

Down-regulation of miRNA 451a promotes many oncogenic signaling pathways in breast cancer patients

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Supplementary data

Table 1 — miR-451a target prediction on the basis of target score.

Gene	Target score
OSR1	92
CUX2	90
PSMB8	90
CXCL16	87
TRAP	83
ST8SIA4	82
CDKN2D	82
MIF	78
FBLN5	78
SAMD4B	77
CERK	77
CAB39	76
VAPA	75
LETM2	72
CMTM6	71
USP46	71
MEX3C	71
PMM2	70
TBC1D9B	70
KIAA1217	68
MAU2	67
RNF217	67
S1PR2	66
MEGF6	66
EVL	65
FBXO33	61
CDKN2B	60
UCK1	60
ATF2	60
CAV1	59
C16ORF72	58
DCAF5	57
RAB5A	57
CACHD1	55
LUZP2	53
EIF2AK3	52
AKTIP	51
FAM171A1	51
TTN	50
NEDD9	50

 Table 2 — miR-451a target in BT-20 at various level of expression.

Expression level	No of Target gene
1- 2	27
3	26
4	23
5	22
6	19
7	17
8-10	16
11-12	14
13-14	13
15-16	11
17	09
18-19	08
20	07

 Table 3 — miR-451a predicted target gene and their expression in BT-20 cell line.

Gene	Target score	Target expression	Expression level
PSMB8	90	82	High
CXCL16	87	23	High
CDKN2D	82	6	Moderate
MIF	78	25	High
SAMD4B	77	16	Moderate
CERK	77	10	Moderate
CAB39	76	35	High
CMTM6	71	29	High
USP46	71	6	Moderate
MEX3C	71	3	Low
PMM2	70	3	Low
TBC1D9B	70	17	Moderate
KIAA1217	68	13	Moderate
MAU2	67	5	Low
RNF217	67	4	Low
MEGF6	66	2	Low
FBXO33	61	3	Low
UCK1	60	14	Moderate
ATF2	60	16	Moderate
CAV1	59	14	Moderate
C16ORF72	58	5	Low
DCAF5	57	7	Low
RAB5A	57	24	High
EIF2AK3	52	5	Low
AKTIP	51	10	Moderate

Table 4 — miR-451a target gene behaviour normal vs primary tumor.

Gene	up	down	P value
OSR1	no	yes	<1E-12
CUX2	no	yes	9.563E-03
PSMB8	yes	no	<1E-12
CXCL16	yes	no	8.443E-01
TRAP	-	-	-
ST8SIA4	yes	no	9.155E-04
CDKN2D	yes	no	<1E-12
MIF	yes	no	1.624E-12
FBLN5	no	yes	1.624E-12
SAMD4B	yes	no	1.378E-08
CERK	yes	no	1.261E-06
CAB39	yes	no	5.432E-04
VAPA	yes	no	2.451E-01
LETM2	yes	no	1.624E-12
CMTM6	yes	no	1.291E-02
USP46	yes	no	1.766E-04
MEX3C	no	yes	9.559E-14
PMM2	yes	no	<1E-12
TBC1D9B	yes	no	2.542E-01
KIAA1217	no	yes	8.641E-10
MAU2	-	-	-
RNF217	no	yes	3.330E-16
S1PR2	no	yes	6.684E-11
MEGF6	yes	no	8.846E-01
EVL	yes	no	<1E-12
FBXO33	no	yes	<1E-12
CDKN2B	no	yes	3.931E-05
UCK1	yes	no	3.937E-02
ATF2	yes	no	6.309E-08
CAV1	no	yes	<1E-12
C16ORF72	yes	no	5.063E-08
DCAF5	yes	no	1.624E-12
RAB5A	yes	no	5.127E-01
CACHD1	no	yes	<1E-12
LUZP2	no	yes	8.993E-11
EIF2AK3	yes	No	3.233E-09
AKTIP	yes	no	2.993E-08
FAM171A1	no	yes	<1E-12
TTN	no	yes	3.139E-01
NEDD9	no	yes	1.624E-12

Table 5 — miR-451a target gene promoter methylation.

Gene	Hypermethylation	Hypomethylation	P value
OSR1	yes	no	<1E-12
CUX2	yes	no	
PSMB8	yes	no	3.28E-07
CXCL16	no	yes	<1E-12
TRAP	-	-	-
ST8SIA4	yes	no	<1E-12
CDKN2D	yes	no	1.037E-01
MIF	yes	no	2.384E-05
FBLN5	yes	no	<1E-12
SAMD4B	yes	no	5.698E-02
CERK	yes	no	5.322E-01
CAB39	yes	no	1.624E-12
VAPA	yes	no	3.516E-02

LETM2	no	yes	7.352E-04
CMTM6	yes	no	1.704E-01
USP46	yes	no	1.042E-04
MEX3C	yes	no	2.285E-01
PMM2	yes	no	7.836E-03
TBC1D9B	yes	no	<1E-12
KIAA1217	yes	no	<1E-12
MAU2	-	-	-
RNF217	no	yes	1.110E-16
S1PR2	yes	no	9.545E-01
MEGF6	yes	no	5.678E-01
EVL	yes	no	9.401E-11
FBXO33	yes	no	5.835E-01
CDKN2B	yes	no	3.336E-01
UCK1	yes	no	<1E-12
ATF2	yes	no	9.392E-01
CAV1	yes	no	1.624E-12
C16ORF72	-	-	-
DCAF5	Yes	no	<1E-12
RAB5A	Yes	no	1.589E-05
CACHD1	Yes	no	1.624E-12
LUZP2	Yes	no	1.624E-12
EIF2AK3	Yes	No	1.252E-01
AKTIP	Yes	no	<1E-12
FAM171A1	Yes	no	3.330E-16
TTN	Yes	no	<1E-12
NEDD9	Yes	no	1.697E-03

Table 6 — miR-451a target total protein.

Gene	Up	down	P value
OSR1	-	-	-
CUX2	-	-	-
PSMB8	Yes	no	3.123E-01
CXCL16	Yes	no	2.073E-03
TRAP	-	-	-
ST8SIA4	-	-	-
CDKN2D	Yes	no	<1E-12
MIF	Yes	no	1.856E-03
FBLN5	Yes	no	3.632E-11
SAMD4B	Yes	no	6.989E-01
CERK	-	-	-
CAB39	Yes	no	9.556E-01
VAPA	Yes	no	-
LETM2	-	-	-
CMTM6	-	-	-
USP46	Yes	no	1.882170E-03
MEX3C	Yes	no	4.678E-06
PMM2	Yes	no	7.654E-12
TBC1D9B	Yes	no	9.084E-01
KIAA1217	Yes	no	2.730E-02
MAU2	No	yes	3.743E-04
RNF217	-	-	-
S1PR2	-	-	-
MEGF6	Yes	no	9.299E-01
EVL	Yes	no	4.184E-19
FBXO33	Yes	no	<1E-12
CDKN2B	-	-	-
UCK1	Yes	no	5.532E-05
ATF2	Yes	no	1.697E-03

CAV1	Yes	no	4.630E-08
C16ORF72	-	-	-
DCAF5	Yes	no	9.265E-02
RAB5A	Yes	no	1.589E-05
CACHD1	No	yes	2.809E-07
LUZP2	-	-	-
EIF2AK3	Yes	No	<1E-12
AKTIP	Yes	no	<1E-12
FAM171A1	Yes	no	<1E-12
TTN	Yes	no	1.726E-04
NEDD9	Yes	no	3.674E-06

Table 7 — miRNA target gene seed location in 3 UTR.

miRNA	Target gene	Genebank accession number	NCBI ID	Seed location	3 UTR length
miR-451a	PSMB8	NM004159	5696	229	261
miR-451a	CDKN2D	NM001800	1032	240	613
miR-451a	ATF2	NM1880	1386	170, 2108	2376
miR-451a	PMM2	NM000303	5373	1127	1529
miR-451a	CDKN2B	NM004936	1030	820, 2180	3101
miR-451a	UCK1	NM001261451	83549	1174	1256
miR-451a	CAV1	NM001753	857	1883	1908
miR-451a	EIF2AK3	NM001313915	9451	514	1006