Supplementary Information to "Nijmegen Breakage Syndrome fibroblasts and iPSCs: cellular models for uncovering diseaseassociated signaling pathways and establishing a screening platform for anti-oxidants" by Barbara Mlody, Wasco Wruck, Soraia Martins, Karl Sperling and James Adjaye

### **Supplementary figures legends**

**Supplementary Figure S1: Characterization of the NBS mutation.** (Modified from our previous publication <sup>1</sup>) a) PCR-based analysis of genomic DNA with primers flanking the deletion, results in either a 60 bp (wt) or 55 bp (657del5) amplicon. b) Sanger sequencing results comparing the genomic DNA sequence of fibroblast sample NBS8 against HFF1 fibroblasts (normal), on the top the blasting result (<u>http://blast.ncbi.nlm.nih.gov/Blast.cgi</u>) from HFF1 Exon 6 (fw) against NBN mRNA (NM\_002485.4), then NBS 1 Exon 6 (fw) against HFF1 Exon 6 (fw) and NBS 8 Exon 6 (fw) against HFF1 Exon 6 (fw). Below the chromatogram of the sequence is shown. c) Immunoflurescent detection of full-length (p95) NBN in patient fibroblasts. Even loading of the SDS-gel is shown by house-keeping protein GAPDH. d) Western Blot detection of p95-NBN in reprogrammed cells. ß-Actin serves as a loading control. For the sake of better readability western blots were cropped.

**Supplementary Figure S2: Sanger sequencing confirms the NBS causing deletion 657del5 in the NBS-iPSCs.** Results of Sanger sequencing of the NBS8-iPSCs showing the chromatogram of the region around the heterozygous 657del5 deletion in the *NBS* gene.

Supplementary Figure S3: NBS-iPSCs: Differentially regulated genes involved in *Glycolysis*. KEGG pathway (hsa00010)<sup>2</sup> of *Glycolysis/Gluconeogenesis*. In red: up-regulated; in green: down-regulated genes in NBS-iPSCs vs. control, classified by differential p-value < 0.05 and fold-change > 1.5.

Supplementary Figure S4: NBS-iPSCs vs. ESCs: Differentially expressed genes from *Pathways in cancer and Cell cycle*. Genes differentially expressed in NBS-iPSCs vs. control, classified by differential p-value < 0.05 and fold-change > 1.5 and functionally annotated as *Pathways in cancer* were further refined by another DAVID analysis. Resulting genes annotated with the KEGG pathway *Cell cycle*<sup>2</sup> were mapped to the chart of this pathway.

Supplementary Figure S5: NBS-iPSCs vs. ESCs: Differentially expressed genes from *Pathways in cancer and p53-signaling*. Genes differentially expressed in NBS-iPSCs vs. control, classified by differential p-value < 0.05 and fold-change > 1.5 and functionally annotated as *Pathways in cancer* were further refined by another DAVID analysis. Resulting genes annotated with the KEGG pathway *p53-signaling*<sup>2</sup> were mapped to the chart of this pathway.

**Supplementary Figure S6: Reprogramming of NBS fibroblasts into iPSCs shifts energy supply to** *Glycolysis.* Hierarchical cluster analysis and heatmap of regulated genes from the KEGG pathway *Glycolysis*<sup>2</sup> in a) NBS fibroblasts and b) NBS-iPSCs shows a change in the *Glycolysis* pathway from predominantly down-regulated in NBS fibroblasts to predominantly up-regulated in NBS-iPSCs. The sample clustering displays a clear separation of NBS and healthy control clusters. (Color bars: blue NBS, red control; high expression: red, low expression; green).

**Supplementary Figure S7: Cluster analysis of** *Oxidative phosphorylation* **pathway in NBS fibroblasts and iPSCs.** Hierarchical cluster analysis and heatmap of genes from the KEGG pathway *Oxidative phosphorylation*<sup>2</sup> in a) NBS fibroblasts and b) NBS-iPSCs shows clear separation of NBS and healthy control clusters. If at all, there is only a slight tendency of more down-regulation of the NBS resulting from the reprogramming because the predominantly down-regulated cluster is bigger in the NBS-iPSCs than in the NBS fibroblasts. (Color bars: blue NBS, red control; high expression: red, low expression; green).

**Supplementary Figure S8: Cluster analysis of** *p53 signaling* **pathway in NBS fibroblasts and iPSCs.** Hierarchical cluster analysis and heatmap of genes from the KEGG pathway *p53-signaling*<sup>2</sup> in NBS fibroblasts and NBS-iPSCs show a cluster of pluripotent stem cells and another cluster of fibroblasts. Within these clusters NBS and healthy control samples were separated. Passage 8 and 15 of the only NBS line which could be reprogrammed showed differences to the other NBS fibroblast lines (Color bars: blue NBS, red control; high expression: red, low expression; green).

## References

1. Mlody, B. & Adjaye, J. Generation of iPSC lines from a Nijmegen Breakage Syndrome patient. *Stem Cell Res.* **15**, 629–632 (2015).

2. Kanehisa, M., Furumichi, M., Tanabe, M., Sato, Y. & Morishima, K. KEGG: new perspectives on genomes, pathways, diseases and drugs. *Nucleic Acids Res.* **45**, D353–D361 (2017).

# Supplementary figures



#### Supplementary Figure S1: Characterization of the NBS mutation



Supplementary Figure S2: Sanger sequencing confirms the NBS causing deletion 657del5 in the NBS-iPSCs





#### Supplementary Figure S3: NBS-iPSCs: Differentially regulated genes involved in *Glycolysis*

Supplementary Figure S4: NBS-iPSCs vs. ESCs: Differentially expressedgenes from *Pathways in cancer and Cell cycle* 



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Supplementary Figure S5: NBS-iPSCs vs. ESCs: Differentially expressed genes from *Pathways in cancer and p53-signaling* 



Supplementary Figure S6: Reprogramming of NBS fibroblasts into iPSCs shifts energy supply to *Glycolysis*.



Supplementary Figure S7: Cluster analysis of *Oxidative phosphorylation* pathway in NBS fibroblasts and iPSCs.





Supplementary Figure S8: Cluster analysis of *p53 signaling* pathway in NBS fibroblasts and iPSCs.

Supplementary ta	ble S1 to Suppleme	entary Figure S3: Gen	e information
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PROBE_ID	SYMBOL	Ratio	EC Name	Definition
ILMN_1728047	AKR1A1	1.57	1.1.1.2	aldo-keto reductase family 1, member A1
ILMN_1741148	ALDOA	2.49	4.1.2.13	aldolase A, fructose- bisphosphate
ILMN_1736700	ALDOA	2.03	4.1.2.13	aldolase A, fructose- bisphosphate
ILMN_1755974	ALDOC	2.70	4.1.2.13	aldolase C, fructose- bisphosphate
ILMN_1765796	ENO2	4.19	4.2.1.11	enolase 2 (gamma,
ILMN_1343295	GAPDH	1.51	1.2.1.12	glyceraldehyde-3- phosphate dehydrogenase
ILMN_1802252	GAPDH	1.59	1.2.1.12	glyceraldehyde-3- phosphate dehydrogenase
ILMN_2173451	GPI	2.15	5.3.1.9	glucose-6-phosphate isomerase
ILMN_1723486	HK2	3.84	2.7.1.1	hexokinase 2
ILMN_1807106	LDHA	2.49	1.1.1.27	lactate dehydrogenase A
ILMN_1713037	PFKL	1.69	2.7.1.11	phosphofructokinase, liver
ILMN_2043809	PFKM	2.00	2.7.1.11	phosphofructokinase, muscle
ILMN_1755749	PGK1	2.45	2.7.2.3	phosphoglycerate kinase 1
ILMN_2216852	PGK1	1.78	2.7.2.3	phosphoglycerate kinase 1
ILMN_1707627	TPI1	1.62	5.3.1.1	triosephosphate isomerase 1
ILMN_2181191	TPI1	1.53	5.3.1.1	triosephosphate isomerase 1
ILMN_1728799	FBP1	0.39	3.1.3.11	fructose-1,6- bisphosphatase 1

# Supplementary table S2: Refinement of genes differentially expressed in NBS-iPSCs vs. HESCs and annotated with pathways in cancer (DAVID funtional annotations)

ccck1, E2F2, SKP2, NFKB1, CDK6, PIAS2, CDK4, LAMB1, MYC, ITGB1,     1.02E-10       hsa05220:Chronic myeloid leukmia     2.58E-12     PIKSR1, CHUK     1.02E-10       hsa05220:Chronic myeloid leukmia     2.58E-12     PIKSR1, CHUK     1.02E-10       hsa05220:Chronic myeloid leukmia     2.58E-11     ITGB1, CCNE, LYREA, CHUK, CNKK, CDKA, PIKSR1, CDKK, CDKA, MYC, PIKSR1, CDKK, CDKA, FIS3R, TU, CDKA, FS2     1.02E-10       hsa05212:Pancreatic cancer     5.38E-11     ITGB1, CCNE, LYCEA, LMB1, MYC, PIKSR1, CDKK, CDKA, PIKSR1, CDKK, CDKA, FIKSR1, CDKK, CDKA, FIKSR1, CDKK, CDKA, FIKSR1, CDKG, CDKA, FIKSR1, CDKG	Term	PValue	Genes	Beniamini
hsa05222.Small cell lung cancer   1.58±12   PIK3R1, CHUK   1.02±10     hsa05222.Small cell lung cancer   8.93±12   ERZ, IRAS, GEB, CFBP2, NFKB1, CDK6, CDK4, MYC, PIK3R1, CHUK   1.02±10     hsa05222.Small cell lung cancer   8.93±12   ERZ, IRAS, GEB, CFB12, NFKB1, CCK6, CDK4, MYC, PIK3R1, CHUK   1.75±09     hsa051212Pancreatic cancer   3.01±09   EZZ, IRAS, WH100, WMT3, XXE2A, INFK1, CHK81, CCK6, CDK4, PIK3R1, CHUK   7.85±09     hsa051212Pancreatic cancer   3.01±09   FGF19, HRAS, FGF8, FGF11, HTLG, NFK81, COK6, CDK4, PIK3R1, CHUK   7.82±09     hsa051212Pancreatic cancer   7.41±09   FGF19, HRAS, FGF8, FGF11, FGF13, CDK6, CDK4, PIK3R1   1.20±07     hsa05212Smaling pathway   5.02±07   FGF19, HRAS, FGF8, FGF11, FGF13, CDK6, CDK4, PIK3R1   1.20±07     hsa05212Smaling pathway   5.02±07   FGF19, HRAS, FGF8, HGF11, FGF13, CDK6, CDK4, PIK3R1   1.25±06     hsa05212Smaling pathway   1.25±07   KMF81   2.55±07   FGF19, HRAS, FGF8, FGF11, KTG2, FGF14, KTR1   2.55±07     hsa052123Mon and cell carcinoma   9.75±08   HRAS, WH1, WEGA, SC221, TGE2, TGFA, EGN14, PIK3R1   1.32±06     hsa052123Mon and cell carcinoma   1.25±07   KMF81   2.55±07   FGF19, HRAS, FGF8, FGF11, FGF13, KTR31, CMCK   1.55±04     hsa0520				
13d22223mail Cell Julig Julice     13d2-12     Phanks Cole     3372-10       hsa02220.Choncin myeloid leukemia     8,3372-11     Choncin Cale     3372-10       hsa02120.Choncin myeloid leukemia     8,337-11     Choncin Cale     1,752-00       hsa02151.P13K-Akt signaling pathway     5,387-11     Clin Cale     1,752-00       hsa02151.P13K-Akt signaling pathway     5,387-10     9,741-60     1,752-00       hsa02151.P13K-Akt signaling pathway     5,206-09     FGF13, HRX, FGF8, RGP11, KRS11, VGF64, CBC4, PIK3R1, CHUK     7,832-60       hsa02212.Pancreatic cancer     3,616-09     E272, HARS, FGF8, RGP11, KGS1, KGF4, KGF4, KGF11, KITG1, KFK81, PS654, SGF4, SGF41, KITG1, KFK81, PS654, SGF4, SGF41, KITG1, KFK81, PS654, SGF44, SGF	hea05222.cmall call lung concer	1 505 13		1 0 2 5 1 0
18.302.20.1110/III.1 Importance     6.35.12     E27, LRAS, CBS, CFG, GFG, ILT, ILTG, KFG, CGG, FGF, IS, KT, CDK,     1.75E-09       hsa04151.P13K-Akt signaling pathway     5.38E-11     ITGBI, CONEJ, VEGFA, KFG, ILTG, KFG, KG, CGK, FGF3, KT, CDK,     1.75E-09       hsa05212.Pancreatic cancer     3.51E-09     KYC, CHUK, IZD7, HKS1, CHKS, CDK6, CDK4, PIK3R1, CHUK     4.65E-08       hsa05212.Pancreatic cancer     3.51E-09     FGF1, HAS, FGR, AKLBP1, NASST, VEGFA, FGF11, KTLG, NFK81, CDK6, CDK4, PIK3R1, CHUK     7.82E-08       hsa05212.Pancreatic cancer     3.51E-09     FGF1, HAS, FGR, AKLBP1, RASST, VEGFA, FGF11, KTLG, NFK81, CDK6, CDK4, PIK3R1     1.20E-07       hsa05213.Pancreatic cancer     7.71E-08     FZD7, INK31, VEGFA, FGF3, FGF11, FGF13, CDK6, CDK4, PIK3R1     1.20E-07       hsa05213.Pancreatic cancer     7.77E-08     FZD7, INK31     VEGFA, FGF3, FGF11, KTLG, NFK81, CDK6, CDK4, MYC, ITGB1, TS2E-05     1.72E-06     HK3, VH, VEGFA, SCL21, TCEB2, TGFA, FGF11, KTLG, NFK81, CDK6, CDK4, MYC, TREB1, TS2E-06     1.72E-06     SND44, SMP2, WNT109, WNT3, KYTLS7, ST2D4, MYC, FZD7, PIK3R1     1.33E-06       hsa05151.Hpatinits B     1.22E-07     EMPA, BMP2, WNT109, WNT3, KTR3, CDK6, CDK4, MYC, RTS3, TCFA, CDK5, CDK4, PIK3R1, CHUK     1.65E-06       hsa04015.Rap1 signaling pathway     2.16E-07     BMP4, BMP2, WNT109, WNT3, RASST1, BKF6, ZDA, KYT, TOS1, ZDA, KYT, TS5E,	hsa05222.5mail cell lung cancer	1.58E-12	FIRST, CHOK	1.02E-10
hsa04151:PI3K-Akt signaling pathway     5.38E-11     TIGB1_CORE, VEGFA_UMAB_NC, PIK3R1_COLW, TOULS     1.75E-09       hsa05166:HTLV-I infection     1.75E-09     PEZF, RIAS, WHT10B, WNT3, SLC2A1, NFKB1, PFKB2, FZD5, CD4, FZD4       hsa05212:Pancreatic cancer     3.01E-09     PEZF, RIAB, FGFR, RIABT, NEKB1, CDK5, CDK4, PIK3R1, CULW     7.82E-08       hsa05212:Pancreatic cancer     3.01E-09     PEZF, RIAB, FGFR, RIABT, NEKB1, CDK5, CDK4, PIK3R1, CULW     7.82E-08       hsa05212:Pancreatic cancer     3.01E-09     FGF19, HRAS, FGFR, RIABT, NEKB1, CDK6, CDK4, PIK3R1, CULW     7.82E-08       hsa05213:Panalogi and the set of	insauszzu:chronic myelora reukemia	8.93E-12	EZEZ, CBLC, HRAS, CBLB, CTBPZ, NEKBI, CDKO, CDK4, WITC, PIK3RI, CHUK	3.87E-10
153/0121/FISA-KA Signaling pathway     5.56-11     FIGBL, CMER, VERAS, WHIDB, WINTS, FIGSA, CHAS, NERAS, LINK A     175-09       hsa05166:HTLVI infection     1.75E-09     MYC, CHUK, F207, PIK3R1     782-08       hsa05212:Pancreatic cancer     3.61E-09     F272, HRAS, VERAS, WTIDB, WNTS, SUCAL, NERAS, INKER, ICNK A, FIGSA, FGF11, KITLG, NFKB1, Soc Context, FIGSA, FGF18, FGF11, KITLG, NFKB1, Soc Context, FIGSA, FGF18, FGF11, FGF13, CDK6, CDK4, PIK3R1     1.20E-07       hsa05212:Binelanoma     7.41E-09     FG71, FIKSR1     2.56E-07       hsa05211:Renal cell carcinoma     1.77E-08     FZ07, FIKSR1     2.56E-07       hsa05201:Bing pathway     5.52E-07     COELC, HRAS, CUEB, WNT10B, WNT3, KEGA, FZD5, FZD4, MYC, ITGB1, I-GF13, CDK4, CDK4, PIK3R1     1.27E-06       hsa05201:Bing pathway     1.75E-08     FZ07, FIKSR1     2.56E-07       hsa05201:Bing pathway     1.52E-07     COELC, FZ2, HRAS, RCSC, NKB1, CCK6, CDK4, PIK3R1     1.27E-06       hsa0521:Bing and pathway     2.15E-07     COELC, FZ2, HRAS, KASSF1, BIRC5, FZ04, FZ07, FZ04, MYC, FZ07     2.16E-06       hsa0521:Bing and pathway     2.15E-07     COELC, FZ2, HRAS, KRASF1, FGF1, KTCL, KK1, KT20, FG71, KTCL, KK1, KT20, FG72, FZ04, FZ07     7.51E-06       hsa04051:FM21	head 41 F 1 (PI 21) Alst signaling pathway	F 20F 11		1 755 00
bsa05166:HTLVI infection     1.79E-09     MVC, CHUK, P207, PIX81     4.65E-08       bsa051212:Pancreatic cancer     3.61E-09     E272, RALBP1, VECFA, TGFA, NFKB1, CDK6, CDK4, PIK3R1, CHUK     7.82E-08       bsa051212:Pancreatic cancer     3.61E-09     E272, RALBP1, VECFA, TGFA, NFKB1, CDK6, CDK4, PIK3R1     1.20E-07       bsa05218:Melanoma     7.41E-09     FGF19, PARAS, FGR8, ALBP1, NEGFA, FGF11, FGF13, CDK6, CDK4, PIK3R1     1.20E-07       bsa05219:roteoglycans in cancer     9.75E-08     HRAS, VHL, VEGFA, SIC2A1, TCEB2, TGFA, EGUNI, PIK3R1     1.27E-06       bsa05211:Bancel cell carcinom     9.75E-08     HRAS, VHL, VEGFA, SIC2A1, TCEB2, TGFA, EGUNI, PIK3R1     1.32E-06       bsa05215:Proteoglycans in cancer     1.77E-08     FZD7, PIK3R1     1.32E-07       bsa05161:Hepatitis B     1.52E-07     CONE1, E2F2, HRAS, BIRC5, NFKB1, CDK6, CDK4, MVC, FZD7, PIK3R1     1.35E-06       bsa05161:Hepatitis B     1.52E-07     CONE1, E2F2, HRAS, RIRC5, NFKB1, CDK6, CDK4, PIK3R1, CHUK     1.65E-06       bsa05161:Hepatitis B     1.52E-07     CONE1, E2F2, HRAS, RIRC5, NFKB1, CDK6, CDK4, PIK3R1, CHUK     1.65E-06       bsa04061:Real signaling pathway     3.47E-06     FGF19, HRAS, WIT108, WIT3, WIT3, WIT178, WIT3, PIK3R1, CHUK     2.66E-05       bsa04061:Real signa	IISaU4151.PI3K-AKt Signaling pathway	5.38E-11	FIGEL, CONEL, VEGRA, LAWIDI, MITC, PINSKI, CHUK	1.75E-09
hsab51bb;H1UF1 Infection     1.79E-09     MRC, LHUR, YLO, YHX3R1     7.82F-08       hsab5212;Pancerreatic cancer     3.61E-09     F27, RALBP1, VGEFA, FGF11, YGF3, CDK6, CDK4, PIK3R1     9.66E-08       hsab5212;Bandanama     7.41E-09     FGF13, KIT, CHUK, PIK3R1     9.66E-08       hsab5212;Bandanama     7.41E-09     FGF13, KIT, CHUK, PIK3R1     9.66E-08       hsab5212;Bandanama     7.41E-09     FGF13, KIT, CHUK, PIK3R1     2.56E-07       hsab5212;Bandaning pathway     1.77E-08     FZD2, PIK3R1     2.56E-07       hsab5512;Hepating pathway     1.72E-07     RMA5, SUC2A1, TCEB2, TGFA, EGLN1, PIK3R1     1.22E-06       hsab5513;Hepating pathway     1.22E-07     RMA4, BMP2, WR108, WN13, RXS51, BICS, FZD3, FZD4, MYC, FZD7, PIK3R1     1.33E-06       hsab5213;Pancells is and is pathway     2.16E-07     SEFC7 CORLE, TZ2, HRA3, RIKCS, FZD3, FZD4, MYC, FZD7     7.51E-06       hsab5213;Pinstal cell carcinoma     8.09E-07     BMP4, BMP2, WN108, WN13, RXS51, BICS, FZD3, FZD4, WCC, FZD7     7.51E-06       hsab5213;Pinstal cell carcinoma     9.02E-07     EZF2, HRA3, GRA5, FGF11, KITG, FG13, KT, ITG81, PIK3R1     2.66E-05       hsab05212;Pinstal cell carcinoma     1.92E-06     FG13, HTK16, KT1, ZD5, FZD4, MYC, TF207     7.51E			EZFZ, HRAS, WNTTUB, WNT3, SLCZAT, NFKB1, NFKB2, FZD5, CDK4, FZD4,	
nsabs/212/pancreatic cancer     3-11-09     CEF2, KNLDP J, VEGA, IGA, MNR31, LUKK, UKK, BLANST, LUKK, UKKB1, MSA1, CHUK     7-82-08       hsad04114:Ras signaling pathway     5.206-09     FGF13, KIT, CHUK, PIKSR1     9-66E-08       hsad05218:Melanoma     7.41E-09     FGF13, KIT, CHUK, PIKSR1     1.20E-07       hsad05218:Melanoma     7.41E-09     FGF13, KIT, CHUK, PIKSR1     1.22F-07       hsad05218:melanoma     1.77E-08     FRS7, WIL, VEGFA, SCI2A1, TCEB2, TGFA, EGIN1, PIK3R1     1.22F-06       hsad0550:Signaling pathway: regulating pathway: regulating pathway: regulating pathway: regulating pathway: CNL (FG7, PKR), UKEGFA, FGF1, KITG, KITGA, KITC, KIT, FGFA, SBRCS, FZD4, MYC, FZD7, PIK3R1     1.32E-06       hsad0450:Heippo signaling pathway: 2.16E-07     BMP4, BMP2, WNT108, WNT3, FZD5, FZD4, MYC, FZD7, PIK3R1     1.32E-06       hsad0451:Meipa signaling pathway     3.22E-06     FRS7, WNT108, WNT3, FCFA, FCFA, FCFA, FCA7, FZD4, FZD7     7.51E-06       hsad0451:Meipa signaling pathway     3.47E-06     FGF1, NITG, KITG, FGF, FCFA, FCF	hsa05166:HTLV-I infection	1.79E-09	MYC, CHUK, FZD7, PIK3R1	4.65E-08
hsa04014.Ras signaling pathway     5.20E-09     FGF13, IRKDS, FORS, NGEPS, IV, EGPA, FGEJ1, IV, RUD, NFKBJ,     9.66E-08       hsa05218.Melanoma     7.41E-09     FGF13, IXT, CHUK, NFKRJ     1.20E-07       cCBLC, HRAS, CBLB, WNT10B, WNT3, VEGPA, FZDS, FZD4, MYC, ITGB1,     1.20E-07     NEAS       hsa05205.Proteoglycans in cancer     1.77E-08     FZO7, PIK3R1     1.22E-07       hsa05211.Brenal cell carcinoma     9.75E-08     HAS, VHL, VEGFA, SLC2A1, TCEB2, TGFA, EGUN1, PIK3R1     1.32E-06       hsa051511.Hepatitis B     1.52E-07     CNE1, FZZ, HRAS, BICS, FKB1, COKE, CDK4, MYC, FZD7, PIK3R1     1.33E-06       hsa05217.bsa011g pathway     2.16E-07     BMP4, BMP2, WNT10B, WNT3, RZDS, FZD4, KWC, FZD7     2.16E-06       hsa05231.Mon-smail cell long cancer     0.22E-07     EZF, HRAS, BICS, FTAC, CDKE, CDKA, PIK3R1     7.32E-06       hsa04015.Rs41 signaling pathway     3.47E-06     FGF19, NTRAS, FGR4, VIRT, FZD5, FZD4, FZD7     1.56E-05       hsa04015.Melanogenesis     1.32E-06     HAS, WNT10B, WNT3, KTG, KHK1, CDK4, PIK3R1     7.32E-06       hsa04051.Hepatis signaling pathway     3.22E-05     SCH2, FRAS, TGAX, CDK4, PIK3R1, FGT1, SCH3, CMK4     8.93E-05       hsa04051.FME     1.56E-04     HCKA, NFK81, KT, MCC, PIK3R1, CHUK <t< td=""><td>hsa05212:Pancreatic cancer</td><td>3.61E-09</td><td>E2F2, RALBP1, VEGFA, IGFA, NFKB1, CDK6, CDK4, PIK3R1, CHUK</td><td>7.82E-08</td></t<>	hsa05212:Pancreatic cancer	3.61E-09	E2F2, RALBP1, VEGFA, IGFA, NFKB1, CDK6, CDK4, PIK3R1, CHUK	7.82E-08
hsa0401248as signaling pathway     5.20E-09     PoFL3, KII, CHUK, PIK3KI     9.66E-08       hsa05218:Melanoma     CHLC9     FGE12, JEZ2, HARS, FGE8, FGE11, FGE13, CDK6, CDK4, PIK3R1     1.20E-07       hsa05218:Melanoma     CHLC, HRAS, CBLB, WNT10B, WNT3, VEGFA, FZDS, FZD4, MYC, ITGB1,     2.56E-07       hsa05211:Signaling pathways regulating     JULF0ETQ, VIKST1     1.27E-06       hsa0511:Signaling pathways regulating     JULF0ETQ, VIKST1     1.27E-07       hsa0511:Signaling pathways regulating     JULF0ETQ, VIKST1     1.32E-07       hsa0511:Signaling pathway     2.16E-07     BMP4, BMP2, WNT10B, WNT3, FZDS, FZD4, MYC, FZD7, PIK3R1     1.38E-06       hsa05121:Sasal cell carcinoma     9.02E-07     EIXP, HASS, FRS5, VIC6A, CDKA, PIKSR1     7.3EE-06       hsa05121:Sasal cell carcinoma     9.02E-07     EIXP, HASS, FGR8, VIC6A, CDK4, PIKSR1     7.3EE-06       hsa04015:Melanogenesis     1.92E-06     HBAS, WIT10B, WNT3, FZD5, FZD4, FZD7     7.156E-06       hsa04015:Rap1 signaling pathway     3.47E-06     FGF19, HRAS, FGR8, VIC6A, FGR11, KTLG, KT, FGT3, KTL, FKT , CTD4, FXD4, MYC     2.99E-05       hsa05219:Bladder cancer     1.30E-05     CNR1, EZZ, HRAS, TGFA, CDK4, MYC     2.99E-05       hsa04060:HT-1     signaling pathwa			FGF19, HKAS, FGF8, KALBP1, KASSF1, VEGFA, FGF11, KITLG, NFKB1,	
nsab213:Mikianoma     741-09     PG-19, E272, HKAS, FoF3, FoF11, FGF13, CUKS, UKA, PIK3R1     1.20E-07       nsa05205:Proteoglycans in cancer     1.77E-08     F2D7, PIK3R1     2.56E-07       nsa05211:Breal cell carcinoma     9.75E-08     HRAS, VHL, VEGFA, SLC2AI, TCEB2, TGFA, EGLN1, PIK3R1     1.27E-06       nsa05311:Breal cell carcinoma     9.75E-08     HRAS, VHL, VEGFA, SLC2AI, TCEB2, TGFA, EGLN1, PIK3R1     1.32E-06       nsa05161:Hepatitis B     1.52E-07     CONE, JEZP, HRAS, BIRCS, NFKB1, CDK6, CDK4, MYC, FZD7, PIK3R1     1.33E-06       nsa05212:Hsatal cell carcinoma     8.09E-07     BMP4, BMP2, WHT10B, WNT3, RASS-F1, BIRCS, FCD4, FZD7     7.51E-06       hsa05121:Hepatitis B     1.52E-07     CDK1, PIKAS, KDK, WNT10B, WNT3, RASS-F1, VEGA, FCD4, FZD7     7.51E-06       hsa05212:Bacal cell carcinoma     8.09E-07     BMP4, BMP2, WNT10B, WNT3, RCD5, FZD4, FZD7     7.51E-06       hsa04015:Bacj ignaling pathway     3.22E-06     FLAS, FGR4, CDKA, MYC     2.99E-05       hsa0405:Bacj ignaling pathway     3.22E-05     FLAS, KREB, VREA, FGR1, KTI, FLAS, FLAS, CREA, VEGA, SLC2AI, TCEB2, NFKB1, CMKA     1.98E-04       hsa04010:Enviroid leukemia     1.97E-05     HRAS, KREB, VREA, NKEB1, PIKAS1, CHUK     1.28E-04       hsa040410:OHAWK signaling pathway <td>hsa04014:Ras signaling pathway</td> <td>5.20E-09</td> <td></td> <td>9.66E-08</td>	hsa04014:Ras signaling pathway	5.20E-09		9.66E-08
CBLC, HRAS, CBLB, WNT10B, WNT3, VEGFA, FZDS, FZD4, MYC, ITGB1,     2.56E-07       hsa05205:Proteoglycans in cancer     1.77E-08     FZD7, PIK3R1     1.27E-06       hsa05205:Signaling pathways regulating     9.75E-08     HRAS, VHL, VEGFA, SLC2A1, TCEB2, TGFA, EGLNI, PIK3R1     1.32E-06       hsa05305:Signaling pathways     1.52E-07     CCNE1, E2F2, HRAS, BIRCS, MrKB1, CDK6, CDK4, MVC, FZD7, PIK3R1     1.33E-06       hsa04306:Hippo signaling pathway     1.52E-07     FEMPA, BMP2, WNT10B, WNT3, FZD5, FZD4, HWC, FZD7, PIK3R1     1.33E-06       hsa04316:Melanogenesis     1.92E-06     HRAS, MSSF1, GFA, CDK6, CDK4, PIK3R1     7.82E-06       hsa04316:Melanogenesis     1.92E-06     FGF19, HRAS, FGF8, VEGFA, FGF11, KIT, KTG51, SKT, ITGB1, PIK3R1     2.66E-05       hsa04916:Melanogenesis     1.92E-06     FRAS, NKB1, KIT, MYC, GFA, CDK4, PIK3R1     2.66E-05       hsa04916:Melanogenesis     1.92E-06     FRAS, NKB1, VGFA, CDK4, MYC     2.99E-05       hsa04916:Melanogenesis     1.92E-06     FRAS, NKB1, KIT, AYC, GFA, CDK4, MYC     2.99E-05       hsa04916:Melanogenesis     1.92E-06     FRAS, NKB1, KIT, AYC, GFA, CDK4, MYC     2.99E-05       hsa04916:Melanogenesis     1.92E-06     FRAS, NKB1, KIT, MYC, PIK3R1, CHUK     2.99E-05 <t< td=""><td>hsa05218:Melanoma</td><td>7.41E-09</td><td>FGF19, E2F2, HRAS, FGF8, FGF11, FGF13, CDK6, CDK4, PIK3R1</td><td>1.20E-07</td></t<>	hsa05218:Melanoma	7.41E-09	FGF19, E2F2, HRAS, FGF8, FGF11, FGF13, CDK6, CDK4, PIK3R1	1.20E-07
hsab5205:Proteoglycans in cancer     1.77E-08     F2D7, PIK3R1     2.55E-07       hsab5215:ginaling pathways regulating pluripotency of stem cells     1.12E-07     BMP4, BMP2, HRAS, WNT10B, WNT3, F2D5, FZD4, MYC, FZD7, PIK3R1     1.33E-06       hsab5161:Hepatitis B     1.52E-07     CNEL, E2Z, HRAS, BIRCS, NFKB1, CDK6, CDK4, MYC, PIK3R1, CHKK     1.53E-06       hsab5161:Hepatitis B     1.52E-07     CNEL, E2Z, HRAS, BIRCS, NFKB1, CDK6, CDK4, MYC, FZD7, PIK3R1     1.33E-06       hsab5161:Hepatitis B     1.52E-07     CNEL, BMP4, BMP2, WNT10B, WNT3, RDS5, PIBICS, FZD4, FZD7     7.51E-06       hsab5223:Non-small cell lung cancer     9.02E-07     E2F2, HRAS, RASSF1, TGA, CDK6, CDK4, PIK3R1     7.82E-06       hsa04015:Rap1 signaling pathway     3.47E-06     FED7, HRAS, FGR A, VCF4A, FG11, KTL3, FGF13, KTI, TGB1, PIK3R1     2.66E-05       hsa04051:H2-1 signaling pathway     3.47E-06     FED7, HRAS, FGR A, CDK4, MYC     2.99E-05       hsa05221:Acute myeloid leukemia     1.97E-05     HRAS, NRESI, KT, MYC, PIK3R1, CHUK     8.93E-05       hsa04056:HF-1 signaling pathway     2.42E-05     CEL2, HRAS, TGFA, NCK4, PIK3R1, CHUK     1.90E-04       hsa04060:HE-1 signaling pathway     1.65E-05     CEL2, HRAS, TGFA, NCK4, PIK3R1, CHUK     1.90E-04       hsa04010:Zrb			CBLC, HRAS, CBLB, WNT10B, WNT3, VEGFA, FZD5, FZD4, MYC, ITGB1,	
hsa05211:Renal cell carcinoma     9.75E-08     HRAS, VHL, VEGFA, SLC2A1, TCEB2, TGFA, EGLN1, PIK3R1     1.27E-06       hsa045505:ginaling pathways regulating     1.12E-07     BMP4, BMP2, HRAS, BMCS, NKB1, CDK6, CDK4, MYC, PIK3R1, CHUK     1.65E-06       hsa043301:Bip po signal ling pathway     2.16E-07     BMP4, BMP2, WNT10B, WNT3, RASSF1, BIRCS, FZD4, MYC, FZD7, PIK3R1     1.35E-06       hsa04321:Basal cell carcinoma     8.09E-07     FBMP4, BMP2, WNT10B, WNT3, RASSF1, BIRCS, FZD4, MYC, FZD7     7.51E-06       hsa0521:Brosn-small cell lung cancer     9.02E-07     F2F2, HRAS, RASSF1, TGFA, CDK6, CDK4, PIK3R1     7.82E-06       hsa04015:Rap1 signaling pathway     3.47E-06     FGF19, HRAS, FGR8, VEGFA, FGF11, KTLIG, FGF13, KIT, ITGB1, PIK3R1     2.66E-05       hsa05213:Brostate cancer     1.30E-05     CCNE1, E2F2, HRAS, TGFA, VKGPA, LOVK, MYC     8.33E-05       hsa04066:HF1-1 signaling pathway     2.42E-05     VHL, VEGFA, SLC2A1, TCEB2, NFKB1, PIK3R1, CHUK     8.33E-05       hsa04066:HF2-1 signaling pathway     3.22E-05     CBLC, HRAS, CBLB, NFKB1, CDK4, PIK3R1, CHUK     1.92E-04       hsa04061:Tcell receptor signaling     3.22E-04     FGF11, FGF13, NFKB1, CHUK     1.93E-04       hsa04010:Twell weight ing pathway     1.65E-04     WNT10B, WNT3, CTEP2, FZD5, FZD4, MYC, FHXR	hsa05205:Proteoglycans in cancer	1.77E-08	FZD7, PIK3R1	2.56E-07
nsau4soUsignaling pathways regulating pluripotency of stem cells     1.12E-07     BMP4, BMP2, HRAS, WNT10B, WNT3, FZD5, FZD4, MYC, FZD7, PIK3R1     1.33E-06       hsa05161:Hepatitis B     1.52E-07     CKPLI, EZ7, HRAS, BIRCS, NFKB1, CDK6, CDK4, MYC, PK3R1, CHUK     1.65E-06       hsa05217:Basal cell carcinoma     8.09E-07     BMP4, BMP2, WNT10B, WNT3, FZD5, FZD4, FZD7     7.51E-06       hsa05217:Basal cell carcinoma     8.09E-07     BMP4, BMP2, WNT3B, WNT3, KTGS, KTKB1, CEDS, FZD4, FZD7     7.51E-06       hsa05217:Basal cell carcinoma     9.02E-07     FZ2, HRAS, RASSF1, TGFA, CDK6, CDK4, PKR3R1     7.82E-06       hsa04016:Melanogenesis     1.92E-06     FGF19, HRAS, FGF8, VEGFA, CDK4, MYC     2.99E-05       hsa05212:Postate cancer     1.30E-05     CCNEL, IZ22, HRAS, TGFA, CDK4, JNCX     8.33E-05       hsa05214:Oute myeloid leukemia     1.97E-05     HRAS, NKRB1, KT, MYC, PIK3R1, CHUK     1.28E-04       hsa0460:HE-1 signaling pathway     2.42E-05     VHL, VEGFA, SLC2A1, TCEB2, NFKB1, EGLN1, PIK3R1     2.32E-04       hsa04010:MAPK signaling pathway     3.22E-05     CBCL, HRAS, CBLB, PKB1, CDK6, NFKB1, CDK4, PIK3R1     2.32E-04       hsa04010:MAPK signaling pathway     1.65E-04     KNT10B, WNT3, CHUK     8.59E-04       hsa04010:MAPK signaling pathwa	hsa05211:Renal cell carcinoma	9.75E-08	HRAS, VHL, VEGFA, SLC2A1, TCEB2, TGFA, EGLN1, PIK3R1	1.27E-06
plurpotency of stem cells     1.12E-07     BMP4, BMP2, HRAS, WNT19, WNT3, F2D4, MYC, F2D7, PiK3R1     1.33E-06       hsa05161-Hepatitis B     1.52E-07     CKNE1, E2F2, HRAS, BIRCS, FKLS, CDK4, MYC, FZD7     2.16E-06       hsa05217-Basal cell carcinoma     8.09E-07     BMP4, BMP2, WNT10B, WNT3, RASSF1, BIRCS, FZD5, FZD4, MYC, FZD7     7.51E-06       hsa052237-Non-small cell lung cancer     9.02E-07     E2F2, HRAS, RASSF1, TGFA, CDK6, CDK4, PIK3R1     7.82E-06       hsa052137-Basal del carcinoma     9.02E-07     E2F2, HRAS, RASSF1, TGFA, CDK6, CDK4, PIK3R1     7.82E-06       hsa04916-Melanogenesis     1.92E-06     FRAS, WNT10B, WNT3, FUGA, CDK4, PIK3R1     7.82E-06       hsa052131-Shrostate cancer     1.34E-06     FGF19, HRAS, FGF8, VEGFA, FGF11, KIT1G, FGF13, KIT, ITGB1, PIK3R1     2.66E-05       hsa04066:HIF-1 signaling pathway     2.42E-05     VHL VEGFA, SLC2A1, TCEB2, NFK81, CHK4, MYC     2.99E-05       hsa04066:HIF-1 signaling pathway     2.42E-05     VHL VEGFA, SLC2A1, TCEB2, NFK81, CHUK     1.90E-04       hsa04066:HIF-1 signaling pathway     3.22E-06     FGF19, HRAS, FGF8, GF11, FGF13, NFK81, NFK82, MYC, CHUK     6.62E-04       hsa04010:MAPK signaling pathway     1.22E-04     FGF19, HRAS, FGF8, FGF11, FGF13, NFK81, NFK82, MYC, CHUK     6.62E-04	nsau4550:Signaling pathways regulating			
hsad430:Httpp:   1,52E-07   CCNE1, E2P, HRAS, BIRCS, NYRB1, CNKB1, CDK6, CDK4, MYC, PIK3R1, CHUK   1,65E-06     hsad432:Httpp:   5,216-07   BMP4, BMP2, WNT108, WNT3, RASSF1, BIRCS, TSCD, FZD4, MYC, FZD7   7,51E-06     hsad4916:Melanogenesis   1,92E-06   FRAS, KNSF1, TGFA, CDK6, CDK4, PIK3R1   7,82E-06     hsad4916:Melanogenesis   1,92E-06   FGF19, HRAS, FGF8, VEGFA, FGF11, KTLG, KT, FZD5, FZD4, FZD7   1,56E-05     hsad5215:Prostate cancer   1,14E-06   FGF19, HRAS, FGF8, VEGFA, FGF11, KTLG, KT, FZD5, FZD4, FZD7   1,56E-05     hsad5215:Prostate cancer   1,30E-05   CCNE1, E2F2, HRAS, TGFA, NFKB1, KTL, MYC   8,93E-05     hsad406:CintLin - Signaling pathway   3,24E-05   CCNE1, E2F2, HRAS, TGFA, NFKB1, KTL, MYC   1,30E-04     hsad5214:Giloma   1,97E-05   HRAS, NFKB1, KT, MYC, PIK3R1, CHUK   1,30E-04     hsad6406:Httl-1 signaling pathway   3,22E-05   CBLC, HRAS, CBLB, NFKB1, CDK4, PIK3R1   2,32E-04     hsad6410:MAPK signaling pathway   1,26E-04   WNT108, WNT3, CTB2, FZD4, KPK81, YKR82, MYC, CHUK   6,62E-04     hsad64201:MAPK signaling pathway   1,26E-04   KNT108, WNT3, CTB2, FZD4, FZD4, FZD4, FZD4, FZD4   8,30E-04     hsad64210:WAPK signaling pathway   1,66E-04   CUC, HRAS, CBR8, YKR81, CDK6, NKR82, JCKA, PIK3R1	pluripotency of stem cells	1.12E-07	BMP4, BMP2, HRAS, WNT10B, WNT3, FZD5, FZD4, MYC, FZD7, PIK3R1	1.33E-06
nsau4390:Hippo signaling pathway   2.16E-07   BMP4, BMP2, WNT10B, WNT3, RASSF1, JBRCS, F2D4, F2D7   7.51E-06     hsao5217:Basal cell carcinoma   8.09E-07   BXP4, BMP2, WNT10B, WNT3, RZDS, FZD4, FZD7   7.51E-06     hsao4915:Malangenesis   1.92E-06   HRAS, WNT10B, WNT3, KITLG, KIT, FZD4, FZD7   1.56E-05     hsao4015:Rap1 signaling pathway   3.47E-06   FGF19, HRAS, FGF8, VEGA, FGF11, KITLG, FGF13, KIT, TGB1, PIK3R1   2.66E-05     hsao5221:Acute myeloid leukemia   1.97E-05   CCRL1, E2F2, HRAS, TGFA, VEGA, FGF11, KITLG, FGF13, KIT, TGB1, PIK3R1   2.86E-04     hsao4066:HF-1 signaling pathway   2.42E-05   VHL, VEGFA, SLC2A1, TCEB2, NFKB1, CHUK   1.98E-04     hsao4066:HF-1 signaling pathway   3.22E-05   CBLC, HRAS, CBLB, NFKB1, CDK4, PIK3R1, CHUK   1.90E-04     hsao4010:MAR signaling pathway   3.22E-05   CBLC, HRAS, CBLB, NFKB1, CDK4, PIK3R1, CHUK   1.90E-04     hsao4010:MAR signaling pathway   1.65E-04   WNT108, WNT3, CTBP2, FZD5, FZD4, MYC, CHUK   6.62E-04     hsao4010:MAR signaling pathway   1.65E-04   WNT30, WNT3, CMEA1, MYC6, PIK3R1   8.30E-04     hsao4010:MAR signaling pathway   1.65E-04   WNT108, WNT3, CRB4, MYC6, PIK3R1   8.30E-04     hsao4010:MAR signaling pathway   1.65E-04   WNT30, KMR3, CMEA, MYC6, PIK3R1 </td <td>hsa05161:Hepatitis B</td> <td>1.52E-07</td> <td>CCNE1, E2F2, HRAS, BIRC5, NFKB1, CDK6, CDK4, MYC, PIK3R1, CHUK</td> <td>1.65E-06</td>	hsa05161:Hepatitis B	1.52E-07	CCNE1, E2F2, HRAS, BIRC5, NFKB1, CDK6, CDK4, MYC, PIK3R1, CHUK	1.65E-06
nsabs217/Basal cell carcinoma   8.09E-07   BMIP4, BMIP2, WN13, L20, K204, F207   7.51E-06     hsab52231/Non-small cell lung cancer   9.02E-07   8.5457237(RASSE), TGFA, CDK6, CDK4, PIK3R1   7.82E-06     hsab5221/shab4der cancer   1.44E-06   FGF19, HRAS, FGFA, VEGFA, FGF11, KITG, FGF13, KIT, ITGB1, PIK3R1   2.66E-05     hsab5213:Prostate cancer   1.30E-05   CCNE1, E2F2, HRAS, TGFA, NFKB1, PIK3R1, CHUK   8.93E-05     hsab4060:HT-1 signaling pathway   2.42E-05   VHL, VEGFA, CDK4, NFKB1, KIT, MYC, PIK3R1, CHUK   8.93E-05     hsab40660:T cell receptor signaling   3.22E-05   CBLC, HRAS, CBLB, NFKB1, CDK4, PIK3R1, CHUK   1.90E-04     hsab404061:HT-1 signaling pathway   3.22E-05   CBLC, HRAS, CBLB, NFKB1, CDK4, PIK3R1, CHUK   1.90E-04     hsab40401:MAPK signaling pathway   1.52E-04   WNT10, WT3, CTBP2, FZD5, ZD4, MYC, FZD7   8.59E-04     hsab4010:MAPK signaling pathway   1.65E-04   WNT10, WT3, CTBP2, FZD5, ZD4, MYC, FZD7   8.59E-04     hsab45206:MicroRNAs in cancer   2.63E-04   CCNE1, HRAS, SKP2, NFKB1, CDK6, NFKB2, CDK4, PIK3R1   9.80E-04     hsab5206:MicroRNAs in cancer   5.75E-04   HRAS, SLC2A1, KIT, MYC, PIK3R1   0.002577     hsab5162:Measles   0.00118   CCNE1, FZF2, KRAS, CMS, PIKAS1, CHUK   0.002557 </td <td>hsa04390:Hippo signaling pathway</td> <td>2.16E-07</td> <td>BMP4, BMP2, WN110B, WN13, RASSF1, BIRC5, FZD5, FZD4, MYC, FZD7</td> <td>2.16E-06</td>	hsa04390:Hippo signaling pathway	2.16E-07	BMP4, BMP2, WN110B, WN13, RASSF1, BIRC5, FZD5, FZD4, MYC, FZD7	2.16E-06
nsad9223:Non-smail cell lung cancer   9.02E-07   EARS, WTIGD, WTS, RITLG, KTF, FZDS, FZD4, FZD7   1.56E-05     hsad9416:Melanogenesis   1.92E-06   FRAS, WTIGD, WTS, KTLG, KTF, FZDS, FZD4, FZD7   1.56E-05     hsad915:Rap1 signaling pathway   3.47E-06   FGF19, HRAS, FGF8, VEGFA, FGF11, KTLG, FGF13, KIT, ITGB1, PIK3R1   2.66E-05     hsad9211:Strostate cancer   4.14E-06   E2F2, HRAS, RASSF1, VEGFA, CDK4, MYC   2.99E-05     hsad92521:Acute myeloid leukemia   1.97E-05   HRAS, NTKB1, KT, MYC, PIK3R1, CHUK   1.28E-04     hsad966:MF-1 signaling pathway   2.42E-05   VHL, VEGFA, SLC2A1, TCEB2, NFKB1, CDK4, PIK3R1, CHUK   1.90E-04     hsad94010:MAPK signaling pathway   1.22E-04   FGF19, HRAS, FGF8, FGF11, FGF13, NFKB1, NFKB2, MYC, CHUK   6.32E-04     hsad94010:MAPK signaling pathway   1.65E-04   WNT106, WNT3, CTBP2, FZD5, FZD4, MYC, FZD7   8.59E-04     hsad9206:MicroRNAs in cancer   2.63E-04   CCNE1, HRAS, SKP2, NFKB1, CDK6, NFKB2, CDK4, PIK3R1   9.80E-04     hsad95216:Thyroid cancer   6.84E-04   HRAS, SLC2A1, KIT, MYC, PIK3R1   0.002557     hsad9410:Wel eycle   8.58E-04   CCNE1, HRAS, SKP2, NFKB1, CDK6, MKB1, CDK6, MYC   0.003593     hsad9410:Gell cycle   8.58E-04   CCNE1, KF2, SKP2, CDK6, CDK4, PIK3R1   0.00	hsa05217:Basal cell carcinoma	8.09E-07	BMP4, BMP2, WN110B, WN13, FZD5, FZD4, FZD7	7.51E-06
nsa04015:Metanogenesis   1.92e-06   HKAS, WN110B, WN13, K1LS, K1, JCD, FLD, FLD, FLD, FLD, FLD, FLD, FLD, FL	nsau5223:Non-small cell lung cancer	9.02E-07	EZFZ, HRAS, RASSF1, IGFA, CDK6, CDK4, PIK3K1	7.82E-06
nsaudous:kap i signaling pathway   3.47406   Feb 19, HKAS, Feb 8, VEGA, Feb 1, Kill K, Feb 13, Kill (HSR1, PiK3R1   2.666-05     hsaud52:Prostate cancer   1.30E-05   CCNE1, E2F2, HRAS, TGFA, NFKB1, PIK3R1, CHUK   8.93E-05     hsaud626:HIF1-signaling pathway   2.42E-05   VHL, VEGFA, SLC2A1, TCEB2, NFKB1, EGLN1, PIK3R1   1.50E-04     hsaud660:T cell receptor signaling   2.42E-05   VHL, VEGFA, SLC2A1, TCEB2, NFKB1, EGLN1, PIK3R1   2.32E-04     pathway   3.22E-05   CBLC, HRAS, CBLB, NFKB1, CDKA, PIK3R1, CHUK   6.62E-04     hsaud010:MAPK signaling pathway   1.65E-04   VNT10B, WNT3, CFB2, FGP1, FGF13, NFKB1, NFKB2, MYC, CHUK   6.62E-04     hsaud012:FrbB signaling pathway   1.65E-04   VNT10B, WNT3, CTBP2, FZD5, FZD4, MYC, FZD7   8.59E-04     hsaud020:FrbB signaling pathway   1.65E-04   CNE1, HRAS, CBLB, TGFA, MYC, PIK3R1   9.80E-04     hsaud021:FrbB signaling pathway   1.65E-04   CNE1, HRAS, SKP2, NFKB1, CDK6, NFKB1, CDK6, MYC   0.001222     hsaud5230:Central carbon metabolism in   caser   2.04E-04   CNE1, FZF2, SKP2, CDK6, CDK4, MYC   0.002557     hsaud510:Wiguitin mediated   proteolysis   0.00118   CCNE1, NFKB1, NFKB1, CHKK   0.002579     hsaud510:Geliduition of actin   0.00135   FGF19, HRA	nsa04916:Melanogenesis	1.92E-06	HRAS, WNT10B, WNT3, KTTLG, KTTLG, FZD4, FZD7	1.56E-05
Insab2129:Bladder Calcer   4.14-E06   2.299E-05     Isab25129:Prostate cancer   1.30E-05   CCNEL, E22, HRAS, GFA, NYKB1, PIK3R1, CHUK   8.93E-05     hsab25129:Crostate cancer   1.30E-05   CCNEL, E22, HRAS, GFA, NYKB1, PIK3R1, CHUK   1.28E-04     hsab4660:Ti-1 signaling pathway   2.42E-05   VH, VEGFA, SLC2A1, TCEB2, NFKB1, EGIN1, PIK3R1   1.50E-04     pathway   3.22E-05   CBLC, HRAS, GBLB, NFKB1, CDK4, PIK3R1, CHUK   1.90E-04     hsab4060:Ti-C cell receptor signaling   3.22E-05   CBLC, HRAS, TGFA, CDK6, CDK4, PIK3R1, CHUK   1.90E-04     hsab4010:MAPK signaling pathway   1.22E-04   FGF19, HRAS, FGF3, NFKB1, NFKB1, NFKB2, MYC, CHUK   6.62E-04     hsab4012:ErbB signaling pathway   1.65E-04   WNT10B, WNT3, CTBP2, FZD5, FZD4, MYC, FZD7   8.59E-04     hsab5203:Viral carcinogenesis   2.04E-04   CCNE1, HRAS, CBLB, TGFA, MYC, PIK3R1   9.80E-04     hsab5203:Central carbon metabolism in cancer   2.63E-04   CRE1, F2F2, HRAS, MNT3, RASSF1, VEGFA, NFKB1, CDK6, MYC   0.001222     hsab6162:Measles   0.00118   CCNE1, F2F2, SKP2, CDK6, CDK4, MYC   0.002557     hsab0410:Regulation of actin   Cres1, NFKB1, CDK6, CDK4, PIK3R1   0.002572     hsab04810:Regulation of actin   Cres2, SKP2, CDK6, CDK4, PIK3R1	hsa04015:Rap1 signaling pathway	3.47E-06	FGF19, HKAS, FGF8, VEGFA, FGF11, KITLG, FGF13, KIT, ITGB1, PIK3R1	2.66E-05
Inades215:Prostate Cancer   1.30E-03   CURET, EZP., HRAS, TGPA, WRAS, IFASH, JFIASH,	hsa05219:Bladder cancer	4.14E-06	EZFZ, HRAS, RASSF1, VEGFA, CDK4, MYC	2.99E-05
hsa04066/th=1 signaling pathway   1.97E-05 HKAS, NFKB1, K11, MYC, PTKB1, EGLN1, PTK3R1   1.25E-04     hsa04066/th=1 signaling pathway   2.42E-05   VHL, VEGFA, SLC2A1, TCEB2, NFKB1, EGLN1, PTK3R1   1.90E-04     hsa04066/th=1 signaling pathway   3.22E-05   CBLC, HRAS, CBLB, NFKB1, CDK4, PTK3R1, CHUK   1.90E-04     hsa04010:MAPK signaling pathway   1.22E-04   FGF19, HRAS, FGFA, GCK6, CDK4, PTK3R1   2.32E-04     hsa04010:MAPK signaling pathway   1.65E-04   VNT10B, WNT3, CTBP2, FZD5, FZD4, MYC, CHUK   6.62E-04     hsa04012:ErbB signaling pathway   1.66E-04   CBLC, HRAS, CBLB, TGFA, MYC, PTK3R1   8.30E-04     hsa05203:Wira carcinogenesis   2.04E-04   CCNE1, HRAS, SKP2, NFKB1, CDK6, NFKB2, CDK4, PTK3R1   9.80E-04     hsa05206:MicroRNAs in cancer   2.63E-04   CCNE1, E2F2, HRAS, WNT3, RASSF1, VEGFA, NFKB1, CDK6, MYC   0.002577     hsa05162:Thyroid cancer   6.84E-04   HRAS, TPR, MYC, PTK3R1   0.002577     hsa04100:Ubiquitin mediated   0.00118   CCNE1, NFKB1, CDK6, CDK4, MYC   0.003583     proteolysis   0.00118   CCNE1, NFKB1, CDK6, CDK4, MYC   0.005282     hsa04100:Regulation of actin   0.00158   FGF19, HRAS, FGF3, FGF11, FGF13, ITGB1, PTK3R1   0.006027     hsa04210:showis   0.0	hsaU5215:Prostate cancer	1.30E-05	CCNE1, E2F2, HKAS, IGFA, NFKB1, PIK3K1, CHUK	8.93E-05
Insudobis.Ini-1 signaling pathway   2.422-05   VH, VEGRA, SLC2A1, ICEB2, NRAB1, EGU1, PRAB1   1.50E-04     pathway   3.22E-05   CBLC, HRAS, CBLB, NFKB1, CDKA, PIK3R1   2.32E-04     hsa04660.Tcell receptor signaling   4.10E-05   E2F2, HRAS, TGFA, CDKA, PIK3R1, CHUK   1.90E-04     hsa043010:MAPK signaling pathway   1.62E-04   FGF19, HRAS, FGF8, FGF11, FGF13, NFKB1, NFKB2, MYC, CHUK   6.62E-04     hsa04310:Wnt signaling pathway   1.66E-04   WNIT0B, WNT3, CTBP2, FZD5, FZD4, MYC, FZD7   8.59E-04     hsa043012:ErbB signaling pathway   1.66E-04   CBLC, HRAS, CBLB, TGFA, MYC, PIK3R1   9.80E-04     hsa05203:Viral carcinogenesis   2.04E-04   CCNE1, E2F2, HRAS, WNT3, RASSF1, VEGFA, NFKB1, CDK6, MYC   0.001222     hsa05216:Thyroid cancer   6.84E-04   HRAS, SLC2A1, KIT, MYC, PIK3R1   0.002577     hsa05216:Thyroid cancer   6.84E-04   HRAS, TPR, MYC, TPM3   0.002559     hsa04100:Veglel with mediated   0.00118   CCNE1, NFKB1, CDK6, CDK4, MYC   0.003593     hsa0410:Regulation of actin   0.00118   CCNE1, NFKB1, CDK6, CDK4, PIK3R1, CHUK   0.00027     rytoskleton   0.00158   FGF19, HRAS, FGF8, FGF11, FGF13, ITGB1, PIK3R1   0.006027     hsa05145:Toxopl asmosis   0.00548	hsa05221:Acute myeroid reukemia	1.97E-05	HKAS, NFKB1, KIT, MIYC, PIK3K1, CHUK	1.28E-04
Insortool. Centreceptor signating   3.22E-05   CBLC, HRAS, CBLB, NFKB1, CDK4, PIK3R1, CHUK   1.90E-04     hsa05214:Glioma   4.10E-05   E2F2, HRAS, TGFA, CDK6, CDK4, PIK3R1, NFKB2, MYC, CHUK   6.62E-04     hsa04010:MAPK signaling pathway   1.22E-04   FGF19, HRAS, FGF8, FGF11, FGF13, NFKB1, NFKB2, MYC, CHUK   6.62E-04     hsa04012:FrbB signaling pathway   1.65E-04   WNT10B, WNT3, CTB92, FZD5, FZD4, MYC, FZD7   8.59E-04     hsa05203:Viral carcinogenesis   2.04E-04   CCNE1, HRAS, SKP2, NFKB1, CDK6, NFKB2, CDK4, PIK3R1   9.80E-04     hsa05230:Central carbon metabolism in cancer   2.63E-04   CCNE1, E2F2, HRAS, TSP, WNT3, RASSF1, VEGFA, NFKB1, CDK6, MYC   0.002557     hsa05162:Thyroid cancer   6.84E-04   HRAS, SLC2A1, KIT, MYC, PIK3R1   0.002559     hsa05162:Measles   0.00118   CCNE1, E2F2, SKP2, CDK6, CDK4, MYC   0.003593     hsa05162:Measles   0.00118   CCNE1, NFKB1, CDK6, CDK4, MYC   0.005282     hsa04810:Regulation of actin   FGF19, HRAS, FGF8, FGF11, FGF13, ITGB1, PIK3R1   0.00627     hsa05131:Endometrial cancer   0.00375   KRA2, MLH1, MYC, PIK3R1, CHUK   0.013867     hsa05145:Toxoplasmosis   0.00555   SF2, NFKB1, IAMB1, ITGB1, PIK3R1, CHUK   0.013867     hsa04210:Apoptosis	hsa04000.miF-1 Signaling pathway	2.42E-05	VAL, VEGFA, SLOZAT, TCEBZ, NEKBT, EGLNT, PIKSKT	1.50E-04
ballway   3.22E-05   CBLC, HRAS, CBLS, NFRAI, CDKA, FIKASI, CHOK   1.90E-04     bsa05214:Glioma   4.10E-05   E2F2, HRAS, TGFA, CDK6, CDK4, PIK3R1   2.32E-04     bsa04010:MAPK signaling pathway   1.65E-04   WNT10B, WNT3, CTBP2, FZD5, FZD4, MYC, CHUK   6.62E-04     bsa04012:ErbB signaling pathway   1.65E-04   CBLC, HRAS, CBLB, TGFA, MYC, PIK3R1   8.30E-04     bsa05203:Viral carcinogenesis   2.04E-04   CCNE1, HRAS, SKP2, NFKB1, CDK6, NFKB2, CDK4, PIK3R1   9.80E-04     bsa05200:Cirtral carbon metabolism in cancer   2.63E-04   CCNE1, HRAS, SLC2A1, KIT, MYC, PIK3R1   0.002257     bsa05216:Thyroid cancer   6.84E-04   HRAS, TPR, MYC, TPM3   0.002559     bsa04110:Cell cycle   8.58E-04   CCNE1, E2F2, SKP2, CDK6, CDK4, MYC   0.003593     bsa05120:Thyroid cancer   6.84E-04   HRAS, TPR, MYC, TPM3   0.002559     bsa04110:Cell cycle   8.58E-04   CCNE1, E2F2, SKP2, CDK6, CDK4, MYC   0.003593     bsa05120:Upiquitin mediated   0.00118   CELC, CBLB, VHL, TCEB2, SKP2, PIAS2   0.005282     hsa04810:Regulation of actin   0.00545   SKP2, NFKB1, IGB1, PIK3R1, CHUK   0.013867     hsa05169:Epstein-Barr virus infection   0.00545   SKP2, NFKB1, NFKB2, MYC, PIK3R1, CHUK </td <td>nathway</td> <td>2 225 05</td> <td></td> <td>1 005 04</td>	nathway	2 225 05		1 005 04
Habbergin   4.10E-05   EZF-, HAXS, IGFA, CDKO, CDKA, PIKSR1   2.32E-04     hsa04010:MAPK signaling pathway   1.25E-04   WNT10B, WNT3, CTBP2, FZD5, FZD4, MYC, FZD7   8.59E-04     hsa04012:ErbB signaling pathway   1.66E-04   CBLC, HRAS, CBLB, TGFA, CMYC, PIK3R1   8.30E-04     hsa05203:Viral carcinogenesis   2.04E-04   CCNE1, HRAS, SKP2, NFKB1, CDK6, NFKB2, CDK4, PIK3R1   9.80E-04     hsa05206:MicroRNAs in cancer   2.63E-04   CCNE1, EZF2, HRAS, WNT3, RASSF1, VEGFA, NFKB1, CDK6, MYC   0.001222     hsa05216:Intyroid cancer   6.84E-04   HRAS, SLC2A1, KIT, MYC, PIK3R1   0.002577     hsa0516:Measles   0.00118   CCNE1, EZF2, SKP2, CDK6, CDK4, MYC   0.002359     hsa0516:Measles   0.00118   CCNE1, EZF2, SKP2, CDK6, CDK4, MYC   0.003759     hsa04110:Cell cycle   8.58E-04   CNE1, EZF2, SKP2, CDK6, CDK4, MYC   0.003759     hsa04110:Cell cycle   8.58E-04   CCNE1, EZF2, SKP2, PIAS2   0.002582     hsa04110:Cell cycle   0.00118   CCNE1, EZF2, SKP2, PIAS2   0.005282     hsa04810:Regulation of actin   0.00158   CCNE1, EZF2, SKP2, PIAS2   0.005282     hsa05169:Epstein-Barr virus infection   0.00555   SKP2, NFKB1, NFKB2, MYC, PIK3R1, CHUK   0.013867 <td>hea05214.Cliama</td> <td>3.22E-05</td> <td></td> <td>1.90E-04</td>	hea05214.Cliama	3.22E-05		1.90E-04
Insadv10://MArk signaling pathway   1.22E-04   FOF15, FMAS, FGF1, FGF15, FGF15	hsa04010:MADK signaling nathway	4.10E-05		2.32E-04
Insods10:Witsignaling pathway   1.05E-04   Witris, CP2, F20, Mitc, F20, Witris, CP2, Witris, CP2, F20, Witris, CP2, F20, Witris, CP2, Witris, Wi	hsa04010.What signaling pathway	1.226-04	MAITION WATE CTRDE FOR FOR ANYC FOR	0.02E-04
Insolv12:L105 signaling patiway   1.00E04 CBCC, HIAS, CBC, HIAS, CH, HIASI, CH, HIASI   8.30E04     hsa05203:Viral carcinogenesis   2.04E-04   CCNE1, HAS, SKP2, NFKB1, CDK6, NFKB2, CDK4, PIK3R1   9.80E-04     hsa05206:MicroRNAs in cancer   2.63E-04   CCNE1, HAS, SKP2, NFKB1, CDK6, NFKB2, CDK4, PIK3R1   0.001222     hsa05230:Central carbon metabolism in   5.75E-04   HRAS, SLC2A1, KIT, MYC, PIK3R1   0.002557     hsa05216:Thyroid cancer   6.84E-04   HRAS, TPR, MYC, TPM3   0.002959     hsa04110:Cell cycle   8.58E-04   CCNE1, E2F2, SKP2, CDK6, CDK4, MYC   0.003593     hsa05162:Measles   0.00118   CCNE1, NFKB1, CDK6, CDK4, PIK3R1, CHUK   0.004771     hsa0410:Regulation of actin   CNE1, NFKB1, CDK6, CDK4, PIK3R1, CHUK   0.005282     hsa05106:Bepstein-Barr virus infection   0.0055   SKP2, NFKB1, NFKB2, MYC, PIK3R1   0.013867     hsa05169:Epstein-Barr virus infection   0.0055   SKP2, NFKB1, NFKB2, MYC, PIK3R1, CHUK   0.01908     hsa0410:Apoptosis   0.00616   BID, NFKB1, PIK3R1, CHUK   0.02908     hsa0410:Apoptosis   0.00616   BID, NFKB1, PIK3R1, CHUK   0.02908     hsa04210:Apoptosis   0.00616   BID, NFKB1, PIK3R1, CHUK   0.020908     h	hsa04310.Witt Signaling pathway	1.031-04	CDIC HDAS CDID TGEA MAY DIV2D1	8.39L-04
Insolvostorial carcinogenesis   2.641-64   Central, Inico, Sir 2, Mikbl, Colke, Colke, Colke, Mikbl, Mikbl, Itagene, Colke, Colke, Mikbl, Mikbl, Colke,	hsa04012.Libb signaling pathway	2.04F-04	CONEL HRAS SKD2 NEKR1 CDK6 NEKR2 CDK4 DIK3R1	9.30L-04
InstructionInstructionInstructionInstructionInstructionInstructionhsa05230:Central carbon metabolism in cancer5.75E-04HRAS, SLC2A1, KIT, MYC, PIK3R10.002577hsa05216:Thyroid cancer6.84E-04HRAS, TPR, MYC, TPM30.002959hsa04110:Cell cycle8.58E-04CCNE1, E2F2, SKP2, CDK6, CDK4, MYC0.003593hsa05162:Measles0.00118CCNE1, NFKB1, CDK6, CDK4, PIK3R1, CHUK0.004771hsa04120:Ubiquitin mediatedproteolysis0.00134CBLC, CBLB, VHL, TCEB2, SKP2, PIAS20.005282hsa04810:Regulation of actin0.00158FGF19, HRAS, FGF8, FGF11, FGF13, ITGB1, PIK3R10.006027hsa05213:Endometrial cancer0.00355HRAS, MLH1, MYC, PIK3R10.013867hsa05169:Epstein-Barr virus infection0.00555SKP2, NFKB1, NFKB2, MYC, PIK3R1, CHUK0.019083hsa05210:Colorectal cancer0.00616BID, NFKB1, PIK3R1, CHUK0.020908hsa044115:p53 signaling pathway0.00828HRAS, NFKB1, PIK3R1, CHUK0.025231hsa04662:B cell receptor signaling pathway0.00828HRAS, NFKB1, PIK3R1, CHUK0.02667hsa05100:Bacterial invasion of roitbalial cells0.001456CRUC, CRUP, JTCP1, PIK2P10.02667	hsa05205.Widi carenogenesis	2.04E 04	CCNE1 E2E2 HRAS WINT3 RASSE1 VEGEA NEKB1 CDK6 MYC	0.001222
Instablishin (arboin inclusion incl	hsa05200.Wieronives in current	2.032.04		0.001222
called   5.75104   INKS, SLEVA   INKS, SLEVA   0.002577     hsa05216:Thyroid cancer   6.84E-04   HRAS, TPR, MYC, TPM3   0.002959     hsa04110:Cell cycle   8.58E-04   CCNE1, E2F2, SKP2, CDK6, CDK4, MYC   0.003593     hsa04120:Ubiquitin mediated   0.00118   CCNE1, NFKB1, CDK6, CDK4, PIK3R1, CHUK   0.004771     hsa0410:Regulation of actin   0.00134   CBLC, CBLB, VHL, TCEB2, SKP2, PIAS2   0.005282     hsa04810:Regulation of actin   0.00158   FGF19, HRAS, FGF8, FGF11, FGF13, ITGB1, PIK3R1   0.006027     hsa05213:Endometrial cancer   0.00375   HRAS, MLH1, MYC, PIK3R1   0.013867     hsa05169:Epstein-Barr virus infection   0.00555   SKP2, NFKB1, NFKB2, MYC, PIK3R1, CHUK   0.01988     hsa04210:Apoptosis   0.000616   BID, NFKB1, PIK3R1, CHUK   0.020908     hsa04210:Apoptosis   0.000616   BID, NFKB1, PIK3R1, CHUK   0.022908     hsa04662:B cell receptor signaling   0.00764   BID, CCNE1, CDK6, CDK4   0.025231     hsa05100:Bacterial invasion of   0.00828   HRAS, NFKB1, PIK3R1, CHUK   0.02667     hsa05100:Bacterial invasion of   0.00176   BID, CCNE1, CDR1, DYCB1   0.002667	cancer	5 755 04		0.002577
Insolution   0.04164   INKG, IT NIG   0.002555     hsa04110:Cell cycle   8.58E-04   CCNE1, E2F2, SKP2, CDK6, CDK4, MYC   0.003593     hsa04120:Ubiquitin mediated   0.00118   CCNE1, NFKB1, CDK6, CDK4, PIK3R1, CHUK   0.004771     hsa0410:Regulation of actin   0.00134   CBLC, CBLB, VHL, TCEB2, SKP2, PIAS2   0.005282     hsa04810:Regulation of actin   0.00158   FGF19, HRAS, FGF8, FGF11, FGF13, ITGB1, PIK3R1   0.006027     hsa05145:Toxoplasmosis   0.00548   NFKB1, LAMB1, ITGB1, PIK3R1, CHUK   0.013867     hsa04210:Apoptosis   0.00555   SKP2, NFKB1, NFKB2, MYC, PIK3R1, CHUK   0.019663     hsa04210:Apoptosis   0.00616   BID, NFKB1, PIK3R1, CHUK   0.020908     hsa04210:Apoptosis   0.00616   BID, NFKB1, PIK3R1, CHUK   0.020908     hsa04210:Apoptosis   0.00616   BID, NFKB1, PIK3R1, CHUK   0.0220908     hsa04210:Colorectal cancer   0.00616   MLH1, BIRC5, MYC, PIK3R1   0.0220908     hsa04662:B cell receptor signaling   0.00764   BID, CCNE1, CDK6, CDK4   0.025231     hsa05100:Bacterial invasion of   0.004158   FRES, NFKB1, PIK3R1, CHUK   0.02667     hsa05100:Bacterial invasion of   0.004158	hsa05216:Thyroid cancer	6.84E-04		0.002377
Instant of the center0.001180.001180.001330.00133hsa05162:Measles0.00118CCNE1, NFKB1, CDK6, CDK4, PIK3R1, CHUK0.004771hsa04120:Ubiquitin mediatedproteolysis0.00134CBLC, CBLB, VHL, TCEB2, SKP2, PIAS20.005282hsa04810:Regulation of actin0.00158FGF19, HRAS, FGF8, FGF11, FGF13, ITGB1, PIK3R10.006027cytoskeleton0.00375HRAS, MLH1, MYC, PIK3R10.013867hsa05145:Toxoplasmosis0.00548NFKB1, LAMB1, ITGB1, PIK3R1, CHUK0.019663hsa05169:Epstein-Barr virus infection0.00555SKP2, NFKB1, NFKB2, MYC, PIK3R1, CHUK0.01938hsa04210:Apoptosis0.00616BID, NFKB1, PIK3R1, CHUK0.020908hsa04115:p53 signaling pathway0.00764BID, CCNE1, CDK6, CDK40.025231hsa04662:B cell receptor signaling pathway0.00828HRAS, NFKB1, PIK3R1, CHUK0.02667hsa05100:Bacterial invasion ofmitholial cells0.004158CRUC, CBUD, JECR1, DIK2R1, DIK2R10.02667	hsa04110:Cell cycle	8 58F-04		0.002555
InstantiationOnoritieCentre, Hinkel, Centre, Centre, Hinkel, Centre,	hsa05162 Measles	0.00118	CCNE1 NEKB1 CDK6 CDK4 PIK3R1 CHUK	0.003333
Instruction0.00134CBLC, CBLB, VHL, TCEB2, SKP2, PIAS20.005282hsa04810:Regulation of actin0.00138CBLC, CBLB, VHL, TCEB2, SKP2, PIAS20.005282hsa04810:Regulation of actin0.00158FGF19, HRAS, FGF8, FGF11, FGF13, ITGB1, PIK3R10.006027hsa05213:Endometrial cancer0.00375HRAS, MLH1, MYC, PIK3R10.013867hsa05145:Toxoplasmosis0.00548NFKB1, LAMB1, ITGB1, PIK3R1, CHUK0.019663hsa05169:Epstein-Barr virus infection0.0555SKP2, NFKB1, NFKB2, MYC, PIK3R1, CHUK0.01938hsa04210:Apoptosis0.00616BID, NFKB1, PIK3R1, CHUK0.020908hsa04115:p53 signaling pathway0.00764BID, CCNE1, CDK6, CDK40.025231hsa04662:B cell receptor signaling pathway0.00828HRAS, NFKB1, PIK3R1, CHUK0.02667hsa05100:Bacterial invasion ofmitholial cells0.01158CBLC, CBLB, JTCB1, PIK3B1, CHUK0.02667	hsa04120:Ubiguitin mediated	0.00110		0.001771
Initial StateInitial State<	nroteolysis	0.00134	CRIC CRIR VHI TCER2 SKP2 PLAS2	0.005282
Instantion of actime0.00158FGF19, HRAS, FGF8, FGF11, FGF13, ITGB1, PIK3R10.006027hsa05213:Endometrial cancer0.00375HRAS, MLH1, MYC, PIK3R10.013867hsa05145:Toxoplasmosis0.00548NFKB1, LAMB1, ITGB1, PIK3R1, CHUK0.019663hsa05169:Epstein-Barr virus infection0.00555SKP2, NFKB1, NFKB2, MYC, PIK3R1, CHUK0.01938hsa04210:Apoptosis0.00616BID, NFKB1, PIK3R1, CHUK0.020908hsa04115:p53 signaling pathway0.00764BID, CCNE1, CDK6, CDK40.025231hsa04662:B cell receptor signaling0.00828HRAS, NFKB1, PIK3R1, CHUK0.02667hsa05100:Bacterial invasion of0.01458CBLC, CBLD, JECR1, DIK2B1, PIK3R1, CHUK0.02667	hsa04810:Regulation of actin	0.00134		0.005202
Cyclostatecoli     0.00138     FGF135, FIGF13, FGF13, FGF1	cytoskeleton	0.00159		0.006027
Insa05213:Endometrial cancer0.00373Inkk, Mich, Mic	hsa05212:Endomotrial cancor	0.00138		0.000027
Insa05145.10x0ph3810330.00548M KD1, DKMD1, HKD1, HKD1, HKD1, HKD10.015003hsa05169:Epstein-Barr virus infection0.00555SKP2, NFKB1, NFKB2, MYC, PIK3R1, CHUK0.01938hsa04210:Apoptosis0.00616BID, NFKB1, PIK3R1, CHUK0.020908hsa05210:Colorectal cancer0.00616MLH1, BIRC5, MYC, PIK3R10.020908hsa04115:p53 signaling pathway0.00764BID, CCNE1, CDK6, CDK40.025231hsa04662:B cell receptor signaling0.00828HRAS, NFKB1, PIK3R1, CHUK0.02667hsa05100:Bacterial invasion of0.01158CRUC, CRUE, CRUE, CRUE, CRUE, CRUE, PIK2R10.026263	hsa05213.Endometrial cancel	0.00373		0.013807
Insolation0.00000000000000000000000000000000000	hsa05169:Enstein-Barr virus infection	0.00540	SKP2 NEKB1 NEKB2 MYC PIK3R1 CHUK	0.019005
Insolver10.Approximation   0.00010 BHz, HIRSH, FINSK, CHOK   0.020000     hsa05210:Colorectal cancer   0.00616 MLH1, BIRC5, MYC, PIK3R1   0.020908     hsa04115:p53 signaling pathway   0.00764 BID, CCNE1, CDK6, CDK4   0.025231     hsa04662:B cell receptor signaling pathway   0.00828 HRAS, NFKB1, PIK3R1, CHUK   0.02667     hsa05100:Bacterial invasion of opitholial cells   0.01158 CPUC, CPUB, LTCP1, PIK2P1   0.026263	hsa04210:Apontosis	0.00555	BID NEKBI PIK3RI CHIK	0.020908
hsa04115:p53 signaling pathway   0.00764   BID, CCNE1, CDK6, CDK4   0.025231     hsa04662:B cell receptor signaling pathway   0.00828   HRAS, NFKB1, PIK3R1, CHUK   0.02667     hsa05100:Bacterial invasion of onitbolial cells   0.01158   CPLC, CPLD, LTCP1, PIK3R1   0.02667	hsa05210:Colorectal cancer	0.00616	MIH1 BIRC5 MYC PIK3R1	0.020908
hsa04662:B cell receptor signaling pathway 0.00828 HRAS, NFKB1, PIK3R1, CHUK 0.02667 hsa05100:Bacterial invasion of patholial cells	hsa04115:p53 signaling pathway	0.00764	BID. CCNE1. CDK6. CDK4	0.025231
pathway 0.00828 HRAS, NFKB1, PIK3R1, CHUK 0.02667   hsa05100:Bacterial invasion of 0.01158 CPUC CPUE	hsa04662:B cell receptor signaling		,, <del></del> ,	
hsa05100:Bacterial invasion of	pathway	0.00828	HRAS. NFKB1. PIK3R1. CHUK	0.02667
	hsa05100:Bacterial invasion of		. , - ,	
0.01158 CBLC, CBLB, FIGBI, PIK3RI 0.030203	epithelial cells	0.01158	CBLC, CBLB, ITGB1, PIK3R1	0.036263