO:0005829	Cytosol	2.82E−10	90	*CCNB1*, *CDK1*†, *CDC20*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *PRC1*, *AURKA*†, *CDKN3*, *RRM2*, *MAD2L1*, *RACGAP1*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *HMMR*, *NDC80*, *PTTG1*, *TPX2*, *BIRC5*†, *CENPA*, *AOX1*, *CCT3*, *CDCA5*, *DLGAP5*, *HDAC1*, *KIF4A*, *NEK2*, *PLK1*†, *STAT3*, *ACACA*, *ANLN*, *APOA1*, *APOB*, *ASS*, *BCL2*, *CD163*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *CSE1L*, *CSNK2A1*, *CSTB*, *DAO*, *DTL*, *DTYMK*, *ECT2*, *EHHADH*, *ERBB2*, *FANCD2*, *GMPS*, *GYS2*, *HAO1*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *IGF2BP3*, *IL7R*, *KIF23*, *KIF2C*, *KIF5B*, *KNTC1*, *KRAS*, *MCM7*, *MTHFR*, *NCAM1*, *NCAPH*, *NRAS*, *PCK2*, *PIK3R1*, *PLCB1*, *PPAT*, *PPIA*, *PSMD1*, *PSMD4*, *RAB10*, *RHOA*, *SMC4*, *SPDL1*, *STK39*, *TCOF1*, *TK1*, *TXNRD1*, *UBE2L3*, *USP21*, *YTHDF2*, *YWHAB*
GO:0000228	Nuclear chromosome	3.07E−10	18	*TOP2A*†, *NCAPG*, *BIRC5*†, *CDC45*, *HDAC1*, *MCM2*, *MCM3*, *NEK2*, *PLK1*†, *CHEK1*, *CSNK2A1*, *JUN*, *MCM10*, *MCM6*, *MCM7*, *NCAPH*, *PRIM1*, *SMC4*
GO:0005737	Cytoplasm	4.32E−10	150	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNB2*†, *BUB1B*†, *CCNA2*, *PRC1*, *AURKA*†, *CDKN3*, *RRM2*, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *UBE2C*, *BUB1*, *HMMR*, *NDC80*, *ASPM*, *KIF20A*, *PTTG1*, *SPP1*, *TPX2*, *BIRC5*†, *CENPA*, *AOX1*, *CCT3*, *CDC45*, *CDCA5*, *CYP3A4*, *DLGAP5*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *MELK*, *NEK2*, *PLK1*†, *SOX4*, *STAT3*, *STC2*, *ABAT*, *ACACA*, *ADAR*, *ALB*, *ANLN*, *APOA1*, *APOB*, *ASS*, *BASP1*, *BCL2*, *BMP4*, *CD163*, *CDC6*, *CDCA8*, *CENPF*, *CEP55*, *CHEK1*, *CHGA*, *CLSPN*, *CNIH4*, *CSE1L*, *CSNK2A1*, *CSRP2*, *CSTB*, *CXCL12*, *CYP2C9*, *CYP8B1*, *DAGLA*, *DAO*, *DTL*, *DTYMK*, *ECT2*, *EGFR*, *EHHADH*, *ERBB2*, *FANCD2*, *FBN1*, *FEN1*, *FGF9*, *GIP*, *GMPS*, *GYS2*, *HAO1*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *IGF2BP3*, *IGFBP1*, *IGFBP3*, *IL7R*, *KIF23*, *KIF2C*, *KIF5B*, *KITLG*, *KNG1*, *KNTC1*, *KRAS*, *MATN3*, *MCM7*, *METTL3*, *MTHFR*, *MYC*, *NCAM1*, *NCAPH*, *NR0B1*, *NRAS*, *PCK2*, *PIK3R1*, *PLCB1*, *PLOD3*, *POTEF*, *PPAT*, *PPIA*, *PSMD1*, *PSMD4*, *RAB10*, *RELN*, *RHOA*, *SCNN1A*, *SERPINA1*, *SERPINC1*, *SETDB1*, *SMC4*, *SORBS2*, *SPDL1*, *SPINK1*, *SRD5A2*, *STK39*, *TCOF1*, *TDRKH*, *TGFB1*, *THBS4*, *TIMP1*, *TK1*, *TXNRD1*, *UBE2L3*, *UGT1A4*, *UGT1A6*, *UGT2B15*, *USP21*, *VCAN*, *VPS45*, *YTHDF2*, *YWHAB*
GO:0031981	Nuclear lumen	1.61E−09	89	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNA2*, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *ZWINT*, *NCAPG*, *UBE2C*, *BUB1*, *NDC80*, *KIF20A*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *RFC4*, *CDC45*, *CDCA5*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *NEK2*, *OIP5*, *PLK1*†, *SOX4*, *STAT3*, *ACACA*, *ADAR*, *ANLN*, *ASF1B*, *ASS*, *BASP1*, *BCL2*, *CDC6*, *CDCA8*, *CENPF*, *CHEK1*, *CLSPN*, *CSE1L*, *CSNK2A1*, *CSTB*, *DTL*, *E2F2*, *E2F3*, *ECT2*, *ESRRG*, *FANCD2*, *FEN1*, *HES5*, *HSF1*, *HSP90AA1*, *HSP90AB1*, *IL7R*, *JUN*, *KDM6B*, *KIF23*, *MCM10*, *MCM6*, *MCM7*, *MED24*, *METTL3*, *MKI67*, *MYBL2*, *MYC*, *NCAPH*, *NOL10*, *NR0B1*, *NR1I2*, *NR6A1*, *PLCB1*, *PRIM1*, *PSMD1*, *PSMD4*, *SETDB1*, *SF3B4*, *SMC4*, *STK39*, *TCOF1*, *TXNRD1*, *UBE2L3*, *USP21*, *ZC3H13*
GO:0043228	Non-membrane-bounded organelle	8.06E−09	97	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNB2*†, *BUB1B*†, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *BUB1*, *HMMR*, *NDC80*, *ASPM*, *KIF20A*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *RFC4*, *CCT3*, *CDC45*, *CDCA5*, *DLGAP5*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *NEK2*, *OIP5*, *PLK1*†, *SOX4*, *STAT3*, *ACACA*, *ADAR*, *ANLN*, *APOB*, *ASF1B*, *BASP1*, *CDC6*, *CDCA8*, *CENPF*, *CEP55*, *CHEK1*, *CSNK2A1*, *CSRP2*, *CSTB*, *DTL*, *E2F2*, *E2F3*, *ECT2*, *ESRRG*, *FANCD2*, *FEN1*, *FOXD2*, *GYS2*, *HES5*, *HSF1*, *HSP90AB1*, *IGF2BP3*, *JUN*, *KIF23*, *KIF2C*, *KIF5B*, *KITLG*, *KNTC1*, *MCM10*, *MCM6*, *MCM7*, *MKI67*, *MYC*, *NCAPH*, *NOL10*, *NR0B1*, *NR1I2*, *NR6A1*, *PLCB1*, *PRIM1*, *PSMD1*, *RAB10*, *RHOA*, *SETDB1*, *SMC4*, *SORBS2*, *SPDL1*, *STK39*, *TCOF1*, *TDRKH*, *TRIP13*, *TXNRD1*, *YTHDF2*
GO:0043232	Intracellular non-membrane-bounded organelle	8.06E−09	97	*CCNB1*, *CDK1*†, *CDC20*†, *TOP2A*†, *CCNB2*†, *BUB1B*†, *PRC1*, *AURKA*†, *MAD2L1*, *NUSAP1*, *RACGAP1*, *TTK*, *ZWINT*, *KIF11*, *NCAPG*, *BUB1*, *HMMR*, *NDC80*, *ASPM*, *KIF20A*, *TPX2*, *BIRC5*†, *CENPA*, *FOXM1*, *RFC4*, *CCT3*, *CDC45*, *CDCA5*, *DLGAP5*, *EZH2*, *HDAC1*, *KIF4A*, *MCM2*, *MCM3*, *NEK2*, *OIP5*, *PLK1*†, *SOX4*, *STAT3*, *ACACA*, *ADAR*, *ANLN*, *APOB*, *ASF1B*, *BASP1*, *CDC6*, *CDCA8*, *CENPF*, *CEP55*, *CHEK1*, *CSNK2A1*, *CSRP2*, *CSTB*, *DTL*, *E2F2*, *E2F3*, *ECT2*, *ESRRG*, *FANCD2*, *FEN1*, *FOXD2*, *GYS2*, *HES5*, *HSF1*, *HSP90AB1*, *IGF2BP3*, *JUN*, *KIF23*, *KIF2C*, *KIF5B*, *KITLG*, *KNTC1*, *MCM10*, *MCM6*, *MCM7*, *MKI67*, *MYC*, *NCAPH*, *NOL10*, *NR0B1*, *NR1I2*, *NR6A1*, *PLCB1*, *PRIM1*, *PSMD1*, *RAB10*, *RHOA*, *SETDB1*, *SMC4*, *SORBS2*, *SPDL1*, *STK39*, *TCOF1*, *TDRKH*, *TRIP13*, *TXNRD1*, *YTHDF2*

†, tHubGs. $P_{adj.}$, adjusted P value; GO, Gene Ontology; HubGs, hub differentially expressed genes; tHubGs, top-ranked hub differentially expressed genes; HCC, hepatocellular carcinoma; MF, molecular function;BP, biological process; CC, cellular component.

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