

## Pathways of interest in NPCgset

Description	P value	FDR	OverlapGene_UserID
EGFR tyrosine kinase inhibitor resistance	0	0	AKT3; EGFR; EIF4E; EIF4EBP1; ERBB2; AKT1; FGFR3; FOXO3; GRB2; GSK3B; HRAS; IGF1; IGF1R; IL6; KRAS; MET; PIK3CA; PIK3R1; PLCG1; MAPK1; PTEN; BAX; BCL2; BCL2L1; RPS6KB1; SRC; STAT3; VEGFA
Pathways in cancer	0	0	AKT3; CDK4; CDK6; CDKN1A; CDKN1B; CDKN2A; RASSF1; BIRC8; CHUK; CRKL; CTNNB1; DAPK1; E2F1; E2F3; EDNRA; EDNRB; EGFR; ERBB2; AKT1; ETS1; MECOM; FGF3; FGF8; FGF11; FGFR3; FN1; FOS; ABL1; GLI3; GRB2; GSK3B; GSTP1; APC; HRAS; BIRC5; IGF1; IGF1R; FAS; IKKBK; IL6; CXCL8; ITGA2; ITGAV; ITGB1; JUN; KRAS; SMAD3; MDM2; MET; MLH1; MMP1; MMP2; MMP9; MSH3; NFKB1; NFKB2; NFKBIA; PIK3CA; PIK3R1; PLCG1; MAPK1; MAPK8; MAPK9; PTEN; PTGS2; PTK2; BAX; RB1; CCND1; BCL2; RELA; BCL2L1; ROCK1; CXCL12; SLC2A1; BRCA2; STAT1; STAT3; TGFB1; TGFB1R1; TGFBR2; TP53; TRAF2; TRAF3; VEGFA; WNT1; WNT3; WNT5A; WNT7A; WNT2B; CXCR4; CCNA1; CCNE1; CCNE2; CDC42; CDH1
PI3K-Akt signaling pathway	0	0	AKT3; CDK4; CDK6; CDKN1A; CDKN1B; CHUK; EGFR; EIF4E; EIF4EBP1; AKT1; FGF3; FGF8; FGF11; FGFR3; FOXO3; FN1; ANGPT1; ANGPT2; GRB2; GSK3B; HRAS; IGF1; IGF1R; IKKBK; IL2; IL4; IL6; IRS1; ITGA2; ITGAV; ITGB1; ITGB3; ITGB5; KRAS; MDM2; MET; MYB; NFKB1; PIK3CA; PIK3R1; PPP2R2C; MAPK1; PTEN; PTK2; RBL2; CCND1; BCL2; RELA; BCL2L1; RPS6KB1; SPP1; BRCA1; TEK; THBS1; TP53; VEGFA; YWHAZ; CCND2; CCNE1; CCNE2
MicroRNAs in cancer	0	0	CDK6; CDKN1A; CDKN1B; CDKN2A; RASSF1; CRKL; DNMT1; DNMT3A; DNMT3B; E2F1; E2F3; EGFR; ERBB2; E2H2; FGF3; FGF8; ABL1; PDCC4; GRB2; APC; HRAS; IKKBK; IRS1; ITGB3; KRAS; MDM2; MET; MMP9; ABCG1; ATM; NFKB1; NOTCH1; NOTCH3; ABCB1; PIK3CA; PLCG1; MAPK1; PTEN; PTGS2; CCND1; BCL2; ROCK1; BMI1; FSCN1; BRCA1; STAT3; ZEB1; THBS1; TP53; VEGFA; VIM; WNT3; HMGA2; TP63; CCND2; CCNE1; CCNE2; ZEB2
Proteoglycans in cancer	0	0	AKT3; CDKN1A; CTNNB1; EGFR; ERBB2; AKT1; FN1; PDCC4; GRB2; HRAS; IGF1; IGF1R; FAS; ITGA2; ITGAV; ITGB1; ITGB3; ITGB5; KRAS; MDM2; MET; MMP2; MMP9; PIK3CA; PIK3R1; PLCG1; MAPK1; PTK2; PTPN6; PXN; CCND1; ROCK1; RPS6KB1; SRC; STAT3; TGFB1; THBS1; TNF; TP53; TWIST1; VAV2; VEGFA; WNT1; WNT3; WNT5A; WNT7A; WNT2B; NANOG; CAV1; CDC42
FoxO signaling pathway	0	0	AKT3; CDKN1A; CDKN1B; GADD45G; CHUK; EGFR; AKT1; FOXO3; GRB2; HRAS; IGF1; IGF1R; IKKBK; IL6; IL10; IRS1; KRAS; SMAD3; MDM2; ATM; PIK3CA; PIK3R1; MAPK1; MAPK8; MAPK9; PTEN; RBL2; CCND1; SOD2; STAT3; TGFB1; TGFB1R1; TGFB1R2; CCNB1; CCND2; CCNB2
TNF signaling pathway	0	0	AKT3; CHUK; CSF2; EDN1; AKT1; FOS; ICAM1; FAS; IKKBK; IL1B; IL6; CXCL10; JUN; LTA; MMP3; MMP9; MMP14; NFKB1; NFKBIA; PIK3CA; PIK3R1; MAPK1; MAPK8; MAPK9; MAP2K7; PTGS2; RELA; CCL2; CCL5; MAP2K4; TNF; TNFAIP3; TRAF2; TRAF3
T cell receptor signaling pathway	0	0	AKT3; CDK4; CHUK; CSF2; AKT1; FOS; GRB2; GSK3B; HRAS; IFNG; IKKBK; IL2; IL4; IL10; JUN; KRAS; NFKB1; NFKBIA; NFKBIB; PIK3CA; PIK3R1; PLCG1; MAPK1; MAPK9; MAP2K7; PTPN6; RELA; TNF; VAV2; CDC42
p53 signaling pathway	0	0	CDK4; CDK6; CDKN1A; CDKN2A; GADD45G; CHEK1; CHEK2; IGF1; FAS; CD82; MDM2; ATM; RRM2B; PTEN; BAX; CCND1; RRM2; THBS1; TP53; TP73; PPM1D; CCNB1; CCND2; CCNE1; CCNB2; CCNE2
Colorectal cancer	0	0	AKT3; CTNNB1; AKT1; FOS; GSK3B; APC; BIRC5; JUN; KRAS; SMAD3; MLH1; MSH3; PIK3CA; PIK3R1; MAPK1; MAPK8; MAPK9; BAX; CCND1; BCL2; TGFB1; TGFB1R1; TGFB1R2; TP53
Epstein-Barr virus infection	1.11E-16	1.46E-15	AKT3; CDKN1A; CDKN1B; CHUK; CR2; AKT1; GSK3B; HLA-A; HLA-B; HLA-E; HSPA1A; HSPA2; ICAM1; IFNG; IKKBK; IL10; JUN; MDM2; NFKB1; NFKB2; NFKBIA; NFKBIB; PIK3CA; PIK3R1; PLCG1; MAPK8; MAPK9; MAP2K7; RB1; BCL2; RELA; RELB; MAP2K4; STAT3; TNFAIP3; TP53; TRAF2; TRAF3; VIM; YWHAZ; CCNA1
HIF-1 signaling pathway	4.44E-16	5.38E-15	AKT3; CDKN1A; CDKN1B; EDN1; EGFR; EIF4E; EIF4EBP1; ERBB2; AKT1; ANGPT1; ANGPT2; IFNG; IGF1; IGF1R; IL6; LDHA; NFKB1; PDK1; PIK3CA; PIK3R1; PLCG1; MAPK1; BCL2; RELA; RPS6KB1; SLC2A1; STAT3; TEK; VEGFA
Focal adhesion	3.44E-15	3.48E-14	AKT3; CRKL; CTNNB1; EGFR; ERBB2; AKT1; FN1; GRB2; GSK3B; HRAS; IGF1; IGF1R; ITGA2; ITGAV; ITGB1; ITGB3; ITGB5; JUN; ARHGAP5; MET; PIK3CA; PIK3R1; MAPK1; MAPK8; MAPK9; PTEN; PTK2; PXN; CCND1; BCL2; ROCK1; SPP1; SRC; THBS1; VAV2; VEGFA; CAV1; CCND2; CDC42
Platinum drug resistance	5.77E-15	5.64E-14	AKT3; CDKN1A; CDKN2A; ERBB2; ERCC1; AKT1; GSTM1; GSTP1; GSTT1; BIRC5; FAS; MDM2; MLH1; MSH3; ATM; PIK3CA; PIK3R1; MAPK1; BAX; BCL2; BCL2L1; BRCA1; TP53; XPA
Toll-like receptor signaling pathway	7.33E-15	6.94E-14	AKT3; CHUK; AKT1; FOS; IKKBK; IL1B; IL6; CXCL8; IL12A; CXCL10; JUN; NFKB1; NFKBIA; PIK3CA; PIK3R1; MAPK1; MAPK8; MAPK9; MAP2K7; RELA; CCL5; MAP2K4; SPP1; STAT1; TLR3; TNF; TRAF3; CD80
Viral carcinogenesis	2.71E-14	2.41E-13	CDK4; CDK6; CDKN1A; CDKN1B; CDKN2A; CHEK1; GRB2; HLA-A; HLA-B; HLA-E; HRAS; JUN; KRAS; MDM2; NFKB1; NFKB2; NFKBIA; PIK3CA; PIK3R1; MAPK1; BAX; PXN; RB1; RBL2; CCND1; RELA; SRC; STAT3; TP53; TRAF2; TRAF3; YWHAZ; CCNA1; CCND2; CCNE1; CCNE2; MAPKAPK2; CDC42
ErbB signaling pathway	3.43E-14	2.89E-13	AKT3; CDKN1A; CDKN1B; CRKL; EGFR; EIF4EBP1; ERBB2; AKT1; ABL1; GRB2; GSK3B; HRAS; JUN; KRAS; PIK3CA; PIK3R1; PLCG1; MAPK1; MAPK8; MAPK9; MAP2K7; PTK2; RPS6KB1; MAP2K4; SRC
Cell cycle	7.51E-14	6.15E-13	CDK4; CDK6; CDKN1A; CDKN1B; CDKN2A; GADD45G; CHEK1; CHEK2; E2F1; E2F3; ABL1; GSK3B; SMAD3; MCM2; MDM2; ATM; RB1; RBL2; CCND1; TGFB1; TP53; WEE1; YWHAZ; CCNA1; CCNB1; CCND2; CCNE1; CCNB2; CCNE2
Endometrial cancer	2.71E-13	2.16E-12	AKT3; CTNNB1; EGFR; ERBB2; AKT1; FOXO3; GRB2; GSK3B; APC; HRAS; KRAS; MLH1; PIK3CA; PIK3R1; MAPK1; PTEN; CCND1; TP53; CDH1
Apoptosis	3.26E-13	2.53E-12	AKT3; GADD45G; CHUK; PARP1; DFFA; DFFB; AKT1; FOS; HRAS; BIRC5; FAS; IKKBK; JUN; KRAS; ATM; NFKB1; NFKBIA; PIK3CA; PIK3R1; MAPK1; MAPK8; MAPK9; PTPN13; BAX; BCL2; RELA; BCL2L1; TNF; TP53; TRAF2
MAPK signaling pathway	3.63E-13	2.75E-12	AKT3; GADD45G; CHUK; CRKL; DUSP3; EGFR; AKT1; MECOM; FGF3; FGF8; FGF11; FGFR3; FOS; GRB2; HRAS; HSPA1A; HSPA2; FAS; IKKBK; IL1B; JUN; KRAS; MAP3K1; NFKB1; NFKB2; CACNA2D3; MAPK1; MAPK8; MAPK9; MAP2K7; RELA; RELB; MAP2K4; TGFB1; TGFB1R1; TGFB1R2; TNF; TP53; TRAF2; MAPKAPK2; CDC42
B cell receptor signaling pathway	2.84E-11	1.96E-10	AKT3; CHUK; CR2; AKT1; FOS; GRB2; GSK3B; HRAS; IKKBK; JUN; KRAS; NFKB1; NFKBIA; NFKBIB; PIK3CA; PIK3R1; MAPK1; PTPN6; RELA; VAV2
NF-kappa B signaling pathway	1.06E-10	7.15E-10	CHUK; PARP1; ICAM1; IKKBK; IL1B; CXCL8; LTA; ATM; NFKB1; NFKB2; NFKBIA; PLCG1; PTGS2; BCL2; RELA; RELB; BCL2L1; CXCL12; TNF; TNFAIP3; TRAF2; TRAF3
NOD-like receptor signaling pathway	3.03E-10	1.87E-09	NLRP3; CHUK; IKKBK; IL1B; IL6; CXCL8; IL18; JUN; NFKB1; NFKBIA; NFKBIB; TRPM7; MAPK1; MAPK8; MAPK9; BCL2; RELA; BCL2L1; CCL2; CCL5; STAT1; STAT2; TNF; TNFAIP3; TP53BP1; TRAF2; TRAF3; BRCC3; CASP1
Signaling pathways regulating pluripotency of stem cells	5.36E-10	3.25E-09	AKT3; CTNNB1; AKT1; FGFR3; GRB2; GSK3B; APC; HRAS; IGF1; IGF1R; KRAS; SMAD3; PIK3CA; PIK3R1; POU5F1; MAPK1; BMI1; SOX2; STAT3; WNT1; WNT3; WNT5A; WNT7A; WNT2B; NANOG; KLF4
RIG-I-like receptor signaling pathway	8.94E-10	5.31E-09	CHUK; CYLD; IKKBK; CXCL8; IL12A; CXCL10; MAP3K1; NFKB1; NFKBIA; NFKBIB; PIN1; MAPK8; MAPK9; RELA; TNF; TRAF2; TRAF3; ISG15
Ras signaling pathway	1.65E-09	9.62E-09	AKT3; RASSF1; CHUK; EGFR; AKT1; ETS1; ETS2; FGF3; FGF8; FGF11; FGFR3; ABL1; ANGPT1; ANGPT2; GRB2; HRAS; IGF1; IGF1R; IKKBK; KRAS; MET; NFKB1; PIK3CA; PIK3R1; PLCG1; MAPK1; MAPK8; MAPK9; RELA; BCL2L1; TEK; VEGFA; CDC42
mTOR signaling pathway	3.31E-09	1.76E-08	AKT3; CHUK; EIF4E; EIF4EBP1; AKT1; GRB2; GSK3B; HRAS; IGF1; IGF1R; IKKBK; IRS1; KRAS; LRP6; PIK3CA; PIK3R1; MAPK1; PTEN; RPS6KB1; TNF; WNT1; WNT3; WNT5A; WNT7A; WNT2B; AKT1S1
Fc epsilon RI signaling pathway	6.87E-09	3.53E-08	AKT3; CSF2; AKT1; GRB2; HRAS; IL4; KRAS; PIK3CA; PIK3R1; PLCG1; MAPK1; MAPK8; MAPK9; MAP2K7; MAP2K4; TNF; VAV2
Transcriptional misregulation in cancer	2.29E-08	1.09E-07	CDKN1A; CDKN1B; CSF2; HOXA10; IGF1; IGF1R; IL6; CXCL8; MDM2; MET; KMT2A; MMP3; MMP9; ATM; NFKB1; PTK2; RELA; BCL2L1; BMI1; SP1; ZEB1; TGFB1R2; TP53; NR4A3; HMGA2; CCNA1; CCND2
Central carbon metabolism in cancer	2.50E-08	1.15E-07	AKT3; EGFR; ERBB2; AKT1; FGFR3; HRAS; KRAS; LDHA; MET; PDK1; PIK3CA; PIK3R1; MAPK1; PTEN; SLC2A1; TP53
VEGF signaling pathway	4.52E-08	2.01E-07	AKT3; AKT1; HRAS; KRAS; PIK3CA; PIK3R1; PLCG1; MAPK1; PTGS2; PTK2; PXN; SRC; VEGFA; MAPKAPK2; CDC42
Adipocytokine signaling pathway	4.88E-08	2.11E-07	AKT3; CHUK; CPT1A; AKT1; IKKBK; IRS1; NFKB1; NFKBIA; NFKBIB; MAPK8; MAPK9; RELA; SLC2A1; STAT3; TNF; TRAF2
Rap1 signaling pathway	5.58E-08	2.38E-07	AKT3; CRKL; CTNNB1; EGFR; AKT1; FGF3; FGF8; FGF11; FGFR3; ANGPT1; ANGPT2; HRAS; IGF1; IGF1R; ITGB1; ITGB3; KRAS; MET; PIK3CA; PIK3R1; PLCG1; MAPK1; SRC; TEK; THBS1; VAV2; VEGFA; CDC42; CDH1
Hippo signaling pathway	6.78E-08	2.81E-07	RASSF1; CTNNB1; WWTR1; LATS2; GSK3B; APC; BIRC5; SMAD3; PPP2R2C; CCND1; SOX2; TGFB1; TGFB1R1; TGFB1R2; TP73; WNT1; WNT3; WNT5A; WNT7A; WNT2B; YWHAZ; CCND2; BTRC; CDH1
Wnt signaling pathway	7.05E-08	2.89E-07	WIF1; CTNNB1; DKK1; GSK3B; APC; JUN; LRP6; SMAD3; MMP7; SERPINF1; MAPK8; MAPK9; CCND1; SFRP1; TP53; WNT1; WNT3; WNT5A; WNT7A; WNT2B; TBL1XR1; CCND2; BTRC
Choline metabolism in cancer	4.05E-07	1.53E-06	AKT3; EGFR; EIF4EBP1; AKT1; FOS; GRB2; HRAS; JUN; KRAS; PIK3CA; PIK3R1; PLCG1; MAPK1; MAPK8; MAPK9; RPS6KB1; SP1; WASL
Jak-STAT signaling pathway	4.56E-07	1.71E-06	AKT3; CDKN1A; IL24; CSF2; AKT1; GRB2; HRAS; IFNG; IL2; IL4; IL6; IL10; IL12A; PIK3CA; PIK3R1; PTPN6; CCND1; BCL2; BCL2L1; STAT1; STAT2; STAT3; CCND2
Adherens junction	6.87E-07	2.48E-06	CTNNB1; EGFR; ERBB2; IGF1R; SMAD3; MET; MAPK1; PTPN6; SNAI1; SRC; TGFB1R1; TGFB1R2; WASL; CDC42; CDH1
Cytokine-cytokine receptor interaction	2.13E-06	7.33E-06	CXCR6; CCR9; IL24; CSF2; EGFR; IFNG; FAS; IL1B; IL2; IL4; IL6; CXCL8; IL10; IL12A; IL18; CXCL10; LTA; MET; CXCL16; CCL2; CCL5; CCL25; CXCL12; TGFB1; TGFB1R1; TGFB1R2; TNF; CCR2; VEGFA; CXCR4
AMPK signaling pathway	8.69E-06	2.89E-05	AKT3; CFTR; CPT1A; EEF2; EIF4EBP1; AKT1; FOXO3; IGF1; IGF1R; IRS1; RAB14; PIK3CA; PIK3R1; PPP2R2C; CCND1; RPS6KB1; AKT1S1; CCNA1
Regulation of actin cytoskeleton	1.06E-05	3.44E-05	CRKL; EGFR; FGF3; FGF8; FGF11; FGFR3; FN1; APC; HRAS; ITGA2; ITGAV; ITGB1; ITGB3; ITGB5; KRAS; PIK3CA; PIK3R1; MAPK1; PTK2; PXN; ROCK1; SRC; VAV2; WASL; CDC42
Cytosolic DNA-sensing pathway	2.11E-05	6.59E-05	CHUK; IKKBK; IL1B; IL6; IL18; CXCL10; NFKB1; NFKBIA; NFKBIB; RELA; CCL5; CASP1
Natural killer cell mediated cytotoxicity	2.86E-05	8.84E-05	RAET1E; CSF2; GRB2; HLA-A; HLA-B; HLA-E; HRAS; ICAM1; IFNG; FAS; KRAS; PIK3CA; PIK3R1; PLCG1; MAPK1; PTPN6; TNF; VAV2
Apoptosis-multiple species	7.65E-05	0.000227	BIRC8; BIRC5; MAPK8; MAPK9; BAX; BCL2; BCL2L1; BECN1
Basal cell carcinoma	0.000135	0.000391	CTNNB1; GLI3; GSK3B; APC; TP53; WNT1; WNT3; WNT5A; WNT7A; WNT2B
TGF-beta signaling pathway	0.001205	0.003351	IFNG; SMAD3; MAPK1; ROCK1; RPS6KB1; SP1; TGFB1; TGFB1R1; TGFB1R2; THBS1; TNF
cAMP signaling pathway	0.003563	0.009308	AKT3; CFTR; EDNRA; AKT1; FOS; GABBR1; GLI3; JUN; NFKB1; NFKBIA; PIK3CA; PIK3R1; MAPK1; MAPK8; MAPK9; RELA; ROCK1; VAV2
Oxytocin signaling pathway	0.004882	0.012433	CDKN1A; EEF2; EGFR; FOS; HRAS; JUN; KRAS; PIK3CA; PIK3R1; CACNA2D3; MAPK1; PTGS2; CCND1; ROCK1; SRC
Hedgehog signaling pathway	0.017491	0.0424	GLI3; GSK3B; CCND1; BCL2; CCND2; BTRC
Mismatch repair	0.017745	0.042673	MLH1; MSH3; PMS2; RPA3