

(Life Technologies, Gaithersburg, MD, USA) and Ham's F12 (Nissui Pharmaceutical, Tokyo, Japan) with 5% fetal bovine serum. HEK293 cells were cultured in Dulbecco's modified Eagle's medium (Sigma-Aldrich, St Louis, MO, USA) supplemented with 10% fetal bovine serum. Cells were cultured at 37°C with 5% CO₂.

In vitro cell viability assay

KYSE cell lines were seeded in 96-well plates and incubated for 24 h. The medium was then removed and replaced with fresh medium that contained cisplatin (Calbiochem, San Diego, CA, USA) or Dimethyl sulfoxide (DMSO) (vehicle control) and the cells were incubated for a further 48 h. Cell viability was examined using the 2-(4-isopropyl)-3-(4-nitrophenyl)-5-(2,4-disulphophenyl)-2H-tetrazolium monosodium salt (WST-1) assay.

miRNA microarray analysis

Total RNA was isolated from the KYSE cell lines with IsoGen lysis buffer (Nippon Gene, Toyama, Japan) followed by precipitation with isopropanol, and the size of the miRNA fractions was confirmed using an Agilent 2100 Bioanalyzer (Agilent Technologies, Santa Clara, CA, USA). The miRNAs were then labeled with Hy5 using a miRCURY LNA microRNA Power Labeling Kit (Exiqon, Woburn, MA, USA) and hybridized with a Human miRNA Oligo chip (Toray, Tokyo, Japan). Arrays were scanned using a ProScanArray laser scanning system (Perkin-Elmer, Waltham, MA, USA), and processed and analyzed with Genepix Pro 4.0 software (Axon Instruments, Sunnyvale, CA, USA). The GEO database accession code of the miRNA microarray data is GSE25464.

TaqMan RT-PCR for miRNA quantification

Expression levels of mature miRNAs were analyzed by real-time PCR using the TaqMan microRNA assay kit (Applied Biosystems, Foster City, CA, USA). Reactions were performed using an Applied Biosystems 7300 instrument with an initial denaturation at 95°C for 10 min, followed by 40 cycles at 95°C for 15 s and 60°C for 1 min.

In vitro drug sensitivity assay

KYSE960 cells (1.7×10^5 per well) were seeded in 96-well plates and transfected with either Pre-miR miR-141 precursor or Pre-miR miR-Precurser-Negative Control #1 (AM17110) (Ambion, Austin, TX, USA) using the HiPerfect Transfection Reagent (Qiagen, Valencia, CA, USA) following the manufacturer's instructions. At 24 h after transfection, cells were treated with cisplatin (7.5, 15, 30, 60 or 120 µM) or DMSO for a further 48 h and then collected for analysis. Cell viability was assessed by the WST-1 assay.

Trypan blue dye exclusion assay

At 24 h after transfection, cells were treated with cisplatin (30 µM) or DMSO and collected for analysis after 0, 24, 48 and 72 h. An equal volume of 0.4% Trypan Blue Stain (Invitrogen, Carlsbad, CA, USA) was added to the cell suspensions, which were then allowed to stand for 5 min at room temperature. Stained cells (10 µl) were placed in a hemocytometer and the number of viable (unstained) cells was counted for each individual time point.

Western blotting

At 72 h after transfection, total protein was extracted from the cells using RIPA lysis buffer (50 mM Tris-HCl pH 7.5, 150 mM NaCl, 0.1% SDS, 1% Nonidet P-40, 0.5% sodium deoxycholate, protease inhibitor cocktail). Equivalent amounts of total protein extract were separated on 8% SDS-PAGE gels and transferred to polyvinylidene fluoride membranes. The blots were probed for 1 h at room temperature with antibodies against YAP1 (sc-13407, Santa Cruz, Santa Cruz, CA, USA; 1:200) or β-actin (Sigma-Aldrich; 1:1000), which was used as an internal control for protein loading. The protein bands were visualized using Western Lightning Chemiluminescence Reagent Plus (Perkin-Elmer).

Quantitative RT-PCR

In parallel, total RNA was isolated from transfected cells as described above. Total RNA (3 µg) was exposed briefly to RNase-free DNase I, and reverse

transcribed to cDNA using random primers and SuperScriptIII Reverse Transcriptase (Invitrogen). Subsequently, real-time PCR was performed in triplicate using the SYBR Premix Ex Taq II reagent (TAKARA BIO, Shiga, Japan) and a DNA Engine Option 2 System (Bio-Rad, Hercules, CA, USA). The PCR primers used for YAP1 were 5'-GTAGCCAGATTACCAACCACTG-3' and 5'-CTGTTCAGGAAGTCATCTGG-3'. The housekeeping gene GAPDH was used as an endogenous control for RNA normalization. The following PCR conditions were used: initial denaturation at 95°C for 10 min, followed by 40 cycles of denaturation at 95°C for 10 s, annealing at 58°C for 20 s and extension at 72°C for 20 s. PCR products were separated by electrophoresis on 2% agarose gels and visualized by ethidium bromide staining. All messenger RNA quantification data were normalized to GAPDH.

Target in vitro reporter assay

Constructs were generated in which the wild-type (pGL3-YAP1-3'UTRWT) and mutated (pGL3-YAP1-3'UTRmut) 3'-UTR of YAP1 was inserted downstream of a luciferase reporter. The 3'-UTR of human YAP1, which contains a putative target site of miR-141, was amplified by PCR from human genomic DNA using the primers 5'-ATGGTTCATGGCAGCACTTG-3' and 5'-CCTAACCATAAGGAGCATCTG-3', and inserted into the EcoRI site, immediately downstream of the luciferase gene in the pGL3-promoter vector (Promega, Madison, WI, USA). Three point mutations in the miR-141 seed region of the YAP1 3'-UTR were generated using the QuikChange Site-Directed Mutagenesis Kit (Stratagene, La Jolla, CA, USA). The following primers were used for the mutagenesis of the miRNA-binding site 5'-CAGAAATTCATCACTCTGAGATGAACCTCAACATCTGC-3' and 5'-GCAATGTTGATGTTTCATCTCAGATGGTATGAATCTG-3'. Wild-type and mutant inserts were verified by DNA sequencing. HEK293 cells (2×10^5 per well) were co-transfected in 24-well plates with 1 µg of the firefly luciferase reporter vector and 100 ng of pRL-TK (a control vector that contains Renilla luciferase; Promega), as well as with 5 pmol of miR-141 or a control precursor (Ambion) or with 25 pmol of miR-141 or a control inhibitor (Dharmacon, Lafayette, CO, USA) using Lipofectamine 2000 (Invitrogen) according to the manufacturer's instructions. Luciferase activity was measured at 24 h after transfection using the Dual-Luciferase Reporter Assay System (Promega). For each well, firefly luciferase activity was normalized to Renilla luciferase activity.

Apoptosis assay

At 24 h after transfection, cells were treated with cisplatin (30 µM) or DMSO for a further 48 h and then collected for analysis. Apoptosis was assayed using a FITC Annexin V Apoptosis Detection Kit 1 (BD Biosciences, San Jose, CA, USA) according to the manufacturer's protocol and analyzed using a FACScalibur flow cytometer (BD Biosciences). Apoptotic cells were indicated by high levels of Annexin V-conjugated FITC fluorescence and low levels of propidium iodide fluorescence.

Statistical analysis

Statistical significance was assessed using an unpaired Student's *t*-test. $P < 0.05$ was considered to be statistically significant. Data were expressed as mean \pm s.e.m.

RESULTS

Cisplatin-sensitive and -resistant human ESCC cell lines

To classify the ESCC cell lines (KYSE series) into cisplatin-sensitive and -resistant cell lines, the cell viability of nine KYSE cell lines in the presence of cisplatin was analyzed using the WST-1 assay (Figure 1). Cisplatin treatment (66.7 µM, 48 h) resulted in a decrease in cell viability of 0–80%, as compared with cells treated with the vehicle DMSO. Among the cell lines examined, KYSE890 and KYSE960 showed the highest sensitivity to cisplatin treatment (~20% cell viability), whereas KYSE450 and KYSE520 showed the lowest sensitivity to cisplatin treatment (~80–100% cell viability). We consequently designated the cell lines KYSE890 and KYSE960 as cisplatin sensitive and KYSE450 and KYSE520 cell lines as cisplatin resistant.

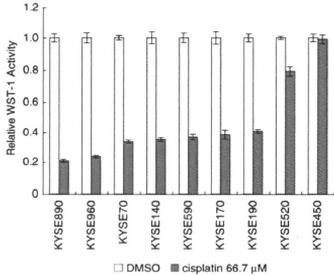


Figure 1 Designation of cisplatin-sensitive and -resistant human ESCC cell lines. The WST-1 activity of cells treated with DMSO was designated as 1 and the relative WST-1 activity is shown.

miR-141 is highly expressed in cisplatin-resistant ESCC cell lines

We then compared the expression of miRNAs in cisplatin-sensitive and -resistant KYSE cell lines using miRNA microarray analysis. Total RNA was isolated from the KYSE cell lines and hybridized to a custom miRNA microarray platform that contained 849 miRNAs. The global miRNA expression analyses (hierarchical clustering and principal component analysis) showed that the expression profiles of the miRNAs differed between the cisplatin-sensitive and -resistant cell lines (Figure 2), and expression levels of 45 miRNAs were changed by more than fourfold in cisplatin-sensitive cell lines as compared with cisplatin-resistant cell lines (Supplementary Table 1). Subsequently, the expression levels of the 10 miRNAs that were selected according to the miRNA microarray data and literature search²³⁻³⁹ were validated by quantitative reverse transcription-PCR. This confirmed that miR-141, miR-21, miR-19b, miR-200a, miR-19a, miR-27a, miR-20a and miR-20b were expressed at significantly higher levels in the cisplatin-resistant lines, and miR-205 and miR-224 at significantly lower levels than in the cisplatin-sensitive cell lines ($P < 0.05$) (Table 1). Notably, miR-141 was upregulated the most in the cisplatin-resistant lines as in contrast with the cisplatin-sensitive lines (87-fold, $P = 0.01$) (Figure 3).

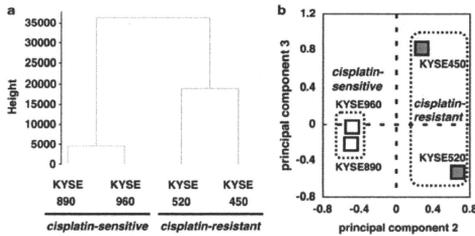


Figure 2 Global miRNA expression analysis of ESCC cell lines. Hierarchical clustering (a) and principal component analysis (b) of global miRNA expression in ESCC cell lines. These analyses reveal different miRNA expression profiles between cisplatin-sensitive and -resistant cell lines.

Table 1 List of miRNAs that were expressed differentially in cisplatin-sensitive and cisplatin-resistant cell lines

miRNAs	Expression level of miRNA (mean \pm s.e.m.)		Fold change Resistant/sensitive	P-value Resistant vs sensitive
	Cisplatin-sensitive cell lines	Cisplatin-resistant cell lines		
miR-141	189.67 \pm 24.95	16587.80 \pm 4145.71	87.45	0.0108
miR-21	64.57 \pm 10.62	3157.66 \pm 511.71	49.90	0.0018
miR-19b	1717.65 \pm 526.16	59809.56 \pm 5297.46	34.82	0.0001
miR-200a	161.26 \pm 45.91	2024.54 \pm 105.95	12.55	0.0001
miR-19a	383.92 \pm 95.89	27437.61 \pm 1074.00	71.47	0.0001
miR-27a	84.33 \pm 19.15	2313.07 \pm 278.58	27.43	0.0005
miR-20a	1620.13 \pm 435.78	79664.13 \pm 15638.85	49.17	0.0041
miR-20b	57.90 \pm 18.89	1063.99 \pm 225.53	18.38	0.0065
miR-205	22770.74 \pm 3752.22	2360.90 \pm 623.31	0.10	0.0026
miR-224	1680.99 \pm 131.29	444.79 \pm 283.08	0.26	0.0054

Abbreviation: miRNA, microRNA.

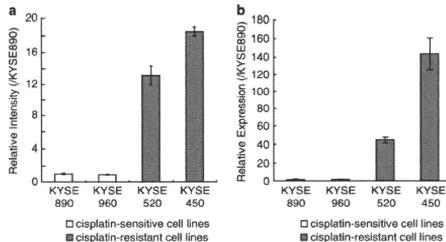


Figure 3 miR-141 is highly expressed in cisplatin-resistant KYSE cell lines. (a) miRNA microarray analysis. The data shown present the signal intensity of miR-141 relative to the signal intensity of miR-141 in KYSE990, which was set as 1. (b) Quantitative reverse transcription-PCR analysis of miR-141 was carried out to validate the microarray results. The data shown present levels of miR-141 relative to that in KYSE990, which was set as 1.

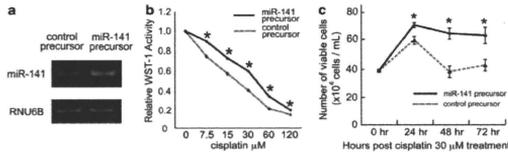


Figure 4 Ectopic expression of miR-141 induces cisplatin resistance in KYSE960 cell lines. (a) Ectopic expression of miR-141. KYSE960 cell lines, which express relatively low levels of endogenous miR-141, were transfected with the miR-141 or control precursor. Quantitative reverse transcription-PCR was used to analyze the expression of miR-141 (top) and *RNU6B* (bottom) in these cells. (b) Cell viability was assessed by the WST-1 assay. The WST-1 activity of cells treated with DMSO was taken as 1. (c) Trypan blue dye exclusion assay. The time at which the cells were treated with cisplatin was considered to be time 0. The number of viable cells at the respective time points is shown. * $P < 0.05$, between miR-141 precursor-transfected cells and control precursor-transfected cells.

Ectopic expression of miR-141 confers cisplatin resistance in cisplatin-sensitive cell lines

To investigate whether miR-141 is involved directly in the development of cisplatin resistance, we examined the effects of miR-141 on cisplatin sensitivity. We expressed the miR-141 precursor ectopically in the cisplatin-sensitive cell lines, because they express relatively low levels of endogenous miR-141, and examines whether miR-141 expression rendered the cells resistant to cisplatin-induced cell death. Following transfection of the miR-141 precursor, the cells were collected and ectopic expression of miR-141 was confirmed by quantitative reverse transcription-PCR (Figure 4a). Cells transfected with the control precursor were used as controls. The results of the WST-1 assay showed that the KYSE960 cells that had been transfected with the miR-141 precursor exhibited a markedly reduced sensitivity to varying concentrations of cisplatin (7.5, 15, 30, 60 or 120 μM) (Figure 4b). Similar findings were obtained with KYSE890 cells (data not shown). Moreover, the trypan blue dye exclusion assay revealed that the proportion of KYSE960 cells, which remained viable after treatment with cisplatin (30 μM), was significantly ($P < 0.05$) elevated at each time point in cells that overexpressed miR-141: 18, 68 and 48% at 24, 48 and 72 h after cisplatin treatment, respectively (Figure 4c). These results

indicated that ectopic expression of miR-141 could confer cisplatin resistance in KYSE cell lines by enhancing their growth and viability.

miR-141 represses YAP1 expression post transcriptionally

In an effort to elucidate the mechanism of induction of cisplatin resistance by miR-141, we searched for potential target(s) of miR-141 using the TargetScan database (<http://www.targetscan.org/>). Among the predicted 429 candidate genes, we studied the functional role of human Yes-Associated Protein (*YAP1*) (NM_006106) further, because it has been reported to be a cisplatin-induced apoptosis-related gene.⁴⁰ First, we investigated the effects of transfection of the miR-141 precursor on *YAP1* expression in cisplatin-sensitive KYSE cell lines. The quantitative reverse transcription-PCR and western blotting analyses revealed that expression levels of *YAP1* messenger RNA and protein were decreased in miR-141 precursor-transfected cells as compared with control precursor-transfected cells (Figure 5a), which indicated that the expression of *YAP1* was inhibited by miR-141. Furthermore, a significant ($P < 0.01$) decrease in relative luciferase activity was noted when the miR-141 precursor was co-transfected with the wild-type, but not with the mutant, *YAP1*-3'-UTR reporter (Figures 5b and c).

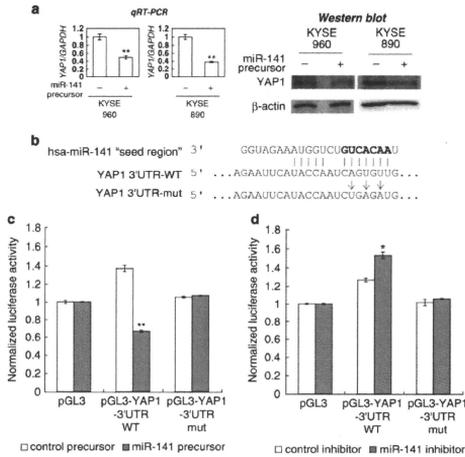


Figure 5 miR-141 negatively regulates YAP1 by binding to a complementary site in the YAP1 3'-UTR. (a) miR-141 reduces the expression levels of YAP1 messenger RNA and protein. Expression levels of YAP1 messenger RNA (left panels) and protein (right panels) were assessed 72 h after transfection of the miR-141 precursor or control precursor in cisplatin-sensitive KYSE cell lines. GAPDH for messenger RNA levels and β-actin for protein levels were used as controls. (b) Sequence alignment of human miR-141 with the 3'-UTR of YAP1. The seed sequence of miR-141 (top) was complementary to a sequence in the 3'-UTR of YAP1 (middle). Bottom, three point mutations were introduced into the 3'-UTR of YAP1 to create the mutant luciferase reporter construct. (c) miR-141 inhibits the wild-type YAP1-3'UTR reporter but not the mutated version. (d) The activity of the wild-type reporter but not the mutated version is upregulated by knockdown of miR-141. For each sample, luciferase activity was normalized to *Renilla* luciferase activity. ** $P < 0.01$, * $P < 0.05$, between miR-141 precursor-transfected cells and control precursor-transfected cells.

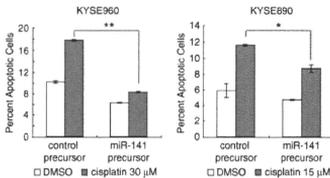


Figure 6 Ectopic expression of miR-141 renders cisplatin-sensitive cell lines resistant to cisplatin-induced apoptosis. KYSE960 and KYSE890 cell lines were transfected with the miR-141 or control precursor. After 24 h, cisplatin was added in fresh medium and the cells were incubated for a further 48 h. The cells were then labeled with FITC-Annexin V and propidium iodide, and apoptosis was analyzed by flow cytometry. The percentage of apoptotic cells is shown. ** $P < 0.01$, * $P < 0.05$, between miR-141 precursor-transfected cells and control precursor-transfected cells.

In contrast, when the wild-type reporter was co-transfected with the miR-141 inhibitor, the relative luciferase activity of the reporter was significantly ($P < 0.05$) enhanced (Figure 5d). These results show that miR-141 interacts directly with the predicted target sequence in YAP1.

miR-141 exerts an anti-apoptotic effect that confers cisplatin resistance in ESCC cell lines

Given that one of the target genes of miR-141 is YAP1, which is a transcriptional factor that promotes the expression of proapoptotic genes during apoptosis induced by DNA-damaging agents, we explored the regulatory mechanism by which miR-141 inhibits cisplatin-mediated apoptosis further. The Annexin V/propidium iodide assay showed that apoptosis of the cisplatin-sensitive ESCC cell lines (KYSE960 and KYSE890) in response to cisplatin was enhanced markedly compared with that of the cisplatin-resistant cells (data not shown). In both KYSE960 and KYSE890 cells, transfection of the miR-141 precursor, but not the control precursor, significantly decreased the percentage of cisplatin-induced apoptotic cells (Figure 6). Taken collectively, these results show that the anti-apoptotic effect of miR-141, perhaps through inhibition of YAP1,



might explain how miR-141 confers cisplatin resistance in ESCC cell lines.

DISCUSSION

In the present study, we explored the possible role of miRNAs in cisplatin resistance in ESCC. By comparing the expression of miRNAs in cisplatin-sensitive and -resistant KYSE series, we found 10 miRNAs that were expressed differentially between these lines. Among them were some miRNAs, such as miR-21, miR-20b, miR-205, miR-224, miR-27a, miR-200a and miR-141, which are known to be associated with cancer. miR-21 has been reported to be ubiquitously over-expressed in diverse tumors, including both esophageal adenocarcinoma and ESCC,²³ and it regulates proliferation and invasion in ESCC.²⁴ In addition, inhibition of miR-21 has been shown to increase the sensitivity of NCI60 and cholangiocarcinoma cell lines to chemotherapeutic agents.^{17,25} miR-20b is highly overexpressed in ESCC and gastric cancer,^{26,27} and its high-expression level is associated with a lower probability of survival.²⁸ The expression of miR-205 is highly specific for squamous epithelium,²⁹ and it has been shown to be downregulated in both esophageal adenocarcinoma and ESCC.³⁰ miR-205 has also been found to function as an oncosuppressor in breast cancer and to improve responsiveness to tyrosine kinase inhibitor therapies.³¹ Furthermore, miR-224, miR-27a and miR-200a have also been associated with hepatocellular carcinoma, ESCC and ovarian cancer, respectively.³²⁻³⁴ miR-141 is associated with various types of cancer.²⁻³⁹ Given that miR-141 was found to be either upregulated (ovarian and colorectal cancers)^{35,36} or downregulated (prostate, hepatocellular and renal cell carcinoma)³⁷⁻³⁹ in various cancers, it appears that miR-141 might have different roles, as either an oncogene or as a tumor-suppressor gene, in different cancer types of cancer. Therefore, most of the differentially expressed miRNAs identified in this study by comparing miRNA expression in cisplatin-sensitive and -resistant human ESCC cell lines appear to show some involvement in cancer; however, none of these miRNAs has previously been found to be associated with the development of cisplatin resistance.

Our study further showed that miR-141, which was the most upregulated miRNA in cisplatin-resistant ESCC cell lines, conferred cisplatin resistance in ESCC. Upon ectopic expression of miR-141, the viability of the cisplatin-sensitive cell lines after cisplatin treatment was elevated significantly. This effect was due to the inhibition of cisplatin-induced apoptosis by miR-141, which indicated that miR-141 is an anti-apoptotic factor. Furthermore, we found that miR-141 negatively regulates the expression of *YAP1*. *YAP1* is a well-documented proapoptotic transcriptional factor, and inhibition of its expression greatly reduces cisplatin-induced apoptosis.^{40,41} Given that the results of our present study showed that miR-141 targets *YAP1* and negatively regulates the expression of *YAP1*, it is likely that miR-141 exerts its anti-apoptotic effect, at least in part, through repressing *YAP1* expression.

In summary, our study provides the first evidence that miR-141 has a key role in cisplatin resistance in ESCC, because of its anti-apoptotic properties. Our study highlights the potentially important role of miRNAs in the development of drug resistance, and suggests that miRNAs might serve as biomarkers for response to chemotherapy.

ACKNOWLEDGEMENTS

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Supplementary Information accompanies the paper on Journal of Human Genetics website (<http://www.nature.com/jhg>)

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.						
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960	
MIMAT0000062	hsa-let-7a	4044	5132	1035	555	
MIMAT0000062	hsa-let-7a	4641	5770	1235	616	
MIMAT0004481	hsa-let-7a*	62	75	94	49	
MIMAT0004481	hsa-let-7a*	99	58	76	104	
MIMAT0000063	hsa-let-7b	1343	1229	593	294	
MIMAT0000063	hsa-let-7b	1637	1346	806	338	
MIMAT0004482	hsa-let-7b*	79	99	151	40	
MIMAT0004482	hsa-let-7b*	46	64	70	72	
MIMAT0000064	hsa-let-7c	2913	3055	850	353	
MIMAT0000064	hsa-let-7c	3303	3467	1089	415	
MIMAT0004483	hsa-let-7c*	98	77	86	82	
MIMAT0004483	hsa-let-7c*	57	91	109	105	
MIMAT0000065	hsa-let-7d	3268	5773	1061	562	
MIMAT0000065	hsa-let-7d	4264	5871	1051	414	
MIMAT0004484	hsa-let-7d*	59	75	59	125	
MIMAT0004484	hsa-let-7d*	100	102	89	91	
MIMAT0000066	hsa-let-7e	643	1112	180	152	
MIMAT0000066	hsa-let-7e	644	735	292	223	
MIMAT0004485	hsa-let-7e*	65	73	85	64	
MIMAT0004485	hsa-let-7e*	83	73	76	128	
MIMAT0000067	hsa-let-7f	3947	5358	600	363	
MIMAT0000067	hsa-let-7f	5227	6099	836	427	
MIMAT0004486	hsa-let-7f-1*	73	131	92	62	
MIMAT0004486	hsa-let-7f-1*	91	74	83	101	
MIMAT0004487	hsa-let-7f-2*	91	99	65	85	
MIMAT0004487	hsa-let-7f-2*	133	98	111	95	
MIMAT0000414	hsa-let-7g	1241	1243	243	169	
MIMAT0000414	hsa-let-7g	1082	976	178	109	
MIMAT0004584	hsa-let-7g*	96	99	78	71	
MIMAT0004584	hsa-let-7g*	85	90	53	56	
MIMAT0000415	hsa-let-7i	418	869	139	126	
MIMAT0000415	hsa-let-7i	376	694	152	101	
MIMAT0004585	hsa-let-7i*	92	45	60	101	
MIMAT0004585	hsa-let-7i*	64	80	72	58	
MIMAT0000416	hsa-miR-1	96	76	78	81	
MIMAT0000416	hsa-miR-1	65	101	78	77	
MIMAT0000098	hsa-miR-100	367	970	57	87	
MIMAT0000098	hsa-miR-100	321	1218	95	39	
MIMAT0004512	hsa-miR-100*	60	64	96	51	
MIMAT0004512	hsa-miR-100*	71	68	38	31	
MIMAT0000099	hsa-miR-101	68	75	49	87	
MIMAT0000099	hsa-miR-101	109	79	44	50	
MIMAT0004513	hsa-miR-101*	43	72	46	73	
MIMAT0004513	hsa-miR-101*	81	77	62	75	
MIMAT0000101	hsa-miR-103	1469	1623	554	405	
MIMAT0000101	hsa-miR-103	1584	3464	623	388	
MIMAT0007402	hsa-miR-103-as	97	101	56	41	
MIMAT0007402	hsa-miR-103-as	92	105	45	92	
MIMAT0000102	hsa-miR-105	52	82	100	68	
MIMAT0000102	hsa-miR-105	58	136	100	111	
MIMAT0004516	hsa-miR-105*	47	91	73	82	
MIMAT0004516	hsa-miR-105*	50	102	35	69	
MIMAT0000103	hsa-miR-106a	2241	2727	187	244	
MIMAT0000103	hsa-miR-106a	2741	3273	184	294	
MIMAT0004517	hsa-miR-106a*	90	47	90	107	
MIMAT0004517	hsa-miR-106a*	85	99	54	44	
MIMAT0000680	hsa-miR-106b	1367	1453	93	233	
MIMAT0000680	hsa-miR-106b	1610	1548	144	221	
MIMAT0004672	hsa-miR-106b*	130	101	96	124	
MIMAT0004672	hsa-miR-106b*	166	96	153	167	
MIMAT0000104	hsa-miR-107	1080	2448	324	388	
MIMAT0000104	hsa-miR-107	1328	3063	415	485	
MIMAT0000253	hsa-miR-10a	96	118	104	44	
MIMAT0000253	hsa-miR-10a	46	153	80	81	
MIMAT0004555	hsa-miR-10a*	57	68	87	73	
MIMAT0004555	hsa-miR-10a*	88	70	118	64	
MIMAT0000254	hsa-miR-10b	55	206	168	90	
MIMAT0000254	hsa-miR-10b	63	120	269	84	

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0004556	hsa-miR-10b*	56	62	64	113
MIMAT0004556	hsa-miR-10b*	58	70	61	103
MIMAT0005823	hsa-miR-1178	77	91	75	41
MIMAT0005823	hsa-miR-1178	74	80	74	80
MIMAT0005824	hsa-miR-1179	76	46	35	57
MIMAT0005824	hsa-miR-1179	23	63	65	58
MIMAT0005825	hsa-miR-1180	89	87	81	73
MIMAT0005825	hsa-miR-1180	82	94	109	89
MIMAT0005826	hsa-miR-1181	96	76	156	86
MIMAT0005826	hsa-miR-1181	63	112	97	117
MIMAT0005827	hsa-miR-1182	71	64	87	89
MIMAT0005827	hsa-miR-1182	103	71	83	71
MIMAT0005828	hsa-miR-1183	65	44	50	79
MIMAT0005828	hsa-miR-1183	84	76	113	83
MIMAT0005829	hsa-miR-1184	62	68	56	78
MIMAT0005829	hsa-miR-1184	77	81	71	45
MIMAT0005798	hsa-miR-1185	114	81	71	69
MIMAT0005798	hsa-miR-1185	58	104	68	34
MIMAT0005955	hsa-miR-1197	42	42	58	52
MIMAT0005955	hsa-miR-1197	79	61	57	69
MIMAT0005863	hsa-miR-1200	46	65	89	83
MIMAT0005863	hsa-miR-1200	117	67	69	81
MIMAT0005864	hsa-miR-1201	374	216	879	459
MIMAT0005864	hsa-miR-1201	424	154	887	517
MIMAT0005865	hsa-miR-1202	50	71	85	88
MIMAT0005865	hsa-miR-1202	95	67	104	68
MIMAT0005866	hsa-miR-1203	64	110	104	121
MIMAT0005866	hsa-miR-1203	97	108	105	108
MIMAT0005868	hsa-miR-1204	88	133	92	83
MIMAT0005868	hsa-miR-1204	129	67	82	114
MIMAT0005869	hsa-miR-1205	86	70	66	50
MIMAT0005869	hsa-miR-1205	82	83	77	54
MIMAT0005870	hsa-miR-1206	37	125	104	46
MIMAT0005870	hsa-miR-1206	163	52	53	76
MIMAT0005872	hsa-miR-1207-3p	71	75	87	46
MIMAT0005872	hsa-miR-1207-3p	89	57	72	98
MIMAT0005871	hsa-miR-1207-5p	123	139	125	86
MIMAT0005871	hsa-miR-1207-5p	115	104	116	88
MIMAT0005873	hsa-miR-1208	66	67	57	47
MIMAT0005873	hsa-miR-1208	80	50	88	85
MIMAT0000421	hsa-miR-122	41	91	126	95
MIMAT0000421	hsa-miR-122	101	65	93	86
MIMAT0004590	hsa-miR-122*	83	49	51	95
MIMAT0004590	hsa-miR-122*	73	115	60	60
MIMAT0005459	hsa-miR-1224-3p	86	80	115	86
MIMAT0005459	hsa-miR-1224-3p	101	70	76	45
MIMAT0005458	hsa-miR-1224-5p	101	127	72	112
MIMAT0005458	hsa-miR-1224-5p	68	102	77	64
MIMAT0005373	hsa-miR-1225-3p	67	117	130	91
MIMAT0005373	hsa-miR-1225-3p	77	111	84	79
MIMAT0005372	hsa-miR-1225-5p	103	95	27	107
MIMAT0005372	hsa-miR-1225-5p	73	56	52	81
MIMAT0005377	hsa-miR-1226	72	140	80	95
MIMAT0005377	hsa-miR-1226	46	114	84	70
MIMAT0005376	hsa-miR-1226*	67	71	64	60
MIMAT0005376	hsa-miR-1226*	88	81	63	39
MIMAT0005580	hsa-miR-1227	61	88	92	29
MIMAT0005580	hsa-miR-1227	39	96	70	87
MIMAT0005583	hsa-miR-1228	78	98	81	71
MIMAT0005583	hsa-miR-1228	108	127	112	96
MIMAT0005582	hsa-miR-1228*	244	257	294	308
MIMAT0005582	hsa-miR-1228*	274	317	421	510
MIMAT0005584	hsa-miR-1229	75	81	121	65
MIMAT0005584	hsa-miR-1229	111	152	91	101
MIMAT0005586	hsa-miR-1231	97	75	66	62
MIMAT0005586	hsa-miR-1231	102	62	82	67
MIMAT0005588	hsa-miR-1233	80	63	123	91
MIMAT0005588	hsa-miR-1233	101	113	105	72

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0005589	hsa-miR-1234	77	76	90	128
MIMAT0005589	hsa-miR-1234	81	86	104	116
MIMAT0005591	hsa-miR-1236	115	64	94	93
MIMAT0005591	hsa-miR-1236	112	74	102	61
MIMAT0005592	hsa-miR-1237	56	81	121	80
MIMAT0005592	hsa-miR-1237	50	79	86	66
MIMAT0005593	hsa-miR-1238	113	37	42	85
MIMAT0005593	hsa-miR-1238	100	85	72	82
MIMAT0000422	hsa-miR-124	73	57	49	42
MIMAT0000422	hsa-miR-124	31	70	66	45
MIMAT0004591	hsa-miR-124*	113	39	42	55
MIMAT0004591	hsa-miR-124*	49	92	91	70
MIMAT0005894	hsa-miR-1243	67	90	28	29
MIMAT0005894	hsa-miR-1243	66	100	72	63
MIMAT0005896	hsa-miR-1244	80	62	91	75
MIMAT0005896	hsa-miR-1244	91	83	101	79
MIMAT0005897	hsa-miR-1245	116	55	90	77
MIMAT0005897	hsa-miR-1245	74	46	122	61
MIMAT0005898	hsa-miR-1246	1189	1390	4543	1216
MIMAT0005898	hsa-miR-1246	1188	1347	3788	925
MIMAT0005899	hsa-miR-1247	45	87	78	68
MIMAT0005899	hsa-miR-1247	77	79	48	61
MIMAT0005900	hsa-miR-1248	59	57	51	102
MIMAT0005900	hsa-miR-1248	45	60	82	65
MIMAT0005901	hsa-miR-1249	104	85	91	133
MIMAT0005901	hsa-miR-1249	92	72	77	88
MIMAT0005902	hsa-miR-1250	73	92	52	64
MIMAT0005902	hsa-miR-1250	47	75	74	39
MIMAT0005903	hsa-miR-1251	19	62	70	77
MIMAT0005903	hsa-miR-1251	48	65	58	54
MIMAT0005944	hsa-miR-1252	65	75	80	99
MIMAT0005944	hsa-miR-1252	56	91	63	72
MIMAT0005904	hsa-miR-1253	46	36	70	57
MIMAT0005904	hsa-miR-1253	57	36	89	41
MIMAT0005905	hsa-miR-1254	63	87	59	44
MIMAT0005905	hsa-miR-1254	86	63	48	112
MIMAT0005906	hsa-miR-1255a	49	95	74	57
MIMAT0005906	hsa-miR-1255a	73	104	59	89
MIMAT0005945	hsa-miR-1255b	128	66	74	116
MIMAT0005945	hsa-miR-1255b	67	72	65	76
MIMAT0005907	hsa-miR-1256	49	66	47	94
MIMAT0005907	hsa-miR-1256	126	75	75	51
MIMAT0005908	hsa-miR-1257	60	40	39	108
MIMAT0005908	hsa-miR-1257	83	51	113	64
MIMAT0005909	hsa-miR-1258	98	50	76	103
MIMAT0005909	hsa-miR-1258	92	90	81	51
MIMAT0005910	hsa-miR-1259	69	91	80	78
MIMAT0005910	hsa-miR-1259	96	55	50	69
MIMAT0004602	hsa-miR-125a-3p	261	395	76	79
MIMAT0004602	hsa-miR-125a-3p	458	539	77	147
MIMAT0000443	hsa-miR-125a-5p	146	442	48	100
MIMAT0000443	hsa-miR-125a-5p	175	331	103	162
MIMAT0000423	hsa-miR-125b	246	629	96	96
MIMAT0000423	hsa-miR-125b	251	584	87	67
MIMAT0004592	hsa-miR-125b-1*	108	100	110	93
MIMAT0004592	hsa-miR-125b-1*	68	131	67	85
MIMAT0004603	hsa-miR-125b-2*	97	88	84	100
MIMAT0004603	hsa-miR-125b-2*	57	81	73	42
MIMAT0000445	hsa-miR-126	228	136	105	101
MIMAT0000445	hsa-miR-126	172	150	98	74
MIMAT0000444	hsa-miR-126*	62	80	67	58
MIMAT0000444	hsa-miR-126*	90	91	64	131
MIMAT0005911	hsa-miR-1260	3218	3165	332	342
MIMAT0005911	hsa-miR-1260	3511	3943	230	298
MIMAT0005913	hsa-miR-1261	39	57	61	66
MIMAT0005913	hsa-miR-1261	42	97	40	78
MIMAT0005914	hsa-miR-1262	123	24	64	59
MIMAT0005914	hsa-miR-1262	20	60	101	53

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.						
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960	
MIMAT0005915	hsa-miR-1263	60	110	80	69	
MIMAT0005915	hsa-miR-1263	104	66	67	84	
MIMAT0005791	hsa-miR-1264	59	74	55	78	
MIMAT0005791	hsa-miR-1264	66	103	79	84	
MIMAT0005918	hsa-miR-1265	65	80	50	84	
MIMAT0005918	hsa-miR-1265	52	107	44	33	
MIMAT0005920	hsa-miR-1266	70	86	106	34	
MIMAT0005920	hsa-miR-1266	89	81	118	86	
MIMAT0005921	hsa-miR-1267	103	79	85	84	
MIMAT0005921	hsa-miR-1267	57	92	119	89	
MIMAT0005922	hsa-miR-1268	186	342	448	287	
MIMAT0005922	hsa-miR-1268	179	325	405	219	
MIMAT0005923	hsa-miR-1269	77	82	98	57	
MIMAT0005923	hsa-miR-1269	55	80	58	78	
MIMAT0000446	hsa-miR-127-3p	71	142	119	60	
MIMAT0000446	hsa-miR-127-3p	67	57	40	53	
MIMAT0004604	hsa-miR-127-5p	59	57	38	76	
MIMAT0004604	hsa-miR-127-5p	46	78	90	79	
MIMAT0005924	hsa-miR-1270	49	80	74	51	
MIMAT0005924	hsa-miR-1270	75	88	92	93	
MIMAT0005796	hsa-miR-1271	46	69	89	62	
MIMAT0005796	hsa-miR-1271	144	69	101	90	
MIMAT0005925	hsa-miR-1272	69	94	68	97	
MIMAT0005925	hsa-miR-1272	85	86	72	48	
MIMAT0005926	hsa-miR-1273	68	81	76	75	
MIMAT0005926	hsa-miR-1273	88	82	101	58	
MIMAT0005927	hsa-miR-1274a	1962	3624	86	106	
MIMAT0005927	hsa-miR-1274a	4143	4824	161	158	
MIMAT0005938	hsa-miR-1274b	10561	21431	242	557	
MIMAT0005938	hsa-miR-1274b	16393	27495	270	408	
MIMAT0005929	hsa-miR-1275	118	125	224	167	
MIMAT0005929	hsa-miR-1275	97	178	174	146	
MIMAT0005930	hsa-miR-1276	86	58	96	47	
MIMAT0005930	hsa-miR-1276	54	90	50	74	
MIMAT0005933	hsa-miR-1277	106	90	93	75	
MIMAT0005933	hsa-miR-1277	55	83	64	47	
MIMAT0005936	hsa-miR-1278	43	75	110	93	
MIMAT0005936	hsa-miR-1278	72	48	59	80	
MIMAT0005937	hsa-miR-1279	76	80	68	49	
MIMAT0005937	hsa-miR-1279	85	37	89	168	
MIMAT0000424	hsa-miR-128	141	145	132	95	
MIMAT0000424	hsa-miR-128	127	184	101	65	
MIMAT0005946	hsa-miR-1280	17665	24581	1430	2226	
MIMAT0005946	hsa-miR-1280	20873	26426	1418	2208	
MIMAT0005939	hsa-miR-1281	82	100	126	94	
MIMAT0005939	hsa-miR-1281	104	82	96	73	
MIMAT0005940	hsa-miR-1282	53	77	87	76	
MIMAT0005940	hsa-miR-1282	23	53	41	92	
MIMAT0005799	hsa-miR-1283	92	81	51	69	
MIMAT0005799	hsa-miR-1283	96	63	78	74	
MIMAT0005941	hsa-miR-1284	113	69	73	85	
MIMAT0005941	hsa-miR-1284	41	88	131	104	
MIMAT0005876	hsa-miR-1285	404	709	722	388	
MIMAT0005876	hsa-miR-1285	590	850	894	507	
MIMAT0005877	hsa-miR-1286	123	65	107	74	
MIMAT0005877	hsa-miR-1286	75	141	76	121	
MIMAT0005878	hsa-miR-1287	130	109	118	69	
MIMAT0005878	hsa-miR-1287	86	138	58	48	
MIMAT0005942	hsa-miR-1288	83	113	77	82	
MIMAT0005942	hsa-miR-1288	90	88	99	42	
MIMAT0005879	hsa-miR-1289	81	100	88	71	
MIMAT0005879	hsa-miR-1289	66	38	96	77	
MIMAT0004605	hsa-miR-129-3p	75	141	49	64	
MIMAT0004605	hsa-miR-129-3p	94	92	104	71	
MIMAT0000242	hsa-miR-129-5p	160	99	107	101	
MIMAT0000242	hsa-miR-129-5p	194	156	127	98	
MIMAT0004548	hsa-miR-129*	54	96	98	69	
MIMAT0004548	hsa-miR-129*	80	75	67	76	

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0005880	hsa-miR-1290	141	116	399	142
MIMAT0005880	hsa-miR-1290	165	143	439	137
MIMAT0005881	hsa-miR-1291	119	104	125	86
MIMAT0005881	hsa-miR-1291	103	80	121	100
MIMAT0005943	hsa-miR-1292	78	84	87	79
MIMAT0005943	hsa-miR-1292	86	88	33	61
MIMAT0005883	hsa-miR-1293	51	58	95	54
MIMAT0005883	hsa-miR-1293	52	73	66	76
MIMAT0005884	hsa-miR-1294	71	51	81	42
MIMAT0005884	hsa-miR-1294	57	73	46	60
MIMAT0005885	hsa-miR-1295	63	63	81	40
MIMAT0005885	hsa-miR-1295	46	55	88	61
MIMAT0005794	hsa-miR-1296	82	123	53	114
MIMAT0005794	hsa-miR-1296	57	99	81	135
MIMAT0005886	hsa-miR-1297	54	91	77	63
MIMAT0005886	hsa-miR-1297	40	60	67	73
MIMAT0005800	hsa-miR-1298	86	62	37	67
MIMAT0005800	hsa-miR-1298	77	31	75	55
MIMAT0005887	hsa-miR-1299	52	79	101	27
MIMAT0005887	hsa-miR-1299	57	40	63	67
MIMAT0005888	hsa-miR-1300	54	41	54	26
MIMAT0005888	hsa-miR-1300	58	74	48	78
MIMAT0005797	hsa-miR-1301	87	56	123	130
MIMAT0005797	hsa-miR-1301	57	53	72	54
MIMAT0005890	hsa-miR-1302	45	90	98	88
MIMAT0005890	hsa-miR-1302	87	41	65	73
MIMAT0005891	hsa-miR-1303	19	94	92	39
MIMAT0005891	hsa-miR-1303	64	49	62	129
MIMAT0005892	hsa-miR-1304	101	77	65	53
MIMAT0005892	hsa-miR-1304	51	91	67	68
MIMAT0005893	hsa-miR-1305	53	101	91	70
MIMAT0005893	hsa-miR-1305	69	84	76	80
MIMAT0005950	hsa-miR-1306	120	131	53	107
MIMAT0005950	hsa-miR-1306	83	141	56	56
MIMAT0005951	hsa-miR-1307	78	72	115	92
MIMAT0005951	hsa-miR-1307	102	67	104	88
MIMAT0005947	hsa-miR-1308	964	993	234	494
MIMAT0005947	hsa-miR-1308	1057	1091	351	480
MIMAT0000425	hsa-miR-130a	504	1917	147	77
MIMAT0000425	hsa-miR-130a	585	1954	122	74
MIMAT0004593	hsa-miR-130a*	125	98	169	109
MIMAT0004593	hsa-miR-130a*	93	106	85	122
MIMAT0000691	hsa-miR-130b	149	493	148	110
MIMAT0000691	hsa-miR-130b	135	477	120	78
MIMAT0004680	hsa-miR-130b*	41	80	93	80
MIMAT0004680	hsa-miR-130b*	99	161	77	96
MIMAT0000426	hsa-miR-132	86	94	48	34
MIMAT0000426	hsa-miR-132	100	103	86	66
MIMAT0004594	hsa-miR-132*	75	70	81	72
MIMAT0004594	hsa-miR-132*	96	72	74	109
MIMAT0005952	hsa-miR-1321	61	90	96	60
MIMAT0005952	hsa-miR-1321	41	87	70	92
MIMAT0005953	hsa-miR-1322	52	61	57	66
MIMAT0005953	hsa-miR-1322	78	86	66	68
MIMAT0005795	hsa-miR-1323	60	98	96	98
MIMAT0005795	hsa-miR-1323	68	118	81	70
MIMAT0005956	hsa-miR-1324	74	82	46	64
MIMAT0005956	hsa-miR-1324	73	91	83	88
MIMAT0000427	hsa-miR-133a	60	111	80	73
MIMAT0000427	hsa-miR-133a	50	81	64	92
MIMAT0000770	hsa-miR-133b	79	111	63	50
MIMAT0000770	hsa-miR-133b	63	59	84	103
MIMAT0000447	hsa-miR-134	31	93	57	70
MIMAT0000447	hsa-miR-134	76	86	83	82
MIMAT0000428	hsa-miR-135a	92	121	83	34
MIMAT0000428	hsa-miR-135a	71	127	99	68
MIMAT0004595	hsa-miR-135a*	83	61	66	74
MIMAT0004595	hsa-miR-135a*	88	60	142	55

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0000758	hsa-miR-135b	70	69	44	56
MIMAT0000758	hsa-miR-135b	144	120	51	118
MIMAT0004698	hsa-miR-135b*	75	62	72	77
MIMAT0004698	hsa-miR-135b*	50	72	53	59
MIMAT0000448	hsa-miR-136	58	53	97	38
MIMAT0000448	hsa-miR-136	69	56	55	101
MIMAT0004606	hsa-miR-136*	124	63	60	69
MIMAT0004606	hsa-miR-136*	57	80	86	47
MIMAT0000429	hsa-miR-137	34	88	66	43
MIMAT0000429	hsa-miR-137	64	98	73	64
MIMAT0000430	hsa-miR-138	47	111	130	66
MIMAT0000430	hsa-miR-138	97	113	79	56
MIMAT0004607	hsa-miR-138-1*	66	95	103	110
MIMAT0004607	hsa-miR-138-1*	92	93	44	118
MIMAT0004596	hsa-miR-138-2*	45	117	66	96
MIMAT0004596	hsa-miR-138-2*	74	131	115	89
MIMAT0004552	hsa-miR-139-3p	41	50	77	93
MIMAT0004552	hsa-miR-139-3p	69	71	56	130
MIMAT0000250	hsa-miR-139-5p	84	153	59	55
MIMAT0000250	hsa-miR-139-5p	76	132	84	60
MIMAT0004597	hsa-miR-140-3p	120	145	100	93
MIMAT0004597	hsa-miR-140-3p	127	136	94	161
MIMAT0000431	hsa-miR-140-5p	55	87	59	60
MIMAT0000431	hsa-miR-140-5p	62	64	50	68
MIMAT0000432	hsa-miR-141	1604	1066	98	82
MIMAT0000432	hsa-miR-141	1698	1283	81	74
MIMAT0004598	hsa-miR-141*	91	74	98	85
MIMAT0004598	hsa-miR-141*	90	92	102	73
MIMAT0000434	hsa-miR-142-3p	56	56	59	52
MIMAT0000434	hsa-miR-142-3p	76	100	45	45
MIMAT0000433	hsa-miR-142-5p	43	41	78	16
MIMAT0000433	hsa-miR-142-5p	56	63	47	53
MIMAT0000435	hsa-miR-143	47	51	91	40
MIMAT0000435	hsa-miR-143	41	66	58	61
MIMAT0004599	hsa-miR-143*	83	70	58	66
MIMAT0004599	hsa-miR-143*	42	82	70	110
MIMAT0000436	hsa-miR-144	81	91	67	44
MIMAT0000436	hsa-miR-144	46	38	74	77
MIMAT0004600	hsa-miR-144*	73	85	92	74
MIMAT0004600	hsa-miR-144*	31	86	92	80
MIMAT0000437	hsa-miR-145	65	79	87	99
MIMAT0000437	hsa-miR-145	68	74	80	61
MIMAT0004601	hsa-miR-145*	84	81	86	87
MIMAT0004601	hsa-miR-145*	86	83	81	89
MIMAT0006789	hsa-miR-1468	92	72	81	65
MIMAT0006789	hsa-miR-1468	72	80	57	56
MIMAT0007347	hsa-miR-1469	112	265	336	249
MIMAT0007347	hsa-miR-1469	237	235	349	196
MIMAT0000449	hsa-miR-146a	63	85	93	63
MIMAT0000449	hsa-miR-146a	55	87	53	113
MIMAT0004608	hsa-miR-146a*	60	58	70	65
MIMAT0004608	hsa-miR-146a*	90	58	77	86
MIMAT0004766	hsa-miR-146b-3p	86	59	87	84
MIMAT0004766	hsa-miR-146b-3p	52	52	68	83
MIMAT0002809	hsa-miR-146b-5p	101	121	65	64
MIMAT0002809	hsa-miR-146b-5p	89	85	62	81
MIMAT0000251	hsa-miR-147	93	125	60	69
MIMAT0000251	hsa-miR-147	95	65	99	84
MIMAT0007348	hsa-miR-1470	68	93	74	82
MIMAT0007348	hsa-miR-1470	104	115	136	122
MIMAT0007349	hsa-miR-1471	72	125	72	71
MIMAT0007349	hsa-miR-1471	112	110	76	81
MIMAT0004928	hsa-miR-147b	67	84	96	71
MIMAT0004928	hsa-miR-147b	88	74	39	81
MIMAT0000243	hsa-miR-148a	72	155	108	88
MIMAT0000243	hsa-miR-148a	87	153	82	91
MIMAT0004349	hsa-miR-148a*	42	89	87	95
MIMAT0004349	hsa-miR-148a*	56	51	56	88

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0000759	hsa-miR-148b	189	107	92	68
MIMAT0000759	hsa-miR-148b	163	112	95	57
MIMAT0004699	hsa-miR-148b*	66	77	50	42
MIMAT0004699	hsa-miR-148b*	66	38	73	107
MIMAT0000450	hsa-miR-149	169	309	411	219
MIMAT0000450	hsa-miR-149	204	266	347	233
MIMAT0004609	hsa-miR-149*	259	416	313	399
MIMAT0004609	hsa-miR-149*	363	334	329	425
MIMAT0000451	hsa-miR-150	123	85	92	68
MIMAT0000451	hsa-miR-150	74	55	94	59
MIMAT0004610	hsa-miR-150*	111	89	74	100
MIMAT0004610	hsa-miR-150*	68	84	92	74
MIMAT0000757	hsa-miR-151-3p	145	152	103	97
MIMAT0000757	hsa-miR-151-3p	206	186	121	97
MIMAT0004697	hsa-miR-151-5p	284	407	197	182
MIMAT0004697	hsa-miR-151-5p	331	478	254	187
MIMAT0000438	hsa-miR-152	60	141	110	59
MIMAT0000438	hsa-miR-152	61	141	52	91
MIMAT0000439	hsa-miR-153	75	115	75	72
MIMAT0000439	hsa-miR-153	22	59	80	86
MIMAT0007399	hsa-miR-1537	112	59	64	67
MIMAT0007399	hsa-miR-1537	80	99	66	100
MIMAT0007400	hsa-miR-1538	79	82	82	107
MIMAT0007400	hsa-miR-1538	81	123	94	103
MIMAT0007401	hsa-miR-1539	83	74	76	97
MIMAT0007401	hsa-miR-1539	103	73	84	57
MIMAT0000452	hsa-miR-154	44	72	89	76
MIMAT0000452	hsa-miR-154	74	99	108	68
MIMAT0000453	hsa-miR-154*	71	83	107	41
MIMAT0000453	hsa-miR-154*	86	69	60	93
MIMAT0000646	hsa-miR-155	142	520	92	70
MIMAT0000646	hsa-miR-155	66	390	58	36
MIMAT0004658	hsa-miR-155*	109	93	58	69
MIMAT0004658	hsa-miR-155*	62	96	91	78
MIMAT0000068	hsa-miR-15a	234	404	115	71
MIMAT0000068	hsa-miR-15a	303	450	97	84
MIMAT0004488	hsa-miR-15a*	69	89	79	55
MIMAT0004488	hsa-miR-15a*	80	81	61	94
MIMAT0000417	hsa-miR-15b	976	1417	889	1188
MIMAT0000417	hsa-miR-15b	993	982	797	1315
MIMAT0004586	hsa-miR-15b*	65	90	84	91
MIMAT0004586	hsa-miR-15b*	132	66	94	112
MIMAT0000069	hsa-miR-16	1729	3277	634	478
MIMAT0000069	hsa-miR-16	2195	3299	486	398
MIMAT0004489	hsa-miR-16-1*	88	100	99	58
MIMAT0004489	hsa-miR-16-1*	108	81	86	90
MIMAT0004518	hsa-miR-16-2*	83	167	71	117
MIMAT0004518	hsa-miR-16-2*	85	75	108	65
MIMAT0000070	hsa-miR-17	2057	2485	189	335
MIMAT0000070	hsa-miR-17	1509	1501	235	400
MIMAT0000071	hsa-miR-17*	124	85	58	56
MIMAT0000071	hsa-miR-17*	115	167	79	73
MIMAT0000256	hsa-miR-181a	86	510	80	89
MIMAT0000256	hsa-miR-181a	149	632	90	104
MIMAT0004558	hsa-miR-181a-2*	64	170	131	44
MIMAT0004558	hsa-miR-181a-2*	120	219	66	79
MIMAT0000270	hsa-miR-181a*	80	99	122	102
MIMAT0000270	hsa-miR-181a*	90	116	75	66
MIMAT0000257	hsa-miR-181b	99	333	71	47
MIMAT0000257	hsa-miR-181b	121	297	105	164
MIMAT0000258	hsa-miR-181c	79	121	64	171
MIMAT0000258	hsa-miR-181c	117	181	69	98
MIMAT0004559	hsa-miR-181c*	88	73	143	89
MIMAT0004559	hsa-miR-181c*	32	76	66	40
MIMAT0002821	hsa-miR-181d	65	161	47	67
MIMAT0002821	hsa-miR-181d	108	249	87	77
MIMAT0000259	hsa-miR-182	528	573	177	118
MIMAT0000259	hsa-miR-182	553	424	122	114

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0000260	hsa-miR-182*	98	200	106	100
MIMAT0000260	hsa-miR-182*	98	229	108	82
MIMAT0006765	hsa-miR-1825	90	99	84	68
MIMAT0006765	hsa-miR-1825	70	87	74	74
MIMAT0006766	hsa-miR-1826	44919	49047	65228	65468
MIMAT0006766	hsa-miR-1826	65483	65480	65467	65475
MIMAT0006767	hsa-miR-1827	85	101	50	90
MIMAT0006767	hsa-miR-1827	55	103	85	42
MIMAT0000261	hsa-miR-183	137	179	47	130
MIMAT0000261	hsa-miR-183	163	267	107	50
MIMAT0004560	hsa-miR-183*	96	50	55	71
MIMAT0004560	hsa-miR-183*	91	78	73	74
MIMAT0000454	hsa-miR-184	48	45	71	90
MIMAT0000454	hsa-miR-184	89	77	53	63
MIMAT0000455	hsa-miR-185	170	567	113	106
MIMAT0000455	hsa-miR-185	163	451	78	80
MIMAT0004611	hsa-miR-185*	44	97	80	91
MIMAT0004611	hsa-miR-185*	76	104	78	69
MIMAT0000456	hsa-miR-186	107	189	90	56
MIMAT0000456	hsa-miR-186	97	200	108	97
MIMAT0004612	hsa-miR-186*	110	100	86	74
MIMAT0004612	hsa-miR-186*	74	83	90	71
MIMAT0000262	hsa-miR-187	42	126	51	88
MIMAT0000262	hsa-miR-187	81	70	108	64
MIMAT0004561	hsa-miR-187*	1019	1439	127	241
MIMAT0004561	hsa-miR-187*	798	1115	181	160
MIMAT0004613	hsa-miR-188-3p	82	73	79	86
MIMAT0004613	hsa-miR-188-3p	63	145	102	97
MIMAT0000457	hsa-miR-188-5p	47	57	77	103
MIMAT0000457	hsa-miR-188-5p	61	89	115	76
MIMAT0000072	hsa-miR-18a	265	403	101	77
MIMAT0000072	hsa-miR-18a	320	381	73	79
MIMAT0002891	hsa-miR-18a*	102	131	141	100
MIMAT0002891	hsa-miR-18a*	96	143	65	100
MIMAT0001412	hsa-miR-18b	142	270	56	81
MIMAT0001412	hsa-miR-18b	289	357	35	80
MIMAT0004751	hsa-miR-18b*	51	67	63	26
MIMAT0004751	hsa-miR-18b*	45	73	96	99
MIMAT0000458	hsa-miR-190	57	34	66	72
MIMAT0000458	hsa-miR-190	49	86	64	68
MIMAT0007881	hsa-miR-1908	266	499	599	376
MIMAT0007881	hsa-miR-1908	343	484	477	404
MIMAT0007883	hsa-miR-1909	181	182	198	141
MIMAT0007883	hsa-miR-1909	169	163	90	165
MIMAT0007882	hsa-miR-1909*	107	109	66	74
MIMAT0007882	hsa-miR-1909*	73	88	55	90
MIMAT0004929	hsa-miR-190b	58	78	62	85
MIMAT0004929	hsa-miR-190b	92	79	79	87
MIMAT0000440	hsa-miR-191	760	732	655	488
MIMAT0000440	hsa-miR-191	766	632	681	408
MIMAT0001618	hsa-miR-191*	61	75	90	42
MIMAT0001618	hsa-miR-191*	64	89	105	46
MIMAT0007884	hsa-miR-1910	120	132	88	130
MIMAT0007884	hsa-miR-1910	74	108	107	96
MIMAT0007885	hsa-miR-1911	62	79	101	111
MIMAT0007885	hsa-miR-1911	77	85	111	50
MIMAT0007886	hsa-miR-1911*	80	93	96	39
MIMAT0007886	hsa-miR-1911*	124	111	54	67
MIMAT0007887	hsa-miR-1912	106	90	69	71
MIMAT0007887	hsa-miR-1912	58	81	80	95
MIMAT0007888	hsa-miR-1913	272	257	156	128
MIMAT0007888	hsa-miR-1913	242	286	189	138
MIMAT0007889	hsa-miR-1914	73	68	50	53
MIMAT0007889	hsa-miR-1914	103	65	98	77
MIMAT0007890	hsa-miR-1914*	72	56	76	92
MIMAT0007890	hsa-miR-1914*	63	106	102	91
MIMAT0007892	hsa-miR-1915	52	125	116	142
MIMAT0007892	hsa-miR-1915	98	118	111	151

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0007891	hsa-miR-1915*	68	42	53	73
MIMAT0007891	hsa-miR-1915*	31	44	72	72
MIMAT0000222	hsa-miR-192	91	179	97	89
MIMAT0000222	hsa-miR-192	121	150	111	146
MIMAT0004543	hsa-miR-192*	83	63	75	98
MIMAT0004543	hsa-miR-192*	83	59	71	62
MIMAT0000459	hsa-miR-193a-3p	101	422	84	111
MIMAT0000459	hsa-miR-193a-3p	67	434	75	118
MIMAT0004614	hsa-miR-193a-5p	84	84	112	66
MIMAT0004614	hsa-miR-193a-5p	71	84	98	82
MIMAT0002819	hsa-miR-193b	292	326	283	230
MIMAT0002819	hsa-miR-193b	310	562	350	313
MIMAT0004767	hsa-miR-193b*	85	84	50	106
MIMAT0004767	hsa-miR-193b*	102	97	102	107
MIMAT0000460	hsa-miR-194	102	119	59	43
MIMAT0000460	hsa-miR-194	90	176	73	64
MIMAT0004671	hsa-miR-194*	60	106	87	123
MIMAT0004671	hsa-miR-194*	93	141	118	80
MIMAT0000461	hsa-miR-195	126	142	85	110
MIMAT0000461	hsa-miR-195	100	150	93	92
MIMAT0004615	hsa-miR-195*	74	43	86	89
MIMAT0004615	hsa-miR-195*	91	73	97	138
MIMAT0000226	hsa-miR-196a	61	96	113	74
MIMAT0000226	hsa-miR-196a	88	80	73	65
MIMAT0004562	hsa-miR-196a*	68	86	78	67
MIMAT0004562	hsa-miR-196a*	40	51	75	123
MIMAT0001080	hsa-miR-196b	46	237	73	50
MIMAT0001080	hsa-miR-196b	78	297	61	62
MIMAT0000227	hsa-miR-197	64	82	108	109
MIMAT0000227	hsa-miR-197	93	109	114	134
MIMAT0000228	hsa-miR-198	50	101	56	81
MIMAT0000228	hsa-miR-198	79	94	71	72
MIMAT0000232	hsa-miR-199a-3p	74	88	58	40
MIMAT0000232	hsa-miR-199a-3p	101	75	101	65
MIMAT0000231	hsa-miR-199a-5p	70	58	119	83
MIMAT0000231	hsa-miR-199a-5p	57	111	82	66
MIMAT0000232	hsa-miR-199b-3p	62	74	76	75
MIMAT0000232	hsa-miR-199b-3p	65	73	76	53
MIMAT0000263	hsa-miR-199b-5p	76	65	65	131
MIMAT0000263	hsa-miR-199b-5p	87	39	87	79
MIMAT0000073	hsa-miR-19a	901	1146	129	59
MIMAT0000073	hsa-miR-19a	1249	1264	78	104
MIMAT0004490	hsa-miR-19a*	66	92	100	92
MIMAT0004490	hsa-miR-19a*	47	116	97	73
MIMAT0000074	hsa-miR-19b	3224	3846	163	177
MIMAT0000074	hsa-miR-19b	3129	3412	147	196
MIMAT0004491	hsa-miR-19b-1*	82	131	82	80
MIMAT0004491	hsa-miR-19b-1*	92	121	64	64
MIMAT0004492	hsa-miR-19b-2*	84	76	84	92
MIMAT0004492	hsa-miR-19b-2*	78	40	71	70
MIMAT0000682	hsa-miR-200a	1017	960	108	149
MIMAT0000682	hsa-miR-200a	1142	1156	83	167
MIMAT0001620	hsa-miR-200a*	78	78	82	51
MIMAT0001620	hsa-miR-200a*	70	82	90	79
MIMAT0000318	hsa-miR-200b	1480	1444	709	1111
MIMAT0000318	hsa-miR-200b	1476	1055	855	1054
MIMAT0004571	hsa-miR-200b*	81	103	97	34
MIMAT0004571	hsa-miR-200b*	115	86	86	85
MIMAT0000617	hsa-miR-200c	3588	2579	2767	2192
MIMAT0000617	hsa-miR-200c	3087	2280	2670	2245
MIMAT0004657	hsa-miR-200c*	115	97	87	72
MIMAT0004657	hsa-miR-200c*	80	107	93	100
MIMAT0002811	hsa-miR-202	84	71	93	78
MIMAT0002811	hsa-miR-202	123	74	82	77
MIMAT0002810	hsa-miR-202*	67	98	64	85
MIMAT0002810	hsa-miR-202*	74	87	82	90
MIMAT0000264	hsa-miR-203	498	533	561	222
MIMAT0000264	hsa-miR-203	651	510	727	294

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.						
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960	
MIMAT0000265	hsa-miR-204	55	56	62	64	
MIMAT0000265	hsa-miR-204	106	87	67	67	
MIMAT0000266	hsa-miR-205	8325	2044	10175	9960	
MIMAT0000266	hsa-miR-205	9712	2462	15466	15075	
MIMAT0000462	hsa-miR-206	73	68	72	80	
MIMAT0000462	hsa-miR-206	72	102	81	109	
MIMAT0000241	hsa-miR-208a	68	100	127	123	
MIMAT0000241	hsa-miR-208a	88	59	93	90	
MIMAT0004960	hsa-miR-208b	58	70	60	54	
MIMAT0004960	hsa-miR-208b	86	71	51	51	
MIMAT0000075	hsa-miR-20a	1594	1600	122	100	
MIMAT0000075	hsa-miR-20a	1919	1806	148	155	
MIMAT0004493	hsa-miR-20a*	157	171	68	71	
MIMAT0004493	hsa-miR-20a*	156	186	95	89	
MIMAT0001413	hsa-miR-20b	1052	1138	95	141	
MIMAT0001413	hsa-miR-20b	1356	1226	144	208	
MIMAT0004752	hsa-miR-20b*	66	93	92	114	
MIMAT0004752	hsa-miR-20b*	71	130	115	73	
MIMAT0000076	hsa-miR-21	2721	7365	180	101	
MIMAT0000076	hsa-miR-21	3673	9465	261	125	
MIMAT0004494	hsa-miR-21*	95	167	38	70	
MIMAT0004494	hsa-miR-21*	136	181	116	69	
MIMAT0000267	hsa-miR-210	169	402	110	144	
MIMAT0000267	hsa-miR-210	243	268	103	160	
MIMAT0000268	hsa-miR-211	66	79	103	90	
MIMAT0000268	hsa-miR-211	97	113	58	60	
MIMAT0000269	hsa-miR-212	88	96	73	70	
MIMAT0000269	hsa-miR-212	72	84	65	115	
MIMAT0000271	hsa-miR-214	84	81	72	123	
MIMAT0000271	hsa-miR-214	107	100	120	77	
MIMAT0004564	hsa-miR-214*	41	72	47	58	
MIMAT0004564	hsa-miR-214*	46	90	63	65	
MIMAT0000272	hsa-miR-215	121	87	122	51	
MIMAT0000272	hsa-miR-215	78	152	68	81	
MIMAT0000273	hsa-miR-216a	73	115	76	88	
MIMAT0000273	hsa-miR-216a	72	65	96	55	
MIMAT0004959	hsa-miR-216b	51	34	82	70	
MIMAT0004959	hsa-miR-216b	55	78	67	22	
MIMAT0000274	hsa-miR-217	103	101	113	108	
MIMAT0000274	hsa-miR-217	94	79	37	83	
MIMAT0000275	hsa-miR-218	55	111	118	88	
MIMAT0000275	hsa-miR-218	109	103	52	80	
MIMAT0004565	hsa-miR-218-1*	63	99	73	57	
MIMAT0004565	hsa-miR-218-1*	76	111	67	68	
MIMAT0004566	hsa-miR-218-2*	55	58	62	60	
MIMAT0004566	hsa-miR-218-2*	57	117	65	54	
MIMAT0004567	hsa-miR-219-1-3p	56	70	54	110	
MIMAT0004567	hsa-miR-219-1-3p	80	65	89	40	
MIMAT0004675	hsa-miR-219-2-3p	119	107	87	88	
MIMAT0004675	hsa-miR-219-2-3p	47	68	103	99	
MIMAT0000276	hsa-miR-219-5p	87	80	54	88	
MIMAT0000276	hsa-miR-219-5p	108	86	34	41	
MIMAT0000077	hsa-miR-22	711	3181	285	214	
MIMAT0000077	hsa-miR-22	918	3005	281	199	
MIMAT0004495	hsa-miR-22*	37	181	105	86	
MIMAT0004495	hsa-miR-22*	51	195	66	80	
MIMAT0000277	hsa-miR-220a	117	97	89	61	
MIMAT0000277	hsa-miR-220a	109	106	70	61	
MIMAT0004908	hsa-miR-220b	87	136	103	60	
MIMAT0004908	hsa-miR-220b	122	118	60	72	
MIMAT0004915	hsa-miR-220c	55	79	65	76	
MIMAT0004915	hsa-miR-220c	70	66	129	102	
MIMAT0000278	hsa-miR-221	1109	2313	311	278	
MIMAT0000278	hsa-miR-221	1146	1812	310	262	
MIMAT0004568	hsa-miR-221*	116	161	78	77	
MIMAT0004568	hsa-miR-221*	84	100	97	83	
MIMAT0000279	hsa-miR-222	667	1269	382	267	
MIMAT0000279	hsa-miR-222	673	1179	330	259	

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0004569	hsa-miR-222*	125	153	126	123
MIMAT0004569	hsa-miR-222*	110	130	92	47
MIMAT0000280	hsa-miR-223	83	89	86	109
MIMAT0000280	hsa-miR-223	62	84	84	93
MIMAT0004570	hsa-miR-223*	93	59	60	58
MIMAT0004570	hsa-miR-223*	65	42	62	108
MIMAT0000281	hsa-miR-224	108	256	364	174
MIMAT0000281	hsa-miR-224	50	207	320	146
MIMAT0000078	hsa-miR-23a	5730	10572	4114	2967
MIMAT0000078	hsa-miR-23a	6602	9280	5138	3579
MIMAT0004496	hsa-miR-23a*	62	73	41	62
MIMAT0004496	hsa-miR-23a*	85	91	81	98
MIMAT0000418	hsa-miR-23b	7608	10249	5792	3910
MIMAT0000418	hsa-miR-23b	7733	11258	5076	3050
MIMAT0004587	hsa-miR-23b*	70	53	75	71
MIMAT0004587	hsa-miR-23b*	62	44	84	77
MIMAT0000080	hsa-miR-24	2394	5039	1097	795
MIMAT0000080	hsa-miR-24	3079	5588	1175	1052
MIMAT0000079	hsa-miR-24-1*	46	91	46	75
MIMAT0000079	hsa-miR-24-1*	99	94	88	99
MIMAT0004497	hsa-miR-24-2*	116	195	86	58
MIMAT0004497	hsa-miR-24-2*	88	178	99	60
MIMAT0000081	hsa-miR-25	687	438	265	520
MIMAT0000081	hsa-miR-25	834	653	266	819
MIMAT0004498	hsa-miR-25*	93	84	87	114
MIMAT0004498	hsa-miR-25*	92	88	104	88
MIMAT0000082	hsa-miR-26a	776	1317	336	276
MIMAT0000082	hsa-miR-26a	1168	1590	437	355
MIMAT0004499	hsa-miR-26a-1*	51	74	91	83
MIMAT0004499	hsa-miR-26a-1*	41	82	84	59
MIMAT0004681	hsa-miR-26a-2*	89	97	101	64
MIMAT0004681	hsa-miR-26a-2*	77	96	81	76
MIMAT0000083	hsa-miR-26b	174	328	94	109
MIMAT0000083	hsa-miR-26b	304	407	107	76
MIMAT0004500	hsa-miR-26b*	75	127	42	75
MIMAT0004500	hsa-miR-26b*	120	82	102	78
MIMAT0000084	hsa-miR-27a	2559	3826	322	304
MIMAT0000084	hsa-miR-27a	3040	4564	451	453
MIMAT0004501	hsa-miR-27a*	68	92	57	107
MIMAT0004501	hsa-miR-27a*	56	102	81	65
MIMAT0000419	hsa-miR-27b	1360	1424	325	243
MIMAT0000419	hsa-miR-27b	1257	1398	286	248
MIMAT0004588	hsa-miR-27b*	119	86	71	93
MIMAT0004588	hsa-miR-27b*	115	92	79	121
MIMAT0004502	hsa-miR-28-3p	73	87	105	84
MIMAT0004502	hsa-miR-28-3p	110	133	95	77
MIMAT0000085	hsa-miR-28-5p	146	331	161	153
MIMAT0000085	hsa-miR-28-5p	268	341	155	241
MIMAT0004679	hsa-miR-296-3p	50	83	81	82
MIMAT0004679	hsa-miR-296-3p	61	79	79	105
MIMAT0000690	hsa-miR-296-5p	179	233	144	148
MIMAT0000690	hsa-miR-296-5p	102	175	151	116
MIMAT0004450	hsa-miR-297	69	97	101	124
MIMAT0004450	hsa-miR-297	112	78	69	64
MIMAT0004901	hsa-miR-298	60	45	62	26
MIMAT0004901	hsa-miR-298	37	93	69	90
MIMAT0000687	hsa-miR-299-3p	93	125	93	95
MIMAT0000687	hsa-miR-299-3p	82	98	94	140
MIMAT0002890	hsa-miR-299-5p	88	85	95	57
MIMAT0002890	hsa-miR-299-5p	61	108	67	78
MIMAT0000086	hsa-miR-29a	379	3001	148	70
MIMAT0000086	hsa-miR-29a	551	3698	100	115
MIMAT0004503	hsa-miR-29a*	38	65	58	96
MIMAT0004503	hsa-miR-29a*	65	70	69	54
MIMAT0000100	hsa-miR-29b	185	1392	70	80
MIMAT0000100	hsa-miR-29b	367	1973	67	55
MIMAT0004514	hsa-miR-29b-1*	68	111	71	45
MIMAT0004514	hsa-miR-29b-1*	44	93	58	82

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0004515	hsa-miR-29b-2*	51	86	104	66
MIMAT0004515	hsa-miR-29b-2*	37	52	53	63
MIMAT0000681	hsa-miR-29c	92	254	51	55
MIMAT0000681	hsa-miR-29c	79	208	68	91
MIMAT0004673	hsa-miR-29c*	73	79	113	92
MIMAT0004673	hsa-miR-29c*	89	107	89	115
MIMAT0004903	hsa-miR-300	76	102	93	66
MIMAT0004903	hsa-miR-300	60	102	35	83
MIMAT0000688	hsa-miR-301a	295	803	22	41
MIMAT0000688	hsa-miR-301a	365	731	99	65
MIMAT0004958	hsa-miR-301b	83	280	89	61
MIMAT0004958	hsa-miR-301b	76	220	59	50
MIMAT0000684	hsa-miR-302a	83	77	60	76
MIMAT0000684	hsa-miR-302a	111	74	96	99
MIMAT0000683	hsa-miR-302a*	41	75	69	77
MIMAT0000683	hsa-miR-302a*	64	74	68	52
MIMAT0000715	hsa-miR-302b	68	90	86	67
MIMAT0000715	hsa-miR-302b	80	86	99	152
MIMAT0000714	hsa-miR-302b*	52	79	77	59
MIMAT0000714	hsa-miR-302b*	92	100	92	50
MIMAT0000717	hsa-miR-302c	88	91	90	76
MIMAT0000717	hsa-miR-302c	60	71	67	57
MIMAT0000716	hsa-miR-302c*	57	82	55	80
MIMAT0000716	hsa-miR-302c*	76	66	47	53
MIMAT0000718	hsa-miR-302d	97	64	88	91
MIMAT0000718	hsa-miR-302d	78	59	119	142
MIMAT0004685	hsa-miR-302d*	89	87	55	75
MIMAT0004685	hsa-miR-302d*	36	71	44	83
MIMAT0005931	hsa-miR-302e	31	69	92	45
MIMAT0005931	hsa-miR-302e	41	59	76	86
MIMAT0005932	hsa-miR-302f	132	88	96	62
MIMAT0005932	hsa-miR-302f	75	66	83	48
MIMAT0000087	hsa-miR-30a	391	1024	136	132
MIMAT0000087	hsa-miR-30a	561	1403	140	132
MIMAT0000088	hsa-miR-30a*	90	122	90	63
MIMAT0000088	hsa-miR-30a*	135	175	77	59
MIMAT0000420	hsa-miR-30b	632	871	198	210
MIMAT0000420	hsa-miR-30b	587	986	298	227
MIMAT0004589	hsa-miR-30b*	68	87	38	115
MIMAT0004589	hsa-miR-30b*	97	103	116	114
MIMAT0000244	hsa-miR-30c	826	1148	471	437
MIMAT0000244	hsa-miR-30c	892	1337	610	547
MIMAT0004674	hsa-miR-30c-1*	64	103	67	72
MIMAT0004674	hsa-miR-30c-1*	95	69	67	68
MIMAT0004550	hsa-miR-30c-2*	77	85	82	78
MIMAT0004550	hsa-miR-30c-2*	77	85	82	64
MIMAT0000245	hsa-miR-30d	451	1318	224	218
MIMAT0000245	hsa-miR-30d	709	1249	198	420
MIMAT0004551	hsa-miR-30d*	93	45	74	67
MIMAT0004551	hsa-miR-30d*	56	97	71	73
MIMAT0000692	hsa-miR-30e	463	462	74	67
MIMAT0000692	hsa-miR-30e	601	670	83	40
MIMAT0000693	hsa-miR-30e*	163	305	148	74
MIMAT0000693	hsa-miR-30e*	171	293	93	131
MIMAT0000089	hsa-miR-31	6759	964	376	1669
MIMAT0000089	hsa-miR-31	8509	2312	386	1541
MIMAT0004504	hsa-miR-31*	440	173	72	139
MIMAT0004504	hsa-miR-31*	572	168	87	113
MIMAT0000090	hsa-miR-32	59	94	70	63
MIMAT0000090	hsa-miR-32	50	144	65	81
MIMAT0004505	hsa-miR-32*	54	69	92	54
MIMAT0004505	hsa-miR-32*	77	87	77	61
MIMAT0000510	hsa-miR-320a	312	380	372	368
MIMAT0000510	hsa-miR-320a	277	400	391	358
MIMAT0005792	hsa-miR-320b	264	252	321	334
MIMAT0005792	hsa-miR-320b	290	299	323	268
MIMAT0005793	hsa-miR-320c	285	259	292	288
MIMAT0005793	hsa-miR-320c	217	249	305	234

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0006764	hsa-miR-320d	191	222	324	311
MIMAT0006764	hsa-miR-320d	305	258	303	437
MIMAT0000755	hsa-miR-323-3p	61	69	93	70
MIMAT0000755	hsa-miR-323-3p	109	66	104	93
MIMAT0004696	hsa-miR-323-5p	83	88	99	85
MIMAT0004696	hsa-miR-323-5p	101	76	92	77
MIMAT0000762	hsa-miR-324-3p	96	120	121	43
MIMAT0000762	hsa-miR-324-3p	127	88	104	87
MIMAT0000761	hsa-miR-324-5p	102	124	54	60
MIMAT0000761	hsa-miR-324-5p	85	155	90	85
MIMAT0000771	hsa-miR-325	78	22	51	52
MIMAT0000771	hsa-miR-325	55	81	59	69
MIMAT0000756	hsa-miR-326	81	97	95	116
MIMAT0000756	hsa-miR-326	74	105	92	137
MIMAT0000752	hsa-miR-328	97	87	77	74
MIMAT0000752	hsa-miR-328	123	123	91	66
MIMAT0001629	hsa-miR-329	37	91	92	70
MIMAT0001629	hsa-miR-329	78	77	106	52
MIMAT0000751	hsa-miR-330-3p	88	132	110	98
MIMAT0000751	hsa-miR-330-3p	150	138	123	94
MIMAT0004693	hsa-miR-330-5p	99	132	69	78
MIMAT0004693	hsa-miR-330-5p	86	68	65	43
MIMAT0000760	hsa-miR-331-3p	79	160	99	108
MIMAT0000760	hsa-miR-331-3p	121	161	171	103
MIMAT0004700	hsa-miR-331-5p	77	95	44	29
MIMAT0004700	hsa-miR-331-5p	105	68	66	73
MIMAT0000765	hsa-miR-335	120	168	78	50
MIMAT0000765	hsa-miR-335	113	190	76	95
MIMAT0004703	hsa-miR-335*	83	71	61	43
MIMAT0004703	hsa-miR-335*	111	108	104	75
MIMAT0000754	hsa-miR-337-3p	71	94	87	72
MIMAT0000754	hsa-miR-337-3p	83	67	86	81
MIMAT0004695	hsa-miR-337-5p	55	69	113	83
MIMAT0004695	hsa-miR-337-5p	62	118	69	48
MIMAT0000763	hsa-miR-338-3p	52	67	72	50
MIMAT0000763	hsa-miR-338-3p	68	77	80	83
MIMAT0004701	hsa-miR-338-5p	55	72	58	30
MIMAT0004701	hsa-miR-338-5p	64	92	94	44
MIMAT0004702	hsa-miR-339-3p	33	127	65	23
MIMAT0004702	hsa-miR-339-3p	56	154	97	85
MIMAT0000764	hsa-miR-339-5p	79	176	114	157
MIMAT0000764	hsa-miR-339-5p	120	187	118	135
MIMAT0000091	hsa-miR-33a	44	50	57	45
MIMAT0000091	hsa-miR-33a	40	77	92	64
MIMAT0004506	hsa-miR-33a*	58	90	117	41
MIMAT0004506	hsa-miR-33a*	34	112	78	71
MIMAT0003301	hsa-miR-33b	64	42	62	97
MIMAT0003301	hsa-miR-33b	65	66	92	60
MIMAT0004811	hsa-miR-33b*	74	62	59	102
MIMAT0004811	hsa-miR-33b*	83	123	55	73
MIMAT0004692	hsa-miR-340	58	93	72	88
MIMAT0004692	hsa-miR-340	45	61	92	47
MIMAT0000750	hsa-miR-340*	61	79	84	73
MIMAT0000750	hsa-miR-340*	99	66	74	57
MIMAT0000753	hsa-miR-342-3p	157	167	170	132
MIMAT0000753	hsa-miR-342-3p	162	279	314	187
MIMAT0004694	hsa-miR-342-5p	92	35	79	30
MIMAT0004694	hsa-miR-342-5p	79	84	59	46
MIMAT0000772	hsa-miR-345	59	79	56	47
MIMAT0000772	hsa-miR-345	90	92	55	51
MIMAT0000773	hsa-miR-346	55	91	60	66
MIMAT0000773	hsa-miR-346	110	116	93	66
MIMAT0000255	hsa-miR-34a	50	128	83	113
MIMAT0000255	hsa-miR-34a	113	125	64	57
MIMAT0004557	hsa-miR-34a*	60	89	82	63
MIMAT0004557	hsa-miR-34a*	74	94	110	47
MIMAT0004676	hsa-miR-34b	63	74	58	96
MIMAT0004676	hsa-miR-34b	66	103	71	152

Supplementary Table 1. The list represents signal values of miRNA microarray analysis.					
Accession number	miRNA NAME	KYSE450	KYSE520	KYSE890	KYSE960
MIMAT0000685	hsa-miR-34b*	80	61	58	57
MIMAT0000685	hsa-miR-34b*	105	79	57	95
MIMAT0004677	hsa-miR-34c-3p	48	95	70	65
MIMAT0004677	hsa-miR-34c-3p	85	43	82	95
MIMAT0000686	hsa-miR-34c-5p	57	70	78	72
MIMAT0000686	hsa-miR-34c-5p	41	64	66	37
MIMAT0004682	hsa-miR-361-3p	102	86	96	143
MIMAT0004682	hsa-miR-361-3p	61	104	66	134
MIMAT0000703	hsa-miR-361-5p	218	344	122	148
MIMAT0000703	hsa-miR-361-5p	156	387	188	128
MIMAT0004683	hsa-miR-362-3p	77	116	72	59
MIMAT0004683	hsa-miR-362-3p	96	38	67	64
MIMAT0000705	hsa-miR-362-5p	92	129	79	95
MIMAT0000705	hsa-miR-362-5p	141	101	104	63
MIMAT0000707	hsa-miR-363	87	44	133	46
MIMAT0000707	hsa-miR-363	164	111	95	49
MIMAT0003385	hsa-miR-363*	47	44	89	48
MIMAT0003385	hsa-miR-363*	65	56	82	94
MIMAT0000710	hsa-miR-365	148	340	189	178
MIMAT0000710	hsa-miR-365	142	265	245	248
MIMAT0000719	hsa-miR-367	80	52	78	87
MIMAT0000719	hsa-miR-367	116	104	81	130
MIMAT0004686	hsa-miR-367*	54	89	107	48
MIMAT0004686	hsa-miR-367*	57	72	87	72
MIMAT0000721	hsa-miR-369-3p	74	98	81	40
MIMAT0000721	hsa-miR-369-3p	50	66	74	41
MIMAT0001621	hsa-miR-369-5p	78	85	56	82
MIMAT0001621	hsa-miR-369-5p	111	54	107	77
MIMAT0000722	hsa-miR-370	81	126	108	101
MIMAT0000722	hsa-miR-370	76	123	118	101
MIMAT0000723	hsa-miR-371-3p	94	86	107	68
MIMAT0000723	hsa-miR-371-3p	92	104	44	66
MIMAT0004687	hsa-miR-371-5p	57	77	69	69
MIMAT0004687	hsa-miR-371-5p	89	71	103	71
MIMAT0000724	hsa-miR-372	45	64	54	96
MIMAT0000724	hsa-miR-372	95	82	92	80
MIMAT0000726	hsa-miR-373	105	95	93	114
MIMAT0000726	hsa-miR-373	60	58	99	84
MIMAT0000725	hsa-miR-373*	77	38	66	66
MIMAT0000725	hsa-miR-373*	74	51	117	110
MIMAT0000727	hsa-miR-374a	77	77	70	75
MIMAT0000727	hsa-miR-374a	92	99	56	95
MIMAT0004688	hsa-miR-374a*	64	72	68	57
MIMAT0004688	hsa-miR-374a*	70	112	64	73
MIMAT0004955	hsa-miR-374b	93	89	72	104
MIMAT0004955	hsa-miR-374b	116	117	91	107
MIMAT0004956	hsa-miR-374b*	58	101	106	65
MIMAT0004956	hsa-miR-374b*	64	93	114	75
MIMAT0000728	hsa-miR-375	62	70	121	44
MIMAT0000728	hsa-miR-375	73	120	56	43
MIMAT0000729	hsa-miR-376a	55	84	89	84
MIMAT0000729	hsa-miR-376a	76	122	102	77
MIMAT0003386	hsa-miR-376a*	37	68	85	95
MIMAT0003386	hsa-miR-376a*	85	95	72	61
MIMAT0002172	hsa-miR-376b	29	93	21	66
MIMAT0002172	hsa-miR-376b	98	66	63	113
MIMAT0000720	hsa-miR-376c	54	47	72	17
MIMAT0000720	hsa-miR-376c	81	53	111	71
MIMAT0000730	hsa-miR-377	44	78	49	58
MIMAT0000730	hsa-miR-377	108	70	65	76
MIMAT0004689	hsa-miR-377*	82	74	48	75
MIMAT0004689	hsa-miR-377*	61	49	70	40
MIMAT0000732	hsa-miR-378	880	215	214	185
MIMAT0000732	hsa-miR-378	815	215	262	179
MIMAT0000731	hsa-miR-378*	127	98	96	78
MIMAT0000731	hsa-miR-378*	88	82	94	62
MIMAT0000733	hsa-miR-379	56	59	70	102
MIMAT0000733	hsa-miR-379	86	82	75	59