

Supplementary Table 3: 64 Significantly enriched pathways regulated by/IR-199 family

KEGG entry number	Annotations	Number of genes	P-value	Genes
4012	ErbB signaling pathway	16	8.52E-09	NRG1 SHC3 PRKCB PIK3CB NRG3 ABL2 RPS6KB1 ERBB4 PAK4 PRKCA MAPK8 PAK1 PLCG1 PIK3R1 SOS2 CBL
4670	Leukocyte transendothelial migration	17	6.66E-08	F11R PRKCB PIK3CB MMP2 RAPGEF4 NOX1 PXN ITK PRKCA VCL RAPGEF3 ARHGAP5 PLCG1 CTNNA2 PIK3R1 MAPK14 ROCK1
4141	Protein processing in endoplasmic reticulum	20	1.03E-07	UBE2J1 YOD1 HSPA5 UGGT1 ATF6 HSPA6 UBE2D3 SEC24A MAPK8 EIF2AK1 MAP3K5 MOGS EDEM1 TRAM1 UBE2D4 DNAJ3 SSR3 LMAN2 SSR1 VCP
5200	Pathways in cancer	29	3.25E-07	WNT4 FGF2 KLK3 IKBK G E2F3 EPAS1 PRKCB PIK3CB MMP2 ITGA3 AR RUNX1 HHP TCEB1 PRKCA MAPK8 PLCG1 CTNNA2 PIK3R1 FZD3 SOS2 ARNT2 RB1 TRAF3 SLC2A1 PAX8 TRAF1 HGF CBL
4722	Neurotrophin signaling pathway	16	1.35E-06	CAMK4 IRS1 IRS4 SHC3 PIK3CB IRAK2 MAPK8 MAP3K5 RPS6KA2 YWHAG PLCG1 PIK3R1 MAPK14 SOS2 PDK1 NTRK3
4510	Focal adhesion	20	3.21E-06	SHC3 PRKCB PIK3CB CNND2 ITGA3 PXN PAK4 ITGA8 PRKCA VCL ARHGAP5 MAPK8 PAK1 PIK3R1 ITGA9 TNC SOS2 ROCK1 ITGB8 HGF
4720	Long-term potentiation	11	6.69E-06	CAMK4 PRKCB GRM5 PRKCA RAPS6KA2 PRKX GRIN2A PRKACB
4310	Wnt signaling pathway	16	1.49E-05	NLK WNT4 PRKCB CNND2 VANGL1 PRKCA PPP2R5E MAPK8 PPP2R1A PRKX FZD3 NKD1 BTRC ROCK1 TBL1XR1 PRKACB
4910	Insulin signaling pathway	15	1.52E-05	IRS1 IRS4 SHC3 PIK3CB RPS6KB1 PDE3B MAPK8 PIK3R1 PRKX SOS2 RHOQ PRKAA2 PRKCI CBL PRKACB
5211	Renal cell carcinoma	10	5.31E-05	EPAS1 PIK3CB PAK4 TCEB1 PAK1 PIK3R1 SOS2 ARNT2 SLC2A1 HGF
4660	T cell receptor signaling pathway	12	1.12E-04	IKBK G PIK3CB ITK PAK4 PAK1 PLCG1 PIK3R1 MAPK14 SOS2 GRAP2 PDK1 CBL
4724	Glutamatergic synapse	13	1.18E-04	PRKCB GRM5 ADCY7 PRKCA GRIN2B GRIA1 SLC1A2 GLUL PRKX GRIN2A GRIN3A ADRBK2 PRKACB
5214	Glioma	9	1.25E-04	SHC3 E2F3 PRKCB PIK3CB PRKCA PLCG1 PIK3R1 SOS2 RB1
5223	Non-small cell lung cancer	8	2.00E-04	E2F3 PRKCB PIK3CB PRKCA PLCG1 PIK3R1 SOS2 RB1
4540	Gap junction	10	3.68E-04	HTR2A PRKCB TUBB1 GRM5 GUCY1A2 ADCY7 PRKCA PRKX SOS2 PRKACB
230	Purine metabolism	14	3.87E-04	PDE11A PDE7B ENPP1 PDE5A GUCY1A2 ADCY7 PDE10A PDE3B PDE7A POLA2 ATIC POLR3A GMPR AK4
5220	Chronic myeloid leukemia	9	3.90E-04	IKBK G SHC3 E2F3 PIK3CB RUNX1 PIK3R1 SOS2 RB1 CBL
4070	Phosphatidylinositol signaling system	9	5.28E-04	CDS2 PRKCB PIK3CB DGKE PRKCA SYNJ1 PLCG1 PIK3R1 PLCE1
4664	Fc epsilon RI signaling pathway	9	5.81E-04	PRKCB PIK3CB PRKCA MAPK8 PLCG1 PIK3R1 MAPK14 SOS2 PDK1
4062	Chemokine signaling pathway	15	6.62E-04	IKBK G SHC3 PRKCB PIK3CB PXN ITK ADCY7 PAK1 PIK3R1 PRKX SOS2 ROCK1 ADRBK2 PRKACB CXCR6
4810	Regulation of actin cytoskeleton	16	7.82E-04	FGF2 ABI2 PIK3CB ITGA3 ARHGEF1 NCKA1 PXN PAK4 ITGA8 VCL PAK1 PIK3R1 ITGA9 SOS2 ROCK1 ITGB8
5014	Amyotrophic lateral sclerosis (ALS)	7	7.95E-04	GRIN2B GRIA1 SLC1A2 MAP3K5 MAPK14 TRIM40
5160	Hepatitis C	12	8.40E-04	IKBK G PIK3CB DDX58 MAPK8 EIF2AK1 MAVS PIK3R1 PPP2R1A MAPK14 SOS2 TRAF3 PDK1
4912	GnRH signaling pathway	10	8.88E-04	PRKCB MMP2 ADCY7 PRKCA MAPK8 FSHB PRKX MAPK14 SOS2 PRKACB
4020	Calcium signaling pathway	14	1.07E-03	CAMK4 HTR2A PRKCB GRM5 ERBB4 ADCY7 OXTR PRKCA PLCG1 PRKX SLC8A3 GRIN2A PRKACB PLCE1
4914	Progesterone-mediated oocyte maturation	9	1.30E-03	PIK3CB ADCY7 PDE3B MAPK8 RPS6KA2 PIK3R1 PRKX MAPK14 PRKACB
5100	Bacterial invasion of epithelial cells	8	1.35E-03	RHOG SHC3 PIK3CB PXN VCL CTNNA2 PIK3R1 CBL
4960	Aldosterone-regulated sodium reabsorption	6	1.68E-03	IRS1 IRS4 PRKCB PIK3CB PRKCA PIK3R1
4962	Vasopressin-regulated water reabsorption	6	2.15E-03	DYNLL2 DCTN6 AQP2 STX4 PRKX PRKACB
5131	Shigellosis	7	2.59E-03	RHOG IKBK G VCL MAPK8 MAPK14 BTRC ROCK1
250	Alanine, aspartate and glutamate metabolism	5	2.73E-03	CAD ASPA GLUL GOT2 GAD2
4120	Ubiquitin mediated proteolysis	11	3.06E-03	UBE2J1 UBE2R2 BRCA1 UBE2D3 TCEB1 UBA6 RCHY1 UBE2D4 BTRC CBL UBA2
4710	Circadian rhythm - mammal	4	4.15E-03	RORB BHLHE41 CLOCK BTRC
532	Glycosaminoglycan biosynthesis - chondroitin sulfate	4	4.15E-03	B3GAT2 CHSY3 XYLT2 B3GAT1
4512	ECM-receptor interaction	8	4.28E-03	SDC2 ITGA3 ITGA8 GP5 ITGA9 TNC DAG1 ITGB8
5222	Small cell lung cancer	8	4.28E-03	IKBK G E2F3 PIK3CB ITGA3 PIK3R1 RB1 TRAF3 TRAF1
5120	Epithelial cell signaling in Helicobacter pylori infection	7	4.42E-03	F11R IKBK G MAPK8 PAK1 PLCG1 MAPK14 ATP6V1C2
4514	Cell adhesion molecules (CAMs)	10	5.27E-03	PVRL1 SDC2 F11R PDCC1LG ITGA8 NLGN1 CADM1 ITGA9 ITGB8 SELE
5110	Vibrio cholerae infection	6	5.54E-03	PRKCB PRKCA PLCG1 PRKX ATP6V1C2 PRKACB
4622	RIG-I-like receptor signaling pathway	7	5.63E-03	TRIM25 IKBK G DDX58 MAPK8 MAVS MAPK14 TRAF3
5215	Prostate cancer	8	5.67E-03	KLK3 IKBK G E2F3 PIK3CB AR PIK3R1 SOS2 RB1
4977	Vitamin digestion and absorption	4	5.74E-03	TCN2 SLC46A1 BTD RBP2
5414	Dilated cardiomyopathy	8	6.06E-03	ITGA3 ITGA8 ADCY7 ITGA9 PRKX DAG1 ITGB8 PRKACB
4520	Adherens junction	7	6.08E-03	PTPRB PVRL1 NLK PTPRJ VCL CTNNA2 FER
4360	Axon guidance	10	6.21E-03	ARHGEF1 NTNG1 PAK4 SEMA4D PLXNA3 ABLIM1 PAK1 SEMA3E SLIT1 ROCK1
4114	Oocyte meiosis	9	6.86E-03	AR ADCY7 PPP2R5E RPS6KA2 YWHAG PPP2R1A PRKX BTRC PRKACB
600	Sphingolipid metabolism	5	7.29E-03	SGPP2 NEU3 SPTLC2 ACER2 ASAH2
4010	MAPK signaling pathway	16	7.41E-03	PPM1B NLK FGF2 IKBK G PRKCB HSPA6 TAOK1 PRKCA MAPK8 MAP3K5 RPS6KA2 PAK1 PRKX MAPK14 SOS2 PRKACB
4621	NOD-like receptor signaling pathway	6	7.90E-03	TAB3 NLRP1 IKBK G SLUG1 MAPK8 MAPK14
5221	Acute myeloid leukemia	6	7.90E-03	IKBK G PIK3CB RPS6KB1 RUNX1 PIK3R1 SOS2
4270	Vascular smooth muscle contraction	9	8.14E-03	PRKCB ARHGEF1 GUCY1A2 ADCY7 PRKCA PPP1R12E PRKX ROCK1 PRKACB
4370	VEGF signaling pathway	7	8.17E-03	PRKCB PIK3CB PXN PRKCA PLCG1 PIK3R1 MAPK14
400	Phenylalanine, tyrosine and tryptophan biosynthesis	2	8.85E-03	GOT2 TAT
4974	Protein digestion and absorption	7	1.01E-02	XPNPEP2 SLC3A1 CQL9A2 KCN5 SLC8A3 KCN13 SLC16A10
3040	Spliceosome	9	1.07E-02	SF3A1 SRSF1 WBP11 HNRNPK PPIE HSPA6 PRPF4 U2SURP PRPF40A
564	Glycerophospholipid metabolism	7	1.08E-02	CDS2 AGPAT4 DGKE AGPAT3 LCLAT1 LPGAT1 CHKA
4620	Toll-like receptor signaling pathway	8	1.26E-02	IKBK G PIK3CB TIRAP MAPK8 PIK3R1 TMED7 MAPK14 TRAF3
512	Mucin type O-Glycan biosynthesis	4	1.28E-02	GCNT1 GALNT2 GALNT8 B4GALT5
4350	TGF-beta signaling pathway	7	1.30E-02	RPS6KB1 PPP2R1A ROCK1 ACVR2B SP1 ACVR2A ACVR1C
4930	Type II diabetes mellitus	5	1.31E-02	IRS1 IRS4 PIK3CB MAPK8 PIK3R1
770	Partothenate and CoA biosynthesis	3	1.42E-02	ENPP1 PANK3 PANK2
561	Glycerolipid metabolism	5	1.43E-02	AGPAT4 DGKE AGPAT3 LCLAT1 PNPLA3
4961	Endocrine and other factor-regulated calcium reabsorption	5	1.69E-02	PRKCB KLK2 PRKCA PRKX PRKACB
510	N-Glycan biosynthesis	5	1.69E-02	MGAT4A MGAT4C ST6GAL1 MOGS MGAT3