



Article

MicroRNA-mediated regulation of the virus cycle and pathogenesis in the SARS-CoV-2 disease

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Supplementary Table S1. Validated target genes, from KEGG analysis, of six V-miRNAs: miR-411-5p, miR-548au-3p, miR-548q, miR-744-3p, miR-5680 and miR-6853-3p. Predicted targets and scores by microT-CDS for miR-6853-3p are shown.

miR-411-5p	miR-548au-3p	miR-744-3p	miR-6853-3p	Score	miR-6853-3p	Score
BIRC3	ATP2A3	AIFM1	ADH1B	0.928	KCNMA1	0.970
CCND1	DHCR24	BAG4	AMOT	0.817	LATS1	0.801
CEBPB	FMO5	CASP3	APAF1	0.954	MAP2K4	0.893
COL4A2	GNAI2	CDKN1B	ATP1B1	0.991	MAPK14	0.849
FGF2	HSPG2	CHD4	ATP1B3	0.872	MECOM	0.865
FN1	MSH3	CREB3	ATP2A2	0.942	MED1	0.800
FST	MYC	CRK	ATP2B1	0.989	MEF2A	0.853
HSP90AB1	NCOR1	DAG1	ATP2B3	0.816	NCOA2	0.837
NCOA1	NOTCH2	DDX5	ATP6V0D1	0.925	NOG	0.989
PDGFRA	ROCK2	INHBB	BMPR2	0.808	NOS3	0.861
PIK3CB	THBS1	JUNB	CCR8	0.886	PDGFD	0.840
SMURF2	YWHAZ	MDM2	CDK6	0.802	PIK3CB	0.919
THBS2		MED14	CREB3L1	0.847	PIK3R2	0.881
		MEF2D	CSF2RB	0.872	PLCZ1	0.876
		MSH6	CTBP2	0.807	PPP2CA	0.997
		MSMO1	CTGF	0.975	PPP3CA	0.891
miR-548q	miR-5680	NCOA2	CTNNA1	0.956	PRKAR2A	0.839
IGF1R	CDK6	NCOA3	CX3CL1	0.806	RBPJ	0.988
NFKBIA	GTF2A1	PGAM5	CXCL5	0.824	RPS6KB1	0.997
SP1	MDM2	PPP1R12A	CYP3A4	0.913	SLC16A10	0.874
UBE3A	RHOA	PPP2CA	DFFA	0.826	SMAD2	0.946
		PPP3CB	DNM1L	0.908	SMAD7	0.995
		RAF1	EP300	0.946	SMURF2	0.812
		SKP1	FZD3	0.898	TBC1D4	0.915
		SMURF2	GUCY1A2	0.831	THBS3	0.879
		YAP1	ID4	0.836	TLR4	0.958
			IRAK3	0.943	UBE3A	0.950
			IRS1	0.880	USP7	0.985
			ITGAV	0.833	WNT9B	0.809

ITGB1	0.900	YAP1	0.960
ITGB8	0.820		

Supplementary Table S2. Table showing seed match and MFE between hsa-miRNA and Viral Genome with best LogitProbability score. The miRNAs are ordered by MFE score.

hsa-miRNAs	ΔG°	LogitProb	hsa-miRNAs	ΔG°	LogitProb
miR-7108-5p	-29.5	0.908	miR-15a-5p	-20.1	0.904
miR-15b-5p	-28.9	0.93	miR-152-3p	-19.6	0.759
miR-6124	-26.5	0.888	miR-6728-3p	-19.3	0.902
miR-4684-3p	-25.8	0.894	miR-4709-5p	-19.1	0.848
miR-298	-24.8	0.888	miR-892c-3p	-18.8	0.855
miR-7851-3p	-24.7	0.519	miR-148b-3p	-18.7	0.808
miR-1226-3p	-24	0.888	miR-589-5p	-18.7	0.945
miR-1293	-23.8	0.879	miR-122b-3p	-18.4	0.86
miR-5192	-23.7	0.852	miR-580-3p	-18	0.947
miR-6811-3p	-23.4	0.89	miR-148a-3p	-17.8	0.864
miR-16-5p	-23.4	0.942	miR-548as-3p	-17.6	0.906
miR-4502	-23.1	0.881	miR-548m	-17.5	0.92
miR-203a-5p	-22.7	0.883	miR-4742-3p	-17.4	0.845
miR-219b-3p	-22.5	0.779	miR-675-3p	-16.9	0.851
miR-644a	-21.8	0.939	miR-1297	-16.8	0.84
miR-195-5p	-21.7	0.941	miR-6835-3p	-16.3	0.821
miR-21-3p	-21.6	0.86	miR-3164	-16.1	0.781
miR-4288	-21.5	0.945	miR-452-5p	-15.9	0.89
miR-5682	-21.5	0.801	miR-196a-1-3p	-15.6	0.954
miR-510-3p	-20.9	0.921	miR-4676-3p	-14.9	0.887
miR-624-5p	-20.7	0.875	miR-6820-3p	-13.4	0.783
miR-219a-1-3p	-20.5	0.886	miR-577	-12.2	0.906
miR-4483	-20.3	0.892	miR-511-3p	-11.7	0.809
miR-4490	-20.2	0.941			

Supplementary Table S3. hsa-miRNAs targeting Wuhan SARS-CoV-2 genome regions and VOCs. miRDB scores are shown in brackets.

5'UTR					
Wuhan	Alpha	Beta	Gamma	Delta	Omicron
miR-298 (91)	miR-298 (92)	miR-298 (96)	miR-298 (92)	miR-298 (92)	miR-298 (92)
miR-7851-3p (91)	nd	nd	nd	nd	nd
NSP13					
Wuhan	Alpha	Beta	Gamma	Delta	Omicron
miR-1226-3p (90)	miR-1226-3p (90)	miR-1226-3p (90)	miR-1226-3p (90)	miR-1226-3p (90)	miR-1226-3p (90)
miR-1293 (87)	miR-1293 (87)	miR-1293 (87)	miR-1293 (87)	miR-1293 (87)	miR-1293 (87)
miR-219b-3p (88)	miR-219b-3p (88)	miR-219b-3p (88)	miR-219b-3p (88)	miR-219b-3p (88)	miR-219b-3p (88)
miR-4483 (86)	miR-4483 (86)	miR-4483 (86)	miR-4483 (86)	miR-4483 (86)	miR-4483 (86)
miR-452-5p (86)	miR-452-5p (86)	miR-452-5p (86)	miR-452-5p (86)	miR-452-5p (86)	miR-452-5p (86)
miR-4676-3p (86)	miR-4676-3p (86)	miR-4676-3p (86)	miR-4676-3p (86)	miR-4676-3p (86)	miR-4676-3p (86)
miR-4709-5p (87)	miR-4709-5p (87)	miR-4709-5p (87)	miR-4709-5p (87)	miR-4709-5p (87)	miR-4709-5p (87)
miR-7108-5p (96)	miR-7108-5p (96)	miR-7108-5p (96)	miR-7108-5p (96)	miR-7108-5p (96)	miR-7108-5p (96)
miR-892c-3p (86)	miR-892c-3p (86)	miR-892c-3p (86)	miR-892c-3p (86)	miR-892c-3p (86)	miR-892c-3p (86)
NSP14					
Wuhan	Alpha	Beta	Gamma	Delta	Omicron
miR-4742-3p (94)	miR-4742-3p (94)	miR-4742-3p (94)	miR-4742-3p (94)	miR-4742-3p (94)	miR-4742-3p (94)
miR-548as-3p (94)	miR-548as-3p (94)	miR-548as-3p (94)	miR-548as-3p (94)	miR-548as-3p (94)	miR-548as-3p (94)
miR-644a (92)	miR-644a (92)	miR-644a (92)	miR-644a (92)	miR-644a (92)	miR-644a (92)
miR-548m (88)	miR-548m (88)	miR-548m (88)	miR-548m (88)	miR-548m (88)	miR-548m (88)
miR-6811-3p (86)	miR-6811-3p (86)	miR-6811-3p (86)	miR-6811-3p (86)	miR-6811-3p (86)	miR-6811-3p (86)
miR-4288 (85)	miR-4288 (85)	miR-4288 (85)	miR-4288 (85)	miR-4288 (85)	miR-4288 (85)
NSP15					
Wuhan	Alpha	Beta	Gamma	Delta	Omicron
miR-122b-3p (94)	miR-122b-3p (94)	miR-122b-3p (94)	miR-122b-3p (94)	miR-122b-3p (94)	miR-122b-3p (94)
miR-1297 (85)	miR-1297 (85)	miR-1297 (85)	miR-1297 (85)	miR-1297 (85)	miR-1297 (85)
miR-21-3p (94)	miR-21-3p (94)	miR-21-3p (94)	miR-21-3p (94)	miR-21-3p (94)	miR-21-3p (94)
SPIKE					
Wuhan	Alpha	Beta	Gamma	Delta	Omicron
miR-122b-3p (71)	miR-122b-3p (80)	miR-122b-3p (87)	miR-122b-3p (87)	miR-122b-3p (80)	miR-122b-3p (79)
miR-15a-5p (87)	miR-15a-5p (87)	miR-15a-5p (87)	miR-15a-5p (91)	miR-15a-5p (87)	miR-15a-5p (87)
miR-15b-5p (87)	miR-15b-5p (87)	miR-15b-5p (87)	miR-15b-5p (91)	miR-15b-5p (87)	miR-15b-5p (87)
miR-16-5p (87)	miR-16-5p (87)	miR-16-5p (87)	miR-16-5p (91)	miR-16-5p (87)	miR-16-5p (87)
miR-182-3p (57)	miR-182-3p (57)	miR-182-3p (57)	miR-182-3p (57)	miR-182-3p (90)	miR-182-3p (57)
miR-195-5p (87)	miR-195-5p (87)	miR-195-5p (87)	miR-195-5p (91)	miR-195-5p (87)	miR-195-5p (87)
miR-196a-1-3p (86)	miR-196a-1-3p (86)	miR-196a-1-3p (86)	miR-196a-1-3p (86)	miR-196a-1-3p (86)	miR-196a-1-3p (86)

miR-203a-5p (87)	miR-203a-5p (87)	miR-203a-5p (87)	miR-203a-5p (87)	miR-203a-5p (87)	miR-203a-5p (87)
miR-21-3p (71)	miR-21-3p (80)	miR-21-3p (87)	miR-21-3p (87)	miR-21-3p (80)	miR-21-3p (79)
miR-219a-1-3p (85)	miR-219a-1-3p (85)	miR-219a-1-3p (85)	miR-219a-1-3p (85)	miR-219a-1-3p (85)	miR-219a-1-3p (85)
miR-424-5p (84)	miR-424-5p (84)	miR-424-5p (84)	miR-424-5p (89)	miR-424-5p (84)	miR-424-5p (84)
miR-4490 (87)	miR-4490 (87)	miR-4490 (87)	miR-4490 (87)	miR-4490 (87)	miR-4490 (87)
miR-497-5p (84)	miR-497-5p (84)	miR-497-5p (84)	miR-497-5p (89)	miR-497-5p (84)	miR-497-5p (84)
miR-510-3p (92)	miR-510-3p (92)	miR-510-3p (92)	miR-510-3p (92)	miR-510-3p (92)	miR-510-3p (92)
miR-511-3p (89)	miR-511-3p (89)	miR-511-3p (89)	miR-511-3p (89)	miR-511-3p (89)	miR-511-3p (89)
miR-597-3p (81)	miR-597-3p (81)	miR-597-3p (81)	miR-597-3p (81)	miR-597-3p (88)	miR-597-3p (81)
miR-6124 (89)	miR-6124 (89)	miR-6124 (89)	miR-6124 (89)	miR-6124 (89)	miR-6124 (87)
miR-624-5p (90)	miR-624-5p (90)	miR-624-5p (90)	miR-624-5p (90)	miR-624-5p (91)	miR-624-5p (90)
miR-6838-5p (84)	miR-6835-5p (68)	miR-6835-5p (68)	miR-6838-5p (89)	miR-6838-3p (51)	miR-6835-5p (68)
ORF6a					
Wuhan	Alpha	Beta	Gamma	Delta	Omicron
miR-3164 (86)	miR-3164 (86)	miR-3164 (86)	miR-3164 (86)	miR-3164 (86)	miR-3164 (86)
miR-577 (89)	miR-577 (89)	miR-577 (89)	miR-577 (89)	miR-577 (89)	miR-577 (89)
miR-580-3p (94)	miR-580-3p (94)	miR-580-3p (94)	miR-580-3p (94)	miR-580-3p (94)	miR-580-3p (94)
miR-6728-3p (96)	miR-6728-3p (96)	miR-6728-3p (96)	miR-6728-3p (96)	miR-6728-3p (96)	miR-6728-3p (96)
miR-6820-3p (86)	miR-6820-3p (86)	miR-6820-3p (86)	miR-6820-3p (86)	miR-6820-3p (86)	miR-6820-3p (86)
ORF7a					
Wuhan	Alpha	Beta	Gamma	Delta	Omicron
miR-148a-3p (94)	miR-148a-3p (94)	miR-148a-3p (94)	miR-148a-3p (94)	miR-148a-3p (94)	miR-148a-3p (94)
miR-148b-3p (94)	miR-148b-3p (94)	miR-148b-3p (94)	miR-148b-3p (94)	miR-148b-3p (94)	miR-148b-3p (94)
miR-152-3p (94)	miR-152-3p (94)	miR-152-3p (94)	miR-152-3p (94)	miR-152-3p (94)	miR-152-3p (94)
miR-4502 (88)	miR-4502 (88)	miR-4502 (88)	miR-4502 (88)	miR-4502 (88)	miR-4502 (88)
miR-5192 (88)	miR-5192 (88)	miR-5192 (88)	miR-5192 (88)	miR-5192 (88)	miR-5192 (88)
ORF7b					
Wuhan	Alpha	Beta	Gamma	Delta	Omicron
miR-589-5p (94)	miR-589-5p (94)	miR-589-5p (94)	miR-589-5p (94)	miR-589-5p (94)	miR-589-5p (94)
miR-6835-3p (91)	miR-6835-3p (91)	miR-6835-3p (91)	miR-6835-3p (91)	miR-6835-3p (91)	miR-6835-3p (91)
Nucleocapsid					
Wuhan	Alpha	Beta	Gamma	Delta	Omicron
miR-4684-3p (86)	miR-4684-3p (86)	miR-4684-3p (86)	miR-4684-3p (86)	miR-4684-3p (86)	miR-4684-3p (86)
miR-5682 (92)	miR-5682 (92)	miR-5682 (92)	miR-5682 (92)	miR-5682 (92)	miR-5682 (92)
miR-615-5p (79)	miR-615-5p (89)	miR-615-5p (79)	miR-615-5p (79)	miR-615-5p (79)	miR-615-5p (80)
miR-675-3p (87)	miR-675-3p (87)	miR-675-3p (87)	miR-675-3p (87)	miR-675-3p (87)	miR-675-3p (87)
3'UTR					
Wuhan	Alpha	Beta	Gamma	Delta	Omicron
miR-3941 (84)	miR-3941 (85)	miR-3941 (85)	miR-3941 (85)	miR-3941 (85)	miR-3941 (80)