

Table S1 Differentially expressed circRNAs in

circRNA_ID	log2FoldChange	Pvalue	circRNA_tjtranscript_id
10:124038515 124C	2.10	0.023082491	exon ENST00000346248,EN
7:102877467 10288	-1.47	0.03473953	exon ENST00000448002,EN
5:41794003 418074	2.31	0.010837877	exon ENST00000509987,EN
4:38089932 381031	-1.28	0.011579354	exon ENST00000508802,EN
1:172555869 17255	2.93	0.002726106	exon ENST00000610051,EN
1:155438327 15545	2.11	0.012940879	exon ENST00000392403,EN
20:34470048 34481	-1.84	0.015237536	exon ENST00000262650,EN
10:32543300 32584	-1.92	0.042841678	exon ENST00000639629
11:128758115 1287	2.32	0.010184065	exon ENST00000281428,EN
15:68141946 68164	2.10	0.022680688	exon ENST00000545237,EN
10:84417771 84425	-1.31	0.025606836	exon ENST00000224756,EN
4:105233897 10523	2.50	0.001558809	exon ENST00000380013,EN
17:20204333 20205	1.76	0.017587862	exon ENST00000395522,EN
6:75621532 756348	1.94	0.037551415	exon ENST00000493959,EN
9:33944365 339561	1.98	0.024253069	exon ENST00000379238,EN
16:30496097 30496	-1.84	0.011339098	exon ENST00000358164,EN
9:83768818 837886	2.22	0.014942916	exon ENST00000376371
6:13632370 136447	1.18	0.03860946	exon ENST00000011619
17:47370437 47379	-2.88	0.002246282	exon ENST00000331493,EN
5:50750151 507972	1.94	0.038334603	exon ENST00000503561,EN
13:28197185 2822C	-1.67	0.03135271	exon ENST00000503791,EN
17:29467145 29482	1.61	0.048390904	exon ENST00000261716,EN
9:121161856 12116	-1.62	0.043254675	exon ENST00000373845,EN
2:203402576 20342	1.63	0.046394831	exon ENST00000417864,EN
22:41125864 4114C	2.79	0.025441411	exon ENST00000263253
2:156549608 15655	-1.95	0.026263393	exon ENST00000310454,EN
8:123077111 12308	-1.40	0.042721232	exon ENST00000518099,EN
11:32927157 32935	2.36	0.036577939	exon ENST00000399302,EN
10:89342414 89342	-1.97	0.037081415	intron ENST00000463623,EN
4:122927634 12297	1.94	0.038768562	exon ENST00000422835,EN
10:1124218 112502	-1.90	0.037672333	exon ENST00000263150,EN
20:41533050 41551	1.86	0.039097508	exon ENST00000373233
13:110622216 1106	1.87	0.03824319	exon ENST00000470164,EN
5:180261684 18028	2.26	0.014573786	exon ENST00000455781,EN
22:46626751 46637	-2.25	0.02340708	exon ENST00000406902
18:62539681 6255C	1.55	0.003787232	exon ENST00000586834,EN
2:119926598 11993	2.79	0.003527997	exon ENST00000263708,EN
1:243613671 24369	-2.25	0.011224785	exon ENST00000366540,EN
2:33134793 331888	2.74	0.004619893	exon ENST00000404816,EN
14:50640750 50645	1.94	0.038334603	exon ENST00000324679,EN
8:67103037 67132C	1.86	0.039097508	exon ENST00000519668,EN
13:95161189 95188	2.34	0.006320114	exon ENST00000376887,EN
X:150727215 1507.	-1.54	0.045645239	exon ENST00000485376,EN
17:28163543 28172	1.19	0.043831574	exon ENST00000407008,EN
4:84739010 847404	1.73	0.041127712	exon ENST00000295888

10:15833630 15843	1.94	0.037551415 exon	ENST00000277632,EN
2:171028339 17106	1.61	0.048390904 exon	ENST00000360843,EN
2:8943187 8974435	2.10	0.041276773 exon	ENST00000462696
6:17665239 176757	1.94	0.038334603 exon	ENST00000537253,EN
11:128480191 1284	-1.52	0.049155195 exon	ENST00000319397,EN
2:40428473 404303	1.67	0.011832172 exon	ENST00000402441,EN
2:33110582 331345	1.87	0.03824319 exon	ENST00000404816
16:88627622 88628	1.79	0.037254331 exon	ENST00000301011,EN
11:3731391 375340	1.86	0.039097508 exon	ENST00000529379,EN
2:230442937 23045	1.56	0.030093679 exon	ENST00000409112,EN
14:73147795 73148	2.10	0.023712476 exon	ENST00000324501,EN
8:55966715 559697	-2.12	0.012461268 exon	ENST00000420292,EN
14:103778745 1037	-1.75	0.026610126 exon	ENST00000202556,EN
20:41092472 41101	2.19	0.003825742 exon	ENST00000361337
17:60265412 60294	2.08	0.016037108 exon	ENST00000300896,EN
5:95755396 957636	1.22	0.03225468 exon	ENST00000379982
21:29321221 29329	2.50	0.000293728 exon	ENST00000286800,EN
3:170136419 17014	1.82	0.049842871 exon	ENST00000479467,EN
18:21023620 21042	-1.54	0.045645239 exon	ENST00000399799,EN
5:61472681 614730	2.08	0.042263199 exon	ENST00000252744
2:61498673 615339	1.86	0.039097508 exon	ENST00000406957,EN
1:168038371 16806	1.63	0.04691439 exon	ENST00000312263,EN
12:12519862 12521	-1.86	0.029487422 exon	ENST00000298573,EN
8:30101898 301044	-2.36	0.015726641 exon	ENST00000442880,EN
1:8655973 8656441	2.06	0.031931196 exon	ENST00000400908,EN
15:65752379 65761	2.12	0.04156796 exon	ENST00000564674,EN
10:31908172 31910	-1.62	0.041695408 exon	ENST00000344936,EN
15:65715478 65761	2.48	0.007000752 exon	ENST00000564674,EN
17:1842803 185318	-1.80	0.019744373 exon	ENST00000570451,EN
9:19360244 193619	-1.67	0.03135271 exon	ENST00000361024,EN
4:139125164 13913	2.18	0.018105313 exon	ENST00000394235,EN
9:33318731 333191	1.77	0.030134953 exon	ENST00000379540,EN
22:42411407 42411	2.10	0.023943271 exon	ENST00000329021,EN
4:105446383 10545	-1.90	0.007840422 exon	ENST00000513649,EN
5:39201826 392029	-1.54	0.045645239 exon	ENST00000351578,EN
11:85996826 86003	1.11	0.035629228 exon	ENST00000532317,EN
13:95115922 95188	2.97	0.001559041 exon	ENST00000376887,EN
17:31940286 31966	2.10	0.02351929 exon	ENST00000322652,EN
12:827042 830160	1.98	0.024253069 exon	ENST00000537687,EN
1:39853970 398574	-2.16	0.01676277 exon	ENST00000492612,EN
22:40881770 40882	-2.16	0.01676277 exon	ENST00000428799,EN
4:177353308 17736	1.21	0.043357576 exon	ENST00000264596
2:43578513 435909	-1.52	0.047920544 exon	ENST00000405006,EN
16:53255600 53268	1.94	0.038334603 exon	ENST00000615216,EN
20:35729312 35732	1.75	0.041814061 exon	ENST00000639702,EN
1:172551512 17255	1.68	0.010975143 exon	ENST00000610051,EN
17:12095575 12113	-1.61	0.03113567 exon	ENST00000538465,EN
1:236859833 23686	2.10	0.023712476 exon	ENST00000366576,EN
5:180549931 18055	2.26	0.015266036 exon	ENST00000261951,EN
16:70532479 70544	2.08	0.016037108 exon	ENST00000302516

1:93894614 938978	2.44	0.025625536 exon	ENST00000615724,EN
8:38114192 381211	2.16	0.011138676 exon	ENST00000517496,EN
5:71502599 715124	1.51	0.049240057 exon	ENST00000508917,EN
7:152783187 15280	1.61	0.049995497 exon	ENST00000377776,EN
3:184924862 18498	1.94	0.038334603 exon	ENST00000436792,EN
3:105670233 10569	-2.12	0.012461268 exon	ENST00000264122,EN
1:151658235 15166	1.61	0.049995497 exon	ENST00000368838,EN
10:84417771 84438	-2.01	0.044803628 exon	ENST00000224756,EN
4:78826037 788788	2.12	0.032146549 exon	ENST00000389010,EN
4:77742141 777763	-1.95	0.026263393 exon	ENST00000504123,EN
5:80767933 807928	2.26	0.015266036 exon	ENST00000265081
1:176081152 17613	-1.71	0.046892869 exon	ENST00000367669,EN
13:114041000 1140	-1.71	0.046892869 exon	ENST00000334062
11:14294471 14295	-2.32	0.011014659 exon	ENST00000529237,EN
6:75659262 756789	2.26	0.014573786 exon	ENST00000370010,EN
15:63529014 63574	2.22	0.014702415 exon	ENST00000558157
2:187484124 18750	1.61	0.048390904 exon	ENST00000392365,EN
6:13579451 135842	-2.20	0.030725244 exon	ENST00000397350,EN
4:145159503 14517	1.75	0.041434525 exon	ENST00000455611,EN
18:32042179 32045	-1.71	0.046892869 exon	ENST00000580863,EN
4:143415477 14344	1.92	0.040425931 exon	ENST00000262995,EN
3:151116338 15112	2.31	0.010837877 exon	ENST00000422248,EN
21:44855210 44861	2.26	0.014573786 exon	ENST00000397886,EN
2:226864604 22690	2.10	0.02351929 exon	ENST00000341329,EN
14:101901719 1019	2.06	0.045290633 exon	ENST00000445439,EN
10:103347238 1033	-1.90	0.037672333 exon	ENST00000490296,EN
17:30481143 30492	-1.52	0.049155195 exon	ENST00000451249,EN
18:2585113 261086	1.72	0.040399963 exon	ENST00000261597
10:96907265 96952	1.76	0.031050571 exon	ENST00000421806,EN
16:30483827 30484	-1.10	0.028325032 exon	ENST00000358164,EN
5:168488602 16849	2.49	0.042998131 exon	ENST00000520013,EN
22:41125864 41146	1.51	0.049240057 exon	ENST00000263253
1:180041138 18004	-1.69	0.029368926 exon	ENST00000367607
10:11997672 12014	1.71	0.019830209 exon	ENST00000357604,EN
14:58215205 58223	-1.52	0.049155195 exon	ENST00000556748,EN
17:47370437 47377	-2.04	0.016775564 exon	ENST00000331493,EN
15:41356039 41377	2.39	0.005886739 exon	ENST00000450592,EN
9:130079630 13009	-1.54	0.045645239 exon	ENST00000372410,EN
19:54909245 54910	-1.81	0.026900725 exon	ENST00000598576,EN
15:49625113 49634	1.98	0.025575102 exon	ENST00000558653,EN
15:65729072 65756	2.70	0.017691075 exon	ENST00000564674,EN
11:86012281 86031	1.86	0.039097508 exon	ENST00000532317,EN
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7:48410520 484125	1.98	0.032492642 exon	ENST00000435803,EN
5:141580744 14158	-1.49	0.043272334 exon	ENST00000523100,EN
5:50402286 504113	-1.54	0.045645239 exon	ENST00000303221,EN
16:47497399 47515	1.30	0.002763599 exon	ENST00000323584,EN
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7:152263016 15226	1.86	0.040746277 exon	ENST00000558084,EN
19:18537601 18538	1.40	0.027553571 exon	ENST00000608443,EN

7:112286873 11228	-1.95	0.026263393 exon	ENST00000450657,EN
X:19965044 19970	1.63	0.046394831 exon	ENST00000379687,EN
1:28742403 287439	2.46	0.009548171 exon	ENST00000541996,EN
9:4823548 4833228	2.16	0.011138676 exon	ENST00000381750,EN
12:32607957 32611	1.91	0.02267251 exon	ENST00000551984,EN
18:45988702 45992	-2.05	0.024008024 exon	ENST00000409746
16:4466153 446946	-2.12	0.033286002 exon	ENST00000404295,EN
X:154789954 15479	1.76	0.031050571 exon	ENST00000369534,EN
2:37974040 380042	1.76	0.031050571 exon	ENST00000406384,EN
16:53254438 53274	2.04	0.034291481 exon	ENST00000615216,EN
12:9584106 960780	1.87	0.03824319 exon	ENST00000641304,EN
9:83677727 836861	2.16	0.011138676 exon	ENST00000257468,EN
18:70121556 70128	-1.47	0.03473953 exon	ENST00000581161,EN
8:47953620 479574	2.34	0.01434032 exon	ENST00000314191,EN
9:93476256 934988	2.10	0.023943271 exon	ENST00000375389,EN
2:230357805 23036	-2.05	0.024008024 exon	ENST00000415673,EN
16:29355787 29365	-1.54	0.045645239 exon	ENST00000507381,EN
2:120278618 12028	1.61	0.048390904 exon	ENST00000420510,EN
3:67495798 674982	-1.71	0.046892869 exon	ENST00000493112,EN
8:140818277 14086	1.73	0.041127712 exon	ENST00000340930,EN

1 RA by RNA-seq analysis

gene_id	Symbol	Description	cirbase_id
ENSG00000182022	CHST15	carbohydrate sulfotrans	hsa_circ_0000264
ENSG00000161040	FBXL13	F-box and leucine rich 1---	
ENSG00000083720	OXCT1	3-oxoacid CoA-transfer	hsa_circ_0004873
ENSG00000065882	TBC1D1	TBC1 domain family m	hsa_circ_0001402
ENSG00000094975	SUCO	SUN domain containinç	hsa_circ_0015262
ENSG00000116539	ASH1L	ASH1 like histone lysir	hsa_circ_0003247
ENSG00000078747	ITCH	itchy E3 ubiquitin prote	hsa_circ_0005868
ENSG00000216937	CCDC7	coiled-coil domain cont	hsa_circ_0000233
ENSG00000151702	FLI1	Fli-1 proto-oncogene, E	hsa_circ_0000369
ENSG00000033800	PIAS1	protein inhibitor of acti	hsa_circ_0036044
ENSG00000107771	CCSER2	coiled-coil serine rich p	hsa_circ_0006956
ENSG00000168769	TET2	tet methylcytosine diox	hsa_circ_0070562
ENSG00000128487	SPECC1	sperm antigen with calç	hsa_circ_0000745
ENSG00000112701	SENP6	SUMO1/sentrin specifiç	hsa_circ_0077078
ENSG00000137073	UBAP2	ubiquitin associated prc	hsa_circ_0001846
ENSG00000005844	ITGAL	integrin subunit alpha I ---	
ENSG00000165113	GKAP1	G kinase anchoring pro ---	
ENSG00000010017	RANBP9	RAN binding protein 9	hsa_circ_0001577
ENSG00000178852	EFCAB13	EF-hand calcium bindir	hsa_circ_0044242
ENSG00000151883	PARP8	poly(ADP-ribose) polyı	hsa_circ_0072431
ENSG00000152520	PAN3	PAN3 poly(A) specific	hsa_circ_0006597
ENSG00000160551	TAOK1	TAO kinase 1	---
ENSG00000119397	CNTRL	centriolin	hsa_circ_0088333
ENSG00000138443	ABI2	abl interactor 2	hsa_circ_0007951
ENSG00000100393	EP300	E1A binding protein p3 ---	
ENSG00000115159	GPD2	glycerol-3-phosphate dç	hsa_circ_0005732
ENSG00000156787	TBC1D31	TBC1 domain family m	hsa_circ_0085438
ENSG00000060749	QSER1	glutamine and serine rich	hsa_circ_0021570
ENSG00000107798	LIPA	lipase A, lysosomal aci---	
ENSG00000145375	SPATA5	spermatogenesis associ---	
ENSG00000047056	WDR37	WD repeat domain 37	hsa_circ_0017469
ENSG00000124177	CHD6	chromodomain helicase	hsa_circ_0001159
ENSG00000213995	NAXD	NAD(P)HX dehydratas	hsa_circ_0030883
ENSG00000050748	MAPK9	mitogen-activated prote	hsa_circ_0001566
ENSG00000075240	GRAMD4	GRAM domain contain	hsa_circ_0001250
ENSG00000141664	ZCCHC2	zinc finger CCHC-type	hsa_circ_0000854
ENSG00000088179	PTPN4	protein tyrosine phosph	hsa_circ_0056247
ENSG00000117020	AKT3	AKT serine/threonine k	hsa_circ_0017251
ENSG00000049323	LTBP1	latent transforming grov---	
ENSG00000151748	SAV1	salvador family WW dç	hsa_circ_0007101
ENSG00000104218	CSPP1	centrosome and spindle	hsa_circ_0001805
ENSG00000125257	ABCC4	ATP binding cassette st	hsa_circ_0030586
ENSG00000063601	MTMR1	myotubularin related pr	hsa_circ_0091685
ENSG00000087095	NLK	nemo like kinase	hsa_circ_0003638
ENSG00000163625	WDFY3	WD repeat and FYVE ç	hsa_circ_0070323

ENSG00000148481	MINDY3	MINDY lysine 48 deub hsa_circ_0005825
ENSG00000198586	TLK1	tousled like kinase 1 ---
ENSG00000143797	MBOAT2	membrane bound O-acy---
ENSG00000124789	NUP153	nucleoporin 153 hsa_circ_0075734
ENSG00000134954	ETS1	ETS proto-oncogene 1, hsa_circ_0002083
ENSG00000183023	SLC8A1	solute carrier family 8 r hsa_circ_0000994
ENSG00000049323	LTBP1	latent transforming grov---
ENSG00000158545	ZC3H18	zinc finger CCCH-type hsa_circ_0040831
ENSG00000110713	NUP98	nucleoporin 98 hsa_circ_0000274
ENSG00000067066	SP100	SP100 nuclear antigen hsa_circ_0003922
ENSG00000080815	PSEN1	presenilin 1 hsa_circ_0003848
ENSG00000254087	LYN	LYN proto-oncogene, S hsa_circ_0084552
ENSG00000088808	PPP1R13B	protein phosphatase 1 r hsa_circ_0005791
ENSG00000198900	TOP1	topoisomerase (DNA) I---
ENSG00000170832	USP32	ubiquitin specific peptichsa_circ_0044949
ENSG00000164292	RHOBTB3	Rho related BTB domain hsa_circ_0007444
ENSG00000156273	BACH1	BTB domain and CNC hsa_circ_0001181
ENSG00000173889	PHC3	polyhomeotic homolog hsa_circ_0001965
ENSG00000067900	ROCK1	Rho associated coiled-c---
ENSG00000130449	ZSWIM6	zinc finger SWIM-type hsa_circ_0005399
ENSG00000082898	XPO1	exportin 1 hsa_circ_0054894
ENSG00000143164	DCAF6	DDB1 and CUL4 assoc hsa_circ_0015132
ENSG00000111266	DUSP16	dual specificity phosph:hsa_circ_0003855
ENSG00000104660	LEPROTL1	leptin receptor overlap hsa_circ_0007353
ENSG00000142599	RERE	arginine-glutamic acid c---
ENSG00000174485	DENND4A	DENN domain containi hsa_circ_0035957
ENSG00000165322	ARHGAP12	Rho GTPase activating hsa_circ_0000231
ENSG00000174485	DENND4A	DENN domain containi---
ENSG00000132383	RPA1	replication protein A1 hsa_circ_0000734
ENSG00000137145	DENND4C	DENN domain containi hsa_circ_0007110
ENSG00000109381	ELF2	E74 like ETS transcript hsa_circ_0001441
ENSG00000086102	NFX1	nuclear transcription fa hsa_circ_0086648
ENSG00000235568	NFAM1	NFAT activating protei hsa_circ_0001240
ENSG00000138777	PPA2	pyrophosphatase (inorg hsa_circ_0007477
ENSG00000082074	FYB1	FYN binding protein 1 hsa_circ_0072340
ENSG00000073921	PICALM	phosphatidylinositol bir hsa_circ_0023919
ENSG00000125257	ABCC4	ATP binding cassette si hsa_circ_0030582
ENSG00000178691	SUZ12	SUZ12 polycomb repre hsa_circ_0042963
ENSG00000060237	WNK1	WNK lysine deficient p hsa_circ_0024960
ENSG00000043514	TRIT1	tRNA isopentenyltransf hsa_circ_0000057
ENSG00000196236	XPNPEP3	X-prolyl aminopeptidas hsa_circ_0008360
ENSG00000109674	NEIL3	nei like DNA glycosyla hsa_circ_0001460
ENSG00000115970	THADA	THADA, armadillo rep hsa_circ_0054322
ENSG00000177200	CHD9	chromodomain helicase hsa_circ_0039365
ENSG00000131051	RBM39	RNA binding motif pro hsa_circ_0008817
ENSG00000094975	SUCO	SUN domain containin hsa_circ_0000160
ENSG00000065559	MAP2K4	mitogen-activated prote hsa_circ_0042098
ENSG00000116984	MTR	5-methyltetrahydrofolat hsa_circ_0003929
ENSG00000113300	CNOT6	CCR4-NOT transcriptic hsa_circ_0008836
ENSG00000189091	SF3B3	splicing factor 3b subur hsa_circ_0005330

ENSG0000023909	GCLM	glutamate-cysteine ligase	hsa_circ_0013222
ENSG00000129691	ASH2L	ASH2 like histone lysine methyltransferase 2	hsa_circ_0006302
ENSG00000145734	BDP1	B double prime 1, subunit 1	---
ENSG00000133627	ACTR3B	ARP3 actin related protein 3	hsa_circ_0006890
ENSG00000156931	VPS8	VPS8, CORVET complex subunit 8	---
ENSG00000114423	CBLB	Cbl proto-oncogene B	hsa_circ_0066715
ENSG00000143376	SNX27	sorting nexin family member 27	hsa_circ_0002394
ENSG00000107771	CCSER2	coiled-coil serine rich protein 2	hsa_circ_0003018
ENSG00000138756	BMP2K	BMP2 inducible kinase	---
ENSG00000138767	CNOT6L	CCR4-NOT transcription complex subunit 6L	---
ENSG00000113318	MSH3	mutS homolog 3	hsa_circ_0073177
ENSG00000143207	RFWD2	ring finger and WD repeat domain 2	hsa_circ_0003572
ENSG00000185989	RASA3	RAS p21 protein activator 3	hsa_circ_0031071
ENSG00000133818	RRAS2	related RAS viral (ras) protein 2	hsa_circ_0004429
ENSG00000112701	SENP6	SUMO1/sentrin specific protease 6	---
ENSG00000140455	USP3	ubiquitin specific protease 3	---
ENSG00000003436	TFPI	tissue factor pathway inhibitor 1	hsa_circ_0003353
ENSG00000124523	SIRT5	sirtuin 5	hsa_circ_0007218
ENSG00000164164	OTUD4	OTU deubiquitinase 4	---
ENSG00000101695,ENSG00000109458	RNF125,AC01	ring finger protein 125	---
ENSG00000109458	GAB1	GRB2 associated binding protein 1	---
ENSG00000144893	MED12L	mediator complex subunit 12L	---
ENSG00000183255	PTTG1IP	PTTG1 interacting protein	hsa_circ_0001200
ENSG00000144468	RHBDD1	rhomboid domain containing 1	hsa_circ_0058494
ENSG00000078304	PPP2R5C	protein phosphatase 2 regulatory subunit 5C	hsa_circ_0003831
ENSG00000156374	PCGF6	polycomb group ring finger 6	hsa_circ_0005052
ENSG00000108587	GOSR1	golgi SNAP receptor class I type 1	hsa_circ_0042839
ENSG00000080986	NDC80	NDC80, kinetochore component	---
ENSG00000196233	LCOR	ligand dependent nuclear corepressor	hsa_circ_0019316
ENSG00000005844	ITGAL	integrin subunit alpha L	hsa_circ_0000690
ENSG00000113643	RARS	arginyl-tRNA synthetase	hsa_circ_0001551
ENSG00000100393	EP300	E1A binding protein p300	hsa_circ_0063481
ENSG00000135837	CEP350	centrosomal protein 350	hsa_circ_0006924
ENSG00000151461	UPF2	UPF2, regulator of nonstop decay	hsa_circ_0000213
ENSG00000131966	ACTR10	actin related protein 10	---
ENSG00000178852	EFCAB13	EF-hand calcium binding domain 13	---
ENSG00000137804	NUSAP1	nucleolar and spindle apparatus protein 1	hsa_circ_0008346
ENSG00000148358	GPR107	G protein-coupled receptor 107	---
ENSG00000189430	NCR1	natural cytotoxicity triggering receptor 1	hsa_circ_0052166
ENSG00000104047	DTWD1	DTW domain containing 1	hsa_circ_0035194
ENSG00000174485	DENND4A	DENN domain containing 4A	hsa_circ_0035946
ENSG00000073921	PICALM	phosphatidylinositol binding clathrate assembly protein	hsa_circ_0023940
ENSG00000108960	MMD	monocyte to macrophage migration inducer	hsa_circ_0002015
ENSG00000179869	ABCA13	ATP binding cassette subfamily A member 13	---
ENSG00000131504	DIAPH1	diaphanous related formin 1	hsa_circ_0074323
ENSG00000170571	EMB	embigin	hsa_circ_0072428
ENSG00000102893	PHKB	phosphorylase kinase regulatory subunit B	hsa_circ_0000698
ENSG00000139132	FGD4	FYVE, RhoGEF and PI3K domain containing 4	hsa_circ_0025843
ENSG00000055609	KMT2C	lysine methyltransferase 2C	hsa_circ_0002932
ENSG00000105701	FKBP8	FK506 binding protein 8	hsa_circ_0000914

ENSG00000198839	ZNF277	zinc finger protein 277	hsa_circ_0001739
ENSG00000173681	BCLAF3	BCLAF1 and THRAP3	---
ENSG00000198492	YTHDF2	YTH N6-methyladenos	hsa_circ_0000039
ENSG00000120158	RCL1	RNA terminal phosphat	hsa_circ_0006134
ENSG00000139132	FGD4	FYVE, RhoGEF and PI	hsa_circ_0000390
ENSG00000152229	PSTPIP2	proline-serine-threonine	---
ENSG00000153406	NMRAL1	NmrA like redox senso	hsa_circ_0007788
ENSG00000130830	MPP1	membrane palmitoylate	hsa_circ_0001952
ENSG00000115841	RMDN2	regulator of microtubul	hsa_circ_0054130
ENSG00000177200	CHD9	chromodomain helicase	hsa_circ_0000702
ENSG00000284634	AC092821.3	---	---
ENSG00000135018	UBQLN1	ubiquilin 1	hsa_circ_0003715
ENSG00000176225	RTTN	rotatin	---
ENSG00000253729	PRKDC	protein kinase, DNA-ac	hsa_circ_0084464
ENSG0000048828	FAM120A	family with sequence si	hsa_circ_0003972
ENSG00000185404	SP140L	SP140 nuclear body prc	hsa_circ_0008382
ENSG00000271699,EN	SNX29P2,ACC	sorting nexin 29 pseudc	hsa_circ_0038891
ENSG00000144118	RALB	RAS like proto-oncoge	hsa_circ_0056285
ENSG00000172340	SUCLG2	succinate-CoA ligase G	hsa_circ_0003060
ENSG00000169398	PTK2	protein tyrosine kinase	hsa_circ_0008345

Table S2 Differentially expressed miRNAs in RA by RNA-seq analysis

ID	Log2FoldChange	P.value
10_18564	2.67	3.78E-05
11_19908	1.67	0.016169263
11_20863	1.66	0.011905993
1_1655	1.56	0.027946021
13_23379	1.45	0.033050499
14_25108	1.67	0.016169263
15_26190	2.20	0.001001147
17_27973	1.67	0.016169263
18_29671	1.49	0.040311402
19_30171	3.97	0.00125122
20_31366	1.62	0.021261083
4_9649	1.32	0.031149879
6_13619	1.56	0.016541167
8_16716	-2.35	0.041605228
hsa-miR-1180-3p	2.28	1.72E-05
hsa-miR-1294	2.24	0.000698543
hsa-miR-129-5p	2.45	0.004961222
hsa-miR-1303	2.13	0.007659642
hsa-miR-1304-5p	2.77	0.029774498
hsa-miR-144-3p	1.87	9.19E-06
hsa-miR-144-5p	2.04	0.00040654
hsa-miR-146a-3p	1.12	0.040923745
hsa-miR-151a-5p	-2.13	0.013799535
hsa-miR-16-2-3p	1.30	0.003898705
hsa-miR-181a-2-3p	-1.86	0.037451457
hsa-miR-182-5p	2.58	1.09E-08
hsa-miR-183-5p	4.36	1.88E-18
hsa-miR-18a-3p	2.01	0.007985414
hsa-miR-219a-1-3p	1.87	0.039607375
hsa-miR-29a-3p	-1.80	0.045221014
hsa-miR-29b-3p	-1.86	0.03313504
hsa-miR-29c-3p	-2.25	0.021617613
hsa-miR-30b-5p	-1.94	0.01518803
hsa-miR-30e-5p	-2.16	0.007124937
hsa-miR-3120-5p	1.57	0.004374711
hsa-miR-3127-3p	4.81	0.012216265
hsa-miR-3149	3.07	0.007673926
hsa-miR-3158-3p	2.35	1.88E-07
hsa-miR-31-5p	-2.95	0.024602066
hsa-miR-3180-5p	1.32	0.041567215
hsa-miR-3184-5p	1.07	0.012435835
hsa-miR-342-3p	-2.61	0.001096137
hsa-miR-3615	1.07	0.017365314
hsa-miR-409-5p	-2.96	0.04387379
hsa-miR-424-3p	2.61	1.98E-06
hsa-miR-4443	1.98	6.49E-06
hsa-miR-4497	2.04	0.047384053

hsa-miR-4508	3.32	0.008075989
hsa-miR-4732-5p	1.20	0.016169263
hsa-miR-4772-3p	-3.38	0.007373098
hsa-miR-486-3p	2.03	0.000122028
hsa-miR-486-5p	2.66	3.80E-09
hsa-miR-5010-3p	1.39	0.011887135
hsa-miR-5189-5p	2.43	0.01217424
hsa-miR-550a-5p	2.71	8.95E-05
hsa-miR-584-3p	3.32	0.037800303
hsa-miR-597-3p	1.26	0.040693893
hsa-miR-6503-3p	3.70	0.018863784
hsa-miR-7848-3p	1.19	0.038707293
hsa-miR-7976	4.27	0.000307902
hsa-miR-92b-3p	1.39	0.007159679
hsa-miR-92b-5p	5.81	8.78E-05
hsa-miR-96-5p	5.03	1.78E-18