

miRNA(microRNA) Expression and Detection

microRNAs (miRNA) were discovered in 1993 by Victor Ambros, Rosalind Lee and Rhonda Feinbaum during a study of the gene *lin-14* in *C. elegans* development. It was found that LIN-14 protein expression was tightly regulated by a short RNA product encoded by the *lin-4* gene. A 61 nucleotide precursor from *lin-4* gene matured to a 22 nucleotide RNA containing sequences partially complementary to multiple sequences in the 3' UTR of the *lin-14* mRNA. These complementarities between the 22 bp and 3'-UTR of the *lin-14* mRNA was sufficient and necessary to inhibit the translation of *lin-14* mRNA into LIN-14 protein. Retrospectively, the *lin-4* small RNA was the first microRNA to be identified, though at the time, it was thought to be a nematode idiosyncrasy. Only in 2000 was a second RNA characterized: *let-7*, which repressed *lin-41*, *lin-14*, *lin-28*, *lin-42*, and *daf-12* expression during developmental stage transitions in *C. elegans*. *let-7* was soon found to be conserved in many species, indicating the existence of a wider phenomenon.

Cellular Functions

The function of miRNAs appears to be in gene regulation. For that purpose, a miRNA is complementary to a part of one or more messenger RNAs (mRNAs). Animal miRNAs are usually complementary to a site in the [3'UTR](#) whereas plant miRNAs are usually complementary to coding regions of mRNAs. Perfect or near perfect base pairing with the target RNA promotes cleavage of the RNA. This is the primary mode of plant microRNAs. In animals, microRNAs more often only partially base pair and inhibit protein translation of the target mRNA (this exists in plants as well but is less common). microRNAs that are partially complementary to a target can also speed up deadenylation, causing mRNAs to be degraded sooner. For partially complementary microRNAs to recognize their targets, nucleotides 2-7 of the miRNA (its 'seed region') still have to be perfectly complementary. miRNAs occasionally also cause histone modification and DNA methylation of promoter sites, which affects the expression of target genes.

Animal microRNAs target in particular developmental genes. In contrast, genes involved in functions common to all cells, such as gene expression, have very few microRNA target sites and seem to be under selection to avoid targeting by microRNAs.

dsRNA can also activate gene expression, a mechanism that has been termed "small RNA-induced gene activation" or RNAa. dsRNAs targeting gene promoters can induce potent transcriptional activation of associated genes. This was demonstrated in human cells using synthetic dsRNAs termed small activating RNAs (saRNAs), but has also been demonstrated for endogenous microRNA.

Evolution

microRNAs are significant phylogenetic markers because of their astonishingly low rate of evolution. Their origin may have permitted the development of morphological innovation, and by making gene expression more specific and subject to more fine tuning, permitted the genesis of complex organs and perhaps, ultimately, complex life. Indeed, rapid bursts of morphological innovation are generally associated with a high rate of microRNA accumulation.

microRNAs originate predominantly by the random formation of hairpins in "non-coding" sections of DNA (i.e. introns or intergene regions), but also by the duplication and modification of existing microRNAs. The rate of evolution (i.e. nucleotide substitution) in recently-originated microRNAs is comparable to that elsewhere in the non-coding DNA, implying evolution by neutral drift; however, older microRNAs have a much lower rate of change (often less than one substitution per hundred million years), suggesting that once a microRNA gains a function it undergoes extreme purifying selection. At this point, microRNA is rarely lost from an animal's genome, although microRNAs which are more recently derived (and thus presumably non-functional) are frequently lost. This makes them a valuable phylogenetic marker, and they are being looked upon as a possible solution to such outstanding phylogenetic problems as the relationships of arthropods.

microRNAs feature in the genomes of most eukaryotic organisms, from the brown algae to the metazoan. Across all species, in excess of 5000 miRNAs had been identified by March 2010. Whilst short RNA sequences (50 – hundreds of base pairs) of a broadly comparable function occur in bacteria, bacteria lack true microRNAs.

Experimental Detection and Manipulation of miRNA

microRNA expression can be quantified in a two-step polymerase chain reaction process of modified RT-PCR followed by quantitative real-time PCR. Variations of this method achieve absolute or relative quantification. miRNAs can also be hybridized to [microarrays, slides or chips](#) with probes to hundreds or thousands of miRNA targets, so that relative levels of miRNAs can be determined in different samples. microRNAs can be both discovered and profiled by high-throughput sequencing and screening methods.

ABM Inc. (www.abmgood.com), the world leader in miRNA/microRNA research and development has developed comprehensive tools for miRNA/microRNA protocols, miRNA/microRNA disease library, miRNA/microRNA profiling in cancer and stem cells. The qPCR-based miRNA/microRNA profiling is the preferred choice for miRNA/microRNA profiling than traditional microRNA microarray due to its speed, sensitivity and quantization. The qPCR-based miRNA/microRNA profiling is the choice of method for miRNA/microRNA



detection and analysis. We believe the qPCR-based miRNA/microRNA profiling is the future method of biomarker development for many different types of human disease.

Once an miRNA/microRNA for a particular target gene is identified, the miRNA/microRNA can be over expressed in different viral vector format including lentiviral and adenoviral vectors in a [ready-to-use format with a GFP reporter](#). In addition, miRNA/microRNA inhibitors are developed ready-to-use adenoviral and lentiviral vector format. Furthermore, all vectors are developed in a separate format of Tet-inducible expression platform for controlled expression of miRNA/microRNAs.

For those who are new to miRNA research, scientists at [ABM Inc.](#) offer comprehensive services for miRNA/microRNA prediction using miRNA/microRNA database and bioinformatics, custom primer design as well as custom [miRNA/microRNA profiling services](#), miRNA/microRNA library screening, [target validations](#), and miRNA/microRNA processing.

miRNA and Disease

Just as miRNA is involved in the normal functioning of eukaryotic cells, so has deregulation of miRNA been associated with disease. The following miRNA-target pairs, validated by luciferase reporter experiments, were extracted manually from the corresponding reference. A few target genes not documented here may be available in "Tar Base" and "miRecords" database systems.

<u>miRNA</u>	<u>Target</u>	<u>Date</u>	<u>Reference</u>
hsa-let-7a	KRAS	2008	A SNP in a let-7 microRNA complementary site in the KRAS 3' untranslated region increases non-small cell lung cancer risk.
hsa-let-7a	HMGA2	2008	Clinical significance of high mobility group A2 in human gastric cancer and its relationship to let-7 microRNA family.
hsa-let-7a	integrin beta(3)	2008	Integrin beta(3) expression is regulated by let-7a miRNA in malignant melanoma.
hsa-let-7a	caspase-3	2008	Let-7a microRNA suppresses therapeutics-induced cancer cell death by targeting caspase-3.
hsa-let-7a	PRDM1/Blimp-1	2008	microRNA-mediated down-regulation of PRDM1/Blimp-1 in Hodgkin/Reed-Sternberg cells: a potential pathogenetic lesion in Hodgkin lymphomas.
hsa-let-7a	HMGA2	2007	Disrupting the pairing between let-7 and Hmga2 enhances oncogenic transformation.
hsa-let-7a	IGF-II	2007	Hypermethylation of let-7a-3 in epithelial ovarian cancer is associated with low insulin-like growth factor-II expression and favorable prognosis.
hsa-let-7a	HMGA2	2007	Let-7 expression defines two differentiation stages of cancer.
hsa-let-7a	HMGA2	2007	let-7 regulates self renewal and tumorigenicity of breast cancer cells.
hsa-let-7a	RAS	2007	let-7 regulates self renewal and tumorigenicity of breast cancer cells.
hsa-let-7a	BCL2	2007	microRNA gene expression during retinoic acid-induced differentiation

hsa-let-7a	RAS	2007	of human acute promyelocytic leukemia. MicroRNA gene expression during retinoic acid-induced differentiation of human acute promyelocytic leukemia.
hsa-let-7a	MYC	2007	MicroRNA let-7a down-regulates MYC and reverts MYC-induced growth in Burkitt lymphoma cells.
hsa-let-7a	CDC25A	2007	The let-7 microRNA represses cell proliferation pathways in human cells.
hsa-let-7a	CDK6	2007	The let-7 microRNA represses cell proliferation pathways in human cells.
hsa-let-7a	NF2	2007	The MicroRNA let-7a modulates interleukin-6-dependent STAT-3 survival signaling in malignant human cholangiocytes.
hsa-let-7a	c-myc	2006	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.
hsa-let-7a	RAS	2006	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.
hsa-let-7a	RAS	2005	RAS is regulated by the let-7 microRNA family.
hsa-let-7a	NIRF	2009	Let-7a elevates p21(WAF1) levels by targeting of NIRF and suppresses the growth of A549 lung cancer cells
hsa-let-7b	Cdc34	2009	let-7 over expression leads to an increased fraction of cells in G2/M, direct down-regulation of Cdc34 and stabilization of Wee1 kinase in primary fibroblasts.
hsa-let-7b	Dicer	2008	A search for conserved sequences in coding regions reveals that the let-7 microRNA targets Dicer within its coding sequence
hsa-let-7b	KRAS	2008	A SNP in a let-7 microRNA complementary site in the KRAS 3' untranslated region increases non-small cell lung cancer risk.
hsa-let-7b	CCND1	2008	microRNA let-7b targets important cell cycle molecules in malignant melanoma cells and interferes with anchorage-independent growth.
hsa-let-7b	CDC25A	2007	The let-7 microRNA represses cell proliferation pathways in human cells.
hsa-let-7b	CDK6	2007	The let-7 microRNA represses cell proliferation pathways in human cells.
hsa-let-7b	HMGA2	2007	The tumor suppressor microRNA let-7 represses the HMGA2 oncogene.
hsa-let-7c	HMGA2	2008	Antiproliferative effects by Let-7 repression of high-mobility group A2 in uterine leiomyoma.
hsa-let-7c	HMGA2	2007	A micro-RNA signature associated with race, tumor size, and target gene activity in human uterine leiomyomas.
hsa-let-7c	HMGA2	2007	Let-7 expression defines two differentiation stages of cancer.
hsa-let-7c	BCL2	2007	MicroRNA gene expression during retinoic acid-induced differentiation of human acute promyelocytic leukemia.
hsa-let-7c	RAS	2007	MicroRNA gene expression during retinoic acid-induced differentiation of human acute promyelocytic leukemia.
hsa-let-7c	CDC25A	2007	The let-7 microRNA represses cell proliferation pathways in human cells.
hsa-let-7c	CDK6	2007	The let-7 microRNA represses cell proliferation pathways in human cells.
hsa-let-7c	RAS	2007	Widespread deregulation of microRNA expression in human prostate cancer.
hsa-let-7d	KRAS	2008	A SNP in a let-7 microRNA complementary site in the KRAS 3' untranslated region increases non-small cell lung cancer risk.
hsa-let-7d	HMGA2	2007	Let-7 prevents early cancer progression by suppressing expression of the embryonic gene HMGA2.
hsa-let-7d	BCL2	2007	MicroRNA gene expression during retinoic acid-induced differentiation of human acute promyelocytic leukemia.

hsa-let-7d	RAS	2007	MicroRNA gene expression during retinoic acid-induced differentiation of human acute promyelocytic leukemia.
hsa-let-7d	CDC25A	2007	The let-7 microRNA represses cell proliferation pathways in human cells.
hsa-let-7d	CDK6	2007	The let-7 microRNA represses cell proliferation pathways in human cells.
hsa-let-7d	BDNF	2009	microRNAs miR-124, let-7d and miR-181a regulate Cocaine-induced Plasticity
hsa-let-7d	D3R	2009	microRNAs miR-124, let-7d and miR-181a regulate Cocaine-induced Plasticity
hsa-let-7e	HMGA2	2007	The tumor suppressor microRNA let-7 represses the HMGA2 oncogene.
hsa-let-7g	KRAS	2008	A SNP in a let-7 microRNA complementary site in the KRAS 3' untranslated region increases non-small cell lung cancer risk.
hsa-let-7g	HMGA2	2008	Suppression of non-small cell lung tumor development by the let-7 microRNA family.
hsa-let-7g	Ras	2008	Suppression of non-small cell lung tumor development by the let-7 microRNA family.
hsa-let-7g	HMGA2	2007	Let-7 expression defines two differentiation stages of cancer.
hsa-let-7g	CDC25A	2007	The let-7 microRNA represses cell proliferation pathways in human cells.
hsa-let-7g	CDK6	2007	The let-7 microRNA represses cell proliferation pathways in human cells.
hsa-miR-1	c-Met	2009	MicroRNA-1/206 targets c-Met and inhibits rhabdomyosarcoma development.
hsa-miR-1	calmodulin	2009	MicroRNA-1 negatively regulates expression of the hypertrophy-associated calmodulin and Mef2a genes
hsa-miR-1	Gata4	2009	MicroRNA-1 negatively regulates expression of the hypertrophy-associated calmodulin and Mef2a genes
hsa-miR-1	Mef2a	2009	MicroRNA-1 negatively regulates expression of the hypertrophy-associated calmodulin and Mef2a genes
hsa-miR-1	BCL2	2009	MicroRNA-1 Regulates Cardiomyocyte Apoptosis by Targeting Bcl-2
hsa-miR-1	Gata4	2009	MicroRNA-27a functions as an oncogene in gastric adenocarcinoma by targeting prohibitin.
hsa-miR-1	calmodulin	2009	Post-transcriptional regulation of mouse mu opioid receptor (MOR1) via its 3' untranslated region: a role for microRNA23b.
hsa-miR-1	Mef2a	2009	Up-regulation of micro-RNA-221 (miRNA-221; chr Xp11.3) and caspase-3 accompanies down-regulation of the survivin-1 homolog BIRC1 (NAIP) in glioblastoma multiforme (GBM).
hsa-miR-1	C/EBPa	2008	Downregulation of microRNA-1 (miR-1) in lung cancer: Suppression of tumorigenic property of lung cancer cells and their sensitization to doxorubicin induced apoptosis by miR-1.
hsa-miR-1	FoxP1	2008	Downregulation of microRNA-1 (miR-1) in lung cancer: Suppression of tumorigenic property of lung cancer cells and their sensitization to doxorubicin induced apoptosis by miR-1.
hsa-miR-1	HDAC4	2008	Downregulation of microRNA-1 (miR-1) in lung cancer: Suppression of tumorigenic property of lung cancer cells and their sensitization to doxorubicin induced apoptosis by miR-1.
hsa-miR-1	MET	2008	Downregulation of microRNA-1 (miR-1) in lung cancer: Suppression of tumorigenic property of lung cancer cells and their sensitization to doxorubicin induced apoptosis by miR-1.
hsa-miR-1	HCN4	2008	Down-regulation of miR-1/miR-133 contributes to re-expression of pacemaker channel genes HCN2 and HCN4 in hypertrophic heart.
hsa-miR-1	FoxP1	2008	Methylation mediated silencing of MicroRNA-1 gene and its role in

hsa-miR-1	HDAC4	2008	hepatocellular carcinogenesis. Methylation mediated silencing of MicroRNA-1 gene and its role in hepatocellular carcinogenesis.
hsa-miR-1	MET	2008	Methylation mediated silencing of MicroRNA-1 gene and its role in hepatocellular carcinogenesis.
hsa-miR-1	Cdk9	2008	MicroRNAs play an essential role in the development of cardiac hypertrophy.
hsa-miR-1	fibronectin	2008	MicroRNAs play an essential role in the development of cardiac hypertrophy.
hsa-miR-1	RasGAP	2008	MicroRNAs play an essential role in the development of cardiac hypertrophy.
hsa-miR-1	Rheb	2008	MicroRNAs play an essential role in the development of cardiac hypertrophy.
hsa-miR-1	MEF-2	2008	The microRNA miR-1 regulates a MEF-2-dependent retrograde signal at neuromuscular junctions.
hsa-miR-1	nAChR	2008	The microRNA miR-1 regulates a MEF-2-dependent retrograde signal at neuromuscular junctions.
hsa-miR-1	GJA1	2007	The muscle-specific microRNA miR-1 regulates cardiac arrhythmogenic potential by targeting GJA1 and KCNJ2.
hsa-miR-1	KCNJ2	2007	The muscle-specific microRNA miR-1 regulates cardiac arrhythmogenic potential by targeting GJA1 and KCNJ2.
hsa-miR-1	HSP60	2007	The muscle-specific microRNAs miR-1 and miR-133 produce opposing effects on apoptosis by targeting HSP60, HSP70 and caspase-9 in cardiomyocytes.
hsa-miR-1	HSP70	2007	The muscle-specific microRNAs miR-1 and miR-133 produce opposing effects on apoptosis by targeting HSP60, HSP70 and caspase-9 in cardiomyocytes.
hsa-miR-1	Hand2	2005	Serum response factor regulates a muscle-specific microRNA that targets Hand2 during cardiogenesis.
hsa-miR-1	Kir2.1	2009	Tanshinone IIA protects against sudden cardiac death induced by lethal arrhythmias via repression of microRNA-1
hsa-miR-100	Plk1	2009	Significance of Plk1 regulation by miR-100 in human nasopharyngeal cancer
hsa-miR-101	EZH2	2009	The tumor suppressor microRNA-101 becomes an epigenetic player by targeting the polycomb group protein EZH2 in cancer
hsa-miR-101	EZH2	2009	Detection of metastatic head and neck squamous cell carcinoma using the relative expression of tissue-specific mir-205.
hsa-miR-101	Mcl-1	2009	Down-regulation of hsa-miR-10a in chronic myeloid leukemia CD34+ cells increases USF2-mediated cell growth.
hsa-miR-101	FOS	2009	MicroRNA-101 regulates expression of the v-fos FBJ murine osteosarcoma viral oncogene homolog (FOS) oncogene in human hepatocellular carcinoma.
hsa-miR-101	EZH2	2009	The putative tumor suppressor microRNA-101 modulates the cancer epigenome by repressing the polycomb group protein EZH2.
hsa-miR-101	FOS	2009	The role of microRNA expression pattern in human intrahepatic cholangiocarcinoma.
hsa-miR-101	ATXN1	2008	miR-19, miR-101 and miR-130 co-regulate ATXN1 levels to potentially modulate SCA1 pathogenesis.
hsa-miR-101	MYCN	2007	MicroRNA signatures in human ovarian cancer.
hsa-miR-101	Ezh2	2010	MicroRNA-101 negatively regulates Ezh2 and its expression is modulated by androgen receptor and HIF-1alpha/HIF-1beta.
hsa-miR-101b	ATXN1	2009	Regulation of microRNA expression by HMGA1 proteins
hsa-miR-101b	STC1	2009	Regulation of microRNA expression by HMGA1 proteins

hsa-miR-106a	IL-10	2009	Posttranscriptional regulation of interleukin-10 expression by hsa-miR-106a
hsa-miR-106a	E2F1	2008	Deregulated expression of miR-106a predicts survival in human colon cancer patients.
hsa-miR-106a	Myip	2006	Oncogenic potential of the miR-106-363 cluster and its implication in human T-cell leukemia.
hsa-miR-106b	p21	2009	Functional links between clustered microRNAs: suppression of cell-cycle inhibitors by microRNA clusters in gastric cancer.
hsa-miR-106b	APP	2009	MicroRNA regulation of Alzheimer's Amyloid precursor protein expression.
hsa-miR-106b	Itch	2009	MicroRNA-regulated pathways associated with endometriosis.
hsa-miR-106b	E2F1	2009	Role of the miR-106b-25 microRNA cluster in hepatocellular carcinoma.
hsa-miR-106b	E2F1	2008	E2F1-regulated microRNAs impair TGFbeta-dependent cell-cycle arrest and apoptosis in gastric cancer.
hsa-miR-106b	PCAF	2008	MicroRNAs regulate critical genes associated with multiple myeloma pathogenesis.
hsa-miR-107	PLAG1	2009	miRNA deregulation by epigenetic silencing disrupts suppression of the oncogene PLAG1 in chronic lymphocytic leukemia.
hsa-miR-107	BACE1	2008	The expression of microRNA miR-107 decreases early in Alzheimer's disease and may accelerate disease progression through regulation of beta-site amyloid precursor protein-cleaving enzyme 1.
hsa-miR-10b	HOXD10	2007	Tumour invasion and metastasis initiated by microRNA-10b in breast cancer.
hsa-miR-10b	PPAR-alpha	2009	Effect of miRNA-10b in regulating cellular steatosis level by targeting PPAR-alpha expression, a novel mechanism for the pathogenesis of NAFLD
hsa-miR-1-2	Hand2	2007	Dysregulation of cardiogenesis, cardiac conduction, and cell cycle in mice lacking miRNA-1-2.
hsa-miR-1-2	Irx5	2007	Dysregulation of cardiogenesis, cardiac conduction, and cell cycle in mice lacking miRNA-1-2.
hsa-miR-1-2	Kcnd2	2007	Dysregulation of cardiogenesis, cardiac conduction, and cell cycle in mice lacking miRNA-1-2.
hsa-miR-122	Bcl-w	2008	miR-122 targets an anti-apoptotic gene, Bcl-w, in human hepatocellular carcinoma cell lines.
hsa-miR-122	ADAM-10	2009	MicroRNA-122 inhibits tumorigenic properties of hepatocellular carcinoma cells and sensitizes these cells to Sorafenib
hsa-miR-122	SRF	2009	MicroRNA-122 inhibits tumorigenic properties of hepatocellular carcinoma cells and sensitizes these cells to Sorafenib
hsa-miR-122	Igf1R	2009	MicroRNA-122 inhibits tumorigenic properties of hepatocellular carcinoma cells and sensitizes these cells to Sorafenib
hsa-miR-122a	CCNG1	2009	MiR-122/cyclin G1 interaction modulates p53 activity and affects doxorubicin sensitivity of human hepatocarcinoma cells.
hsa-miR-122a	CCNG1	2007	Cyclin G1 is a target of miR-122a, a microRNA frequently down-regulated in human hepatocellular carcinoma.
hsa-miR-122a	AMPK	2006	miR-122 regulation of lipid metabolism revealed by in vivo antisense targeting.
hsa-miR-124	BDNF	2009	microRNAs miR-124, let-7d and miR-181a regulate Cocaine-induced Plasticity
hsa-miR-124	D3R	2009	microRNAs miR-124, let-7d and miR-181a regulate Cocaine-induced Plasticity
hsa-miR-124	Sox9	2009	miR-124 regulates adult neurogenesis in the subventricular zone stem cell niche
hsa-miR-124a	Rb	2009	Epigenetic silencing of the tumor suppressor microRNA Hsa-miR-124a

			regulates CDK6 expression and confers a poor prognosis in acute lymphoblastic leukemia.
hsa-miR-124a	IkappaBzeta	2009	IkappaBzeta expression is regulated by miR-124a
hsa-miR-124a	CDK6	2008	miR-124 and miR-137 inhibit proliferation of glioblastoma multiforme cells and induce differentiation of brain tumor stem cells.
hsa-miR-124a	CDK6	2008	Regulation of cyclin dependent kinase 6 by microRNA 124 in medulloblastoma.
hsa-miR-124a	CDK6	2007	CpG island hypermethylation of tumor suppressor microRNAs in human cancer.
hsa-miR-124a	CDK6	2007	Genetic unmasking of an epigenetically silenced microRNA in human cancer cells.
hsa-miR-125a	TrkC	2009	Low-Level Expression of MicroRNAs let-7d and miR-205 Are Prognostic Markers of Head and Neck Squamous Cell Carcinoma.
hsa-miR-125a	TrkC	2008	MicroRNA profiling in human medulloblastoma.
hsa-miR-125a	ERBB2	2006	Coordinate suppression of ERBB2 and ERBB3 by enforced expression of micro-RNA miR-125a or miR-125b.
hsa-miR-125a	ERBB3	2006	Coordinate suppression of ERBB2 and ERBB3 by enforced expression of micro-RNA miR-125a or miR-125b.
hsa-miR-125a	p53	2009	MicroRNA 125a and its regulation of the p53 tumor suppressor gene
hsa-miR-125a	HuR	2009	MicroRNA-125a represses cell growth by targeting HuR in breast cancer
hsa-miR-125a	ARID3B	2009	The epidermal growth factor receptor responsive miR-125a represses mesenchymal morphology in ovarian cancer cells
hsa-miR-125b	VDR	2009	MicroRNA regulates human vitamin D receptor
hsa-miR-125b	p53	2009	MicroRNA-125b is a novel negative regulator of p53
hsa-miR-125b	BAK1	2009	MicroRNAs and their potential for translation in prostate cancer.
hsa-miR-125b	CDK6	2009	MicroRNAs and their potential for translation in prostate cancer.
hsa-miR-125b	Gli1	2008	Concerted microRNA control of Hedgehog signalling in cerebellar neuronal progenitor and tumour cells.
hsa-miR-125b	Bak1	2007	An androgen-regulated miRNA suppresses Bak1 expression and induces androgen-independent growth of prostate cancer cells.
hsa-miR-125b	HMGA1	2007	Specific microRNAs are downregulated in human thyroid anaplastic carcinomas.
hsa-miR-125b	HMGA2	2007	Specific microRNAs are downregulated in human thyroid anaplastic carcinomas.
hsa-miR-125b	EIF4EBP1	2007	Widespread deregulation of microRNA expression in human prostate cancer.
hsa-miR-125b	ERBB2	2006	Coordinate suppression of ERBB2 and ERBB3 by enforced expression of micro-RNA miR-125a or miR-125b.
hsa-miR-125b	ERBB3	2006	Coordinate suppression of ERBB2 and ERBB3 by enforced expression of micro-RNA miR-125a or miR-125b.
hsa-miR-125b	BMPR1B	2009	A risk variant in an miR-125b binding site in BMPR1B is associated with breast cancer pathogenesis
hsa-miR-126	IRS-1	2009	Regulation of epidermal growth factor receptor signaling in human cancer cells by microRNA-7.
hsa-miR-126	p85beta	2008	Attribution of vascular phenotypes of the murine Egfl7 locus to the microRNA miR-126
hsa-miR-126	PLK2	2008	Distinct microRNA expression profiles in acute myeloid leukemia with common translocations.
hsa-miR-126	CRK	2008	MicroRNA-126 inhibits invasion in non-small cell lung carcinoma cell lines.
hsa-miR-126	HOXA9	2008	MicroRNA-126 regulates HOXA9 by binding to the homeobox.
hsa-miR-126	SPRED1	2008	miR-126 regulates angiogenic signaling and vascular integrity
hsa-miR-126	p85beta	2008	The noncoding RNA, miR-126, suppresses the growth of neoplastic cells

			by targeting phosphatidylinositol 3-kinase signaling and is frequently lost in colon cancers.
hsa-miR-126	p85beta	2008	The noncoding RNA, miR-126, suppresses the growth of neoplastic cells by targeting phosphatidylinositol 3-kinase signaling and is frequently lost in colon cancers.
hsa-miR-126	Crk	2009	Regulation of miRNA expression by Src and contact normalization: effects on nonanchored cell growth and migration
hsa-miR-126*	prostein	2007	Ectopic expression of miR-126*, an intronic product of the vascular endothelial EGF-like 7 gene, regulates prostein translation and invasiveness of prostate cancer LNCaP cells.
hsa-miR-127	BLIMP1	2009	B cell differentiation in EBV-positive Burkitt Lymphoma is impaired at post-transcriptional level by miRNA altered expression.
hsa-miR-127	XBP1	2009	B cell differentiation in EBV-positive Burkitt Lymphoma is impaired at post-transcriptional level by miRNA altered expression.
hsa-miR-127	BCL6	2008	Down-regulation of the microRNAs miR-34a, miR-127, and miR-200b in rat liver during hepatocarcinogenesis induced by a methyl-deficient diet.
hsa-miR-127	BCL6	2007	CpG island hypermethylation of tumor suppressor microRNAs in human cancer.
hsa-miR-127	BCL6	2006	Specific activation of microRNA-127 with downregulation of the proto-oncogene BCL6 by chromatin-modifying drugs in human cancer cells.
hsa-miR-128	DCX	2009	MiR-128 up-regulation inhibits Reelin and DCX expression and reduces neuroblastoma cell motility and invasiveness.
hsa-miR-128	Reelin	2009	MiR-128 up-regulation inhibits Reelin and DCX expression and reduces neuroblastoma cell motility and invasiveness.
hsa-miR-128	NTRK3	2009	Allele variants in functional MicroRNA target sites of the neurotrophin-3 receptor gene (NTRK3) as susceptibility factors for anxiety disorders.
hsa-miR-128	E2F3a	2009	MicroRNA-21 down-regulates the expression of tumor suppressor PDCD4 in human glioblastoma cell T98G.
hsa-miR-128	E2F3a	2008	MicroRNA-128 inhibits glioma cells proliferation by targeting transcription factor E2F3a.
hsa-miR-128b	EGFR	2008	EGFR regulation by microRNA in lung cancer: correlation with clinical response and survival to gefitinib and EGFR expression in cell lines.
hsa-miR-128b	MLL	2009	miR-128b is a potent glucocorticoid sensitizer in MLL-AF4 acute lymphocytic leukemia cells and exerts cooperative effects with miR-221
hsa-miR-128b	AF4	2009	miR-128b is a potent glucocorticoid sensitizer in MLL-AF4 acute lymphocytic leukemia cells and exerts cooperative effects with miR-221
hsa-miR-128b	MLL-AF4	2009	miR-128b is a potent glucocorticoid sensitizer in MLL-AF4 acute lymphocytic leukemia cells and exerts cooperative effects with miR-221
hsa-miR-128b	AF4-MLL	2009	miR-128b is a potent glucocorticoid sensitizer in MLL-AF4 acute lymphocytic leukemia cells and exerts cooperative effects with miR-221
hsa-miR-129	GALNT1	2009	Genomic profiling of microRNAs in bladder cancer: miR-129 is associated with poor outcome and promotes cell death in vitro.
hsa-miR-129	SOX4	2009	Genomic profiling of microRNAs in bladder cancer: miR-129 is associated with poor outcome and promotes cell death in vitro.
hsa-miR-130	ATXN1	2008	miR-19, miR-101 and miR-130 co-regulate ATXN1 levels to potentially modulate SCA1 pathogenesis.
hsa-miR-130a	FOG-2	2009	Translational control of FOG-2 expression in cardiomyocytes by microRNA-130a
hsa-miR-130b	TP53INP1	2008	Roles for microRNAs, miR-93 and miR-130b, and tumor protein 53-induced nuclear protein 1 tumor suppressor in cell growth dysregulation by human T-cell lymphotropic virus 1.
hsa-miR-132	p250GAP	2007	A microRNA-based gene dysregulation pathway in Huntington's

hsa-miR-132	MeCP2	2009	disease. MeCP2 controls an epigenetic pathway that promotes myofibroblast transdifferentiation and fibrosis
hsa-miR-132	p250GAP	2009	An activity-induced microRNA controls dendritic spine formation by regulating Rac1-PAK signaling
hsa-miR-132	SirT1	2009	MicroRNA 132 regulates nutritional stress-induced chemokine production through repression of SirT1
hsa-miR-133	KLF15	2009	MicroRNA-133 regulates the expression of GLUT4 by targeting KLF15 and is involved in metabolic control in cardiac myocytes
hsa-miR-133	KLF15	2009	MicroRNA-133 regulates the expression of GLUT4 by targeting KLF15 and is involved in metabolic control in cardiac myocytes
hsa-miR-133a	KRT7	2009	Identification of novel microRNA targets based on microRNA signatures in bladder cancer.
hsa-miR-133a	UCP2	2009	In vitro evidence suggests that miR-133a-mediated regulation of uncoupling protein 2 (UCP2) is an indispensable step in myogenic differentiation
hsa-miR-133a	HCN2	2008	Down-regulation of miR-1/miR-133 contributes to re-expression of pacemaker channel genes HCN2 and HCN4 in hypertrophic heart.
hsa-miR-133a	HCN4	2008	Down-regulation of miR-1/miR-133 contributes to re-expression of pacemaker channel genes HCN2 and HCN4 in hypertrophic heart.
hsa-miR-133a	PKM2	2008	Identification of pyruvate kinase type M2 as potential oncoprotein in squamous cell carcinoma of tongue through microRNA profiling.
hsa-miR-133a	ERG	2007	MicroRNA miR-133 represses HERG K ⁺ channel expression contributing to QT prolongation in diabetic hearts.
hsa-miR-133a	Cdc42	2007	MicroRNA-133 controls cardiac hypertrophy.
hsa-miR-133a	Nelf-A/WHSC2	2007	MicroRNA-133 controls cardiac hypertrophy.
hsa-miR-133a	RhoA	2007	MicroRNA-133 controls cardiac hypertrophy.
hsa-miR-133a	Casp9	2007	The muscle-specific microRNAs miR-1 and miR-133 produce opposing effects on apoptosis by targeting HSP60, HSP70 and caspase-9 in cardiomyocytes.
hsa-miR-133b	Mcl-1	2009	MicroRNA 133B targets pro-survival molecules MCL-1 and BCL2L2 in lung cancer.
hsa-miR-133b	BCL2L2	2009	MicroRNA 133B targets pro-survival molecules MCL-1 and BCL2L2 in lung cancer.
hsa-miR-133b	IGF-IR	2009	MicroRNA regulation of neuron-like differentiation of adipose tissue-derived stem cells
hsa-miR-133b	PKM2	2008	Identification of pyruvate kinase type M2 as potential oncoprotein in squamous cell carcinoma of tongue through microRNA profiling.
hsa-miR-133b	Pitx3	2007	A MicroRNA feedback circuit in midbrain dopamine neurons.
hsa-miR-135a	JAK2	2009	Regulation of JAK2 by miR-135a: prognostic impact in classical Hodgkin lymphoma.
hsa-miR-137	CDK6	2008	Exploration of tumor-suppressive microRNAs silenced by DNA hypermethylation in oral cancer.
hsa-miR-137	CDK6	2008	miR-124 and miR-137 inhibit proliferation of glioblastoma multiforme cells and induce differentiation of brain tumor stem cells.
hsa-miR-138	hTERT	2008	Downregulation of miR-138 is associated with overexpression of human telomerase reverse transcriptase protein in human anaplastic thyroid carcinoma cell lines.
hsa-miR-140	Cxcl12	2008	Experimental identification of microRNA-140 targets by silencing and overexpressing miR-140
hsa-miR-140	HDAC4	2009	Mechanism of chemoresistance mediated by miR-140 in human osteosarcoma and colon cancer cells
hsa-miR-140*	Dnm1	2008	Nicotine modulates expression of miR-140*, which targets the 3'-

hsa-miR-141	Dlx5	2009	untranslated region of dynamin 1 gene (Dnm1) MicroRNA-141 and -200a are involved in bone morphogenetic protein-2-induced mouse Pre-osteoblast differentiation by targeting distal-less homeobox 5
hsa-miR-141	ZEB1(deltaEF1)	2008	A reciprocal repression between ZEB1 and members of the miR-200 family promotes EMT and invasion in cancer cells.
hsa-miR-141	SIP1(ZEB2)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.
hsa-miR-141	ZEB1(deltaEF1)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.
hsa-miR-141	SIP1(ZEB2)	2008	The miR-200 family inhibits epithelial-mesenchymal transition and cancer cell migration by direct targeting of E-cadherin transcriptional repressors ZEB1 and ZEB2.
hsa-miR-141	ZEB1(deltaEF1)	2008	The miR-200 family inhibits epithelial-mesenchymal transition and cancer cell migration by direct targeting of E-cadherin transcriptional repressors ZEB1 and ZEB2.
hsa-miR-141	CLOCK	2006	Involvement of human micro-RNA in growth and response to chemotherapy in human cholangiocarcinoma cell lines.
hsa-miR-141	SIP1	2009	MicroRNA-141 Regulates Smad Interacting Protein 1 (SIP1) and Inhibits Migration and Invasion of Colorectal Cancer Cells
hsa-miR-141	ZEB1	2009	Regulation of miR-200 family microRNAs and ZEB transcription factors in ovarian cancer: Evidence supporting a mesothelial-to-epithelial transition
hsa-miR-141	ZEB2	2009	Regulation of miR-200 family microRNAs and ZEB transcription factors in ovarian cancer: Evidence supporting a mesothelial-to-epithelial transition
hsa-miR-142-3p	AC9	2009	miR-142-3p restricts cAMP production in CD4+CD25- T cells and CD4+CD25+ TREG cells by targeting AC9 mRNA
hsa-miR-143	DNMT3A	2009	MicroRNA-143 targets DNA methyltransferases 3A in colorectal cancer.
hsa-miR-143	Klf4	2009	miR-145 and miR-143 regulate smooth muscle cell fate and plasticity
hsa-miR-143	Elk-1	2009	miR-145 and miR-143 regulate smooth muscle cell fate and plasticity
hsa-miR-143	KRAS	2009	Role of miR-143 targeting KRAS in colorectal tumorigenesis
hsa-miR-143	ERK5	2009	Role of microRNA-143 in Fas-mediated apoptosis in human T-cell leukemia Jurkat cells.
hsa-miR-143	KRAS	2009	Role of miR-143 targeting KRAS in colorectal tumorigenesis.
hsa-miR-143	FND3B	2009	Up-regulated microRNA-143 transcribed by nuclear factor kappa B enhances hepatocarcinoma metastasis by repressing fibronectin expression.
hsa-miR-143	ERK5	2007	Downregulation of microRNAs-143 and -145 in B-cell malignancies.
hsa-miR-143	ERK5	2007	Downregulation of microRNAs-143 and -145 in B-cell malignancies.
hsa-miR-143	ERK5	2007	MicroRNA-143 and -145 in colon cancer.
hsa-miR-143	ERK5	2006	MicroRNAs 143 and 145 are possible common onco-microRNAs in human cancers.
hsa-miR-143	ERK5	2004	MicroRNA-143 regulates adipocyte differentiation.
hsa-miR-144	Klfd	2008	Mir-144 selectively regulates embryonic {alpha}-hemoglobin synthesis during primitive erythropoiesis.
hsa-miR-145	Klf4	2009	miR-145 and miR-143 regulate smooth muscle cell fate and plasticity
hsa-miR-145	Elk-1	2009	miR-145 and miR-143 regulate smooth muscle cell fate and plasticity
hsa-miR-145	IGF-IR	2009	Mechanism of growth inhibition by MicroRNA 145: the role of the IGF-I receptor signaling pathway.
hsa-miR-145	IRS-1	2009	Mechanism of growth inhibition by MicroRNA 145: the role of the IGF-I receptor signaling pathway.
hsa-miR-145	KLF4	2009	MicroRNA-145 regulates OCT4, SOX2, and KLF4 and represses

hsa-miR-145	SOX2	2009	pluripotency in human embryonic stem cells MicroRNA-145 regulates OCT4, SOX2, and KLF4 and represses pluripotency in human embryonic stem cells
hsa-miR-145	KLF5	2009	MicroRNA-145, a Novel Smooth Muscle Cell Phenotypic Marker and Modulator, Controls Vascular Neointimal Lesion Formation.
hsa-miR-145	IRS-1	2007	Micro RNA 145 targets the insulin receptor substrate-1 and inhibits the growth of colon cancer cells.
hsa-miR-145	BNIP3	2010	MicroRNA145 targets BNIP3 and suppresses prostate cancer progression.
hsa-miR-146a	TRAF6	2009	MicroRNA-146a feedback inhibits RIG-I-dependent Type I IFN production in macrophages by targeting TRAF6, IRAK1, and IRAK2
hsa-miR-146a	IRAK1	2009	MicroRNA-146a feedback inhibits RIG-I-dependent Type I IFN production in macrophages by targeting TRAF6, IRAK1, and IRAK2
hsa-miR-146a	IRAK2	2009	MicroRNA-146a feedback inhibits RIG-I-dependent Type I IFN production in macrophages by targeting TRAF6, IRAK1, and IRAK2
hsa-miR-146a	CFH	2009	Characterization of an NF-kappaB-regulated, miRNA-146a-mediated down-regulation of complement factor H (CFH) in metal-sulfate-stressed human brain cells.
hsa-miR-146a	BRCA1	2008	A functional polymorphism in the miR-146a gene and age of familial breast/ovarian cancer diagnosis.
hsa-miR-146a	BRCA2	2008	A functional polymorphism in the miR-146a gene and age of familial breast/ovarian cancer diagnosis.
hsa-miR-146a	CFH	2008	An NF-kB-sensitive microRNA-146a-mediated inflammatory circuit in Alzheimer's disease and in stressed human brain cells.
hsa-miR-146a	NF-kappaB	2008	Expression of microRNA-146 suppresses NF-kappaB activity with reduction of metastatic potential in breast cancer cells.
hsa-miR-146a	ROCK1	2008	Loss of mir-146a function in hormone-refractory prostate cancer.
hsa-miR-146a	IRAK1	2006	NF-kappaB-dependent induction of microRNA miR-146, an inhibitor targeted to signaling proteins of innate immune responses.
hsa-miR-146a	TRAF6	2006	NF-kappaB-dependent induction of microRNA miR-146, an inhibitor targeted to signaling proteins of innate immune responses.
hsa-miR-146a	KIT	2005	The role of microRNA genes in papillary thyroid carcinoma.
hsa-miR-146b	MMP16	2009	microRNA-146b inhibits glioma cell migration and invasion by targeting MMPs.
hsa-miR-146b	NF-kappaB	2008	Expression of microRNA-146 suppresses NF-kappaB activity with reduction of metastatic potential in breast cancer cells.
hsa-miR-148a	TGIF2	2008	A microRNA DNA methylation signature for human cancer metastasis
hsa-miR-148a	HLA-G	2007	Allele-specific targeting of microRNAs to HLA-G and risk of asthma.
hsa-miR-148a	DNMT-1	2010	MicroRNA-dependent regulation of DNA methyltransferase-1 and tumor suppressor gene expression by interleukin-6 in human malignant cholangiocytes.
hsa-miR-148b	HLA-G	2007	Allele-specific targeting of microRNAs to HLA-G and risk of asthma.
hsa-miR-15	c-myb	2009	Genome-wide microRNA expression profiling in renal cell carcinoma: significant down-regulation of miR-141 and miR-200c.
hsa-miR-150	P2X7	2008	MicroRNAs miR-186 and miR-150 down-regulate expression of the proapoptotic purinergic P2X7 receptor by activation of instability sites at the 3'-untranslated region of the gene that decrease steady-state levels of the transcript
hsa-miR-152	HLA-G	2007	Allele-specific targeting of microRNAs to HLA-G and risk of asthma.
hsa-miR-152	DNMT-1	2010	MicroRNA-dependent regulation of DNA methyltransferase-1 and tumor suppressor gene expression by interleukin-6 in human malignant cholangiocytes.
hsa-miR-153	Mcl-1	2009	Down-regulations of B-cell lymphoma 2 (Bcl-2) and myeloid cell

hsa-miR-153	BCL2	2009	leukemia sequence 1 (Mcl-1) by MicroRNA 153 induce apoptosis in a glioblastoma cell line DBTRG-05MG. Down-regulations of B-cell lymphoma 2 (Bcl-2) and myeloid cell leukemia sequence 1 (Mcl-1) by MicroRNA 153 induce apoptosis in a glioblastoma cell line DBTRG-05MG.
hsa-miR-155	SOCS1	2009	Foxp3-dependent microRNA155 confers competitive fitness to regulatory T cells by targeting SOCS1 protein
hsa-miR-155	SHIP1	2009	Inositol phosphatase SHIP1 is a primary target of miR-155
hsa-miR-155	TAB2	2009	MicroRNA-155 modulates the interleukin-1 signaling pathway in activated human monocyte-derived dendritic cells
hsa-miR-155	AGTR1	2008	Human microRNA-155 on chromosome 21 differentially interacts with its polymorphic target in the AGTR1 3' untranslated region: a mechanism for functional single-nucleotide polymorphisms related to phenotypes.
hsa-miR-155	Ets-1	2008	MicroRNA 155 modulates megakaryopoiesis at progenitor and precursor level by targeting Ets-1 and Meis1 transcription factors
hsa-miR-155	Meis1	2008	MicroRNA 155 modulates megakaryopoiesis at progenitor and precursor level by targeting Ets-1 and Meis1 transcription factors
hsa-miR-155	RhoA	2008	MicroRNA-155 Is Regulated by TGF{beta}/Smad Pathway and Contributes to Epithelial Cell Plasticity by Targeting RhoA
hsa-miR-155	RhoA	2008	MicroRNA-155 is regulated by the transforming growth factor beta/Smad pathway and contributes to epithelial cell plasticity by targeting RhoA.
hsa-miR-155	TP53INP1	2007	Tumor protein 53-induced nuclear protein 1 expression is repressed by miR-155, and its restoration inhibits pancreatic tumor development.
hsa-miR-155	hAT1R	2006	MicroRNA-155 regulates human angiotensin II type 1 receptor expression in fibroblasts.
hsa-miR-155	ET-1	2009	Ethanol-induced expression of ET-1 and ET-BR in liver sinusoidal endothelial cells and human endothelial cells involves hypoxia-inducible factor-1alpha and microRNA-199
hsa-miR-155	JARID2	2009	Reticuloendotheliosis virus strain T induces miR-155 which targets JARID2 and promotes cell survival
hsa-miR-155	KGF	2009	Identification of keratinocyte growth factor as a target of microRNA-155 in lung fibroblasts: implication in epithelial-mesenchymal interactions
hsa-miR-15a	CCND1	2009	miR-15a and miR-16 are implicated in cell cycle regulation in a Rb-dependent manner and are frequently deleted or down-regulated in non-small cell lung cancer.
hsa-miR-15a	CCND2	2009	miR-15a and miR-16 are implicated in cell cycle regulation in a Rb-dependent manner and are frequently deleted or down-regulated in non-small cell lung cancer.
hsa-miR-15a	CCNE1	2009	miR-15a and miR-16 are implicated in cell cycle regulation in a Rb-dependent manner and are frequently deleted or down-regulated in non-small cell lung cancer.
hsa-miR-15a	CCND1	2009	miR-15a and miR-16 are implicated in cell cycle regulation in a Rb-dependent manner and are frequently deleted or down-regulated in non-small cell lung cancer.
hsa-miR-15a	CCND2	2009	miR-15a and miR-16 are implicated in cell cycle regulation in a Rb-dependent manner and are frequently deleted or down-regulated in non-small cell lung cancer.
hsa-miR-15a	CCNE1	2009	miR-15a and miR-16 are implicated in cell cycle regulation in a Rb-dependent manner and are frequently deleted or down-regulated in non-small cell lung cancer.
hsa-miR-15a	CCND1	2009	miR-15a and miR-16 Are Implicated in Cell Cycle Regulation in a Rb-

hsa-miR-15a	Cdc25A	2008	Dependent Manner and Are Frequently Deleted or Down-regulated in Non-Small Cell Lung Cancer.
hsa-miR-15a	Cdc25A	2008	MicroRNA15a modulates expression of the cell-cycle regulator Cdc25A and affects hepatic cystogenesis in a rat model of polycystic kidney disease.
hsa-miR-15a	Myb	2008	The c-myb Protooncogene and microRNA (miR)-15a comprise an active autoregulatory feedback loop in human hematopoietic cells
hsa-miR-15a	CCND1	2008	The miR-15a-miR-16-1 cluster controls prostate cancer by targeting multiple oncogenic activities.
hsa-miR-15a	WNT3A	2008	The miR-15a-miR-16-1 cluster controls prostate cancer by targeting multiple oncogenic activities.
hsa-miR-15a	BCL2	2007	MicroRNA gene expression during retinoic acid-induced differentiation of human acute promyelocytic leukemia.
hsa-miR-15a	RAS	2007	MicroRNA gene expression during retinoic acid-induced differentiation of human acute promyelocytic leukemia.
hsa-miR-15a	BCL2	2007	The role of microRNA and other non-coding RNA in the pathogenesis of chronic lymphocytic leukemia.
hsa-miR-15a	BCL2	2005	miR-15 and miR-16 induce apoptosis by targeting BCL2.
hsa-miR-15a	RAS	2005	miR-15a and miR-16-1 down-regulation in pituitary adenomas.
hsa-miR-15a	BMI1	2009	MiR-15a and MiR-16 control Bmi-1 expression in ovarian cancer.
hsa-miR-15b	CCNE1	2009	MicroRNA-15b regulates cell cycle progression by targeting cyclins in glioma cells.
hsa-miR-15b	BCL2	2009	miR-15b and miR-16 are implicated in activation of the rat hepatic stellate cell: An essential role for apoptosis
hsa-miR-15b	caspases-3	2009	miR-15b and miR-16 are implicated in activation of the rat hepatic stellate cell: An essential role for apoptosis
hsa-miR-15b	caspases-8	2009	miR-15b and miR-16 are implicated in activation of the rat hepatic stellate cell: An essential role for apoptosis
hsa-miR-15b	caspases-9	2009	miR-15b and miR-16 are implicated in activation of the rat hepatic stellate cell: An essential role for apoptosis
hsa-miR-15b	CCNE1	2009	miR-21 plays a pivotal role in gastric cancer pathogenesis and progression.
hsa-miR-15b	BCL2	2008	miR-15b and miR-16 modulate multidrug resistance by targeting BCL2 in human gastric cancer cells.
hsa-miR-15b	eIF-4A	2006	Differentially regulated micro-RNAs and actively translated messenger RNA transcripts by tumor suppressor p53 in colon cancer.
hsa-miR-16	BCL2	2009	Epigallocatechin gallate up-regulation of miR-16 and induction of apoptosis in human cancer cells.
hsa-miR-16	CCND1	2009	miR-15a and miR-16 Are Implicated in Cell Cycle Regulation in a Rb-Dependent Manner and Are Frequently Deleted or Down-regulated in Non-Small Cell Lung Cancer.
hsa-miR-16	BCL2	2009	miR-15b and miR-16 are implicated in activation of the rat hepatic stellate cell: An essential role for apoptosis
hsa-miR-16	caspases-3	2009	miR-15b and miR-16 are implicated in activation of the rat hepatic stellate cell: An essential role for apoptosis
hsa-miR-16	caspases-8	2009	miR-15b and miR-16 are implicated in activation of the rat hepatic stellate cell: An essential role for apoptosis
hsa-miR-16	caspases-9	2009	miR-15b and miR-16 are implicated in activation of the rat hepatic stellate cell: An essential role for apoptosis
hsa-miR-16	Caprin-1	2009	Two new miR-16 targets: Caprin-1 and HMGA1, proteins implicated in cell proliferation
hsa-miR-16	HMGA1	2009	Two new miR-16 targets: Caprin-1 and HMGA1, proteins implicated in cell proliferation

hsa-miR-16	BCL2	2008	miR-15b and miR-16 modulate multidrug resistance by targeting BCL2 in human gastric cancer cells.
hsa-miR-16	CCND1	2008	miR-16 family induces cell cycle arrest by regulating multiple cell cycle genes
hsa-miR-16	CCND3	2008	miR-16 family induces cell cycle arrest by regulating multiple cell cycle genes
hsa-miR-16	CCNE1	2008	miR-16 family induces cell cycle arrest by regulating multiple cell cycle genes
hsa-miR-16	CDK6	2008	miR-16 family induces cell cycle arrest by regulating multiple cell cycle genes
hsa-miR-16	CCND1	2008	Truncation in CCND1 mRNA alters miR-16-1 regulation in mantle cell lymphoma.
hsa-miR-16	BCL2	2007	Abnormal microRNA-16 locus with synteny to human 13q14 linked to CLL in NZB mice.
hsa-miR-16	BCL2	2007	MicroRNA gene expression during retinoic acid-induced differentiation of human acute promyelocytic leukemia.
hsa-miR-16	RAS	2007	MicroRNA gene expression during retinoic acid-induced differentiation of human acute promyelocytic leukemia.
hsa-miR-16	BCL2	2007	The role of microRNA and other non-coding RNA in the pathogenesis of chronic lymphocytic leukemia.
hsa-miR-16	BCL2	2005	miR-15 and miR-16 induce apoptosis by targeting BCL2.
hsa-miR-16	RAS	2005	miR-15a and miR-16-1 down-regulation in pituitary adenomas.
hsa-miR-16	RARS	2002	Frequent deletions and down-regulation of micro-RNA genes miR15 and miR16 at 13q14 in chronic lymphocytic leukemia.
hsa-miR-16	CDK1	2009	Systemic Delivery of Synthetic MicroRNA-16 Inhibits the Growth of Metastatic Prostate Tumors via Downregulation of Multiple Cell-cycle Genes
hsa-miR-16	CDK2	2009	Systemic Delivery of Synthetic MicroRNA-16 Inhibits the Growth of Metastatic Prostate Tumors via Downregulation of Multiple Cell-cycle Genes
hsa-miR-16	BMI1	2009	MiR-15a and MiR-16 control Bmi-1 expression in ovarian cancer.
hsa-miR-16-1	CCND1	2008	The miR-15a-miR-16-1 cluster controls prostate cancer by targeting multiple oncogenic activities.
hsa-miR-16-1	WNT3A	2008	The miR-15a-miR-16-1 cluster controls prostate cancer by targeting multiple oncogenic activities.
hsa-miR-16a	BCL2	2008	Down-regulation of the microRNAs miR-34a, miR-127, and miR-200b in rat liver during hepatocarcinogenesis induced by a methyl-deficient diet.
hsa-miR-17	E2F1	2009	miR-17 and miR-20a temper an E2F1-induced G1 checkpoint to regulate cell cycle progression
hsa-miR-17	CDKN1A	2008	MicroRNA-17-92 downregulates expression of distinct targets in different B-cell lymphoma subtypes.
hsa-miR-17	p21	2008	MicroRNA-17-92 downregulates expression of distinct targets in different B-cell lymphoma subtypes.
hsa-miR-17	YES1	2009	A high throughput experimental approach to identify miRNA targets in human cells
hsa-miR-17	RBJ	2009	A high throughput experimental approach to identify miRNA targets in human cells
hsa-miR-17	NPAT	2009	A high throughput experimental approach to identify miRNA targets in human cells
hsa-miR-17	FBX031	2009	A high throughput experimental approach to identify miRNA targets in human cells
hsa-miR-17	OBFC2A	2009	A high throughput experimental approach to identify miRNA targets in

hsa-miR-17	GPR137B	2009	human cells A high throughput experimental approach to identify miRNA targets in human cells
hsa-miR-17	CCL1	2009	A high throughput experimental approach to identify miRNA targets in human cells
hsa-miR-17	ZNF1	2009	A high throughput experimental approach to identify miRNA targets in human cells
hsa-miR-17	PKD2	2009	MicroRNA-17 post-transcriptionally regulates polycystic kidney disease-2 gene and promotes cell proliferation.
hsa-miR-17-3p	T ₁ ÂRII	2007	Synergistic action of the microRNA-17 polycistron and Myc in aggressive cancer development.
hsa-miR-17-3p	vimentin	2009	MicroRNA-17-3p is a prostate tumor suppressor in vitro and in vivo, and is decreased in high grade prostate tumors analyzed by laser capture microdissection
hsa-miR-17-5p	BMP2	2009	Interleukin-6 modulates the expression of the bone morphogenic protein receptor type II through a novel STAT3-microRNA cluster 17/92 pathway.
hsa-miR-17-5p	CCND1	2008	A cyclin D1/microRNA 17/20 regulatory feedback loop in control of breast cancer cell proliferation.
hsa-miR-17-5p	BIM	2008	Antagomir-17-5p abolishes the growth of therapy-resistant neuroblastoma through p21 and BIM
hsa-miR-17-5p	p21	2008	Antagomir-17-5p abolishes the growth of therapy-resistant neuroblastoma through p21 and BIM
hsa-miR-17-5p	E2F1	2008	Deregulated expression of miR-106a predicts survival in human colon cancer patients.
hsa-miR-17-5p	PTPRO	2008	Protein tyrosine phosphatase receptor-type O (PTPRO) is co-regulated by E2F1 and miR-17-92.
hsa-miR-17-5p	T ₁ ÂRII	2007	Synergistic action of the microRNA-17 polycistron and Myc in aggressive cancer development.
hsa-miR-17-5p	AIB1	2006	Mir-17-5p regulates breast cancer cell proliferation by inhibiting translation of AIB1 mRNA.
hsa-miR-18	CTGF	2006	Comprehensive analysis of microRNA expression patterns in hepatocellular carcinoma and non-tumorous tissues.
hsa-miR-18	RANKL	2006	Comprehensive analysis of microRNA expression patterns in hepatocellular carcinoma and non-tumorous tissues.
hsa-miR-181a	CDX2	2009	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.
hsa-miR-181a	GATA6	2009	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.
hsa-miR-181a	NLK	2009	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.
hsa-miR-181a	PLAG1	2009	miRNA deregulation by epigenetic silencing disrupts suppression of the oncogene PLAG1 in chronic lymphocytic leukemia.
hsa-miR-181a	BDNF	2009	microRNAs miR-124, let-7d and miR-181a regulate Cocaine-induced Plasticity
hsa-miR-181a	D3R	2009	microRNAs miR-124, let-7d and miR-181a regulate Cocaine-induced Plasticity
hsa-miR-181a	PCAF	2008	MicroRNAs regulate critical genes associated with multiple myeloma pathogenesis.
hsa-miR-181b	CDX2	2009	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.
hsa-miR-181b	GATA6	2009	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.

hsa-miR-181b	NLK	2009	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.
hsa-miR-181b	PLAG1	2009	miRNA deregulation by epigenetic silencing disrupts suppression of the oncogene PLAG1 in chronic lymphocytic leukemia.
hsa-miR-181b	PCAF	2008	MicroRNAs regulate critical genes associated with multiple myeloma pathogenesis.
hsa-miR-181b	AID	2008	miR-181b negatively regulates activation-induced cytidine deaminase in B cells
hsa-miR-181b	Tcl1	2006	Tcl1 expression in chronic lymphocytic leukemia is regulated by miR-29 and miR-181.
hsa-miR-181c	CDX2	2009	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.
hsa-miR-181c	GATA6	2009	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.
hsa-miR-181c	NLK	2009	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.
hsa-miR-182	FOXO1	2009	Coordinate Regulation of FOXO1 by miR-27a, miR-96, and miR-182 in Breast Cancer Cells.
hsa-miR-183	Ezrin	2008	MicroRNA-183 regulates Ezrin expression in lung cancer cells.
hsa-miR-184	NFAT1	2009	MicroRNA 184 regulates expression of NFAT1 in umbilical cord blood CD4+ T-cells
hsa-miR-186	P2X7	2008	MicroRNAs miR-186 and miR-150 down-regulate expression of the proapoptotic purinergic P2X7 receptor by activation of instability sites at the 3'-untranslated region of the gene that decrease steady-state levels of the transcript
hsa-miR-189	SLITRK1	2008	Sequence variants in SLITRK1 are associated with Tourette's syndrome.
hsa-miR-18a*	KRAS	2009	The miR-18a* microRNA functions as a potential tumor suppressor by targeting on K-Ras
hsa-miR-18a*	KRAS	2009	The miR-18a* microRNA functions as a potential tumor suppressor by targeting on K-Ras.
hsa-miR-19	ATXN1	2008	miR-19, miR-101 and miR-130 co-regulate ATXN1 levels to potentially modulate SCA1 pathogenesis.
hsa-miR-192	CDKN1A/p21	2009	MicroRNA alterations in head and neck squamous cell carcinoma.
hsa-miR-192	MIP-2 alpha	2008	MicroRNAs are differentially expressed in ulcerative colitis and alter expression of macrophage inflammatory peptide-2 alpha.
hsa-miR-193a	E2F6	2008	Exploration of tumor-suppressive microRNAs silenced by DNA hypermethylation in oral cancer.
hsa-miR-193b	CCND1	2010	MicroRNA-193b represses cell proliferation and regulates cyclin D1 in melanoma.
hsa-miR-195	CCND1	2009	MicroRNA-195 suppresses tumorigenicity and regulates G(1)/S transition of human hepatocellular carcinoma cells.
hsa-miR-195	CDK6	2009	MicroRNA-195 suppresses tumorigenicity and regulates G(1)/S transition of human hepatocellular carcinoma cells.
hsa-miR-195	E2F3	2009	MicroRNA-195 suppresses tumorigenicity and regulates G(1)/S transition of human hepatocellular carcinoma cells.
hsa-miR-195	WEE1	2009	microRNAs regulate human embryonic stem cell division
hsa-miR-196a	KRT5	2009	MicroRNA-196a is a Potential Marker of Progression during Barrett's Metaplasia-Dysplasia-Invasive Adenocarcinoma Sequence in Esophagus.
hsa-miR-196a	S100A9	2009	MicroRNA-196a is a Potential Marker of Progression during Barrett's Metaplasia-Dysplasia-Invasive Adenocarcinoma Sequence in Esophagus.
hsa-miR-196a	SPRR2C	2009	MicroRNA-196a is a Potential Marker of Progression during Barrett's

hsa-miR-196a	HOXC8	2009	Metaplasia-Dysplasia-Invasive Adenocarcinoma Sequence in Esophagus.
hsa-miR-196a	ANXA1	2008	miR-196a Regulates Proliferation and Osteogenic Differentiation in Mesenchymal Stem Cells Derived From Human Adipose Tissue
hsa-miR-196a	BMP4	2010	MicroRNA-196a targets annexin A1: a microRNA-mediated mechanism of annexin A1 downregulation in cancers.
hsa-miR-196a-2	HOXB8	2009	MicroRNA miR-196a is a central regulator of HOX-B7 and BMP4 expression in malignant melanoma.
hsa-miR-197	FUS1	2009	Functional variant in microRNA-196a2 contributes to the susceptibility of congenital heart disease in a Chinese population.
hsa-miR-197	ACVR1	2006	miR-93, miR-98, and miR-197 regulate expression of tumor suppressor gene FUS1.
hsa-miR-197	TSPAN3	2006	A limited set of human MicroRNA is deregulated in follicular thyroid carcinoma.
hsa-miR-199	ET-1	2009	A limited set of human MicroRNA is deregulated in follicular thyroid carcinoma.
hsa-miR-199a	IKK-beta	2008	Ethanol-induced expression of ET-1 and ET-BR in liver sinusoidal endothelial cells and human endothelial cells involves hypoxia-inducible factor-1alpha and microRNA-199
hsa-miR-199a*	Smad1	2009	Regulation of IKKbeta by miR-199a affects NF-kappaB activity in ovarian cancer cells.
hsa-miR-199a*	ERK2	2008	miR-199a*, a bone morphogenic protein 2 responsive microRNA, regulates chondrogenesis via direct targeting to Smad1
hsa-miR-199a*	MET	2008	MicroRNA miR-199a* regulates the MET proto-oncogene and the downstream extracellular signal-regulated kinase 2 (ERK2).
hsa-miR-199b	SET	2010	MicroRNA miR-199a* regulates the MET proto-oncogene and the downstream extracellular signal-regulated kinase 2 (ERK2).
hsa-miR-199b-5p	HES1	2009	Decreased expression of microRNA-199b increases protein levels of SET (protein phosphatase 2A inhibitor) in human choriocarcinoma.
hsa-miR-19a	PTEN	2008	MicroRNA-199b-5p impairs cancer stem cells through negative regulation of HES1 in medulloblastoma.
hsa-miR-19a	BIM	2008	Differential expression of PTEN-targeting microRNAs miR-19a and miR-21 in Cowden syndrome.
hsa-miR-19a	SOCS-1	2008	MicroRNAs regulate critical genes associated with multiple myeloma pathogenesis.
hsa-miR-19b	BIM	2008	MicroRNAs regulate critical genes associated with multiple myeloma pathogenesis.
hsa-miR-19b	SOCS-1	2008	MicroRNAs regulate critical genes associated with multiple myeloma pathogenesis.
hsa-miR-200a	beta-catenin	2009	MicroRNAs regulate critical genes associated with multiple myeloma pathogenesis.
hsa-miR-200a	Dlx5	2009	"Down-regulated microRNA-200a in Meningiomas Promotes Tumor Growth by Reducing E-cadherin and Activating the Wnt/{beta} catenin Signaling Pathway.
hsa-miR-200a	SIP1/ZEB2	2008	MicroRNA-141 and -200a are involved in bone morphogenetic protein-2-induced mouse Pre-osteoblast differentiation by targeting distal-less homeobox 5
hsa-miR-200a	ZEB1/deltaEF1	2008	A double-negative feedback loop between ZEB1-SIP1 and the microRNA-200 family regulates epithelial-mesenchymal transition
hsa-miR-200a	SIP1(ZEB2)	2008	A double-negative feedback loop between ZEB1-SIP1 and the microRNA-200 family regulates epithelial-mesenchymal transition
			The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.

hsa-miR-200a	ZEB1(deltaEF1)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.
hsa-miR-200a	SIP1(ZEB2)	2008	The miR-200 family inhibits epithelial-mesenchymal transition and cancer cell migration by direct targeting of E-cadherin transcriptional repressors ZEB1 and ZEB2.
hsa-miR-200a	ZEB1(deltaEF1)	2008	The miR-200 family inhibits epithelial-mesenchymal transition and cancer cell migration by direct targeting of E-cadherin transcriptional repressors ZEB1 and ZEB2.
hsa-miR-200a	WAVE3	2009	The miR200 family of microRNAs regulates WAVE3-dependent cancer cell invasion
hsa-miR-200a	ZEB1	2009	Regulation of miR-200 family microRNAs and ZEB transcription factors in ovarian cancer: Evidence supporting a mesothelial-to-epithelial transition
hsa-miR-200a	ZEB2	2009	Regulation of miR-200 family microRNAs and ZEB transcription factors in ovarian cancer: Evidence supporting a mesothelial-to-epithelial transition
hsa-miR-200b	SIP1/ZEB3	2008	A double-negative feedback loop between ZEB1-SIP1 and the microRNA-200 family regulates epithelial-mesenchymal transition
hsa-miR-200b	ZEB1/deltaEF1	2008	A double-negative feedback loop between ZEB1-SIP1 and the microRNA-200 family regulates epithelial-mesenchymal transition
hsa-miR-200b	SIP1(ZEB2)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.
hsa-miR-200b	ZEB1(deltaEF1)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.
hsa-miR-200b	SIP1(ZEB2)	2008	The miR-200 family inhibits epithelial-mesenchymal transition and cancer cell migration by direct targeting of E-cadherin transcriptional repressors ZEB1 and ZEB2.
hsa-miR-200b	ZEB1(deltaEF1)	2008	The miR-200 family inhibits epithelial-mesenchymal transition and cancer cell migration by direct targeting of E-cadherin transcriptional repressors ZEB1 and ZEB2.
hsa-miR-200b	PTPN12	2006	Involvement of human micro-RNA in growth and response to chemotherapy in human cholangiocarcinoma cell lines.
hsa-miR-200b	WAVE3	2009	The miR200 family of microRNAs regulates WAVE3-dependent cancer cell invasion
hsa-miR-200b	ZEB1	2009	E-cadherin transcriptional down-regulation by epigenetic and microRNA-200 family alterations is related to mesenchymal and drug-resistant phenotypes in human breast cancer cells.
hsa-miR-200b	ZEB2	2009	E-cadherin transcriptional down-regulation by epigenetic and microRNA-200 family alterations is related to mesenchymal and drug-resistant phenotypes in human breast cancer cells.
hsa-miR-200b	ZEB1	2009	Regulation of miR-200 family microRNAs and ZEB transcription factors in ovarian cancer: Evidence supporting a mesothelial-to-epithelial transition
hsa-miR-200b	ZEB2	2009	Regulation of miR-200 family microRNAs and ZEB transcription factors in ovarian cancer: Evidence supporting a mesothelial-to-epithelial transition
hsa-miR-200c	BMI1	2009	Downregulation of miRNA-200c links breast cancer stem cells with normal stem cells.
hsa-miR-200c	TUBB3	2009	MicroRNA-200c mitigates invasiveness and restores sensitivity to microtubule-targeting chemotherapeutic agents.
hsa-miR-200c	E-cadherin	2009	Stable expression of miR-200c alone is sufficient to regulate TCF8 (ZEB1) and restore E-cadherin expression
hsa-miR-200c	ZEB1	2009	Stable expression of miR-200c alone is sufficient to regulate TCF8 (ZEB1)

			and restore E-cadherin expression
hsa-miR-200c	ZEB1(deltaEF1)	2008	A reciprocal repression between ZEB1 and members of the miR-200 family promotes EMT and invasion in cancer cells.
hsa-miR-200c	SIP1(ZEB2)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.
hsa-miR-200c	ZEB1(deltaEF1)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.
hsa-miR-200c	SIP1(ZEB2)	2008	The miR-200 family inhibits epithelial-mesenchymal transition and cancer cell migration by direct targeting of E-cadherin transcriptional repressors ZEB1 and ZEB2.
hsa-miR-200c	ZEB1(deltaEF1)	2008	The miR-200 family inhibits epithelial-mesenchymal transition and cancer cell migration by direct targeting of E-cadherin transcriptional repressors ZEB1 and ZEB2.
hsa-miR-200c	ZEB1	2009	E-cadherin transcriptional down-regulation by epigenetic and microRNA-200 family alterations is related to mesenchymal and drug-resistant phenotypes in human breast cancer cells.
hsa-miR-200c	ZEB2	2009	E-cadherin transcriptional down-regulation by epigenetic and microRNA-200 family alterations is related to mesenchymal and drug-resistant phenotypes in human breast cancer cells.
hsa-miR-200c	ZEB1	2009	Regulation of miR-200 family microRNAs and ZEB transcription factors in ovarian cancer: Evidence supporting a mesothelial-to-epithelial transition
hsa-miR-200c	ZEB2	2009	Regulation of miR-200 family microRNAs and ZEB transcription factors in ovarian cancer: Evidence supporting a mesothelial-to-epithelial transition
hsa-miR-203	p63	2008	A skin microRNA promotes differentiation by repressing 'stemness'.
hsa-miR-203	ABL1	2008	Genetic and epigenetic silencing of microRNA-203 enhances ABL1 and BCR-ABL1 oncogene expression.
hsa-miR-203	ABL1	2008	Genetic and epigenetic silencing of microRNA-203 enhances ABL1 and BCR-ABL1 oncogene expression.
hsa-miR-203	BCR-ABL1	2008	Genetic and epigenetic silencing of microRNA-203 enhances ABL1 and BCR-ABL1 oncogene expression.
hsa-miR-203	BCR-ABL1	2008	Genetic and epigenetic silencing of microRNA-203 enhances ABL1 and BCR-ABL1 oncogene expression.
hsa-miR-203	SOCS-3	2007	MicroRNAs: novel regulators involved in the pathogenesis of Psoriasis?
hsa-miR-204	BCL2	2009	MicroRNA microarray identifies Let-7i as a novel biomarker and therapeutic target in human epithelial ovarian cancer.
hsa-miR-204	Mcl-1	2009	p53-Responsive microRNAs 192 and 215 are capable of inducing cell cycle arrest.
hsa-miR-204	HOXA10	2008	Distinctive microRNA signature of acute myeloid leukemia bearing cytoplasmic mutated nucleophosmin.
hsa-miR-204	MEIS1	2008	Distinctive microRNA signature of acute myeloid leukemia bearing cytoplasmic mutated nucleophosmin.
hsa-miR-204	PDEF	2008	MicroRNA-mediated inhibition of prostate-derived Ets factor messenger RNA translation affects prostate-derived Ets factor regulatory networks in human breast cancer.
hsa-miR-205	LRP1	2009	MicroRNA-205 inhibits tumor cell migration through down-regulating the expression of the LDL receptor-related protein 1
hsa-miR-205	HER3	2009	microRNA-205 regulates HER3 in human breast cancer.
hsa-miR-205	SHIP2	2009	MicroRNA-184 antagonizes microRNA-205 to maintain SHIP2 levels in epithelia
hsa-miR-205	SIP1(ZEB2)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.

hsa-miR-205	ZEB1(deltaEF1)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.
hsa-miR-206	MET	2009	"The muscle-specific microRNA miR-206 blocks human rhabdomyosarcoma growth in xenotransplanted mice by promoting myogenic differentiation."
hsa-miR-206	c-Met	2009	MicroRNA-1/206 targets c-Met and inhibits rhabdomyosarcoma development.
hsa-miR-206	ER-alpha	2008	miR-206 Expression is down-regulated in estrogen receptor alpha-positive human breast cancer.
hsa-miR-206	ER-alpha	2007	The micro-ribonucleic acid (miRNA) miR-206 targets the human estrogen receptor-alpha (ERalpha) and represses ERalpha messenger RNA and protein expression in breast cancer cell lines.
hsa-miR-206	NOTCH3	2009	MICRORNA-206 targets NOTCH3, activates apoptosis, inhibits tumor cell migration and foci formation
hsa-miR-208	THRAP1	2007	Control of stress-dependent cardiac growth and gene expression by a microRNA.
hsa-miR-20a	BMPR2	2009	Interleukin-6 modulates the expression of the bone morphogenic protein receptor type II through a novel STAT3-microRNA cluster 17/92 pathway.
hsa-miR-20a	E2F1	2009	miR-17 and miR-20a temper an E2F1-induced G1 checkpoint to regulate cell cycle progression
hsa-miR-20a	CCND1	2008	A cyclin D1/microRNA 17/20 regulatory feedback loop in control of breast cancer cell proliferation.
hsa-miR-20a	CDKN1A	2008	MicroRNA-17-92 downregulates expression of distinct targets in different B-cell lymphoma subtypes.
hsa-miR-20a	p21	2008	MicroRNA-17-92 downregulates expression of distinct targets in different B-cell lymphoma subtypes.
hsa-miR-20b	Mylip	2006	Oncogenic potential of the miR-106-363 cluster and its implication in human T-cell leukemia.
hsa-miR-21	LRRFIP1	2009	MicroRNA-21 targets LRRFIP1 and contributes to VM-26 resistance in glioblastoma multiforme.
hsa-miR-21	PTEN	2009	Cholesteatoma Growth and Proliferation: Posttranscriptional Regulation by MicroRNA-21.
hsa-miR-21	PDCD4	2009	Cholesteatoma Growth and Proliferation: Posttranscriptional Regulation by MicroRNA-21.
hsa-miR-21	PDCD4	2009	MicroRNA-21 promotes cell proliferation and down-regulates the expression of programmed cell death 4 (PDCD4) in HeLa cervical carcinoma cells.
hsa-miR-21	BMPRII	2009	BMPRII is a direct target of miR-21
hsa-miR-21	PDCD4	2009	An autoregulatory loop mediated by miR-21 and PDCD4 controls the AP-1 activity in RAS transformation
hsa-miR-21	PTEN	2009	An autoregulatory loop mediated by miR-21 and PDCD4 controls the AP-1 activity in RAS transformation
hsa-miR-21	REST	2009	Is REST a regulator of pluripotency?
hsa-miR-21	PDCD4	2009	Locked nucleic acid in situ hybridization analysis of miR-21 expression during colorectal cancer development.
hsa-miR-21	JAG1	2009	MicroRNA profiling identifies miR-34a and miR-21 and their target genes JAG1 and WNT1 in the co-ordinate regulation of dendritic cell differentiation
hsa-miR-21	WNT1	2009	MicroRNA profiling identifies miR-34a and miR-21 and their target genes JAG1 and WNT1 in the co-ordinate regulation of dendritic cell differentiation
hsa-miR-21	PDCD4	2009	MicroRNA-101 regulates expression of the v-fos FBJ murine

			osteosarcoma viral oncogene homolog (FOS) oncogene in human hepatocellular carcinoma.
hsa-miR-21	Spry1	2009	MicroRNA-143 as a Tumor Suppressor for Bladder Cancer.
hsa-miR-21	RECK	2009	MicroRNA-15b regulates cell cycle progression by targeting cyclins in glioma cells.
hsa-miR-21	MARCKS	2009	MicroRNA-21 directly targets MARCKS and promotes apoptosis resistance and invasion in prostate cancer cells.
hsa-miR-21	PDCD4	2009	MicroRNA-21 regulates the proliferation and invasion in esophageal squamous cell carcinoma.
hsa-miR-21	LRRFIP1	2009	MicroRNA-21 targets LRRFIP1 and contributes to VM-26 resistance in glioblastoma multiforme.
hsa-miR-21	BASP1	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	DERL1	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	Maspin	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	NCAPG	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	PDCD4	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	PDHA2	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	PLOD3	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	PTEN	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	RPS7	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	RTN4	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	TM9SF3	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	TPM1	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	Vector	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	WFS1	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	WIBG	2009	Nuclear hormone receptor regulation of microRNAs controls developmental progression
hsa-miR-21	BTG2	2009	Regulation of the cell cycle gene, BTG2, by miR-21 in human laryngeal carcinoma.
hsa-miR-21	PTEN	2009	Unsaturated fatty acids inhibit the expression of tumor suppressor phosphatase and tensin homolog (PTEN) via microRNA-21 up-regulation in hepatocytes
hsa-miR-21	PDCD4	2009	Up-regulation of miR-21 by HER2/neu Signaling Promotes Cell Invasion.
hsa-miR-21	PDCD4	2008	An autoregulatory loop mediated by miR-21 and PDCD4 controls the AP-1 activity in RAS transformation
hsa-miR-21	PTEN	2008	Differential expression of PTEN-targeting microRNAs miR-19a and miR-21 in Cowden syndrome.
hsa-miR-21	RECK	2008	MicroRNA 21 promotes glioma invasion by targeting matrix

			metalloproteinase regulators.
hsa-miR-21	TIMP3	2008	MicroRNA 21 promotes glioma invasion by targeting matrix metalloproteinase regulators.
hsa-miR-21	PDCD4	2008	MicroRNA-21 (miR-21) post-transcriptionally downregulates tumor suppressor Pcd4 and stimulates invasion, intravasation and metastasis in colorectal cancer.
hsa-miR-21	PDCD4	2008	MicroRNA-21 promotes cell transformation by targeting the programmed cell death 4 gene.
hsa-miR-21	HNRPK	2008	MicroRNA-21 targets a network of key tumor-suppressive pathways in glioblastoma cells.
hsa-miR-21	TAp63	2008	MicroRNA-21 targets a network of key tumor-suppressive pathways in glioblastoma cells.
hsa-miR-21	TGF-beta	2008	MicroRNA-21 targets a network of key tumor-suppressive pathways in glioblastoma cells.
hsa-miR-21	SPRY2	2008	MicroRNA-21 Targets Sprouty2 and Promotes Cellular Outgrowths.
hsa-miR-21	maspin	2008	MicroRNA-21 targets tumor suppressor genes in invasion and metastasis.
hsa-miR-21	PDCD4	2008	MicroRNA-21 targets tumor suppressor genes in invasion and metastasis.
hsa-miR-21	TPM1	2008	MicroRNA-21 targets tumor suppressor genes in invasion and metastasis.
hsa-miR-21	BCL2	2007	MicroRNA expression signature and antisense-mediated depletion reveal an essential role of MicroRNA in vascular neointimal lesion formation.
hsa-miR-21	PTEN	2007	MicroRNA expression signature and antisense-mediated depletion reveal an essential role of MicroRNA in vascular neointimal lesion formation.
hsa-miR-21	PTEN	2007	MicroRNA-21 regulates expression of the PTEN tumor suppressor gene in human hepatocellular cancer.
hsa-miR-21	TPM1	2007	MicroRNA-21 targets the tumor suppressor gene tropomyosin 1 (TPM1).
hsa-miR-21	BCL2	2007	miR-21-mediated tumor growth.
hsa-miR-21	PDCD4	2007	Programmed cell death 4 (PDCD4) is an important functional target of the microRNA miR-21 in breast cancer cells.
hsa-miR-21	PTEN	2006	Involvement of human micro-RNA in growth and response to chemotherapy in human cholangiocarcinoma cell lines.
hsa-miR-21	PDCD4	2006	MicroRNA expression abnormalities in pancreatic endocrine and acinar tumors are associated with distinctive pathologic features and clinical behavior.
hsa-miR-21	PDCD4	2009	Pcd4, a colon cancer prognostic that is regulated by a microRNA
hsa-miR-21	p53	2009	Distinct microRNA alterations characterize high- and low-grade bladder cancer
hsa-miR-21	Cdc25A	2009	microRNA-21 negatively regulates Cdc25A and cell cycle progression in colon cancer cells
hsa-miR-210	RAD52	2009	MicroRNA regulation of DNA repair gene expression in hypoxic stress
hsa-miR-210	Ephrin-A3	2008	MicroRNA-210 modulates endothelial cell response to hypoxia and inhibits the receptor tyrosine kinase ligand Ephrin-A3.
hsa-miR-210	ISCU1/2	2009	MicroRNA-210 controls mitochondrial metabolism during hypoxia by repressing the iron-sulfur cluster assembly proteins ISCU1/2
hsa-miR-210	FGFRL1	2009	Hypoxia-inducible mir-210 regulates normoxic gene expression involved in tumor initiation
hsa-miR-210	HOXA1	2009	Hypoxia-inducible mir-210 regulates normoxic gene expression involved in tumor initiation
hsa-miR-210	PIM1	2009	Hypoxia-inducible mir-210 regulates normoxic gene expression

hsa-miR-210	TP53I11	2009	involved in tumor initiation Hypoxia-inducible mir-210 regulates normoxic gene expression involved in tumor initiation
hsa-miR-210	HOXA9	2009	Hypoxia-inducible mir-210 regulates normoxic gene expression involved in tumor initiation
hsa-miR-212	ZO-1	2008	Effect of alcohol on miR-212 expression in intestinal epithelial cells and its potential role in alcoholic liver disease.
hsa-miR-214	PTEN	2008	MicroRNA expression profiling in human ovarian cancer: miR-214 induces cell survival and cisplatin resistance by targeting PTEN.
hsa-miR-214	Ezh2	2009	Mir-214-dependent regulation of the polycomb protein Ezh2 in skeletal muscle and embryonic stem cells
hsa-miR-214	MEK3	2009	MicroRNA-214 is aberrantly expressed in cervical cancers and inhibits the growth of HeLa cells
hsa-miR-214	JNK1	2009	MicroRNA-214 is aberrantly expressed in cervical cancers and inhibits the growth of HeLa cells
hsa-miR-215	CDKN1A/p21	2009	MicroRNA-128 inhibits glioma cells proliferation by targeting transcription factor E2F3a.
hsa-miR-216a	PTEN	2009	TGF-beta activates Akt kinase through a microRNA-dependent amplifying circuit targeting PTEN
hsa-miR-217	PTEN	2009	TGF-beta activates Akt kinase through a microRNA-dependent amplifying circuit targeting PTEN
hsa-miR-217	SirT1	2009	MicroRNA 217 modulates endothelial cell senescence via silent information regulator 1
hsa-miR-218	LAMB3	2008	Human papillomavirus type 16 reduces the expression of microRNA-218 in cervical carcinoma cells.
hsa-miR-219	CaMKIIgamma	2009	MicroRNA-219 modulates NMDA receptor-mediated neurobehavioral dysfunction
hsa-miR-22	ERalpha	2009	miR-22 inhibits estrogen signaling by directly targeting the estrogen receptor alpha mRNA.
hsa-miR-221	Bmf	2009	MicroRNA-221 targets Bmf in hepatocellular carcinoma and correlates with tumor multifocality.
hsa-miR-221	p27	2009	A necessary role of miR-221 and miR-222 in vascular smooth muscle cell proliferation and neointimal hyperplasia
hsa-miR-221	p27	2009	Co-suppression of miR-221/222 cluster suppresses human glioma cell growth by targeting p27kip1 in vitro and in vivo.
hsa-miR-221	p27(Kip1)	2009	Effects of miR-34a on cell growth and chemoresistance in prostate cancer PC3 cells.
hsa-miR-221	p27	2009	Functional links between clustered microRNAs: suppression of cell-cycle inhibitors by microRNA clusters in gastric cancer.
hsa-miR-221	p57	2009	Functional links between clustered microRNAs: suppression of cell-cycle inhibitors by microRNA clusters in gastric cancer.
hsa-miR-221	c-KIT	2009	Induction of MicroRNA-221 by Platelet-derived Growth Factor Signaling Is Critical for Modulation of Vascular Smooth Muscle Phenotype
hsa-miR-221	p27Kip1	2009	Induction of MicroRNA-221 by Platelet-derived Growth Factor Signaling Is Critical for Modulation of Vascular Smooth Muscle Phenotype
hsa-miR-221	Bim	2009	Sustained activation of ERK1/2 by NGF induces microRNA-221 and 222 in PC12 cells
hsa-miR-221	c-KIT	2009	The c-myb proto-oncogene and microRNA-15a comprise an active autoregulatory feedback loop in human hematopoietic cells.
hsa-miR-221	CDKN1B/Kip1	2008	MicroRNA signatures of TRAIL resistance in human non-small cell lung cancer.

hsa-miR-221	KIT	2008	MicroRNA signatures of TRAIL resistance in human non-small cell lung cancer.
hsa-miR-221	c-KIT	2008	MicroRNA-221 and -222 pathway controls melanoma progression.
hsa-miR-221	p27(Kip1)	2008	MicroRNA-221 and -222 pathway controls melanoma progression.
hsa-miR-221	p27(Kip1)	2008	MicroRNA-221/222 Confers Tamoxifen Resistance in Breast Cancer by Targeting p27Kip1.
hsa-miR-221	ERalpha	2008	MicroRNA-221/222 Negatively Regulates Estrogen Receptor{alpha} and Is Associated with Tamoxifen Resistance in Breast Cancer.
hsa-miR-221	CDKN1B/p27/Kip1	2008	MiR-221 controls CDKN1C/p57 and CDKN1B/p27 expression in human hepatocellular carcinoma.
hsa-miR-221	CDKN1C/p57	2008	MiR-221 controls CDKN1C/p57 and CDKN1B/p27 expression in human hepatocellular carcinoma.
hsa-miR-221	CDKN1B/p27/Kip1	2008	The promyelocytic leukemia zinc finger-microRNA-221/-222 pathway controls melanoma progression through multiple oncogenic mechanisms.
hsa-miR-221	c-KIT	2008	The promyelocytic leukemia zinc finger-microRNA-221/-222 pathway controls melanoma progression through multiple oncogenic mechanisms.
hsa-miR-221	KIT	2008	The promyelocytic leukemia zinc finger-microRNA-221/-222 pathway controls melanoma progression through multiple oncogenic mechanisms.
hsa-miR-221	BIRC1	2008	Up-regulation of micro-RNA-221 (miRNA-221; chr Xp11.3) and caspase-3 accompanies down-regulation of the survivin-1 homolog BIRC1 (NAIP) in glioblastoma multiforme (GBM).
hsa-miR-221	CDKN1B/p27/Kip1	2007	miR-221 and miR-222 expression affects the proliferation potential of human prostate carcinoma cell lines by targeting p27Kip1.
hsa-miR-221	CDKN1B/p27/Kip1	2007	Regulation of p27Kip1 by miRNA 221/222 in glioblastoma.
hsa-miR-221	KIT	2005	The role of microRNA genes in papillary thyroid carcinoma.
hsa-miR-221	p27	2009	MicroRNA-221 and microRNA-222 modulate differentiation and maturation of skeletal muscle cells
hsa-miR-221	CDKN1B	2009	miR-128b is a potent glucocorticoid sensitizer in MLL-AF4 acute lymphocytic leukemia cells and exerts cooperative effects with miR-221
hsa-miR-222	p27	2009	A necessary role of miR-221 and miR-222 in vascular smooth muscle cell proliferation and neointimal hyperplasia
hsa-miR-222	p27	2009	Co-suppression of miR-221/222 cluster suppresses human glioma cell growth by targeting p27kip1 in vitro and in vivo.
hsa-miR-222	p27	2009	Functional links between clustered microRNAs: suppression of cell-cycle inhibitors by microRNA clusters in gastric cancer.
hsa-miR-222	p57	2009	Functional links between clustered microRNAs: suppression of cell-cycle inhibitors by microRNA clusters in gastric cancer.
hsa-miR-222	MMP1	2009	"MicroRNA-222 regulates cell invasion by targeting matrix metalloproteinase 1(MMP1) and manganese superoxide dismutase 2 (SOD2) in tongue squamous cell carcinoma cell lines."
hsa-miR-222	SOD2	2009	"MicroRNA-222 regulates cell invasion by targeting matrix metalloproteinase 1(MMP1) and manganese superoxide dismutase 2 (SOD2) in tongue squamous cell carcinoma cell lines."
hsa-miR-222	Bim	2009	Sustained activation of ERK1/2 by NGF induces microRNA-221 and 222 in PC12 cells
hsa-miR-222	CDKN1B/p27/Kip1	2008	MicroRNA signatures of TRAIL resistance in human non-small cell lung cancer.
hsa-miR-222	KIT	2008	MicroRNA signatures of TRAIL resistance in human non-small cell lung cancer.
hsa-miR-222	c-KIT	2008	MicroRNA-221 and -222 pathway controls melanoma progression.

hsa-miR-222	p27(Kip1)	2008	MicroRNA-221 and -222 pathway controls melanoma progression.
hsa-miR-222	p27(Kip1)	2008	MicroRNA-221/222 Confers Tamoxifen Resistance in Breast Cancer by Targeting p27Kip1.
hsa-miR-222	ERalpha	2008	MicroRNA-221/222 Negatively Regulates Estrogen Receptor{alpha} and Is Associated with Tamoxifen Resistance in Breast Cancer.
hsa-miR-222	CDKN1C/p57	2008	MicroRNAs 221 and 222 Bypass Quiescence and Compromise Cell Survival.
hsa-miR-222	CDKN1B/p27/Kip1	2008	The promyelocytic leukemia zinc finger-microRNA-221/-222 pathway controls melanoma progression through multiple oncogenic mechanisms.
hsa-miR-222	c-KIT	2008	The promyelocytic leukemia zinc finger-microRNA-221/-222 pathway controls melanoma progression through multiple oncogenic mechanisms.
hsa-miR-222	KIT	2008	The promyelocytic leukemia zinc finger-microRNA-221/-222 pathway controls melanoma progression through multiple oncogenic mechanisms.
hsa-miR-222	CDKN1B/p27/Kip1	2007	miR-221 and miR-222 expression affects the proliferation potential of human prostate carcinoma cell lines by targeting p27Kip1.
hsa-miR-222	CDKN1B/p27/Kip1	2007	Regulation of p27Kip1 by miRNA 221/222 in glioblastoma.
hsa-miR-222	KIT	2005	The role of microRNA genes in papillary thyroid carcinoma.
hsa-miR-222	p27	2009	MicroRNA-221 and microRNA-222 modulate differentiation and maturation of skeletal muscle cells
hsa-miR-223	LMO2	2009	MicroRNA 223-dependent expression of LMO2 regulates normal erythropoiesis
hsa-miR-223	STMN1	2008	MicroRNA-223 is commonly repressed in hepatocellular carcinoma and potentiates expression of Stathmin1.
hsa-miR-223	Mef2c	2008	Regulation of progenitor cell proliferation and granulocyte function by microRNA-223.
hsa-miR-223	NFI-A	2007	Epigenetic silencing of the myelopoiesis regulator microRNA-223 by the AML1/ETO oncoprotein.
hsa-miR-223	RhoB	2009	Sequence context outside the target region influences the effectiveness of miR-223 target sites in the RhoB 3'UTR
hsa-miR-224	API-5	2008	Profiling microRNA expression in hepatocellular carcinoma reveals microRNA-224 up-regulation and apoptosis inhibitor-5 as a microRNA-224-specific target.
hsa-miR-23	LMNB1	2009	miR-23 regulation of lamin B1 is crucial for oligodendrocyte development and myelination
hsa-miR-23a	RING1	2009	miR-23a functions downstream of NFATc3 to regulate cardiac hypertrophy.
hsa-miR-23b	MOR1	2009	MicroRNA-dependent regulation of cKit in cutaneous melanoma.
hsa-miR-23b	MOR1	2008	Post-transcriptional regulation of mouse {micro} opioid receptor (MOR1) via its 3' untranslated region: a role for microRNA23b
hsa-miR-24	L protein	2007	Hypersusceptibility to vesicular stomatitis virus infection in Dicer1-deficient mice is due to impaired miR24 and miR93 expression.
hsa-miR-24	P protein	2007	Hypersusceptibility to vesicular stomatitis virus infection in Dicer1-deficient mice is due to impaired miR24 and miR93 expression.
hsa-miR-24	DHFR	2004	A miR-24 microRNA binding-site polymorphism in dihydrofolate reductase gene leads to methotrexate resistance.
hsa-miR-24	E2F2	2009	miR-24 Inhibits cell proliferation by targeting E2F2, MYC, and other cell-cycle genes via binding to "seedless" 3'UTR microRNA recognition elements
hsa-miR-24	MYC	2009	miR-24 Inhibits cell proliferation by targeting E2F2, MYC, and other cell-cycle genes via binding to "seedless" 3'UTR microRNA recognition

hsa-miR-24	AURKB	2009	elements miR-24 Inhibits cell proliferation by targeting E2F2, MYC, and other cell-cycle genes via binding to "seedless" 3'UTR microRNA recognition elements
hsa-miR-24	CCNA2	2009	miR-24 Inhibits cell proliferation by targeting E2F2, MYC, and other cell-cycle genes via binding to "seedless" 3'UTR microRNA recognition elements
hsa-miR-24	CDC2	2009	miR-24 Inhibits cell proliferation by targeting E2F2, MYC, and other cell-cycle genes via binding to "seedless" 3'UTR microRNA recognition elements
hsa-miR-24	CDK4	2009	miR-24 Inhibits cell proliferation by targeting E2F2, MYC, and other cell-cycle genes via binding to "seedless" 3'UTR microRNA recognition elements
hsa-miR-24	FEN1	2009	miR-24 Inhibits cell proliferation by targeting E2F2, MYC, and other cell-cycle genes via binding to "seedless" 3'UTR microRNA recognition elements
hsa-miR-24a	apaf1	2009	microRNA-24a is required to repress apoptosis in the developing neural retina
hsa-miR-24a	Casp9	2009	microRNA-24a is required to repress apoptosis in the developing neural retina
hsa-miR-25	p57	2009	Functional links between clustered microRNAs: suppression of cell-cycle inhibitors by microRNA clusters in gastric cancer.
hsa-miR-25	Bim	2009	Role of the miR-106b-25 microRNA cluster in hepatocellular carcinoma.
hsa-miR-25	PCAF	2008	MicroRNAs regulate critical genes associated with multiple myeloma pathogenesis.
hsa-miR-26a	PTEN	2009	The PTEN-regulating microRNA miR-26a is amplified in high-grade glioma and facilitates gliomagenesis in vivo.
hsa-miR-26a	CCND2	2009	Therapeutic microRNA delivery suppresses tumorigenesis in a murine liver cancer model.
hsa-miR-26a	CCNE2	2009	Therapeutic microRNA delivery suppresses tumorigenesis in a murine liver cancer model.
hsa-miR-26a	EZH2	2008	MYC stimulates EZH2 expression by repression of its negative regulator miR-26a.
hsa-miR-26a	HMGA1	2007	Specific microRNAs are downregulated in human thyroid anaplastic carcinomas.
hsa-miR-26a	HMGA2	2007	Specific microRNAs are downregulated in human thyroid anaplastic carcinomas.
hsa-miR-27	Runx1	2009	MicroRNA-27 enhances differentiation of myeloblasts into granulocytes by post-transcriptionally downregulating Runx1
hsa-miR-27a	FOXO1	2009	Coordinate Regulation of FOXO1 by miR-27a, miR-96, and miR-182 in Breast Cancer Cells.
hsa-miR-27a	Runx1	2009	A regulatory interplay between miR-27a and Runx1 during megakaryopoiesis
hsa-miR-27a	prohibitin	2009	miR-320 targets transferrin receptor 1 (CD71) and inhibits cell proliferation.
hsa-miR-27a	Myt-1	2007	The oncogenic microRNA-27a targets genes that regulate specificity protein transcription factors and the G2-M checkpoint in MDA-MB-231 breast cancer cells.
hsa-miR-27a	ZBTB10	2007	The oncogenic microRNA-27a targets genes that regulate specificity protein transcription factors and the G2-M checkpoint in MDA-MB-231 breast cancer cells.
hsa-miR-27b	PPARGamma	2009	microRNA miR-27b impairs human adipocyte differentiation and targets PPARGamm

hsa-miR-296	HGS	2008	miR-296 regulates growth factor receptor overexpression in angiogenic endothelial cells.
hsa-miR-298	BACE1	2009	MicroRNA-21 is overexpressed in pancreatic cancer and a potential predictor of survival.
hsa-miR-298	BACE1	2008	MicroRNA-298 and microRNA-328 regulate expression of mouse beta – amyloid precursor protein converting enzyme 1.
hsa-miR-29a	B7-H3	2009	MicroRNA miR-29 modulates expression of immunoinhibitory molecule B7-H3: potential implications for immune based therapy of human solid tumors.
hsa-miR-29a	BACE1	2008	Loss of microRNA cluster miR-29a/b-1 in sporadic Alzheimer's disease correlates with increased BACE1/beta-secretase expression.
hsa-miR-29a	DNMT3A	2007	MicroRNA-29 family reverts aberrant methylation in lung cancer by targeting DNA methyltransferases 3A and 3B.
hsa-miR-29a	DNMT3B	2007	MicroRNA-29 family reverts aberrant methylation in lung cancer by targeting DNA methyltransferases 3A and 3B.
hsa-miR-29b	ACVR2A	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	ACVR2A	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	COL1A1	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	COL4A2	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	COL5A3	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	CTNNBIP1	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	CTNNBIP1	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	HDAC4	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	HDAC4	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	TGFss3	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	TGFss3	2009	Biological functions of miR-29b contribute to positive regulation of osteoblast differentiation
hsa-miR-29b	DNMT3B	2009	Detection of miR-106a in gastric carcinoma and its clinical significance.
hsa-miR-29b	Sp1	2009	Genomic loss of microRNA-101 leads to overexpression of histone methyltransferase EZH2 in cancer.
hsa-miR-29b	DNMT3A	2009	MicroRNA-298 and MicroRNA-328 Regulate Expression of Mouse {beta}-Amyloid Precursor Protein-converting Enzyme 1.
hsa-miR-29b	BACE1	2008	Loss of microRNA cluster miR-29a/b-1 in sporadic Alzheimer's disease correlates with increased BACE1/beta-secretase expression.
hsa-miR-29b	DNMT3A	2007	MicroRNA-29 family reverts aberrant methylation in lung cancer by targeting DNA methyltransferases 3A and 3B.
hsa-miR-29b	DNMT3B	2007	MicroRNA-29 family reverts aberrant methylation in lung cancer by targeting DNA methyltransferases 3A and 3B.
hsa-miR-29b	Mcl-1	2007	mir-29 regulates Mcl-1 protein expression and apoptosis.
hsa-miR-29b	Tcl1	2007	The role of microRNA and other non-coding RNA in the pathogenesis of chronic lymphocytic leukemia.
hsa-miR-29b	Tcl1	2006	Tcl1 expression in chronic lymphocytic leukemia is regulated by miR-29 and miR-181.

hsa-miR-29b	Mcl-1	2009	MicroRNA 29b functions in acute myeloid leukemia
hsa-miR-29c	COL15A1	2008	MicroRNA 29c is down-regulated in nasopharyngeal carcinomas, up-regulating mRNAs encoding extracellular matrix proteins.
hsa-miR-29c	COL1A1	2008	MicroRNA 29c is down-regulated in nasopharyngeal carcinomas, up-regulating mRNAs encoding extracellular matrix proteins.
hsa-miR-29c	COL1A2	2008	MicroRNA 29c is down-regulated in nasopharyngeal carcinomas, up-regulating mRNAs encoding extracellular matrix proteins.
hsa-miR-29c	COL3A1	2008	MicroRNA 29c is down-regulated in nasopharyngeal carcinomas, up-regulating mRNAs encoding extracellular matrix proteins.
hsa-miR-29c	COL4A1	2008	MicroRNA 29c is down-regulated in nasopharyngeal carcinomas, up-regulating mRNAs encoding extracellular matrix proteins.
hsa-miR-29c	COL4A2	2008	MicroRNA 29c is down-regulated in nasopharyngeal carcinomas, up-regulating mRNAs encoding extracellular matrix proteins.
hsa-miR-29c	FUSIP1iso1	2008	MicroRNA 29c is down-regulated in nasopharyngeal carcinomas, up-regulating mRNAs encoding extracellular matrix proteins.
hsa-miR-29c	LAMININ g1	2008	MicroRNA 29c is down-regulated in nasopharyngeal carcinomas, up-regulating mRNAs encoding extracellular matrix proteins.
hsa-miR-29c	SPARC	2008	MicroRNA 29c is down-regulated in nasopharyngeal carcinomas, up-regulating mRNAs encoding extracellular matrix proteins.
hsa-miR-29c	TDG	2008	MicroRNA 29c is down-regulated in nasopharyngeal carcinomas, up-regulating mRNAs encoding extracellular matrix proteins.
hsa-miR-29c	DNMT3A	2007	MicroRNA-29 family reverts aberrant methylation in lung cancer by targeting DNA methyltransferases 3A and 3B.
hsa-miR-29c	DNMT3B	2007	MicroRNA-29 family reverts aberrant methylation in lung cancer by targeting DNA methyltransferases 3A and 3B.
hsa-miR-302d	KLF13	2009	Target identification of microRNAs expressed highly in human embryonic stem cells
hsa-miR-302d	MBNL2	2009	Target identification of microRNAs expressed highly in human embryonic stem cells
hsa-miR-302d	TRPS1	2009	Target identification of microRNAs expressed highly in human embryonic stem cells
hsa-miR-30-3p	KRT7	2009	Identification of novel microRNA targets based on microRNA signatures in bladder cancer.
hsa-miR-30a	beclin 1	2009	Regulation of autophagy by a beclin 1-targeted microRNA, miR-30a, in cancer cells
hsa-miR-30e	Ubc9	2009	MicroRNA-mediated regulation of Ubc9 expression in cancer cells
hsa-miR-31	RhoA	2009	A pleiotropically acting microRNA, miR-31, inhibits breast cancer metastasis.
hsa-miR-31	FOXP3	2009	Human natural Treg microRNA signature: Role of microRNA-31 and microRNA-21 in FOXP3 expression
hsa-miR-32	PCAF	2008	MicroRNAs regulate critical genes associated with multiple myeloma pathogenesis.
hsa-miR-320	Hsp20	2009	MicroRNA-320 is involved in the regulation of cardiac ischemia/reperfusion injury by targeting heat-shock protein 20.
hsa-miR-320	TfR-1	2009	Polymorphic mature microRNAs from passenger strand of pre-miR-146a contribute to thyroid cancer.
hsa-miR-320	Mcl-1	2009	Specific activation of microRNA106b enables the p73 apoptotic response in chronic lymphocytic leukemia by targeting the ubiquitin ligase, Itch for degradation.
hsa-miR-320	BCL2	2009	The bifunctional microRNA miR-9/miR-9* regulates REST and CoREST and is downregulated in Huntington's disease.
hsa-miR-320	CD71	2008	The genomic analysis of erythrocyte microRNA expression in sickle cell

hsa-miR-324-5p	Gli1	2008	diseases.
hsa-miR-324-5p	Gli1	2008	Concerted microRNA control of Hedgehog signalling in cerebellar neuronal progenitor and tumour cells.
hsa-miR-326	Gli1	2008	Concerted microRNA control of Hedgehog signalling in cerebellar neuronal progenitor and tumour cells.
hsa-miR-328	ABCG2	2009	MicroRNA-328 Negatively Regulates the Expression of Breast Cancer Resistance Protein (BCRP/ABCG2) in Human Cancer Cells.
hsa-miR-328	BACE1	2009	MicroRNA-377 is up-regulated and can lead to increased fibronectin production in diabetic nephropathy.
hsa-miR-328	CD44	2008	MicroRNA miR-328 regulates zonation morphogenesis by targeting CD44 expression.
hsa-miR-328	BACE1	2008	MicroRNA-298 and microRNA-328 regulate expression of mouse beta – amyloid precursor protein converting enzyme 1.
hsa-miR-330	E2F1	2009	MicroRNA-330 acts as tumor suppressor and induces apoptosis of prostate cancer cells through E2F1-mediated suppression of Akt phosphorylation.
hsa-miR-335	SOX4	2008	Endogenous human microRNAs that suppress breast cancer metastasis.
hsa-miR-338	COXIV	2009	MicroRNA-338 regulates local cytochrome c oxidase IV mRNA levels and oxidative phosphorylation in the axons of sympathetic neurons
hsa-miR-34	SIRT1	2009	MiR-34, SIRT1 and p53: the feedback loop
hsa-miR-346	EFEMP2	2006	A limited set of human MicroRNA is deregulated in follicular thyroid carcinoma.
hsa-miR-346	RIP140	2009	An Epigenetic Switch Involving NF-kappaB, Lin28, Let-7 MicroRNA, and IL6 Links Inflammation to Cell Transformation
hsa-miR-34a	BCL2	2009	miR-34a, a microRNA up-regulated in a double transgenic mouse model of Alzheimer's disease, inhibits bcl2 translation.
hsa-miR-34a	JAG1	2009	MicroRNA profiling identifies miR-34a and miR-21 and their target genes JAG1 and WNT1 in the co-ordinate regulation of dendritic cell differentiation
hsa-miR-34a	WNT1	2009	MicroRNA profiling identifies miR-34a and miR-21 and their target genes JAG1 and WNT1 in the co-ordinate regulation of dendritic cell differentiation
hsa-miR-34a	c-Met	2009	MicroRNA-34a inhibits uveal melanoma cell proliferation and migration through downregulation of c-Met.
hsa-miR-34a	c-Met	2009	miR-34a inhibits migration and invasion by down-regulation of c-Met expression in human hepatocellular carcinoma cells.
hsa-miR-34a	BCL2	2008	A functional screen identifies miR-34a as a candidate neuroblastoma tumor suppressor gene.
hsa-miR-34a	MYCN	2008	A functional screen identifies miR-34a as a candidate neuroblastoma tumor suppressor gene.
hsa-miR-34a	E2F3	2008	Down-regulation of the microRNAs miR-34a, miR-127, and miR-200b in rat liver during hepatocarcinogenesis induced by a methyl-deficient diet.
hsa-miR-34a	NOTCH1	2008	Down-regulation of the microRNAs miR-34a, miR-127, and miR-200b in rat liver during hepatocarcinogenesis induced by a methyl-deficient diet.
hsa-miR-34a	SIRT1	2008	Effects of miR-34a on cell growth and chemoresistance in prostate cancer PC3 cells.
hsa-miR-34a	GRM7	2008	Evidence for Selective microRNAs and their Effectors as Common Long-Term Targets for the Actions of Mood Stabilizers
hsa-miR-34a	SIRT1	2008	MicroRNA-101, down-regulated in hepatocellular carcinoma, promotes apoptosis and suppresses tumorigenicity.
hsa-miR-34a	c-Met	2008	The cell growth suppressor, mir-126, targets IRS-1.

hsa-miR-34a	MYCN	2008	The MYCN oncogene is a direct target of miR-34a.
hsa-miR-34a	E2F	2007	MicroRNA-34a functions as a potential tumor suppressor by inducing apoptosis in neuroblastoma cells.
hsa-miR-34a	E2F3	2007	MicroRNA-34a functions as a potential tumor suppressor by inducing apoptosis in neuroblastoma cells.
hsa-miR-34a	BCL2	2007	p53-mediated activation of miRNA34 candidate tumor-suppressor genes.
hsa-miR-34a	BCL2	2007	Transactivation of miR-34a by p53 broadly influences gene expression and promotes apoptosis.
hsa-miR-34a	BIRC3	2007	Transactivation of miR-34a by p53 broadly influences gene expression and promotes apoptosis.
hsa-miR-34a	DcR3	2007	Transactivation of miR-34a by p53 broadly influences gene expression and promotes apoptosis.
hsa-miR-34a	E2F	2007	Tumor-suppressive miR-34a induces senescence-like growth arrest through modulation of the E2F pathway in human colon cancer cells.
hsa-miR-34a	c-Met	2009	MicroRNA-34a inhibits glioblastoma growth by targeting multiple oncogenes
hsa-miR-34a	Notch-1	2009	MicroRNA-34a inhibits glioblastoma growth by targeting multiple oncogenes
hsa-miR-34a	Notch-2	2009	MicroRNA-34a inhibits glioblastoma growth by targeting multiple oncogenes
hsa-miR-34a	CDK6	2009	MicroRNA-34a inhibits glioblastoma growth by targeting multiple oncogenes
hsa-miR-34b	CREB	2009	miR-34b targets cyclic AMP-responsive element binding protein in acute myeloid leukemia.
hsa-miR-34b	CDK6	2008	A microRNA DNA methylation signature for human cancer metastasis
hsa-miR-34b	c-myc	2008	A microRNA DNA methylation signature for human cancer metastasis
hsa-miR-34b	c-myc	2008	MYC translocation-negative classical Burkitt lymphoma cases: an alternative pathogenetic mechanism involving miRNA deregulation.
hsa-miR-34b	BCL2	2007	p53-mediated activation of miRNA34 candidate tumor-suppressor genes.
hsa-miR-34c	c-myc	2008	A microRNA DNA methylation signature for human cancer metastasis
hsa-miR-34c	E2F3	2008	A microRNA DNA methylation signature for human cancer metastasis
hsa-miR-34c	BCL2	2007	p53-mediated activation of miRNA34 candidate tumor-suppressor genes.
hsa-miR-34c	c-Met	2010	Hsa-miR-34c suppresses growth and invasion of human laryngeal carcinoma cells via targeting c-Met.
hsa-miR-370	MAP3K8	2008	Epigenetic regulation of microRNA-370 by interleukin-6 in malignant human cholangiocytes.
hsa-miR-372	KLF13	2009	Target identification of microRNAs expressed highly in human embryonic stem cells
hsa-miR-372	MBNL2	2009	Target identification of microRNAs expressed highly in human embryonic stem cells
hsa-miR-372	TRPS1	2009	Target identification of microRNAs expressed highly in human embryonic stem cells
hsa-miR-372	LATS2	2006	A genetic screen implicates miRNA-372 and miRNA-373 as oncogenes in testicular germ cell tumors.
hsa-miR-372	WEE1	2009	microRNAs regulate human embryonic stem cell division
hsa-miR-373	RAD23B	2009	MicroRNA regulation of DNA repair gene expression in hypoxic stress
hsa-miR-373	LATS2	2009	"MicroRNA-373 (miR-373) post-transcriptionally regulates large tumor suppressor, homolog 2 (LATS2) and stimulates proliferation in human esophageal cancer."
hsa-miR-373	CD44	2008	The microRNAs miR-373 and miR-520c promote tumour invasion and

hsa-miR-373	LATS2	2006	metastasis. A genetic screen implicates miRNA-372 and miRNA-373 as oncogenes in testicular germ cell tumors.
hsa-miR-375	PDK1	2008	miR-375 targets PDK1 and regulates glucose-induced biological responses in pancreatic {beta}-cells.
hsa-miR-375	Mtpn	2004	A pancreatic islet-specific microRNA regulates insulin secretion.
hsa-miR-375	TIMM8A	2009	A high throughput experimental approach to identify miRNA targets in human cells
hsa-miR-378	GalNT-7	2009	MicroRNA miR-378 regulates nephronectin expression modulating osteoblast differentiation by targeting GalNT-7
hsa-miR-424	PLAG1	2009	miRNA deregulation by epigenetic silencing disrupts suppression of the oncogene PLAG1 in chronic lymphocytic leukemia.
hsa-miR-429	SIP1/ZEB4	2008	A double-negative feedback loop between ZEB1-SIP1 and the microRNA-200 family regulates epithelial-mesenchymal transition
hsa-miR-429	ZEB1/deltaEF1	2008	A double-negative feedback loop between ZEB1-SIP1 and the microRNA-200 family regulates epithelial-mesenchymal transition
hsa-miR-429	SIP1(ZEB2)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.
hsa-miR-429	ZEB1(deltaEF1)	2008	The miR-200 family and miR-205 regulate epithelial to mesenchymal transition by targeting ZEB1 and SIP1.
hsa-miR-429	SIP1(ZEB2)	2008	The miR-200 family inhibits epithelial-mesenchymal transition and cancer cell migration by direct targeting of E-cadherin transcriptional repressors ZEB1 and ZEB2.
hsa-miR-429	ZEB1(deltaEF1)	2008	The miR-200 family inhibits epithelial-mesenchymal transition and cancer cell migration by direct targeting of E-cadherin transcriptional repressors ZEB1 and ZEB2.
hsa-miR-429	WAVE3	2009	The miR200 family of microRNAs regulates WAVE3-dependent cancer cell invasion
hsa-miR-429	ZEB1	2009	Regulation of miR-200 family microRNAs and ZEB transcription factors in ovarian cancer: Evidence supporting a mesothelial-to-epithelial transition
hsa-miR-429	ZEB2	2009	Regulation of miR-200 family microRNAs and ZEB transcription factors in ovarian cancer: Evidence supporting a mesothelial-to-epithelial transition
hsa-miR-433	FGF20	2008	Variation in the miRNA-433 binding site of FGF20 confers risk for Parkinson disease by overexpression of alpha-synuclein.
hsa-miR-449a	HDAC-1	2009	miR-449a targets HDAC-1 and induces growth arrest in prostate cancer.
hsa-miR-451	MIF	2009	microRNA-451 regulates macrophage migration inhibitory factor production and proliferation of gastrointestinal cancer cells.
hsa-miR-451	MIF	2009	microRNA-451 regulates macrophage migration inhibitory factor production and proliferation of gastrointestinal cancer cells.
hsa-miR-485-3p	NTRK3	2009	Allele variants in functional MicroRNA target sites of the neurotrophin-3 receptor gene (NTRK3) as susceptibility factors for anxiety disorders.
hsa-miR-504	DRD1	2009	Differential allelic expression of dopamine D1 receptor gene (DRD1) is modulated by microRNA miR-504
hsa-miR-504	DRD1	2009	Differential Allelic Expression of Dopamine D1 Receptor Gene (DRD1) Is Modulated by microRNA miR-504
hsa-miR-509	NTRK3	2009	Allele variants in functional MicroRNA target sites of the neurotrophin-3 receptor gene (NTRK3) as susceptibility factors for anxiety disorders.
hsa-miR-510	HTR3E	2008	First evidence for an association of a functional variant in the microRNA-510 target site of the serotonin receptor type 3E gene with diarrhea predominant irritable bowel syndrome.
hsa-miR-510	PDEF	2008	MicroRNA-mediated inhibition of prostate-derived Ets factor messenger

hsa-miR-512-5p	Mcl-1	2009	RNA translation affects prostate-derived Ets factor regulatory networks in human breast cancer.
hsa-miR-512-5p	Mcl-1	2009	Chromatin remodeling at Alu repeats by epigenetic treatment activates silenced microRNA-512-5p with downregulation of Mcl-1 in human gastric cancer cells.
hsa-miR-513	B7-H	2009	MicroRNA-513 regulates B7-H1 translation and is involved in IFN-gamma-induced B7-H1 expression in cholangiocytes
hsa-miR-519	HuR	2010	miR-519 suppresses tumor growth by reducing HuR levels.
hsa-miR-519c	ABCG2	2009	Escape from hsa-miR-519c enables drug-resistant cells to maintain high expression of ABCG2
hsa-miR-520c	CD44	2008	The microRNAs miR-373 and miR-520c promote tumour invasion and metastasis.
hsa-miR-520h	ABCG2	2009	Escape from hsa-miR-519c enables drug-resistant cells to maintain high expression of ABCG2
hsa-miR-521	CSA	2008	Radiation modulation of microRNA in prostate cancer cell lines.
hsa-miR-532-5p	RUNX3	2009	Regulation of RUNX3 Tumor Suppressor Gene Expression in Cutaneous Melanoma.
hsa-miR-548d-3p	ERBB2	2009	Preliminary validation of ERBB2 expression regulated by miR-548d-3p and miR-559
hsa-miR-559	ERBB2	2009	Preliminary validation of ERBB2 expression regulated by miR-548d-3p and miR-559
hsa-miR-562	EYA1	2009	Loss of heterozygosity at 2q37 in sporadic Wilms' tumor: putative role for miR-562
hsa-miR-659	GRN	2008	Common variation in the miR-659 binding-site of GRN is a major risk factor for TDP43-positive frontotemporal dementia.
hsa-miR-661	MTA1	2009	MicroRNA-661, a c/EBPalpha target, inhibits metastatic tumor antigen 1 and regulates its functions.
hsa-miR-7	SNCA	2009	Repression of alpha-synuclein expression and toxicity by microRNA-7.
hsa-miR-7	EGFR	2009	MicroRNA-184 antagonizes microRNA-205 to maintain SHIP2 levels in epithelia.
hsa-miR-7	EGFR	2009	MicroRNA-21 contributes to myocardial disease by stimulating MAP kinase signalling in fibroblasts.
hsa-miR-7	EGFR	2009	MicroRNA-34a Inhibits Uveal Melanoma Cell Proliferation and Migration through Downregulation of c-Met.
hsa-miR-7	EGFR	2009	Regulation of epidermal growth factor receptor signaling in human cancer cells by microRNA-7.
hsa-miR-7	EGFR	2008	microRNA-7 inhibits the epidermal growth factor receptor and the Akt pathway and is down-regulated in glioblastoma.
hsa-miR-7	Pak1	2008	MicroRNA-7, a homeobox D10 target, inhibits p21-activated kinase 1 and regulates its functions.
hsa-miR-709	BORIS	2009	DNA damage-induced upregulation of miR-709 in the germline downregulates BORIS to counteract aberrant DNA hypomethylation
hsa-miR-765	NTRK3	2009	Allele variants in functional MicroRNA target sites of the neurotrophin-3 receptor gene (NTRK3) as susceptibility factors for anxiety disorders.
hsa-miR-9	E-cadherin	2009	MicroRNA-9 reduces cell invasion and E-cadherin secretion in SK-Hep-1 cell.
hsa-miR-9	NF-kappaB1	2009	MicroRNA-9 inhibits ovarian cancer cell growth through regulation of NF-kappaB1.
hsa-miR-9	TLX	2009	A feedback regulatory loop involving microRNA-9 and nuclear receptor TLX in neural stem cell fate determination
hsa-miR-9	TrkC	2009	microRNA-1 negatively regulates expression of the hypertrophy-associated genes calmodulin and Mef2a.
hsa-miR-9	REST	2009	Role of miR-143 targeting KRAS in colorectal tumorigenesis.

hsa-miR-9	MMP13	2009	The identification of differentially expressed microRNA in osteoarthritic tissue that modulate the production of TNF-alpha and MMP13
hsa-miR-9	TrkC	2008	MicroRNA profiling in human medulloblastoma.
hsa-miR-9	PRDM1/Blimp-1	2008	MicroRNA-mediated down-regulation of PRDM1/Blimp-1 in Hodgkin/Reed-Sternberg cells: a potential pathogenetic lesion in Hodgkin lymphomas.
hsa-miR-9	ONECUT-2	2006	MicroRNA-9 controls the expression of Granuphilin/Slp4 and the secretory response of insulin-producing cells.
hsa-miR-9*	CoREST	2009	MicroRNA profiling in human medulloblastoma.
hsa-miR-92b	p57	2009	MicroRNA 92b Controls the G1/S Checkpoint Gene p57 in Human Embryonic Stem Cells
hsa-miR-93	FUS1	2009	miR-93, miR-98, and miR-197 regulate expression of tumor suppressor gene FUS1.
hsa-miR-93	p21	2009	Functional links between clustered microRNAs: suppression of cell-cycle inhibitors by microRNA clusters in gastric cancer.
hsa-miR-93	E2F1	2009	Role of the miR-106b-25 microRNA cluster in hepatocellular carcinoma.
hsa-miR-93	E2F1	2008	E2F1-regulated microRNAs impair TGFbeta-dependent cell-cycle arrest and apoptosis in gastric cancer.
hsa-miR-93	PCAF	2008	MicroRNAs regulate critical genes associated with multiple myeloma pathogenesis.
hsa-miR-93	TP53INP1	2008	Roles for microRNAs, miR-93 and miR-130b, and tumor protein 53-induced nuclear protein 1 tumor suppressor in cell growth dysregulation by human T-cell lymphotropic virus 1.
hsa-miR-96	FOXO1	2009	Coordinate Regulation of FOXO1 by miR-27a, miR-96, and miR-182 in Breast Cancer Cells.
hsa-miR-98	FUS1	2009	miR-93, miR-98, and miR-197 regulate expression of tumor suppressor gene FUS1.
hsa-miR-98	HMGA2	2007	High mobility group A2 is a target for miRNA-98 in head and neck squamous cell carcinoma.