

Additional File 6A

Gene Ontology Term Enrichment Analysis		
Term	Genes	FDR Corrected p value
GO:0000278 mitotic cell cycle	KIF23, KIF22, KIFC1, PRC1, KNTC1, TTK, PTTG2, AURKA, AURKB, GTSE1, FAM83D, KIF2C, CDCA8, MTBP, CDCA5, ASPM, CDCA3, CDC7, CDC6, KIF11, CCNF, KIF15, NUSAP1, ESPL1, UBE2C, INHBA, PSME1, RCC2, PSMA5, PSME2, SPAG5, ZWINT, HORMAD1, PSMB10, PPP6C, CCDC99, NEK2, CEP55, RCC1, KIAA1009, CENPA, PSMB2, NPAT, BUB1, BUB3, HELLS, KIF18A, CENPF, BIRC5, CENPE, CDKN3, CDC25C, SMC2, MIS12, PSMB8, SMC4, CCNB1, MPHOSPH9, CCNB2, PSMD11, PLK1, POLD1, PSMC2, ID4, SMC1A	4.09E-15
GO:0007049 cell cycle	KIFC1, PRC1, KNTC1, TTK, AURKA, PTTG2, AURKB, CDCA8, MAP3K8, H2AFX, CDCA5, ASPM, CDCA3, SGOL2, RBL1, ESPL1, AHR, HHEX, KRT18, RCC2, PSMA5, SPAG5, ZWINT, CCDC99, NEK2, RCC1, KIAA1009, GADD45GIP1, OVOL1, PSMB2, MNS1, LFNG, HELLS, PARD6B, CCPG1, TP53BP2, AK1, GAS1, RAD54L, PSMB8, SUV39H2, PLK1, PSMC2, POLD1, SMC1A, KCTD11, KIF23, KIF22, CLSPN, E2F7, E2F8, SENP5, GTSE1, CDT1, FAM83D, KIF2C, MTBP, CDC7, CDC6, KIF11, CCNF, KIF15, NUSAP1, UBE2C, RAD51, INHBA, SASS6, PSME1, RIF1, PSME2, HORMAD1, PSMB10, PPP6C, CEP55, CENPA, MDC1, NPAT, BUB1, BUB3, TRIP13, IL8, GMNN, PSRC1, KIF18A, CENPF, BIRC5, CENPE, CP110, CDKN3, CDC25C, SMC2, MIS12, GSG2, SMC4, CCNB1, MPHOSPH9, CCNB2, PSMD11, ID4, BARD1	8.22E-15
GO:0000279 M phase	KIF23, KIF22, KIFC1, PRC1, KNTC1, TTK, PTTG2, AURKA, AURKB, FAM83D, KIF2C, CDCA8, H2AFX, CDCA5, ASPM, CDCA3, CDC6, KIF11, SGOL2, CCNF, KIF15, NUSAP1, ESPL1, UBE2C, RAD51, RCC2, SPAG5, ZWINT, HORMAD1, CCDC99, NEK2, CEP55, RCC1, KIAA1009, OVOL1, BUB1, MNS1, LFNG, BUB3, HELLS, TRIP13, KIF18A, CENPF, BIRC5, CENPE, CDC25C, RAD54L, SMC2, MIS12, SUV39H2, SMC4, CCNB1, MPHOSPH9, CCNB2, PLK1, SMC1A	6.59E-12
GO:0007067 mitosis	KIF23, KIF22, KIFC1, CCDC99, NEK2, KNTC1, PTTG2, AURKA, AURKB, CEP55, RCC1, KIAA1009, FAM83D, KIF2C, CDCA8, BUB1, CDCA5, HELLS, ASPM, BUB3, CDCA3, CDC6, KIF11, KIF15, CCNF, KIF18A, CENPF, NUSAP1, BIRC5, CENPE, ESPL1, CDC25C, UBE2C, SMC2, MIS12, SMC4, CCNB1, CCNB2, RCC2, SPAG5, PLK1, ZWINT, HORMAD1, SMC1A	2.74E-11
GO:0007059 chromosome segregation	KIFC1, CCDC99, NEK2, SGOL2, KIF18A, CENPF, NUSAP1, CTCF, PTTG2, CENPE, BIRC5, ESPL1, SMC2, MIS12, SMC4, RIOK3, ZWINT, SMC1A, CDCA5, TOP2A, BUB3	4.72E-06
GO:0051301 cell division	KIF23, KIFC1, PRC1, NEK2, KNTC1, PTTG2, CEP55, AURKB, SENP5, RCC1, KIAA1009, FAM83D, CDCA8, BUB1, CDCA5, ASPM, HELLS, CDCA3, CDC7, PARD6B, CDC6, KIF11, SGOL2, CCNF, CENPF, NUSAP1, BIRC5, CENPE, ESPL1, CDC25C, UBE2C, SMC2, MIS12, SMC4, CCNB1, CCNB2, RCC2, SPAG5, PLK1, ZWINT, SMC1A	2.43E-05

GO:0051276 chromosome organization	KIFC1, HMGN2, PTTG2, CTCF, CBX5, CDCA8, H2AFV, PRMT6, HIRIP3, H2AFX, HIST3H2BB, TOP2A, CDCA5, MYST4, MYST3, BRD8, H1F0, HIST1H1D, HIST1H1B, SGOL2, HIST1H1A, RBL1, NUSAP1, ESPL1, RBBP7, DCLRE1C, ZWINT, CCDC99, HIST1H4L, NEK2, HIST1H2AD, HAT1, SET, CENPA, HIST1H4B, HIST1H4E, HIST1H4F, ACTL6A, HIST1H4D, CHD6, HIST1H4J, BUB3, HELLS, CHD3, HIST1H2BD, KIF18A, CENPF, CENPE, RAD54L, SMC2, GSG2, MIS12, SUV39H2, SMC4, HDAC1, WHSC1L1, HIST1H3F, VCX, SMC1A, PARP1, HIST1H2AL, HIST1H3I	8.30E-05
GO:0006323 DNA packaging	HIST1H4L, HIST1H2AD, HAT1, CTCF, SET, H2AFV, HIST1H4B, CENPA, HIST1H4E, HIST1H4F, H2AFX, HIST1H4D, HIST3H2BB, CDCA5, TOP2A, HIST1H4J, MYST4, HELLS, MYST3, H1F0, HIST1H1D, HIST1H2BD, HIST1H1B, HIST1H1A, NUSAP1, SMC2, SMC4, HIST1H3F, HIST1H2AL, HIST1H3I	1.62E-04
GO:0000070 mitotic sister chromatid segregation	KIFC1, CCDC99, NEK2, KIF18A, NUSAP1, CENPE, ESPL1, SMC2, SMC4, ZWINT, SMC1A, CDCA5, BUB3	2.02E-04
GO:0006259 DNA metabolic process	KIF22, CLSPN, ZNF12, PTTG2, CTCF, MCM10, CDT1, FANCM, PRMT6, NSMCE2, H2AFX, CRY1, TOP2A, CDC7, CDC6, NUDT1, DTL, NOL8, GIYD1, TOPBP1, RAD9A, RBBP7, RNASEH2A, MCM4, RAD51, DCLRE1C, RFC3, DCLRE1B, RRM2, NFIX, POLA2, TK1, PRPF19, RPA2, SET, MDC1, POLE3, HELLS, FEN1, TRIP13, RECQL4, GINS1, GINS2, FOXL2, RAD51AP1, CENPF, CDC25C, RAD54L, SOD2, ORC3L, POLD1, SFPQ, SMC1A, PARP1, BARD1	3.39E-04
GO:0007017 microtubule-based process	KIF23, KIFC1, KIF22, CCDC99, KIF24, PRC1, KIF27, NEK2, DNAH17, UCHL1, TTK, AURKA, RCC1, GTSE1, KIF2C, KIF7, CENPA, KIF14, KIF11, KIF15, PSRC1, KIF18A, NUSAP1, CENPE, ESPL1, CP110, MID1, UBE2C, SASS6, SPAG5, ZWINT, FGFR1OP, TUBD1, KIF26A, SMC1A	3.75E-04

Additional File 6B

Gene Ontology Term Enrichment Analysis		
Term	Genes	FDR Corrected p value
GO:0008544 epidermis development	FRAS1, FGF7, LCE3D, SOX9, CDSN, SPINK5, CDKN2A, SPRR2C, SPRR2D, SPRR2B, TGM1, KRT1, KRT2, KRT13, GJB5, GRHL3, KRT34, SCEL, EVPL, CST6, KRT16, SPRR1A, SPRR1B, KRT14, COL1A2, FOXE1, SPRR3, CSTA, KGFLP1, EMP1, FABP5	3.10E-12
GO:0030855 epithelial cell differentiation	TFCP2L1, LCE3D, FZD1, SPINK5, CDSN, SCEL, EVPL, RHCG, SPRR2C, SPRR1A, SPRR2D, SPRR1B, KRT14, SPRR2B, TGM1, SPRR3, KRT2, KRT4, CSTA, EMP1	8.53E-06

GO:0030216 keratinocyte differentiation	LCE3D, CDSN, SCEL, EVPL, SPRR2C, SPRR2D, SPRR1A, SPRR1B, SPRR2B, TGM1, SPRR3, KRT2, CSTA	2.95E-04
GO:0060429 epithelium development	FRAS1, TFCP2L1, LCE3D, FZD1, SPINK5, CDSN, SCEL, EVPL, RHCG, SPRR2C, OVOL2, SPRR1A, SPRR2D, SPRR1B, KRT14, SPRR2B, TGM1, SPRR3, KRT2, CSTA, KRT4, EMP1	0.001629085
GO:0031424 keratinization	EVPL, SPRR2C, SPRR2D, SPRR1A, SPRR1B, LCE3D, TGM1, SPRR2B, SPRR3, KRT2	0.00306369