

Table S1: Predicted target genes of miR-34a-5p

Starbase	mirDIP	Targetscan	miRDB
C11orf30	SYT1	VAMP2	MDM4
RBM16	NAV3	SLC23A3	DLL1
SUPT16H	FAM76A	PVRL1	RAP1GDS1
RNF41	NOTCH1	KCNK3	FAM167A
BRPF3	DLL1	TMED8	HCN3
PRKRIR	PDGFRA	LRRC55	SDK2
GTF3C4	LGR4	GABRA3	FAM76A
EPC2	SATB2	DPYSL4	E2F5
ZRANB1	RALGPS2	MET	FKBP1B
SIRT1	ZDHHC17	MPP2	PPP1R11
FBXO30	E2F5	EVI5L	SCN2B
FAM73A	STRN3	TMEM246	MGAT4A
ERC1	FUT8	ORAI3	NAV3
SCML2	LEF1	RAB43	SYT1
LBR	TPD52	DNAH10OS	SATB2
ARMC1	FOXP1	TMEM184B	CELF3
ZNF551	PKP4	TSPAN18	XYLT1
BAT2L1	ARID4B	VPS37B	FLOT2
LDOC1L	ZNF281	LZTS3	MET
CRK	PKIA	TUSC5	MYCN
TBP	ANK3	ZNF282	PACS1
DHX33	ACBD3	RSPO4	NAV1
FOXN3	TMEM55A	ZCCHC17	CACNA1E
CTCF	UBP1	FOXJ2	LGR4
ZMYND11	E2F3	ISY1- RAB43	NECTIN1
RAB11FIP2	JAG1	SHISA7	TGIF2

PTPN4	WASF1	LPAR2	VAMP2
VCL	POGZ	NOS1AP	FUT9
MEX3C	MLLT3	FOXP1	PKP4
POLR3F	PPP1R11	SEPT3	RRAS
C5orf41	DDX17	WASF1	SHANK3
ZNF134	CTNND2	RIC8B	ABR
STK38L	MET	CTNND2	AHCYL2
DNAJB6	MYRIP	RRAGC	MPP2
TGFBR2	JAKMIP1	AL117190.3	CUEDC1
DCTN5	GALNT7	ATMIN	SLC25A27
PTPRG	FOXN3	RPS6KA4	MLLT3
SMAD4	SOX4	LMAN2L	PITPNC1
MLL	UHRF2	MYRIP	CAMTA1
PKIA	BRINP1	RAE1	NPNT
DDX18	ZNF644	MTMR9	MEX3C
C14orf43	ZFHX4	B3GAT1	FOXP1
SPEN	ACSL1	ADK	TBL1XR1
EIF2C2	FOXN2	ELL2	CYREN
TMEM185B	COL12A1	C8orf37	TOB2
PFKM	BCL2	METAP1	SRPRA
WAC	MPP2	APH1A	FUT8
AKT3	NR4A2	ATXN7L3B	TMEM255A
SNX12	FNDC3B	PKIA	PPARGC1B
WDR82	FLOT2	UHRF2	TNRC18
EXT2	AGO4	THSD4	JAKMIP1
DLX2	TGIF2	USF1	SNAI1
UBR5	HCN3	SIDT2	NUMBL
PCYOX1	NUMBL	CELF3	FGD6
PREPL	CBFA2T3	POMGNT1	ELMOD1

FOXP2	BNC2	FBXO10	FOXN2
ZNF281	SATB1	IKZF1	KIAA1217
GAS1	TAF5	GPR12	TPPP
TNRC18	AKAP6	TMEM109	LEF1
MTMR9	PTPRM	ZC3H12B	UBP1
ARPP19	VAMP2	DAAM1	GABRA3
ASB1	NRIP3	CES4A	OLIG3
ADAMTS1	EML5	CRTC1	HNF4A
LSM14A	TCF12	AGTRAP	FOXJ2
EIF4G2	ACSL4	HDAC1	ASIC2
DAAM1	FOXG1	RASGRP4	EML5
DLL1	KIAA1217	SLC44A2	BMP3
E2F5	JMJD1C	SVOP	DAAM1
ZNF417	PRKD1	B4GALT2	DNM1L
ZNF644	ZMYM4	TMEM164	GALNT7
HNRNPR	SGPP1	TOB2	TASOR
FAM160B1	SVOP	LRRC7	PPFIA1
SLC39A10	MYCN	RALY	ZMYM4
C14orf135	PACS1	CHD1	CERS6
TGIF2	RGS17	ARSJ	RPS6KL1
SNAPC5	PNOC	NAA50	GPR22
LCORL	RRAS	CTDSP2	TAF4B
ZNF800	PEA15	SIPA1	SERPINF2
TMEM48	KLF4	TMOD2	LMAN1
MOBKL3	MEX3C	CNTNAP1	ARID4B
TAOK1	CCNE2	VWA5B2	FAM117B
CDK6	RAB21	JHDM1D	CACNB3
C6orf120	ALDOA	PTPRM	UNC13C
ATMIN	VAT1	ELMSAN1	CDK6

PAFAH1B2	MAP2K1	SIX3	ADO
MCFD2	SCN2B	FRMD4A	CREB3L2
PPIL1	DCX	FNDC8	TMEM184B
MKRN2	ATP5S	DAGLA	GOLPH3L
ATXN7L3B	LIMD2	JAG1	ATMIN
IREB2	AXL	SUPT6H	AKIP1
STC2	CNOT6	CDKN1C	NRN1
ROCK1	NAV1	SYT9	SLC4A7
ANKS1A	BCL11B	INPP5K	IL6R
ARID1A	SLC2A13	STAC2	STRN3
SOCS4	EVI5L	PTPN4	UCN2
ZFHX4	CAPN6	WSCD2	KDM5D
TM9SF2	SAR1A	GHDC	ZDHHC17
YIPF6	PPFIA1	ACSL1	TPCN2
SYNJ2	CORO1C	ESRRA	HSPA1B
RNF38	MSL2	PDE4B	RPGRIP1L
RNF138	CAMTA1	ST8SIA3	PDE7B
C12orf29	LGI1	MYH9	SMIM15
CBX1	RTF1	ZIC5	CTNND2
FOXN2	TMEM255A	AGAP2	PURB
PPP2R5C	GLCE	HK1	TSN
PJA2	MGAT4A	FOXG1	FGF23
G3BP2	RALGDS	MLLT1	ANK3
GMFB	NETO1	CNOT6L	AMER1
CUX1	ASIC2	TBC1D13	PPP2R3A
PAPOLA	ELMOD1	GORASP2	SFT2D1
GSPT2	HTR2C	RAP1GAP	CLOCK
PLCG1	TMEM246	TANGO2	CPLX2
ZFP91	YY1	SP2	GPR158

RORA	BTBD11	KCNQ3	RFX3
CRKL	BRPF3	COPS7B	SHOC2
MCM3APAS	DAAM1	CDC37	PDXK
MYC	NRN1	C22orf23	DGKZ
KIAA0196	OSGIN2	NAPEPLD	PTGIS
RDH11	XYLT1	ZNF207	MTMR10
PPAP2B	ARID4A	GPC6	MBLAC1
MOAP1	FOXJ2	MRAS	SAR1A
BNC2	FBXO30	RORA	BCL2L13
PHF6	PPP2R3A	PGAP2	ANKRD52
STRAP	AFF4	KLC2	ADIPOR2
DDX6	DIXDC1	FAM126B	KITLG
HECTD2	SIRT1	ARID4B	TMEM164
SLC25A32	SEMA4C	DCAF7	GMNC
RAB3GAP1	TTC19	CACNA2D1	BRINP1
LGR4	ASB1	PSD3	CBX3
STRN3	LDHA	TGFBRAP1	ANKS1A
ZFAND1	CALCR	PCDH1	MYT1
NSD1	RELN	ACTR1A	DPYSL4
SEC24B	FGD6	INO80	ZNF644
ZNF507	ATMIN	SYVN1	NRIP3
KIAA1462	EPHA4	SBK1	ZYG11B
PURA	DGKZ	POFUT1	BRPF3
BAZ2A	CASP2	TBC1D25	TPD52
TMEM20	DPYSL4	TFDP2	ABCD1
FAM122A	TBL1XR1	GATAD2B	SHKBP1
ZHX2	NECTIN1	TNPO3	JADE2
TRAPPC6B	PAN3	FAT2	SGPP1
CALU	ACTR1A	VCL	ZNF281

MYCL1	ARHGAP26	ADAM11	CCNE2
ZBTB9	SYNJ1	KREMEN1	ASB4
MOBKL1B	AHCYL2	RNF152	ZNF304
HNRNPA1	TMEM109	ZER1	ARHGAP26
PPP3R1	OXSRI	JPH3	ZFHX4
TOPORS	CPEB2	GIGYF1	BNC2
KIAA1704	SLC4A7	ATXN7L3	POGZ
EPS15	SLCO3A1	HCFC2	C14orf28
ADIPOR2	KITLG	GLCE	ZBTB9
HACE1	ZCCHC17	SEC16A	PNOC
AMD1	BAZ2A	MAZ	TENT5A
CORO1C	MTA2	RNF213	RRAGC
PPP1CC	AMER1	GATS	FAM83A
BAMBI	FAM167A	KIAA1024	GLCE
BRD2	JADE2	EHD4	WASF1
CHTF8	MPPED2	CYB561D1	DIXDC1
ZBTB4	CAMSAP1	ACOT11	SEMA4B
USP33	LHX2	KIAA0753	PPP1R16B
PSME3	CSF1R	LPHN1	PLAG1
CNTNAP1	CACNB3	MAP4K4	STK38L
RTN4	SNX15	DOCK3	ADAM22
DCAF7	FOSL1	CACNA2D2	ZNF551
CTNND1	RIC8B	AHCYL2	CDH13
LYPLA1	SERPINF2	FBXO41	SNTB2
MBNL1	CELF3	BCL9L	GP5
SRPK1	ARHGAP1	GDAP1L1	ADD2
ACSL4	C3orf58	GRID1	HTR2C
CNNM2	GMFB	MRPL3	CLCN3
ADAM10	FKBP1B	G6PC3	TRIM67

CNOT4	MAP1A	MRPL52	FRA10AC1
BCL2	SCML2	TMEM134	RCAN1
SSR1	CACNA1E	GABRB1	LYST
SHOC2	BMP3	ZBTB20	MAP7D3
SLC20A2	INHBB	TMEM97	XPO5
GOLT1B	SGSM2	GATSL2	MGAT5B
PKP4	TMCC3	CACNG2	FBXO30
SNX9	YTHDC1	WNT1	ACSL4
LSM11	CCND1	RBCK1	RELN
MARCKS	CNTNAP2	NEUROD2	DNAJC16
PEG10	RARB	CNTD1	LILRA1
FIGN	ZDHHC23	KLHDC8A	DCAF7
ULK1	GPR85	TRIM44	RAB21
PHF8	LOXL3		SLC44A2
ERLIN1	CERS6		OSGIN2
SV2A	TOPORS		AGO4
DEGS1	NCEH1		JAG1
YY1	GREM2		SOGA1
TFAP2A	MTMR9		TANC2
AASDHPPT	RPS6KA4		TMEM200B
KANK1	LZTS3		PDGFRA
PPP6C	NOTCH2		AXL
GINS3	TMEFF1		SLC27A4
ANKRD52	CNTN2		CDC25A
UBE2D3	PURB		ZBTB20
C1orf9	SLC2A4RG		CBFA2T3
NF1	GAS1		INA
EEA1	LMBR1L		KLF4
TJAP1	MARCKSL1		RTN4RL1

MGAT4A	PIP5K1A	EPHA4
UBE2G1	GPR158	LMAN2L
RAPGEF2	ZNF207	CACNA1C
SBDS	NDST1	SHISA7
RNF44	ALCAM	LDHA
PTCD3	PGRMC2	NOS1AP
UBE3C	ANK2	OAZ2
NOTCH2	STX17	PLOD1
ANP32A	PODXL	STX17
SSFA2	PPP1CC	SLC37A3
TSN	INA	CA7
DOCK4	SNTB2	ZDHHC16
PHF19	PLAG1	FRMD5
RAB10	ELL2	STAB2
GLCE	IGSF1	MAP2K1
UBP1	CD47	NCEH1
GMNN	VPS37B	RALGPS1
CHD9	SEMA4F	USP31
ZNF100	PID1	DPP3
BCL11A	MDM4	SNX15
CDC23	ZDHHC16	ANK2
SYNJ1	LMAN2L	ACBD3
STARD7	PGM1	RTL6
MLL2	COPS7B	RGS17
HMMR	ELMSAN1	CNOT6
BAT2L2	CPLX2	PLEKHH2
SAR1A	PPP1R16B	ERGIC1
DNM1L	SLC30A3	TRANK1
TUBB	SLC25A27	PRKD1

TMEM109	ORMDL3	TAF5
ITPR1	FNDC8	RAD9B
PDE4B	LYST	IGF2BP3
XPO7	RIMS3	PGM1
RAPGEF1	XPO5	ESYT3
PTGES3	NFE2L1	EPN2
NAA50	GRM7	ARHGAP1
C14orf129	MTUS1	TMEM109
TMTC3	CPEB3	ASB1
CDADC1	RAP1GDS1	MMAB
OXR1	GABRA3	DAGLA
CSNK1G1	ITSN1	PEA15
PRC1	CA7	SIDT2
SGPP1	STK38L	MCIDAS
TSPAN12	CHD1	KCNK3
TOPBP1	C6orf120	EPS15L1
ANP32B	PLCB1	SNX9
NOP56	APH1A	NCDN
MAP2K1	ABR	GMFB
PURB	DCP1A	RPS6KA4
YPEL5	GOLPH3L	LHX2
TOP2A	CDK6	E2F3
TBL1XR1	PPM1A	RDH11
GTPBP4	RTN4RL1	NOTCH2
REPS1	FAM126B	ZCCHC17
BNIP2	PTPRD	GREM2
ZDHHC17	CR2	ERC1
EDARADD	TOB2	SYNJ1
PAG1	XBP1	RTL8A

CD59	STC1	CDH9
SPRYD3	IL6R	MYH9
CPSF6	FUT9	TMEM74
ATG2A	SERPINE1	SGTA
MAZ	ANP32A	ZMYND11
TMBIM6	SGTA	CA10
FKBP1A	DMWD	PPM1A
KDM6B	DNAJC16	VCL
CPEB3	NCOA1	SSX5
RTF1	HSPA1B	PAX5
UBN2	ARHGAP36	TMEM79
EFNB2	SMIM15	C9orf47
TNRC6B	NAA50	XBP1
PAIP2	DYNC1LI1	CHM
POGZ	MYH9	THSD4
SERPINB9	DOCK9	CAMK4
C2orf42	STAC2	SNX12
LYAR	PALLD	NSD1
PRKAR1A	C14orf28	LIN28B
MTMR4	CNTNAP1	ZNF16
HOXA13	TSN	ATG5
BLZF1	PPP2R5A	ARHGEF33
ACVR1	TBCK	UHRF2
TMEM22	ATG9A	GINS3
GIGYF1	USP31	FAM107A
SPTBN2	CNOT6L	NOTCH1
C6orf106	RALGPS1	CDH4
NACC2	RECK	ALDOA
TSPAN14	CHMP7	WIPI2

SYVN1	RCAN1	TBCK
POFUT1	ZNF282	ACSL1
ZNF189	CREB5	SURF4
ORC6L	RANBP10	LIMD2
RPS18	PREB	ELL2
POU2F1	CTNND1	ISY1
C1orf52	SEH1L	BTBD11
CCT3	CACNB1	ATG4B
POGK	EI24	PEG10
MRPL30	SURF4	DMWD
FOXP1	MCFD2	COL26A1
ANKRD17	ARSJ	ANP32A
CDKN1B	TNRC6B	MLLT1
HECTD1	ABRAXAS2	UBL4A
KLF10	FBXO10	YTHDC1
METAP1	TMUB2	ALG13
RAB21	FAM46A	GAS1
DMTF1	RAB43	CNTN2
LRRFIP1	PDCD4	JMJD1C
FNDC3B	TMEM200B	SIDT1
ARL2	NRXN2	SLC6A17
HSPA1A	RDH11	SUCO
CCNA2	LRRC40	CAPN6
PODXL	DNAJC24	DMAC2L
LIN28B	CNOT4	METAP1
FAM127B	VCL	ZNF641
EIF4A1	CSNK1G3	TNFSF14
TM9SF3	PPP1R10	SGSM2
ZFP36L1	MAPT	RIMS3

LONRF1	METAP1	PPP1R10
ELL2	ADK	CORO1C
DDX17	PEG10	MYRIP
FANCI	HOXA13	ZHX2
TDRD9	TRIM67	LELP1
CEP55	DCAF7	DDX17
SLC48A1	PDE7B	PRDM11
MARCKSL1	DNAJB1	TM9SF3
SPRY2	SIDT1	KMT5B
PARD6B	SDHC	HK1
ARHGAP1	EFNB1	BAZ2A
CREG1	IKZF1	PLCB1
FAM18B	LRRC55	AMER2
C12orf73	ZC3H12B	VWA5B2
CDK5R1	SRPRA	H6PD
ONECUT2	FAM117B	ACE
ARID4B	ACVR2B	TP53INP2
EVI5L	GATA3	TPD52L3
IBTK	RNF44	FAM219A
ATXN7L3	BCL6	SDR9C7
PNP	ADGRG2	CTDSP2
ACTR1A	ANP32B	JCAD
KIAA0802	TEX264	ASPHD2
IMPA1	SHKBP1	MSTN
SLC4A7	FRMD4A	ADAM10
RHOB	PLOD1	SLC35G2
LRP10	F2RL2	CD47
C7orf49	PRKACB	PIP5K1A
RFK	PPP6C	AKAP6

SRC	POU6F1	FAT4
ATXN2L	FRK	TNRC6B
AEBP2	ZIC5	SPICE1
SLC25A13	ZMYND11	LRRC40
CD47	B4GALT2	PROX1
REEP5	KLF12	PLPP5
GTF2F1	HECW2	UBN2
MMD	SLC12A2	PTPN4
E2F3	WSCD2	MED8
SOX4	STX1A	PPP2R5A
VAMP2	MTMR4	IRAK2
PPP1R15B	CTDSPL	NR4A2
TBCA	ESRRA	ORAI3
ITSN2	RALY	C16orf58
NPTX1	ADO	ZNF282
ATF3	STRAP	CDS2
SLC2A1	CLOCK	NDST1
LEF1	SIDT2	FOXN3
ARSB	ADIPOR2	TUBGCP3
PEA15	COL4A4	COL5A2
MOCS2	LMAN1	TFCP2L1
STX17	LRRC7	DCX
GGPS1	C7orf49	SOCS7
ANKFY1	RET	SIRT1
FAM76A	ANKS1A	MRPL10
CASK	KDM7A	CASP2
PHF15	SCN1A	SVOP
MSL2	ADD2	BCL11B
ZC3H4	ITGB8	CCDC85A

RRAGD	SMAD4	RALGPS2
ADIPOR1	ZNF304	VPS37B
C1orf144	GRID1	SEMA4F
SLC25A44	ZER1	TMEM250
NEDD8	SP2	MSL2
ZFP36	CSNK1G1	CPEB3
LNX2	ERGIC1	EME1
DYNC1LI2	SPEG	KCNA2
FAM49B	SOCS4	ARID4A
PAM	TMEM25	VAT1
GPBP1	DPP3	ADGRG2
SLC2A3	THSD4	SMAD4
ZFYVE21	TBC1D25	MCFD2
LDHA	AREG	PPP1R14D
CPEB2	PPARGC1B	PEAK1
CNN2	SDK2	SF3B3
STK33	MRPL52	ZDHHC23
OGT	ZNF641	SLC2A4RG
LMAN2L	ADGRL1	IRGQ
CYB5R3	PDE4B	DGKH
TMED7-		
TICAM2	SZRD1	CXCL10
	SUCO	C14orf132
	CRHR1	PRKCB
	AP1B1	AFF4
	PLCG1	ALCAM
	HS2ST1	PIP4P2
	SPCS2	MPV17L2
	ATXN7	SYNC

CDKN1C	RUFY2
RARG	NISCH
TMEM184B	UCP3
NOS1AP	SNX17
ANKRD52	SLC25A35
DOCK3	PRKCQ
PPP1R14D	RNF44
LIMA1	MYB
MECP2	ENAM
SAMD12	PPDPFL
SLC27A4	KIAA0825
SEC61A1	KY
ATXN7L3	USF1
PER2	AK4
STK35	FOSL1
CREBRF	OR2H1
TRANK1	OXSRI
LRRTM2	NAT8L
SLC35G2	EIF2S2
OLFML1	FUT11
PHF24	KCNH7
DGKI	ANHX
PLEKHH2	SAMD12
CELF2	SEMA4C
IGFBP3	ERLIN1
ATG4B	ADRA1D
NCDN	STX1A
RNF213	BCL6
CUEDC1	P2RY14

CDIP1	IQGAP3
SYVN1	C3orf70
B3GAT3	KALRN
JAZF1	CCN5
NAPEPLD	MCTP1
POU2F1	ARHGDIB
OGT	PER2
JPH1	DUOXA1
FOXP2	NFE2L1
GPR22	TMCC3
PHF19	EDAR
TM9SF3	MOAP1
	SYT9
	CNTNAP2
	LRRC46
	CSF1R
	WSCD2
	SH3PXD2A
	ROCK1
	C8orf37
	BTBD18
	RASL12
	OLFML1
	FAM131B
	TWIST2
	HS2ST1
	PXDC1
	KLRC4-
	KLRK1

KCNA6
KLRK1
USP54
PPM1L
PTPN2
ILDR2
AP4B1
S1PR2
RNASEL
NOL10
SPRED1
RTN4
GRM7
RNF38
CBFB
ATG9A
PRKAG1
FAM120AOS
POU3F3
ACVR2B
IGSF3
FRK
YY1
SLCO2A1
ATP6V0B
TMEM72
CHMP7
TMEM59L
AP1S2

LZTS3

LRRTM2

ULBP2

SLC6A1

ZNF844

TGFBRAP1

ISY1-RAB43

NAPEPLD

TMEM104

SCML2

RNF144B

CSRNP3

TTC19

RAB43

CR2

Figure S1

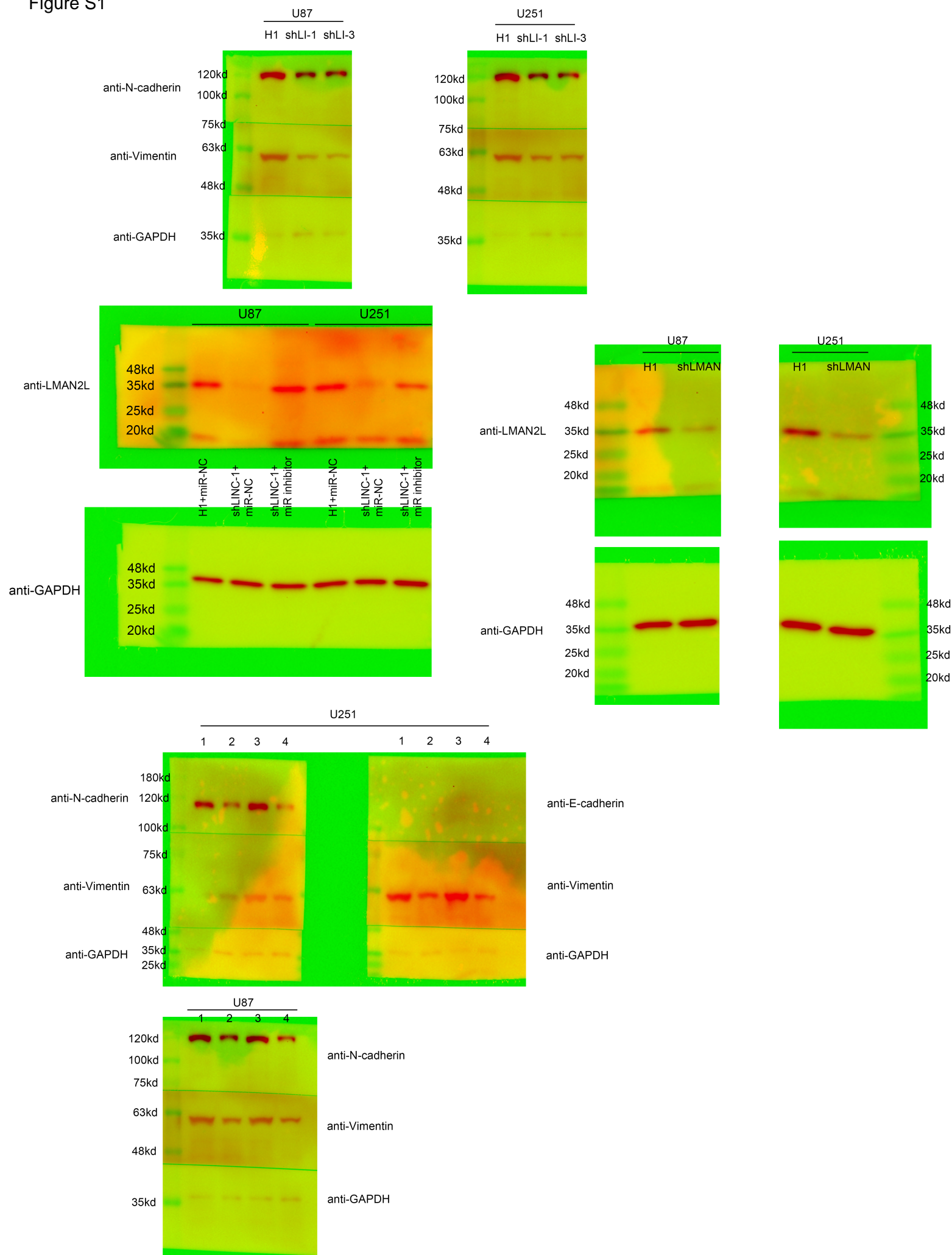


Figure S1. The uncropped and unedited versions of the Western blots (Figure 3C, 5H, 6B and 6E). The antibodies, lanes and molecular mass markers were labelled.

Figure S2

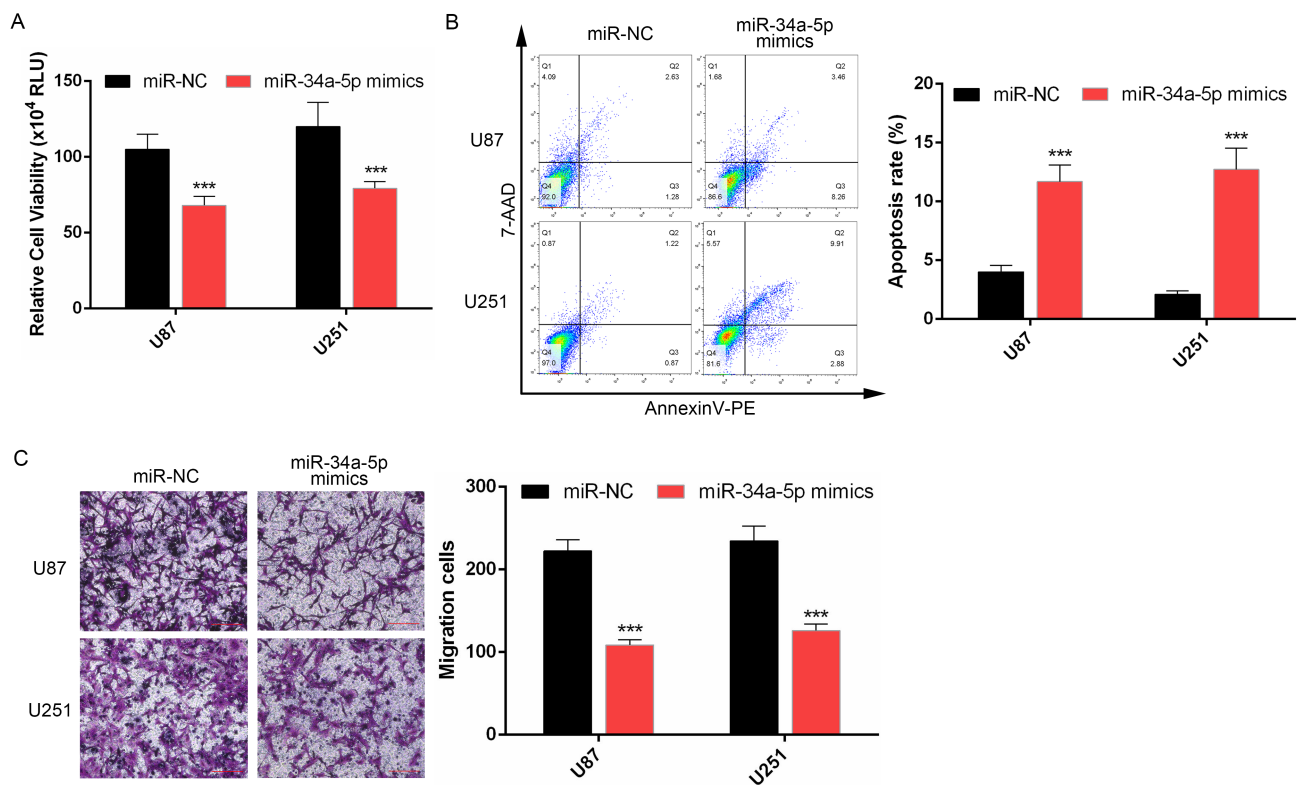


Figure S2. miR-34a-5p overexpression suppressed cell growth, migration and induced apoptosis in glioma. (A) Proliferation of miR-34a-5p-overexpressed U87 and U251 cells was quantitated by Celltiter-Glo assay. **(B)** Flow cytometry was utilized to measure the apoptotic rates of U87 and U251 cells following either miR-NC or miR-34a-5p mimics transfection. **(C)** Transwell assay was applied to evaluate the cell migration affected by miR-34a-5p overexpression. Scale bar = 500 μ m. Note: RLU, relative light unit; AAD, aminoactinomycin D; *** $P < 0.001$

Figure S3

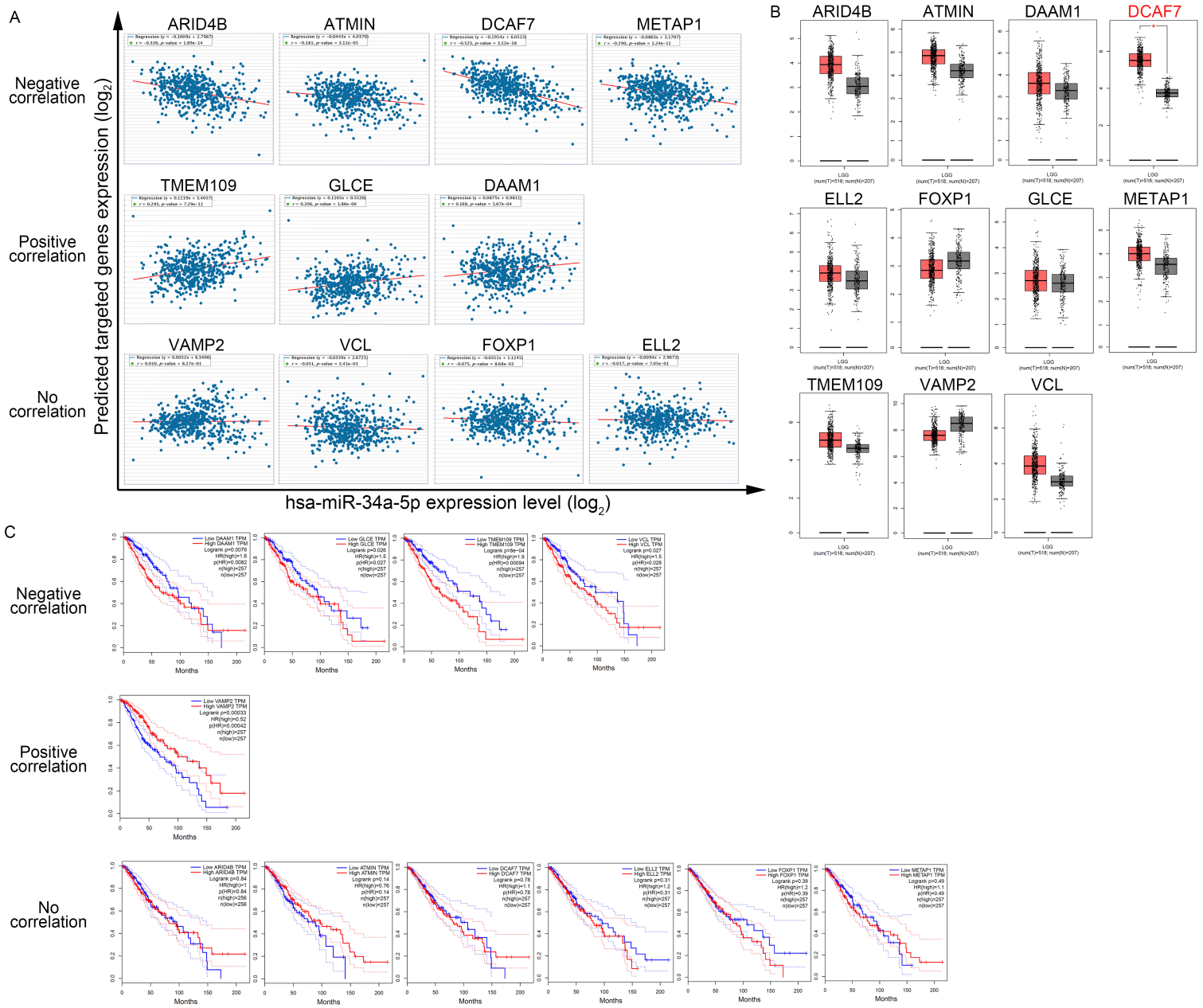


Figure S3. Bioinformatic analysis of correlation, expression and survival risk of predicted miR-34a-5p target genes (ARID4B, ATMIN, DAAM1, DCAF7, ELL2, FOXP1, GLCE, METAP1, TMEM109, VAMP2, VCL) using GEPIA or TCGA database. (A) Pearson's correlation between the expression of miR-34a-5p and predicted miR-34a-5p target genes in glioma tissues. **(B, C)** The expression level **(B, red color indicated significance)** and survival risk **(C)** of predicted miR-34a-5p target genes in glioma patients. Note: LGG, low-grade glioma; T, glioma tissue; N, normal tissue; ARID4B, AT-Rich interaction domain 4B; ATMIN, ATM interactor; DAAM1: dishevelled associated activator of morphogenesis 1; DCAF7: DDB1 and CUL4 associated factor 7; ELL2, elongation factor for RNA polymerase 2; FOXP1, forkhead box P1; GLCE, glucuronic acid epimerase; METAP1, methionyl aminopeptidase 1; TMEM109, transmembrane protein 109; VAMP2, vesicle-associated membrane protein 2; VCL, vinculin.