Table SI. Pathway enrichment analysis for the target genes of the seven microRNAs.

Pathway	Count	P-value	Genes
Acute myeloid leukemia	12	0.00004	NFKB1, , PIK3CA, HRAS, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, CCND1, RUNX1T1, PIM1, MAP2K1, RPS6KB1, SPI1, GRB2, ZBTB16, AKT3, MAPK1, TCF7L2
Adherens junction	8	0.03580	IGF1R, MET, MAP3K7, FGFR1, SMAD3, CSNK2A1, WASL, SMAD4, MAPK1, TCF7L2, TGFBR2
Aldosterone-regulated sodium reabsorption	7	0.00301	PIK3CA, KCNJ1, KRAS, PIK3CG, PIK3R1, PIK3R2, IRS1
Apoptosis	13	0.00031	NFKB1, PIK3CA, BCL2, AKT1, AKT2, NFKBIA, PIK3CG, PIK3R1, PIK3R2, PRKAR2A, AKT3, XIAP, TNFRSF10B, TP53, TNFRSF10A
B cell receptor signaling pathway	14	0.00003	NFKB1, PIK3CA, FOS, HRAS, JUN, AKT1, AKT2, KRAS, NFKBIA, PIK3CG, PIK3R1, PIK3R2, MAP2K1, VAV2, GRB2, AKT3, MAPK1, MALT1
Bladder cancer	9	0.00003	HRAS, KRAS, E2F1, CCND1, MAP2K1, CDK4, DAPK1, RPS6KA5, MAPK1, TP53
Carbohydrate digestion and absorption	6	0.00054	PIK3CA, AKT1, AKT2, PIK3CG, PIK3R1, PIK3R2, AKT3
Cell cycle	14	0.00401	CCNE2, E2F1, CDK6, CCND2, CCND3, CCNE1, CDK1, CDC25A, CCND1, CHEK1, SMAD3, ORC4, YWHAQ, ANAPC13, WEE1, YWHAH, CDC14A, CCNA2, CDK4, SMAD4, ORC1, TP53, CHEK2, SMC3, SMC1A
Chagas disease (American trypanosomiasis)	12	0.00219	NFKB1, PIK3CA, FOS, JUN, AKT1, AKT2, NFKBIA, PIK3CG, PIK3R1, PIK3R2, GNAL, SMAD3, AKT3, MAPK1, TGFBR2
Chemokine signaling pathway	22	0.00011	NFKB1, PIK3CA, RAP1B, CXCR4, ROCK2, HRAS, AKT1, AKT2, KRAS, NFKBIA, PIK3CG, PIK3R1, PIK3R2, ROCK1, CXCL12, FOXO3, CRKL, CRK, MAP2K1, VAV2, GNB1, GRB2, AKT3, GNG12, CCR6, WASL, MAPK1, CCL22
Cholinergic synapse	11	0.01010	PIK3CA, BCL2, FOS, HRAS, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, MAP2K1, GNB1, ITPR1, AKT3, GNG12, MAPK1
Chronic myeloid leukemia	20	0.00000	NFKB1, PIK3CA, HRAS, AKT1, AKT2, KRAS, NFKBIA, PIK3CG, PIK3R1, PIK3R2, E2F1, CRKL, CRK, CDK6, CCND1, MAP2K1, GRB2, SMAD3, AKT3, CDK4, SMAD4, MAPK1, TGFBR2, TP53
Colorectal cancer	15	0.00000	PIK3CA, BCL2, FOS, JUN, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, CCND1, MAP2K1, SMAD3, AKT3, SMAD4, MAPK1, TCF7L2, TGFBR2
Endometrial cancer	12	0.00000	PIK3CA, HRAS, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, FOXO3, CCND1, MAP2K1, GRB2, AXIN2, AKT3, MAPK1, TCF7L2
Epstein-Barr virus infection	11	0.00743	NFKB1, PIK3CA, JUN, AKT1, AKT2, NFKBIA, PIK3CG, PIK3R1, PIK3R2, MAP2K3, MAP3K7, RBPJ, AKT3, CCNA2, TP53
ErbB signaling pathway	15	0.00003	PIK3CA, ABL2, HRAS, JUN, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, CRKL, CRK, MAP2K1, RPS6KB1, GRB2, PAK2, AKT3, EREG, MAPK1, PAK4
Fc epsilon RI signaling pathway	10	0.00602	PIK3CA, HRAS, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, MAP2K1, MAP2K3, VAV2, GRB2, AKT3, MAPK1, PLA2G12A
Fc gamma R-mediated phagocytosis	12	0.00419	PIK3CA, AKT1, AKT2, PIK3CG, PIK3R1, PIK3R2, CRKL, CRK, MAP2K1, RPS6KB1, VAV2, PLPP3, AKT3, CFL2, WASL, MAPK1, MYO10
Focal adhesion	24	0.00003	PIK3CA, RAP1B, ROCK2, BCL2, HRAS, IGF1R, JUN, MET, VEGFA, AKT1, AKT2, PIK3CG, PIK3R1, PIK3R2, ROCK1, CRKL, CRK, CCND2, CCND3, CCND1, MAP2K1, VAV2, DIAPH1, GRB2, ITGA2, LAMC1, PAK2, AKT3, FLNC, XIAP, MAPK1, PPP1R12A, PAK4
Glioma	16	0.00000	PIK3CA, HRAS, IGF1R, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, E2F1, CDK6, CCND1, MAP2K1, GRB2, AKT3, CALM2, CDK4, MAPK1, TP53

Table SI. Continued.

Pathway	Count	P-value	Genes
Hepatitis C	15	0.00014	NFKB1, PIK3CA, HRAS, AKT1, AKT2, KRAS, NFKBIA, PIK3CG, PIK3R1, PIK3R2, GRB2, PIAS1, AKT3, IRF1, MAPK1, TP53, MAVS, EIF2AK2
HTLV-I infection	24	0.00003	NFKB1, PIK3CA, WNT1, HRAS, JUN, AKT1, AKT2, KRAS, NFKBIA, PIK3CG, PIK3R1, PIK3R2, E2F1, CCND2, CCND3, CCND1, CANX, SPI1, CHEK1, ELK4, SMAD3, MYB, FZD6, FZD9, TBPL1, AKT3, CDK4, SMAD4, TGFBR2, TP53, CHEK2, MAP3K3, TNFRSF13C, SLC2A1
Influenza A	16	0.00008	NFKB1, PIK3CA, SLC25A6, JUN, AKT1, AKT2, NFKBIA, PIK3CG, PIK3R1, PIK3R2, MAP2K1, MAP2K3, HSPA1B, HSPA8, AKT3, IFIH1, TNFRSF10B, MAPK1, MAVS, TNFRSF10A, EIF2AK2
Insulin signaling pathway	16	0.00134	PIK3CA, HRAS, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, IRS1, CRKL, CRK, PHKA1, PRKAA1, PRKAR2A, MAP2K1, RPS6KB1, FASN, FLOT2, GRB2, SOCS2, AKT3, G6PC, CALM2, MAPK1, FOXO1
Jak-STAT signaling pathway	12	0.00477	PIK3CA, SPRY4, AKT1, AKT2, SPRED1, PIK3CG, PIK3R1, PIK3R2, CCND2, CCND3, CCND1, PIM1, GRB2, PIAS1, SOCS2, SOCS5, AKT3, IL23R, IFNLR1
MAPK signaling pathway	21	0.01660	NFKB1, RAP1B, DUSP22, FOS, HRAS, JUN, AKT1, AKT2, KRAS, PTPN7, CRKL, CRK, PPM1A, MAP2K1, MAP2K3, MAP4K2, MAP3K7, ELK4, FGF2, FGFR1, FGFR4, GRB2, HSPA1B, HSPA8, PAK2, AKT3, GNG12, FLNC, MAPKAPK5, RPS6KA5, MAPK1, TGFBR2, TP53, PLA2G12A, MAP3K3
Measles	16	0.00005	NFKB1, PIK3CA, CCNE2, AKT1, AKT2, NFKBIA, PIK3CG, PIK3R1, PIK3R2, CCND2, CCND3, CCNE1, CCND1, MAP3K7, AKT3, IFIH1, TNFRSF10B, TP53, MAVS, TNFRSF10A, EIF2AK2
Melanoma	16	0.00000	PIK3CA, HRAS, IGF1R, MET, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, E2F1, CDK6, CCND1, MAP2K1, FGF2, FGFR1, AKT3, CDK4, MAPK1, TP53
mTOR signaling pathway	9	0.00068	PIK3CA, VEGFA, AKT1, AKT2, PIK3CG, PIK3R1, PIK3R2, PRKAA1, RPS6KB1, HIF1A, AKT3, MAPK1
Neurotrophin signaling pathway	21	0.00000	NFKB1, PIK3CA, RAP1B, HRAS, JUN, AKT1, AKT2, KRAS, NFKBIA, PIK3CG, PIK3R1, PIK3R2, FOXO3, IRS1, CRKL, CRK, ARHGDIA, MAP2K1, GRB2, YWHAQ, PRDM4, YWHAH, MAGED1, AKT3, CALM2, RPS6KA5, MAPK1, TP53, MAP3K3
Non-small cell lung cancer	14	0.00000	PIK3CA, HRAS, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, E2F1, FOXO3, CDK6, CCND1, MAP2K1, RARB, GRB2, AKT3, CDK4, MAPK1
Osteoclast differentiation	13	0.00743	NFKB1, PIK3CA, FOS, JUN, AKT1, AKT2, NFKBIA, PIK3CG, PIK3R1, PIK3R2, MAP2K1, MAP3K7, GRB2, AKT3, OSCAR, MAPK1, TGFBR2, LILRA2
p53 signaling pathway	11	0.00083	CCNE2, CDK6, CCND2, CCND3, CCNE1, CDK1, CCND1, SIAH1, CHEK1, ZMAT3, CDK4, TNFRSF10B, TP53, CHEK2, CCNG1, SESN2
Pancreatic cancer	16	0.00000	NFKB1, PIK3CA, VEGFA, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, E2F1, CDK6, CCND1, MAP2K1, SMAD3, AKT3, CDK4, SMAD4, MAPK1, TGFBR2
Pathways in cancer	36	0.00000	NFKB1, PIK3CA, WNT1, BCL2, FOS, HRAS, HSP90AA1, IGF1R, JUN, MET, VEGFA, CCNE2, AKT1, AKT2, KRAS, NFKBIA, PIK3CG, PIK3R1, PIK3R2, E2F1, CRKL, CRK, CDK6, CCNE1, CCND1, RUNX1T1, MAP2K1, PTCH1, SPI1, TPM3, FGF2, FGFR1, GRB2, HIF1A, ITGA2, LAMC1, SMAD3, ZBTB16, FZD6, FZD9, CUL2, PIAS1, AKT3, XIAP, CDK4, DAPK1, SMAD4, MAPK1, TCF7L2, TGFBR2, TP53, EGLN3, FOXO1, SLC2A1
Progesterone-mediated oocyte maturation	11	0.00308	PIK3CA, HSP90AA1, IGF1R, AKT1, AKT2, KRAS, PGR, PIK3CG, PIK3R1, PIK3R2, CDK1, CDC25A, MAP2K1, ANAPC13, AKT3, MAPK1

Table SI. Continued.

Pathway	Count	P-value	Genes
Prostate cancer	20	0.00000	NFKB1, PIK3CA, BCL2, HRAS, HSP90AA1, IGF1R, CCNE2, AKT1, AKT2, KRAS, NFKBIA, PIK3CG, PIK3R1, PIK3R2, E2F1, CCNE1, CCND1, MAP2K1, FGFR1, GRB2, AKT3, MAPK1, TCF7L2, TP53, FOXO1
Regulation of actin cytoskeleton	16	0.01770	PIK3CA, ROCK2, HRAS, KRAS, PIK3CG, PIK3R1, PIK3R2, ROCK1, CRKL, CRK, MAP2K1, VAV2, DIAPH1, FGFR1, FGFR4, ITGA2, PAK2, NCKAP1, GNG12, CFL2, WASL, MAPK1, PPP1R12A, PFN1, PAK4
Renal cell carcinoma	16	0.00000	PIK3CA, RAP1B, JUN, MET, VEGFA, AKT1, AKT2, PIK3CG, PIK3R1, PIK3R2, CRKL, CRK, MAP2K1, GRB2, HIF1A, PAK2, AKT3, MAPK1, EGLN3, PAK4, SLC2A1
Small cell lung cancer	14	0.00005	NFKB1, PIK3CA, CCNE2, AKT1, AKT2, NFKBIA, PIK3CG, PIK3R1, PIK3R2, E2F1, CDK6, CCNE1, CCND1, ITGA2, LAMC1, PIAS1, AKT3, XIAP, CDK4
T cell receptor signaling pathway	15	0.00011	NFKB1, PIK3CA, FOS, HRAS, JUN, AKT1, AKT2, KRAS, NFKBIA, PIK3CG, PIK3R1, PIK3R2, MAP2K1, MAP3K7, VAV2, GRB2, PAK2, PDCD1, AKT3, MAPK1, PAK4, MALT1
TGF-beta signaling pathway	10	0.01270	ROCK2, ACVR2B, ROCK1, ACVR2A, RPS6KB1, SMAD3, SMAD7, SMURF1, ACVR1, ZFYVE9, LEFTY1, SMAD4, MAPK1, TGFBR2, NODAL
Thyroid cancer	5	0.02430	HRAS, KRAS, CCND1, MAP2K1, TPM3, MAPK1, TCF7L2
Toxoplasmosis	11	0.00868	NFKB1, PIK3CA, AKT1, AKT2, NFKBIA, PIK3CG, PIK3R1, PIK3R2, MAP2K3, MAP3K7, HSPA1B, HSPA8, LAMC1, AKT3, XIAP, MAPK1
VEGF signaling pathway	11	0.00216	PIK3CA, HRAS, VEGFA, AKT1, AKT2, KRAS, PIK3CG, PIK3R1, PIK3R2, MAP2K1, AKT3, MAPK1, PLA2G12A
Wnt signaling pathway	14	0.01330	WNT1, ROCK2, JUN, LRP6, MMP7, ROCK1, CCND2, CCND3, CCND1, PPP2R5C, SIAH1, MAP3K7, CSNK1E, AXIN2, FZD6, FZD9, PRICKLE2, CSNK2A1, SMAD4, TCF7L2, TP53, PPP2R5E