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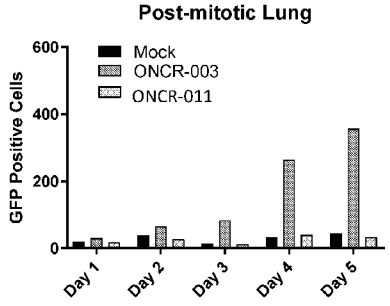
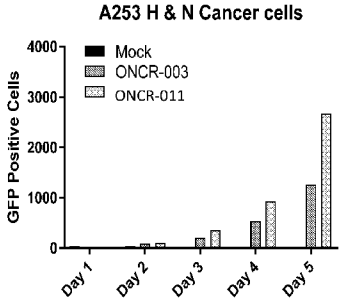
(54) Title: ONCOLYTIC VIRAL VECTORS AND USES THEREOF

FIG. 33

Vector	ICP4 miRNA site	ICP27 miRNA site
ONCR-003	miR-124	None
ONCR-011	miR-124	miR-125

Cells	miR 125a	miR 124
PM-Lung	>3000	<100
H & N CA	<100	<100





(57) Abstract: The present disclosure relates to recombinant viral vectors for the treatment and prevention of cancer. Oncolytic viral vectors incorporate one or more of the following features: viral replication restriction by insertion of tumor-suppressive microRNA (miRNA) target sequences into the viral genome; disruption of oncogenic miRNA function; cancer microenvironment remodeling; and cancer cell targeting by incorporation of protease-activated antibodies into the viral particle.

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ONCOLYTIC VIRAL VECTORS AND USES THEREOF

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application No. 62/287,619, filed January 27, 2016, the content of which are incorporated by herein reference in its entirety.

STATEMENT REGARDING SEQUENCE LISTING

[0002] The Sequence Listing associated with this application is provided in text format in lieu of a paper copy, and is hereby incorporated by reference into the specification. The name of the text file containing the Sequence Listing is ONCR_001_01WO_ST2.txt. The text file is 7 KB, was created on January 26, 2017, and is being submitted electronically via EFS-Web.

FIELD OF THE INVENTION

[0003] The present disclosure relates to recombinant viral vectors for the treatment and prevention of cancer. The viral vectors utilize one or more of the following aspects: viral replication restriction by insertion of tumor-suppressive microRNA (miRNA) target sequences into the viral genome; disruption of oncogenic miRNA function; cancer microenvironment remodeling; and/or cancer cell targeting by incorporation of protease-activated antibodies into the viral particle.

BACKGROUND OF THE INVENTION

[0004] Current targeted cancer therapeutics are efficacious in only a narrow range of cancers due to the heterogeneity of tumor protein expression profiles. Furthermore, many cancer treatments, including existing viral vectors, chemotherapy, radiation, and surgery lack the specificity to selectively treat cancerous cells, while maintaining the health and viability of normal, non-cancerous cells and can produce undesirable off-target effects. As such, there is a

need in the art for cancer therapies that are broadly efficacious in multiple cancers and are capable of selectively eliminating cancerous cells.

[0005] Oncolytic viruses are viruses that preferentially infect cancer cells and have been used in multiple pre-clinical and clinical studies for cancer treatment. Use of oncolytic viruses carries the risk of non-specific viral infection of healthy cells, leading to the death of non-cancerous cells and tissues. However, genetic manipulation of the viruses to exploit pathways, proteins, and genes that are differentially expressed in normal vs. cancerous tissue can increase the specificity of these viruses and limit off-target infection and cell death.

[0006] MicroRNAs (miRNAs or miRs) are small non-coding endogenous RNAs that regulate gene expression by directing their target messenger RNAs for degradation or translational repression. miRNAs are intimately associated with normal cellular processes and therefore, deregulation of miRNAs contributes to a wide array of diseases including cancer. Many miRNA genes are located in cancer associated genomic regions, or in fragile sites, further strengthening the evidence that miRNAs play a pivotal role in cancer. miRNAs are differentially expressed in cancer tissues compared to normal tissues and can have a causative relationship to tumorigenesis. By exploiting this differential miRNA expression in diverse tumor types, the cancer therapeutics described herein possess a broad spectrum safety and efficacy profile, wherein oncolytic viral replication is regulated based on the expression of a particular miRNA or group of miRNAs. Further, the oncolytic viruses described herein may also express proteins that facilitate viral spread throughout a tumor, such as those altering the expression of genes and proteins that regulate the extracellular matrix, thereby increasing their therapeutic efficacy.

SUMMARY OF THE INVENTION

[0007] The invention relates to recombinant viral vectors that are useful for the treatment and prevention of cancer. The oncolytic viral vectors comprise the following aspects individually or in combination: restricting viral vector replication to cancer or tumor cells by inserting tumor-suppressive microRNA (miR) target sequences into the viral genome; incorporation of one or more genes into the viral genome whose product(s) disrupt the function of oncogenic miRNA and/or the cancer extracellular matrix; and highly selective targeting of the vectors to cancer/tumor cells by incorporating protease-activated antibodies into the viral particle.

[0008] In some embodiments, the present invention provides for a recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication. In some embodiments, the virus is a herpes simplex virus, an adenovirus, a polio virus, a vaccinia virus, a measles virus, a vesicular stomatitis virus, an orthomyxovirus, a parvovirus, a maraba virus or a coxsackievirus. In some embodiments, the virus is a herpes simplex virus and wherein the one or more viral genes required for viral replication is selected from the group consisting of UL1, UL5, UL6, UL7, UL8, UL9, UL11, UL12, UL14, UL15, UL17, UL18, UL19, UL20, UL22, UL25, UL26, UL26.5, UL27, UL28, UL29, UL30, UL31, UL32, UL33, UL34, UL35, UL36, UL37, UL38, UL39, UL40, UL42, UL48, UL49, UL52, UL53, UL54, ICP0, ICP4, ICP22, ICP27, ICP47, gamma-34.5, US3, US4, US5, US6, US7, US8, US9, US10, US11, and US12. In some embodiments, the tumor-suppressive miR target sequence is a target sequence for a miR selected from Table 3. In some embodiments, the one or more tumor-suppressive miR target sequences is incorporated into the 5' untranslated region (UTR) or 3' UTR of the one or more viral genes required for viral replication.

[0009] In some embodiments, the present invention provides for a recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication, wherein replication of the virus is reduced or attenuated in a first cell compared to replication of the virus in a second cell. In some embodiments, the first cell has an increased expression of a tumor-suppressive miR capable of binding to the one or more tumor-suppressive miR target sequences compared to the expression of the tumor-suppressive miR in the second cell. In some embodiments, the expression level of the tumor-suppressive miR in the first cell is at least 5% greater than the expression level of the tumor-suppressive miR in the second cell. In some embodiments, the second cell has a reduced expression of a tumor-suppressive miR capable of binding to the one or more tumor-suppressive miR target sequences compared to the expression of the tumor-suppressive miR in the first cell. In some embodiments, the expression level of the tumor-suppressive miR in the second cell is at least 5% less than the expression level of the tumor-suppressive miR in the first cell. In some embodiments, the second cell is a cancerous cell.

[0010] In some embodiments, the present invention provides for a recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication, wherein the tumor-suppressive miR target sequences for miR-124, miR-451a, miR-143-3p, and miR-559. In further embodiments, the oncolytic virus is used for the treatment of pancreatic, lung, and/or colon cancer. In some embodiments, the oncolytic virus comprises the tumor-suppressive miR target sequences for miR-124, miR-451, miR-143-3p, miR-1, and miR-559. In some embodiments, the oncolytic virus comprises the tumor-suppressive miR target sequences for miR-124, miR-451, miR-145-5p, and miR-559. In further embodiments, the oncolytic virus is used for the treatment of a tumor derived from any type of cancer. In some embodiments, the oncolytic virus comprises the tumor-suppressive miR target sequences for miR-205p, miR-141-5p, miR-31-5p, and miR-124. In further embodiments, the oncolytic virus is used for the treatment of schwannoma. In further embodiments, the tumor-suppressive miR target sequences are inserted into the ICP4, ICP27, UL19, and/or UL30 locus.

[0011] In some embodiments, the present invention provides for a recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication, wherein the tumor-suppressive miR target sequence is a target sequence for miR-136-3p, miR-432-5p, miR-1-3p, miR-127-3p, miR-379-5p, miR-493-5p, miR-223-5p, miR-223-5p, miR-136-5p, miR-451a, miR-487b-3p, miR-370-3p, miR-410-3p, miR-431-3p, miR-4485-3p, miR-4485-5p, miR-127-5p, miR-409-3p, miR-338-3p, miR-559, miR-411-5p, miR-133a-5p, miR-143-3p, miR-376b-3p, miR-758-3p, miR-1, miR-101, miR-1180, miR-1236, miR-124-3p, miR-125b, miR-126, miR-1280, miR-133a, miR-133b, miR-141, miR-143, miR-144, miR-145, miR-155, miR-16, miR-18a, miR-192, miR-195, miR-200a, miR-200b, miR-200c, miR-203, miR-205, miR-214, miR-218, miR-23b, miR-26a, miR-29c, miR-320c, miR-34a, miR-370, miR-409-3p, miR-429, miR-451b, miR-490-5p, miR-493, miR-576-3p, and/or miR-99a. In further embodiments, the oncolytic virus is used for treating bladder cancer.

[0012] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-1251-5p, miR-219a-5p, miR-219a-2-3p, miR-124-3p, miR-448, miR-138-2-3p, miR-490-5p, miR-129-1-3p, miR-1264, miR-3943, miR-490-3p, miR-383-5p, miR-133b, miR-129-2-3p, miR-128-2-5p, miR-133a-3p, miR-129-5p, miR-1-3p, miR-885-3p, miR-

124-5p, miR-759, miR-7158-3p, miR-770-5p, miR-135a-5p, miR-885-5p, let-7g-5p, miR-100, miR-101, miR-106a, miR-124, miR-124a, miR-125a, miR-125a-5p, miR-125b, miR-127-3p, miR-128, miR-129, miR-136, miR-137, miR-139-5p, miR-142-3p, miR-143, miR-145, miR-146b-5p, miR-149, miR-152, miR-153, miR-195, miR-21, miR-212-3p, miR-219-5p, miR-222, miR-29b, miR-31, miR-3189-3p, miR-320, miR-320a, miR-326, miR-330, miR-331-3p, miR-340, miR-342, miR-34a, miR-376a, miR-449a, miR-483-5p, miR-503, miR-577, miR-663, miR-7, miR-7-5p, miR-873, let-7a, let-7f, miR-107, miR-122, miR-124-5p, miR-139, miR-146a, miR-146b, miR-15b, miR-16, miR-181a, miR-181a-1, miR-181a-2, miR-181b, miR-181b-1, miR-181b-2, miR-181c, miR-181d, miR-184, miR-185, miR-199a-3p, miR-200a, miR-200b, miR-203, miR-204, miR-205, miR-218, miR-23b, miR-26b, miR-27a, miR-29c, miR-328, miR-34c-3p, miR-34c-5p, miR-375, miR-383, miR-451, miR-452, miR-495, miR-584, miR-622, miR-656, miR-98, miR-124-3p, miR-181b-5p, miR-200b, and/or miR-3189-3p. In further embodiments, the oncolytic virus is used for treating brain cancer.

[0013] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-10b-5p, miR-126-3p, miR-145-3p, miR-451a, miR-199b-5p, miR-5683, miR-3195, miR-3182, miR-1271-5p, miR-204-5p, miR-409-5p, miR-136-5p, miR-514a-5p, miR-559, miR-483-3p, miR-1-3p, miR-6080, miR-144-3p, miR-10b-3p, miR-6130, miR-6089, miR-203b-5p, miR-4266, miR-4327, miR-5694, miR-193b, let-7a, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-100, miR-107, miR-10a, miR-10b, miR-122, miR-124, miR-1258, miR-125a-5p, miR-125b, miR-126, miR-127, miR-129, miR-130a, miR-132, miR-133a, miR-143, miR-145, miR-146a, miR-146b, miR-147, miR-148a, miR-149, miR-152, miR-153, miR-15a, miR-16, miR-17-5p, miR-181a, miR-1826, miR-183, miR-185, miR-191, miR-193a-3p, miR-195, miR-199b-5p, miR-19a-3p, miR-200a, miR-200b, miR-200c, miR-205, miR-206, miR-211, miR-216b, miR-218, miR-22, miR-26a, miR-26b, miR-300, miR-30a, miR-31, miR-335, miR-339-5p, miR-33b, miR-34a, miR-34b, miR-34c, miR-374a, miR-379, miR-381, miR-383, miR-425, miR-429, miR-450b-3p, miR-494, miR-495, miR-497, miR-502-5p, miR-517a, miR-574-3p, miR-638, miR-7, miR-720, miR-873, miR-874, miR-92a, miR-98, miR-99a, mmu-miR-290-3p, and/or mmu-miR-290-5p. In further embodiments, the oncolytic virus is used for treating breast cancer.

[0014] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-143, miR-145, miR-17-5p, miR-203, miR-214, miR-218, miR-335,

miR-342-3p, miR-372, miR-424, miR-491-5p, miR-497, miR-7, miR-99a, miR-99b, miR-100, miR-101, miR-15a, miR-16, miR-34a, miR-886-5p, miR-106a, miR-124, miR-148a, miR-29a, and/or miR-375. In further embodiments, the oncolytic virus is used for treating cervical cancer.

[0015] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-133a-5p, miR-490-5p, miR-124-3p, miR-137, miR-655-3p, miR-376c-3p, miR-369-5p, miR-490-3p, miR-432-5p, miR-487b-3p, miR-342-3p, miR-223-3p, miR-136-3p, miR-136-3p, miR-143-5p, miR-1-3p, miR-214-3p, miR-143-3p, miR-199a-3p, miR-199b-3p, miR-451a, miR-127-3p, miR-133a-3p, miR-145-5p, miR-145-3p, miR-199a-5p, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-100, miR-101, miR-126, miR-142-3p, miR-143, miR-145, miR-192, miR-200c, miR-21, miR-214, miR-215, miR-22, miR-25, miR-302a, miR-320, miR-320a, miR-34a, miR-34c, miR-365, miR-373, miR-424, miR-429, miR-455, miR-484, miR-502, miR-503, miR-93, miR-98, miR-186, miR-30a-5p, miR-627, let-7a, miR-1, miR-124, miR-125a, miR-129, miR-1295b-3p, miR-1307, miR-130b, miR-132, miR-133a, miR-133b, miR-137, miR-138, miR-139, miR-139-5p, miR-140-5p, miR-148a, miR-148b, miR-149, miR-150-5p, miR-154, miR-15a, miR-15b, miR-16, miR-18a, miR-191, miR-193a-5p, miR-194, miR-195, miR-196a, miR-198, miR-199a-5p, miR-203, miR-204-5p, miR-206, miR-212, miR-218, miR-224, miR-24-3p, miR-26b, miR-27a, miR-28-3p, miR-28-5p, miR-29b, miR-30a-3p, miR-30b, miR-328, miR-338-3p, miR-342, miR-345, miR-34a-5p, miR-361-5p, miR-375, miR-378, miR-378a-3p, miR-378a-5p, miR-409-3p, miR-422a, miR-4487, miR-483, miR-497, miR-498, miR-518a-3p, miR-551a, miR-574-5p, miR-625, miR-638, miR-7, miR-96-5p, miR-202-3p, miR-30a, and/or miR-451. In further embodiments, the oncolytic virus is used for treating colon or colorectal cancer.

[0016] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-101, miR-130a, miR-130b, miR-134, miR-143, miR-145, miR-152, miR-205, miR-223, miR-301a, miR-301b, miR-30c, miR-34a, miR-34c, miR-424, miR-449a, miR-543, and/or miR-34b inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments, the oncolytic virus is used for treating endometrial cancer.

[0017] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-125b, miR-138, miR-15a, miR-15b, miR-16, miR-16-1, miR-16-1-3p, miR-16-2, miR-181a, miR-181b, miR-195, miR-223, miR-29b, miR-34b, miR-34c, miR-424,

miR-10a, miR-146a, miR-150, miR-151, miR-155, miR-2278, miR-26a, miR-30e, miR-31, miR-326, miR-564, miR-27a, let-7b, miR-124a, miR-142-3p, let-7c, miR-17, miR-20a, miR-29a, miR-30c, miR-720, miR-107, miR-342, miR-34a, miR-202, miR-142-5p, miR-29c, miR-145, miR-193b, miR-199a, miR-214, miR-22, miR-137, and/or miR-197 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments, the oncolytic virus is used for treating hematologic cancer.

[0018] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-1, miR-145, miR-1826, miR-199a, miR-199a-3p, miR-203, miR-205, miR-497, miR-508-3p, miR-509-3p, let-7a, let-7d, miR-106a*, miR-126, miR-1285, miR-129-3p, miR-1291, miR-133a, miR-135a, miR-138, miR-141, miR-143, miR-182-5p, miR-200a, miR-218, miR-28-5p, miR-30a, miR-30c, miR-30d, miR-34a, miR-378, miR-429, miR-509-5p, miR-646, miR-133b, let-7b, let-7c, miR-200c, miR-204, miR-335, miR-377, and/or miR-506 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments, the oncolytic virus is used for treating kidney cancer.

[0019] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f, let-7f-1, let-7f-2, let-7g, let-7i, miR-1, miR-100, miR-101, miR-105, miR-122, miR-122a, miR-1236, miR-124, miR-125b, miR-126, miR-127, miR-1271, miR-128-3p, miR-129-5p, miR-130a, miR-130b, miR-133a, miR-134, miR-137, miR-138, miR-139, miR-139-5p, miR-140-5p, miR-141, miR-142-3p, miR-143, miR-144, miR-145, miR-146a, miR-148a, miR-148b, miR-150-5p, miR-15b, miR-16, miR-181a-5p, miR-185, miR-188-5p, miR-193b, miR-195, miR-195-5p, miR-197, miR-198, miR-199a, miR-199a-5p, miR-199b, miR-199b-5p, miR-200a, miR-200b, miR-200c, miR-202, miR-203, miR-204-3p, miR-205, miR-206, miR-20a, miR-21, miR-21-3p, miR-211, miR-212, miR-214, miR-217, miR-218, miR-219-5p, miR-22, miR-223, miR-26a, miR-26b, miR-29a, miR-29b-1, miR-29b-2, miR-29c, miR-302b, miR-302c, miR-30a, miR-30a-3p, miR-335, miR-338-3p, miR-33a, miR-34a, miR-34b, miR-365, miR-370, miR-372, miR-375, miR-376a, miR-377, miR-422a, miR-424, miR-424-5p, miR-433, miR-4458, miR-448, miR-450a, miR-451, miR-485-5p, miR-486-5p, miR-497, miR-503, miR-506, miR-519d, miR-520a, miR-520b, miR-520c-3p, miR-582-5p, miR-590-5p, miR-610, miR-612, miR-625, miR-637, miR-675, miR-7, miR-877, miR-940, miR-941, miR-98, miR-99a, miR-132, and/or miR-31 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments,

the oncolytic virus is used for treating liver cancer. In further embodiments, the liver cancer is hepatocellular carcinoma.

[0020] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-143-3p, miR-126-3p, miR-126-5p, miR-1266-3p, miR-6130, miR-6080, miR-511-5p, miR-143-5p, miR-223-5p, miR-199b-5p, miR-199a-3p, miR-199b-3p, miR-451a, miR-142-5p, miR-144, miR-150-5p, miR-142-3p, miR-214-3p, miR-214-5p, miR-199a-5p, miR-145-3p, miR-145-5p, miR-1297, miR-141, miR-145, miR-16, miR-200a, miR-200b, miR-200c, miR-29b, miR-381, miR-409-3p, miR-429, miR-451, miR-511, miR-99a, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-1, miR-101, miR-133b, miR-138, miR-142-5p, miR-144, miR-1469, miR-146a, miR-153, miR-15a, miR-15b, miR-16-1, miR-16-2, miR-182, miR-192, miR-193a-3p, miR-194, miR-195, miR-198, miR-203, miR-217, miR-218, miR-22, miR-223, miR-26a, miR-26b, miR-29c, miR-33a, miR-34a, miR-34b, miR-34c, miR-365, miR-449a, miR-449b, miR-486-5p, miR-545, miR-610, miR-614, miR-630, miR-660, miR-7515, miR-9500, miR-98, miR-99b, miR-133a, let-7a, miR-100, miR-106a, miR-107, miR-124, miR-125a-3p, miR-125a-5p, miR-126, miR-126*, miR-129, miR-137, miR-140, miR-143, miR-146b, miR-148a, miR-148b, miR-149, miR-152, miR-154, miR-155, miR-17-5p, miR-181a-1, miR-181a-2, miR-181b, miR-181b-1, miR-181b-2, miR-181c, miR-181d, miR-184, miR-186, miR-193b, miR-199a, miR-204, miR-212, miR-221, miR-224, miR-27a, miR-27b, miR-29a, miR-30a, miR-30b, miR-30c, miR-30d, miR-30d-5p, miR-30e-5p, miR-32, miR-335, miR-338-3p, miR-340, miR-342-3p, miR-361-3p, miR-373, miR-375, miR-4500, miR-4782-3p, miR-497, miR-503, miR-512-3p, miR-520a-3p, miR-526b, miR-625*, and/or miR-96 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments, the oncolytic virus is used for treating lung cancer.

[0021] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for let-7b, miR-101, miR-125b, miR-1280, miR-143, miR-146a, miR-146b, miR-155, miR-17, miR-184, miR-185, miR-18b, miR-193b, miR-200c, miR-203, miR-204, miR-205, miR-206, miR-20a, miR-211, miR-218, miR-26a, miR-31, miR-33a, miR-34a, miR-34c, miR-376a, miR-376c, miR-573, miR-7-5p, miR-9, and/or miR-98 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments, the oncolytic virus is used for treating melanoma.

[0022] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for let-7d, miR-218, miR-34a, miR-375, miR-494, miR-100, miR-124, miR-1250, miR-125b, miR-126, miR-1271, miR-136, miR-138, miR-145, miR-147, miR-148a, miR-181a, miR-206, miR-220a, miR-26a, miR-26b, miR-29a, miR-32, miR-323-5p, miR-329, miR-338, miR-370, miR-410, miR-429, miR-433, miR-499a-5p, miR-503, miR-506, miR-632, miR-646, miR-668, miR-877, and/or miR-9 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments, the oncolytic virus is used for treating oral cancer.

[0023] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for let-7i, miR-100, miR-124, miR-125b, miR-129-5p, miR-130b, miR-133a, miR-137, miR-138, miR-141, miR-145, miR-148a, miR-152, miR-153, miR-155, miR-199a, miR-200a, miR-200b, miR-200c, miR-212, miR-335, miR-34a, miR-34b, miR-34c, miR-409-3p, miR-411, miR-429, miR-432, miR-449a, miR-494, miR-497, miR-498, miR-519d, miR-655, miR-9, miR-98, miR-101, miR-532-5p, miR-124a, miR-192, miR-193a, and/or miR-7 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments, the oncolytic virus is used for treating ovarian cancer.

[0024] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-216a-5p, miR-802, miR-217, miR-145-3p, miR-143-3p, miR-451a, miR-375, miR-214-3p, miR-216b-3p, miR-432-5p, miR-216a-3p, miR-199b-5p, miR-199a-5p, miR-136-3p, miR-216b-5p, miR-136-5p, miR-145-5p, miR-127-3p, miR-199a-3p, miR-199b-3p, miR-559, miR-129-2-3p, miR-4507, miR-1-3p, miR-148a-3p, miR-101, miR-1181, miR-124, miR-1247, miR-133a, miR-141, miR-145, miR-146a, miR-148a, miR-148b, miR-150*, miR-150-5p, miR-152, miR-15a, miR-198, miR-203, miR-214, miR-216a, miR-29c, miR-335, miR-34a, miR-34b, miR-34c, miR-373, miR-375, miR-410, miR-497, miR-615-5p, miR-630, miR-96, miR-132, let-7a, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-126, miR-135a, miR-143, miR-144, miR-150, miR-16, miR-200a, miR-200b, miR-200c, miR-217, miR-218, miR-337, miR-494, and/or miR-98 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments, the oncolytic virus is used for treating pancreatic cancer.

[0025] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for let-7a-3p, let-7c, miR-100, miR-101, miR-105, miR-124, miR-128, miR-

1296, miR-130b, miR-133a-1, miR-133a-2, miR-133b, miR-135a, miR-143, miR-145, miR-146a, miR-154, miR-15a, miR-187, miR-188-5p, miR-199b, miR-200b, miR-203, miR-205, miR-212, miR-218, miR-221, miR-224, miR-23a, miR-23b, miR-25, miR-26a, miR-26b, miR-29b, miR-302a, miR-30a, miR-30b, miR-30c-1, miR-30c-2, miR-30d, miR-30e, miR-31, miR-330, miR-331-3p, miR-34a, miR-34b, miR-34c, miR-374b, miR-449a, miR-4723-5p, miR-497, miR-628-5p, miR-642a-5p, miR-765, and/or miR-940 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments, the oncolytic virus is used for treating prostate cancer.

[0026] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-101, miR-183, miR-204, miR-34a, miR-365b-3p, miR-486-3p, and/or miR-532-5p inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. In further embodiments, the oncolytic virus is used for treating retinoblastoma.

[0027] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-143-3p, miR-133b, miR-1264, miR-448, miR-1298-5p, miR-490-5p, miR-138-2-3p, miR-144-3p, miR-144-5p, miR-150-5p, miR-129-1-3p, miR-559, miR-1-3-p, miR-143-5p, miR-223-3p, miR-3943, miR-338-3p, miR-124-3p, miR-219a-5p, miR-219a-2-3p, miR-451a, miR-142-5p, miR-133a-3p, miR-145-5p, and/or miR-145-3p. In further embodiments, the oncolytic virus is used for treating glioblastoma.

[0028] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-143-3p, miR-223-3p, miR-6080, miR-208b-3p, miR-206, miR-133a-5p, miR-133b, miR-199a-5p, miR-199b-5p, miR-145-3p, miR-145-5p, miR-150-5p, miR-142-3p, miR-144-3p, miR-144-5p, miR-338-3p, miR-214-3p, miR-559, miR-133a-3p, miR-1-3p, miR-126-3p, miR-142-5p, miR-451a, miR-199a-3p, and/or miR-199b-3p. In further embodiments, the oncolytic virus is used for treating head and neck cancer.

[0029] In some embodiments, the tumor-suppressive miR target sequence is a target sequence for miR-133b, miR-208b-3p, miR-6130, miR-141-5p, miR-31-3p, miR-1293, miR-129-2-3p, miR-129-5p, miR-124-3p, miR-219a-5p, miR-219a-2-3p, miR-490-3p, miR-488-3p, miR-935, miR-124-5p, miR-122-3p, miR-122-5p, miR-1-3p, miR-133a-3p, miR-375, miR-141-3p, miR-31-5p, miR-205-5p, miR-200c-3p, and/or miR-203a-3p. In further embodiments, the oncolytic virus is used for treating a Schwannoma.

[0030] In some embodiments, the present invention provides for recombinant oncolytic viruses comprising one or more of (a) one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication; (b) one or more polynucleotides encoding one or more proteins or oligonucleotides, wherein the proteins or oligonucleotides reduce the expression or inhibit the function of a miR, a gene, or a TIMP; (c) at least one protease-activated antibody; and/or (d) a polynucleotide encoding at least one protease activated antibody. In some embodiments, the miR is an oncogenic miR or a microenvironment remodeling miR. In some embodiments, the oncogenic miR is selected from the miRs listed in Table 4. In some embodiments, the gene is an oncogenic gene. In some embodiments, the oncogenic gene is selected from the genes listed in Table 7. In some embodiments, the microenvironment remodeling miR is selected from the miRs listed in Table 5. In some embodiments, the TIMP is selected from TIMP1, TIMP2, TIMP3 and TIMP4. In some embodiments, the oligonucleotide of (b) is an shRNA or a decoy oligonucleotide. In some embodiments,

[0031] In some embodiments, the present invention provides for recombinant oncolytic viruses comprising one or more of (a) one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication; (b) one or more polynucleotides encoding one or more proteins or oligonucleotides, wherein the proteins or oligonucleotides reduce the expression or inhibit the function of a miR, a gene, or a TIMP; (c) at least one protease-activated antibody; and/or (d) a polynucleotide encoding at least one protease activated antibody, wherein the protein is a nuclease, a bispecific T-cell engager (BiTE), an anti-immunosuppressive protein, or an immunogenic antigen. In some embodiments, the nuclease is selected from a Clustered Regulatory Interspaced Short Palindromic Repeats (CRISPR)-associated endonuclease, a zinc-finger nuclease (ZFN) or a Transcription activator-like effector nuclease (TALEN). In some embodiments, the CRISPR-associated endonuclease is selected from SpCas9, SpCas9-HF1, SpCas9-HF2, SpCas9-HF3, SpCas9-HF4, SaCas9, FnCpf, FnCas9, eSpCas9, C2C1, C2C3, Cpf1, Casl, CaslB, Cas2, Cas3, Cas4, Cas5, Cas6, Cas7, Cas8, Cas9, Cas10, Csyl, Csy2, Csy3, Csel, Cse2, Cscl, Csc2, Csa5, Csn2, Csm2, Csm3, Csm4, Csm5, Csm6, Cmrl, Cmr3, Cmr4, Cmr5, Cmr6, Csbl, Csb2, Csb3, Csxl7, Csxl4, Csx10, Csx16, CsaX, Csx3, Csxl, Csxl5, Csfl, Csf2, Csf3, and Csf4. In further embodiments, the oncolytic virus further comprises a heterologous polynucleotide encoding an

tracr-RNA (trRNA) and a crispr-RNA (crRNA), wherein the crRNA is targeted to a genomic DNA sequence encoding a miR or a TIMP and wherein the trRNA facilitates binding and activation of a CRISPR-associated endonuclease.

[0032] In some embodiments, the anti-immunosuppressive protein is an anti-regulatory T-cell (Treg) protein or an anti-myeloid-derived suppressor cell (MDSC) protein. In some embodiments, the anti-immunosuppressive protein is a VHH-derived blocker or a VHH-derived BiTE.

[0033] In some embodiments, the protein induces an anti-tumor immune response. In further embodiments, the protein is selected from EpCAM, folate, IFNβ, anti-CTLA-4, anti-PD1, A2A, anti-FGF2, anti-FGFR/FGFR2b, anti-SEMA4D, CCL5, CD137, CD200, CD38, CD44, CSF-1R, CXCL10, CXCL13, endothelin B Receptor, IL-12, IL-15, IL-2, IL-21, IL-35, ISRE7, LFA-1, NG2 (also known as SPEG4), a SMAD protein, STING, TGFβ, and VCAM1.

[0034] In some embodiments, the present invention provides for recombinant oncolytic viruses comprising one or more of (a) one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication; (b) one or more polynucleotides encoding one or more proteins or oligonucleotides, wherein the proteins or oligonucleotides reduce the expression or inhibit the function of a miR, a gene, or a TIMP; (c) at least one protease-activated antibody; and/or (d) a polynucleotide encoding at least one protease activated antibody, wherein the at least one protease-activated antibody is incorporated into a viral glycoprotein envelope. In some embodiments, the protease-activated antibody is activated by a protease selected from a cysteine cathepsin, an aspartic cathepsin, a kallikrein (hK), a serine protease, a caspase, a matrix metalloproteinase (MMP), and a disintegrin metalloproteinase (ADAM). In some embodiments, the protease is selected from cathepsin K, cathepsin B, cathepsin L, cathepsin E, cathepsin D, hK1, PSA (hK3), hK10, hK15, uPA, uPAR, MMP-1, MMP-2, MMP-3, MMP-7, MMP-8, MMP-9, MMP-10, MMP-11, MMP-12, MMP-13, MMP-14, MMP-15, MMP-16, MMP-17, MMP-18, MMP-19, MMP-20, MMP-21, MMP-23A, MMP-23B, MMP-24, MMP-25, MMP-26, MMP-27, MMP-28, or a protease listed in Table 6.

[0035] In some embodiments, the protease-activated antibody binds to a protein expressed more highly by a cancer cell or in a cancer microenvironment than by a non-cancer

cell or in a non-cancer microenvironment. In some embodiments, the protease-activated antibody binds NKG2D, c-met, HGFR, CD8, heparan sulfate, VSPG4 (also known as NG2), EGFR, EGFRvIII, CD133, CXCR4, carcinoembryonic antigen (CEA), CLC-3, annexin II, human transferrin receptor, or EpCAM.

[0036] In some embodiments, the miR target sequence and/or the one or more polynucleotides is inserted into a gene locus of the viral genome. In some embodiments, the virus is a herpes simplex virus and wherein the at least one polynucleotide is inserted into or between one or more viral gene loci selected from the group consisting of the internal repeat joint region (comprising one copy each of the diploid genes ICP0, ICP34.5, LAT, ICP4, and the ICP47 promoter), ICP0, LAT, UL1, UL5, UL6, UL7, UL8, UL9, UL11, UL12, UL14, UL15, UL17, UL18, UL19, UL20, UL22, UL25, UL26, UL26.5, UL27, UL28, UL29, UL30, UL31, UL32, UL33, UL34, UL35, UL36, UL37, UL38, UL39, UL40, UL42, UL48, UL49, UL52, UL53, UL54, ICP0, ICP4, ICP22, ICP27, ICP47, gamma-34.5, US3, US4, US5, US6, US7, US8, US9, US10, US11, and US12.

[0037] In some embodiments, the invention provides for a nucleic acid molecule encoding an oncolytic virus described herein. In some embodiments, the invention provides for a viral stock of an oncolytic virus described herein. In some embodiments, the invention provides for a composition comprising an oncolytic virus described herein and a pharmaceutically-acceptable carrier.

[0038] In some embodiments, the invention provides a method of killing a cancerous cell, comprising exposing the cancerous cell to an oncolytic virus described herein or compositions thereof under conditions sufficient for the oncolytic virus to infect and replicate within said cancerous cell, and wherein replication of the oncolytic virus within the cancerous cell results in cell death. In some embodiments, the cancerous cell has a reduced expression of a tumor-suppressive miR capable of binding to the one or more tumor-suppressive miR-target sequences compared to the expression of the tumor-suppressive miR in a non-cancerous cell. In some embodiments, the expression level of the tumor-suppressive miR in the cancerous cell is at least 5% less than the expression level the tumor-suppressive miR in the non-cancerous cell. In some embodiments, replication of the oncolytic virus is increased or maintained in cancerous cells with a reduced expression of the tumor-suppressive miR capable of binding to the one or more tumor-suppressive miR-target sequences. In some embodiments, viral replication is at least

5% greater in the cancerous cells compared to the viral replication in the non-cancerous cell. In some embodiments, the cell is *in vivo*. In some embodiments, the cell is within a tumor.

[0039] In some embodiments, the invention provides a method of treating cancer in a subject in need thereof, comprising administering an oncolytic virus described herein or compositions thereof to the subject. In some embodiments, the subject is a mouse, a rat, a rabbit, a cat, a dog, a horse, a non-human primate, or a human. In some embodiments, the oncolytic virus or compositions thereof are administered intravenously, subcutaneously, intratumorally, intramuscularly, or intranasally. In some embodiments, the cancer is selected from lung cancer, breast cancer, ovarian cancer, cervical cancer, prostate cancer, testicular cancer, colorectal cancer, colon cancer, pancreatic cancer, liver cancer, gastric cancer, head and neck cancer, thyroid cancer, malignant glioma, glioblastoma, melanoma, B-cell chronic lymphocytic leukemia, diffuse large B-cell lymphoma (DLBCL), and marginal zone lymphoma (MZL). In some embodiments, lung cancer is small cell lung cancer or non-small cell lung cancer. In some embodiments, liver cancer is hepatocellular carcinoma (HCC).

BRIEF DESCRIPTION OF THE DRAWINGS

[0040] FIG. 1 illustrates a heat map of an miRNA expression profile in cancerous and non-cancerous brain tissue corresponding to 25 selected miRNAs.

[0041] FIG. 2 illustrates a heat map of an miRNA expression profile in cancerous and non-cancerous bladder tissue corresponding to 25 selected miRNAs.

[0042] FIG. 3 illustrates a heat map of an miRNA expression profile in cancerous and non-cancerous breast tissue corresponding to 25 selected miRNAs.

[0043] FIG. 4 illustrates a heat map of an miRNA expression profile in cancerous and non-cancerous colon tissue corresponding to 25 selected miRNAs.

[0044] FIG. 5 illustrates a heat map of an miRNA expression profile in glioblastoma and non-cancerous brain tissue corresponding to 25 selected miRNAs.

[0045] FIG. 6 illustrates a heat map of an miRNA expression profile in cancerous and non-cancerous head and neck tissue corresponding to 25 selected miRNAs.

[0046] FIG. 7 illustrates a heat map of an miRNA expression profile in cancerous and non-cancerous lung tissue corresponding to 25 selected miRNAs.

[0047] FIG. 8 illustrates a heat map of an miRNA expression profile in cancerous and non-cancerous pancreatic tissue corresponding to 25 selected miRNAs.

[0048] FIG. 9 illustrates a heat map of an miRNA expression profile in schwannoma and non-schwannoma tissue corresponding to 25 selected miRNAs.

[0049] FIG. 10 illustrates downregulation of miR-451a expression in all tumor types (CA) compared to non-cancerous tissue (Norm).

[0050] FIG. 11 illustrates downregulation of miR-1 expression in all tumor types (CA), moderate expression of miR-1 in non-cancerous tissue (Norm), and high expression of miR-1 in non-cancerous head and neck tissue (H&N).

[0051] FIG. 12 illustrates downregulation of miR-559 expression in all tumor types (CA), low expression of miR-559 in non-cancerous tissue (Norm), and high expression of miR-559 in non-cancerous lung tissue.

[0052] FIG. 13 illustrates downregulation of miR-145-5p expression in all tumor types (CA) and high expression of miR-145-5p in the majority of non-cancerous tissue (Norm).

[0053] FIG. 14 illustrates downregulation of miR-143-3p expression in colon lung, and pancreatic tumor types (CA) and high expression of miR-143-3p in the majority of non-cancerous tissue (Norm).

[0054] FIG. 15A- FIG. 15C illustrate a miRNA expression and attenuation reporter gene system described in Example 2. FIG. 15A shows a schematic of a pTetR tet repressor plasmid that induces expression of an miRNA expression plasmid. FIG. 15B shows a schematic of a pTF-002 miRNA expression plasmid containing a tet-inducible mCherry and miRNA expression cassette. FIG. 15C shows a schematic of a pTF-004 miRNA attenuation reporter enabling the read-out of destabilized GFP (dsGFP).

[0055] FIG. 16 illustrates miR-122 expression and attenuation using the reporter system shown in FIG. 15 and described in Example 2.

[0056] FIG. 17 illustrates miR-122, miR-184, miR-34a, and Let7a-mediated GFP attenuation using the reporter system shown in FIG. 15 and described in Example 2. Circled wells indicate reduced GFP expression levels.

[0057] FIG. 18 illustrates expression of miR-122, miR-184, miR-34a, and Let7a, indicated by mCherry expression, using the reporter system shown in FIG. 15 and described in Example 2.

[0058] FIG. 19 illustrates miR-122, miR-124, miR-145, miR-199, and miR-451-mediated GFP attenuation using the reporter system shown in FIG. 15 and described in Example 2. Circled wells indicate reduced GFP expression levels.

[0059] FIG. 20 illustrates expression of miR-122, miR-124, miR-145, miR-199, and miR-451, indicated by mCherry expression, using the reporter system shown in FIG. 15 and described in Example 2.

[0060] FIG. 21 shows quantitation of miR-122 and miR-184 attenuated GFP fluorescence.

[0061] FIG. 22 shows quantitation of miR-34a and miR-184 attenuated GFP fluorescence.

[0062] FIG. 23 shows quantitation of Let7a and miR-184 attenuated GFP fluorescence.

[0063] FIG. 24 shows quantitation of miR-124 and miR-184 attenuated GFP fluorescence.

[0064] FIG. 25 shows quantitation of miR-145 and miR-184 attenuated GFP fluorescence.

[0065] FIG. 26 shows quantitation of miR-199 and miR-451 attenuated GFP fluorescence.

[0066] FIG. 27 shows quantitation of miR-125 and miR-451 attenuated GFP fluorescence.

[0067] FIG. 28 shows quantitation of miR-126 and miR-451 attenuated GFP fluorescence.

[0068] FIG. 29 shows quantitation of miR-127 and miR-451 attenuated GFP fluorescence.

[0069] FIG. 30 shows quantitation of miR-133 and miR-451 attenuated GFP fluorescence.

[0070] FIG. 31 shows quantitation of miR-223 and miR-451 attenuated GFP fluorescence.

[0071] FIG. 32 shows miR-attenuated HSV constructs with target sequences for various miRNAs inserted into the ICP27 and ICP4 genes.

[0072] FIG. 33 illustrates HSV attenuation by miR-125 in non-cancerous (post-mitotic lung) and cancerous (A253) cells.

[0073] FIG. 34 shows qPCR-based quantitation of HSV attenuation by miR-125 in non-cancerous (PM Lung) and cancerous (A253) lung cells.

[0074] FIG. 35 illustrates fluorescence-based quantitation of HSV attenuation by miR-145 in HCC1395 vs. A253 cells.

[0075] FIG. 36 shows qPCR-based quantitation of HSV attenuation by miR-145 in HCC1395 vs. A253 cells.

[0076] FIG. 37 illustrates fluorescence-based quantitation of HSV attenuation by miR-199a-5p vs. miR-143-3p in normal lung cells.

[0077] FIG. 38 shows qPCR-based quantitation of HSV attenuation in normal lung cells by miR-199a-5p vs. miR-143-3p.

[0078] FIG. 39 illustrates a schematic of an ICP4-TmiRNA-attenuated HSV vector for the treatment of cancer or benign hyper-proliferative disorders.

[0079] FIG. 40 shows a schematic of an ICP27-TmiRNA-attenuated HSV vector for the treatment of cancer or benign hyper-proliferative disorders.

[0080] FIG. 41 shows a schematic of a UL19-TmiRNA-attenuated HSV vector for the treatment of cancer or benign hyper-proliferative disorders.

[0081] FIG. 42 shows a schematic of an UL19-TmiRNA and ICP27-TmiRNA-attenuated HSV vector for the treatment of cancer or benign hyper-proliferative disorders.

[0082] FIG. 43 shows a schematic of an UL19-TmiRNA and ICP4-TmiRNA-attenuated HSV vector for the treatment of cancer or benign hyper-proliferative disorders.

[0083] FIG. 44 shows a schematic of an UL19-TmiRNA, ICP27-TmiRNA, and ICP4-TmiRNA-attenuated HSV vector for the treatment of cancer or benign hyper-proliferative disorders.

[0084] FIG. 45 shows a schematic of an ICP4-TmiRNA-attenuated, genome-editing HSV vector for the treatment of cancer.

[0085] FIG. 46 shows a schematic of an ICP4-TmiRNA-attenuated, genome-editing, microenvironment-remodeling HSV vector for the treatment of cancer.

[0086] FIG. 47 shows a schematic of an ICP4-TmiRNA and ICP27-TmiRNA-attenuated HSV vector for the treatment of pancreatic, lung, and colon cancer.

[0087] FIG. 48 shows a schematic of an ICP4-TmiRNA and ICP27-TmiRNA-attenuated HSV vector for the treatment of multiple cancer types.

[0088] FIG. 49 shows a schematic of an ICP4-TmiRNA and ICP27-TmiRNA-attenuated HSV vector for the treatment of schwannoma.

DETAILED DESCRIPTION OF THE INVENTION

[0089] In some aspects, the present invention utilizes differential miRNA expression profiles to effectively restrict viral vector replication to tumor cells. In some embodiments, the viral vectors described herein also disrupt the expression of specific miRNAs for reduced tumor proliferation, metastasis, and/or remodeling of the tumor microenvironment to enable enhanced viral spread. In some embodiments, the viral vectors described herein encompass the use of surface molecules on viral vectors to facilitate targeting to tumor cells. These aspects can be applied individually or in combination to develop viral vectors potentially capable of treating a wide array of cancer types with a single viral vector. As such, the invention further encompasses recombinant oncolytic viral vectors for use in the treatment and prevention of diseases and disorders (e.g., cancer). In some embodiments, this invention utilizes endogenous microRNA (miRNA) to enable a safe and efficacious recombinant viral vector suitable to treat a broad array of cancers.

[0090] The section headings used herein are for organizational purposes only and are not to be construed as limiting the subject matter described. All documents, or portions of documents, cited herein, including but not limited to patents, patent applications, articles, books, and treatises, are hereby expressly incorporated by reference in their entirety for any purpose. In the event that one or more of the incorporated documents or portions of documents define a term that contradicts that term's definition in the application, the definition that appears in this application controls. However, mention of any reference, article, publication, patent, patent publication, and patent application cited herein is not, and should not be taken as an acknowledgment, or any form of suggestion, that they constitute valid prior art or form part of the common general knowledge in any country in the world.

[0091] In the present description, any concentration range, percentage range, ratio range, or integer range is to be understood to include the value of any integer within the recited range and, when appropriate, fractions thereof (such as one tenth and one hundredth of an

integer), unless otherwise indicated. It should be understood that the terms "a" and "an" as used herein refer to "one or more" of the enumerated components unless otherwise indicated. The use of the alternative (*e.g.*, "or") should be understood to mean either one, both, or any combination thereof of the alternatives. As used herein, the terms "include" and "comprise" are used synonymously. As used herein, "plurality" may refer to one or more components (e.g., one or more miRNA target sequences).

Oncolytic Viruses

[0092] In some embodiments, the present invention provides for recombinant oncolytic viruses, wherein one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences are inserted into a locus of one or more viral genes required for viral replication. As used herein, the term "oncolytic virus" refers to a virus that has been modified to, or naturally, preferentially infect cancer cells. Examples of oncolytic viruses are known in the art including, but not limited to, herpes simplex virus, an adenovirus, a polio virus, a vaccinia virus, a measles virus, a vesicular stomatitis virus, an orthomyxovirus, a parvovirus, a maraba virus or a coxsackievirus. In some embodiments, the oncolytic viruses described herein are incorporated into a viral vector. The term "vector" is used herein to refer to a nucleic acid molecule capable transferring or transporting another nucleic acid molecule. The transferred nucleic acid is generally linked to, e.g., inserted into, the vector nucleic acid molecule. A vector may include sequences that direct autonomous replication in a cell, or may include sequences sufficient to allow integration into host cell DNA. A viral vector may sometimes be referred to as a "recombinant virus" or a "virus." The terms "oncolytic virus" and "oncolytic vector" are used interchangeably herein. In particular embodiments, the recombinant viral vector is a herpes simplex virus capable of tumor-selective vector replication as described in International PCT Publication No. WO 2015/066042, which is incorporated by reference in its entirety.

[0093] The terms "microRNA," "miRNA," and "miR" are used interchangeably herein and refer to small non-coding endogenous RNAs that regulate gene expression by directing their target messenger RNAs (mRNA) for degradation or translational repression. miRs are differentially expressed in a broad array of disease states, including multiple types of cancer. In some aspects, cancer cells of a given cancer type or tissue demonstrate differential expression of miRs compared to non-cancerous control cells. As used herein, the term "oncomiR" refers to

miRs that are associated (either positively or negatively) with carcinogenesis, malignant transformation, or metastasis. In some aspects, the expression level of a particular oncomiR is associated with the development or maintenance of a particular cancer. Such miRs are referred to herein as "oncogenic miRs."

[0094] In some embodiments, the expression of an oncogenic miR is increased in cancerous cells or tissues compared to non-cancerous controls. For example, the expression of an oncogenic miR in a cancerous cell may be increased by at least 5% compared to the expression of the oncogenic miR in a non-cancerous cell or tissue. In some embodiments, the expression of an oncogenic miR is increased by at least 5%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 45%, 50%, 60%, 70%, 80%, 90%, 100%, 150%, 200%, 300%, 400%, 500%, 1000% or more compared to the expression of the oncogenic miR in a non-cancerous cell or tissue. In some aspects, a cancerous cell or tissue may express an oncogenic miR that is not expressed in non-cancerous control cells or tissues. In some embodiments, the expression of an oncogenic miR is increased in cancerous cells or tissues compared to cancerous cells derived from a different cancer type. For example, the expression of an oncogenic miR in a cancerous cell may be increased by at least 5% compared to cancerous cells derived from a different cancer type. In some embodiments, the expression of an oncogenic miR is increased by at least 5%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 45%, 50%, 60%, 70%, 80%, 90%, 100%, 150%, 200%, 300%, 400%, 500%, 1000% or more compared to cancerous cells derived from a different cancer type. Examples of oncogenic miRNAs that are frequently over-expressed in cancer tissues include, but are not limited to, miR-21, miR-155 and miR-17-92. Additional examples of oncogenic miRs are listed in Table 4.

[0095] In some embodiments, the expression of a particular oncomiR is associated with the prevention and/or delay of carcinogenesis and/or metastasis. Such oncomiRs are referred to herein as "tumor-suppressor miRs" or "tumor-suppressive miRs," as their expression prevents or suppresses the development of cancer. In some embodiments, under-expression of tumor-suppressive miRs can lead to cancer. As such, in some aspects, tumor-suppressive miRs are expressed in healthy cells and are not expressed in cancerous cells. In some aspects, the expression of a particular tumor-suppressive miR is increased in a healthy cell compared to a cancerous cell. For example, the expression of a tumor-suppressive miR in a healthy (*e.g.*, non-cancerous) cell may be increased by at least 5% compared to the expression of

a tumor-suppressive miR a cancerous cell. In some embodiments, the expression of a tumor-suppressive miR is increased by at least 5%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 45%, 50%, 60%, 70%, 80%, 90%, 100%, 150%, 200%, 300%, 400%, 500%, 1000% or more compared to the expression of the tumor-suppressive miR in a cancerous cell. In some embodiments, the expression of a tumor-suppressive miR is increased in normal cells or tissues compared to normal cells derived from a different tissue type or location in the body. For example, the expression of a tumor-suppressive miR in a normal cell may be increased by at least 5% compared to normal cells derived from a different tissue type or location in the body. In some embodiments, the expression of a tumor-suppressive miR in a normal cell is increased by at least 5%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 45%, 50%, 60%, 70%, 80%, 90%, 100%, 150%, 200%, 300%, 400%, 500%, 1000% or more compared to normal cells derived from a different tissue type or location in the body. Examples of tumor-suppressive miRNAs include, but are not limited to, miR-15a, miR-16-1, miR-34, as well as miRNAs of the let-7 family. Additional examples of tumor-suppressive miRs are listed in Table 3 and Table 8.

[0096] Cancer pathogenesis is a heterogeneous and multigenic process. As such, activation of particular pathways and the expression of particular genes may lead to cancer development in one context, and result in distinct or opposing results when activated or expressed in a different context. Therefore, the characterization of a particular gene or miR as an "oncogene" or "oncogenic miR" or as a "tumor-suppressor" or "tumor-suppressive miR" is not a binary distinction and is often context dependent. For example, miR-152b functions as an oncogenic miR in the vast majority of hematologic malignancies, but functions as a tumor-suppressive miR in many solid tumors. Further, a particular miR may be highly expressed in both cancerous and non-cancerous cells. For example, miR-155 is highly expressed in normal cells, playing an essential role in macrophage polarization, and is also highly expressed in cancer cells. As such, the development of the miR-attenuated, genome-editing, and microenvironment-remodeling oncolytic viruses described herein is based on the differential expression of a particular miR or group of miRs in one cell population or tissue compared to another cell population or tissue. One of skill in the art will understand that the term tumor-suppressive miR generally refers to a miR that is more highly expressed in a non-cancerous cell or tissue compared to a cancerous cell or tissue, and that the term oncogenic miR generally refers to a miR that is more highly expressed in a cancerous cell or tissue compared to a non-cancerous cell or

tissue. One of skill in the art will further understand that a miR characterized as a tumor-suppressive miR in one type of cancer may or more may not function as a tumor-suppressive miR in a different type of cancer, and that a miR characterized as an oncogenic miR in one type of cancer may or more may not function as an oncogenic miR in a different type of cancer.

[0097] Table 1 shows the relationship between 12 select oncomiRs (9 tumor suppressors and 3 oncogenic miRNAs) and numerous cancers. A list of 3,410 oncomiR-cancer relationships is shown in Table 2. miRNAs regulate many transcripts of proteins that are involved in the control of cellular proliferation and apoptosis. Regulated proteins include conventional proto-oncoproteins and tumor suppressors such as Ras, Myc, Bcl2, PTEN and p53. Aberrant expression of miRNAs therefore often is involved in development of cancer and can therapeutically be corrected by either inhibiting oncogenic miRNAs or replacing the depleted tumor suppressor miRNA. Further, the differential expression of particular oncomiRs in cancerous vs. non-cancerous cells can be exploited as a means to target cancer therapeutics specifically to cancer cells. As such, in some embodiments, the oncolytic viral vectors described herein can comprise the following properties individually or in combination: insertion of tumor-suppressive miRNA target sequences into the viral genome, thereby restricting viral vector replication to cancer or tumor cells; one or more polynucleotides incorporated into the viral genome whose product(s) disrupt the function of an oncogenic miRNA and/or the cancer extracellular matrix; and/or protease-activated antibodies incorporated into the viral particle in order to highly selectively target the vectors to cancer and/or tumor cells.

[0098] One aspect of the invention comprises a recombinant oncolytic virus (or viral vector) comprising a plurality of copies of one or more tumor-suppressive miRNA target sequences (e.g., an miRNA selected from the miRNAs listed in Table 3 or Table 8) inserted into a locus of one or more viral genes required for viral replication. In certain embodiments, a recombinant oncolytic virus may comprise tumor-suppressive miRNA target sequences inserted into a locus of at least one, at least two, at least three, at least four, at least five, at least six, at least seven, at least eight, at least nine, or at least ten viral genes required for viral replication. Tumor-suppressor miRNAs expressed in normal (non-cancerous) cells can bind to such target sequences and suppress expression of the viral gene containing the miRNA target sequence, thereby limiting viral replication in healthy, non-cancerous cells. Such recombinant oncolytic viruses and/or vectors are referred to herein as "miR-attenuated" or "replication-restricted" as

they result in reduced or attenuated viral replication in cell that express a tumor-suppressive miR capable of binding to the incorporated tumor-suppressive miR target sequence compared to cells that do not express, or have reduced expression of, the tumor-suppressive miR. By incorporating tumor-suppressive miRNAs into key genes required for viral replication, viral replication can be conditionally suppressed in normal diploid cells expressing the tumor-suppressive miRNAs and can proceed normally in cells that do not express the tumor-suppressive miRNAs. In such embodiments, healthy, non-cancerous cells are protected from the normal cells from lytic effects of infection by the recombinant viral vector.

[0099] In certain embodiments, the one or more tumor-suppressive miRNA target sequences is incorporated into the 5' untranslated region (UTR) and/or 3' UTR of one or more genes one or more viral genes required for viral replication. In normal diploid cells, tumor-suppressive miRNAs can bind to the engineered 3' or 5' non coding sequence which comprises a tumor-suppressive miRNA target sequence, but these tumor-suppressive miRNAs are lacking in transformed or malignant cells. Thus, viral replication can proceed in cells that lack, or have reduced expression of, the tumor-suppressive miRNAs. In some embodiments, at least one tumor-suppressive miR target sequence is incorporated into one or more viral genes required for replication. In some embodiments, the oncolytic viral vector may comprise multiple copies of an identical tumor-suppressive miR target sequence incorporated into one viral gene required for replication. For example, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or more copies of a tumor-suppressive miR target sequence may be incorporated into a viral gene required for replication. In particular embodiments, 2 to 6 copies of a tumor-suppressive miR target sequence are incorporated into the 3' or 5' UTR of a viral gene required for replication. In further embodiments, 4 copies of a tumor-suppressive miR target sequence are incorporated into the 3' or 5' UTR of a viral gene required for replication. In some embodiments, the oncolytic viral vector may comprise multiple copies of the same tumor-suppressive miR target sequence incorporated into a plurality of viral genes required for replication. For example, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or more copies of a tumor-suppressive miR target sequence may be incorporated into 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, or more genes required for viral replication. In particular embodiments, 2 to 6 copies of a tumor-suppressive miR target sequence are incorporated into the 3' or 5' UTR of two or more viral genes required for replication. In further embodiments, at least 4 copies of a tumor-suppressive

miR target sequence are incorporated into the 3' or 5' UTR of two or more viral genes required for replication.

[00100] In some embodiments, the oncolytic viral vector may comprise target sequences for more than one tumor-suppressive miR incorporated into one viral gene required for replication. For example, target sequences for 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or more different tumor-suppressive miRs may be incorporated into a single gene required for viral replication. In some embodiments, the oncolytic viral vector may comprise target sequences for more than one tumor-suppressive miR incorporated into a plurality of viral genes required for replication. For example, target sequences for 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or more different tumor-suppressive miRs may be incorporated into 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, or more genes required for viral replication. In some embodiments, the oncolytic viral vector may comprise multiple target sequences (*e.g.*, at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 copies of one target sequence) for at least two different tumor-suppressive miRs (*e.g.*, at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 different tumor-suppressive miRs). In such embodiments, the multiple target sequences for a first tumor-suppressive miR may be incorporated into a first gene required for replication, the multiple target sequences for a second tumor-suppressive miR may be incorporated into a second gene required for replication, the multiple target sequences for a third tumor-suppressive miR may be incorporated into a third gene required for replication, etc. In particular embodiments, the oncolytic viral vectors described herein comprise at least 2 to at least 8 copies of first tumor-suppressive miR target sequence incorporated into the 3' or 5' UTR of a first gene required for replication, at least 2 to at least 8 copies of second tumor-suppressive miR target sequence incorporated into the 3' or 5' UTR of a second gene required for replication, and at least 2 to at least 8 copies of third tumor-suppressive miR target sequence incorporated into the 3' or 5' UTR of a third gene required for replication.

[00101] In some embodiments, the miR-attenuated oncolytic viruses described herein result in reduced viral replication in a cell that expresses a tumor-suppressive miR capable of binding to one or more of the incorporated miR-target sequences. "Viral replication" refers to the total number of viral replication cycles that occur in a particular cell or population of cells during a given amount of time. In some embodiments, viral replication can be measured directly by assessing the total viral titer present over the course of the given amount of time, or by assessing the number of viral genome copies present (*e.g.*, by sequencing). In some

embodiments, the viral vector may additionally comprise a detectable label, such as a fluorescent reporter. In such embodiments, viral replication may be assessed by measuring the fluorescence intensity of the reporter, or the number of cells that express the reporter. In some embodiments, viral replication can be measured indirectly by assessing the number of viable cells over the course of the given amount of time. For example, the level of viral replication would be expected to inversely correlate with the number of viable cells over time.

[00102] "Reduced viral replication" as used herein, refers to a level of viral replication that is lower in a first cell or first population of cells compared to a second cell or a second population of cells. In some embodiments, the level of viral replication in the first cell or first population of cells is reduced by at least 5% compared to the level of viral replication in the second cell or population of cells. In some embodiments, the level of viral replication in the first cell or first population of cells is reduced by at least 5%, 6%, 7%, 8%, 9%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 50%, 60%, 70%, 80%, 90% or more compared to the level of viral replication in the second cell or population of cells. In some embodiments, viral replication in the first cell or first population of cells is completely inhibited compared to the viral replication in the second cell or population of cells.

[00103] In some embodiments, the reduced viral replication in the first cell or first population of cells correlates with the expression of a tumor-suppressive miR capable of binding to the one or more miR-target sequences incorporated into one or more viral genes required for replication. In some embodiments, expression of a tumor-suppressive miR corresponding to the incorporated miR-target sequence therefore inhibits or reduces the expression of the replication gene, thereby inhibiting or reducing viral replication. In some embodiments, the second cell or second population of cells does not express, or has a reduced expression level, of the tumor-suppressive miR. In some embodiments, absent or reduced expression of a tumor-suppressive miR (*e.g.*, in a cancer cell) corresponding to the incorporated miR-target sequence allows for viral replication to proceed. In some embodiments, the expression level of the tumor-suppressive miR in the second cell or population of cells is at least 5% lower than the expression level of the tumor-suppressive miR in the first cell or population. In some embodiments, the expression level of the tumor-suppressive miR in the second cell or population of cells is reduced at least 5%, 6%, 7%, 8%, 9%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 50%, 60%, 70%, 80%, 90% or more compared to the expression level of the tumor-suppressive miR in the first cell or population. In

some embodiments, the second cell does not express the tumor-suppressive miR. In particular embodiments, the first cell is a non-cancerous cell and the second cell is a cancerous cell.

[00104] In some aspects, the multiple copies (*e.g.*, at least 2, at least 3, at least 4, at least 5, at least 6, or more copies) of a tumor-suppressive miRNA target sequence are inserted into a locus in the viral genome in tandem. In such embodiments, the multiple copies of the target sequence may be separated by a linker sequence or a space sequence. In some embodiments, the linker and/or spacer sequence comprises 4 or more nucleotides. For example, a space or linker sequence may comprise 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, or more nucleotides. In some embodiments, the linker sequence or the spacer sequence comprises about 5 to about 20 nucleotides. In further embodiments, the linker sequence or the spacer sequence comprises about 8 to about 16 nucleotides. As an illustrative embodiment, and not meant to limit the present invention in any way, an oncolytic virus may comprise at least one, at least two, at least three, at least four, at least five, at least six, at least seven, at least eight, at least nine, or at least ten of one or more of the following subunits inserted in tandem into a locus of one or more viral genes required for viral replication: (a) target sequence for a first tumor-suppressive miRNA – linker or spacer sequence – target sequence for the first tumor-suppressive miRNA; or (b) target sequence for a first tumor-suppressive miRNA – linker or spacer sequence – target sequence for a second tumor-suppressive miRNA. In some embodiments, the miRNA target sequence is the reverse complement of the miRNA.

[00105] In some embodiments, an oncolytic virus is a herpes simplex virus (HSV), and the viral gene required for viral replication UL1, UL5, UL6, UL7, UL8, UL9, UL11, UL12, UL14, UL15, UL17, UL18, UL19, UL20, UL22, UL25, UL26, UL26.5, UL27, UL28, UL29, UL30, UL31, UL32, UL33, UL34, UL35, UL36, UL37, UL38, UL39, UL40, UL42, UL48, UL49, UL52, UL53, UL54, ICP0, ICP4, ICP22, ICP27, ICP47, gamma-34.5, US3, US4, US5, US6, US7, US8, US9, US10, US11, and/or US12. In some embodiments, an oncolytic virus is a herpes simplex virus (HSV), and the one or more tumor-suppressive miRNA target sequences is incorporated into one or more of ICP0, ICP4, UL19, and ICP27 genes. In certain embodiments, an oncolytic viral vector is an HSV that comprises one or more tumor suppressive miRNA target sequences (*e.g.*, any of the tumor-suppressive miRs listed in Table 3) incorporated into the 5' or 3' UTR of one or more genes (e.g., UL1, UL5, UL6, UL7, UL8, UL9, UL11, UL12, UL14, UL15, UL17, UL18, UL19, UL20, UL22, UL25, UL26, UL26.5, UL27, UL28, UL29, UL30,

UL31, UL32, UL33, UL34, UL35, UL36, UL37, UL38, UL39, UL40, UL42, UL48, UL49, UL52, UL53, UL54, ICP0, ICP4, ICP22, ICP27, ICP47, gamma-34.5, US3, US4, US5, US6, US7, US8, US9, US10, US11, or US12) that are required for viral replication (*e.g.*, FIGs. 39-49).

[00106] In some embodiments, a replication-restricted viral vector (*e.g.*, a miR-attenuated viral vector) comprises at least one let-7 target sequence and is used to treat lung cancer. In some embodiments, a replication-restricted viral vector comprises at least one miR-15a and/or at least one miR-16A target sequences and is used to treat B-cell chronic lymphocytic leukemia. In some embodiments, a replication-restricted viral vector comprises at least one miR-125b, at least one miR-145, at least one miR-21, and/or at least one miR-155 target sequences and is used to treat breast cancer. In other embodiments, a replication-restricted viral vector comprises at least one miR-143 and/or at least one miR-145 target sequences and is used to treat colorectal cancer. In certain embodiments, a replication-restricted viral vector comprises at least one miR-181a, at least one miR-181b, and/or at least one miR-181c target sequences and is used to treat glioblastoma. In some embodiments, a replication-restricted viral vector comprises at least one miR-199a*, at least one miR-195, at least one miR-199a, at least one miR-200a, and/or at least one miR-125a target sequences and is used to treat liver cancer (e.g., hepatocellular carcinoma).

[00107] In particular embodiments, a replication-restricted viral vector comprises at least one miR-451a target sequence, at least one miR-143-3p target sequence, at least one miR-559 target sequence, and at least one miR-124 target sequence and is used for the treatment of pancreatic, lung, and/or colon cancer. In such embodiments, the target sequences for miR-451a, miR-143-3p, miR-559, and miR-124 are incorporated into two or more genes required for viral replication (*e.g.*, ICP4 and ICP27). In further particular embodiments, a replication-restricted viral vector comprises at least one miR-451a target sequence, at least one miR-145-5p target sequence, at least one miR-559 target sequence, and at least one miR-124 target sequence and is used for the treatment of any type of cancer described herein. In such embodiments, the target sequences for miR-451a, miR-145-5p, miR-559, and miR-124 are incorporated into two or more genes required for viral replication (*e.g.*, ICP4 and ICP27). In further particular embodiments, a replication-restricted viral vector comprises at least one miR-205p target sequence, at least one miR-141-5p target sequence, at least one miR-31-5p target sequence, and at least one miR-124 target sequence and is used for the treatment of schwannoma. In such

embodiments, the target sequences for miR-205p, miR-141-5p, miR-31-5p, and miR-124 are incorporated into two or more genes required for viral replication (*e.g.*, ICP4 and ICP27).

[00108] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-136-3p, miR-432-5p, miR-1-3p, miR-127-3p, miR-379-5p, miR-493-5p, miR-223-5p, miR-223-5p, miR-136-5p, miR-451a, miR-487b-3p, miR-370-3p, miR-410-3p, miR-431-3p, miR-4485-3p, miR-4485-5p, miR-127-5p, miR-409-3p, miR-338-3p, miR-559, miR-411-5p, miR-133a-5p, miR-143-3p, miR-376b-3p, miR-758-3p, miR-1, miR-101, miR-1180, miR-1236, miR-124-3p, miR-125b, miR-126, miR-1280, miR-133a, miR-133b, miR-141, miR-143, miR-144, miR-145, miR-155, miR-16, miR-18a, miR-192, miR-195, miR-200a, miR-200b, miR-200c, miR-203, miR-205, miR-214, miR-218, miR-23b, miR-26a, miR-29c, miR-320c, miR-34a, miR-370, miR-409-3p, miR-429, miR-451, miR-490-5p, miR-493, miR-576-3p, and/or miR-99a inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating bladder cancer.

[00109] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-1251-5p, miR-219a-5p, miR-219a-2-3p, miR-124-3p, miR-448, miR-138-2-3p, miR-490-5p, miR-129-1-3p, miR-1264, miR-3943, miR-490-3p, miR-383-5p, miR-133b, miR-129-2-3p, miR-128-2-5p, miR-133a-3p, miR-129-5p, miR-1-3p, miR-885-3p, miR-124-5p, miR-759, miR-7158-3p, miR-770-5p, miR-135a-5p, miR-885-5p, let-7g-5p, miR-100, miR-101, miR-106a, miR-124, miR-124a, miR-125a, miR-125a-5p, miR-125b, miR-127-3p, miR-128, miR-129, miR-136, miR-137, miR-139-5p, miR-142-3p, miR-143, miR-145, miR-146b-5p, miR-149, miR-152, miR-153, miR-195, miR-21, miR-212-3p, miR-219-5p, miR-222, miR-29b, miR-31, miR-3189-3p, miR-320, miR-320a, miR-326, miR-330, miR-331-3p, miR-340, miR-342, miR-34a, miR-376a, miR-449a, miR-483-5p, miR-503, miR-577, miR-663, miR-7, miR-7-5p, miR-873, let-7a, let-7f, miR-107, miR-122, miR-124-5p, miR-139, miR-146a, miR-146b, miR-15b, miR-16, miR-181a, miR-181a-1, miR-181a-2, miR-181b, miR-181b-1, miR-181b-2, miR-181c, miR-181d, miR-184, miR-185, miR-199a-3p, miR-200a, miR-200b, miR-203, miR-204, miR-205, miR-218, miR-23b, miR-26b, miR-27a, miR-29c, miR-328, miR-34c-3p, miR-34c-5p, miR-375, miR-383, miR-451, miR-452, miR-495, miR-584, miR-622, miR-656, miR-98, miR-124-3p, miR-181b-5p, miR-200b, and/or miR-3189-3p inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral

replication. This oncolytic virus may be used in methods and compositions for treating brain cancer. In certain embodiments, the brain cancer is astrocytoma, glioblastoma, or glioma.

[00110] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-10b-5p, miR-126-3p, miR-145-3p, miR-451a, miR-199b-5p, miR-5683, miR-3195, miR-3182, miR-1271-5p, miR-204-5p, miR-409-5p, miR-136-5p, miR-514a-5p, miR-559, miR-483-3p, miR-1-3p, miR-6080, miR-144-3p, miR-10b-3p, miR-6130, miR-6089, miR-203b-5p, miR-4266, miR-4327, miR-5694, miR-193b, let-7a, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-100, miR-107, miR-10a, miR-10b, miR-122, miR-124, miR-1258, miR-125a-5p, miR-125b, miR-126, miR-127, miR-129, miR-130a, miR-132, miR-133a, miR-143, miR-145, miR-146a, miR-146b, miR-147, miR-148a, miR-149, miR-152, miR-153, miR-15a, miR-16, miR-17-5p, miR-181a, miR-1826, miR-183, miR-185, miR-191, miR-193a-3p, miR-195, miR-199b-5p, miR-19a-3p, miR-200a, miR-200b, miR-200c, miR-205, miR-206, miR-211, miR-216b, miR-218, miR-22, miR-26a, miR-26b, miR-300, miR-30a, miR-31, miR-335, miR-339-5p, miR-33b, miR-34a, miR-34b, miR-34c, miR-374a, miR-379, miR-381, miR-383, miR-425, miR-429, miR-450b-3p, miR-494, miR-495, miR-497, miR-502-5p, miR-517a, miR-574-3p, miR-638, miR-7, miR-720, miR-873, miR-874, miR-92a, miR-98, miR-99a, mmu-miR-290-3p, and/or mmu-miR-290-5p inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating breast cancer.

[00111] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-143, miR-145, miR-17-5p, miR-203, miR-214, miR-218, miR-335, miR-342-3p, miR-372, miR-424, miR-491-5p, miR-497, miR-7, miR-99a, miR-99b, miR-100, miR-101, miR-15a, miR-16, miR-34a, miR-886-5p, miR-106a, miR-124, miR-148a, miR-29a, and/or miR-375 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating cervical cancer.

[00112] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-133a-5p, miR-490-5p, miR-124-3p, miR-137, miR-655-3p, miR-376c-3p, miR-369-5p, miR-490-3p, miR-432-5p, miR-487b-3p, miR-342-3p, miR-223-3p, miR-136-3p, miR-136-3p, miR-143-5p, miR-1-3p,

miR-214-3p, miR-143-3p, miR-199a-3p, miR-199b-3p, miR-451a, miR-127-3p, miR-133a-3p, miR-145-5p, miR-145-3p, miR-199a-5p, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-100, miR-101, miR-126, miR-142-3p, miR-143, miR-145, miR-192, miR-200c, miR-21, miR-214, miR-215, miR-22, miR-25, miR-302a, miR-320, miR-320a, miR-34a, miR-34c, miR-365, miR-373, miR-424, miR-429, miR-455, miR-484, miR-502, miR-503, miR-93, miR-98, miR-186, miR-30a-5p, miR-627, let-7a, miR-1, miR-124, miR-125a, miR-129, miR-1295b-3p, miR-1307, miR-130b, miR-132, miR-133a, miR-133b, miR-137, miR-138, miR-139, miR-139-5p, miR-140-5p, miR-148a, miR-148b, miR-149, miR-150-5p, miR-154, miR-15a, miR-15b, miR-16, miR-18a, miR-191, miR-193a-5p, miR-194, miR-195, miR-196a, miR-198, miR-199a-5p, miR-203, miR-204-5p, miR-206, miR-212, miR-218, miR-224, miR-24-3p, miR-26b, miR-27a, miR-28-3p, miR-28-5p, miR-29b, miR-30a-3p, miR-30b, miR-328, miR-338-3p, miR-342, miR-345, miR-34a-5p, miR-361-5p, miR-375, miR-378, miR-378a-3p, miR-378a-5p, miR-409-3p, miR-422a, miR-4487, miR-483, miR-497, miR-498, miR-518a-3p, miR-551a, miR-574-5p, miR-625, miR-638, miR-7, miR-96-5p, miR-202-3p, miR-30a, and/or miR-451 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating colon or colorectal cancer.

[00113] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-101, miR-130a, miR-130b, miR-134, miR-143, miR-145, miR-152, miR-205, miR-223, miR-301a, miR-301b, miR-30c, miR-34a, miR-34c, miR-424, miR-449a, miR-543, and/or miR-34b inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating endometrial cancer.

[00114] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-125b, miR-138, miR-15a, miR-15b, miR-16, miR-16-1, miR-16-1-3p, miR-16-2, miR-181a, miR-181b, miR-195, miR-223, miR-29b, miR-34b, miR-34c, miR-424, miR-10a, miR-146a, miR-150, miR-151, miR-155, miR-2278, miR-26a, miR-30e, miR-31, miR-326, miR-564, miR-27a, let-7b, miR-124a, miR-142-3p, let-7c, miR-17, miR-20a, miR-29a, miR-30c, miR-720, miR-107, miR-342, miR-34a, miR-202, miR-142-5p, miR-29c, miR-145, miR-193b, miR-199a, miR-214, miR-22, miR-137, and/or miR-197 inserted into the 5' UTR or 3' UTR of one or more viral genes required for

viral replication. This oncolytic virus may be used in methods and compositions for treating hematologic cancer. In some embodiments, the hematologic cancer is leukemia, lymphoma, or myeloma.

[00115] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-1, miR-145, miR-1826, miR-199a, miR-199a-3p, miR-203, miR-205, miR-497, miR-508-3p, miR-509-3p, let-7a, let-7d, miR-106a*, miR-126, miR-1285, miR-129-3p, miR-1291, miR-133a, miR-135a, miR-138, miR-141, miR-143, miR-182-5p, miR-200a, miR-218, miR-28-5p, miR-30a, miR-30c, miR-30d, miR-34a, miR-378, miR-429, miR-509-5p, miR-646, miR-133b, let-7b, let-7c, miR-200c, miR-204, miR-335, miR-377, and/or miR-506 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating kidney cancer.

[00116] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f, let-7f-1, let-7f-2, let-7g, let-7i, miR-1, miR-100, miR-101, miR-105, miR-122, miR-122a, miR-1236, miR-124, miR-125b, miR-126, miR-127, miR-1271, miR-128-3p, miR-129-5p, miR-130a, miR-130b, miR-133a, miR-134, miR-137, miR-138, miR-139, miR-139-5p, miR-140-5p, miR-141, miR-142-3p, miR-143, miR-144, miR-145, miR-146a, miR-148a, miR-148b, miR-150-5p, miR-15b, miR-16, miR-181a-5p, miR-185, miR-188-5p, miR-193b, miR-195, miR-195-5p, miR-197, miR-198, miR-199a, miR-199a-5p, miR-199b, miR-199b-5p, miR-200a, miR-200b, miR-200c, miR-202, miR-203, miR-204-3p, miR-205, miR-206, miR-20a, miR-21, miR-21-3p, miR-211, miR-212, miR-214, miR-217, miR-218, miR-219-5p, miR-22, miR-223, miR-26a, miR-26b, miR-29a, miR-29b-1, miR-29b-2, miR-29c, miR-302b, miR-302c, miR-30a, miR-30a-3p, miR-335, miR-338-3p, miR-33a, miR-34a, miR-34b, miR-365, miR-370, miR-372, miR-375, miR-376a, miR-377, miR-422a, miR-424, miR-424-5p, miR-433, miR-4458, miR-448, miR-450a, miR-451, miR-485-5p, miR-486-5p, miR-497, miR-503, miR-506, miR-519d, miR-520a, miR-520b, miR-520c-3p, miR-582-5p, miR-590-5p, miR-610, miR-612, miR-625, miR-637, miR-675, miR-7, miR-877, miR-940, miR-941, miR-98, miR-99a, miR-132, and/or miR-31 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and

compositions for treating liver cancer. In some embodiments, the liver cancer is hepatocellular carcinoma.

[00117] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-143-3p, miR-126-3p, miR-126-5p, miR-1266-3p, miR-6130, miR-6080, miR-511-5p, miR-143-5p, miR-223-5p, miR-199b-5p, miR-199a-3p, miR-199b-3p, miR-451a, miR-142-5p, miR-144, miR-150-5p, miR-142-3p, miR-214-3p, miR-214-5p, miR-199a-5p, miR-145-3p, miR-145-5p, miR-1297, miR-141, miR-145, miR-16, miR-200a, miR-200b, miR-200c, miR-29b, miR-381, miR-409-3p, miR-429, miR-451, miR-511, miR-99a, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-1, miR-101, miR-133b, miR-138, miR-142-5p, miR-144, miR-1469, miR-146a, miR-153, miR-15a, miR-15b, miR-16-1, miR-16-2, miR-182, miR-192, miR-193a-3p, miR-194, miR-195, miR-198, miR-203, miR-217, miR-218, miR-22, miR-223, miR-26a, miR-26b, miR-29c, miR-33a, miR-34a, miR-34b, miR-34c, miR-365, miR-449a, miR-449b, miR-486-5p, miR-545, miR-610, miR-614, miR-630, miR-660, miR-7515, miR-9500, miR-98, miR-99b, miR-133a, let-7a, miR-100, miR-106a, miR-107, miR-124, miR-125a-3p, miR-125a-5p, miR-126, miR-126*, miR-129, miR-137, miR-140, miR-143, miR-146b, miR-148a, miR-148b, miR-149, miR-152, miR-154, miR-155, miR-17-5p, miR-181a-1, miR-181a-2, miR-181b, miR-181b-1, miR-181b-2, miR-181c, miR-181d, miR-184, miR-186, miR-193b, miR-199a, miR-204, miR-212, miR-221, miR-224, miR-27a, miR-27b, miR-29a, miR-30a, miR-30b, miR-30c, miR-30d, miR-30d-5p, miR-30e-5p, miR-32, miR-335, miR-338-3p, miR-340, miR-342-3p, miR-361-3p, miR-373, miR-375, miR-4500, miR-4782-3p, miR-497, miR-503, miR-512-3p, miR-520a-3p, miR-526b, miR-625*, and/or miR-96 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating lung cancer.

[00118] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for let-7b, miR-101, miR-125b, miR-1280, miR-143, miR-146a, miR-146b, miR-155, miR-17, miR-184, miR-185, miR-18b, miR-193b, miR-200c, miR-203, miR-204, miR-205, miR-206, miR-20a, miR-211, miR-218, miR-26a, miR-31, miR-33a, miR-34a, miR-34c, miR-376a, miR-376c, miR-573, miR-7-5p, miR-9, and/or miR-98 inserted into the 5' UTR or 3' UTR of one or more viral genes required

for viral replication. This oncolytic virus may be used in methods and compositions for treating melanoma.

[00119] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for let-7d, miR-218, miR-34a, miR-375, miR-494, miR-100, miR-124, miR-1250, miR-125b, miR-126, miR-1271, miR-136, miR-138, miR-145, miR-147, miR-148a, miR-181a, miR-206, miR-220a, miR-26a, miR-26b, miR-29a, miR-32, miR-323-5p, miR-329, miR-338, miR-370, miR-410, miR-429, miR-433, miR-499a-5p, miR-503, miR-506, miR-632, miR-646, miR-668, miR-877, and/or miR-9inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating oral cancer.

[00120] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for let-7i, miR-100, miR-124, miR-125b, miR-129-5p, miR-130b, miR-133a, miR-137, miR-138, miR-141, miR-145, miR-148a, miR-152, miR-153, miR-155, miR-199a, miR-200a, miR-200b, miR-200c, miR-212, miR-335, miR-34a, miR-34b, miR-34c, miR-409-3p, miR-411, miR-429, miR-432, miR-449a, miR-494, miR-497, miR-498, miR-519d, miR-655, miR-9, miR-98, miR-101, miR-532-5p, miR-124a, miR-192, miR-193a, and/or miR-7 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating ovarian cancer.

[00121] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-216a-5p, miR-802, miR-217, miR-145-3p, miR-143-3p, miR-451a, miR-375, miR-214-3p, miR-216b-3p, miR-432-5p, miR-216a-3p, miR-199b-5p, miR-199a-5p, miR-136-3p, miR-216b-5p, miR-136-5p, miR-145-5p, miR-127-3p, miR-199a-3p, miR-199b-3p, miR-559, miR-129-2-3p, miR-4507, miR-1-3p, miR-148a-3p, miR-101, miR-1181, miR-124, miR-1247, miR-133a, miR-141, miR-145, miR-146a, miR-148a, miR-148b, miR-150*, miR-150-5p, miR-152, miR-15a, miR-198, miR-203, miR-214, miR-216a, miR-29c, miR-335, miR-34a, miR-34b, miR-34c, miR-373, miR-375, miR-410, miR-497, miR-615-5p, miR-630, miR-96, miR-132, let-7a, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-126, miR-135a, miR-143, miR-144, miR-150, miR-16, miR-200a, miR-200b, miR-200c, miR-217, miR-218, miR-337, miR-494, and/or miR-98 inserted into the 5' UTR or 3' UTR of one or more viral genes required for

viral replication. This oncolytic virus may be used in methods and compositions for treating pancreatic cancer.

[00122] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for let-7a-3p, let-7c, miR-100, miR-101, miR-105, miR-124, miR-128, miR-1296, miR-130b, miR-133a-1, miR-133a-2, miR-133b, miR-135a, miR-143, miR-145, miR-146a, miR-154, miR-15a, miR-187, miR-188-5p, miR-199b, miR-200b, miR-203, miR-205, miR-212, miR-218, miR-221, miR-224, miR-23a, miR-23b, miR-25, miR-26a, miR-26b, miR-29b, miR-302a, miR-30a, miR-30b, miR-30c-1, miR-30c-2, miR-30d, miR-30e, miR-31, miR-330, miR-331-3p, miR-34a, miR-34b, miR-34c, miR-374b, miR-449a, miR-4723-5p, miR-497, miR-628-5p, miR-642a-5p, miR-765, and/or miR-940 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating prostate cancer.

[00123] In some embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences for miR-101, miR-183, miR-204, miR-34a, miR-365b-3p, miR-486-3p, and/or miR-532-5p inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication. This oncolytic virus may be used in methods and compositions for treating retinoblastoma.

[00124] In some embodiments, an oncolytic virus described herein is a herpes simplex virus and wherein the one or more viral genes required for viral replication is selected from the group consisting of UL1, UL5, UL6, UL7, UL8, UL9, UL11, UL12, UL14, UL15, UL17, UL18, UL19, UL20, UL22, UL25, UL26, UL26.5, UL27, UL28, UL29, UL30, UL31, UL32, UL33, UL34, UL35, UL36, UL37, UL38, UL39, UL40, UL42, UL48, UL49, UL52, UL53, UL54, ICP0, ICP4, ICP22, ICP27, ICP47, gamma-34.5, US3, US4, US5, US6, US7, US8, US9, US10, US11, and US12.

[00125] In some cases, the recombinant viral vector of the invention is a herpes simplex virus (HSV) and further comprises a deletion of the internal repeat (joint) region comprising one copy each of the diploid genes ICP0, ICP34.5, LAT, and ICP4 along with the promoter for the ICP47 gene.

[00126] In certain embodiments, the recombinant viral vector of the invention is an HSV that exhibits enhanced entry into cells, either through direct infection and/or lateral spread.

In one aspect, HSV vectors of the present invention can directly infect cells through interaction with cell proteins other than typical mediators of HSV infection (e.g., other than nectin-1, HVEM, or heparan sulfate/chondroitin sulfate proteoglycans). In certain embodiments, the recombinant viral vector of the invention is an HSV and further comprises a mutation of the gB or gH gene that facilitates vector entry though non-canonical receptors. In another aspect, the invention provides an HSV vector further comprising mutant gH glycoproteins that exhibit lateral spread in cells typically resistant to HSV lateral spread, such as cells lacking gD receptors. In some embodiments, an HSV vector of the invention comprises one or more of the mutant gB or gH proteins as described in U.S. Patent Publication No. 2013/0096186, which is incorporated herein by reference in its entirety. In certain aspects, the mutant entry protein within an HSV vector is a glycoprotein involved with viral entry, such as gB, gH, and the mutant HSV vector can comprise mutated versions of both. However, the mutant entry protein can be any protein effecting entry of the HSV vector into cells. In certain embodiments, the mutant entry protein is other than gD, although the HSV vector can additionally comprise a mutant gD, such as containing a ligand or other desired mutation. Non-limiting mutations of gB or gH glycoprotein for use in the inventive HSV vector occur at one or more of the following residues: gB:D285, gB:A549, gB:S668, gH:N753, and gH:A778. In some embodiments, the inventive HSV vector comprises mutations at both gB:D285 and gB:A549, at both gH:N753 and gH:A778, and/or at each of gB:S668, gH:N753, and gH:A778. In certain embodiments, the HSV vector contains two or more of such mutations (e.g., 3 or more, 4 or more), and the HSV vector can comprise mutations in all five of these residues. In one embodiment, an HSV vector has mutations at gB:285, gB;549, gH:753, and gH:778. The mutations are referred to herein relative to the codon (amino acid) numbering of the gD, gB, and gH genes of the HSV-1 strain KOS derivative K26GFP. The sequences for gB and gH of K26GFP differ from the sequences for gB as disclosed in GenBank (#AF311740 (incorporated herein by reference)) and for gH (GenBank #X03896 (incorporated herein by reference)) as reflected in the following table:

	Amino acid position	AF311740	K26GFP	Nucleotide position(s)	AF311740	K26GFP
gB	313	T	S	938-939	ACG	AGC
	315	A	T	943	GCC	ACC
	515	H	R	1,544	CAC	CGC
X03896				X03896		
gH	12	I	L	1,011	ATT	CTT

	110	P	S	1,305	CCG	TCG
	127	T	I	1,357	ACC	ATC
	138	S	A	1,389	TCG	GCG
	150	A	T	1,425	GCC	ACC
	532	A	A	2,573	GCT	GCG
	633	R	R	2,876	CGT	CGC

[00127] However, K26GFP may contain additional differences in the region of the gene corresponding to nucleotides 2,079-2,102 of GenBank X03896. Thus, it will be understood that the sequence of either KOS derivative K26GFP or GenBank Accession No. AF311740 can serve as a reference sequence for the gB mutations discussed herein. Also, the sequence of either KOS derivative K26GFP or GenBank Accession No. X03896 can serve as a reference sequence for the gH mutations discussed herein. However, HSV vectors of the invention may include homologous mutations in gB and gH of any HSV strain.

[00128] In some aspects, the mutation of the entry protein for inclusion in an HSV vector is a substitution mutation; however, mutations are not limited to substitution mutants. In certain embodiments, mutant gB or gH glycoproteins for use in an HSV vector are selected from the group of substitution mutations consisting of gB:D285N, gB:A549T, gB:S668N, gH:N753K, gH:A778V. In certain aspects, an HSV vector includes combinations of these substitutions (such as two or more of such substitutions (e.g., 3 or more, 4 or more, or all)), with the gB:D285N/gB:A549T double mutant, the gH:N753K/gH:A778V double mutant, and the gB:S668N/gH:N753K/gH:A778V triple mutant being examples of embodiments. In one embodiment, an HSV vector comprises gB:D285N/gB:A549T/gH:N753K/gH:A778V.

[00129] In certain aspects, an HSV vector comprises a mutant gB and/or a mutant gH glycoprotein, wherein the mutations in the glycoproteins are substitution mutations in at least two residues, wherein, when the vector is HSV -1 K26GFP, the at least two residues are selected from the group consisting of gB:D285, gB:A549, gB:S668, gH:N753, and gH:A778, or wherein when the vector is a homologous HSV, the at least two residues are selected from amino acids that correlate to gB:D285, gB:A549, gB:S668, gH:N753, and gH:A778 wherein the gB:D285 residue correlates to X in VYPYXEFVL (SEQ ID NO:1), the gB:A549 residue correlates to X in KLNPNXIAS (SEQ ID NO:2), the gB:S668 residue correlates to X in ITTVXTFID (SEQ ID NO:3) the gH:N753 residue correlates to X in VDTDXTQQQ (SEQ ID NO:4), and the gH:A778

residue correlates to X in VPSTXLLLF (SEQ ID NO:5); and wherein the HSV vector is an HSV-1 or HSV-2 vector.

[00130] In one aspect, the invention encompasses a recombinant oncolytic virus comprising at least one polynucleotide encoding a protein or an oligonucleotide (e.g., an shRNA, a decoy oligonucleotide, or an antagomir) that reduces the expression or inhibits the function of an miRNA, a gene, or a tissue inhibitor of metalloproteinases (TIMP). Such recombinant oncolytic viruses are referred to herein as "genome-editing" or "microenvironment-remodeling" viruses or vectors. The encoded protein or oligonucleotide may reduce expression or inhibit the function of a miRNA, gene, or TIMP in any number of ways including targeting the protein (*e.g.*, a TIMP) for degradation (*e.g.*, by ubiquitination and proteosomal degradation or targeting for lysosomal degradation), blocking interactions with cognate receptors (*e.g.*, blocking antibodies or antigen binding fragments thereof or peptide inhibitors), degrading messenger RNA transcripts (*e.g.*, a short interfering RNA or short hairpin RNA), and/or altering the genomic DNA sequence encoding the specific miR, gene, or protein (*e.g.*, by an endonuclease).

[00131] In particular embodiments, the protein or oligonucleotide reduces the expression of a miR or a gene involved in carcinogenesis or metastasis (*e.g.*, an oncogenic miR or an oncogene). In some embodiments, a recombinant oncolytic virus comprises at least one polynucleotide encoding a protein or an oligonucleotide that reduces the expression or function of an miRNA that is an oncogenic miRNA (e.g., one or more of the miRNAs listed in Table 4). In some embodiments, the recombinant oncolytic virus comprises at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or more polynucleotides encoding for a protein or oligonucleotide that reduces the expression or function of an oncogenic miRNA. In some embodiments, the recombinant oncolytic virus comprises at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or more polynucleotides encoding for a plurality of proteins or oligonucleotides that reduce the expression or function of a plurality of oncogenic miRNAs. In some embodiments, the protein or oligonucleotide reduces the expression of miR-17–92 and is used to treat lung cancer (e.g., small-cell lung cancer). In other embodiments, the protein or oligonucleotide reduces the expression of miR-221 and/or miR-21 and is used to treat glioblastoma. In certain embodiments, the protein or oligonucleotide reduces the expression of miR-155 and/or miR-17–92 and is used to treat lymphoma (e.g., Burkitt's lymphoma, diffuse large B cell lymphoma, marginal zone lymphoma, or chronic lymphocytic leukemia). In some embodiments, the protein or oligonucleotide reduces the expression of miR-221, miR-222,

and/or miR-146 and is used to treat thyroid cancer. In some embodiments, the protein or oligonucleotide reduces the expression of miR-372 and/or miR-373 and is used to treat testicular cancer (e.g., testicular germ cell tumors). In some embodiments, the protein or oligonucleotide reduces the expression of miR-18 and/or miR-224 and is used to treat liver cancer (e.g., hepatocellular carcinoma).

[00132] In some embodiments, a recombinant viral vector described herein may be used to degrade the tumor extracellular matrix (ECM), which in some aspects leads to enhanced viral spread. Matrix metalloproteinases (MMPs) are zinc-dependent proteases that are classified, based on their activity, into collagenases, gelatinases, stromelysins and matrilysins. These proteases are generally secreted as pro-enzymes (zymogens) and are activated by proteolytic removal of the pro-peptide pro-domain. The primary role that MMPs play in cancer is in the degradation of the ECM, which facilitates tumor invasion and metastasis. MMPs are also involved in tumor progression, epithelial to mesenchymal transition (EMT), and angiogenesis. MMPs are regulated by miRNAs as well as TIMPs, which comprise a family of four protease inhibitors (TIMP1, TIMP2, TIMP3, and TIMP4). A broad array of tumor microenvironments can be degraded by disrupting miRNAs or TIMPs that negatively regulate the MMP family with the recombinant viral vectors of the invention. Examples of miRNA/MMP interactions are shown in Table 5. Many of these interactions show that multiple MMPs are regulated by a single miRNA: e.g. let-7 regulates MMP-2, MMP-9, and MMP-14; miR-143 regulates MMP-2, MMP-9, and MMP-13; miR-218 regulates MMP-2, MMP-7, and MMP-9. Furthermore, the vast majority of MMPs may be regulated by a single TIMP master switch: e.g. TIMP1 is known to inhibit most all of the known MMPs and also promotes cell proliferation in a wide range of cell types; TIMP2 interacts with MMP-14 and MMP-2.

[00133] In some embodiments, a recombinant oncolytic virus comprises at least one polynucleotide encoding a protein or an oligonucleotide that reduces the expression or function of an miRNA that is a microenvironment remodeling miRNA (e.g., one or more of the miRNAs listed in Table 5). In some embodiments, the protein or oligonucleotide reduces the expression or function of one microenvironment remodeling miRNA. In some embodiments, the protein or oligonucleotide reduces the expression or function of at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 or more microenvironment remodeling miRNAs. In some embodiments, the recombinant oncolytic virus comprises a plurality of polynucleotides encoding a plurality of protein or

oligonucleotides that reduce the expression or function of a plurality of microenvironment remodeling miRNAs. In some embodiments, strategies described herein may be utilized by recombinant viral vectors of the present invention to knockdown or disrupt expression or function of miRNAs or TIMPs which negatively regulate MMPs. In some embodiments, a recombinant oncolytic virus reduces the expression of a TIMP selected from TIMP1, TIMP2, TIMP3 and TIMP4.

[00134] In some embodiments, the recombinant oncolytic viruses described herein comprise at least one polynucleotide encoding a protein or an oligonucleotide that reduces the expression or function of a gene. In some aspects, the gene is an oncogenic gene (e.g., a gene selected from the genes listed in Table 7). In some aspects, the gene encodes an oncogenic miR (e.g., a miRNA listed in Table 4), a microenvironment remodeling miR (*e.g.*, a miRNA listed in Table 5), or a negative regulator of ECM-degradation (*e.g.*, a TIMP). Reduction of gene expression and/or function may be accomplished by at the level of transcription (*e.g.*, mutating, deleting, or silencing the genomic DNA sequence) or at the level of translation (*e.g.*, by inhibiting the production of the gene product through mRNA degradation). In some embodiments, the recombinant oncolytic viruses described herein comprise one or more polynucleotides that encode for nucleases that reduce the expression or function of a gene by enabling the mutation, deletion, or repression of transcription of a gene sequence. In specific embodiments, the nuclease is selected from a Clustered Regulatory Interspaced Short Palindromic Repeats (CRISPR)-associated endonuclease, a zinc-finger nuclease (ZFN) or a Transcription activator-like effector nuclease (TALEN). In non-limiting examples, a CRISPR-associated endonuclease is selected from SpCas9, SpCas9-HF1, SpCas9-HF2, SpCas9-HF3, SpCas9-HF4, SaCas9, FnCpf, FnCas9, eSpCas9, C2C1, C2C3, Cpf1, Casl, CaslB, Cas2, Cas3, Cas4, Cas5, Cas6, Cas7, Cas8, Cas9 (also known as Csnl and Csx12), Cas10, Csyl, Csy2, Csy3, Csel, Cse2, Cscl, Csc2, Csa5, Csn2, Csm2, Csm3, Csm4, Csm5, Csm6, Cmrl, Cmr3, Cmr4, Cmr5, Cmr6, Csbl, Csb2, Csb3, Csxl7, Csxl4, Csx10, Csx16, CsaX, Csx3, Csxl, Csxl5, Csfl, Csf2, Csf3, and Csf4.

[00135] Recombinant viral vectors of the invention may utilize the CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats)/Cas (CRISPR Associated) nuclease system, which is an engineered nuclease system based on a bacterial system that can be used for mammalian genome engineering. Generally, the system comprises a Cas nuclease and a guide

RNA (gRNA). The gRNA is comprised of two parts; a crispr-RNA (crRNA) that is specific for a target genomic DNA sequence, and a tracr RNA (trRNA) that facilitates Cas binding. The crRNA and trRNA may be present as separate RNA oligonucleotides, or may be present in the same RNA oligonucleotide, referred to as a single guide-RNA (sgRNA). As used herein, the term "guide RNA" or "gRNA" refers to either the combination of an individual trRNA and an individual crRNA or an sgRNA. See, e.g., Jinek *et al.* (2012) *Science* 337:816-821; Cong *et al.* (2013) *Science* 339:819-823; Mali *et al.* (2013) *Science* 339:823-826; Qi *et al.* (2013) *Cell* 152:1173-1183; Jinek *et al.* (2013), *eLife* 2:e00471; David Segal (2013) *eLife* 2:e00563; Ran *et al.* (2013) *Nature Protocols* 8(11):2281-2308; Zetsche *et al.* (2015) *Cell* 163(3):759-771; PCT Publication Nos. WO 2007/025097, WO 2008/021207, WO 2010/011961, WO 2010/054108, WO 2010/054154, WO 2012/054726, WO 2012/149470, WO 2012/164565, WO 2013/098244, WO 2013/126794, WO 2013/141680, and WO 2013/142578; U.S. Patent Publication Nos. 2010-0093617, 2013-0011828, 2010-0257638, 2010-0076057, 2011-0217739, 2011-0300538, 2013-0288251, and 2012-0277120; and U.S. Patent No. 8,546,553, each of which is incorporated herein by reference in its entirety.

[00136] Multiple class 1 CRISPR-Cas systems, which include the type I and type III systems, have been identified and functionally characterized in detail, revealing the complex architecture and dynamics of the effector complexes (Brouns *et al.*, 2008, Marraffini and Sontheimer, 2008, Hale *et al.*, 2009, Sinkunas *et al.*, 2013, Jackson *et al.*, 2014, Mulepati *et al.*, 2014). In addition, several class 2-type II CRISPR-Cas systems that employ homologous RNA-guided endonucleases of the Cas9 family as effectors have also been identified and experimentally characterized (Barrangou et al., 2007, Garneau *et al.*, 2010, Deltcheva *et al.*, 2011, Sapranauskas *et al.*, 2011, Jinek *et al.*, 2012, Gasiunas *et al.*, 2012). A second, putative class 2-type V CRISPR-Cas system has been recently identified in several bacterial genomes. The putative type V CRISPR-Cas systems contain a large, ~1,300 amino acid protein called Cpf1 (CRISPR from Prevotella and Francisella 1).

[00137] In some embodiments, an oncolytic virus described herein further comprises at least one polynucleotide encoding a trRNA and crRNA targeted to the miRNA or the TIMP. In some cases, the at least one polynucleotide encoding a trRNA and crRNA is inserted into a locus on the viral genome. In some embodiments, the polynucleotide is an insulated sequence comprising a synthetic insulator or a native viral (e.g., HSV) insulator. In

certain embodiments, an oncolytic virus is a herpes simplex virus and the at least one polynucleotide encoding an RNA binding site is inserted into or between one or more loci including the internal repeat joint region (comprising one copy each of the diploid genes ICP0, ICP34.5, LAT, ICP4, and the ICP47 promoter), ICP0, LAT, UL1, UL5, UL6, UL7, UL8, UL9, UL11, UL12, UL14, UL15, UL17, UL18, UL19, UL20, UL22, UL25, UL26, UL26.5, UL27, UL28, UL29, UL30, UL31, UL32, UL33, UL34, UL35, UL36, UL37, UL38, UL39, UL40, UL42, UL48, UL49, UL52, UL53, UL54, ICP0, ICP4, ICP22, ICP27, ICP47, gamma-34.5, US3, US4, US5, US6, US7, US8, US9, US10, US11, and US12. In one embodiment, an oncolytic virus is a herpes simplex virus (HSV) and the at least one polynucleotide encoding an RNA binding site is inserted into a locus between the UL3 and the UL4 open reading frames (*e.g.*, FIG. 45 and FIG. 46).

[00138] In some embodiments, the recombinant oncolytic virus comprises at least one polynucleotide encoding a protein that is a bispecific T-cell engager (BiTE), an anti-immunosuppressive protein, or an immunogenic antigen. As used herein an "anti-immunosuppressive protein" is a protein that inhibits an immunosuppressive pathway. The invention encompasses an oncolytic virus expressing an anti-immunosuppressive protein that is an anti-regulatory T-cell (Treg) protein or an anti-myeloid-derived suppressor cell (MDSC) protein. In some embodiments, the anti-immunosuppressive protein is a VHH-derived blocker or a VHH-derived BiTE. As used herein, an "immunogenic antigen" refers to a protein that increases an inflammatory or immunogenic immune response. In particular embodiments, the anti-immunosuppressive and immunogenic antigens induce an anti-tumor immune response. Examples of such proteins include antibody or antigen binding fragments thereof that bind to and inhibit immune checkpoint receptors (*e.g.* CTLA4, LAG3, PD1, PDL1, and others), pro-inflammatory cytokines (*e.g.*, IFNγ, IFNα, IFNβ, TNFα, IL-12, IL-2, IL-6, IL-8, GM-CSF, and others), or proteins that binding to and activate an activating receptor (*e.g.*, FcγRI, FcγIIa, FcγIIIa, costimulatory receptors, and others). In particular embodiments, the protein is selected from EpCAM, folate, IFNβ, anti-CTLA-4, anti-PD1, A2A, anti-FGF2, anti-FGFR/FGFR2b, anti-SEMA4D, CCL5, CD137, CD200, CD38, CD44, CSF-1R, CXCL10, CXCL13, endothelin B Receptor, IL-12, IL-15, IL-2, IL-21, IL-35, ISRE7, LFA-1, NG2 (also known as SPEG4), SMADs, STING, TGFβ, and VCAM1.

[00139] In certain embodiments, a polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of an miRNA, a gene, or a TIMP is inserted into a locus on the viral genome of a recombinant oncolytic virus. In some embodiments, the polynucleotide is an insulated sequence comprising a synthetic insulator or a native viral (e.g., HSV) insulator. In certain embodiments, the oncolytic virus is a herpes simplex virus and the at least one polynucleotide encoding an RNA binding site is inserted into or between one or more loci including the internal repeat joint region (comprising one copy each of the diploid genes ICP0, ICP34.5, LAT, ICP4, and the ICP47 promoter), ICP0, LAT, UL1, UL5, UL6, UL7, UL8, UL9, UL11, UL12, UL14, UL15, UL17, UL18, UL19, UL20, UL22, UL25, UL26, UL26.5, UL27, UL28, UL29, UL30, UL31, UL32, UL33, UL34, UL35, UL36, UL37, UL38, UL39, UL40, UL42, UL48, UL49, UL52, UL53, UL54, ICP0, ICP4, ICP22, ICP27, ICP47, gamma-34.5, US3, US4, US5, US6, US7, US8, US9, US10, US11, and US12.. In one embodiment, the virus is a herpes simplex virus (HSV) and the at least one polynucleotide is inserted into a locus between the UL3 and the UL4 open reading frames (see, *e.g.*, FIG. 45 and FIG. 46).

[00140] In some embodiments, the recombinant oncolytic virus comprises at least one protease-activated antibody. Protease-activated antibodies, such as those described by Metz et al. (Protein Eng Des Sel, 25(10):571-80, 2012) are activated and bind only to targets following protease cleavage of a protective cap. In some instances, tumor microenvironments possess an array of proteases that are well differentiated from surrounding healthy tissues. For example, the protease cathepsin B is overexpressed in numerous cancers, including breast, cervix, colon, colorectal, gastric, head and neck, liver, lung, melanoma, ovarian, pancreatic, prostate, and thyroid cancer. The human degradome, comprised of a complete list of proteases synthesized by human cells, is made up of at least 569 proteases that are distributed into five broad classes (in order from greatest to least number): metalloproteinases (MMPs), serine, cysteine, threonine, and aspartic proteases (Lopez-Otin et al., Nat Rev Cancer, 7(10):800-8, 2007). In particular, protease antibodies specifically cleaved by MMPs can serve as an excellent means of targeting the recombinant viral vectors described herein to the tumor microenvironment, as MMPs are found in the extracellular and pericellular areas of the cell. Table 6 summarizes proteases that are overexpressed in cancers which can be exploited to enable specific binding of recombinant viral vectors pseudotyped with protease-activated antibodies.

[00141] In certain embodiments, the protease-activated antibody is incorporated into the viral glycoprotein envelope. Protease-activated antibodies can be incorporated into the glycoprotein envelope of a recombinant viral vector of the invention (e.g., an HSV vector) to increase the therapeutic index and reduce off-target infection. In the case of an HSV vector, in some embodiments, the glycoprotein may be gC or gD. In some embodiments, the recombinant oncolytic viruses described herein comprise at least one polynucleotide encoding a protease-activated antibody. In certain embodiments, a protease-activated antibody is activated by a protease selected from a cysteine cathepsin, an aspartic cathepsin, a kallikrein (hK), a serine protease, a caspase, a matrix metalloproteinase (MMP), and a disintegrin and metalloproteinase (ADAM). In some embodiments, a protease is selected from cathepsin K, cathepsin B, cathepsin L, cathepsin E, cathepsin D, hK1, PSA (hK3), hK10, hK15, uPA, uPAR, MMP-1, MMP-2, MMP-3, MMP-7, MMP-8, MMP-9, MMP-10, MMP-11, MMP-12, MMP-13, MMP-14, MMP-15, MMP-16, MMP-17, MMP-18, MMP-19, MMP-20, MMP-21, MMP-23A, MMP-23B, MMP-24, MMP-25, MMP-26, MMP-27, MMP-28, or a protease listed in Table 6.

[00142] In some embodiments, the protease-activated antibody binds a protein expressed more highly by cancer cells or in cancer microenvironments than by non-cancer cells or in non-cancer microenvironments. In certain aspects, a protease-activated antibody binds NKG2D, c-met, HGFR, CD8, heparan sulfate, VSPG4 (also known as NG2), EGFR, EGFRvIII, CD133, CXCR4, carcinoembryonic antigen (CEA), CLC-3, annexin II, human transferrin receptor, or EpCAM. In certain instances, multiple protease activated antibodies may be incorporated into a single viral vector particle to ensure that diverse tumor histotypes are targeted. For example, at least 1, 2, 3, 4, 6, 7, 8, 9, 10, or more protease activated antibodies may be incorporated into the viral glycoprotein envelope. In some embodiments, the recombinant oncolytic virus comprises at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, or more polynucleotides that encodes for at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, or more protease activated antibodies. In some embodiments, an oncolytic virus comprises a first protease-activated antibody that binds a first protein expressed more highly by cancer cells or in cancer microenvironments than by non-cancer cells or in non-cancer microenvironments, and a second protease-activated antibody that binds a second protein expressed more highly by cancer cells or in cancer microenvironments than by non-cancer cells or in non-cancer microenvironments. In further embodiments, an oncolytic virus comprises a plurality of protease-activated antibodies binding a plurality of

protein expressed more highly by cancer cells or in cancer microenvironments than by non-cancer cells or in non-cancer microenvironments. An oncolytic virus comprises, for example, a protease-activated antibody that is a human antibody, a humanized antibody or a chimeric antibody. In some embodiments, an oncolytic virus comprises an antibody that is a full-length immunoglobulin, an scFv, a Fab, a Fab', an F(ab')2, an Fv, a diabody, a triabody, a minibody, a single-domain antibody, or a multispecific antibody.

[00143] In some embodiments, a recombinant oncolytic virus comprises one or more of: one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication; one or more polynucleotides encoding one or more proteins or oligonucleotides, wherein the proteins or oligonucleotides reduce the expression or inhibit the function of a miR, a gene, or a TIMP; at least one protease-activated antibody; and/or a polynucleotide encoding at least one protease activated antibody. In some embodiments, a recombinant oncolytic virus comprises: a plurality of copies of one or more tumor-suppressive miRNA target sequences inserted into a locus of a viral gene required for viral replication in non-cancerous cells; and/or a first polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of an oncogenic miRNA or an oncogenic gene; and/or a second polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of a microenvironment remodeling miRNA or a TIMP. In some embodiments, a recombinant oncolytic virus comprises: a plurality of copies of one or more tumor-suppressive miRNA target sequences inserted into a locus of a viral gene required for viral replication in non-cancerous cells; and/or a polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of an oncogenic miRNA or an oncogenic gene; and/or at least one protease-activated antibody. In further embodiments, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences inserted into a locus of a viral gene required for viral replication in non-cancerous cells; and/or a polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of a microenvironment remodeling miRNA or a TIMP; and/or at least one protease-activated antibody. In one embodiment, a recombinant oncolytic virus comprises a plurality of copies of one or more tumor-suppressive miRNA target sequences inserted into a locus of a viral gene required for viral replication in non-cancerous cells; and/or a first polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of an oncogenic miRNA or an oncogenic gene; and/or a second

polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of a microenvironment remodeling miRNA or a TIMP; and/or at least one protease-activated antibody. In some specific embodiments, an oncolytic virus described in this paragraph is a herpes simplex virus and the viral gene required for viral replication in non-cancerous cells is UL1, UL5, UL6, UL7, UL8, UL9, UL11, UL12, UL14, UL15, UL17, UL18, UL19, UL20, UL22, UL25, UL26, UL26.5, UL27, UL28, UL29, UL30, UL31, UL32, UL33, UL34, UL35, UL36, UL37, UL38, UL39, UL40, UL42, UL48, UL49, UL52, UL53, UL54, ICP0, ICP4, ICP22, ICP27, ICP47, gamma-34.5, US3, US4, US5, US6, US7, US8, US9, US10, US11, and US12.

[00144] In certain aspects, the invention relates to a recombinant oncolytic virus comprising a first polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of an oncogenic miRNA or an oncogenic gene; and a second polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of a microenvironment remodeling miRNA or a TIMP. In other embodiments, a recombinant oncolytic virus comprises a polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of an oncogenic miRNA or an oncogenic gene; and at least one protease-activated antibody. In some embodiments, a recombinant oncolytic virus comprises a polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of a microenvironment remodeling miRNA or a TIMP; and at least one protease-activated antibody. In one embodiment, a recombinant oncolytic virus comprises a first polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of an oncogenic miRNA or an oncogenic gene; and/or a second polynucleotide encoding a protein or an oligonucleotide targeted to reduce expression of a microenvironment remodeling miRNA or a TIMP; and/or at least one protease-activated antibody.

[00145] In certain embodiments, an oncolytic virus described herein is a herpesvirus (for example, herpes simplex virus (e.g., HSV-1 or HSV-2)), an adenovirus, a polio virus, a vaccinia virus, a measles virus, a vesicular stomatitis virus, an orthomyxovirus, a parvovirus, a maraba virus or a coxsackievirus. HSV-based vectors and methods for their construction are described in, for example, U.S. Pat. Nos. 7,078,029, 6,261,552, 5,998,174, 5,879,934, 5,849,572, 5,849,571, 5,837,532, 5,804,413, and 5,658,724, and International Patent Applications WO 91/02788, WO 96/04394, WO 98/15637, and WO 99/06583, which are

incorporated herein by reference in their entireties. The sequence of HSV is published (NCBI Accession No. NC_001806; see also McGoech et al., J. Gen. Virol, 69 (PT 7), 1531-1574 (1988)), which may facilitate designing HSV-based vectors of the invention.

[00146] The invention also encompasses a nucleic acid molecule encoding an oncolytic virus described herein.

Compositions and Methods of Use

[00147] Certain aspects of the invention relate to stocks and compositions comprising the oncolytic viruses described herein. In some aspects, the invention relates to a viral stock comprising an oncolytic virus described herein. In some embodiments, a viral stock is a homogeneous stock. The preparation and analysis of viral stocks is well known in the art. For example, a viral stock can be manufactured in roller bottles containing cells transduced with the viral vector. The viral stock can then be purified on a continuous nycodenze gradient, and aliquotted and stored until needed. Viral stocks vary considerably in titer, depending largely on viral genotype and the protocol and cell lines used to prepare them.

[00148] In particular embodiments, the titer of a viral stock (e.g., an HSV-based vector viral stock) contemplated herein is at least about 10^5 plaque-forming units (pfu), such as at least about 10^6 pfu or even more preferably at least about 10^7 pfu. In certain embodiments, the titer can be at least about 10^8 pfu, or at least about 10^9 pfu, and high titer stocks of at least about 10^{10} pfu or at least about 10^{11} pfu are most preferred.

[00149] The invention further contemplates a composition comprising an oncolytic virus or a nucleic acid molecule described herein and a pharmaceutically acceptable carrier. The phrase "pharmaceutically-acceptable" refers to molecular entities and compositions that do not produce an allergic or similar untoward reaction when administered to a subject (e.g., a human). The term "composition" as used herein refers to a formulation of one or more oncolytic virus or a nucleic acid molecules described herein that is capable of being administered or delivered to a subject and/or a cell. Typically, formulations include all physiologically acceptable compositions including derivatives and/or prodrugs, solvates, stereoisomers, racemates, or tautomers thereof with any physiologically acceptable carriers, diluents, and/or excipients. A "therapeutic composition" or "pharmaceutical composition" (used interchangeably herein) is a composition of

one or more agents capable of is capable of being administered or delivered to a patient and/or subject and/or cell for the treatment of a particular disease or disorder.

[00150] The compositions disclosed herein may be formulated in a neutral or salt form. "Pharmaceutically acceptable salt" includes both acid and base addition salts. Pharmaceutically-acceptable salts include the acid addition salts (formed with the free amino groups of the protein) and which are formed with inorganic acids such as, for example, hydrochloric acid, hydrobromic acid, sulfuric acid, nitric acid, phosphoric acid and the like, and organic acids such as, but not limited to, acetic acid, 2,2-dichloroacetic acid, adipic acid, alginic acid, ascorbic acid, aspartic acid, benzenesulfonic acid, benzoic acid, 4-acetamidobenzoic acid, camphoric acid, camphor-10-sulfonic acid, capric acid, caproic acid, caprylic acid, carbonic acid, cinnamic acid, citric acid, cyclamic acid, dodecylsulfuric acid, ethane-1,2-disulfonic acid, ethanesulfonic acid, 2-hydroxyethanesulfonic acid, formic acid, fumaric acid, galactaric acid, gentisic acid, glucoheptonic acid, gluconic acid, glucuronic acid, glutamic acid, glutaric acid, 2-oxo-glutaric acid, glycerophosphoric acid, glycolic acid, hippuric acid, isobutyric acid, lactic acid, lactobionic acid, lauric acid, maleic acid, malic acid, malonic acid, mandelic acid, methanesulfonic acid, mucic acid, naphthalene-1,5-disulfonic acid, naphthalene-2-sulfonic acid, 1-hydroxy-2-naphthoic acid, nicotinic acid, oleic acid, orotic acid, oxalic acid, palmitic acid, pamoic acid, propionic acid, pyroglutamic acid, pyruvic acid, salicylic acid, 4-aminosalicylic acid, sebacic acid, stearic acid, succinic acid, tartaric acid, thiocyanic acid, *p*toluenesulfonic acid, trifluoroacetic acid, undecylenic acid, and the like. Salts formed with the free carboxyl groups can also be derived from inorganic bases such as, for example, sodium, potassium, lithium, ammonium, calcium, magnesium, iron, zinc, copper, manganese, aluminum salts and the like. Salts derived from organic bases include, but are not limited to, salts of primary, secondary, and tertiary amines, substituted amines including naturally occurring substituted amines, cyclic amines and basic ion exchange resins, such as ammonia, isopropylamine, trimethylamine, diethylamine, triethylamine, tripropylamine, diethanolamine, ethanolamine, deanol, 2-dimethylaminoethanol, 2-diethylaminoethanol, dicyclohexylamine, lysine, arginine, histidine, caffeine, procaine, hydrabamine, choline, betaine, benethamine, benzathine, ethylenediamine, glucosamine, methylglucamine, theobromine, triethanolamine, tromethamine, purines, piperazine, piperidine, *N*-ethylpiperidine, polyamine resins and the like. Particularly preferred organic bases are isopropylamine, diethylamine, ethanolamine, trimethylamine,

dicyclohexylamine, choline and caffeine. Upon formulation, solutions will be administered in a manner compatible with the dosage formulation and in such amount as is therapeutically effective. The formulations are easily administered in a variety of dosage forms such as injectable solutions, drug-release capsules, and the like.

[00151] As used herein, "carrier" includes any and all solvents, dispersion media, vehicles, coatings, diluents, antibacterial and antifungal agents, isotonic and absorption delaying agents, buffers, carrier solutions, suspensions, colloids, and the like. The use of such media and agents for pharmaceutical active substances is well known in the art. Except insofar as any conventional media or agent is incompatible with the active ingredient, its use in the therapeutic compositions is contemplated. Supplementary active ingredients can also be incorporated into the compositions.

[00152] As used herein "pharmaceutically acceptable carrier" includes without limitation any adjuvant, carrier, excipient, glidant, sweetening agent, diluent, preservative, dye/colorant, flavor enhancer, surfactant, wetting agent, dispersing agent, suspending agent, stabilizer, isotonic agent, solvent, surfactant, dispersion media, coatings, antibacterial and antifungal agents, isotonic and absorption delaying agents, and the like that are physiologically compatible, including pharmaceutically acceptable cell culture media and/or emulsifier which has been approved by the United States Food and Drug Administration as being acceptable for use in humans and/or domestic animals. Exemplary pharmaceutically acceptable carriers include, but are not limited to, to sugars, such as lactose, glucose and sucrose; starches, such as corn starch and potato starch; cellulose, and its derivatives, such as sodium carboxymethyl cellulose, ethyl cellulose and cellulose acetate; tragacanth; malt; gelatin; talc; cocoa butter, waxes, animal and vegetable fats, paraffins, silicones, bentonites, silicic acid, zinc oxide; oils, such as peanut oil, cottonseed oil, safflower oil, sesame oil, olive oil, corn oil and soybean oil; glycols, such as propylene glycol; polyols, such as glycerin, sorbitol, mannitol and polyethylene glycol; esters, such as ethyl oleate and ethyl laurate; agar; buffering agents, such as magnesium hydroxide and aluminum hydroxide; alginic acid; pyrogen- free water; isotonic saline; Ringer's solution; ethyl alcohol; phosphate buffer solutions; and any other compatible substances employed in pharmaceutical formulations. Except insofar as any conventional media and/or agent is incompatible with the agents of the present disclosure, its use in therapeutic

compositions is contemplated. Supplementary active ingredients also can be incorporated into the compositions.

[00153] Wetting agents, emulsifiers and lubricants, such as sodium lauryl sulfate and magnesium stearate, as well as coloring agents, release agents, coating agents, sweetening, flavoring and perfuming agents, preservatives and antioxidants can also be present in the compositions.

[00154] Examples of pharmaceutically-acceptable antioxidants include: (1) water soluble antioxidants, such as ascorbic acid, cysteine hydrochloride, sodium bisulfate, sodium metabisulfite, sodium sulfite and the like; (2) oil-soluble antioxidants, such as ascorbyl palmitate, butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT), lecithin, propyl gallate, alpha-tocopherol, and the like; and (3) metal chelating agents, such as citric acid, ethylenediamine tetraacetic acid (EDTA), sorbitol, tartaric acid, phosphoric acid, and the like.

[00155] In one embodiment, a composition comprising a carrier is suitable for parenteral administration, *e.g.*, intravascular (intravenous or intraarterial), intraperitoneal or intramuscular administration. Pharmaceutically acceptable carriers include sterile aqueous solutions or dispersions and sterile powders for the extemporaneous preparation of sterile injectable solutions or dispersion. The use of such media and agents for pharmaceutically active substances is well known in the art. Except insofar as any conventional media or agent is incompatible with a viral vector or nucleic acid molecule, use thereof in the pharmaceutical compositions of the invention is contemplated.

[00156] The compositions of the invention may comprise one or more polypeptides, polynucleotides, vectors comprising same, infected cells, etc., as described herein, formulated in pharmaceutically-acceptable or physiologically-acceptable solutions for administration to a cell or an animal, either alone, or in combination with one or more other modalities of therapy. It will also be understood that, if desired, the compositions of the invention may be administered in combination with other agents as well, such as, e.g., cytokines, growth factors, hormones, small molecules or various pharmaceutically-active agents. There is virtually no limit to other components that may also be included in the compositions, provided that the additional agents do not adversely affect the ability of the composition to deliver the intended therapy.

[00157] In the pharmaceutical compositions of the invention, formulation of pharmaceutically-acceptable excipients and carrier solutions is well-known to those of skill in the art, as is the development of suitable dosing and treatment regimens for using the particular compositions described herein in a variety of treatment regimens. Upon formulation, solutions are administered in a manner compatible with the dosage formulation and in such amount as is therapeutically effective to result in an improvement or remediation of the symptoms. The formulations are easily administered in a variety of dosage forms such as ingestible solutions, drug release capsules and the like. Some variation in dosage can occur depending on the condition of the subject being treated. The person responsible for administration can, in any event, determine the appropriate dose for the individual subject. Moreover, for human administration, preparations meet sterility, general safety and purity standards as required by FDA Center for Biologics Evaluation and Research standards. The route of administration will vary, naturally, with the location and nature of the disease being treated, and may include, for example intradermal, transdermal, subdermal, parenteral, nasal, intravenous, intramuscular, intranasal, subcutaneous, percutaneous, intratracheal, intraperitoneal, intratumoral, perfusion, lavage, direct injection, and oral administration.

[00158] In certain circumstances it will be desirable to deliver the compositions, recombinant viral vectors, and nucleic acid molecules disclosed herein parenterally, intravenously, intramuscularly, or even intraperitoneally as described, for example, in U.S. Patent No. 5,543,158; U.S. Patent No. 5,641,515 and U.S. Patent No. 5,399,363 (each specifically incorporated herein by reference in its entirety). Solutions of the active compounds as free base or pharmacologically acceptable salts may be prepared in water suitably mixed with a surfactant, such as hydroxypropylcellulose. Dispersions may also be prepared in glycerol, liquid polyethylene glycols, and mixtures thereof and in oils. Under ordinary conditions of storage and use, these preparations contain a preservative to prevent the growth of microorganisms.

[00159] The pharmaceutical forms suitable for injectable use include sterile aqueous solutions or dispersions and sterile powders for the extemporaneous preparation of sterile injectable solutions or dispersions (U.S. Pat. No. 5,466,468, specifically incorporated herein by reference in its entirety). In all cases the form should be sterile and should be fluid to the extent that easy syringability exists. It should be stable under the conditions of manufacture

and storage and should be preserved against the contaminating action of microorganisms, such as bacteria and fungi. The carrier can be a solvent or dispersion medium containing, for example, water, ethanol, polyol (*e.g.*, glycerol, propylene glycol, and liquid polyethylene glycol, and the like), suitable mixtures thereof, and/or vegetable oils. Proper fluidity may be maintained, for example, by the use of a coating, such as lecithin, by the maintenance of the required particle size in the case of dispersion and by the use of surfactants. The prevention of the action of microorganisms can be facilitated by various antibacterial and antifungal agents, for example, parabenes, chlorobutanol, phenol, sorbic acid, thimerosal, and the like. In many cases, it will be preferable to include isotonic agents, for example, sugars or sodium chloride. Prolonged absorption of the injectable compositions can be brought about by the use in the compositions of agents delaying absorption, for example, aluminum monostearate and gelatin. The preparation of an aqueous composition that contains a protein as an active ingredient is well understood in the art. Typically, such compositions are prepared as injectables, either as liquid solutions or suspensions; solid forms suitable for solution in, or suspension in, liquid prior to injection can also be prepared. The preparation can also be emulsified.

[00160] For parenteral administration in an aqueous solution, for example, the solution should be suitably buffered if necessary and the liquid diluent first rendered isotonic with sufficient saline or glucose. These particular aqueous solutions are especially suitable for intravenous, intramuscular, subcutaneous and intraperitoneal administration. In this connection, a sterile aqueous medium that can be employed will be known to those of skill in the art in light of the present disclosure. For example, one dosage may be dissolved in 1 ml of isotonic NaCl solution and either added to 1000 ml of hypodermoclysis fluid or injected at the proposed site of infusion (*see*, *e.g.*, Remington: The Science and Practice of Pharmacy, 20th Edition. Baltimore, MD: Lippincott Williams & Wilkins, 2000). Some variation in dosage will necessarily occur depending on the condition of the subject being treated. The person responsible for administration will, in any event, determine the appropriate dose for the individual subject. Moreover, for human administration, preparations should meet sterility, pyrogenicity, and the general safety and purity standards as required by FDA Office of Biologics standards.

[00161] Sterile injectable solutions can be prepared by incorporating the active compounds in the required amount in the appropriate solvent with the various other ingredients enumerated above, as required, followed by filtered sterilization. Generally, dispersions are

prepared by incorporating the various sterilized active ingredients into a sterile vehicle which contains the basic dispersion medium and the required other ingredients from those enumerated above. In the case of sterile powders for the preparation of sterile injectable solutions, the preferred methods of preparation are vacuum-drying and freeze-drying techniques which yield a powder of the active ingredient plus any additional desired ingredient from a previously sterile-filtered solution thereof.

[00162] In certain embodiments, the compositions may be delivered by intranasal sprays, inhalation, and/or other aerosol delivery vehicles. Methods for delivering polynucleotides and peptide compositions directly to the lungs via nasal aerosol sprays has been described *e.g.*, in U.S. Pat. No. 5,756,353 and U.S. Pat. No. 5,804,212 (each specifically incorporated herein by reference in its entirety). Likewise, the delivery of drugs using intranasal microparticle resins (Takenaga *et al.*, 1998) and lysophosphatidyl-glycerol compounds (U.S. Pat. No. 5,725,871, specifically incorporated herein by reference in its entirety) are also well-known in the pharmaceutical arts. Likewise, transmucosal drug delivery in the form of a polytetrafluoroetheylene support matrix is described in U.S. Pat. No. 5,780,045 (specifically incorporated herein by reference in its entirety).

[00163] In certain embodiments, the delivery may occur by use of liposomes, nanocapsules, microparticles, microspheres, lipid particles, vesicles, optionally mixing with CPP polypeptides, and the like, for the introduction of the compositions of the present invention into suitable host cells. In particular, the compositions of the present invention may be formulated for delivery either encapsulated in a lipid particle, a liposome, a vesicle, a nanosphere, a nanoparticle or the like. The formulation and use of such delivery vehicles can be carried out using known and conventional techniques. The formulations and compositions of the invention may comprise one or more polypeptides, polynucleotides, and small molecules, as described herein, formulated in pharmaceutically-acceptable or physiologically-acceptable solutions (*e.g.*, culture medium) for administration to a cell or an animal, either alone, or in combination with one or more other modalities of therapy. It will also be understood that, if desired, the compositions of the invention may be administered in combination with other agents as well, such as, *e.g.*, cells, other proteins or polypeptides or various pharmaceutically-active agents.

[00164] In a particular embodiment, a formulation or composition according to the present invention comprises a cell contacted with a combination of any number of polynucleotides or viral vectors, as contemplated herein.

[00165] In certain aspects, the present invention provides formulations or compositions suitable for the delivery of viral vector systems.

[00166] Exemplary formulations for *ex vivo* delivery may also include the use of various transfection agents known in the art, such as calcium phosphate, electroporation, heat shock and various liposome formulations (*i.e.*, lipid-mediated transfection). Liposomes are lipid bilayers entrapping a fraction of aqueous fluid. DNA spontaneously associates to the external surface of cationic liposomes (by virtue of its charge) and these liposomes will interact with the cell membrane.

[00167] Particular embodiments of the invention may comprise other formulations, such as those that are well known in the pharmaceutical art, and are described, for example, in Remington: The Science and Practice of Pharmacy, 20th Edition. Baltimore, MD: Lippincott Williams & Wilkins, 2000.

[00168] In certain aspects, the present invention provides pharmaceutically acceptable compositions which comprise a therapeutically effective amount of one or more viral vectors or polynucleotides, as described herein, formulated together with one or more pharmaceutically acceptable carriers (additives) and/or diluents (*e.g.*, pharmaceutically acceptable cell culture medium). As used herein, a "therapeutically effective amount" refers to the amount of a composition or recombinant virus described herein required to achieve a desired physiologic and/or biological outcome. A "therapeutically effective amount" of a virus, a viral stock, or a composition may vary according to factors such as the disease state, age, sex, and weight of the individual, and the ability of the stem and progenitor cells to elicit a desired response in the individual. A therapeutically effective amount is also one in which any toxic or detrimental effects of the virus or transduced therapeutic cells are outweighed by the therapeutically beneficial effects. The term "therapeutically effective amount" includes an amount that is effective to "treat" a subject (e.g., a patient). The therapeutically effective amount may be quantified by the total number of plaque forming units (pfu) (*e.g.* at least $1e^{1}$ to at least $1e^{20}$, particularly about $1e^{4}$ to about $1e^{15}$, more particularly about $1e^{6}$ to about $1e^{12}$ pfu), or number of viral genomes (*e.g.* at least $1e^{1}$ to at least $1e^{20}$, particularly about $1e^{4}$ to about $1e^{15}$,

more particularly about $1e^6$ to about $1e^{12}$ viral genomes). One of skill in the art will understand that the therapeutically effective amount will vary based on the type of virus being administered, nature of the formulation, route of administration, nature and/or severity of the disease to be treated, and/or general health and well-being of the subject.

[00169] Some aspects of the invention encompass a method of killing a cancerous cell, comprising exposing the cancerous cell to an oncolytic virus described herein or compositions thereof under conditions sufficient for the oncolytic virus to infect and replicate within said cancerous cell, and wherein replication of the oncolytic virus within the cancerous cell results in cell death. In certain embodiments, the cancerous cell has a reduced expression of a tumor-suppressive miR compared to a non-cancerous cell. In some embodiments, a cancerous cell killed by this method is *in vivo*. In certain embodiments, a cancerous cell killed by this method is within a tumor.

[00170] The invention relates to a method of treating cancer in a subject in need thereof, comprising administering a prophylactically effective amount or a therapeutically effective amount of an oncolytic virus, a viral stock, or a composition as described herein to the subject. A "subject," as used herein, includes any animal that exhibits a symptom of a disease, disorder, or condition that can be treated with the recombinant viral vectors, compositions, and methods disclosed herein. Suitable subjects (e.g., patients) include laboratory animals (such as mouse, rat, rabbit, or guinea pig), farm animals (such as horse or cow), and domestic animals or pets (such as cat or dog). Non-human primates and, preferably, human patients, are included.

[00171] "Administration" refers herein to introducing an oncolytic virus, a viral stock, or a composition thereof into a subject or contacting an oncolytic virus, a viral stock, or a composition thereof with a cell and/or tissue. Administration can occur by injection, irrigation, inhalation, consumption, electro-osmosis, hemodialysis, iontophoresis, and other methods known in the art. The route of administration will vary, naturally, with the location and nature of the disease being treated, and may include, for example auricular, buccal, conjunctival, cutaneous, dental, endocervical, endosinusial, endotracheal, enteral, epidural, interstitial, intra-articular, intra-arterial, intra-abdominal, intraauricular, intrabiliary, intrabronchial, intrabursal, intracavernous, intracerebral, intracisternal, intracorneal, intracronal, intracoronary, intracranial, intradermal, intradiscal, intraductal, intraduodenal, intraduodenal, intradural, intraepicardial, intraepidermal, intraesophageal, intragastric, intragingival, intrahepatic, intraileal, intralesional,

intralingual, intraluminal, intralymphatic, intramammary, intramedulleray, intrameningeal, instramuscular, intranasal, intranodal, intraocular, intraomentum, intraovarian, intraperitoneal, intrapericardial, intrapleural, intraprostatic, intrapulmonary, intraruminal, intrasinal, intraspinal, intrasynovial, intratendinous, intratesticular, intratracheal, intrathecal, intrathoracic, intratubular, intratumoral, intratympanic, intrauterine, intraperitoneal, intravascular, intraventricular, intravesical, intravestibular, intravenous, intravitreal, larangeal, nasal, nasogastric, oral, ophthalmic, oropharyngeal, parenteral, percutaneous, periarticular, peridural, perineural, periodontal, respiratory, retrotubular, rectal, spinal, subarachnoid, subconjunctival, subcutaneous, subdermal, subgingival, sublingual, submucosal, subretinal, topical, transdermal, transendocardial, transmucosal, transplacental, trantracheal, transtympanic, ureteral, urethral, and/or vaginal perfusion, lavage, direct injection, and oral administration.

[00172] The term "treating" and "treatment" as used herein refers to administering to a subject a therapeutically effective amount of a recombinant virus or composition thereof as described herein so that the subject has an improvement in a disease or condition, or a symptom of the disease or condition. The improvement is any improvement or remediation of the disease or condition, or symptom of the disease or condition. The improvement is an observable or measurable improvement, or may be an improvement in the general feeling of well-being of the subject. Thus, one of skill in the art realizes that a treatment may improve the disease condition, but may not be a complete cure for the disease. A “prophylactically effective amount” refers to an amount of a virus, a viral stock, or a composition effective to achieve the desired prophylactic result. As used herein, "prophylaxis" can mean complete prevention of the symptoms of a disease, a delay in onset of the symptoms of a disease, or a lessening in the severity of subsequently developed disease symptoms. Typically, but not necessarily, since a prophylactic dose is used in subjects prior to or at an earlier stage of disease, the prophylactically effective amount is less than the therapeutically effective amount.

[00173] "Cancer" herein refers to or describes the physiological condition in mammals that is typically characterized by unregulated cell growth. Examples of cancer include but are not limited to carcinoma, lymphoma, blastoma, sarcoma (including liposarcoma, osteogenic sarcoma, angiosarcoma, endotheliosarcoma, leiomyosarcoma, chordoma, lymphangiosarcoma, lymphangioendotheliosarcoma, rhabdomyosarcoma, fibrosarcoma, myxosarcoma, chondrosarcoma), neuroendocrine tumors, mesothelioma, synovioma,

schwannoma, meningioma, adenocarcinoma, melanoma, and leukemia or lymphoid malignancies. More particular examples of such cancers include squamous cell cancer (e.g. epithelial squamous cell cancer), lung cancer including small-cell lung cancer, non-small cell lung cancer, adenocarcinoma of the lung and squamous carcinoma of the lung, small cell lung carcinoma, cancer of the peritoneum, hepatocellular cancer, gastric or stomach cancer including gastrointestinal cancer, pancreatic cancer, glioblastoma, cervical cancer, ovarian cancer, liver cancer, bladder cancer, hepatoma, breast cancer, colon cancer, rectal cancer, colorectal cancer, endometrial or uterine carcinoma, salivary gland carcinoma, kidney or renal cancer, prostate cancer, vulvar cancer, thyroid cancer, hepatic carcinoma, anal carcinoma, penile carcinoma, testicular cancer, esophageal cancer, tumors of the biliary tract, Ewing's tumor, basal cell carcinoma, adenocarcinoma, sweat gland carcinoma, sebaceous gland carcinoma, papillary carcinoma, papillary adenocarcinomas, cystadenocarcinoma, medullary carcinoma, bronchogenic carcinoma, renal cell carcinoma, hepatoma, bile duct carcinoma, choriocarcinoma, seminoma, embryonal carcinoma, Wilms' tumor, testicular tumor, lung carcinoma, bladder carcinoma, epithelial carcinoma, glioma, astrocytoma, medulloblastoma, craniopharyngioma, ependymoma, pinealoma, hemangioblastoma, acoustic neuroma, oligodendroglioma, meningioma, melanoma, neuroblastoma, retinoblastoma, leukemia, lymphoma, multiple myeloma, Waldenstrom's macroglobulinemia, myelodysplastic disease, heavy chain disease, neuroendocrine tumors, Schwannoma, and other carcinomas, as well as head and neck cancer.

[00174] In certain embodiments, an oncolytic virus (e.g., an HSV), a viral stock, or a composition as described herein are used to treat a cancer selected from lung cancer (e.g., small cell lung cancer or non-small cell lung cancer), breast cancer, ovarian cancer, cervical cancer, prostate cancer, testicular cancer, colorectal cancer, colon cancer, pancreatic cancer, liver cancer (e.g., hepatocellular carcinoma (HCC)), gastric cancer, head and neck cancer, thyroid cancer, malignant glioma, glioblastoma, melanoma, B-cell chronic lymphocytic leukemia, diffuse large B-cell lymphoma (DLBCL), and marginal zone lymphoma (MZL).

[00175] In certain aspects, the invention relates to an oncolytic viral vector as shown in any one of the figures or embodiments disclosed herein.

EXAMPLES

[00176] The following examples for the purpose of illustrating various embodiments of the invention and are not meant to limit the present invention in any fashion. The present examples, along with the methods described herein, are exemplary, and are not intended as limitations on the scope of the invention. Alterations, modifications, and other changes to the described embodiments which are encompassed within the spirit of the invention as defined by the scope of the claims are specifically contemplated.

Example 1- miR Sequence Analysis of Normal and Malignant Cells

[00177] Differential miR expression is a hallmark of many cancers (Lu et al, Nature, 2005). Experiments were performed to determine the miRs that were mostly highly differentially expressed in eight different cancer cells lines. Differential expression was determined by comparisons to non-cancerous control tissues. In total, 108 samples were sequenced. Sample details are provided in the following table.

Cancer Type	**# of Cancer Cell Lines**	**# of Control Tissue Samples**
Bladder	8	4
Colon	8	3
Breast	12	4
Pancreatic	7	3
Lung	8	5
Head and Neck	6	6
Schwannoma	7	4*
Glioblastoma	14	4*
Additional Controls		
Normal Liver	3	
Normal Bone Marrow	3	

*Same control samples used for both Schwannoma and glioblastoma analysis

[00178] To facilitate the identification of appropriate miRNA target sequences suitable for HSV attenuation in select cell types, miRNA sequence profiling of cancer lines and non-cancer control tissue was performed. Sequencing libraries of dicer-processed RNAs were generated for cancer and non-cancer cells, including bladder, colon, breast, pancreas, lung, head and neck, schwannoma, glioblastoma, brain, liver, and bone marrow. These miRNA sequencing libraries were normalized to total RNA, and sequenced using a HiSeq 2500 ultra-high throughput sequencing system with HiSeq V4 chemistry reagents for sequencing reads up to $3e^8$ reads/run (Illumina). FASTQ files from sequencing runs were analyzed using the miRNAs Analysis tool in Basespace (Illumina). Rankings were made by calculating the mean of normal, the mean of

cancer and sorting the ratio of normal/cancer from high to low. Heat maps were generated with natural logarithmic values with zero and negative values converted to zero (scale: black is high, white is low expression). Normalized data across samples were expressed as normalized miRNA read counts in a given sample. Normalization is related to total number of reads in a given sample relative to other samples in the comparison.

[00179] FIG. 1 exemplifies the miRNA expression profile heat map in non-cancerous and cancerous brain tissue of twenty-five miRNAs. Additional examples of miRNA expression profile heat maps are shown for non-cancerous and cancerous bladder (FIG. 2), breast (FIG. 3), colon (FIG. 4), brain (FIG. 5), head and neck (FIG. 6), lung (FIG. 7), pancreas (FIG. 8), and schwannoma (FIG. 9) tissue corresponding to twenty-five miRNAs in each example. FIG. 10 shows that miR-451a levels are down regulated in all tumor types compared to non-cancerous tissue, representing a pan-tumor suppressor miRNA. FIG. 11 shows that miR-1 is down-regulated in all tumor types tested, present at moderate levels in non-cancerous tissue, and present at high levels in head and neck tissue. FIG. 12 shows that miR-559 is down-regulated in all tumor types tested, present generally at low levels in non-cancerous tissue, and present at high levels in non-cancerous lung tissue. FIG. 13 shows that miR-145-5p is down-regulated in all tumor types tested and present generally at high levels in the majority of non-cancerous tissue types tested. FIG. 14 shows that miR-143-3p is down-regulated in colon, lung, and pancreatic tumors, and is present at high levels in all normal tissue types and some breast tumor lines. miRNA data analysis revealed at least eleven miRNAs that represent novel and unexpected miRNA expression profiles. not previously identified in the literature.

[00180] Many of these identified miRNAs are pan- or multi-tumor specific. For example, expression of miR-451a, miR-559, miR-1, miR-145-3p, and miR143-3p were generally down-regulated across all cancer cell lines tested compared to control tissues. This was particularly notable for miR-451a, which was highly expressed in all normal tissue type and substantially down-regulated in all cancer types, thus representing a pan-specific tumor-suppressive miRNA. The expression of miR-559 was lower in normal tissue types, except for normal lung tissue, and expression of miR-1 and mir-145-3p in normal tissue was variable. Despite the variability in the magnitude of differences and absolute expression levels, mean expression of each miR in cancer cells lines was substantially lower compared to levels in the

corresponding normal tissues. These miRNAs are candidates for generating pan-tumor HSV virions that are capable of broadly treating a variety of cancer types.

[00181] Although the mean expression for miR-451a, miR-559, miR-1, miR-145-3p, and miR143-3p was lower in cancer cell lines compared to normal controls, the decreased expression was not fully penetrant across all cancer cell lines. For example, 2/3 of the normal bladder samples tested showed increased expression of miR-145-3p, while expression in the remaining sample was substantially similar to the average observed in the cancer cell lines. Similar results were observed in breast cancer cell lines. Although the average read count for all breast cancer samples was 106, 5/12 samples had a normalized read count of > 1000 counts, 2 of which were > 40,000 counts.

[00182] These data indicate the potential to generate a single miR-attenuated oncolytic virus capable of targeting a broad array of tumor types. For example, a construct comprising target sequences for miR-124, miR-451a, miR-559, miR-1, and miR-145-3p may be used in the treatment of all the tumor types tested (*e.g.*, bladder, colon, breast, pancreatic, lung, head and neck, Schwannoma, and glioblastoma). The variability in expression levels of miRs in different cancer types indicates the potential need to stratify patients by miR expression or through the use of an additional biomarker.

Example 2- Construction and use of a reporter system to rapidly assay miRNA-based gene attenuation

[00183] A reporter system was developed to assess miRNA-based gene attenuation using virtually any miRNA target sequence and cognate miRNA. In this system (shown in FIG. 15), the target sequence recognized by miRNAs (i.e. hsa-miR-122) was inserted into the 3' UTR of de-stabilized green fluorescent protein (dsGFP). The cognate miRNA was then expressed via a tetracycline (tet) inducible promoter using mCherry as a control for miRNA expression. All expression vectors were cloned into a tet repressible vector pcDNA5 Frt/To that also expresses mCherry (pTF002). All miRNAs for expression generated by gene synthesis from human genomic DNA and were cloned into pTF002. To generate attenuation reporter vectors, dsGFP was cloned into cDNA3.1+, generating vector pTF004. Attenuation vectors contain four tandem repeats of the reverse complement of the miRNA sequence of interest separated by 8-16 nucleotides. Plasmids were constructed by insertion of synthetically generated oligonucleotides

into the 3 'UTR of the dsGFP gene of pTF004 using standard molecular biology techniques. On day one, HEK293TetR cells were transfected with the miRNA attenuation and reporter expression plasmids (0.15 µg each, for a total of 0.3 µg of CMV promotor-containing plasmid) using Lipofectamine 2000 per manufacturers protocol (Invitrogen). On day two, cells were treated with Tetracycline at 5 ng/ml and allowed to incubate for up to 72 hours. After incubation, GFP and mCherry fluorescence signals were detected daily using a SpectraMax® i3x Minimax multi-mode microplate reader (Molecular Devices) and analyzed using Softmax Pro or Metamorph imaging software (Molecular Devices). Phase images were acquired with an exposure of 5-6ms, GFP (541nm channel) exposure 10ms, and mCherry (713nm channel) 200-1500ms.

[00184] FIG. 16 exemplifies miR-122 mediated attenuation of GFP expression upon induction of miR-122 expression via tet at 24 hours. The control constructs miR-184, miR-34a, and Let7a do not attenuate GFP levels, nor is GFP attenuation observed in the absence of tet. FIG. 17 shows miR-122, miR-184, miR-34a, and Let7a expression and GFP attenuation using each miR target sequence individually and in cassette combinations of miR-122/Let7a, miR-122/Let7a/miR-34a, or miR-122/Let7a/miR-184. Decreased GFP is only observed when the appropriate miR and cognate target sequence are present together (circled wells). FIG. 18 serves as a non-attenuated control and shows miR-122, miR-184, miR-34a, and Let7a expression and mCherry expression.

[00185] FIG. 19 shows miR-122, miR-124, miR-145, miR-199, and miR-451 expression and GFP attenuation using each target sequence individually (circled wells). FIG. 20 serves as a non-attenuated control for the above example and shows miR-122, miR-124, miR-145, miR-199, and miR-451 expression and mCherry expression using each target sequence individually. FIG. 21 shows that miR-122 and miR-184 attenuate GFP fluorescence at 72 hours post transfection when the cognate miR-122 or miR-184 target sequences are present. FIG. 22 shows that miR-34a and miR-184 attenuate GFP fluorescence at 72 hours post transfection when the cognate miR-34a or miR-184 target sequences are present. FIG. 23 shows that Let-7a and miR-184 attenuate GFP fluorescence at 72 hours post transfection when the cognate Let-7a or miR-184 target sequences are present. FIG. 24 shows that miR-124 and miR-184 attenuate GFP fluorescence at 72 hours post transfection when the cognate miR-124 or miR-184 target sequences are present. FIG. 25 shows that miR-145 and miR-184 attenuate GFP fluorescence at

72 hours post transfection when the cognate miR-145 or miR-184 target sequences are present. FIG. 26 shows that miR-199 and miR-451 attenuate GFP fluorescence at 72 hours post transfection when the cognate miR-199 or miR-451 target sequences are present. FIG. 27 shows that miR-125 and miR-451 attenuate GFP fluorescence at 72 hours post transfection when the cognate miR-125 or miR-451 target sequences are present. FIG. 28 shows that miR-126 and miR-451 attenuate GFP fluorescence at 72 hours post transfection when the cognate miR-126 or miR-451 target sequences are present. FIG. 29 shows that miR-127 and miR-451 attenuate GFP fluorescence at 72 hours post transfection when the cognate miR-127 or miR-451 target sequences are present. FIG. 30 shows that miR-133 and miR-451 attenuate GFP fluorescence at 72 hours post transfection when the cognate miR-133 or miR-451 target sequences are present. FIG. 31 shows that miR-223 and miR-451 attenuate GFP fluorescence at 72 hours post transfection when the cognate miR-223 or miR-451 target sequences are present.

[00186] As such, these data indicate that miR expression can result in the specific attenuation of genes expressing the cognate miR target sequence.

Example 3- Generation of miRNA-attenuated HSV

[00187] Following reporter gene-based validation of miRNA target sequences and cognate miRNA pairs, HSV-based viruses were generated containing miRNA attenuation cassettes. A series of modifications were made in KOS-37 BAC, a full-length genomic clone of the KOS strain of HSV-1 on a bacterial artificial chromosome (BAC) as described (Mazzacurati et al., Mol Ther., 2015). The product, KGBAC, was deleted for the internal repeat (joint) region containing one copy each of the diploid genes ICP0, ICP34.5, LAT and ICP4 along with the promoter for the ICP47 gene. This deletion facilitates manipulation of the remaining copies of the 4 deleted genes, provides abundant space for the potential incorporation of transgenes that enhance the oncolytic activity of the virus, and increases tumor specificity by reducing expression of the neurovirulence factor ICP34.5; elimination of ICP47 expression benefits immune recognition of infected cancer cells by virus-specific T cells. KGBAC also contains the GFP open reading frame (ORF) fused to the glycoprotein C (gC) ORF via a 2A peptide sequence to allow monitoring of late (post-replication) viral gene expression. Lastly, KGBAC contains a pair of mutations in the gB gene shown to enhance HSV entry through non-canonical receptors. The miRNA target sequence cassettes were recombined into the 3' UTR of the ICP4 and/or

ICP27 genes of 2A5B-MMP9 to generate ONCR-003, ONCR-010, ONCR-011, ONCR-012, ONCR-013, ONCR-014, ONCR-015, ONCR-016, ONCR-017, ONCR-018, ONCR-019, ONCR-020, ONCR-021, and ONCR-022 as shown in FIG. 32. All BAC constructs were converted to virus particles with simultaneous removal of the BAC sequences located between loxP sites by transfection of Vero-Cre cells. Following plaque purification, virus stocks were prepared and titered on Vero cells.

Example 4- Viral infectivity assay using miRNA-attenuated HSV

[00188] To assay for viral infectivity and replication in normal and cancerous cells, miRNA-attenuated HSV particles were tested in the following *in vitro* assay. On day one, for each cell type infected, HSV particles were introduced to achieve a multiplicity of infection (moi) of 0.01. On days two through five, viral infectivity was assayed by GFP detection using a SpectraMax® i3x Minimax multi-mode microplate reader (Molecular Devices) and analyzed using Softmax Pro or Metamorph imaging software (Molecular Devices). Phase images were acquired with an exposure of 5-6 ms, GFP (541 nm channel) exposure 1 0ms, and mCherry (713 nm channel) 200-1500 ms was used to evaluated any potential nonspecific autofluorescence signal.

[00189] ONCR-011 replication was significantly attenuated in post-mitotic lung tissue due to the presence of the miR-125 cassette in the ICP27 gene and high levels of miR-125a (>3000 counts) in these cells, as shown in FIG. 33 (read out by GFP positive cell quantitation) and FIG. 34 (read out by quantitative PCR). Although ONCR-011 and the control virus, ONCR-003, contain miR-124 target sequences in the ICP4 gene, miR-124 is present at low levels (<100 counts) which were insufficient to attenuate viral replication. Both ONCR-011 and ONCR-003 replicated freely in head and neck cancer cells (A253) because these cells contain low levels of both miR-125a and miR-124 (<100 counts). ONCR-013 replication was significantly attenuated in HCC1395 cells, but not in A253 cells as shown in FIG. 35 (read out by GFP positive cell quantitation) and FIG. 36 (read out by quantitative PCR). ONCR-014 replication was significantly attenuated in non-cancerous lung tissue as shown in FIG. 37 (read out by GFP positive cell quantitation) and FIG. 38 (read out by quantitative PCR).

Example 5- Treatment of a patient suffering from pancreatic cancer, lung cancer, or colon cancer

[00190] A patient suffering from pancreatic cancer, lung cancer, or colon cancer is treated using the compositions and methods disclosed herein. HSV-based viral stocks may be generated that are attenuated by incorporating one or more miRNA target sequences into UL19, ICP4, ICP27 (or other viral genes) as shown in FIGs. 39-44. In some cases, genome-editing capabilities for tumor destruction and/or microenvironment remodeling are engineered into the virus in addition to miRNA target sequences, as shown in FIGs. 45-46. In a specific example, an HSV-based stock containing miR-124, miR-451a, miR-143-3p, and miR-559 attenuation cassettes incorporated into ICP4 and ICP27 is generated according to the methods described in Example 3. The miRNA target sequence cassettes are introduced into the 3' UTR of the ICP4 (miR-124) and ICP27 (miR-451a, miR-143-3p, miR-559) genes as shown in FIG. 47. BAC constructs are converted to virus particles with simultaneous removal of the BAC sequences located between loxP sites by transfection of Vero-Cre cells. Following plaque purification, virus stocks are further purified, buffer exchanged, and titered on Vero cells. For *in vivo* administration to a patient suffering from pancreatic cancer, lung cancer, or colon cancer, HSV particles are prepared in phosphate buffered solution (PBS) along with pharmaceutically acceptable stabilizing agents. On the day of treatment, 10^9 vector genomes in a volume of 1.0 mL pharmaceutically acceptable carrier are administered via intra-tumoral infusion. The patient is monitored for tumor regression using standard of care procedures at an appropriate time interval based on that patient's particular prognosis.

Example 6- Treatment of a patient suffering from brain cancer, bladder cancer, breast cancer, or head and neck cancer

[00191] A patient suffering from brain cancer, bladder cancer, breast cancer, or head and neck cancer is treated using the compositions and methods disclosed herein. An HSV-based viral stock is generated containing miR-124, miR-451a, miR-145-3p, and miR-559 attenuation cassettes according to the methods described in Example 3. The miRNA target sequence cassettes are introduced into the 3' UTR of the ICP4 (miR-124) and ICP27 (miR-451a, miR-145-3p, miR-559) genes as shown in FIG. 48. BAC constructs are converted to virus particles with simultaneous removal of the BAC sequences located between loxP sites by

transfection of Vero-Cre cells. Following plaque purification, virus stocks are further purified, buffer exchanged, and titered on Vero cells. For *in vivo* administration to a patient suffering from brain cancer, bladder cancer, breast cancer, or head and neck cancer, HSV particles are prepared in phosphate buffered solution (PBS) along with pharmaceutically acceptable stabilizing agents. On the day of treatment, 10^9 vector genomes in a volume of 1.0 mL pharmaceutically acceptable carrier are administered via intra-tumoral infusion. The patient is monitored for tumor regression using standard of care procedures at an appropriate time interval based on that patient's particular prognosis.

Example 7- Treatment of a patient suffering from schwannoma

[00192] A patient suffering from schwannoma is treated using the compositions and methods disclosed herein. An HSV-based viral stock is generated containing miR-124-3p, miR-205-5p, miR-141-5p, and miR-31-5p attenuation cassettes according to the methods described in Example 3. The miRNA target sequence cassettes were recombined into the 3' UTR of the ICP4 (miR-124) and ICP27 (miR-205-5p, miR-141-5p, miR-31-5p) genes as shown in FIG. 49. BAC constructs are converted to virus particles with simultaneous removal of the BAC sequences located between loxP sites by transfection of Vero-Cre cells. Following plaque purification, virus stocks were further purified, buffer exchanged, and titered on Vero cells. For *in vivo* administration to a patient suffering from schwannoma, HSV particles are prepared in phosphate buffered solution (PBS) along with pharmaceutically acceptable stabilizing agents. On the day of treatment, 10^9 vector genomes in a volume of 1.0 mL pharmaceutically acceptable carrier are administered via intra-tumoral infusion. The patient is monitored for tumor regression using standard of care procedures at an appropriate time interval based on that patient's particular prognosis.

[00193] While preferred embodiments of the present invention are shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions can be implemented by those skilled in the art without departing from the invention. It should be understood that various alternatives to the embodiments of the invention described herein may be employed in practicing the invention. It is intended that the following claims define the scope of the

invention and that methods and structures within the scope of these claims and their equivalents be covered thereby.

Table 1. Summary of relationships between 12 select oncomiRs (9 tumor suppressors and 3 oncogenic miRNAs) versus cancers.

let-7 (downregulated)	miR-15a (downregulated)	miR-16 (downregulated)	miR-34a (downregulated)	miR-34c (downregulated)	miR-9* (downregulated)	miR-100 (downregulated)	miR-124 (downregulated)	miR-200c (downregulated)	miR-21 (upregulated)	miR-31 (upregulated)	miR-155 (upregulated)
acute lymphoblastic leukemia	breast cancer	bladder cancer	acute myeloid leukemia	b-cell lymphoma	breast cancer	bladder cancer	acute lymphoblastic leukemia	colorectal carcinoma	acute myeloid leukemia	adrenal cortical carcinoma	acute myeloid leukemia
acute myeloid leukemia	cervical carcinoma	breast cancer	breast cancer	bladder cancer	bronchioloalveolar carcinoma	cervical carcinoma	anaplastic astrocytoma	follicular lymphoma	b-cell lymphoma	b-cell lymphoma	anaplastic large-cell lymphoma
acute promyelocytic leukemia	chronic lymphocytic leukemia	cervical carcinoma	cervical squamous cell carcinoma	breast cancer	colon cancer	cholangiocarcinoma	astrocytoma	gastric cancer	bladder cancer	breast cancer	bladder cancer
breast cancer	colorectal cancer	chronic lymphocytic leukemia	colorectal cancer	cervical carcinoma	esophageal squamous cell carcinoma	colon cancer	bladder cancer	hepatocellular carcinoma	breast cancer	cervical cancer	breast cancer
bronchioloalveolar carcinoma	esophageal cancer	chronic myelogenous leukemia	gastric cancer	cholangiocarcinoma	gastric cancer	colorectal cancer	breast cancer	osteosarcoma	breast carcinoma	cervical carcinoma	cervical cancer
chondrosarcoma	lung cancer	colorectal cancer	head and neck squamous cell carcinoma	chordoma	glioma	endometrial cancer	cervical cancer		cervical cancer	cholangiocarcinoma	Chronic lymphocytic leukemia
colon cancer	neuroblastoma	esophageal squamous cell carcinoma	hepatocellular carcinoma	choriocarcinoma	hepatocellular carcinoma	esophageal cancer	cervical squamous cell carcinoma		cholangiocarcinoma	clear cell renal cell cancer	chronic myelogenous leukemia
colorectal cancer	non-small cell lung cancer	glioma	mantle cell lymphoma	clear cell renal cell cancer	lung cancer	esophageal squamous cell carcinoma	colorectal cancer		colorectal cancer	colon cancer	clear cell renal cell cancer
esophageal squamous cell carcinoma	osteosarcoma	head and neck squamous cell carcinoma	mesenchymal cancer	colon cancer	malignant melanoma	gastric cancer	epithelial ovarian cancer		colorectal carcinoma	colorectal cancer	colon cancer
gastric cancer	pancreatic cancer	hepatocellular carcinoma	monocytic leukemia	colorectal cancer	nasopharyngeal carcinoma	glioblastoma	esophageal cancer		esophageal squamous cell carcinoma	colorectal carcinoma	colorectal cancer
glioblastoma	pancreatic ductal adenocarcinoma	laryngeal carcinoma	neuroblastoma	endometrial cancer	neuroblastoma	hepatocellular carcinoma	gastric cancer		gastric cancer	diffuse large B-cell lymphoma	colorectal carcinoma
glioma	prostate cancer	lung adenocarcinoma	non-small cell lung cancer	esophageal squamous cell carcinoma	ovarian cancer	laryngeal squamous cell carcinoma	glioblastoma		glioma	endometrial cancer	cutaneous t-cell lymphoma
head and neck squamous cell carcinoma	squamous carcinoma	lung cancer	oral squamous cell carcinoma	extrahepatic cholangiocarcinoma	pancreatic ductal adenocarcinoma	liver cancer	glioma		hepatocellular carcinoma	esophageal cancer	diffuse large B-cell lymphoma
hepatocellular carcinoma		neuroblastoma		gastric cancer		lung cancer	hepatocellular carcinoma		lung cancer	esophageal squamous cell carcinoma	endometrial cancer
lung cancer		non-small cell lung cancer		glioblastoma		malignant melanoma	mantle cell lymphoma		malignant melanoma	gastric cancer	gallbladder carcinoma
malignant melanoma		osteosarcoma		glioma		nasopharyngeal carcinoma	medulloblastoma		mantle cell lymphoma	glioblastoma	gastric cancer
nasopharyngeal carcinoma		pancreatic ductal adenocarcinoma		head and neck squamous cell carcinoma		non-small cell lung cancer	nasopharyngeal carcinoma		medulloblastoma	head and neck cancer	glioma

let-7 (downregulated)	miR-15a (downregulated)	miR-16 (downregulated)	miR-26a (downregulated)	miR-34a (downregulated)	miR-96 (downregulated)	miR-100 (downregulated)	miR-124 (downregulated)	miR-202 (downregulated)	miR-17 (upregulated)	miR-21 (upregulated)	miR-155 (upregulated)
neuroblastoma		papillary thyroid carcinoma		hepatocellular carcinoma		osteosarcoma	neuroblastoma		nasopharyngeal cancer	head and neck squamous cell carcinoma	hepatocellular carcinoma
non-small cell lung cancer		prostate cancer		lung cancer		ovarian carcinoma	non-small cell lung cancer		non-small cell lung cancer	hepatocellular carcinoma	liver cancer
oral cancer		renal cell carcinoma		malignant melanoma		pancreatic cancer	oral squamous cell carcinoma		osteosarcoma	hypopharyngeal squamous cell carcinoma	lung adenocarcinoma
osteosarcoma		squamous carcinoma		neuroblastoma		papillary thyroid carcinoma	osteosarcoma		pancreatic cancer	kidney cancer	lung cancer
ovarian cancer				non-small cell lung cancer		prostate cancer	ovarian cancer		pituitary carcinoma	laryngeal carcinoma	malignant melanoma
pancreatic ductal adenocarcinoma				oral cancer		retinoblastoma	pancreatic cancer		t-cell lymphoblastic lymphoma	laryngeal squamous cell carcinoma	malt lymphoma
papillary thyroid carcinoma				osteosarcoma			prostate cancer			liver cancer	mantle cell lymphoma
prostate cancer				ovarian cancer						lung cancer	nasopharyngeal carcinoma
renal cell carcinoma				pancreatic cancer						malignant melanoma	non-small cell lung cancer
renal clear cell carcinoma				pancreatic ductal adenocarcinoma						multiple myeloma	oral squamous cell carcinoma
				papillary thyroid carcinoma						nasopharyngeal carcinoma	ovarian cancer
				prostate cancer						non-small cell lung cancer	papillary thyroid carcinoma
				rectal cancer						oral cancer	prostate cancer
				renal cell carcinoma						oral squamous cell carcinoma	rectal cancer
				retinoblastoma						osteosarcoma	renal clear cell carcinoma
				squamous carcinoma						ovarian cancer	squamous carcinoma
				uveal melanoma						pancreatic adenocarcinoma	
										pancreatic cancer	
										pancreatic ductal adenocarcinoma	
										papillary thyroid carcinoma	
										prostate cancer	
										rectal cancer	
										renal cell carcinoma	
										retinoblastoma	
										squamous carcinoma	

Table 2. List of examples of oncomiR-cancer relationships.

miR	Cancer	Exp.	Reference	miR	Cancer	Exp.	Reference	miR	Cancer	Exp.	Reference
let-7a	breast cancer	down	Lin28 induces epithelial-to-mesenchymal transition and stemness via downregulation of let-7a in breast cancer cells.	mir-16-1	neuro-blastoma	up	miR-15a/16-1 enhances retinoic acid-mediated differentiation of leukemic cells and is up-regulated by retinoic acid.	mir-24-2-5p	breast cancer	up	c-MYC regulated miR-23a~24-2~27a cluster promotes mammary carcinoma cell invasion and hepatic metastasis by targeting Sprouty2.
let-7a	breast cancer	down	MicroRNA let-7a suppresses breast cancer cell migration and invasion through downregulation of C-C chemokine receptor type 7.	mir-16-1-3p	chronic lymphocytic leukemia	down	Aberrant microRNA expression in Chinese patients with chronic lymphocytic leukemia.	mir-24-3p	breast cancer	up	miRNA-24-3p promotes cell proliferation and inhibits apoptosis in human breast cancer by targeting p27Kip1.
let-7a	breast cancer	down	The heterochronic microRNA let-7 inhibits cell motility by regulating the genes in the actin cytoskeleton pathway in breast cancer.	mir-16-2	chronic lymphocytic leukemia	down	miR-15 and miR-16 induce apoptosis by targeting BCL2.	mir-24-3p	colorectal cancer	down	Down-regulation of miR-24-3p in colorectal cancer is associated with malignant behavior.
let-7a	chondro-sarcoma	down	Analysis of microRNAs expressions in chondrosarcoma	mir-16-2	chronic lymphocytic leukemia	down	Defective DROSHA processing contributes to downregulation of MiR-15/-16 in chronic lymphocytic leukemia.	mir-24-3p	glioma	up	miR-24-3p and miR-27a-3p promote cell proliferation in glioma cells via cooperative regulation of MXI1.
let-7a	colorectal cancer	down	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-16-2	lung cancer	down	Histone deacetylases inhibitor trichostatin A increases the expression of Dleu2/miR-15a/16-1 via HDAC3 in non-small cell lung cancer.	mir-25	cervical carcinoma	up	[miR-25 promotes cell proliferation by targeting RECK in human cervical carcinoma HeLa cells].
let-7a	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-16-2	neuro-blastoma	up	miR-15a/16-1 enhances retinoic acid-mediated differentiation of leukemic cells and is up-regulated by retinoic acid.	mir-25	colon cancer	down	MicroRNA-25 functions as a potential tumor suppressor in colon cancer by targeting Smad7.
let-7a	esophageal squamous cell carcinoma	down	[Expressions and correlations of let-7a and IL-6 in esophageal squamous cell carcinoma]	mir-17	acute myeloid leukemia	down	HIF-1? downregulates miR-17/20a directly targeting p21 and STAT3: a role in myeloid leukemic cell differentiation.	mir-25	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.
let-7a	gastric cancer	down	Lentiviral vector-mediated upregulation of let-7a inhibits gastric carcinoma cell growth in vitro and in vivo.	mir-17	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-25	colorectal cancer	up	The expression of miR-25 is increased in colorectal cancer and is associated with patient prognosis.
let-7a	gastric cancer	down	Low-level expression of let-7a in gastric cancer and its involvement in tumorigenesis by targeting RAB40C.	mir-17	breast cancer	up	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.	mir-25	endometrial cancer	up	TSA Suppresses miR-106b-93-25 Cluster Expression through Downregulation of MYC and Inhibits Proliferation and Induces Apoptosis in Human EMC.

let-7a	gastric cancer	down	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-17	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.	mir-25	esophageal squamous cell carcinoma	up	MicroRNA-25 promotes cell migration and invasion in esophageal squamous cell carcinoma.
let-7a	gastric cancer	down	Investigation and identification of let-7a related functional proteins in gastric carcinoma by proteomics.	mir-17	cholangio-carcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.	mir-25	esophageal squamous cell carcinoma	up	Clinical significance of serum miR-223, miR-25 and miR-375 in patients with esophageal squamous cell carcinoma.
let-7a	gastric cancer	down	Differentially expressed proteins identified in overexpressed let-7a gastric carcinoma cells by two-dimensional polyacrylamide gel electrophoresis.	mir-17	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-25	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.
let-7a	gastric cancer	down	Circulating microRNAs in plasma of patients with gastric cancers.	mir-17	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-25	gastric cancer	up	miR-25 promotes gastric cancer cells growth and motility by targeting RECK.
let-7a	glioma	down	Overexpressed let-7a inhibits glioma cell malignancy by directly targeting K-ras, independently of PTEN.	mir-17	colorectal carcinoma	up	Up-regulated miR-17 promotes cell proliferation, tumour growth and cell cycle progression by targeting the RND3 tumour suppressor gene in colorectal carcinoma.	mir-25	gastric cancer	up	MicroRNA-25 promotes gastric cancer migration, invasion and proliferation by directly targeting transducer of ERBB2, 1 and correlates with poor survival.
let-7a	naso-pharyngeal carcinoma	down	Let-7a inhibits proliferation and induces apoptosis by targeting EZH2 in nasopharyngeal carcinoma cells.	mir-17	esophageal squamous cell carcinoma	up		mir-25	glioma	up	miR-25 promotes glioma cell proliferation by targeting CDKN1C.
let-7a	non-small cell lung cancer	down	Circulating micro-RNA expression profiles in early stage nonsmall cell lung cancer.	mir-17	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-25	head and neck squamous cell carcinoma	up	Comprehensive MicroRNA profiling for head and neck squamous cell carcinomas.
let-7a	osteosarcoma	down	Tumor-suppressive microRNA-let-7a inhibits cell proliferation via targeting of E2F2 in osteosarcoma cells.	mir-17	gastric cancer	up	Overexpression of miR-17 in gastric cancer is correlated with proliferation-associated oncogene amplification.	mir-25	hepato-cellular carcinoma	up	Upregulation of microRNA-25 associates with prognosis in hepatocellular carcinoma.
let-7a	pancreatic ductal adeno-carcinoma	down	XMD8-92 Inhibits Pancreatic Tumor Xenograft Growth via DCLK1-Dependent Mechanism.	mir-17	gastric cancer	up	Inhibition of microRNA-17/20a suppresses cell proliferation in gastric cancer by modulating UBE2C expression.	mir-25	non-small cell lung cancer	up	Downregulation of miR-25 modulates non-small cell lung cancer cells by targeting CDC42.
let-7a	renal cell carcinoma	down	let-7a functions as a tumor suppressor in renal cell carcinoma cell lines by targeting c-myc.	mir-17	glioma	up	Identification and functional characterization of microRNAs involved in the malignant progression of gliomas.	mir-25	non-small cell lung cancer	up	miR-25 targets the modulator of apoptosis 1 gene in lung cancer.

let-7a-1	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122.	mir-17	glioma	up	Increased expression of microRNA-17 predicts poor prognosis in human glioma.	mir-25	ovarian cancer	up	MiR-25 regulates apoptosis by targeting Bim in human ovarian cancer.
let-7a-1	bronchiolo-alveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-17	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.	mir-25	ovarian cancer	up	MiR-25 promotes ovarian cancer proliferation and motility by targeting LATS2.
let-7a-1	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.	mir-17	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.	mir-25	prostate cancer	down	miR-25 Modulates Invasiveness and Dissemination of Human Prostate Cancer Cells via Regulation of α_v- and β_6-Integrin Expression.
let-7a-1	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-17	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-25	small cell lung cancer	up	MicroRNA-25 regulates small cell lung cancer cell development and cell cycle through cyclin E2.
let-7a-1	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.	mir-17	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-26a	acute myeloid leukemia	down	Critical Role of c-Myc in Acute Myeloid Leukemia Involving Direct Regulation of miR-26a and Histone Methyltransferase EZH2.
let-7a-1	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-17	malignant melanoma	down	MicroRNA-17 inhibits tumor growth by stimulating T-cell mediated host immune response.	mir-26a	bladder cancer	down	miR-26a inhibits proliferation and motility in bladder cancer by targeting HMGA1.
let-7a-1	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NIRF and suppresses the growth of A549 lung cancer cells.	mir-17	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.	mir-26a	breast cancer	down	Pathologically decreased miR-26a antagonizes apoptosis and facilitates carcinogenesis by targeting MTDH and EZH2 in breast cancer.
let-7a-1	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival.	mir-17	medullo-blastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.	mir-26a	breast cancer	down	MiR-26a Inhibits Proliferation and Migration of Breast Cancer through Repression of MCL-1.
let-7a-1	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-17	naso-pharyngeal cancer	up	Circulating miR-17, miR-20a, miR-29c, and miR-223 Combined as Non-Invasive Biomarkers in Nasopharyngeal Carcinoma.	mir-26a	breast cancer	down	MicroRNA-26a inhibits proliferation by targeting high mobility group AT-hook 1 in breast cancer.
let-7a-1	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc.	mir-17	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.	mir-26a	cholangio-carcinoma	up	

			expression.								
let-7a-1	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-17-5p	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-26a	chronic myelo-genous leukemia	down	ApoptomiRs expression modulated by BCR-ABL is linked to CML progression and imatinib resistance.
let-7a-1	pancreatic ductal adenocarcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression.	mir-17-5p	breast cancer	down	Mir-17-5p regulates breast cancer cell proliferation by inhibiting translation of AIB1 mRNA.	mir-26a	gastric cancer	down	miR-26a Suppresses Tumor Growth and Metastasis by Targeting FGF9 in Gastric Cancer.
let-7a-2	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122.	mir-17-5p	breast cancer	up	miR-17-5p promotes human breast cancer cell migration and invasion through suppression of HBP1.	mir-26a	glioma	up	MicroRNA-26a Promotes Tumor Growth and Angiogenesis in Glioma by Directly Targeting Prohibitin.
let-7a-2	bronchiolo-alveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-17-5p	cervical cancer	down	MiR-17-5p targets TP53INP1 and regulates cell proliferation and apoptosis of cervical cancer cells.	mir-26a	hepato-cellular carcinoma	down	MicroRNA-26a Inhibits Angiogenesis by Down-Regulating VEGFA through the PIK3C2?/Akt/HIF-1? Pathway in Hepatocellular Carcinoma.
let-7a-2	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.	mir-17-5p	gastric cancer	up	Circulating microRNAs in plasma of patients with gastric cancers.	mir-26a	hepato-cellular carcinoma	down	MicroRNA-26a suppresses angiogenesis in human hepatocellular carcinoma by targeting HGF-cmet pathway.
let-7a-2	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-17-5p	gastric cancer	up	Prognostic impact of circulating miR-21 in the plasma of patients with gastric carcinoma.	mir-26a	hepato-cellular carcinoma	down	MicroRNA-26a promotes anoikis in human hepatocellular carcinoma cells by targeting alpha5 integrin.
let-7a-2	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.	mir-17-5p	gastric cancer	up	miR-17-5p promotes proliferation by targeting SOCS6 in gastric cancer cells.	mir-26a	hepato-cellular carcinoma	down	Tumor-specific expression of microRNA-26a suppresses human hepatocellular carcinoma growth via cyclin-dependent and -independent pathways.
let-7a-2	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-17-5p	hepato-cellular carcinoma	up	miR-17-5p Promotes migration of human hepatocellular carcinoma cells through the p38 mitogen-activated protein kinase-heat shock protein 27 pathway.	mir-26a	hepato-cellular carcinoma	down	microRNA-26a suppresses recruitment of macrophages by down-regulating macrophage colony-stimulating factor expression through the PI3K/Akt pathway in hepatocellular carcinoma.
let-7a-2	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened	mir-17-5p	hepato-cellular carcinoma	up	miR-17-5p as a novel prognostic marker for hepatocellular carcinoma.	mir-26a	hepato-cellular carcinoma	down	IL-6 upregulation contributes to the reduction of miR-26a expression in hepatocellular carcinoma

			postoperative survival.								cells.
let-7a-2	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-17-5p	malignant melanoma	up	Regulation of cancer aggressive features in melanoma cells by microRNAs.	mir-26a	hepato-cellular carcinoma	down	MicroRNA-26a suppresses tumor growth and metastasis of human hepatocellular carcinoma by targeting IL-6-Stat3 pathway.
let-7a-2	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NIRF and suppresses the growth of A549 lung cancer cells.	mir-17-5p	malignant melanoma	up	Altered expression of selected microRNAs in melanoma: antiproliferative and proapoptotic activity of miRNA-155.	mir-26a	lung cancer	down	MicroRNA-26a/b Regulate DNA Replication Licensing, Tumorigenesis and Prognosis by Targeting CDC6 in Lung Cancer.
let-7a-2	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc expression.	mir-17-5p	non-small cell lung cancer	down	Circulating micro-RNA expression profiles in early stage nonsmall cell lung cancer.	mir-26a	malignant melanoma	down	MicroRNA-26a Is Strongly Downregulated in Melanoma and Induces Cell Death through Repression of Silencer of Death Domains (SODD).
let-7a-2	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-17-5p	pancreatic cancer	up	miR-17-5p Inhibitor Enhances Chemosensitivity to Gemcitabine Via Upregulating Bim Expression in Pancreatic Cancer Cells.	mir-26a	oral squamous cell carcinoma	down	MicroRNA expression signature of oral squamous cell carcinoma: functional role of microRNA-26a/b in the modulation of novel cancer pathways.
let-7a-2	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression.	mir-17-5p	pancreatic cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-26a	osteo-sarcoma	down	Downregulation of microRNA-26a is associated with metastatic potential and the poor prognosis of osteosarcoma patients.
let-7a-3	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122.	mir-17-5p	pancreatic cancer	up	MicroRNA-10a is overexpressed in human pancreatic cancer and involved in its invasiveness partially via suppression of the HOXA1 gene.	mir-26a	ovarian cancer	up	MiR-26a promotes ovarian cancer proliferation and tumorigenesis.
let-7a-3	bronchiolo-alveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-17-5p	pituitary carcinoma	up	MicroRNA involvement in a metastatic non-functioning pituitary carcinoma.	mir-26a	papillary thyroid carcinoma	down	miR-26a and its target CKS2 modulate cell growth and tumorigenesis of papillary thyroid carcinoma.
let-7a-3	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.	mir-181a	acute myeloid leukemia	down	MicroRNA 181a Influences the Expression of HMGB1 and CD4 in Acute Leukemias.	mir-26a	primary thyroid lymphoma	down	A 4-MicroRNA signature can discriminate primary lymphomas from anaplastic carcinomas in thyroid cytology smears.
let-7a-3	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.	mir-181a	acute promyelo-cytic leukemia	up	PML/RAR? -regulated miR-181a/b cluster targets the tumor suppressor RASSF1A in Acute Promyelocytic Leukemia.	mir-26a	prostate cancer	down	Myc enforces overexpression of EZH2 in early prostatic neoplasia via transcriptional and post-transcriptional mechanisms.

let-7a-3	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-181a	breast cancer	down	Decreased serum miR-181a is a potential new tool for breast cancer screening.	mir-26a	prostate cancer	down	MiR-26a inhibits prostate cancer progression by repression of Wnt5a.
let-7a-3	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-181a	breast cancer	up	Transforming growth factor-? regulates the sphere-initiating stem cell-like feature in breast cancer through miRNA-181 and ATM.	mir-26b	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.
let-7a-3	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NIRF and suppresses the growth of A549 lung cancer cells.	mir-181a	cervical cancer	up	MicroRNA-181a enhances the chemoresistance of human cervical squamous cell carcinoma to cisplatin by targeting PRKCD.	mir-26b	breast cancer	down	MiRNA-26b inhibits proliferation by targeting PTGS2 in breast cancer.
let-7a-3	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival.	mir-181a	chronic lymphocytic leukemia	down	Aberrant microRNA expression in Chinese patients with chronic lymphocytic leukemia.	mir-26b	breast cancer	down	MiRNA-26b inhibits cellular proliferation by targeting CDE8 in breast cancer.
let-7a-3	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-181a	chronic lymphocytic leukemia	down	miR-181a/b significantly enhances drug sensitivity in chronic lymphocytic leukemia cells via targeting multiple anti-apoptosis genes.	mir-26b	breast cancer	down	MicroRNA-26b is underexpressed in human breast cancer and induces cell apoptosis by targeting SLC7A11.
let-7a-3	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc expression.	mir-181a	colon cancer	up	miR-181a mediates metabolic shift in colon cancer cells via the PTEN/AKT pathway.	mir-26b	colorectal cancer	down	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.
let-7a-3	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-181a	colorectal cancer	up	MicroRNA-181a promotes tumor growth and liver metastasis in colorectal cancer by targeting the tumor suppressor WIF-1.	mir-26b	glioma	down	Role of microRNA-26b in glioma development and its mediated regulation on EphA2.
let-7a-3	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression.	mir-181a	gastric cancer	up	MicroRNA-181a promotes gastric cancer by negatively regulating tumor suppressor KLF6.	mir-26b	hepato-cellular carcinoma	down	MicroRNA-26b inhibits epithelial-mesenchymal transition in hepatocellular carcinoma by targeting USP9X.
let-7a-3p	prostate cancer	down	The miRNA let-7a1 inhibits the expression of insulin-like growth factor 1 receptor (IGF1R) in prostate cancer PC-3 cells.	mir-181a	gastric cancer	up	Genetic polymorphism at miR-181a binding site contributes to gastric cancer susceptibility.	mir-26b	lung cancer	down	MicroRNA-26a/b Regulate DNA Replication Licensing, Tumorigenesis and Prognosis by Targeting CDC6 in Lung Cancer.
let-7b	acute lymphoblastic leukemia	down	Suppression of the let-7b microRNA pathway by DNA hypermethylation in infant acute lymphoblastic leukemia with MLL gene rearrangements.	mir-181a	gastric cancer	down	MicroRNA-181a Inhibits Tumor Proliferation, Invasiveness, and Metastasis and Is Downregulated in Gastric Cancer.	mir-26b	non-small cell lung cancer	down	Down-regulation of microRNA-26b modulates non-small cell lung cancer cells chemoresistance and migration through the association of PTEN.

let-7b	breast cancer	down	Analysis of miR-205 and miR-155 expression in the blood of breast cancer patients.	mir-181a	glioma	down	mir-181a and mir-181b function as tumor suppressors in human glioma cells.	mir-26b	oral squamous cell carcinoma	down	MicroRNA expression signature of oral squamous cell carcinoma: functional role of microRNA-26a/b in the modulation of novel cancer pathways.
let-7b	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122.	mir-181a	glioma	up	MiR-181a regulates blood-tumor barrier permeability by targeting Kr?ppel-like factor 6.	mir-26b	osteo-sarcoma	down	miR-26b inhibits proliferation, migration, invasion and apoptosis induction via the downregulation of 6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase-3 driven glycolysis in osteosarcoma cells.
let-7b	breast cancer	down	The heterochronic microRNA let-7 inhibits cell motility by regulating the genes in the actin cytoskeleton pathway in breast cancer.	mir-181a	hepato-cellular carcinoma	up	Up-regulated MicroRNA-181a induces carcinogenesis in Hepatitis B virus-related hepatocellular carcinoma by targeting E2F5.	mir-26b	osteo-sarcoma	down	MicroRNA-26b inhibits metastasis of osteosarcoma via targeting CTGF and Smad1.
let-7b	bronchioloalveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-181a	hepato-cellular carcinoma	up	Polycyclic aromatic hydrocarbon (PAH)-mediated upregulation of hepatic microRNA-181 family promotes cancer cell migration by targeting MAPK phosphatase-5, regulating the activation of p38 MAPK.	mir-26b	prostate cancer	down	Myc enforces overexpression of EZH2 in early prostatic neoplasia via transcriptional and post-transcriptional mechanisms.
let-7b	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.	mir-181a	oral squamous cell carcinoma	down	miR-181a shows tumor suppressive effect against oral squamous cell carcinoma cells by downregulating K-ras.	mir-27a	acute leukemia	down	MiR-27a functions as a tumor suppressor in acute leukemia by regulating 14-3-3?.
let-7b	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-181a	osteo-sarcoma	up	MicroRNA signatures associate with pathogenesis and progression of osteosarcoma.	mir-27a	breast cancer	up	c-MYC regulated miR-23a~24-2~27a cluster promotes mammary carcinoma cell invasion and hepatic metastasis by targeting Sprouty2.
let-7b	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.	mir-181a	osteo-sarcoma	up	MicroRNA 181a improves proliferation and invasion, suppresses apoptosis of osteosarcoma cell.	mir-27a	colorectal cancer	down	Tumor Suppressor MicroRNA-27a in Colorectal Carcinogenesis and Progression by Targeting SGPP1 and Smad2.
let-7b	gastric cancer	down	Let-7b inhibits cell proliferation, migration, and invasion through targeting Cthrc1 in gastric cancer.	mir-181a	pancreatic cancer	up	LPS Induced miR-181a Promotes Pancreatic Cancer Cell Migration via Targeting PTEN and MAP2K4.	mir-27a	colorectal cancer	up	Novel evidence for curcumin and boswellic acid induced chemoprevention through regulation of miR-34a and miR-27a in colorectal cancer.

let-7b	gastric cancer	down	MicroRNA let-7b suppresses human gastric cancer malignancy by targeting ING1.	mir-181a-1	glioma	down	MicroRNA-181 inhibits glioma cell?proliferation by targeting cyclin B1.	mir-27a	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.
let-7b	gastric cancer	down	let-7b/g silencing activates AKT signaling to promote gastric carcinogenesis.	mir-181a-1	hepato-cellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-27a	esophageal squamous cell carcinoma	down	microRNA-27a functions as a tumor suppressor in esophageal squamous cell carcinoma by targeting KRAS.
let-7b	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-181a-1	non-small cell lung cancer	down	MicroRNA-181 functions as a tumor suppressor in non-small cell lung cancer (NSCLC) by targeting Bcl-2.	mir-27a	esophageal squamous cell carcinoma	down	MicroRNA-27a directly targets KRAS to inhibit cell proliferation in esophageal squamous cell carcinoma.
let-7b	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival.	mir-181a-1	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-27a	gastric adeno-carcinoma	up	MicroRNA-27a functions as an oncogene in gastric adenocarcinoma by targeting prohibitin.
let-7b	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-181a-1	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-27a	gastric cancer	up	Down-regulation of miR-27a might inhibit proliferation and drug resistance of gastric cancer cells.
let-7b	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NIRF and suppresses the growth of A549 lung cancer cells.	mir-181a-2	glioma	down	MicroRNA-181 inhibits glioma cell?proliferation by targeting cyclin B1.	mir-27a	gastric cancer	up	miR-27 promotes human gastric cancer cell metastasis by inducing epithelial-to-mesenchymal transition.
let-7b	malignant melanoma	down	MicroRNA let-7b targets important cell cycle molecules in malignant melanoma cells and interferes with anchorage-independent growth.	mir-181a-2	hepato-cellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-27a	glioma	down	Emerging role of microRNA-27a in human malignant glioma cell survival via targeting of prohibitin.
let-7b	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc expression.	mir-181a-2	non-small cell lung cancer	down	MicroRNA-181 functions as a tumor suppressor in non-small cell lung cancer (NSCLC) by targeting Bcl-2.	mir-27a	hepato-cellular carcinoma	up	MiR-27a promotes hepatocellular carcinoma cell proliferation through suppression of its target gene peroxisome proliferator-activated receptor ?
let-7b	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-181a-2	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-27a	laryngeal carcinoma	up	MicroRNA-27a promotes proliferation and suppresses apoptosis by targeting PLK2 in laryngeal carcinoma.
let-7b	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression.	mir-181a-2	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-27a	liver cancer	up	Adipose tissue-secreted miR-27a promotes liver cancer by targeting FOXO1 in obese individuals.
let-7b	renal clear cell carcinoma	down	let-7b and let-7c are determinants of intrinsic chemoresistance in renal	mir-181a-2*	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-27a	non-small cell lung cancer	down	Circulating micro-RNA expression profiles in early stage nonsmall cell lung

			cell carcinoma.								cancer.
let-7c	acute myeloid leukemia	down	miRNA let-7c promotes granulocytic differentiation in acute myeloid leukemia.	mir-181a-5p	gastric cancer	up	miR-181a-5p Expression and Effects on Cell Proliferation in Gastric Cancer.	mir-27a	osteo-sarcoma	up	Diagnostic and prognostic potentials of microRNA-27a in osteosarcoma.
let-7c	acute promyelocytic leukemia	down	A restricted signature of miRNAs distinguishes APL blasts from normal promyelocytes.	mir-181a-5p	hepato-cellular carcinoma	down	miR-181a-5p is downregulated in hepatocellular carcinoma and suppresses motility, invasion and branching-morphogenesis by directly targeting c-Met.	mir-27a	osteo-sarcoma	up	MicroRNA-27a Promotes Proliferation, Migration and Invasion by Targeting MAP2K4 in Human Osteosarcoma Cells.
let-7c	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122.	mir-181b	acute promyelo-cytic leukemia	up	PML/RAR? -regulated miR-181a/b cluster targets the tumor suppressor RASSF1A in Acute Promyelocytic Leukemia.	mir-27a	ovarian cancer	up	Oncogenic MicroRNA-27a is a Target for Genistein in Ovarian Cancer Cells.
let-7c	bronchiolo-alveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-181b	breast cancer	up	Transforming growth factor-? regulates the sphere-initiating stem cell-like feature in breast cancer through miRNA-181 and ATM.	mir-27a	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
let-7c	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.	mir-181b	cervical cancer	up	miR-181b promotes cell proliferation and reduces apoptosis by repressing the expression of adenylyl cyclase 9 (AC9) in cervical cancer cells.	mir-27a	pancreatic cancer	up	Genistein Inhibits Cell Growth and Invasion Through Regulation of MiR-27a in Pancreatic Cancer Cells.
let-7c	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-181b	chronic lymphocytic leukemia	down	Aberrant microRNA expression in Chinese patients with chronic lymphocytic leukemia.	mir-27a	renal cell carcinoma	up	miR-27a promotes cell proliferation and metastasis in renal cell carcinoma.
let-7c	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.	mir-181b	chronic lymphocytic leukemia	down	miR-181a/b significantly enhances drug sensitivity in chronic lymphocytic leukemia cells via targeting multiple anti-apoptosis genes.	mir-27a	small cell lung cancer	down	miR-27a regulates the self renewal of the H446 small cell lung cancer cell line in vitro.
let-7c	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-181b	gastric adeno-carcinoma	down	MicroRNA-181b targets cAMP responsive element binding protein 1 in gastric adenocarcinomas.	mir-27a	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.
let-7c	hepatocellular carcinoma	down	MicroRNA let-7c Inhibits Cell Proliferation and Induces Cell Cycle Arrest by Targeting CDC25A in Human Hepatocellular Carcinoma.	mir-181b	gastric cancer	down	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-27a*	head and neck squamous cell carcinoma	down	Coordinated Targeting of the EGFR Signaling Axis by MicroRNA-27a*.
let-7c	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NIRF and suppresses the growth of A549 lung cancer cells.	mir-181b	glioma	down	mir-181a and mir-181b function as tumor suppressors in human glioma cells.	mir-27a-3p	glioma	up	miR-24-3p and miR-27a-3p promote cell proliferation in glioma cells via cooperative regulation of MXI1.
let-7c	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association	mir-181b	glioma	down	MiRNA-181b suppresses IGF-1R and functions as a tumor suppressor gene in gliomas.	mir-27b	gastric cancer	up	miR-27 promotes human gastric cancer cell metastasis by inducing

			with shortened postoperative survival								epithelial-to-mesenchymal transition.
let-7c	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-181b	glioma	down	MiR-181b suppresses proliferation of and reduces chemoresistance to temozolomide in U87 glioma stem cells.	mir-27b	glioma	up	Expression and function of miR-27b in human glioma
let-7c	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc expression.	mir-181b	hepato-cellular carcinoma	up	Polycyclic aromatic hydrocarbon (PAH)-mediated upregulation of hepatic microRNA-181 family promotes cancer cell migration by targeting MAPK phosphatase-5, regulating the activation of p38 MAPK.	mir-27b	glioma	up	MicroRNA-27b inhibits Spry2 expression and promotes cell invasion in glioma U251 cells.
let-7c	naso-pharyngeal carcinoma	down	Knocking down CDK4 mediates the elevation of let-7c suppressing cell growth in nasopharyngeal carcinoma.	mir-181b	non-small cell lung cancer	down	Down-regulation of microRNA-181b is a potential prognostic marker of non-small cell lung cancer.	mir-27b	non-small cell lung cancer	down	MicroRNA-27b suppresses growth and invasion of NSCLC cells by targeting Sp1.
let-7c	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-181b	oral squamous cell carcinoma	up	Relationship between microRNA expression levels and histopathological features of dysplasia in oral leukoplakia.	mir-27b	oral squamous cell carcinoma	up	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer
let-7c	non-small cell lung cancer	down	MicroRNA let-7c inhibits migration and invasion of human non-small cell lung cancer by targeting ITGB3 and MAP4K3.	mir-181b	osteo-sarcoma	up	MicroRNA signatures associate with pathogenesis and progression of osteosarcoma.	mir-27b	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
let-7c	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression.	mir-181b	ovarian cancer	up	MicroRNA-181b promotes ovarian cancer cell growth and invasion by targeting LATS2.	mir-28-3p	colorectal cancer	down	Strand-Specific miR-28-5p and miR-28-3p Have Distinct Effects in Colorectal Cancer Cells.
let-7c	prostate cancer	down	MicroRNA let-7c suppresses androgen receptor expression and activity via regulation of Myc expression in prostate cancer cells.	mir-181b	prostate cancer	up	MicroRNA-181b expression in prostate cancer tissues and its influence on the biological behavior of the prostate cancer cell line PC-3.	mir-28-3p	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.
let-7c	prostate cancer	down	MicroRNA let-7c is downregulated in prostate cancer and suppresses prostate cancer growth.	mir-181b	retinoblastoma	up	Hypoxia-induced miR-181b enhances angiogenesis of retinoblastoma cells by targeting PDCD10 and GATA6.	mir-28-5p	colorectal cancer	down	Strand-Specific miR-28-5p and miR-28-3p Have Distinct Effects in Colorectal Cancer Cells.
let-7c	renal clear cell carcinoma	down	let-7b and let-7c are determinants of intrinsic chemoresistance in renal cell carcinoma.	mir-181b-1	glioma	down	MicroRNA-181 inhibits glioma cell?proliferation by targeting cyclin B1.	mir-28-5p	renal cell carcinoma	down	A panel of five serum miRNAs as a potential diagnostic tool for early-stage renal cell carcinoma.
let-7d	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7	mir-181b-1	hepato-cellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem	mir-296-5p	gastric cancer	up	MicroRNA-296-5p increases proliferation in gastric cancer through repression of Caudal-

			and miR-122.				cells.				related homeobox 1.
let-7d	bronchiolo-alveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-181b-1	non-small cell lung cancer	down	MicroRNA-181 functions as a tumor suppressor in non-small cell lung cancer (NSCLC) by targeting Bcl-2.	mir-29a	acute myeloid leukemia	up	microRNA-29a induces aberrant self-renewal capacity in hematopoietic progenitors, biased myeloid development, and acute myeloid leukemia.
let-7d	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.	mir-181b-1	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-29a	acute myeloid leukemia	down	MicroRNA29a regulates the expression of the nuclear oncogene Ski.
let-7d	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.	mir-181b-1	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-29a	breast cancer	up	Next-generation sequencing of microRNAs for breast cancer detection.
let-7d	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-181b-2	glioma	down	MicroRNA-181 inhibits glioma cell?proliferation by targeting cyclin B1.	mir-29a	breast cancer	up	microRNA-29 negatively regulates EMT regulator N-myc interactor in breast cancer.
let-7d	head and neck squamous cell carcinoma	down	Low-level expression of microRNAs let-7d and miR-205 are prognostic markers of head and neck squamous cell carcinoma.	mir-181b-2	hepato-cellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-29a	cervical squamous cell carcinoma	down	Tumor-suppressive microRNA-29a inhibits cancer cell migration and invasion via targeting HSP47 in cervical squamous cell carcinoma.
let-7d	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-181b-2	non-small cell lung cancer	down	MicroRNA-181 functions as a tumor suppressor in non-small cell lung cancer (NSCLC) by targeting Bcl-2.	mir-29a	colorectal cancer	up	microRNA expression profile in stage III colorectal cancer: Circulating miR-18a and miR-29a as promising biomarkers.
let-7d	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival.	mir-181b-2	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-29a	colorectal cancer	up	MicroRNA-29a promotes colorectal cancer metastasis by regulating matrix metalloproteinase 2 and E-cadherin via KLF4.
let-7d	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-181b-2	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-29a	colorectal cancer	up	Evaluation of microRNAs-29a, 92a and 145 in colorectal carcinoma as candidate diagnostic markers: An Egyptian pilot study.
let-7d	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NIRF and suppresses the growth of A549 lung cancer cells.	mir-181b-5p	astrocytoma	down	MiR-181b-5p downregulates NOVA1 to suppress proliferation, migration and invasion and promote apoptosis in astrocytoma.	mir-29a	gastric cancer	down	MicroRNA-29a inhibits cell migration and invasion via targeting Roundabout homolog 1 in gastric cancer cells.
let-7d	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through	mir-181c	gastric cancer	up	Upregulation of MicroRNA 181c Expression in Gastric Cancer Tissues and Plasma.	mir-29a	gastric cancer	down	Effects of microRNA-29 family members on proliferation and invasion

			downregulating c-Myc expression.								of gastric cancer cell lines.
let-7d	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-181c	glioma	down	MicroRNA-181 inhibits glioma cell?proliferation by targeting cyclin B1.	mir-29a	gastric cancer	down	MiR-29a inhibits cell proliferation and induces cell cycle arrest through the downregulation of p42.3 in human gastric cancer.
let-7d	oral cancer	down	Let-7d functions as novel regulator of epithelial-mesenchymal transition and chemoresistant property in oral cancer.	mir-181c	hepato-cellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-29a	gastric cancer	down	miR-29a suppresses growth and invasion of gastric cancer cells in vitro by targeting VEGF-A.
let-7d	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression	mir-181c	neuroblastoma	down	MiR-181c modulates the proliferation, migration, and invasion of neuroblastoma cells by targeting Smad7.	mir-29a	gastric cancer	down	MicroRNA-29a could target AKT2 to inhibit gastric cancer cells invasion ability
let-7d	pancreatic ductal adeno-carcinoma	down	MicroRNAs Targeting Oncogenes Are Down-Regulated in Pancreatic Malignant Transformation from Benign Tumors.	mir-181c	non-small cell lung cancer	down	MicroRNA-181 functions as a tumor suppressor in non-small cell lung cancer (NSCLC) by targeting Bcl-2.	mir-29a	head and neck squamous cell carcinoma	down	Tumour-suppressive microRNA-29s inhibit cancer cell migration and invasion by targeting laminin-integrin signalling in head and neck squamous cell carcinoma.
let-7d	renal cell carcinoma	down	Let-7d suppresses growth, metastasis, and tumor macrophage infiltration in renal cell carcinoma by targeting COL3A1 and CCL7.	mir-181c	osteo-sarcoma	up	MicroRNA signatures associate with pathogenesis and progression of osteosarcoma.	mir-29a	hepato-cellular carcinoma	down	Effects of microRNA-29 on apoptosis, tumorigenicity, and prognosis of hepatocellular carcinoma
let-7e	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122.	mir-181c	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-29a	hepato-cellular carcinoma	down	microRNA-29a suppresses cell proliferation by targeting SPARC in hepatocellular carcinoma
let-7e	bronchiolo-alveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-181c	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-29a	hepato-cellular carcinoma	down	Negative feedback of miR-29 family TET1 involves in hepatocellular cancer.
let-7e	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.	mir-181d	glioma	down	MiR-181d acts as a tumor suppressor in glioma by targeting K-ras and Bcl-2.	mir-29a	hepato-cellular carcinoma	down	Erratum to: Negative feedback of miR-29 family TET1 involves in hepatocellular cancer.
let-7e	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-181d	glioma	down	MicroRNA-181 inhibits glioma cell?proliferation by targeting cyclin B1.	mir-29a	mantle cell lymphoma	down	microRNA expression profile and identification of miR-29 as a prognostic marker and pathogenetic factor by targeting CDK6 in mantle cell lymphoma.

let-7e	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-21a and let-7a in esophageal squamous cell carcinoma.	mir-181d	hepato-cellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-29a	mesen-chymal cancer	down	miR-29 Acts as a Decoy in Sarcomas to Protect the Tumor Suppressor A20 mRNA from Degradation by HuR.
let-7e	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-181d	hepato-cellular carcinoma	up	Polycyclic aromatic hydrocarbon (PAH)-mediated upregulation of hepatic microRNA-181 family promotes cancer cell migration by targeting MAPK phosphatase-5, regulating the activation of p38 MAPK.	mir-29a	monocytic leukemia	down	Altered expression pattern of miR-29a, miR-29b and the target genes in myeloid leukemia.
let-7e	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-181d	non-small cell lung cancer	down	MicroRNA-181 functions as a tumor suppressor in non-small cell lung cancer (NSCLC) by targeting Bcl-2.	mir-29a	neuro-blastoma	down	Deep MicroRNA sequencing reveals downregulation of miR-29a in neuroblastoma central nervous system metastasis.
let-7e	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NIRF and suppresses the growth of A549 lung cancer cells.	mir-181d	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-29a	non-small cell lung cancer	down	Suppression of Wnt signaling by the miR-29 family is mediated by demethylation of WIF-1 in non-small-cell lung cancer.
let-7e	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival.	mir-181d	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-29a	oral squamous cell carcinoma	down	MicroRNA-29a upregulates MMP2 in oral squamous cell carcinoma to promote cancer invasion and anti-apoptosis.
let-7e	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc expression.	mir-182	bladder cancer	up	Synthetic miRNA-mowers targeting miR-183-96-182 cluster or miR-210 inhibit growth and migration and induce apoptosis in bladder cancer cells.	mir-29a-3p	gastric cancer	down	Reduced miR-29a-3p expression is linked to the cell proliferation and cell migration in gastric cancer.
let-7e	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-182	breast cancer	up		mir-29b	chronic lymphocytic leukemia	down	Aberrant microRNA expression in Chinese patients with chronic lymphocytic leukemia.
let-7e	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression.	mir-182	breast cancer	up	Suppression of MIM by microRNA-182 activates RhoA and promotes breast cancer metastasis.	mir-29b	colorectal cancer	down	miR-29b suppresses tumor growth and metastasis in colorectal cancer via downregulating Tiam1 expression and inhibiting epithelial-mesenchymal transition.
let-7e	papillary thyroid carcinoma	up	Circulating microRNA profiles as potential biomarkers for diagnosis of papillary thyroid carcinoma.	mir-182	breast cancer	up	Higher expression of circulating miR-182 as a novel biomarker for breast cancer.	mir-29b	esophageal squamous cell carcinoma	down	miR-29b inhibits the progression of esophageal squamous cell carcinoma by targeting MMP-2.
let-7f	glioma	down	Let-7f Inhibits Glioma Cell Proliferation, Migration, and Invasion by Targeting Periostin.	mir-182	colorectal adeno-carcinoma	up	Enhanced miR-182 transcription is a predictor of poor overall survival in colorectal adenocarcinoma patients.	mir-29b	gastric cancer	down	MicroRNA-29s could target AKT2 to inhibit gastric cancer cells invasion ability.

let-7f	hepatocellular carcinoma	down	Expression of serum miR-16, let-7f, and miR-21 in patients with hepatocellular carcinoma and their clinical significances.	mir-182	colorectal cancer	up	miR-182 promotes cell growth and invasion by targeting forkhead box F2 transcription factor in colorectal cancer.	mir-29b	gastric cancer	down 25428377	MicroRNA-29a could target AKT2 to inhibit gastric cancer cells invasion ability
let-7f-1	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122.	mir-182	colorectal cancer	up	Up-regulation of miR-182 expression in colorectal cancer tissues and its prognostic value.	mir-29b	gastric cancer	down	Deregulation between miR-29b/c and DNMT3A is associated with epigenetic silencing of the CDH1 gene, affecting cell migration and invasion in gastric cancer.
let-7f-1	bronchiolo-alveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-182	colorectal cancer	up	microRNA-182 targets special AT-rich sequence-binding protein 2 to promote colorectal cancer proliferation and metastasis.	mir-29b	glioblastoma	down	miR-29b and miR-125a regulate podoplanin and suppress invasion in glioblastoma.
let-7f-1	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells	mir-182	colorectal cancer	up	Circulating miR-182 is a biomarker of colorectal adenocarcinoma progression.	mir-29b	lung adenocarcinoma	down	MicroRNA-29b is involved in the Src-ID1 signaling pathway and is dysregulated in human lung adenocarcinoma
let-7f-1	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-182	colorectal cancer	up	SATB1 and 2 in colorectal cancer	mir-29b	mantle cell lymphoma	down	microRNA expression profile and identification of miR-29 as a prognostic marker and pathogenetic factor by targeting CDK6 in mantle cell lymphoma.
let-7f-1	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma	mir-182	colorectal carcinoma	up	Increased expression of miRNA-182 in colorectal carcinoma: an independent and tissue-specific prognostic factor.	mir-29b	monocytic leukemia	down	Altered expression pattern of miR-29a, miR-29b and the target genes in myeloid leukemia
let-7f-1	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-182	endometrial cancer	up	MicroRNA-182 Promotes Tumor Cell Growth by Targeting Transcription Elongation Factor A-like 7 in Endometrial Carcinoma.	mir-29b	non-small cell lung cancer	down	Preclinical rationale for combining an EGFR antibody with cisplatin/gemcitabine for the treatment of NSCLC
let-7f-1	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival.	mir-182	gallbladder carcinoma	up	TGF-?? upregulates miR-182 expression to promote gallbladder cancer metastasis by targeting CADM1.	mir-29b	non-small cell lung cancer	down	Suppression of Wnt signaling by the miR-29 family is mediated by demethylation of WIF-1 in non-small-cell lung cancer.
let-7f-1	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-182	gastric adeno-carcinoma	down	MicroRNA-182 targets cAMP-responsive element-binding protein?1 and suppresses cell growth in human gastric adenocarcinoma	mir-29b	non-small cell lung cancer	down	MicroRNA-29b attenuates non-small cell lung cancer metastasis by targeting matrix metalloproteinase 2 and PTEN
let-7f-1	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NIRF and suppresses the growth of A549 lung cancer cells	mir-182	gastric cancer	down	MicroRNA-182 inhibits proliferation through targeting oncogenic ANUBL1 in gastric cancer	mir-29b	osteosarcoma	down	MicroRNA signatures associate with pathogenesis and progression of osteosarcoma

let-7f-1	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc expression.	mir-182	glioma	up	The miR-183/96/182 Cluster Regulates Oxidative Apoptosis and Sensitizes Cells to Chemotherapy in Gliomas.	mir-29b	prostate cancer	down	miRNA-29b suppresses prostate cancer metastasis by regulating epithelial-mesenchymal transition signaling
let-7f-1	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-182	glioma	up	miR-182 as a prognostic marker for glioma progression and patient survival.	mir-29b-1	breast cancer	up	microRNA-29 negatively regulates EMT regulator N-myc interactor in breast cancer.
let-7f-1	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression	mir-182	hepato-cellular carcinoma	up	OncomiR miR-96 and miR-182 promote cell proliferation and invasion through targeting ephrinA5 in hepatocellular carcinoma	mir-29b-1	gastric cancer	down	Effects of microRNA-29 family members on proliferation and invasion of gastric cancer cell lines.
let-7f-2	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122.	mir-182	hepato-cellular carcinoma	up	Wnt/beta-Catenin activates MiR-183/96/182 expression in hepatocellular carcinoma that promotes cell invasion.	mir-29b-1	head and neck squamous cell carcinoma	down	Tumour-suppressive microRNA-29s inhibit cancer cell migration and invasion by targeting laminin-integrin signalling in head and neck squamous cell carcinoma.
let-7f-2	bronchiolo-alveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-182	hepato-cellular carcinoma	up	Serum miR-182 and miR-331-3p as diagnostic and prognostic markers in patients with hepatocellular carcinoma.	mir-29b-1	hepato-cellular carcinoma	down	Erratum to: Negative feedback of miR-29 family TET1 involves in hepatocellular cancer.
let-7f-2	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.	mir-182	hepato-cellular carcinoma	up	MicroRNA-182 downregulates metastasis suppressor 1 and contributes to metastasis of hepatocellular carcinoma.	mir-29b-1	hepato-cellular carcinoma	down	Effects of microRNA-29 on apoptosis, tumorigenicity, and prognosis of hepatocellular carcinoma.
let-7f-2	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.	mir-182	hepato-cellular carcinoma	up	MiR-182 is up-regulated and targeting Cebpa in hepatocellular carcinoma.	mir-29b-1	hepato-cellular carcinoma	down	Negative feedback of miR-29 family TET1 involves in hepatocellular cancer.
let-7f-2	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-182	lung cancer	up	Differential MicroRNAs Expression in Serum of Patients with Lung Cancer, Pulmonary Tuberculosis, and Pneumonia	mir-29b-1	mesen-chymal cancer	down	miR-29 Acts as a Decoy in Sarcomas to Protect the Tumor Suppressor A20 mRNA from Degradation by HuR.
let-7f-2	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-182	lung cancer	up	Downregulation of microRNA-182 inhibits cell growth and invasion by targeting programmed cell death 4 in human lung adenocarcinoma cells.	mir-29b-1-5p	mesen-chymal cancer	down	miR-29 Acts as a Decoy in Sarcomas to Protect the Tumor Suppressor A20 mRNA from Degradation by HuR.
let-7f-2	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-182	lung cancer	down	[Methylation Status of miR-182 Promoter in Lung Cancer Cell Lines].	mir-29b-2	breast cancer	up	microRNA-29 negatively regulates EMT regulator N-myc interactor in breast cancer.

let-7f-2	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NRF and suppresses the growth of A549 lung cancer cells.	mir-182	malignant melanoma	up	Aberrant miR-182 expression promotes melanoma metastasis by repressing FOXO3 and microphthalmia-associated transcription factor.	mir-29b-2	gastric cancer	down	Effects of microRNA-29 family members on proliferation and invasion of gastric cancer cell lines.
let-7f-2	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival.	mir-182	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-29b-2	head and neck squamous cell carcinoma	down	Tumour-suppressive microRNA-29s inhibit cancer cell migration and invasion by targeting laminin-integrin signalling in head and neck squamous cell carcinoma.
let-7f-2	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc expression.	mir-182	mesenchymal cancer	up	MicroRNA-182 drives metastasis of primary sarcomas by targeting multiple genes.	mir-29b-2	hepato-cellular carcinoma	down	Effects of microRNA-29 on apoptosis, tumorigenicity, and prognosis of hepatocellular carcinoma.
let-7f-2	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-182	ovarian cancer	up	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-29b-2	hepato-cellular carcinoma	down	Negative feedback of miR-29 family TET1 involves in hepatocellular cancer.
let-7f-2	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression.	mir-182	ovarian cancer	up	Anti-MiR-182 reduces ovarian cancer burden, invasion and metastasis: An in vivo study in orthotopic xenografts of nude mice.	mir-29b-2	hepato-cellular carcinoma	down	Erratum to: Negative feedback of miR-29 family TET1 involves in hepatocellular cancer.
let-7g	breast cancer	down	The heterochromic microRNA let-7 inhibits cell motility by regulating the genes in the actin cytoskeleton pathway in breast cancer.	mir-182	ovarian cancer	up	The upregulation of signal transducer and activator of transcription 5-dependent microRNA-182 and microRNA-96 promotes ovarian cancer cell proliferation by targeting forkhead box O3 upon leptin stimul	mir-29b-2	mesen-chymal cancer	down	miR-29 Acts as a Decoy in Sarcomas to Protect the Tumor Suppressor A20 mRNA from Degradation by HuR.
let-7g	breast cancer	down	Breast cancer-specific TRAIL expression mediated by mRNA response elements of let-7 and miR-122.	mir-182	ovarian carcinoma	up	MicroRNA-182 promotes cell growth, invasion and chemoresistance by targeting programmed cell death 4 (PDCD4) in human ovarian carcinomas.	mir-29c	bladder cancer	down	Down-regulation of miR-29c in human bladder cancer and the inhibition of proliferation in T24 cell via PI3K-AKT pathway.
let-7g	bronchiolo-alveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-182	papillary thyroid carcinoma	up	miR-182 targets CHL1 and controls tumor growth and invasion in papillary thyroid carcinoma.	mir-29c	breast cancer	up	microRNA-29 negatively regulates EMT regulator N-myc interactor in breast cancer.
let-7g	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.	mir-182	prostate cancer	up	miR-183-96-182 cluster is overexpressed in prostate tissue and regulates zinc homeostasis in prostate cells.	mir-29c	esophageal squamous cell carcinoma	down	miR-29c induces cell cycle arrest in esophageal squamous cell carcinoma by modulating cyclin E expression.

let-7g	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-182	prostate cancer	up	Overexpressed microRNA-182 promotes proliferation and invasion in prostate cancer PC-3 cells by down-regulating N-myc downstream regulated gene 1 (NDRG1).	mir-29c	gastric cancer	down	MicroRNA-29c mediates initiation of gastric carcinogenesis by directly targeting ITGB1.
let-7g	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.	mir-182	uveal melanoma	down	Role of microRNA-182 in posterior uveal melanoma: regulation of tumor development through MITF, BCL2 and cyclin D2.	mir-29c	gastric cancer	down	MicroRNA-29s could target AKT2 to inhibit gastric cancer cells invasion ability
let-7g	gastric cancer	down	let-7b/g silencing activates AKT signaling to promote gastric carcinogenesis.	mir-182-5p	bladder cancer	up	Oncogenic miRNA-182-5p targets Smad4 and RECK in human bladder cancer.	mir-29c	gastric cancer	down	Effects of microRNA-29 family members on proliferation and invasion of gastric cancer cell lines
let-7g	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-182-5p	prostate cancer	up	MicroRNA-182-5p Promotes Cell Invasion and Proliferation by Down Regulating FOXF2, RECK and MTSS1 Genes in Human Prostate Cancer.	mir-29c	gastric cancer	down	Deregulation between miR-29b/c and DNMT3A is associated with epigenetic silencing of the CDH1 gene, affecting cell migration and invasion in gastric cancer.
let-7g	hepatocellular carcinoma	down	MicroRNA let-7g and let-7i inhibit hepatoma cell growth concurrently via downregulation of the anti-apoptotic protein B-cell lymphoma-extra large.	mir-182-5p	renal cell carcinoma	down	Downregulation of microRNA-182-5p contributes to renal cell carcinoma proliferation via activating the AKT/FOXO3a signaling pathway.	mir-29c	gastric cancer	down	The tumor suppressor microRNA-29c is downregulated and restored by celecoxib in human gastric cancer cells.
let-7g	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival.	mir-1826	breast cancer	down	MicroRNA-1826 targets VEGFC, beta-catenin (CTNNB1) and MEK1 (MAP2K1) in human bladder cancer	mir-29c	gastric cancer	down	MiR-29c is downregulated in gastric carcinomas and regulates cell proliferation by targeting RCC2.
let-7g	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-1826	kidney cancer	down	MicroRNA-1826 directly targets beta-catenin (CTNNB1) and MEK1 (MAP2K1) in VHL-inactivated renal cancer.	mir-29c	gastric cancer	down	[Relationship between the expression level of miR-29c and biological behavior of gastric cancer].
let-7g	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NIRF and suppresses the growth of A549 lung cancer cells.	mir-183	bladder cancer	up	MicroRNA expression signatures of bladder cancer revealed by deep sequencing.	mir-29c	glioma	down	MiR-29c inhibits glioma cell proliferation, migration, invasion and angiogenesis.
let-7g	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc expression.	mir-183	bladder cancer	up	Synthetic miRNA-mowers targeting miR-183-96-182 cluster or miR-210 inhibit growth and migration and induce apoptosis in bladder cancer cells.	mir-29c	head and neck squamous cell carcinoma	down	Tumour-suppressive microRNA-29s inhibit cancer cell migration and invasion by targeting laminin-integrin signalling in head and neck squamous cell carcinoma.
let-7g	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-183	breast cancer	down	Dysregulated miR-183 inhibits migration in breast cancer cells.	mir-29c	hepato-cellular carcinoma	down	PKCalpha mediated induction of miR-101 in human hepatoma HepG2 cells.

let-7g	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression.	mir-183	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-29c	hepato-cellular carcinoma	down	MicroRNA-29c functions as a tumor suppressor by direct targeting oncogenic SIRT1 in hepatocellular carcinoma.
let-7g-5p	glioblastoma	down	miRNA microarray reveals specific expression in the peripheral blood of glioblastoma patients.	mir-183	colorectal cancer	up	Overexpression of microRNA-183 in human colorectal cancer and its clinical significance.	mir-29c	hepato-cellular carcinoma	down	Negative feedback of miR-29 family TET1 involves in hepatocellular cancer.
let-7i	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122.	mir-183	colorectal cancer	up	Plasma miR-183 predicts recurrence and prognosis in patients with colorectal cancer.	mir-29c	hepato-cellular carcinoma	down	Erratum to: Negative feedback of miR-29 family TET1 involves in hepatocellular cancer.
let-7i	bronchioloalveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.	mir-183	esophageal cancer	up	miRNA-183 suppresses apoptosis and promotes proliferation in esophageal cancer by targeting PDCD4.	mir-29c	hepato-cellular carcinoma	down	A suppressive role of ionizing radiation-responsive miR-29c in the development of liver carcinoma via targeting WIP1.
let-7i	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.	mir-183	esophageal squamous cell carcinoma	up	MicroRNA-183 promotes proliferation and invasion in oesophageal squamous cell carcinoma by targeting programmed cell death 4.	mir-29c	hepato-cellular carcinoma	down	Effects of microRNA-29 on apoptosis, tumorigenicity, and prognosis of hepatocellular carcinoma.
let-7i	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.	mir-183	follicular thyroid carcinoma	up	Differential miRNA expression defines migration and reduced apoptosis in follicular thyroid carcinomas.	mir-29c	lung cancer	down	miRNA-29c Suppresses Lung Cancer Cell Adhesion to Extracellular Matrix and Metastasis by Targeting Integrin ?1 and Matrix Metalloproteinase2 (MMP2).
let-7i	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.	mir-183	gastric cancer	down	miR-183 inhibits invasion of gastric cancer by targeting Ezrin.	mir-29c	mantle cell lymphoma	down	microRNA expression profile and identification of miR-29 as a prognostic marker and pathogenetic factor by targeting CDK6 in mantle cell lymphoma.
let-7i	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-183	gastric cancer	up	MicroRNA-183 inhibits apoptosis and promotes proliferation and invasion of gastric cancer cells by targeting PDCD4.	mir-29c	mesen-chymal cancer	down	miR-29 Acts as a Decoy in Sarcomas to Protect the Tumor Suppressor A20 mRNA from Degradation by HuR.
let-7i	hepatocellular carcinoma	down	MicroRNA let-7g and let-7i inhibit hepatoma cell growth concurrently via downregulation of the anti-apoptotic protein B-cell lymphoma-extra large.	mir-183	gastric cancer	down	MicroRNA-183 inhibits gastric cancer proliferation and invasion via directly targeting Bmi-1.	mir-29c	naso-pharyngeal cancer	down	Circulating miR-17, miR-20a, miR-29c, and miR-223 Combined as Non-Invasive Biomarkers in Nasopharyngeal Carcinoma.
let-7i	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.	mir-183	glioma	up	The miR-183/96/182 Cluster Regulates Oxidative Apoptosis and Sensitizes Cells to Chemotherapy in Gliomas.	mir-29c	naso-pharyngeal carcinoma	down	MiR-29c suppresses invasion and metastasis by targeting TIAM1 in nasopharyngeal carcinoma.

let-7i	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NRF and suppresses the growth of A549 lung cancer cells.	mir-183	hepato-cellular carcinoma	up		mir-29c	non-small cell lung cancer	down	Suppression of Wnt signaling by the miR-29 family is mediated by demethylation of WIF-1 in non-small-cell lung cancer.
let-7i	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival.	mir-183	hepato-cellular carcinoma	up	miR-183 inhibits TGF-beta1-induced apoptosis by downregulation of PDCD4 expression in human hepatocellular carcinoma cells.	mir-29c	non-small cell lung cancer	up	Expression of miR-29c, miR-93, and miR-429 as Potential Biomarkers for Detection of Early Stage Non-Small Lung Cancer.
let-7i	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc expression.	mir-183	hepato-cellular carcinoma	up	Expression and Significance of MicroRNA-183 in Hepatocellular Carcinoma.	mir-29c	non-small cell lung cancer	up	Circulating micro-RNA expression profiles in early stage nonsmall cell lung cancer.
let-7i	neuro-blastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.	mir-183	kidney cancer	up	microRNA-183 plays as oncogenes by increasing cell proliferation, migration and invasion via targeting protein phosphatase 2A in renal cancer cells.	mir-29c	pancreatic cancer	down	miR-29c suppresses pancreatic cancer liver metastasis in an orthotopic implantation model in nude mice and affects survival in pancreatic cancer patients.
let-7i	ovarian cancer	down	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-183	medullary thyroid carcinoma	up	MicroRNA profiling of sporadic and hereditary medullary thyroid cancer identifies predictors of nodal metastasis, prognosis, and potential therapeutic targets.	mir-300	breast cancer	down	miR-300 inhibits epithelial to mesenchymal transition and metastasis by targeting Twist in human epithelial cancer.
let-7i	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression.	mir-183	osteo-sarcoma	down	Down-regulation of miR-183 promotes migration and invasion of osteosarcoma by targeting Ezrin.	mir-300	head and neck squamous cell carcinoma	down	miR-300 inhibits epithelial to mesenchymal transition and metastasis by targeting Twist in human epithelial cancer.
mir-1	bladder cancer	down	The tumour-suppressive function of miR-1 and miR-133a targeting TAGLN2 in bladder cancer.	mir-183	papillary thyroid carcinoma	up	miR-183 regulates biological behavior in papillary thyroid carcinoma by targeting the programmed cell death 4.	mir-300	osteo-sarcoma	up	Up-Regulation of MiR-300 Promotes Proliferation and Invasion of Osteosarcoma by Targeting BRD7.
mir-1	bladder cancer	down	miR-1 downregulates long non-coding RNA urothelial cancer associated 1 in bladder cancer.	mir-183	prostate cancer	up	miR-183-96-182 cluster is overexpressed in prostate tissue and regulates zinc homeostasis in prostate cells.	mir-301a	colorectal cancer	up	MicroRNA-301a promotes migration and invasion by targeting TGFBR2 in human colorectal cancer.
mir-1	chordoma	down	Prognostic significance of miRNA-1 (miR-1) expression in patients with chordoma.	mir-183	prostate cancer	up	microRNA-183 is an oncogene targeting Dkk-3 and SMAD4 in prostate cancer.	mir-301a	colorectal cancer	up	MiR-301a promotes colorectal cancer cell growth and invasion by directly targeting SOCS6.
mir-1	chordoma	down	MicroRNA-1 (miR-1) inhibits chordoma cell migration and invasion by targeting slug.	mir-183	retino-blastoma	down	MicroRNA-183 suppresses retinoblastoma cell growth, invasion and migration by targeting LRP6.	mir-301a	endometrial cancer	down	Mutant p53 gain-of-function induces epithelial-mesenchymal transition through modulation of the miR-130b-ZEB1 axis.
mir-1	colorectal cancer	down	Tumor suppressor miR-1 restrains epithelial-mesenchymal transition and metastasis of colorectal carcinoma via the MAPK and PI3K/AKT pathway.	mir-183-3p	lung cancer	up	Up-regulation of microRNA-183-3p is a potent prognostic marker for lung adenocarcinoma of female non-smokers.	mir-301a	gastric cancer	up	Overexpressed miR-301a promotes cell proliferation and invasion by targeting RUNX3 in gastric cancer.

mir-1	esophageal squamous cell carcinoma	down	Downregulation of microRNA-1 in esophageal squamous cell carcinoma correlates with an advanced clinical stage and its overexpression inhibits cell migration and invasion.	mir-184	glioma	down	Identification and functional characterization of microRNAs involved in the malignant progression of gliomas.	mir-301a	gastric cancer	up	Abnormal expression of miR-301a in gastric cancer associated with progression and poor prognosis.
mir-1	gastric cancer	down	MicroRNA-1 (miR-1) inhibits gastric cancer cell proliferation and migration by targeting MET.	mir-184	glioma	down	MicroRNA-184 inhibits cell proliferation and invasion, and specifically targets TNFAIP2 in Glioma.	mir-301a	hepato-cellular carcinoma	up	miR-301a Is a Candidate Oncogene that Targets the Homeobox Gene Gax in Human Hepatocellular Carcinoma.
mir-1	head and neck squamous cell carcinoma	down	Low-level expression of microRNAs let-7d and miR-205 are prognostic markers of head and neck squamous cell carcinoma.	mir-184	head and neck squamous cell carcinoma	up	Co-targeting of multiple microRNAs on factor-inhibiting hypoxia-inducible factor (FIH) gene for the pathogenesis of head and neck carcinomas.	mir-301a	pancreatic adeno-carcinoma	up	miR-301a as an NF-?B activator in pancreatic cancer cells.
mir-1	head and neck squamous cell carcinoma	down	miR-1 as a tumor suppressive microRNA targeting TAGLN2 in head and neck squamous cell carcinoma.	mir-184	hepato-cellular carcinoma	up	Mir-184 Post-Transcriptionally Regulates SOX7 Expression and Promotes Cell Proliferation in Human Hepatocellular Carcinoma.	mir-301a	pancreatic cancer	up	miR-301a promotes pancreatic cancer cell proliferation by directly inhibiting Bim expression.
mir-1	hepatocellular carcinoma	down	MicroRNA-1 inhibits proliferation of hepatocarcinoma cells by targeting endothelin-1.	mir-184	hepato-cellular carcinoma	up	MicroRNA-184 inhibits cell proliferation and invasion, and specifically targets TNFAIP2 in Glioma.	mir-301a-3p	pancreatic cancer	up	MicroRNA-301a-3p promotes pancreatic cancer progression via negative regulation of SMAD4
mir-1	kidney cancer	down	MiR-1 downregulation correlates with poor survival in clear cell renal cell carcinoma where it interferes with cell cycle regulation and metastasis.	mir-184	malignant melanoma	down	Regulation of cancer aggressive features in melanoma cells by microRNAs.	mir-301b	endometrial cancer	down	Mutant p53 gain-of-function induces epithelial-mesenchymal transition through modulation of the miR-130b-ZEB1 axis.
mir-1	lung cancer	down	Down-regulation of micro-RNA-1 (miR-1) in lung cancer. Suppression of tumorigenic property of lung cancer cells and their sensitization to doxorubicin-induced apoptosis by miR-1.	mir-184	neuro-blastoma	down	MicroRNA-184 inhibits neuroblastoma cell survival through targeting the serine/threonine kinase AKT2.	mir-301b	pancreatic carcinoma	up	MicroRNA-301b promotes cell invasiveness through targeting TP63 in pancreatic carcinoma cells.
mir-1	naso-pharyngeal carcinoma	down	EZH2 promotes angiogenesis through inhibition of miR-1/Endothelin-1 axis in nasopharyngeal carcinoma.	mir-184	neuro-blastoma	down	MicroRNA-184-mediated inhibition of tumour growth in an orthotopic murine model of neuroblastoma.	mir-302a	colon cancer	down	MicroRNA-302a functions as a putative tumor suppressor in colon cancer by targeting Akt.
mir-1	non-small cell lung cancer	down	MiR-1 targets PIK3CA and inhibits tumorigenic properties of A549 cells.	mir-184	non-small cell lung cancer	down	MicroRNA-184 Deregulated by the MicroRNA-21 Promotes Tumor Malignancy and Poor Outcomes in Non-small Cell Lung Cancer via Targeting CDC25A and c-Myc.	mir-302a	prostate cancer	down	MicroRNA-302a Suppresses Tumor Cell Proliferation by Inhibiting AKT in Prostate Cancer.

mir-1	osteosarcoma	down	MicroRNA-1 functions as a potential tumor suppressor in osteosarcoma by targeting Med1 and Med31.	mir-184	squamous carcinoma	up	MicroRNA-184 inhibits cell proliferation and invasion, and specifically targets TNFAIP2 in Glioma.	mir-302b	esophageal squamous cell carcinoma	down	miR-302b is a potential molecular marker of esophageal squamous cell carcinoma and functions as a tumor suppressor by targeting ErbB4.
mir-1	renal cell carcinoma	down	The functional significance of miR-1 and miR-133a in renal cell carcinoma.	mir-185	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-302b	gastric adeno-carcinoma	down	Down-regulation of miR-302b, an ESC-specific microRNA, in Gastric Adenocarcinoma.
mir-100	breast cancer	down	miR-100 suppresses IGF2 and inhibits breast tumorigenesis by interfering with proliferation and survival signaling.	mir-185	breast cancer	down	MicroRNA-185 inhibits proliferation by targeting c-Met in human breast cancer cells.	mir-302b	hepato-cellular carcinoma	down	MicroRNA-302b suppresses cell proliferation by targeting EGFR in human hepatocellular carcinoma SMMC-7721 cells.
mir-100	breast cancer	down	miR-100 Induces Epithelial-Mesenchymal Transition but Suppresses Tumorigenesis, Migration and Invasion.	mir-185	breast cancer	down	MiR-185 is involved in human breast carcinogenesis by targeting Vegfa.	mir-302b	hepato-cellular carcinoma	down	miRNA-302b Suppresses Human Hepatocellular Carcinoma by Targeting AKT2.
mir-100	cervical carcinoma	down	miR-99 inhibits cervical carcinoma cell proliferation by targeting TRIB2.	mir-185	esophageal squamous cell carcinoma	down	[Molecular mechanism and effect of microRNA185 on proliferation, migration and invasion of esophageal squamous cell carcinoma]	mir-302c	hepato-cellular carcinoma	down	MiR-302c inhibits tumor growth of hepatocellular carcinoma by suppressing the endothelial-mesenchymal transition of endothelial cells.
mir-100	chondro-sarcoma	down	Analysis of microRNAs expressions in chondrosarcoma.	mir-185	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-302f	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-100	chondro-sarcoma	down	MicroRNA-100 Resensitizes Resistant Chondrosarcoma Cells to Cisplatin through Direct Targeting of mTOR.	mir-185	gastric cancer	down	miR-185 is an independent prognosis factor and suppresses tumor metastasis in gastric cancer.	mir-30a	breast cancer	down	miR-30a suppresses breast cancer cell proliferation and migration by targeting Eya2.
mir-100	colon cancer	down	MicroRNA-100 functions as a tumor suppressor by inhibiting Lgr5 expression in colon cancer cells.	mir-185	glioma	down	LRRC4 inhibits glioma cell growth and invasion through a miR-185-dependent pathway.	mir-30a	breast cancer	down	MicroRNA-30a inhibits cell migration and invasion by downregulating vimentin expression and is a potential prognostic marker in breast cancer.
mir-100	colorectal cancer	down	Downregulation of microRNA-100 correlates with tumor progression and poor prognosis in colorectal cancer.	mir-185	hepato-cellular carcinoma	down	miR-185 inhibits hepatocellular carcinoma growth by targeting the DNMT1/PTEN/Akt pathway.	mir-30a	breast cancer	down	Down-regulation of miRNA-30a in human plasma is a novel marker for breast cancer.
mir-100	colorectal cancer	down	MicroRNA-100 regulates SW620 colorectal cancer cell proliferation and invasion by targeting RAP1B.	mir-185	malignant melanoma	down	Regulation of cancer aggressive features in melanoma cells by microRNAs.	mir-30a	breast cancer	down	MicroRNA-30a suppresses breast tumor growth and metastasis by targeting metadherin.

mir-100	esophageal squamous cell carcinoma	down	MicroRNA-99a/100 promotes apoptosis by targeting mTOR in human esophageal squamous cell carcinoma.	mir-186	colon carcinoma	down	[Expression of miR-186 and its role in human colon carcinoma cells].	mir-30a	chondrosarcoma	down	Association of SOX4 regulated by tumor suppressor miR-30a with poor prognosis in low-grade chondrosarcoma
mir-100	esophageal squamous cell carcinoma	up	MicroRNA-100 promotes migration and invasion through mammalian target of rapamycin in esophageal squamous cell carcinoma.	mir-186	non-small cell lung cancer	down	miR-186 downregulation correlates with poor survival in lung adenocarcinoma, where it interferes with cell-cycle regulation.	mir-30a	colorectal carcinoma	down	miR-30a suppresses cell migration and invasion through downregulation of PIK3CD in colorectal carcinoma
mir-100	esophageal squamous cell carcinoma	down	Prognostic value of microRNA-100 in esophageal squamous cell carcinoma.	mir-186	non-small cell lung cancer	down	MiR-186 targets ROCK1 to suppress the growth and metastasis of NSCLC cells	mir-30a	hepato-cellular carcinoma	down	Effects of microRNA-30a on migration, invasion and prognosis of hepatocellular carcinoma
mir-100	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-186	pancreatic ductal adeno-carcinoma	up	miR-186 and 326 Predict the Prognosis of Pancreatic Ductal Adenocarcinoma and Affect the Proliferation and Migration of Cancer Cells.	mir-30a	non-small cell lung cancer	down	MicroRNA-30a inhibits epithelial-to-mesenchymal transition by targeting Snail and is downregulated in non-small cell lung cancer
mir-100	glioblastoma	down	microRNA-100 Targets SMRT/NCOR2, Reduces Proliferation, and Improves Survival in Glioblastoma Animal Models.	mir-187	prostate cancer	down	MiR-187 Targets the Androgen-Regulated Gene ALDH1A3 in Prostate Cancer.	mir-30a	non-small cell lung cancer	down	MiR-30a suppresses non-small cell lung cancer progression through AKT signaling pathway by targeting IGF1R
mir-100	hepatocellular carcinoma	down	Sequential analysis of multistage hepatocarcinogenesis reveals that miR-100 and PLK1 dysregulation is an early event maintained along tumor progression.	mir-188-5p	hepato-cellular carcinoma	down	MicroRNA-188-5p Suppresses Tumor Cell Proliferation and Metastasis by Directly Targeting FGF5 in Hepatocellular Carcinoma.	mir-30a	prostate cancer	down	miR-30 as a tumor suppressor connects EGF/Src signal to ERG and EMT
mir-100	hepatocellular carcinoma	down	Downregulation of microRNA-100 correlates with tumor progression and poor prognosis in hepatocellular carcinoma.	mir-188-5p	prostate cancer	down	miR-188-5p inhibits tumour growth and metastasis in prostate cancer by repressing LAPTM4B expression.	mir-30a	renal cell carcinoma	down	MiRNA-30a-mediated autophagy inhibition sensitizes renal cell carcinoma cells to sorafenib
mir-100	mesenchymal cancer	down	MicroRNA Expression Profiles in Kaposi's Sarcoma.	mir-18a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-30a-3p	colorectal cancer	down	Candidate microRNA biomarkers in human colorectal cancer: Systematic review profiling studies and experimental validation.
mir-100	non-small cell lung cancer	down	MicroRNA-100 is a potential molecular marker of non-small cell lung cancer and functions as a tumor suppressor by targeting polo-like kinase 1.	mir-18a	bladder cancer	down	microRNA-18a, a member of the oncogenic miR-17-92 cluster, targets Dicer and suppresses cell proliferation in bladder cancer T24 cells.	mir-30a-3p	hepato-cellular carcinoma	down	MicroRNA-30a-3p inhibits tumor proliferation, invasiveness and metastasis and is downregulated in hepatocellular carcinoma
mir-100	oral squamous cell carcinoma	down	Decreased expression of miR-125b and miR-100 in oral cancer cells contributes to malignancy.	mir-18a	breast cancer	up	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.	mir-30a-5p	colon carcinoma	down	MiR-30a-5p suppresses tumor growth in colon carcinoma by targeting DTL

mir-100	osteosarcoma	down	MicroRNA-100 inhibits osteosarcoma cell proliferation by targeting Cyr61.	mir-18a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.	mir-30a-5p	esophageal squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.
mir-100	ovarian cancer	down	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-18a	cholangiocarcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.	mir-30a-5p	gastric cancer	down	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.
mir-100	ovarian carcinoma	down	Prognostic implications of microRNA-100 and its functional roles in human epithelial ovarian cancer.	mir-18a	colon cancer	up	MicroRNA-18a Attenuates DNA Damage Repair through Suppressing the Expression of Ataxia Telangiectasia Mutated in Colorectal Cancer.	mir-30a-5p	glioma	up	Analysis of miR-30a-5p Expression in Human Gliomas.
mir-100	prostate cancer	down	Loss of miR-100 enhances migration, invasion, epithelial-mesenchymal transition and stemness properties in prostate cancer cells through targeting Argonaute 2.	mir-18a	colorectal cancer	up	microRNA expression profile in stage III colorectal cancer: Circulating miR-18a and miR-29a as promising biomarkers.	mir-30a-5p	head and neck squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.
mir-100	renal cell carcinoma	up	Overexpression of microRNA-100 predicts an unfavorable prognosis in renal cell carcinoma.	mir-18a	colorectal cancer	up	Plasma miR-200c and miR-18a as potential biomarkers for the detection of colorectal carcinoma.	mir-30b	colorectal cancer	down	MiR-30b regulates migration and invasion of human colorectal cancer via SIX1.
mir-101	bladder cancer	down	MicroRNA-101 suppresses motility of bladder cancer cells by targeting c-Met.	mir-18a	colorectal cancer	down	miR-18a Inhibits CDC42 and Plays a Tumour Suppressor Role in Colorectal Cancer Cells.	mir-30b	esophageal cancer	down	Differential expression of miRNAs in esophageal cancer tissue.
mir-101	bladder cancer	down	miR-101 Suppresses Vascular Endothelial Growth Factor C That Inhibits Migration and Invasion and Enhances Cisplatin Chemosensitivity of Bladder Cancer Cells.	mir-18a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-30b	gastric cancer	down	miR-30b, Down-Regulated in Gastric Cancer, Promotes Apoptosis and Suppresses Tumor Growth by Targeting Plasminogen Activator Inhibitor-1.
mir-101	cervical carcinoma	down	MicroRNA-101 inhibits cell proliferation, invasion, and promotes apoptosis by regulating cyclooxygenase-2 in Hela cervical carcinoma cells.	mir-18a	esophageal squamous cell carcinoma	up		mir-30b	medulloblastoma	up	Amplification and overexpression of miR-30b, miR-30d and KHDRBS3 at 8q24.22-q24.23 in medulloblastoma.
mir-101	cholangiocarcinoma	down	miR-101 inhibits cholangiocarcinoma angiogenesis through targeting vascular endothelial growth factor (VEGF).	mir-18a	esophageal squamous cell carcinoma	up	Clinical impact of circulating miR-18a in plasma of patients with oesophageal squamous cell carcinoma.	mir-30b	non-small cell lung cancer	down	MicroRNA-30b/c inhibits non-small cell lung cancer cell proliferation by targeting Rab18.
mir-101	colon cancer	down	Loss of miR-101 Expression Promotes Wnt/beta-Catenin Signalling Pathway	mir-18a	gastric cancer	up	Diagnostic and prognostic value of circulating miR-18a in the plasma of patients with gastric cancer.	mir-30b	prostate cancer	down	miR-30 as a tumor suppressor connects EGF/Src signal to ERG and EMT.

			Activation and Malignancy in Colon Cancer Cells.								
mir-101	colon cancer	down	MicroRNA-455 inhibits proliferation and invasion of colorectal cancer by targeting RAF proto-oncogene serine/threonine-protein kinase.	mir-18a	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-30b-5p	pancreatic ductal adeno-carcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-101	colorectal cancer	down	Gene module based regulator inference identifying miR-139 as a tumor suppressor in colorectal cancer.	mir-18a	glioblastoma	up	MiR-18a regulates the proliferation, migration and invasion of human glioblastoma cell by targeting neogenin.	mir-30c	acute myeloid leukemia	down	Transcription factor C/EBP?-induced microRNA-30c inactivates Notch1 during granulopoiesis and is downregulated in acute myeloid leukemia.
mir-101	endometrial cancer	down	MicroRNA-101 targets EZH2, MCL-1 and FOS to suppress proliferation, invasion and stem cell-like phenotype of aggressive endometrial cancer cells.	mir-18a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.	mir-30c	endometrial cancer	down	microRNA-30c negatively regulates endometrial cancer cells by targeting metastasis-associated gene-1.
mir-101	endometrial cancer	down	MicroRNA-101 targets EZH2, MCL-1 and FOS to suppress proliferation, invasion and stem cell-like phenotype of aggressive endometrial cancer cells.	mir-18a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.	mir-30c	endometrial cancer	down	Estrogen regulates the tumour suppressor MiRNA-30c and its target gene, MTA-1, in endometrial cancer.
mir-101	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-18a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-30c	non-small cell lung cancer	down	MicroRNA-30b/c inhibits non-small cell lung cancer cell proliferation by targeting Rab18.
mir-101	esophageal squamous cell carcinoma	down	miR-101 suppresses tumor proliferation and migration, and induces apoptosis by targeting EZH2 in esophageal cancer cells.	mir-18a	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-30c	non-small cell lung cancer	down	Low expression of microRNA-30c promotes invasion by inducing epithelial mesenchymal transition in non-small cell lung cancer.
mir-101	gastric cancer	down	MicroRNA-101 is down-regulated in gastric cancer and involved in cell migration and invasion.	mir-18a	malignant melanoma	up	Altered expression of selected microRNAs in melanoma: antiproliferative and proapoptotic activity of miRNA-155.	mir-30c	renal cell carcinoma	down	Hypoxia-induced downregulation of miR-30c promotes epithelial-mesenchymal transition in human renal cell carcinoma.
mir-101	gastric cancer	down	MicroRNA-101 is down-regulated in gastric cancer and involved in cell migration and invasion.	mir-18a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.	mir-30c-1	prostate cancer	down	miR-30 as a tumor suppressor connects EGF/Src signal to ERG and EMT.

mir-101	gastric cancer	down	Lack of microRNA-101 causes E-cadherin functional deregulation through EZH2 up-regulation in intestinal gastric cancer.	mir-18a	medullo-blastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.	mir-30c-2	prostate cancer	down	miR-30 as a tumor suppressor connects EGF/Src signal to ERG and EMT.
mir-101	gastric cancer	down	Down-regulation of miR-101 in gastric cancer correlates with COX-2 overexpression and tumor growth.	mir-18a	naso-pharyngeal carcinoma	up	miR-18a promotes malignant progression by impairing microRNA biogenesis in nasopharyngeal carcinoma	mir-30d	hepato-cellular carcinoma	up	MicroRNA-30d promotes tumor invasion and metastasis by targeting Galphai2 in hepatocellular carcinoma.
mir-101	glioblastoma	down	miR-101 is down-regulated in glioblastoma resulting in EZH2-induced proliferation, migration, and angiogenesis.	mir-18a	neuro-blastoma	up	MYCN-regulated microRNAs repress estrogen receptor-alpha (ESR1) expression and neuronal differentiation in human neuroblastoma.	mir-30d	lung cancer	up	Evaluation of dynamic change of serum miR-21 and miR-24 in pre- and post-operative lung carcinoma patients.
mir-101	glioblastoma	down	Expression of 19 microRNAs in glioblastoma and comparison with other brain neoplasia of grades I-III.	mir-18a	non-small cell lung cancer	up	Peripheral Blood miR-328 Expression as a Potential Biomarker for the Early Diagnosis of NSCLC.	mir-30d	medullo-blastoma	up	Amplification and overexpression of miR-30b, miR-30d and KHDRBS3 at 8q24.22-q24.23 in medulloblastoma.
mir-101	hepatocellular carcinoma	down	MicroRNA-101 inhibits human hepatocellular carcinoma progression through EZH2 downregulation and increased cytostatic drug sensitivity.	mir-18a	osteo-sarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.	mir-30d	non-small cell lung cancer	down	Clinical evaluation of microRNA expression profiling in non small cell lung cancer.
mir-101	hepatocellular carcinoma	down	Systemic Delivery of MicroRNA-101 Potently Inhibits Hepatocellular Carcinoma In Vivo by Repressing Multiple Targets.	mir-18a	pancreatic cancer	up	Novel diagnostic value of circulating miR-18a in plasma of patients with pancreatic cancer	mir-30d	prostate cancer	down	miR-30 as a tumor suppressor connects EGF/Src signal to ERG and EMT.
mir-101	hepatocellular carcinoma	down	PI3Calpha mediated induction of miR-101 in human hepatoma HepG2 cells.	mir-18a	pancreatic ductal adeno-carcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.	mir-30d	prostate cancer	down	Downregulation of miR-221, -30d, and -15a contributes to pathogenesis of prostate cancer by targeting Bmi-1.
mir-101	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-18a	prostate cancer	up	MicroRNA-18a is elevated in prostate cancer and promotes tumorigenesis through suppressing STK4 in vitro and in vivo.	mir-30d	renal cell carcinoma	down	Proliferation inhibition and the underlying molecular mechanisms of microRNA-30d in renal carcinoma cells.
mir-101	hepatocellular carcinoma	down	miR-101 inhibits autophagy and enhances cisplatin-induced apoptosis in hepatocellular carcinoma cells.	mir-18b	breast cancer	up	microRNA-18b is upregulated in breast cancer and modulates genes involved in cell migration.	mir-30d-5p	non-small cell lung cancer	down	MicroRNA-30d-5p inhibits tumour cell proliferation and motility by directly targeting CCNE2 in non-small cell lung cancer.
mir-101	liver cancer	down	MiR-101 functions as a tumor suppressor by directly targeting nemo-like kinase in liver cancer.	mir-18b	malignant melanoma	down	The Role of miR-18b in MDM2-p53 Pathway Signaling and Melanoma Progression.	mir-30e	chronic myelo-genous leukemia	down	MiR-30e induces apoptosis and sensitizes K562 cells to imatinib treatment via regulation of the BCR-ABL.

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mir-101	lung cancer	down	microRNA-101 inhibits lung cancer invasion through the regulation of enhancer of zeste homolog 2.	mir-190b	hepato-cellular carcinoma	up	Up-Regulation of MicroRNA-190b Plays a Role for Decreased IGF-1 That Induces Insulin Resistance in Human Hepatocellular Carcinoma.	mir-30e	glioma	up	Ionizing radiation-inducible miR-30e promotes glioma cell invasion through EGFR stabilization by directly targeting CBL-B.
mir-101	malignant melanoma	down	MiR-101 inhibits melanoma cell invasion and proliferation by targeting MITF and EZH2.	mir-191	breast cancer	up	Differential expression of miR-21, miR-125b and miR-191 in breast cancer tissue.	mir-30e	prostate cancer	down	miR-30 as a tumor suppressor connects EGF/Src signal to ERG and EMT.
mir-101	naso-pharyngeal carcinoma	down	miR-101 sensitizes human nasopharyngeal carcinoma cells to radiation by targeting stathmin 1.	mir-191	breast cancer	down	Estrogen mediated-activation of miR-191/425 cluster modulates tumorigenicity of breast cancer cells depending on estrogen receptor status.	mir-30e*	glioma	up	MicroRNA-30e* promotes human glioma cell invasiveness in an orthotopic xenotransplantation model by disrupting the NF-?B/I?B? negative feedback loop.
mir-101	non-small cell lung cancer	down	MicroRNA-101 exerts tumor-suppressive functions in non-small cell lung cancer through directly targeting enhancer of zeste homolog 2.	mir-191	breast cancer	up	HIF-inducible miR-191 promotes migration in breast cancer through complex regulation of TGF?-signaling in hypoxic microenvironment.	mir-30e-5p	non-small cell lung cancer	down	Clinical evaluation of microRNA expression profiling in non small cell lung cancer.
mir-101	non-small cell lung cancer	down	MiR-101 and Mcl-1 in non-small-cell lung cancer: expression profile and clinical significance.	mir-191	colorectal cancer	down	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-31	breast cancer	down	Concurrent suppression of integrin alpha5, radixin, and RhoA phenocopies the effects of miR-31 on metastasis.
mir-101	osteosarcoma	down	Effect of microRNA-101 on proliferation and apoptosis of human osteosarcoma cells by targeting mTOR.	mir-191	colorectal cancer	up	miR-191 promotes tumorigenesis of human colorectal cancer through targeting C/EBP?.	mir-31	breast cancer	down	miR-31 and its host gene lncRNA LOC554202 are regulated by promoter hypermethylation in triple-negative breast cancer.
mir-101	ovarian carcinoma	down	MiR-101 suppresses the epithelial-to-mesenchymal transition by targeting ZEB1 and ZEB2 in ovarian carcinoma.	mir-191	colorectal carcinoma	up	MicroRNA-191 correlates with poor prognosis of colorectal carcinoma and plays multiple roles by targeting tissue inhibitor of metalloprotease 3.	mir-31	cervical cancer	up	miR-31 functions as an oncogene in cervical cancer.
mir-101	pancreatic cancer	down	miRNA-101 suppresses epithelial-to-mesenchymal transition by targeting HMGA2 in pancreatic cancer cells.	mir-191	colorectal carcinoma	up	MicroRNA-191 correlates with poor prognosis of colorectal carcinoma and plays multiple roles by targeting tissue inhibitor of metalloprotease 3.	mir-31	cervical cancer	up	MiR-31 is an independent prognostic factor and functions as an oncomir in cervical cancer via targeting ARID1A.
mir-101	papillary thyroid carcinoma	down	miR-101 inhibits cell proliferation by targeting Rac1 in papillary thyroid carcinoma.	mir-191	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-31	chordoma	down	MicroRNA expression profiling reveals the potential function of microRNA-31 in chordomas.

mir-101	papillary thyroid carcinoma	down	microRNA-101 suppresses migration and invasion by targeting Rac1 in thyroid cancer cells.	mir-191	hepato-cellular carcinoma	up	Hypomethylation of the miR-191 locus causes high expression of mir-191 and promotes the epithelial-to-mesenchymal transition in hepatocellular carcinoma.	mir-31	chronic myelo-genous leukemia	down	Downregulation of miR-31, miR-155, and miR-564 in chronic myeloid leukemia cells.
mir-101	prostate cancer	down	Enforced expression of miR-101 inhibits prostate cancer cell growth by modulating the COX-2 pathway in vivo.	mir-191	osteo-sarcoma	up	MicroRNA-199a-3p is downregulated in human osteosarcoma and regulates cell proliferation and migration.	mir-31	colon cancer	up	The tumor suppressor gene RhoBTB1 is a novel target of miR-31 in human colon cancer.
mir-101	retino-blastoma	down	miR-101, downregulated in retinoblastoma, functions as a tumor suppressor in human retinoblastoma cells by targeting EZH2.	mir-191	osteo-sarcoma	up	MicroRNA-191 promotes osteosarcoma cells proliferation by targeting checkpoint kinase 2.	mir-31	colorectal cancer	up	MicroRNA signatures: novel biomarker for colorectal cancer?
mir-103	colorectal cancer	up	PER3, a novel target of miR-103, plays a suppressive role in colorectal cancer in vitro.	mir-191	pancreatic cancer	up	MicroRNA-191 promotes pancreatic cancer progression by targeting USP10.	mir-31	colorectal cancer	up	Expression of miR-21, miR-31, miR-96 and miR-135b is correlated with the clinical parameters of colorectal cancer.
mir-103	colorectal cancer	up	MicroRNA-103 Promotes Colorectal Cancer by Targeting Tumor Suppressor DICER and PTEN.	mir-192	bladder cancer	down	Expression of microRNAs in the Urine of Patients With Bladder Cancer.	mir-31	colorectal cancer	up	Elevated microRNA-31 expression regulates colorectal cancer progression by repressing its target gene SATB2.
mir-103	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-192	bladder cancer	down	Regulation of growth of human bladder cancer by miR-192.	mir-31	colorectal cancer	up	Identification of microRNA-135b in Stool as a Potential Noninvasive Biomarker for Colorectal Cancer and Adenoma.
mir-103a	gastric cancer	down	MicroRNA-103a inhibits gastric cancer cell proliferation, migration and invasion by targeting c-Myb.	mir-192	colon cancer	down	Prognostic significance of miR-215 in colon cancer.	mir-31	colorectal cancer	up	Clinicopathological significance of microRNA-31, -143 and -145 expression in colorectal cancer.
mir-103a-3p	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-192	colorectal cancer	down	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-31	colorectal cancer	up	SATB1 and 2 in colorectal cancer.
mir-105	hepatocellular carcinoma	down	MicroRNA-105 suppresses cell proliferation and inhibits PI3K/AKT signaling in human hepatocellular carcinoma.	mir-192	colorectal cancer	down	microRNA-192, -194 and -215 are frequently downregulated in colorectal cancer.	mir-31	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.
mir-105	prostate cancer	down	miR-105 Inhibits Prostate Tumour Growth by Suppressing CDK6 Levels.	mir-192	epithelial ovarian cancer	down	Gain-of-function microRNA screens identify miR-193a regulating proliferation and apoptosis in epithelial ovarian cancer cells.	mir-31	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.
mir-106a	cervical squamous cell carcinoma	down	MiRNAs and their association with locoregional staging and survival following surgery	mir-192	gastric cancer	up	MicroRNA-192 and -215 are upregulated in human gastric cancer in vivo and suppress ALCAM expression in vitro.	mir-31	esophageal squamous cell carcinoma	up	The oncogenetic role of microRNA-31 as a potential biomarker in oesophageal squamous cell

			for esophageal carcinoma.								carcinoma.
mir-106a	colorectal cancer	up	[Expression of plasma miR-106a in colorectal cancer and its clinical significance]	mir-192	gastric cancer	up	Plasma miR-122 and miR-192 as potential novel biomarkers for the early detection of distant metastasis of gastric cancer.	mir-31	gastric cancer	down	Down-regulation of miR-31 expression in gastric cancer tissues and its clinical significance.
mir-106a	colorectal cancer	up	Candidate microRNA biomarkers in human colorectal cancer: Systematic review profiling studies and experimental validation.	mir-192	gastric cancer	up	MiR-215/192 participates in gastric cancer progression.	mir-31	glioblastoma	down	Human miR-31 targets radixin and inhibits migration and invasion of glioma cells.
mir-106a	endometrial cancer	up	TSA Suppresses miR-106b-93-25 Cluster Expression through Downregulation of MYC and Inhibits Proliferation and Induces Apoptosis in Human EMC.	mir-192	lung cancer	down	MicroRNA-192 targeting retinoblastoma 1 inhibits cell proliferation and induces cell apoptosis in lung cancer cells.	mir-31	glioblastoma	down	Expression of 19 microRNAs in glioblastoma and comparison with other brain neoplasia of grades I-III.
mir-106a	gastric cancer	up	Circulating microRNAs in plasma of patients with gastric cancers.	mir-192	pancreatic ductal adeno-carcinoma	up	Diagnostic and biological significance of microRNA-192 in pancreatic ductal adenocarcinoma.	mir-31	head and neck squamous cell carcinoma	up	Co-targeting of multiple microRNAs on factor-inhibiting hypoxia-inducible factor (FIH) gene for the pathogenesis of head and neck carcinomas.
mir-106a	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-193a	epithelial ovarian cancer	down	Gain-of-function microRNA screens identify miR-193a regulating proliferation and apoptosis in epithelial ovarian cancer cells.	mir-31	hepato-cellular carcinoma	up	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno
mir-106a	gastric cancer	up	miR-106a is frequently upregulated in gastric cancer and inhibits the extrinsic apoptotic pathway by targeting FAS.	mir-193a-3p	breast cancer	down	Global microRNA level regulation of EGFR-driven cell-cycle protein network in breast cancer.	mir-31	liver cancer	down	MicroRNA-31 functions as a tumor suppressor by regulating cell cycle and epithelial-mesenchymal transition regulatory proteins in liver cancer.
mir-106a	gastric cancer	up	Prognostic impact of circulating miR-21 in the plasma of patients with gastric carcinoma.	mir-193a-3p	lung cancer	down	miR-193a-3p functions as a tumor suppressor in lung cancer by downregulating ERBB4.	mir-31	lung adeno-carcinoma	up	MicroRNA-31 Predicts the Presence of Lymph Node Metastases and Survival in Patients with Lung Adenocarcinoma.
mir-106a	gastric cancer	up	miR-106a confers cisplatin resistance by regulating PTEN/Akt pathway in gastric cancer cells.	mir-193a-3p	renal cell carcinoma	up	A panel of five serum miRNAs as a potential diagnostic tool for early-stage renal cell carcinoma.	mir-31	malignant melanoma	down	Genetic and epigenetic loss of microRNA-31 leads to feed-forward expression of EZH2 in melanoma.
mir-106a	gastric cancer	up	MicroRNA-106a targets TIMP2 to regulate invasion and metastasis of gastric cancer.	mir-193a-5p	colorectal cancer	down	Downregulation of miR-193a-5p correlates with lymph node metastasis and poor prognosis in colorectal cancer.	mir-31	malignant melanoma	down	Regulation of cancer aggressive features in melanoma cells by microRNAs.

mir-106a	glioblastoma	down	Decreased miR-106a inhibits glioma cell glucose uptake and proliferation by targeting SLC2A3 in GBM.	mir-193b	breast cancer	down	Downregulation of miR-193b contributes to enhance urokinase-type plasminogen activator (uPA) expression and tumor progression and invasion in human breast cancer.	mir-31	medullo-blastoma	down	MicroRNA-31 suppresses medulloblastoma cell growth by inhibiting DNA replication through minichromosome maintenance 2.
mir-106a	glioma	down	MiR-106a inhibits glioma cell growth by targeting E2F1 independent of p53 status.	mir-193b	breast cancer	cell lines: MDA-MB-231, mCF-7;	Tumor suppressive microRNA-193b promotes breast cancer progression via targeting DNAJC13 and RAB22A.	mir-31	non-small cell lung cancer	up	Use of Luminex xMAP bead-based suspension array for detecting microRNA in NSCLC tissues and its clinical application
mir-106a	non-small cell lung cancer	down	Circulating micro-RNA expression profiles in early stage nonsmall cell lung cancer.	mir-193b	glioma	up	miR-193b promotes cell proliferation by targeting Smad3 in human glioma.	mir-31	oral carcinoma	up	Exploiting salivary miR-31 as a clinical biomarker of oral squamous cell carcinoma
mir-106a	ovarian cancer	up	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.	mir-193b	hepato-cellular carcinoma	down	miR-193b acts as a cisplatin sensitizer via the caspase-3-dependent pathway in HCC chemotherapy.	mir-31	oral carcinoma	up	Dysregulation of miR-31 and miR-375 expression is associated with clinical outcomes in oral carcinoma
mir-106a*	renal cell carcinoma	down	miR-106a* inhibits the proliferation of renal carcinoma cells by targeting IRS-2.	mir-193b	malignant melanoma	up	miR-193b Regulates Mcl-1 in Melanoma.	mir-31	oral squamous cell carcinoma	up	miR-31 is up-regulated in oral premalignant epithelium and contributes to the immortalization of normal oral keratinocytes.
mir-106a-5p	clear cell renal cell cancer	down	Exploring the miRNA-mRNA regulatory network in clear cell renal cell carcinomas by next-generation sequencing expression profiles.	mir-193b	malignant melanoma	down	Stathmin 1 is a potential novel oncogene in melanoma.	mir-31	oral squamous cell carcinoma	up	EGF up-regulates miR-31 through the C/EBP? signal cascade in oral carcinoma.
mir-106b	gastric cancer	up	Circulating microRNAs in plasma of patients with gastric cancers.	mir-193b	non-small cell lung cancer	down	MicroRNA-193b modulates proliferation, migration, and invasion of non-small cell lung cancer cells.	mir-31	pancreatic ductal adeno-carcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-106b	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-193b	primary cns lymphomas	down	Differential micro-RNA expression in primary CNS and nodal diffuse large B-cell lymphomas.	mir-31	prostate cancer	down	Downregulation of miR-205 and miR-31 confers resistance to chemotherapy-induced apoptosis in prostate cancer cells.
mir-106b	gastric cancer	up	Prognostic impact of circulating miR-21 in the plasma of patients with gastric carcinoma.	mir-194	colorectal cancer	down	microRNA-192, -194 and -215 are frequently downregulated in colorectal cancer.	mir-31	prostate cancer	up	Screening Biomarkers of Prostate Cancer by Integrating microRNA and mRNA Microarrays
mir-106b	glioma	up	Down-regulation of miR-106b suppresses the growth of human glioma cells.	mir-194	colorectal cancer	down	MiR-194, commonly repressed in colorectal cancer, suppresses tumor growth by regulating the MAP4K4/c-Jun/MDM2 signaling pathway.	mir-31	prostate cancer	down	Polycomb protein EZH2 suppresses apoptosis by silencing the proapoptotic miR-31.

mir-106b	head and neck squamous cell carcinoma	up	Comprehensive MicroRNA profiling for head and neck squamous cell carcinomas.	mir-194	gastric cancer	down	miR-194 targets RBX1 gene to modulate proliferation and migration of gastric cancer cells.	mir-3127	hepato-cellular carcinoma	up	MicroRNA-3127 promotes cell proliferation and tumorigenicity in hepatocellular carcinoma by disrupting of PI3K/AKT negative regulation.
mir-106b	hepatocellular carcinoma	up	Over-expression of miR-106b promotes cell migration and metastasis in hepatocellular carcinoma by activating epithelial-mesenchymal transition process.	mir-194	gastric cancer	down	MicroRNA-194 Inhibits the Epithelial-Mesenchymal Transition in Gastric Cancer Cells by Targeting FoxM1.	mir-3189-3p	astrocytoma	down	Anti-Tumoral Effects of miR-3189-3p in Glioblastoma.
mir-106b	hepatocellular carcinoma	up	Upregulation of microRNA-106b is associated with poor prognosis in hepatocellular carcinoma.	mir-194	lung cancer	down	miR-194 suppresses metastasis of non-small cell lung cancer through regulating expression of BMP1 and p27(kip1.)	mir-3189-3p	glioblastoma	down	Anti-Tumoral Effects of miR-3189-3p in Glioblastoma.
mir-106b	laryngeal carcinoma	up	MiR-106b promotes cell proliferation via targeting RB in laryngeal carcinoma.	mir-194	osteosarcoma	down	microRNA-194 suppresses osteosarcoma cell proliferation and metastasis in vitro and in vivo by targeting CDH2 and IGF1R.	mir-32	acute myeloid leukemia	up	MicroRNA-32 upregulation by 1,25-dihydroxyvitamin D3 in human myeloid leukemia cells leads to Bim targeting and inhibition of AraC-induced apoptosis.
mir-106b	laryngeal carcinoma	up	MicroRNA-106b regulates the tumor suppressor RUNX3 in laryngeal carcinoma cells.	mir-194	pancreatic ductal adeno-carcinoma	up	Upregulation of miR-194 contributes to tumor growth and progression in pancreatic ductal adenocarcinoma.	mir-32	colorectal cancer	up	The relationship between and clinical significance of MicroRNA-32 and phosphatase and tensin homologue expression in colorectal cancer.
mir-106b	medullo-blastoma	up	miR-106b is overexpressed in medulloblastomas and interacts directly with PTEN.	mir-195	adrenal cortical carcinoma	down	miR-195 and miR-483-5p Identified as Predictors of Poor Prognosis in Adrenocortical Cancer.	mir-32	hepato-cellular carcinoma	up	MiR-32 induces cell proliferation, migration, and invasion in hepatocellular carcinoma by targeting PTEN.
mir-106b	pituitary carcinoma	up	MicroRNA involvement in a metastatic non-functioning pituitary carcinoma.	mir-195	adrenal cortical carcinoma	down	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma.	mir-32	non-small cell lung cancer	down	Tanshinones suppress AURKA through up-regulation of miR-32 expression in non-small cell lung cancer.
mir-106b-5p	glioma	up	MicroRNA-106b-5p boosts glioma tumorigenesis by targeting multiple tumor suppressor genes.	mir-195	bladder cancer	down	Cyclin-dependent kinase 4 is a novel target in micoRNA-195-mediated cell cycle arrest in bladder cancer cells.	mir-32	non-small cell lung cancer	down	Expression of miR-32 in human non-small cell lung cancer and its correlation with tumor progression and patient survival.
mir-107	acute promyelocytic leukemia	down	A restricted signature of miRNAs distinguishes APL blasts from normal promyelocytes.	mir-195	breast cancer	down	Analysis of MiR-195 and MiR-497 expression, regulation and role in breast cancer.	mir-32	oral squamous cell carcinoma	down	MiR-32 functions as a tumor suppressor and directly targets EZH2 in human oral squamous cell carcinoma.
mir-107	breast cancer	down	MiRNA-107 inhibits proliferation and migration by targeting CDK8 in breast cancer.	mir-195	breast cancer	down	Upregulation of miR-195 increases the sensitivity of breast cancer cells to Adriamycin treatment through inhibition of	mir-32	osteosarcoma	down	MicroRNA-32 inhibits osteosarcoma cell proliferation and invasion by targeting Sox9.

							Raf-1.				
mir-107	gastric cancer	up	MicroRNA-107 promotes proliferation of gastric cancer cells by targeting cyclin dependent kinase 8.	mir-195	breast cancer	down	Serum microRNA-195 is down-regulated in breast cancer: a potential marker for the diagnosis of breast cancer.	mir-320	colon cancer	down	miR-320 enhances the sensitivity of human colon cancer cells to chemoradiotherapy in vitro by targeting FOXM1.
mir-107	gastric cancer	up	MicroRNA-107, an oncogene microRNA that regulates tumour invasion and metastasis by targeting DICER1 in gastric cancer.	mir-195	chronic lymphocytic leukemia	down	miR-15 and miR-16 induce apoptosis by targeting BCL2.	mir-320	glioblastoma	down	miRNA microarray reveals specific expression in the peripheral blood of glioblastoma patients.
mir-107	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-195	chronic lymphocytic leukemia	down	Defective DROSHA processing contributes to downregulation of MiR-15/-16 in chronic lymphocytic leukemia.	mir-320	glioma	down	MicroRNA-320 inhibits cell proliferation in glioma by targeting E2F1.
mir-107	gastric cancer	up	Upregulation of MicroRNA-107 induces proliferation in human gastric cancer cells by targeting the transcription factor FOXO1.	mir-195	colorectal cancer	down	microRNA-195 promotes apoptosis and suppresses tumorigenicity of human colorectal cancer cells.	mir-320	osteosarcoma	down	MicroRNA-320 inhibits osteosarcoma cells proliferation by directly targeting fatty acid synthase.
mir-107	glioma	down	P53-induced microRNA-107 inhibits proliferation of glioma cells and down-regulates the expression of CDK6 and Notch-2.	mir-195	colorectal cancer	down	Downregulation of miR-195 correlates with lymph node metastasis and poor prognosis in colorectal cancer.	mir-320a	colon cancer	down	
mir-107	glioma	down	MicroRNA-107 inhibits glioma cell migration and invasion by modulating Notch2 expression.	mir-195	colorectal cancer	down	MicroRNA-195 inhibits colorectal cancer cell proliferation, colony-formation and invasion through targeting CARMA3.	mir-320a	colorectal cancer	down	
mir-107	glioma	down	Low-expression of microRNA-107 inhibits cell apoptosis in glioma by upregulation of SALL4.	mir-195	esophageal squamous cell carcinoma	down	Differential expression of miR-195 in esophageal squamous cell carcinoma and miR-195 expression inhibits tumor cell proliferation and invasion by targeting of Cdc42.	mir-320a	colorectal cancer	down	miR-320a suppresses colorectal cancer progression by targeting Rac1.
mir-107	head and neck squamous cell carcinoma	down	microRNA-107 functions as a candidate tumor-suppressor gene in head and neck squamous cell carcinoma by downregulation of protein kinase C?	mir-195	gastric cancer	down	MicroRNA-195 and microRNA-378 mediate tumor growth suppression by epigenetical regulation in gastric cancer.	mir-320a	colorectal cancer	down	[Corrigendum] microRNA-320a inhibits tumor invasion by targeting neuropilin 1 and is associated with liver metastasis in colorectal cancer.
mir-107	head and neck squamous cell carcinoma	down	Lipid-based nanoparticle delivery of Pre-miR-107 inhibits the tumorigenicity of head and neck squamous cell carcinoma.	mir-195	glioblastoma	down	MicroRNA-195 plays a tumor-suppressor role in human glioblastoma cells by targeting signaling pathways involved in cellular proliferation and invasion.	mir-320a	glioblastoma	down	MicroRNA-320a suppresses in GBM patients and modulates glioma cell functions by targeting IGF-1R.

mir-107	non-small cell lung cancer	down	Clinicopathological and prognostic significance of microRNA-107 in human non small cell lung cancer.	mir-195	glioma	down	MicroRNA-195 Inhibits the Proliferation of Human Glioma Cells by Directly Targeting Cyclin D1 and Cyclin E1.	mir-320a	naso-pharyngeal carcinoma	down	MicroRNA-320a inhibits cell proliferation, migration and invasion by targeting BMI-1 in nasopharyngeal carcinoma.
mir-107	prostate carcinoma	down	Dysregulation of the mitogen granulin in human cancer through the miR-15/107 microRNA gene group.	mir-195	hepato-cellular carcinoma	down	MicroRNA-195 suppresses angiogenesis and metastasis of hepatocellular carcinoma by inhibiting the expression of VEGF, VAV2 and CDC42.	mir-320a	osteosarcoma	up	Identification of a plasma four-microRNA panel as potential noninvasive biomarker for osteosarcoma.
mir-10a	breast cancer	down	MicroRNA-10a is reduced in breast cancer and regulated in part through retinoic acid.	mir-195	hepato-cellular carcinoma	down	MicroRNA-195 acts as a tumor suppressor by directly targeting Wnt3a in HepG2 hepatocellular carcinoma cells.	mir-320b	colorectal cancer	up	MicroRNA-320b promotes colorectal cancer proliferation and invasion by competing with its homologous microRNA-320a.
mir-10a	cervical cancer	up	MicroRNA-10a targets CHL1 and promotes cell growth, migration and invasion in human cervical cancer cells.	mir-195	hepato-cellular carcinoma	down	microRNA-195 functions as a tumor suppressor by inhibiting CBX4 in hepatocellular carcinoma.	mir-320c	bladder cancer	down	MicroRNA-320c inhibits tumorous behaviors of bladder cancer by targeting Cyclin-dependent kinase 6.
mir-10a	chronic myelogenous leukemia	down	Down-regulation of miR-10a in chronic myeloid leukemia CD34+ cells increases USF2-mediated cell growth.	mir-195	lung cancer	down	Histone deacetylases inhibitor trichostatin A increases the expression of Dleu2/miR-15a/16-1 via HDAC3 in non-small cell lung cancer.	mir-323-5p	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer.
mir-10a	gastric cancer	up	miRNA expression profile in primary gastric cancers and paired lymph node metastases indicates that miR-10a plays a role in metastasis from primary gastric cancer to lymph nodes.	mir-195	lung cancer	down	MiR-195 suppresses non-small cell lung cancer by targeting CHEK1.	mir-324-3p	naso-pharyngeal carcinoma	down	[The expression and significance of miRNA-324-3p and WNT2B in nasopharyngeal carcinoma].
mir-10a	gastric cancer	down	MicroRNA-10a Is Down-Regulated by DNA Methylation and Functions as a Tumor Suppressor in Gastric Cancer Cells.	mir-195	neuro-blastoma	up	miR-15a/16-1 enhances retinoic acid-mediated differentiation of leukemic cells and is up-regulated by retinoic acid.	mir-324-3p	naso-pharyngeal carcinoma	down	MicroRNA-324-3p regulates nasopharyngeal carcinoma radioresistance by directly targeting WNT2B.
mir-10a	pancreatic cancer	up	MicroRNA-10a is overexpressed in human pancreatic cancer and involved in its invasiveness partially via suppression of the HOXA1 gene.	mir-195	non-small cell lung cancer	down	MiR-195 suppresses non-small cell lung cancer by targeting CHEK1.	mir-326	chronic myelogenous leukemia	down	Targeting of the signal transducer Smo links microRNA-326 to the oncogenic Hedgehog pathway in CD34(+) CML stem/progenitor cells.
mir-10b	bladder cancer	up	MicroRNA-10b promotes migration and invasion through KLF4 and HOXD10 in human bladder cancer.	mir-195	non-small cell lung cancer	down	MicroRNA-195 inhibits non-small cell lung cancer cell proliferation, migration and invasion by targeting MYB.	mir-326	colorectal cancer	up	MicroRNA-326 functions as a tumor suppressor in colorectal cancer by targeting the nin one binding protein.
mir-10b	breast cancer	down	Analysis of miR-205 and miR-155 expression in the blood of breast cancer patients.	mir-195	non-small cell lung cancer	down	miR-195 inhibits the growth and metastasis of NSCLC cells by targeting IGF1R.	mir-326	glioblastoma	down	Expression and clinical significance of microRNA-326 in human glioma miR-326 expression in glioma.

mir-10b	breast cancer	up	Exosome-mediated transfer of miR-10b promotes cell invasion in breast cancer.	mir-195	osteo-sarcoma	down	MicroRNA profiling identifies MiR-195 suppresses osteosarcoma cell metastasis by targeting CCND1.	mir-326	glioma	down	Targeting the SMO oncogene by miR-326 inhibits glioma biological behaviors and stemness.
mir-10b	colorectal cancer	up	MicroRNA-10b is upregulated and has an invasive role in colorectal cancer through enhanced Rhoc expression.	mir-195	osteo-sarcoma	down	microRNA-195 suppresses osteosarcoma cell invasion and migration in vitro by targeting FASN.	mir-326	glioma	down	The neuronal microRNA miR-326 acts in a feedback loop with notch and has therapeutic potential against brain tumors.
mir-10b	esophageal cancer	up	MicroRNA-10b promotes migration and invasion through KLF4 in human esophageal cancer cell lines.	mir-195	papillary thyroid carcinoma	down	microRNA-339-5p modulates Na+/I- symporter-mediated radioiodide uptake.	mir-326	glioma	down	MicroRNA-326 functions as a tumor suppressor in glioma by targeting the Nin one binding protein (NOB1).
mir-10b	gastric cancer	up	miR-10b promotes cell invasion through RhoC-AKT signaling pathway by targeting HOXD10 in gastric cancer.	mir-195-5p	hepato-cellular carcinoma	down	MicroRNA-195-5p acts as an anti-oncogene by targeting PHF19 in hepatocellular carcinoma.	mir-328	colorectal cancer	down	MicroRNA expression profiling identifies miR-328 regulates cancer stem cell-like SP cells in colorectal cancer.
mir-10b	gastric cancer	up	Clinicopathologic significance of miR-10b expression in gastric carcinoma.	mir-195-5p	osteo-sarcoma	up	Identification of a plasma four-microRNA panel as potential noninvasive biomarker for osteosarcoma.	mir-328	gastric cancer	down	Macrophage-derived reactive oxygen species suppress miR-328 targeting CD44 in cancer cells and promote redox adaptation.
mir-10b	gastric cancer	down	DNA methylation downregulated mir-10b acts as a tumor suppressor in gastric cancer.	mir-196a	breast cancer	up	MicroRNA-196a post-transcriptionally upregulates the UBE2C proto-oncogene and promotes cell proliferation in breast cancer.	mir-328	glioma	up	MiR-328 promotes glioma cell invasion via SFRP1-dependent Wnt-signaling activation.
mir-10b	glioblastoma	up	Oncogenic effects of miR-10b in glioblastoma stem cells.	mir-196a	cervical cancer	up	MicroRNA-196a promotes cervical cancer proliferation through the regulation of FOXO1 and p27(Kip1.).	mir-328	glioma	down	microRNA-328 is a favorable prognostic marker in human glioma via suppressing invasive and proliferative phenotypes of malignant cells.
mir-10b	glioblastoma	up	Expression of 19 microRNAs in glioblastoma and comparison with other brain neoplasia of grades I-III.	mir-196a	colorectal cancer	down	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-328	non-small cell lung cancer	up	Peripheral Blood miR-328 Expression as a Potential Biomarker for the Early Diagnosis of NSCLC.
mir-10b	glioma	up	MicroRNA-10b induces glioma cell invasion by modulating MMP-14 and uPAR expression via HOXD10.	mir-196a	colorectal cancer	up	Upregulation of microRNA-196a and microRNA-196b cooperatively correlate with aggressive progression and unfavorable prognosis in patients with colorectal cancer.	mir-329	gastric cancer	down	By downregulating TIAM1 expression, microRNA-329 suppresses gastric cancer invasion and growth.
mir-10b	hepatocellular carcinoma	up	miR-10b is overexpressed in hepatocellular carcinoma and promotes cell proliferation, migration and invasion through RhoC, uPAR and MMPs.	mir-196a	esophageal adeno-carcinoma	up	MicroRNAs in Barrett's esophagus and esophageal adenocarcinoma.	mir-329	oral squamous cell carcinoma	down	Downregulated miR-329 and miR-410 promote the proliferation and invasion of oral squamous cell carcinoma by targeting Wnt-7b.

mir-10b	hepatocellular carcinoma	up	MicroRNA-10b promotes migration and invasion through CADM1 in human hepatocellular carcinoma cells.	mir-196a	gastric cancer	up	MiR-196a Is Up-regulated in Gastric cancer and Promotes Cell proliferation by Down-regulating p27kip1.	mir-330	glioblastoma	down	Expression of 19 microRNAs in glioblastoma and comparison with other brain neoplasia of grades I-III.
mir-10b	lung cancer	up	microRNA miR-10b inhibition reduces cell proliferation and promotes apoptosis in non-small cell lung cancer (NSCLC) cells.	mir-196a	gastro-intestinal stromal tumor	up	Upregulation of miR-196a and HOTAIR Drive Malignant Character in Gastrointestinal Stromal Tumors.	mir-330	prostate cancer	down	MicroRNA-330 acts as tumor suppresser and induces apoptosis of prostate cancer cells through E2F1-mediated suppression of Akt phosphorylation.
mir-10b	naso-pharyngeal carcinoma	up	Over-expression of miR-10b in NPC patients: correlation with LMP1 and Twist1.	mir-196a	glioblastoma	up	MiR-196a exerts its oncogenic effect in glioblastoma multiforme by inhibition of I?B? both in vitro and in vivo.	mir-330	prostate cancer	down	microRNA-330 inhibits cell motility by downregulating Sp1 in prostate cancer cells.
mir-10b	naso-pharyngeal carcinoma	up	miR-10b Promotes Migration and Invasion in Nasopharyngeal Carcinoma Cells.	mir-196a	head and neck squamous cell carcinoma	up	MicroRNA-196a promotes an oncogenic effect in head and neck cancer cells by suppressing annexin A1 and enhancing radioresistance.	mir-330-3p	esophageal squamous cell carcinoma	up	MicroRNA-330-3p functions as an oncogene in human esophageal cancer by targeting programmed cell death 4.
mir-10b	non-small cell lung cancer	up	microRNA miR-10b inhibition reduces cell proliferation and promotes apoptosis in non-small cell lung cancer (NSCLC) cells.	mir-196a	non-small cell lung cancer	up	MicroRNA-196a promotes non-small cell lung cancer cell proliferation and invasion through targeting HOXA5.	mir-330-3p	non-small cell lung cancer	up	miR-330-3p controls cell proliferation by targeting early growth response 2 in non-small-cell lung cancer.
mir-10b	non-small cell lung cancer	up	MicroRNA-10b indicates a poor prognosis of non-small cell lung cancer and targets E-cadherin.	mir-196a	pancreatic cancer	up	MiR-196a Promotes Pancreatic Cancer Progression by Targeting Nuclear Factor Kappa-B-Inhibitor Alpha.	mir-331	acute myeloid leukemia	up	Expression of microRNA-331 can be used as a predictor for response to therapy and survival in acute myeloid leukemia patients.
mir-10b	oral cancer	up	Oncogenic function and early detection potential of miRNA-10b in oral cancer as identified by microRNA profiling.	mir-196a	pancreatic ductal adeno-carcinoma	up	MicroRNAs as diagnostic markers for pancreatic ductal adenocarcinoma and its precursor, pancreatic intraepithelial neoplasm.	mir-331-3p	gastric cancer	down	miRNA-331-3p directly targets E2F1 and induces growth arrest in human gastric cancer.
mir-10b	pancreatic cancer	up	MicroRNA-10b is overexpressed in pancreatic cancer, promotes its invasiveness, and correlates with a poor prognosis.	mir-196a	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.	mir-331-3p	glioblastoma	down	miR-331-3p regulates expression of neuropilin-2 in glioblastoma.
mir-10b	pancreatic cancer	up	MicroRNA-10b is overexpressed in pancreatic cancer.	mir-196a*	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-331-3p	hepatocellular carcinoma	up	Serum miR-182 and miR-331-3p as diagnostic and prognostic markers in patients with hepatocellular carcinoma.
mir-10b	pancreatic ductal adeno-carcinoma	up	microRNAs as markers of survival and chemoresistance in pancreatic ductal adenocarcinoma.	mir-196a-1	glioblastoma	up	MiRNA-196 is upregulated in glioblastoma but not in anaplastic astrocytoma and has prognostic significance.	mir-331-3p	prostate cancer	down	miR-331-3p regulates ERBB-2 expression and androgen receptor signaling in prostate cancer.

mir-10b	pancreatic ductal adeno-carcinoma	up	microRNA-10b enhances pancreatic cancer cell invasion by suppressing TIP30 expression and promoting EGF and TGF-? actions.	mir-196a-1	oral cancer	up	OncomiR-196 promotes an invasive phenotype in oral cancer through the NME4-JNK-TIMP1-MMP signaling pathway.	mir-331-3p	prostate cancer	down	Regulation of Expression of Deoxyhypusine Hydroxylase (DOHH), the Enzyme That Catalyzes the Activation of eIF5A, by miR-331-3p and miR-642-5p in Prostate Cancer Cells
mir-1179	colorectal cancer	up	MicroRNA expression profiles in human colorectal cancers with liver metastases	mir-196a-1	oral squamous cell carcinoma	up	miR-196a Overexpression and miR-196a2 Gene Polymorphism Are Prognostic Predictors of Oral Carcinomas.	mir-335	adrenal cortical carcinoma	down	miR-195 and miR-483-5p Identified as Predictors of Poor Prognosis in Adrenocortical Cancer
mir-1179	esophageal squamous cell carcinoma	up	miR-1179 promotes cell invasion through SLIT2/ROBO1 axis in esophageal squamous cell carcinoma.	mir-196a-2	glioblastoma	up	MiRNA-196 is upregulated in glioblastoma but not in anaplastic astrocytoma and has prognostic significance.	mir-335	astrocytoma	up	Targeting oncogenic miR-335 inhibits growth and invasion of malignant astrocytoma cells.
mir-1180	bladder cancer	down	Up-regulation of p21(WAF1/CIP1) by miRNAs and its implications in bladder cancer cells	mir-196a-2	oral cancer	up	OncomiR-196 promotes an invasive phenotype in oral cancer through the NME4-JNK-TIMP1-MMP signaling pathway.	mir-335	breast cancer	down	MicroRNA-335 inhibits tumor reinitiation and is silenced through genetic and epigenetic mechanisms in human breast cancer.
mir-1181	pancreatic cancer	down	MiR-1181 inhibits stem cell-like phenotypes and suppresses SOX2 and STAT3 in human pancreatic cancer	mir-196a-2	oral squamous cell carcinoma	up	miR-196a Overexpression and miR-196a2 Gene Polymorphism Are Prognostic Predictors of Oral Carcinomas.	mir-335	breast cancer	down	Analysis of miR-205 and miR-155 expression in the blood of breast cancer patients.
mir-1207-5p	gastric cancer	down	miR-1207-5p and miR-1266 suppress gastric cancer growth and invasion by targeting telomerase reverse transcriptase.	mir-196a-5p	gastric cancer	up	Clinical significance of upregulation of mir-196a-5p in gastric cancer and enriched KEGG pathway analysis of target genes.	mir-335	breast cancer	down	MiR-335 inhibits migration of breast cancer cells through targeting oncoprotein c-Met.
mir-122	breast cancer	down	MiR-122 Inhibits Cell Proliferation and Tumorigenesis of Breast Cancer by Targeting IGF1R	mir-196b	colorectal cancer	up	Upregulation of microRNA-196a and microRNA-196b cooperatively correlate with aggressive progression and unfavorable prognosis in patients with colorectal cancer.	mir-335	cervical cancer	down	MicroRNA-335 represents an independent prognostic marker in cervical cancer.
mir-122	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122	mir-196b	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-335	chondro-sarcoma	down	Analysis of microRNAs expressions in chondrosarcoma.
mir-122	gastric cancer	down	Plasma miR-122 and miR-192 as potential novel biomarkers for the early detection of distant metastasis of gastric cancer	mir-196b	gastric cancer	up	Transcriptional regulation of miR-196b by ETS2 in gastric cancer cells.	mir-335	glioma	up	Tumor microRNA-335 expression is associated with poor prognosis in human glioma.
mir-122	glioma	down	miR-122/Wnt/beta-catenin regulatory circuitry sustains glioma progression	mir-196b	gastric cancer	up	Epigenetic regulation of miR-196b expression in gastric cancer	mir-335	hepatocellular carcinoma	down	Epigenetic silencing of miR-335 and its host gene MEST in hepatocellular carcinoma

mir-122	hepatocellular carcinoma	up	Circulating microRNAs, miR-21, miR-122, and miR-223, in patients with hepatocellular carcinoma or chronic hepatitis	mir-196b	glioblastoma	up	MiRNA-196 is upregulated in glioblastoma but not in anaplastic astrocytoma and has prognostic significance.	mir-335	hepatocellular carcinoma	down	MiR-335 acts as a potential tumor suppressor miRNA via downregulating ROCK1 expression in hepatocellular carcinoma
mir-122	hepatocellular carcinoma	down	miR-122 Regulates Tumorigenesis in Hepatocellular Carcinoma by Targeting AKT3	mir-196b	glioblastoma	up	Upregulation of miR-196b confers a poor prognosis in glioblastoma patients via inducing a proliferative phenotype.	mir-335	meningioma	up	miR-335 promotes cell proliferation by directly targeting Rb1 in meningiomas.
mir-122	hepatocellular carcinoma	down	MicroRNA-122 sensitizes HCC cancer cells to adriamycin and vincristine through modulating expression of MDR and inducing cell cycle arrest	mir-196b	oral cancer	up	OncomiR-196 promotes an invasive phenotype in oral cancer through the NME4-JNK-TIMP1-MMP signaling pathway	mir-335	mesenchymal cancer	down	MicroRNA Expression Profiles in Kaposi's Sarcoma
mir-122	hepatocellular carcinoma	down	MicroRNA-122 inhibits tumorigenic properties of hepatocellular carcinoma cells and sensitizes these cells to sorafenib.	mir-196b	oral squamous cell carcinoma	up	miR-196a Overexpression and miR-196a2 Gene Polymorphism Are Prognostic Predictors of Oral Carcinomas.	mir-335	neuro-blastoma	down	MiRNA-335 Suppresses Neuroblastoma Cell Invasiveness By Direct Targeting of Multiple Genes from the non-Canonical TGF-? Signalling Pathway
mir-122	hepatocellular carcinoma	up	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-197	breast cancer	up	Role of microRNAs -29b-2, -155, -197 and -205 as diagnostic biomarkers in serum of breast cancer females.	mir-335	non-small cell lung cancer	down	Effect of miR-335 upregulation on the apoptosis and invasion of lung cancer cell A549 and H1299
mir-122	hepatocellular carcinoma	down	miR-122 affects the viability and apoptosis of hepatocellular carcinoma cells.	mir-197	esophageal cancer	down	Implications of microRNA-197 downregulated expression in esophageal cancer with poor prognosis.	mir-335	osteosarcoma	down	miR-335 suppresses migration and invasion by targeting ROCK1 in osteosarcoma cells.
mir-122	hepatocellular carcinoma	down	MicroRNA-122 suppresses cell proliferation and induces cell apoptosis in hepatocellular carcinoma by directly targeting Wnt/beta-catenin pathway	mir-197	follicular thyroid carcinoma	up	A limited set of human MicroRNA is deregulated in follicular thyroid carcinoma.	mir-335	ovarian cancer	down	miR-335 represents an invasion suppressor gene in ovarian cancer by targeting Bcl-w.
mir-122	hepatocellular carcinoma	down	microRNA-122 as a regulator of mitochondrial metabolic gene network in hepatocellular carcinoma	mir-197	gastric cancer	down	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3	mir-335	ovarian cancer	down	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.
mir-122	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-197	hepato-cellular carcinoma	down	Anti-miR-197 inhibits migration in HCC cells by targeting KAI 1/CD82.	mir-335	pancreatic cancer	down	miR-335 functions as a tumor suppressor in pancreatic cancer by targeting OCT4.
mir-122	hepatocellular carcinoma	down	A novel GSK-3 beta-C/EBP alpha-miR-122-insulin-like growth factor 1 receptor regulatory	mir-197	lung cancer	up	Differential MicroRNAs Expression in Serum of Patients with Lung Cancer, Pulmonary Tuberculosis, and Pneumonia.	mir-335	primary gallbladder carcinoma	down	Increased expression of microRNA-335 predicts a favorable prognosis in primary gallbladder

			circuitry in human hepatocellular carcinoma.								carcinoma.
mir-122	hepatocellular carcinoma	up	Epigenetic regulation of miR-122 by PPARγ and hepatitis B virus X protein in hepatocellular carcinoma cells.	mir-197	multiple myeloma	down	miR-137 and miR-197 Induce Apoptosis and Suppress Tumorigenicity by Targeting MCL-1 in Multiple Myeloma.	mir-335	renal clear cell carcinoma	down	miRNA profiling for clear cell renal cell carcinoma: biomarker discovery and identification of potential controls and consequences of miRNA dysregulation.
mir-122	liver cancer	down	MicroRNA-122, a tumor suppressor microRNA that regulates intrahepatic metastasis of hepatocellular carcinoma.	mir-197	uterine leiomyoma	down	Upregulation of miR-197 inhibits cell proliferation by directly targeting IGFBP5 in human uterine leiomyoma cells.	mir-335-5p	gastric cancer	down	The clinical significance of downregulation of mir-124-3p, mir-146a-5p, mir-155-5p and mir-335-5p in gastric cancer tumorigenesis
mir-122	osteosarcoma	down	Tumor necrosis factor-related apoptosis-inducing ligand induces cytotoxicity specific to osteosarcoma by microRNA response elements	mir-1974	adrenal cortical carcinoma	down	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma	mir-337	pancreatic ductal adeno-carcinoma	down	miR-337 regulates the proliferation and invasion in pancreatic ductal adenocarcinoma by targeting HOXB7
mir-122	pituitary carcinoma	up	MicroRNA expression in ACTH-producing pituitary tumors: up-regulation of microRNA-122 and -493 in pituitary carcinomas	mir-198	colorectal cancer	down	MiR-198 represses tumor growth and metastasis in colorectal cancer by targeting fucosyl transferase 8.	mir-337-3p	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-122	renal clear cell carcinoma	up	miRNA profiling for clear cell renal cell carcinoma: biomarker discovery and identification of potential controls and consequences of miRNA dysregulation	mir-198	hepato-cellular carcinoma	down	miR-198 inhibits migration and invasion of hepatocellular carcinoma cells by targeting the HGF/c-MET pathway.	mir-338	gastric cancer	down	MicroRNA-338 Inhibits Growth, Invasion and Metastasis of Gastric Cancer by Targeting NRP1 Expression.
mir-1228	hepatocellular carcinoma	up	miR-1228 promotes the proliferation and metastasis of hepatoma cells through a p53 forward feedback loop	mir-198	lung cancer	down	MicroRNA-198 Inhibits Proliferation and Induces Apoptosis of Lung Cancer Cells Via Targeting FGFR1	mir-338	oral squamous cell carcinoma	down	miR-338 suppresses the growth and metastasis of OSCC cells by targeting NRP1.
mir-1228*	gastric cancer	down	Restoration of miR-1228* expression suppresses epithelial-mesenchymal transition in gastric cancer.	mir-198	pancreatic cancer	down	A Tumorigenic Factor Interactome Connected Through Tumor Suppressor MicroRNA-198 in Human Pancreatic Cancer.	mir-338-3p	colorectal cancer	down	Relationship between miRNA-338-3p expression and progression and prognosis of human colorectal carcinoma
mir-1229	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer	mir-198	pancreatic ductal adeno-carcinoma	up	MiR-21, miR-34a, miR-198 and miR-217 as diagnostic and prognostic biomarkers for chronic pancreatitis and pancreatic ductal adenocarcinoma	mir-338-3p	colorectal carcinoma	down	MicroRNA-338-3p Inhibits Colorectal Carcinoma Cell Invasion and Migration by Targeting Smoothened.
mir-122a	gastro-intestinal cancer	down	MicroRNA-122a functions as a novel tumor suppressor downstream of adenomatous polyposis coli in gastrointestinal cancers.	mir-199a	chondro-sarcoma	down	CCL5 promotes vascular endothelial growth factor expression and induces angiogenesis by down-regulating miR-199a in human chondrosarcoma cells.	mir-338-3p	gastric cancer	down	Epigenetic silencing of miR-338-3p contributes to tumorigenicity in gastric cancer by targeting SSX2IP.

mir-122a	hepatocellular carcinoma	down	Cyclin G1 is a target of miR-122a, a microRNA frequently down-regulated in human hepatocellular carcinoma.	mir-199a	gastric cancer	up	miR-199a regulates the tumor suppressor mitogen-activated protein kinase kinase kinase 11 in gastric cancer.	mir-338-3p	gastric cancer	down	miR-338-3p Suppresses Gastric Cancer Progression through a PTEN-AKT Axis by Targeting P-REX2a.
mir-122a	hepatocellular carcinoma	down	[MicroRNA profiling in patients with hepatocellular carcinoma].	mir-199a	hepato-cellular carcinoma	down	[MicroRNA profiling in patients with hepatocellular carcinoma].	mir-338-3p	gastric cancer	down	MiR-338-3p inhibits epithelial-mesenchymal transition in gastric cancer cells by targeting ZEB2 and MACC1/Met/Akt signaling.
mir-122a	hepatocellular carcinoma	down	Proteomic identification of microRNA-122a target proteins in hepatocellular carcinoma.	mir-199a	hepato-cellular carcinoma	down	Circulating microRNAs as biomarkers for hepatocellular carcinoma.	mir-338-3p	hepatocellular carcinoma	down	miR-338-3p Is Down-Regulated by Hepatitis B Virus X and Inhibits Cell Proliferation by Targeting the 3'-UTR Region of CyclinD1.
mir-1233	renal cell carcinoma	up	MicroRNAs in renal cell carcinoma: diagnostic implications of serum miR-1233 levels.	mir-199a	hepato-cellular carcinoma	down	Lentivirus-mediated overexpression of microRNA-199a inhibits cell proliferation of human hepatocellular carcinoma.	mir-338-3p	hepatocellular carcinoma	down	MiR-338-3p inhibits hepatocarcinoma cells and sensitizes these cells to sorafenib by targeting hypoxia-induced factor 1?.
mir-1236	bladder cancer	down	Up-regulation of p21(WAF1/CIP1) by miRNAs and its implications in bladder cancer cells.	mir-199a	hepato-cellular carcinoma	down	MiR-199a regulates cell proliferation and survival by targeting FZD7.	mir-338-3p	hepatocellular carcinoma	down	MicroRNA-338-3p inhibits cell proliferation in hepatocellular carcinoma by target forkhead box P4 (FOXP4).
mir-1236	hepatocellular carcinoma	down	miR-1236 down-regulates alpha-fetoprotein, thus causing PTEN accumulation, which inhibits the PI3K/Akt pathway and malignant phenotype in hepatoma cells.	mir-199a	kidney cancer	down	Re-expression of miR-199a suppresses renal cancer cell proliferation and survival by targeting GSK-3?.	mir-338-3p	liver cancer	down	miR-338-3p suppresses invasion of liver cancer cell by targeting smoothened.
mir-124	anaplastic astrocytoma	down	miR-124 and miR-137 inhibit proliferation of glioblastoma multiforme cells and induce differentiation of brain tumor stem cells.	mir-199a	non-small cell lung cancer	down	MiR-199a suppresses the hypoxia-induced proliferation of non-small cell lung cancer cells through targeting HIF1?	mir-338-3p	neuro-blastoma	down	miR-338-3p suppresses neuroblastoma proliferation, invasion and migration through targeting PREX2a.
mir-124	breast cancer	down	miR-124 suppresses multiple steps of breast cancer metastasis by targeting a cohort of pro-metastatic genes in vitro.	mir-199a	ovarian cancer	down	Roles and Mechanism of miR-199a and miR-125b in Tumor Angiogenesis.	mir-338-3p	non-small cell lung cancer	down	microRNA-338-3p functions as a tumor suppressor in human non?small?cell lung carcinoma and targets Ras-related protein 14.
mir-124	breast cancer	down	miR-124 inhibits cell proliferation in breast cancer through downregulation of CDK4.	mir-199a	ovarian cancer	down	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-339	non-small cell lung cancer	up	Peripheral Blood miR-328 Expression as a Potential Biomarker for the Early Diagnosis of NSCLC.

mir-124	breast cancer	down	Global microRNA level regulation of EGFR-driven cell-cycle protein network in breast cancer.	mir-199a	primary cns lymphomas	down	Differential micro-RNA expression in primary CNS and nodal diffuse large B-cell lymphomas.	mir-339-5p	breast cancer	down	MiR-339-5p inhibits breast cancer cell migration and invasion in vitro and may be a potential biomarker for breast cancer prognosis.
mir-124	breast cancer	down	MiR-124 targets Slug to regulate epithelial-mesenchymal transition and metastasis of breast cancer.	mir-199a-3p	esophageal adeno-carcinoma	up	MicroRNA 223 is Up-regulated in the Multistep Progression of Barrett's Esophagus and Modulates Sensitivity to Chemotherapy by Targeting PARP1.	mir-339-5p	papillary thyroid carcinoma	up	microRNA-339-5p modulates Na+/I- symporter-mediated radioiodide uptake.
mir-124	breast cancer	down	MicroRNA-124 suppresses breast cancer cell growth and motility by targeting CD151.	mir-199a-3p	gastric cancer	down	MicroRNA-199a-3p is downregulated in gastric carcinomas and modulates cell proliferation.	mir-33a	glioma	up	miR-33a promotes glioma-initiating cell self-renewal via PKA and NOTCH pathways.
mir-124	breast cancer	down	Microrna-124 targets flotillin-1 to regulate proliferation and migration in breast cancer.	mir-199a-3p	gastric cancer	up	MiR-199a-3p promotes gastric cancer progression by targeting ZHX1.	mir-33a	hepatocellular carcinoma	down	Aflatoxin B1 Negatively Regulates Wnt/beta-Catenin Signaling Pathway through Activating miR-33a.
mir-124	breast cancer	down	MicroRNA-124 inhibits cellular proliferation and invasion by targeting Ets-1 in breast cancer.	mir-199a-3p	glioma	down	MicroRNA-199a-3p suppresses glioma cell proliferation by regulating the AKT/mTOR signaling pathway.	mir-33a	lung cancer	down	
mir-124	cervical squamous cell carcinoma	down	Down-regulation of miR-124/-214 in cutaneous squamous cell carcinoma mediates abnormal cell proliferation via the induction of ERK.	mir-199a-3p	kidney cancer	down	miR-199a-3p inhibits hepatocyte growth factor/c-Met signaling in renal cancer carcinoma.	mir-33a	malignant melanoma	down	miR-33a functions as a tumor suppressor in melanoma by targeting HIF-1?.
mir-124	colorectal cancer	down	MiR-124 Suppresses Growth of Human Colorectal Cancer by Inhibiting STAT3.	mir-199a-3p	osteo-sarcoma	down	MicroRNA-199a-3p is downregulated in human osteosarcoma and regulates cell proliferation and migration.	mir-33b	breast cancer	down	MicroRNA-33b Inhibits Breast Cancer Metastasis by Targeting HMGA2, SALL4 and Twist1.
mir-124	colorectal cancer	down	MiR-124 Radiosensitizes Human Colorectal Cancer Cells by Targeting PRRX1.	mir-199a-3p	osteo-sarcoma	down	A three-plasma miRNA signature serves as novel biomarkers for osteosarcoma.	mir-33b	osteosarcoma	down	MicroRNA-33b suppresses migration and invasion by targeting c-Myc in osteosarcoma cells.
mir-124	colorectal cancer	down	KITENIN-targeting MicroRNA-124 Suppresses Colorectal Cancer Cell Motility and Tumorigenesis.	mir-199a-3p	osteo-sarcoma	up	Identification of a plasma four-microRNA panel as potential noninvasive biomarker for osteosarcoma.	mir-340	glioblastoma	down	miR-340 inhibits glioblastoma cell proliferation by suppressing CDK6, cyclin-D1 and cyclin-D2.
mir-124	colorectal cancer	down	Gene module based regulator inference identifying miR-139 as a tumor suppressor in colorectal cancer.	mir-199a-3p	osteo-sarcoma	down	Polymeric nanoparticle-based delivery of microRNA-199a-3p inhibits proliferation and growth of osteosarcoma cells.	mir-340	glioblastoma	down	miR-340 suppresses glioblastoma multiforme.
mir-124	colorectal cancer	down	Downregulation of microRNA-124 is an independent prognostic factor in patients with colorectal cancer.	mir-199a-3p	papillary thyroid carcinoma	down	miR-199a-3p displays tumor suppressor functions in papillary thyroid carcinoma.	mir-340	glioblastoma	up	miRNA microarray reveals specific expression in the peripheral blood of glioblastoma patients.

mir-124	colorectal cancer	down	MicroRNA-124 inhibits cancer cell growth through PTB1/PKM1/PKM2 feedback cascade in colorectal cancer.	mir-199a-3p	renal cell carcinoma	down	miR-199a-3p inhibits hepatocyte growth factor/c-Met signaling in renal cancer carcinoma.	mir-340	non-small cell lung cancer	down	miR-340 inhibits tumor cell proliferation and induces apoptosis by targeting multiple negative regulators of p27 in non-small cell lung cancer.
mir-124	colorectal cancer	down	MicroRNA-124 Regulates the Proliferation of Colorectal Cancer Cells by Targeting tASPP.	mir-199a-5p	colorectal cancer	down	The deoxycholic acid targets miRNA-dependent CAC1 gene expression in multidrug resistance of human colorectal cancer.	mir-340	osteosarcoma	down	MicroRNA-340 suppresses osteosarcoma tumor growth and metastasis by directly targeting ROCK1.
mir-124	colorectal cancer	down	Downregulation of rho-associated protein kinase 1 by miR-124 in colorectal cancer.	mir-199a-5p	esophageal adeno-carcinoma	up	MicroRNA 223 is Up-regulated in the Multistep Progression of Barrett's Esophagus and Modulates Sensitivity to Chemotherapy by Targeting PARP1.	mir-340*	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-124	esophageal cancer	down	STAT3 is involved in miR-124-mediated suppressive effects on esophageal cancer cells.	mir-199a-5p	gastric cancer	up	Up-regulated miR-199a-5p in gastric cancer functions as an oncogene and targets klotho.	mir-342	acute promyelocytic leukemia	down	A restricted signature of miRNAs distinguishes APL blasts from normal promyelocytes.
mir-124	gastric cancer	down	microRNA-124 inhibits proliferation and induces apoptosis by directly repressing EZH2 in gastric cancer.	mir-199a-5p	hepato-cellular carcinoma	down	Role of microRNA-199a-5p and discoidin domain receptor 1 in human hepatocellular carcinoma invasion.	mir-342	colorectal cancer	down	MicroRNA-342 inhibits colorectal cancer cell proliferation and invasion by directly targeting DNA methyltransferase 1.
mir-124	gastric cancer	down	miR-124 inhibits cell proliferation in gastric cancer through down-regulation of SPHK1.	mir-199a-5p	hepato-cellular carcinoma	down	Identification of differentially expressed microRNAs in human hepatocellular adenoma associated with type I glycogen storage disease: a potential utility as biomarkers.	mir-342	glioblastoma	down	Functional profiling of precursor MicroRNAs identifies MicroRNAs essential for glioma proliferation.
mir-124	gastric cancer	down	[miR-124 suppresses cell proliferation and invasion in gastric carcinoma and its mechanism].	mir-199a-5p	hepato-cellular carcinoma	down	Increase of miR-199a-5p by protoporphyrin IX, a photocatalyzer, directly inhibits E2F3, sensitizing mesenchymal tumor cells to anti-cancer agents.	mir-342-3p	cervical cancer	down	miR-342-3p suppresses proliferation, migration and invasion by targeting FOXM1 in human cervical cancer.
mir-124	glioblastoma	down	miR-124 and miR-137 inhibit proliferation of glioblastoma multiforme cells and induce differentiation of brain tumor stem cells.	mir-199b	chorio-carcinoma	down	Decreased expression of microRNA-199b increases protein levels of SET (protein phosphatase 2A inhibitor) in human choriocarcinoma.	mir-342-3p	non-small cell lung cancer	down	miR-342-3p targets RAP2B to suppress proliferation and invasion of non-small cell lung cancer cells.
mir-124	glioblastoma	down	Downregulation of miR-124 promotes the growth and invasiveness of glioblastoma cells involving upregulation of PPP1R13L.	mir-199b	follicular thyroid carcinoma	down	Differential miRNA expression defines migration and reduced apoptosis in follicular thyroid carcinomas.	mir-345	colorectal cancer	down	MicroRNA 345, a methylation-sensitive microRNA is involved in cell proliferation and invasion in human colorectal cancer.
mir-124	glioma	down	microRNA-124 Inhibits Migration and Invasion by Down-Regulating ROCK1 in Glioma.	mir-199b	hepato-cellular carcinoma	down	[MicroRNA profiling in patients with hepatocellular carcinoma].	mir-345	oral squamous cell carcinoma	up	Relationship between microRNA expression levels and histopathological features of dysplasia in oral leukoplakia.

mir-124	glioma	down	MiR-124 governs glioma growth and angiogenesis and enhances chemosensitivity by targeting R-Ras and N-Ras.	mir-199b	hepato-cellular carcinoma	down	Underexpressed microRNA-199b-5p targets hypoxia-inducible factor-1? in hepatocellular carcinoma and predicts prognosis of hepatocellular carcinoma patients.	mir-346	follicular thyroid carcinoma	up	A limited set of human MicroRNA is deregulated in follicular thyroid carcinoma.
mir-124	glioma	down	Downregulation of microRNA-124 predicts poor prognosis in glioma patients.	mir-199b	prostate cancer	down	MiR199b Suppresses Expression of Hypoxia-Inducible Factor 1? (HIF-1?) in Prostate Cancer Cells.	mir-346	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
mir-124	hepatocellular carcinoma	down	The putative tumour suppressor microRNA-124 modulates hepatocellular carcinoma cell aggressiveness by repressing ROCK2 and EZH2.	mir-199b-3p	esophageal adeno-carcinoma	up	MicroRNA 223 is Up-regulated in the Multistep Progression of Barrett's Esophagus and Modulates Sensitivity to Chemotherapy by Targeting PARP1.	mir-34a	b-cell lymphoma	down	The Epstein-Barr virus (EBV)-induced tumor suppressor microRNA MiR-34a is growth promoting in EBV-infected B cells.
mir-124	hepatocellular carcinoma	down	MiR-124 suppresses cell proliferation in hepatocellular carcinoma by targeting PIK3CA.	mir-199b-5p	breast cancer	down	MiR-199b-5p targets HER2 in breast cancer cells.	mir-34a	bladder cancer	down	MicroRNA-34a functions as an anti-metastatic microRNA and suppresses angiogenesis in bladder cancer by directly targeting CD44.
mir-124	hepatocellular carcinoma	down	MicroRNA-124 suppresses growth of human hepatocellular carcinoma by targeting STAT3.	mir-199b-5p	hepato-cellular carcinoma	down	Identification of differentially expressed microRNAs in human hepatocellular adenoma associated with type I glycogen storage disease: a potential utility as biomarkers.	mir-34a	breast cancer	down	MicroRNA-34a suppresses the breast cancer stem cell-like characteristics by downregulating Notch1 pathway.
mir-124	medullo-blastoma	down	miR-124 is frequently down-regulated in medulloblastoma and is a negative regulator of SLC16A1.	mir-199b-5p	medulloblastoma	down	The micro-RNA 199b-5p regulatory circuit involves Hes1, CD15, and epigenetic modifications in medulloblastoma.	mir-34a	breast cancer	down	Circulating miR-34a levels are reduced in colorectal cancer.
mir-124	naso-pharyngeal carcinoma	down	MiR-124 suppresses tumor growth and metastasis by targeting Foxq1 in nasopharyngeal carcinoma.	mir-199b-5p	mesenchymal cancer	down	MicroRNA Expression Profiles in Kaposi's Sarcoma.	mir-34a	breast cancer	down	MicroRNA-34 suppresses breast cancer invasion and metastasis by directly targeting Fra-1.
mir-124	neuro-blastoma	down	Silencing of miR-124 induces neuroblastoma SK-N-SH cell differentiation, cell cycle arrest and apoptosis through promoting AHR.	mir-199b-5p	papillary thyroid carcinoma	up	Expression profile and clinical significance of microRNAs in papillary thyroid carcinoma.	mir-34a	breast cancer	down	Targeted Expression of miR-34a Using the T-VISA System Suppresses Breast Cancer Cell Growth and Invasion.
mir-124	non-small cell lung cancer	down	miRNA-124 down-regulates SOX8 expression and suppresses cell proliferation in non-small cell lung cancer.	mir-19a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-34a	breast cancer	down	MicroRNA-34a Suppresses Cell Proliferation by Targeting LMTK3 in Human Breast Cancer MCF-7 Cell Line.

mir-124	non-small cell lung cancer	down	miRNA-124 down-regulates SOX8 expression and suppresses cell proliferation in non-small cell lung cancer.	mir-19a	bladder cancer	up	miR-19a acts as an oncogenic microRNA and is up-regulated in bladder cancer.	mir-34a	cervical carcinoma	down	MicroRNA-34a suppresses invasion through downregulation of Notch1 and Jagged1 in cervical carcinoma and choriocarcinoma cells.
mir-124	non-small cell lung cancer	down	Down-regulation of microRNA-124 is correlated with tumor metastasis and poor prognosis in patients with lung cancer.	mir-19a	breast cancer	up	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.	mir-34a	chordoma	down	MicroRNA-608 and microRNA-34a regulate chordoma malignancy by targeting EGFR, Bcl-xL and MET.
mir-124	oral squamous cell carcinoma	down	MicroRNA-124 suppresses oral squamous cell carcinoma motility by targeting ITGB1.	mir-19a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.	mir-34a	chorio-carcinoma	down	MicroRNA-34a suppresses invasion through downregulation of Notch1 and Jagged1 in cervical carcinoma and choriocarcinoma cells.
mir-124	osteosarcoma	down	MicroRNA-124 functions as a tumor suppressor and indicates prognosis in human osteosarcoma.	mir-19a	cervical cancer	up	MicroRNA-19a and -19b regulate cervical carcinoma cell proliferation and invasion by targeting CUL5.	mir-34a	chorio-carcinoma	down	MicroRNA-34a is a tumor suppressor in choriocarcinoma via regulation of Delta-like1.
mir-124	osteosarcoma	down	The tumor suppressor role of miR-124 in osteosarcoma.	mir-19a	cholangiocarcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.	mir-34a	colon cancer	down	MicroRNA-34a inhibits migration and invasion of colon cancer cells via targeting to Fra-1.
mir-124	ovarian cancer	down	MiR-124 inhibits the migration and invasion of ovarian cancer cells by targeting SphK1.	mir-19a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-34a	colon cancer	down	Expression of miR-34 is lost in colon cancer which can be re-expressed by a novel agent CDF.
mir-124	pancreatic cancer	down	Methylation-mediated silencing of the miR-124 genes facilitates pancreatic cancer progression and metastasis by targeting Rac1.	mir-19a	esophageal squamous cell carcinoma	up		mir-34a	colorectal cancer	down	Circulating miR-34a levels are reduced in colorectal cancer.
mir-124	prostate cancer	down	MiR-124 suppresses cell motility and adhesion by targeting talin 1 in prostate cancer cells.	mir-19a	gastric cancer	up	MicroRNA-19a/b regulates multidrug resistance in human gastric cancer cells by targeting PTEN.	mir-34a	colorectal cancer	down	Dysregulation of MicroRNA-34a Expression in Colorectal Cancer Inhibits the Phosphorylation of FAK Via VEGF.
mir-124-3p	astrocytoma	down	Reductions in the expression of miR-124-3p, miR-128-1, and miR-221-3p in pediatric astrocytomas are related to high-grade supratentorial, and recurrent tumors in Mexican children.	mir-19a	gastric cancer	up	miR-19a Promotes Cell Growth and Tumorigenesis through Targeting SOCS1 in Gastric Cancer.	mir-34a	colorectal cancer	down	Novel evidence for curcumin and boswellic acid induced chemoprevention through regulation of miR-34a and miR-27a in colorectal cancer.

mir-124-3p	bladder cancer	down	MicroRNA-124-3p inhibits cell migration and invasion in bladder cancer cells by targeting ROCK1.	mir-19a	gastric cancer	up	MiR-19a/b modulate the metastasis of gastric cancer cells by targeting the tumour suppressor MXD1.	mir-34a	endometrial cancer	down	Role of miR-34a as a suppressor of L1CAM in endometrial carcinoma.
mir-124-3p	gastric cancer	down	The clinical significance of downregulation of mir-124-3p, mir-146a-5p, mir-155-5p and mir-335-5p in gastric cancer tumorigenesis.	mir-19a	gastric cancer	up	MiR-19a promotes epithelial-mesenchymal transition through PI3K/AKT pathway in gastric cancer.	mir-34a	esophageal squamous cell carcinoma	down	miR-34a inhibits the migration and invasion of esophageal squamous cell carcinoma by targeting Yin Yang-1.
mir-124-5p	glioma	down	MiR-124-5p inhibits the growth of high-grade gliomas through posttranscriptional regulation of LAMB1.	mir-19a	gastric cancer	up	MiR-19a promotes epithelial-mesenchymal transition through PI3K/AKT pathway in gastric cancer	mir-34a	gastric cancer	down	Sirt7 promotes gastric cancer growth and inhibits apoptosis by epigenetically inhibiting miR-34a.
mir-1246	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-19a	glioma	up	miR-19a and miR-19b Overexpression in Gliomas.	mir-34a	gastric cancer	up	MicroRNA profiling of human gastric cancer
mir-1247	pancreatic cancer	down	miR-1247 is Correlated with Prognosis of Pancreatic Cancer and Inhibits Cell Proliferation by Targeting Neuropilins.	mir-19a	glioma	up	MicroRNA-19a promotes glioma cell growth by repressing LRIG1.	mir-34a	gastric cancer	down	The prognostic value of miR-34a expression in completely resected gastric cancer: tumor recurrence and overall survival.
mir-124a	acute lymphoblastic leukemia	down	Epigenetic silencing of the tumor suppressor microRNA miR-124a regulates CDK6 expression and confers a poor prognosis in acute lymphoblastic leukemia.	mir-19a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.	mir-34a	gastric cancer	down	Expression and regulatory function of miRNA-34a in targeting survivin in gastric cancer cells.
mir-124a	epithelial ovarian cancer	down	Gain-of-function microRNA screens identify miR-193a regulating proliferation and apoptosis in epithelial ovarian cancer cells.	mir-19a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-34a	gastric cancer	down	Evaluation of MicroRNA Expression Pattern of Gastric Adenocarcinoma Associated with Socioeconomic, Environmental and Lifestyle Factors in Northwestern Hungary
mir-124a	glioblastoma	down	miR-124a is frequently down-regulated in glioblastoma and is involved in migration and invasion.	mir-19a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.	mir-34a	gastric cancer	down	microRNA-34a Inhibits the Growth, Invasion and Metastasis of Gastric Cancer by Targeting PDGFR and MET Expression
mir-124a	glioma	down		mir-19a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.	mir-34a	gastric cancer	down	MiRNA-34a inhibits EGFR-signaling-dependent MMP7 activation in gastric cancer
mir-124a	mantle cell lymphoma	up	microRNA expression profile and identification of miR-29 as a prognostic marker and pathogenetic factor by targeting CDK6	mir-19a	medullo-blastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar	mir-34a	glioblastoma	down	MicroRNA-34a inhibits glioblastoma growth by targeting multiple oncogenes.

			in mantle cell lymphoma				neural precursors.				
mir-1250	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer.	mir-19a	neuro-blastoma	up	MYCN-regulated microRNAs repress estrogen receptor-alpha (ESR1) expression and neuronal differentiation in human neuroblastoma.	mir-34a	glioblastoma	down	MicroRNA-34a targets notch1 and inhibits cell proliferation in glioblastoma multiforme.
mir-1258	breast cancer	down	MicroRNA-1258 suppresses breast cancer brain metastasis by targeting heparanase.	mir-19a	non-small cell lung cancer	up	Serum miR-19a expression correlates with worse prognosis of patients with non-small cell lung cancer.	mir-34a	glioblastoma	down	miR-34a functions as a tumor suppressor modulating EGFR in glioblastoma multiforme.
mir-1258	breast cancer	down	The expression and clinical significance of microRNA-1258 and heparanase in human breast cancer.	mir-19a	osteo-sarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.	mir-34a	glioma	down	MicroRNA-34a inhibits glioblastoma growth by targeting multiple oncogenes.
mir-1259	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-19a-3p	breast cancer	down	MicroRNA-19a-3p inhibits breast cancer progression and metastasis by inducing macrophage polarization through downregulated expression of Fra-1 proto-oncogene.	mir-34a	glioma	down	microRNA-34a is tumor suppressive in brain tumors and glioma stem cells.
mir-125a	breast cancer	up	MicroRNA-125a influences breast cancer stem cells by targeting leukemia inhibitory factor receptor which regulates the hippo signaling pathway.	mir-19b	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-34a	glioma	down	MicroRNA-34a induces apoptosis in the human glioma cell line, A172, through enhanced ROS production and NOX2 expression.
mir-125a	colorectal cancer	down	Candidate microRNA biomarkers in human colorectal cancer: Systematic review profiling studies and experimental validation.	mir-19b	breast cancer	up	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.	mir-34a	head and neck squamous cell carcinoma	down	Dysregulation of microRNA-34a expression in head and neck squamous cell carcinoma promotes tumor growth and tumor angiogenesis.
mir-125a	glioblastoma	down	miR-29b and miR-125a regulate podoplanin and suppress invasion in glioblastoma.	mir-19b	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.	mir-34a	hepatocellular carcinoma	down	Oncolytic adenovirus co-expressing miRNA-34a and IL-24 induces superior antitumor activity in experimental tumor model.
mir-125a-3p	gastric cancer	down	Down-regulation of miR-125a-3p in human gastric cancer and its clinicopathological significance.	mir-19b	cervical cancer	up	MicroRNA-19a and -19b regulate cervical carcinoma cell proliferation and invasion by targeting CUL5.	mir-34a	hepatocellular carcinoma	down	Underexpression of miR-34a in hepatocellular carcinoma and its contribution towards enhancement of proliferating inhibitory effects of agents targeting c-MET.

mir-125a-3p	non-small cell lung cancer	down	miR-125a-3p and miR-125a-5p are downregulated in non-small cell lung cancer and have inverse effects on invasion and migration of lung cancer cells.	mir-19b	cholangio-carcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.	mir-34a	hepatocellular carcinoma	down	MicroRNA-34a Targets Bcl-2 and Sensitizes Human Hepatocellular Carcinoma Cells to Sorafenib Treatment.
mir-125a-3p	non-small cell lung cancer	down	miR-125a-3p targets MTA1 to suppress NSCLC cell proliferation, migration, and invasion.	mir-19b	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-34a	hepatocellular carcinoma	down	Methylation-associated silencing of microRNA-34b in hepatocellular carcinoma cancer.
mir-125a-5p	breast cancer	down	Analysis of miR-205 and miR-155 expression in the blood of breast cancer patients.	mir-19b	esophageal squamous cell carcinoma	up		mir-34a	hepatocellular carcinoma	down	miR-34a inhibits migration and invasion by down-regulation of c-Met expression in human hepatocellular carcinoma cells.
mir-125a-5p	glioblastoma	down	MiRNA-125a-5p inhibits glioblastoma cell proliferation and promotes cell differentiation by targeting TAZ.	mir-19b	gastric cancer	up	MiR-19a/b modulate the metastasis of gastric cancer cells by targeting the tumour suppressor MXD1.	mir-34a	lung cancer	down	Development of a lung cancer therapeutic based on the tumor suppressor microRNA-34.
mir-125a-5p	non-small cell lung cancer	down	miR-125a-5p and miR-125a-5p are downregulated in non-small cell lung cancer and have inverse effects on invasion and migration of lung cancer cells.	mir-19b	gastric cancer	up	MicroRNA-19a/b regulates multidrug resistance in human gastric cancer cells by targeting PTEN.	mir-34a	malignant melanoma	down	MicroRNA-15b represents an independent prognostic parameter and is correlated with tumor cell proliferation and apoptosis in malignant melanoma.
mir-125a-5p	non-small cell lung cancer	up	Serum miR-125a-5p, miR-145 and miR-146a as diagnostic biomarkers in non-small cell lung cancer.	mir-19b	glioma	up	miR-19a and miR-19b Overexpression in Gliomas.	mir-34a	malignant melanoma	down	Regulation of cancer aggressive features in melanoma cells by microRNAs.
mir-125b	acute myeloid leukemia	up	[miR-125b promotes proliferation of human acute myeloid leukemia cells by targeting Bak1].	mir-19b	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.	mir-34a	malignant melanoma	down	Overexpression of the miR-34 family suppresses invasive growth of malignant melanoma with the wild-type p53 gene.
mir-125b	bladder cancer	down	MicroRNA-125b suppresses the development of bladder cancer by targeting E2F3.	mir-19b	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.	mir-34a	malignant melanoma	down	Identification of FLOT2 as a novel target for microRNA-34a in melanoma.
mir-125b	bladder cancer	down	microRNA-125b inhibits cell migration and invasion by targeting matrix metallopeptidase 13 in bladder cancer.	mir-19b	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-34a	neuroblastoma	down	A functional screen identifies miR-34a as a candidate neuroblastoma tumor suppressor gene.
mir-125b	breast cancer	down	MUCIN 1 ONCOPROTEIN EXPRESSION IS SUPPRESSED BY THE miR-125b ONCOMIR.	mir-19b	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.	mir-34a	neuroblastoma	down	MicroRNA-34a functions as a potential tumor suppressor by inducing apoptosis in neuroblastoma cells.

mir-125b	breast cancer	down	miR-125b is methylated and functions as a tumor suppressor by regulating the ETS1 proto-oncogene in human invasive breast cancer.	mir-19b	medullo-blastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.	mir-34a	non-small cell lung cancer	up	Circulating miR-22, miR-24 and miR-34a as novel predictive biomarkers to pemetrexed-based chemotherapy in advanced non small cell lung cancer.
mir-125b	breast cancer	down	MicroRNA-125b induces metastasis by targeting STARD13 in MCF-7 and MDA-MB-231 breast cancer cells.	mir-19b	osteo-sarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.	mir-34a	non-small cell lung cancer	down	Restoration of p53/miR-34a regulatory axis decreases survival advantage and ensures Bax-dependent apoptosis of non-small cell lung carcinoma cells.
mir-125b	breast cancer	down	Differential expression of miR-21, miR-125b and miR-191 in breast cancer tissue.	mir-200a	bladder cancer	down	Expression of microRNAs in the Urine of Patients With Bladder Cancer.	mir-34a	non-small cell lung cancer	down	The microRNA miR-34a Inhibits Non-Small Cell Lung Cancer (NSCLC) Growth and the CD44hi Stem-Like NSCLC Cells.
mir-125b	breast cancer	down	The role of miR-125b-mitochondria-caspase-3 pathway in doxorubicin resistance and therapy in human breast cancer.	mir-200a	breast cancer	up	Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes metastatic colonization.	mir-34a	oral cancer	down	MiR-34a inhibits oral cancer progression partially by repression of interleukin-6-receptor.
mir-125b	chronic lymphocytic leukemia	down	The down-regulation of miR-125b in chronic lymphocytic leukemias leads to metabolic adaptation of cells to a transformed state.	mir-200a	breast cancer	up	MicroRNA-200a Promotes Anoikis Resistance and Metastasis by Targeting YAP1 in Human Breast Cancer.	mir-34a	osteosarcoma	down	MicroRNA-34a inhibits the proliferation and metastasis of osteosarcoma cells both in vitro and in vivo.
mir-125b	follicular cancer	up	MicroRNA expression profiling is a potential diagnostic tool for thyroid cancer.	mir-200a	breast cancer	down	microRNA-200a Inhibits Cell Proliferation by Targeting Mitochondrial Transcription Factor A in Breast Cancer	mir-34a	osteosarcoma	down	MicroRNA-34a inhibits human osteosarcoma proliferation by downregulating ether a go-go 1 expression.
mir-125b	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-200a	esophageal adeno-carcinoma	up	Gastric adenocarcinoma has a unique microRNA signature not present in esophageal adenocarcinoma.	mir-34a	osteosarcoma	down	Tumor necrosis factor-related apoptosis-inducing ligand induces cytotoxicity specific to osteosarcoma by microRNA response elements.
mir-125b	gastric cancer	up	MiR-125b promotes cell migration and invasion by targeting PPP1CA-Rb signal pathways in gastric cancer, resulting in a poor prognosis.	mir-200a	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-34a	ovarian cancer	down	Frequent downregulation of miR-34 family in human ovarian cancers.
mir-125b	glioblastoma	down	Myc-associated zinc finger protein (MAZ) is regulated by miR-125b and mediates VEGF-induced angiogenesis in glioblastoma.	mir-200a	esophageal cancer	up	miR-200a/miR-141 and miR-205 upregulation might be associated with hormone receptor status and prognosis in endometrial carcinomas.	mir-34a	ovarian cancer	down	MiR-34a suppresses ovarian cancer proliferation and motility by targeting AXL.

mir-125b	glioblastoma	up	miR-125b promotes cell proliferation by directly targeting Lin28 in glioblastoma stem cells with low expression levels of miR-125b.	mir-200a	gastric adeno-carcinoma	down	Downregulated microRNA-200a promotes EMT and tumor growth through the wnt/beta-catenin pathway by targeting the E-cadherin repressors ZEB1/ZEB2 in gastric adenocarcinoma	mir-34a	pancreatic cancer	down	Genistein inhibits cell growth and induces apoptosis through up-regulation of miR-34a in pancreatic cancer cells.
mir-125b	glioma	up	miR-125b Inhibits Connexin43 and Promotes Glioma Growth	mir-200a	gastric adenocarcinoma	down	Gastric adenocarcinoma has a unique microRNA signature not present in esophageal adenocarcinoma.	mir-34a	pancreatic cancer	down	MicroRNA miR-34 inhibits human pancreatic cancer tumor-initiating cells.
mir-125b	glioma	down	Serum MicroRNA-125b as a Potential Biomarker for Glioma Diagnosis	mir-200a	glioma	down	MiR-200a impairs glioma cell growth, migration, and invasion by targeting SIM2-s.	mir-34a	pancreatic ductal adenocarcinoma	up	MiR-21, miR-34a, miR-198 and miR-217 as diagnostic and prognostic biomarkers for chronic pancreatitis and pancreatic ductal adenocarcinoma
mir-125b	glioma	up	MiR-125b expression affects the proliferation and apoptosis of human glioma cells by targeting Bmf.	mir-200a	hepato-cellular carcinoma	down	The histone deacetylase 4/SP1/microrna-200a regulatory network contributes to aberrant histone acetylation in hepatocellular carcinoma.	mir-34a	papillary thyroid carcinoma	up	MiR-34a targets GAS1 to promote cell proliferation and inhibit apoptosis in papillary thyroid carcinoma via PI3K/Akt/Bad pathway
mir-125b	hepatocellular carcinoma	down	MicroRNA-125b Functions as a Tumor Suppressor in Hepatocellular Carcinoma Cells.	mir-200a	hepato-cellular carcinoma	down	The microRNA-200 family-A potential diagnostic marker in hepatocellular carcinoma?	mir-34a	prostate cancer	down	The microRNA miR-34a inhibits prostate cancer stem cells and metastasis by directly repressing CD44.
mir-125b	hepatocellular carcinoma	down	Histone lysine methyltransferase, SUV39H1, promotes HCC progression and is negatively regulated by microRNA-125b	mir-200a	hepato-cellular carcinoma	down	miR-200a suppresses cell growth and migration by targeting MACC1 and predicts prognosis in hepatocellular carcinoma.	mir-34a	prostate cancer	down	MicroRNA-34a modulates c-Myc transcriptional complexes to suppress malignancy in human prostate cancer cells.
mir-125b	hepatocellular carcinoma	down	Overexpression of microRNA-125b sensitizes human hepatocellular carcinoma cells to 5-fluorouracil through inhibition of glycolysis by targeting hexokinase II.	mir-200a	hepato-cellular carcinoma	down	MicroRNA-200a suppresses metastatic potential of side population cells in human hepatocellular carcinoma by decreasing ZEB2.	mir-34a	prostate cancer	down	LEF1 Targeting EMT in Prostate Cancer Invasion is Regulated by miR-34a
mir-125b	hepatocellular carcinoma	down	Diagnostic and prognostic implications of microRNAs in human hepatocellular carcinoma.	mir-200a	lung adeno-carcinoma	down	miR-200 Inhibits lung adenocarcinoma cell invasion and metastasis by targeting Flt1/VEGFR1.	mir-34a	rectal cancer	up	The quantitative analysis by stem-loop real-time PCR revealed the microRNA-34a, microRNA-155 and microRNA-200c overexpression in human colorectal cancer.
mir-125b	hepatocellular carcinoma	down	Regulation of placenta growth factor by microRNA-125b in hepatocellular cancer.	mir-200a	malignant melanoma	up	MicroRNA-200 family members differentially regulate morphological plasticity and mode of melanoma cell invasion.	mir-34a	renal cell carcinoma	down	MicroRNA-34a suppresses cell proliferation and metastasis by targeting CD44 in human renal carcinoma cell

mir-125b	hepatocellular carcinoma	down	MicroRNA-125b promotes apoptosis by regulating the expression of Mcl-1, Bcl-w and IL-6R.	mir-200a	meningioma	down	Downregulated microRNA-200a in meningiomas promotes tumor growth by reducing E-cadherin and activating the Wnt/beta-catenin signaling pathway.	mir-34a	renal cell carcinoma	down	MicroRNA-34a suppresses malignant transformation by targeting c-Myc transcriptional complexes in human renal cell carcinoma.
mir-125b	malignant melanoma	down	MicroRNA miR-125b controls melanoma progression by direct regulation of c-Jun protein expression.	mir-200a	mesen-chymal cancer	down	MicroRNA Expression Profiles in Kaposi's Sarcoma.	mir-34a	renal cell carcinoma	down	Tumor suppressor microRNA-34a inhibits cell proliferation by targeting Notch1 in renal cell carcinoma.
mir-125b	malignant melanoma	down	miR-125b induces cellular senescence in malignant melanoma.	mir-200a	neuro-blastoma	down	miR-200a inhibits tumor proliferation by targeting AP-2? in neuroblastoma cells	mir-34a	retino-blastoma	down	Differential microRNA-34a expression and tumor suppressor function in retinoblastoma cells
mir-125b	neuro-blastoma	up	MicroRNA-125b is a novel negative regulator of p53.	mir-200a	non-small cell lung cancer	up	MiR-200a enhances the migrations of A549 and SK-MES-1 cells by regulating the expression of TSPAN1.	mir-34a	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.
mir-125b	oral squamous cell carcinoma	down	Decreased expression of miR-125b and miR-100 in oral cancer cells contributes to malignancy.	mir-200a	ovarian cancer	up	Upregulation of microRNA-200a associates with tumor proliferation, CSCs phenotype and chemosensitivity in ovarian cancer.	mir-34a	uveal melanoma	down	MicroRNA-34a inhibits uveal melanoma cell proliferation and migration through downregulation of c-Met.
mir-125b	oral squamous cell carcinoma	up	[Expression and clinical significance of plasma microRNA-125b level in patients with oral squamous cell carcinoma].	mir-200a	ovarian cancer	down	A miR-200 microRNA cluster as prognostic marker in advanced ovarian cancer.	mir-34a-5p	colorectal cancer	down	miR-34a-5p suppresses colorectal cancer metastasis and predicts recurrence in patients with stage II/III colorectal cancer.
mir-125b	osteosarcoma	down	miR-125b suppresses the proliferation and migration of osteosarcoma cells through down-regulation of STAT3.	mir-200a	pancreatic ductal adeno-carcinoma	down	XMD8-92 Inhibits Pancreatic Tumor Xenograft Growth via DCLK1-Dependent Mechanism.	mir-34b	breast cancer	down	MicroRNA-34 suppresses breast cancer invasion and metastasis by directly targeting Fra-1.
mir-125b	ovarian cancer	down	Roles and Mechanism of miR-199a and miR-125b in Tumor Angiogenesis.	mir-200a	renal cell carcinoma	down	Tumor suppressive microRNA-200a inhibits renal cell carcinoma development by directly targeting TGFB2.	mir-34b	breast cancer	down	The Regulation and Function of miR-21-FOXO3a-miR-34b/c Signaling in Breast Cancer.
mir-125b	ovarian cancer	down	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-200b	astrocytoma	down	Prognostic value of coexistence of abnormal expression of micro-RNA-200b and cyclic adenosine monophosphate-responsive element-binding protein 1 in human astrocytoma.	mir-34b	chronic lymphocytic leukemia	down	Epigenetic inactivation of mir-34b/c in addition to mir-34a and DAPK1 in chronic lymphocytic leukemia
mir-125b	ovarian cancer	down	PPAR? inhibits ovarian cancer cells proliferation through upregulation of miR-125b.	mir-200b	bladder cancer	down	Expression of microRNAs in the Urine of Patients With Bladder Cancer.	mir-34b	endometrial serous adeno-carcinoma	down	MicroRNA-34b functions as a potential tumor suppressor in endometrial serous adenocarcinoma.
mir-125b	prostate cancer	up	Widespread deregulation of microRNA expression in human prostate cancer.	mir-200b	breast cancer	up	Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes metastatic colonization.	mir-34b	gastric cancer	down	Epigenetic regulation of miR-34b and miR-129 expression in gastric cancer.

mir-125b	prostate cancer	up	Oncomir miR-125b suppresses p14(ARF) to modulate p53-dependent and p53-independent apoptosis in prostate cancer.	mir-200b	breast cancer	down	Regulation of the MicroRNA 200b (miRNA-200b) by Transcriptional Regulators PEA3 and ELK-1 Protein Affects Expression of Pin1 Protein to Control Anoikis.	mir-34b	hepatocellular carcinoma	down	Methylation-associated silencing of microRNA-34b in hepatocellular carcinoma cancer.
mir-125b-1-3p	mesenchymal cancer	up	miR-29 Acts as a Decoy in Sarcomas to Protect the Tumor Suppressor A20 mRNA from Degradation by HuR.	mir-200b	breast cancer	down	miR-200b as a prognostic factor in breast cancer targets multiple members of RAB family.	mir-34b	lung cancer	down	Development of a lung cancer therapeutic based on the tumor suppressor microRNA-34.
mir-125b-2*	colorectal cancer	up	MicroRNA expression profiles in human colorectal cancers with liver metastases.	mir-200b	cholangio-carcinoma	down	Direct targeting of SUZ12/ROCK2 by miR-200b/c inhibits cholangiocarcinoma tumourigenesis and metastasis.	mir-34b	non-small cell lung cancer	down	MicroRNA-34b functions as a tumor suppressor and acts as a nodal point in the feedback loop with Met.
mir-126	bladder cancer	down	MicroRNA-126 inhibits invasion in bladder cancer via regulation of ADAM9.	mir-200b	colorectal cancer	up	microRNA-200b and microRNA-200c promote colorectal cancer cell proliferation via targeting the reversion-inducing cysteine-rich protein with Kazal motifs.	mir-34b	osteosarcoma	down	Tumor necrosis factor-related apoptosis-inducing ligand induces cytotoxicity specific to osteosarcoma by microRNA response elements.
mir-126	breast cancer	down	Endothelial-specific intron-derived miR-126 is down-regulated in human breast cancer and targets both VEGFA and PIK3R2.	mir-200b	endometrial cancer	up	MicroRNA-200b is overexpressed in endometrial adenocarcinomas and enhances MMP2 activity by downregulating TIMP2 in human endometrial cancer cell line HEC-1A cells.	mir-34b	ovarian cancer	down	Frequent downregulation of miR-34 family in human ovarian cancers.
mir-126	colon cancer	down	Expression of miR-126 suppresses migration and invasion of colon cancer cells by targeting CXCR4.	mir-200b	esophageal squamous cell carcinoma	down	miR-200b suppresses invasiveness and modulates the cytoskeletal and adhesive machinery in esophageal squamous cell carcinoma cells via targeting Kindlin-2.	mir-34b	ovarian carcinoma	down	MicroRNA-34b and MicroRNA-34c are targets of p53 and cooperate in control of cell proliferation and adhesion-independent growth.
mir-126	colon cancer	down	[miR-126 inhibits colon cancer proliferation and invasion through targeting IRS1, SLC7A5 and TOM1 gene].	mir-200b	gastric cancer	up	MicroRNA-200b Regulates Cell Proliferation, Invasion, and Migration by Directly Targeting ZEB2 in Gastric Carcinoma.	mir-34b	pancreatic cancer	down	MicroRNA miR-34 inhibits human pancreatic cancer tumor-initiating cells.
mir-126	colon cancer	down	MiR-126 suppresses colon cancer cell proliferation and invasion via inhibiting RhoA/ROCK signaling pathway.	mir-200b	gastric cancer	down	miR-200b and miR-200c as prognostic factors and mediators of gastric cancer cell progression.	mir-34b	pancreatic cancer	down	MicroRNA-34b inhibits pancreatic cancer metastasis through repressing Smad3.
mir-126	colorectal cancer	down	Low expression of MicroRNA-126 is associated with poor prognosis in colorectal cancer.	mir-200b	glioma	down	miR-200b as a prognostic factor targets multiple members of RAB family in glioma.	mir-34b	papillary thyroid carcinoma	down	MicroRNA signature distinguishes the degree of aggressiveness of papillary thyroid carcinoma.
mir-126	colorectal cancer	down	Down-regulation of miR-126 expression in colorectal cancer and its clinical significance.	mir-200b	glioma	down	Decreased expression of microRNA-200b is an independent unfavorable prognostic factor for glioma patients.	mir-34b	prostate cancer	down	miRNA-34b inhibits prostate cancer through demethylation, active chromatin modifications, and AKT pathways.

mir-126	colorectal cancer	down	Epigenetic silencing of miR-126 contributes to tumor invasion and angiogenesis in colorectal cancer.	mir-200b	glioma	down	[miR-200b suppresses glioma cell invasion by targeting PROM1].	mir-34b	uveal melanoma	down	MicroRNA-34b/c suppresses uveal melanoma cell proliferation and migration through multiple targets.
mir-126	colorectal cancer	down	MicroRNA-126 functions as a tumor suppressor in colorectal cancer cells by targeting CXCR4 via the AKT and ERK1/2 signaling pathways.	mir-200b	hepato-cellular carcinoma	down	The microRNA-200 family--A potential diagnostic marker in hepatocellular carcinoma?	mir-34c	breast cancer	down	The Regulation and Function of miR-21-FOXO3a-miR-34b/c Signaling in Breast Cancer.
mir-126	esophageal cancer	down	Differential expression of miRNAs in esophageal cancer tissue.	mir-200b	lung adeno-carcinoma	down	miR-200 Inhibits lung adenocarcinoma cell invasion and metastasis by targeting Flt1/VEGFR1.	mir-34c	breast cancer	down	MicroRNA-34 suppresses breast cancer invasion and metastasis by directly targeting Fra-1.
mir-126	esophageal squamous cell carcinoma	down	Insulin receptor substrate-1 and Golgi phosphoprotein 3 are downstream targets of miR7126 in esophageal squamous cell carcinoma.	mir-200b	malignant melanoma	up	MicroRNA-200 family members differentially regulate morphological plasticity and mode of melanoma cell invasion.	mir-34c	breast cancer	down	Expression of miR-34c induces G2/M cell cycle arrest in breast cancer cells.
mir-126	gastric cancer	down	miR-126 functions as a tumour suppressor in human gastric cancer.	mir-200b	mesenchymal cancer	down	MicroRNA Expression Profiles in Kaposi's Sarcoma.	mir-34c	chronic lymphocytic leukemia	down	Epigenetic inactivation of mir-34b/c in addition to mir-34a and DAPK1 in chronic lymphocytic leukemia.
mir-126	gastric cancer	up	MicroRNA-126 inhibits SOX2 expression and contributes to gastric carcinogenesis.	mir-200b	naso-pharyngeal carcinoma	down	miR-200b Suppresses Cell Growth, Migration and Invasion by Targeting Notch1 in Nasopharyngeal Carcinoma.	mir-34c	colon cancer	down	Expression of miR-34 is lost in colon cancer which can be re-expressed by a novel agent CDF.
mir-126	gastric cancer	down	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-200b	ovarian cancer	down	A miR-200 microRNA cluster as prognostic marker in advanced ovarian cancer.	mir-34c	endometrial cancer	down	MiR-34c oligonucleotide enhances chemosensitivity of Ishikawa cell to cisplatin by inducing apoptosis.
mir-126	gastric cancer	down	Mir-126 inhibits growth of SGC-7901 cells by synergistically targeting the oncogenes PI3KR2 and Crk, and the tumor suppressor PLK2.	mir-200b	pancreatic ductal adeno-carcinoma	down	XMD8-92 Inhibits Pancreatic Tumor Xenograft Growth via DCLK1-Dependent Mechanism.	mir-34c	endometrial cancer	down	miR-34c plays a role of tumor suppressor in HEC1-B cells by targeting E2F3 protein.
mir-126	gastric cancer	down	Reduced miR-126 expression facilitates angiogenesis of gastric cancer through its regulation on VEGF-A.	mir-200b	prostate cancer	down	miR-200b suppresses cell proliferation, migration and enhances chemosensitivity in prostate cancer by regulating Bmi-1.	mir-34c	gastric cancer	down	Regulation of microtubule-associated protein tau (MAPT) by miR-34c-5p determines the chemosensitivity of gastric cancer to paclitaxel.
mir-126	gastric cancer	down	MicroRNA-126 inhibits cell proliferation in gastric cancer by targeting LAT-1.	mir-200b	prostate cancer	down	miR-200b inhibits prostate cancer EMT, growth and metastasis.	mir-34c	lung cancer	down	Uncovering growth-suppressive MicroRNAs in lung cancer.
mir-126	hepatocellular carcinoma	down	Decreased expression of miR-126 correlates with metastatic recurrence of hepatocellular carcinoma.	mir-200b	tongue cancer	down	MiR-200b and miR-15b regulate chemotherapy-induced epithelial-mesenchymal transition in human tongue cancer cells by targeting BMI1.	mir-34c	lung cancer	down	Development of a lung cancer therapeutic based on the tumor suppressor microRNA-34.

mir-126	hepatocellular carcinoma	down	miR-126 inhibits cell proliferation and induces cell apoptosis of hepatocellular carcinoma cells partially by targeting Sox2.	mir-200c	bladder cancer	down	Expression of microRNAs in the Urine of Patients With Bladder Cancer.	mir-34c	malignant melanoma	down	Overexpression of the miR-34 family suppresses invasive growth of malignant melanoma with the wild-type p53 gene.
mir-126	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-200c	breast cancer	up	Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes metastatic colonization.	mir-34c	naso-pharyngeal carcinoma	down	MiR-34c suppresses tumor growth and metastasis in nasopharyngeal carcinoma by targeting MET.
mir-126	malignant mesothelioma	down	MicroRNA-126 Suppresses Mesothelioma Malignancy by Targeting IRS1 and Interfering with Mitochondrial Function.	mir-200c	breast cancer	down	MiR-200c suppresses TGF-? signaling and counteracts trastuzumab resistance and metastasis by targeting ZNF217 and ZEB1 in breast cancer.	mir-34c	osteosarcoma	down	MiR-34c inhibits osteosarcoma metastasis and chemoresistance.
mir-126	non-small cell lung cancer	down	Expression of microRNA miR-126 and miR-200c is associated with prognosis in patients with non-small cell lung cancer.	mir-200c	cholangio-carcinoma	down	Direct targeting of SUZ12/ROCK2 by miR-200b/c inhibits cholangiocarcinoma tumourigenesis and metastasis.	mir-34c	osteosarcoma	down	Tumor necrosis factor-related apoptosis-inducing ligand induces cytotoxicity specific to osteosarcoma by microRNA response elements.
mir-126	non-small cell lung cancer	down	miR-126 inhibits non-small cell lung cancer cells proliferation by targeting EGFL7.	mir-200c	colon cancer	down	miR-200c inhibits invasion and migration in human colon cancer cells SW480/620 by targeting ZEB1.	mir-34c	ovarian cancer	down	Frequent downregulation of miR-34 family in human ovarian cancers.
mir-126	non-small cell lung cancer	down	miR-126 enhances the sensitivity of non-small cell lung cancer cells to anticancer agents by targeting vascular endothelial growth factor A.	mir-200c	colon cancer	up	The roles of miR-200c in colon cancer and associated molecular mechanisms.	mir-34c	ovarian carcinoma	down	MicroRNA-34b and MicroRNA-34c are targets of p53 and cooperate in control of cell proliferation and adhesion-independent growth.
mir-126	non-small cell lung cancer	down	MicroRNA-126 inhibits tumor cell growth and its expression level correlates with poor survival in non-small cell lung cancer patients.	mir-200c	colorectal cancer	down	miR-200c inhibits invasion and migration in human colon cancer cells SW480/620 by targeting ZEB1.	mir-34c	pancreatic cancer	down	MicroRNA miR-34 inhibits human pancreatic cancer tumor-initiating cells.
mir-126	non-small cell lung cancer	down	Use of Luminex xMAP bead-based suspension array for detecting microRNA in NSCLC tissues and its clinical application.	mir-200c	colorectal cancer	up	MicroRNA-200c modulates epithelial-to-mesenchymal transition (EMT) in human colorectal cancer metastasis.	mir-34c	prostate cancer	down	miR-34c is downregulated in prostate cancer and exerts tumor suppressive functions.
mir-126	oral squamous cell carcinoma	up	Downregulation of miR-126 induces angiogenesis and lymphangiogenesis by activation of VEGF-A in oral cancer.	mir-200c	colorectal cancer	up	Plasma miR-200c and miR-18a as potential biomarkers for the detection of colorectal carcinoma.	mir-34c	uveal melanoma	down	MicroRNA-34b/c suppresses uveal melanoma cell proliferation and migration through multiple targets.

mir-126	oral squamous cell carcinoma	down	Suppressive effect of microRNA-126 on oral squamous cell carcinoma in vitro.	mir-200c	colorectal cancer	up	microRNA-200b and microRNA-200c promote colorectal cancer cell proliferation via targeting the reversion-inducing cysteine-rich protein with Kazal motifs.	mir-34c-3p	glioma	down	Differential effects of miR-34c-3p and miR-34c-5p on the proliferation, apoptosis and invasion of glioma cells.
mir-126	osteosarcoma	down	MicroRNA-126 inhibits osteosarcoma cells proliferation by targeting Sirt1.	mir-200c	endometrial cancer	up	The interactions between MicroRNA-200c and BRD7 in endometrial carcinoma.	mir-34c-5p	glioma	down	Differential effects of miR-34c-3p and miR-34c-5p on the proliferation, apoptosis and invasion of glioma cells.
mir-126	osteosarcoma	down	miR-126 functions as a tumor suppressor in osteosarcoma by targeting Sox2.	mir-200c	gastric cancer	down	miR-200b and miR-200c as prognostic factors and mediators of gastric cancer cell progression.	mir-361-3p	non-small cell lung cancer	down	Low levels of cell-free circulating miR-361-3p and miR-625* as blood-based markers for discriminating malignant from benign lung tumors.
mir-126	pancreatic ductal adeno-carcinoma	down	MicroRNAs Targeting Oncogenes Are Down-Regulated in Pancreatic Malignant Transformation from Benign Tumors.	mir-200c	gastric cancer	down	The downregulation of miR-200c/141 promotes ZEB1/2 expression and gastric cancer progression.	mir-361-5p	colorectal cancer	down	MiR-361-5p inhibits colorectal and gastric cancer growth and metastasis by targeting staphylococcal nuclease domain containing-1.
mir-126	renal cell carcinoma	down	Low Expression of miR-126 Is a Prognostic Marker for Metastatic Clear Cell Renal Cell Carcinoma.	mir-200c	head and neck squamous cell carcinoma	down	MicroRNA-200c attenuates tumour growth and metastasis of presumptive head and neck squamous cell carcinoma stem cells.	mir-361-5p	gastric cancer	down	MiR-361-5p inhibits colorectal and gastric cancer growth and metastasis by targeting staphylococcal nuclease domain containing-1.
mir-126	small cell lung cancer	down	miR-126 inhibits proliferation of small cell lung cancer cells by targeting SLC7A5.	mir-200c	hepato-cellular carcinoma	down	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-362	renal cell carcinoma	up	A panel of five serum miRNAs as a potential diagnostic tool for early-stage renal cell carcinoma
mir-126*	non-small cell lung cancer	down	Clinical evaluation of microRNA expression profiling in non small cell lung cancer.	mir-200c	hepato-cellular carcinoma	down	Expression Profile of MicroRNA-200 Family in Hepatocellular Carcinoma With Bile Duct Tumor Thrombus.	mir-362-3p	gastric cancer	up	Erratum to: Anti-miR-362-3p Inhibits Migration and Invasion of Human Gastric Cancer Cells by Its Target CD82.
mir-126-5p	acute myeloid leukemia	up	Upregulation of microRNA-126-5p is associated with drug resistance to cytarabine and poor prognosis in AML patients.	mir-200c	lung adeno-carcinoma	down	miR-200 Inhibits lung adenocarcinoma cell invasion and metastasis by targeting Flt1/VEGFR1.	mir-362-3p	gastric cancer	up	Anti-miR-362-3p Inhibits Migration and Invasion of Human Gastric Cancer Cells by Its Target CD82.
mir-1260b	renal cell carcinoma	up	Genistein downregulates onco-miR-1260b and inhibits Wnt-signalling in renal cancer cells.	mir-200c	malignant melanoma	up	MicroRNA-200 family members differentially regulate morphological plasticity and mode of melanoma cell invasion.	mir-362-3p	hepatocellular carcinoma	up	Upregulation of miR-362-3p modulates proliferation and anchorage-independent growth by directly targeting Tob2 in hepatocellular carcinoma.

mir-1266	gastric cancer	down	miR-1207-5p and miR-1266 suppress gastric cancer growth and invasion by targeting telomerase reverse transcriptase	mir-200c	malignant melanoma	down	Differential expression of microRNAs during melanoma progression: miR-200c, miR-205 and miR-211 are downregulated in melanoma and act as tumour suppressors.	mir-362-5p	hepatocellular carcinoma	up	MicroRNA-362-5p promotes tumor growth and metastasis by targeting CYLD in hepatocellular carcinoma.
mir-1269	hepatocellular carcinoma	up	Upregulated MiR-1269 in hepatocellular carcinoma and its clinical significance	mir-200c	malignant melanoma	down	miR-200c Inhibits Melanoma Progression and Drug Resistance through Down-Regulation of Bmi-1.	mir-363	head and neck squamous cell carcinoma	down	Dysregulated miR-363 affects head and neck cancer invasion and metastasis by targeting podoplanin
mir-1269	hepatocellular carcinoma	up	MicroRNA-1269 promotes proliferation in human hepatocellular carcinoma via downregulation of FOXO1	mir-200c	malignant melanoma	down	miR-200c/Bmi1 axis and epithelial-mesenchymal transition contribute to acquired resistance to BRAF inhibitor treatment.	mir-365	colon cancer	down	microRNA-365, down-regulated in colon cancer, inhibits cell cycle progression and promotes apoptosis of colon cancer cells by probably targeting Cyclin D1 and Bcl-2
mir-1269a	colorectal cancer	up	miR-1269 promotes metastasis and forms a positive feedback loop with TGF-?	mir-200c	mesen-chymal cancer	down	MicroRNA Expression Profiles in Kaposi's Sarcoma.	mir-365	hepatocellular carcinoma	down	Prognostic significance and anti-proliferation effect of microRNA-365 in hepatocellular carcinoma
mir-127	breast cancer	down	MicroRNA-127 is Downregulated by Tudor-SN Protein and Contributes to Metastasis and Proliferation in Breast Cancer Cell Line MDA-MB-231	mir-200c	non-small cell lung cancer	up	Expression of microRNA miR-126 and miR-200c is associated with prognosis in patients with non-small cell lung cancer.	mir-365	lung cancer	down	MicroRNA-365 regulates NKX2-1, a key mediator of lung cancer
mir-127	breast cancer	down	miR-127 Regulates Cell Proliferation and Senescence by Targeting BCL6.	mir-200c	non-small cell lung cancer	up	High expression of serum miR-21 and tumor miR-200c associated with poor prognosis in patients with lung cancer.	mir-365	non-small cell lung cancer	down	Associations of deregulation of mir-365 and its target mRNA TTF-1 and survival in patients with NSCLC
mir-127	gastric cancer	down	The Tumor Suppressor Roles of miR-433 and miR-127 in Gastric Cancer.	mir-200c	ovarian cancer	down	A miR-200 microRNA cluster as prognostic marker in advanced ovarian cancer.	mir-365b-3p	retino-blastoma	down	MiR-365b-3p, down-regulated in retinoblastoma, regulates cell cycle progression and apoptosis of human retinoblastoma cells by targeting PAX6
mir-127	hepatocellular carcinoma	down	A Feedback Inhibition between miRNA-127 and TGF?c-Jun Cascade in HCC Cell Migration via MMP13.	mir-200c	ovarian cancer	down	Restoration of miR-200c to ovarian cancer reduces tumor burden and increases sensitivity to paclitaxel.	mir-367	gastric cancer	down	The microRNA-367 Inhibits the Invasion and Metastasis of Gastric Cancer by Directly Repressing Rab23.
mir-127	hepatocellular carcinoma	down	MicroRNA-127 Post-Transcriptionally Downregulates Sept7 and Suppresses Cell Growth in Hepatocellular Carcinoma Cells.	mir-200c	ovarian cancer	up	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.	mir-367	pancreatic cancer	up	miR-367 promotes epithelial-to-mesenchymal transition and invasion of pancreatic ductal adenocarcinoma cells by targeting the Smad7-TGF-? signalling pathway

mir-127-3p	glioblastoma	up	MicroRNA-127-3p promotes glioblastoma cell migration and invasion by targeting the tumor-suppressor gene SEPT7.	mir-200c	ovarian cancer	up	miR-200c modulates ovarian cancer cell metastasis potential by targeting zinc finger E-box-binding homeobox 2 (ZEB2) expression.	mir-369-5p	pancreatic ductal adeno-carcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-127-3p	glioblastoma	down	Next Generation Sequencing Analysis of miRNAs. MiR-127-3p Inhibits Glioblastoma Proliferation and Activates TGF-? Signaling by Targeting SKI.	mir-200c	pancreatic ductal adeno-carcinoma	down	XMD8-92 Inhibits Pancreatic Tumor Xenograft Growth via DCLK1-Dependent Mechanism.	mir-370	acute myeloid leukemia	up	Integration of SNP and mRNA arrays with microRNA profiling reveals that MiR-370 is upregulated and targets NF1 in acute myeloid leukemia.
mir-127-3p	osteosarcoma	down	MicroRNA-199a-3p is downregulated in human osteosarcoma and regulates cell proliferation and migration.	mir-200c	rectal cancer	up	The quantitative analysis by stem-loop real-time PCR revealed the microRNA-34a, microRNA-155 and microRNA-200c overexpression in human colorectal cancer.	mir-370	bladder cancer	down	Up-regulation of p21(WAF1/CIP1) by miRNAs and its implications in bladder cancer cells.
mir-1271	gastric cancer	down	miR-1271 Regulates Cisplatin Resistance of Human Gastric Cancer Cell Lines by Targeting IGF1R, IRS1, mTOR, and BCL2.	mir-200c	renal clear cell carcinoma	down	miRNA profiling for clear cell renal cell carcinoma: biomarker discovery and identification of potential controls and consequences of miRNA dysregulation.	mir-370	gastric cancer	up	Overexpression of miR-370 and downregulation of its novel target TGF?-RII contribute to the progression of gastric carcinoma.
mir-1271	hepatocellular carcinoma	down	A functional screening identifies five miRNAs controlling glypican-3: Role of miR-1271 down-regulation in hepatocellular carcinoma.	mir-200c	renal clear cell carcinoma	down	Genome-wide microRNA expression profiling in renal cell carcinoma. significant down-regulation of miR-141 and miR-200c.	mir-370	gastric cancer	up	Upregulation of miR-370 contributes to the progression of gastric carcinoma via suppression of FOXO1.
mir-1271	oral squamous cell carcinoma	down	miR-1271 inhibits OSCC cell growth and metastasis by targeting ALK.	mir-202	follicular lymphoma	down	Targetome profiling, pathway analysis and genetic association study implicate miR-202 in lymphomagenesis.	mir-370	hepatocellular carcinoma	down	Perturbation of miR-370-LIN28A-NF-?B regulatory circuit contributes to the development of hepatocellular carcinoma.
mir-1274a	gastric cancer	up	The role of microRNA-1274a in the tumorigenesis of gastric cancer: accelerating cancer cell proliferation and migration via directly targeting FOXO4.	mir-202	hepato-cellular carcinoma	down	miR-202 suppresses cell proliferation in human hepatocellular carcinoma by downregulating LRP6 post-transcriptionally.	mir-370	laryngeal squamous cell carcinoma	down	miR-370 targeted FoxM1 functions as a tumor suppressor in laryngeal squamous cell carcinoma (LSCC).
mir-128	acute lymphoblastic leukemia	up	Distinctive microRNA signature is associated with the diagnosis and prognosis of acute leukemia.	mir-202-3p	colorectal carcinoma	down	MicroRNA-202-3p Inhibits Cell Proliferation by Targeting ADP-Ribosylation Factor-like 5A in Human Colorectal Carcinoma.	mir-370	oral squamous cell carcinoma	down	miR-370 modulates insulin receptor substrate-1 expression and inhibits the tumor phenotypes of oral carcinoma.
mir-128	acute myeloid leukemia	up	Distinctive microRNA signature is associated with the diagnosis and prognosis of acute leukemia.	mir-202-3p	gastric cancer	down	Decrease of miR-202-3p Expression, a Novel Tumor Suppressor, in Gastric Cancer.	mir-371-5p	hepatocellular carcinoma	up	miR-371-5p down-regulates pre mRNA processing factor 4 homolog B (PRPF4B) and facilitates the G1/S transition in human hepatocellular carcinoma.

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mir-128	glioblastoma	down	Micro-RNA-128 (miRNA-128) down-regulation in glioblastoma targets ARP5 (ANGPTL6), Bmi-1 and E2F-3a, key regulators of brain cell proliferation.	mir-203	basal cell carcinoma	down	MicroRNA-203 functions as a tumor suppressor in basal cell carcinoma.	mir-372	cervical cancer	down	MicroRNA-372 is down-regulated and targets cyclin-dependent kinase 2 (CDK2) and cyclin A1 in human cervical cancer, which may contribute to tumorigenesis.
mir-128	glioblastoma	down	PDGF-B-mediated downregulation of miR-21: new insights into PDGF signaling in glioblastoma.	mir-203	bladder cancer	down	microRNA-203 suppresses bladder cancer development by repressing bcl-w expression.	mir-372	epithelial ovarian cancer	up	Gain-of-function microRNA screens identify miR-193a regulating proliferation and apoptosis in epithelial ovarian cancer cells.
mir-128	glioblastoma	down	miR-128 and miR-149 enhance the chemosensitivity of temozolomide by Rap1B-mediated cytoskeletal remodeling in glioblastoma.	mir-203	bladder cancer	down	Curcumin modulates microRNA-203-mediated regulation of the Src-Akt axis in bladder cancer.	mir-372	glioma	up	Correlation of microma-372 upregulation with poor prognosis in human glioma.
mir-128	glioma	down	MiR-128 inhibits tumor growth and angiogenesis by targeting p70S6K1.	mir-203	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-372	head and neck squamous cell carcinoma	up	miR-372 inhibits p62 in head and neck squamous cell carcinoma in vitro and in vivo.
mir-128	glioma	down	Proteomic screening and identification of microRNA-128 targets in glioma cells.	mir-203	breast cancer	up	Anti-miR-203 Upregulates SOCS3 Expression in Breast Cancer Cells and Enhances Cisplatin Chemosensitivity.	mir-372	hepatocellular carcinoma	up	Upregulation of microRNA-372 associates with tumor progression and prognosis in hepatocellular carcinoma.
mir-128	glioma	down	Serum microRNA-128 as a biomarker for diagnosis of glioma.	mir-203	cervical cancer	down	miR-203 Suppresses Tumor Growth and Angiogenesis by Targeting VEGFA in Cervical Cancer.	mir-372	hepatocellular carcinoma	down	miR-372 down-regulates the oncogene ATAD2 to influence hepatocellular carcinoma proliferation and metastasis.
mir-128	glioma	down	MicroRNA-128 inhibits glioma cells proliferation by targeting transcription factor E2F3a.	mir-203	cervical cancer	down	BANF1 Is Downregulated by IRF1-Regulated MicroRNA-203 in Cervical Cancer.	mir-373	breast cancer	up	The microRNAs miR-373 and miR-520c promote tumour invasion and metastasis.
mir-128	glioma	down	Targeting of the Bmi-1 oncogene/stem cell renewal factor by microRNA-128 inhibits glioma proliferation and self-renewal.	mir-203	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-373	cervical carcinoma	up	MicroRNA-373 functions as an oncogene and targets YOD1 gene in cervical cancer.
mir-128	glioma	down	MicroRNA-128 downregulates Bax and induces apoptosis in human embryonic kidney cells.	mir-203	colorectal cancer	down	MiR-203 Suppresses ZNF217 Upregulation in Colorectal Cancer and Its Oncogenicity.	mir-373	colon cancer	down	Epigenetic silencing of microRNA-373 plays an important role in regulating cell proliferation in colon cancer.

mir-128	head and neck squamous cell carcinoma	down	Functions of MiRNA-128 on the regulation of head and neck squamous cell carcinoma growth and apoptosis.	mir-203	esophageal adeno-carcinoma	down	Deciphering the Unique MicroRNA Signature in Human Esophageal Adenocarcinoma.	mir-373	epithelial ovarian cancer	up	Gain-of-function microRNA screens identify miR-193a regulating proliferation and apoptosis in epithelial ovarian cancer cells.
mir-128	meningioma	down	Serum microRNA-128 as a biomarker for diagnosis of glioma.	mir-203	esophageal cancer	up	Alteration of miRNA Expression Correlates with Lifestyle, Social and Environmental Determinants in Esophageal Carcinoma.	mir-373	esophageal squamous cell carcinoma	up	MicroRNA-373 (miR-373) post-transcriptionally regulates large tumor suppressor, homolog 2 (LATS2) and stimulates proliferation in human esophageal cancer.
mir-128	osteosarcoma	up	MicroRNA-128 promotes proliferation in osteosarcoma cells by downregulating PTEN.	mir-203	esophageal cancer	down	MiR-203 suppresses tumor growth and invasion and down-regulates MiR-21 expression through repressing Ran in esophageal cancer.	mir-373	gastric adeno-carcinoma	up	MicroRNA-373 is upregulated and targets TNFAIP1 in human gastric cancer, contributing to tumorigenesis.
mir-128	prostate cancer	down	MicroRNA-128 downregulates Bax and induces apoptosis in human embryonic kidney cells.	mir-203	esophageal cancer	down	miR-203 inhibits the proliferation and self-renewal of esophageal cancer stem-like cells by suppressing stem renewal factor Bmi-1.	mir-373	hepatocellular carcinoma	up	MicroRNA-373, a new regulator of protein phosphatase?6, functions as an oncogene in hepatocellular carcinoma.
mir-128	prostate cancer	down	miRNA-128 suppresses prostate cancer by inhibiting BMI-1 to inhibit tumor-initiating cells.	mir-203	esophageal squamous cell carcinoma	down	MicroRNA-203 inhibits cell proliferation by repressing ?Np63 expression in human esophageal squamous cell carcinoma.	mir-373	non-small cell lung cancer	down	Epigenetic silencing of microRNA-373 to epithelial-mesenchymal transition in non-small cell lung cancer through IRAK2 and LAMP1 axes.
mir-128-3p	hepatocellular carcinoma	down	miR-128-3p suppresses hepatocellular carcinoma proliferation by regulating PIK3R1 and is correlated with the prognosis of HCC patients.	mir-203	esophageal squamous cell carcinoma	down	miR-203 is a Direct Transcriptional Target of E2F1 and Causes G1 Arrest in Esophageal Cancer Cells.	mir-373	pancreatic cancer	down	Micro RNA-373 is Down-regulated in Pancreatic Cancer and Inhibits Cancer Cell Invasion.
mir-1280	bladder cancer	down	MicroRNA-1280 Inhibits Invasion and Metastasis by Targeting ROCK1 in Bladder Cancer.	mir-203	glioma	down	MicroRNA 203 Modulates Glioma Cell Migration via Robo1/ERK/MMP-9 Signaling.	mir-374a	breast cancer	down	Effects of Differential Distribution of Microvessel Density, Possibly Regulated by miR-374a, on Breast Cancer Prognosis.
mir-1280	malignant melanoma	down	Anti-tumor activity of miR-1280 in melanoma by regulation of Src.	mir-203	hepato-cellular carcinoma	down	miR-203 inhibits proliferation of HCC cells by targeting survivin.	mir-374a	gastric cancer	up	miR-374a promotes cell proliferation, migration and invasion by targeting SRCIN1 in gastric cancer.
mir-1280	non-small cell lung cancer	up	Upregulation of MiR-1280 Expression in Non-small Cell Lung Cancer Tissues.	mir-203	hypo-pharyngeal cancer	up	Effect of microRNA-203 on tumor growth in human hypopharyngeal squamous cell carcinoma.	mir-374a-5p	osteosarcoma	up	Identification of a plasma four-microRNA panel as potential noninvasive biomarker for osteosarcoma.
mir-1285	renal cell carcinoma	down	Tumor suppressive microRNA-1285 regulates novel molecular targets: Aberrant expression and functional significance in	mir-203	kidney cancer	down	miR-203 inhibition of renal cancer cell proliferation, migration and invasion by targeting of FGF2.	mir-374b	prostate cancer	down	Global analysis of the differentially expressed miRNAs of prostate cancer in Chinese patients.

			renal cell carcinoma.								
mir-128a	hepatocellular carcinoma	up	[miR-128a is up-regulated in hepatocellular carcinoma and promotes tumor cell proliferation by targeting RND3].	mir-203	laryngeal squamous cell carcinoma	down	MiR-203 is downregulated in laryngeal squamous cell carcinoma and can suppress proliferation and induce apoptosis of tumours.	mir-375	cervical squamous cell carcinoma	down	miR-375 is down-regulated in squamous cervical cancer and inhibits cell migration and invasion via targeting transcription factor SP1.
mir-128a	medulloblastoma	down	MicroRNA 128a increases intracellular ROS level by targeting Bmi-1 and inhibits medulloblastoma cancer cell growth by promoting senescence.	mir-203	lung cancer	down	miR-203 Suppresses the Proliferation and Migration and Promotes the Apoptosis of Lung Cancer Cells by Targeting SRC.	mir-375	colorectal cancer	down	Expression levels of microRNA-375 in colorectal carcinoma.
mir-129	breast cancer	down	[The down-regulation of miR-129 in breast cancer and its effect on breast cancer migration and motility].	mir-203	lung cancer	down	The expression and function of microRNA-203 in lung cancer.	mir-375	colorectal cancer	down	Identification and functional screening of microRNAs highly deregulated in colorectal cancer.
mir-129	colorectal cancer	down	miR-129 promotes apoptosis and enhances chemosensitivity to 5-fluorouracil in colorectal cancer.	mir-203	malignant melanoma	down	Analysis of microRNA-203 function in CREB/MITF/RAB27a pathway: comparison between canine and human melanoma cells.	mir-375	colorectal cancer	down	MicroRNA-375 inhibits colorectal cancer growth by targeting PIK3CA.
mir-129	glioblastoma	down	Functional profiling of precursor MicroRNAs identifies MicroRNAs essential for glioma proliferation.	mir-203	malignant melanoma	down	MiR-203 inhibits melanoma invasive and proliferative abilities by targeting the polycomb group gene BMI1.	mir-375	esophageal cancer	down	Epigenetic silencing of microRNA-375 regulates PDK1 expression in esophageal cancer.
mir-129	non-small cell lung cancer	down	MiR-129 regulates MMP9 to control metastasis of non-small cell lung cancer.	mir-203	malignant melanoma	down	Anti-oncogenic MicroRNA-203 Induces Senescence by Targeting E2F3 in Human Melanoma Cells.	mir-375	esophageal cancer	down	The expression of miR-21 and miR-375 predict prognosis of esophageal cancer.
mir-129-1-3p	gastric cancer	down	Growth inhibitory effects of three miR-129 family members on gastric cancer.	mir-203	malignant melanoma	down	MicroRNA-203 inhibits malignant melanoma cell migration by targeting versican.	mir-375	esophageal squamous cell carcinoma	down	Circulating microRNAs in plasma of patients with oesophageal squamous cell carcinoma.
mir-129-2-3p	gastric cancer	down	Growth inhibitory effects of three miR-129 family members on gastric cancer.	mir-203	pancreatic adeno-carcinoma	up	MicroRNA-203 expression as a new prognostic marker of pancreatic adenocarcinoma.	mir-375	esophageal squamous cell carcinoma	down	Cell-specific detection of miR-375 downregulation for predicting the prognosis of esophageal squamous cell carcinoma by miRNA in situ hybridization.
mir-129-3p	gastric cancer	down	Epigenetic regulation of miR-34b and miR-129 expression in gastric cancer.	mir-203	pancreatic cancer	down	miR-203 inhibits tumor cell migration and invasion via caveolin-1 in pancreatic cancer cells.	mir-375	esophageal squamous cell carcinoma	down	Clinical significance of serum miR-223, miR-25 and miR-375 in patients with esophageal squamous cell carcinoma.
mir-129-3p	renal cell carcinoma	down	miR-129-3p, as a diagnostic and prognostic biomarker for renal cell carcinoma, attenuates cell	mir-203	pancreatic ductal adeno-carcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal	mir-375	gastric cancer	down	MicroRNA-375 is downregulated in gastric carcinomas and regulates cell survival by targeting

			migration and invasion via downregulating multiple metastasis-related genes				Adenocarcinomas.				PDK1 and 14-3-3zeta.
mir-129-5p	gastric cancer	down	Growth inhibitory effects of three miR-129 family members on gastric cancer.	mir-203	prostate cancer	down	MiR-203 down-regulates Rap1A and suppresses cell proliferation, adhesion and invasion in prostate cancer.	mir-375	gastric cancer	down	MiR-375 frequently downregulated in gastric cancer inhibits cell proliferation by targeting JAK2.
mir-129-5p	gastric cancer	down	lncRNA-AC130710 targeting by miR-129-5p is upregulated in gastric cancer and associates with poor prognosis.	mir-203	prostate cancer	down	Loss of EGFR signaling regulated miR-203 promotes prostate cancer bone metastasis and tyrosine kinase inhibitors resistance.	mir-375	gastric cancer	down	miR-375 inhibits the proliferation of gastric cancer cells by repressing ERBB2 expression.
mir-129-5p	hepatocellular carcinoma	down	MicroRNA-129-5p inhibits hepatocellular carcinoma cell metastasis and invasion via targeting ETS1.	mir-203	rhabdo-myosarcoma	down	miR-203, a tumor suppressor frequently down-regulated by promoter hypermethylation in Rhabdomyosarcoma.	mir-375	gastric cancer	down	Snail-regulated MiR-375 inhibits migration and invasion of gastric cancer cells by targeting JAK2.
mir-129-5p	laryngeal squamous cell carcinoma	down	Down-Regulation of miR-129-5p Inhibits Growth and Induces Apoptosis in Laryngeal Squamous Cell Carcinoma by Targeting APC.	mir-203	squamous carcinoma	down	MicroRNA expression profiles of esophageal cancer.	mir-375	glioma	down	Correlation of microRNA-375 downregulation with unfavorable clinical outcome of patients with glioma.
mir-129-5p	medullary thyroid carcinoma	down	MiR-129-5p is down-regulated and involved in the growth, apoptosis and migration of medullary thyroid carcinoma cells through targeting RET.	mir-203	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.	mir-375	head and neck squamous cell carcinoma	down	Comprehensive MicroRNA profiling for head and neck squamous cell carcinomas.
mir-129-5p	ovarian cancer	down	A novel role for microRNA-129-5p in inhibiting ovarian cancer cell proliferation and survival via direct suppression of transcriptional co-activators YAP and TAZ.	mir-203a	renal cell carcinoma	up	miR-203a regulates proliferation, migration, and apoptosis by targeting glycogen synthase kinase-3? in human renal cell carcinoma.	mir-375	hepatocellular carcinoma	down	MicroRNA-375 targets AEG-1 in hepatocellular carcinoma and suppresses liver cancer cell growth in vitro and in vivo.
mir-1290	colon cancer	up	Up-regulation of microRNA-1290 impairs cytokinesis and affects the reprogramming of colon cancer cells.	mir-204	gastric cancer	down	MiR-204 down regulates SIRT1 and reverts SIRT1-induced epithelial-mesenchymal transition, anoikis resistance and invasion in gastric cancer cells.	mir-375	hepatocellular carcinoma	down	miR-375 inhibits autophagy and reduces viability of hepatocellular carcinoma cells under hypoxic conditions.
mir-1290	esophageal squamous cell carcinoma	up	MicroRNA-1290 promotes esophageal squamous cell carcinoma cell proliferation and metastasis.	mir-204	glioma	down	Loss of miR-204 expression enhances glioma migration and stem cell-like phenotype.	mir-375	laryngeal squamous cell carcinoma	down	miR-375 Suppresses IGF1R Expression and Contributes to Inhibition of Cell Progression in Laryngeal Squamous Cell Carcinoma.
mir-1291	renal cell carcinoma	down	Tumor-suppressive microRNA-1291 directly regulates glucose transporter 1 (GLUT1) in	mir-204	malignant melanoma	down	Regulation of cancer aggressive features in melanoma cells by microRNAs.	mir-375	naso-pharyngeal carcinoma	down	Significance of dysregulated metadherin and microRNA-375 in head and neck cancer.

			renal cell carcinoma.								
mir-1294	esophageal squamous cell carcinoma	down	Down-Regulation of MiR-1294 is Related to Dismal Prognosis of Patients with Esophageal Squamous Cell Carcinoma through Elevating C-MYC Expression.	mir-204	naso-pharyngeal carcinoma	down	Down-regulation of miRNA-204 by LMP-1 enhances CDC42 activity and facilitates invasion of EBV-associated nasopharyngeal carcinoma cells.	mir-375	non-small cell lung cancer	down	Decreased expression of microRNA-375 in nonsmall cell lung cancer and its clinical significance.
mir-1295b-3p	colorectal cancer	down	Decreased expression of fecal miR-4478 and miR-1295b-3p in early-stage colorectal cancer.	mir-204	non-small cell lung cancer	down	miR-204 functions as a tumor suppressor by regulating SIX1 in NSCLC.	mir-375	non-small cell lung cancer	up	Claudin-1 is a novel target of miR-375 in non-small-cell lung cancer.
mir-1296	prostate cancer	down	Regulation of minichromosome maintenance gene family by microRNA-1296 and genistein in prostate cancer.	mir-204	non-small cell lung cancer	down	MiR-204 inhibits human NSCLC metastasis through suppression of NUAK1.	mir-375	oral cancer	down	MicroRNA alterations and associated aberrant DNA methylation patterns across multiple sample types in oral squamous cell carcinoma.
mir-1297	lung adeno-carcinoma	down	miR-511 and miR-1297 inhibit human lung adenocarcinoma cell proliferation by targeting oncogene TRIB2.	mir-204	osteo-sarcoma	down	MicroRNA-204 inhibits proliferation, migration, invasion and epithelial-mesenchymal transition in osteosarcoma cells via targeting Sirtuin 1.	mir-375	oral cancer	down	Anti-Cancer Drugs Reactivate Tumor Suppressor miR-375 Expression in Tongue Cancer Cells.
mir-1301	liver cancer	up	Identification of miRNAs that specifically target tumor suppressive KLF6-FL rather than oncogenic KLF6-SV1 isoform.	mir-204	prostate cancer	up	Mechanisms and functional consequences of PDEF protein expression loss during prostate cancer progression.	mir-375	oral carcinoma	down	Dysregulation of miR-31 and miR-375 expression is associated with clinical outcomes in oral carcinoma.
mir-1303	gastric cancer	up	miR-1303 Targets Claudin-18 Gene to Modulate Proliferation and Invasion of Gastric Cancer Cells.	mir-204	renal clear cell carcinoma	down	VHL-regulated MiR-204 suppresses tumor growth through inhibition of LC3B-mediated autophagy in renal clear cell carcinoma.	mir-375	osteosarcoma	down	MicroRNA-375 functions as a tumor suppressor in osteosarcoma by targeting PIK3CA.
mir-1307	colorectal cancer	down	The polymorphic terminal-loop of pre-miR-1307 binding with MBNL1 contributes to colorectal carcinogenesis via interference with Dicer1 recruitment.	mir-204	retino-blastoma	down	MiR-204, down-regulated in retinoblastoma, regulates proliferation and invasion of human retinoblastoma cells by targeting CyclinD2 and MMP-9.	mir-375	pancreatic cancer	down	MicroRNA-375 is downregulated in pancreatic cancer and inhibits cell proliferation in vitro.
mir-130a	breast cancer	down	MicroRNA-130a inhibits cell proliferation, invasion and migration in human breast cancer by targeting the RAB5A.	mir-204-3p	hepato-cellular carcinoma	down	Growth inhibition of hepatocellular carcinoma tumor endothelial cells by miR-204-3p and underlying mechanism.	mir-375	pancreatic cancer	down	Expression levels of microRNA-375 in pancreatic cancer.
mir-130a	endometrial cancer	down	Mutant p53 gain-of-function induces epithelial-mesenchymal transition through modulation of the miR-130b-ZEB1 axis.	mir-204-5p	colorectal cancer	up	miR-204-5p expression in colorectal cancer: an autophagy-associated gene.	mir-375	pancreatic carcinoma	down	MicroRNA-375 targets PDK1 in pancreatic carcinoma and suppresses cell growth through the Akt signaling pathway.

mir-130a	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-204-5p	colorectal cancer	down	miR-204-5p Inhibits Proliferation and Invasion and Enhances Chemotherapeutic Sensitivity of Colorectal Cancer Cells by Downregulating RAB22A.	mir-375	pancreatic ductal adeno-carcinoma	down	Knockdown of microRNA-21 inhibits proliferation and increases cell death by targeting programmed cell death 4 (PDCD4) in pancreatic ductal adenocarcinoma.
mir-130a	hepatocellular carcinoma	up	Upregulated miR-130a increases drug resistance by regulating RUNX3 and Wnt signaling in cisplatin-treated HCC cell.	mir-204-5p	gastric cancer	down	MicroRNA-204-5p inhibits gastric cancer cell proliferation by downregulating USP47 and RAB22A.	mir-375	pancreatic ductal adeno-carcinoma	down	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-130a	hepatocellular carcinoma	down	MicroRNA-130a is down-regulated in hepatocellular carcinoma and associates with poor prognosis.	mir-204-5p	papillary thyroid carcinoma	down	miR-204-5p suppresses cell proliferation by inhibiting IGFBP5 in papillary thyroid carcinoma.	mir-375	squamous carcinoma	down	Tumor suppressive microRNA-375 regulates lactate dehydrogenase B in maxillary sinus squamous cell carcinoma.
mir-130b	colorectal cancer	up	MicroRNA-130b Promotes Tumor Development and Is Associated with Poor Prognosis in Colorectal Cancer.	mir-205	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-376a	chondro-sarcoma	down	Analysis of microRNAs expressions in chondrosarcoma.
mir-130b	colorectal cancer	down	Microma 130b Suppresses Migration and Invasion of Colorectal Cancer Cells through Downregulation of Integrin 21.	mir-205	bladder cancer	down	Expression of microRNAs in the Urine of Patients With Bladder Cancer.	mir-376a	glioblastoma	down	Functional profiling of precursor MicroRNAs identifies MicroRNAs essential for glioma proliferation.
mir-130b	colorectal cancer	up	MicroRNA-130b Promotes Tumor Development and Is Associated with Poor Prognosis in Colorectal Cancer.	mir-205	breast cancer	down	Suppression of cell growth and invasion by miR-205 in breast cancer.	mir-376a	hepatocellular carcinoma	down	miR-376a suppresses proliferation and induces apoptosis in hepatocellular carcinoma.
mir-130b	endometrial cancer	down	Mutant p53 gain-of-function induces epithelial-mesenchymal transition through modulation of the miR-130b-ZEB1 axis.	mir-205	breast cancer	down	Analysis of miR-205 and miR-155 expression in the blood of breast cancer patients.	mir-376a	malignant melanoma	down	Silencing of a large microRNA cluster on human chromosome 14q32 in melanoma: biological effects of mir-376a and mir-376c on insulin growth factor 1 receptor.
mir-130b	esophageal squamous cell carcinoma	up	MiR-130b plays an oncogenic role by repressing PTEN expression in esophageal squamous cell carcinoma cells.	mir-205	breast cancer	down	miRNA-205 affects infiltration and metastasis of breast cancer.	mir-376a	pancreatic ductal adeno-carcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-130b	hepatocellular carcinoma	down	Repression of microRNA-130b by thyroid hormone enhances cell motility.	mir-205	breast cancer	up	Role of microRNAs -29b-2, -155, -197 and -205 as diagnostic biomarkers in serum of breast cancer females.	mir-376c	malignant melanoma	down	Silencing of a large microRNA cluster on human chromosome 14q32 in melanoma: biological effects of mir-376a and mir-376c on insulin growth factor 1 receptor.

mir-130b	hepatocellular carcinoma	up	Identification of differentially expressed microRNAs in human hepatocellular adenoma associated with type I glycogen storage disease: a potential utility as biomarkers.	mir-205	cervical cancer	up	Serum microRNA-205 as a novel biomarker for cervical cancer patients.	mir-376c	osteosarcoma	down	MicroRNA-376c Inhibits Cell Proliferation and Invasion in Osteosarcoma by Targeting to Transforming Growth Factor-Alpha.
mir-130b	hepatocellular carcinoma	up	High expression of microRNA-130b correlates with poor prognosis of patients with hepatocellular carcinoma.	mir-205	cervical cancer	up	miR-205 Expression Promotes Cell Proliferation and Migration of Human Cervical Cancer Cells.	mir-376c	osteosarcoma	down	MicroRNA-199a-3p is downregulated in human osteosarcoma and regulates cell proliferation and migration.
mir-130b	ovarian cancer	down	Epigenetic silencing of miR-130b in ovarian cancer promotes the development of multidrug resistance by targeting colony-stimulating factor 1.	mir-205	cervical squamous cell carcinoma	up	miRNAs expression profiling to distinguish lung squamous-cell carcinoma from adenocarcinoma subtypes.	mir-377	gastric cancer	up	MicroRNA-377 predicts poor clinical outcome of gastric cancer and induces tumorigenesis by targeting multiple tumor-suppressor genes.
mir-130b	papillary thyroid carcinoma	down	MicroRNA signature distinguishes the degree of aggressiveness of papillary thyroid carcinoma.	mir-205	endometrial cancer	up	miR-205 promotes tumor proliferation and invasion through targeting ESRRG in endometrial carcinoma.	mir-377	hepatocellular carcinoma	down	MicroRNA-377 Suppresses Cell Proliferation and Invasion by Inhibiting TIAM1 Expression in Hepatocellular Carcinoma.
mir-130b	prostate cancer	down	MiR-130b suppresses prostate cancer metastasis through down-regulation of MMP2.	mir-205	endometrial cancer	down	MiR-205 inhibits cell apoptosis by targeting phosphatase and tensin homolog deleted on chromosome ten in endometrial cancer Ishikawa cells.	mir-377	renal clear cell carcinoma	down	miR-377 functions as a tumor suppressor in human clear cell renal cell carcinoma by targeting ETS1.
mir-130b*	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-205	esophageal cancer	up	Alteration of miRNA Expression Correlates with Lifestyle, Social and Environmental Determinants in Esophageal Carcinoma.	mir-378	acute myeloid leukemia	up	Overexpression of miR-378 is frequent and may affect treatment outcomes in patients with acute myeloid leukemia.
mir-132	breast cancer	down	MiR-132 prohibits proliferation, invasion, migration, and metastasis in breast cancer by targeting HN1.	mir-205	esophageal cancer	up	miR-200a/miR-141 and miR-205 upregulation might be associated with hormone receptor status and prognosis in endometrial carcinomas.	mir-378	breast cancer	up	Association between mir-24 and mir-378 in formalin-fixed paraffin-embedded tissues of breast cancer.
mir-132	colorectal cancer	down	miR-132 inhibits colorectal cancer invasion and metastasis via directly targeting ZEB2.	mir-205	gastric cancer	down	Down-regulation of MicroRNA-205 promotes gastric cancer cell proliferation.	mir-378	colorectal cancer	down	Identification and functional screening of microRNAs highly deregulated in colorectal cancer.
mir-132	glioma	up	Upregulation of miR-132 expression in glioma and its clinical significance.	mir-205	glioma	down	Identification of microRNA-205 as a potential prognostic indicator for human glioma.	mir-378	colorectal cancer	down	MicroRNA-378 inhibits cell growth and enhances 5-OHP-induced apoptosis in human colorectal cancer.
mir-132	liver cancer	down	Effects of MicroRNA-132 Transfection on the Proliferation and Apoptosis of Human Liver Cancer Cells in vitro and in vivo.	mir-205	glioma	down	MicroRNA-205 functions as a tumor suppressor in human glioblastoma cells by targeting VEGF-A.	mir-378	gastric cancer	down	MicroRNA-195 and microRNA-378 mediate tumor growth suppression by epigenetical regulation in gastric cancer.

mir-132	osteosarcoma	down	Loss of microRNA-132 predicts poor prognosis in patients with primary osteosarcoma.	mir-205	head and neck squamous cell carcinoma	down	Low-level expression of microRNAs let-7d and miR-205 are prognostic markers of head and neck squamous cell carcinoma.	mir-378	gastric cancer	down	MicroRNA profiling of human gastric cancer.
mir-132	osteosarcoma	down	miR-132 targeting cyclin E1 suppresses cell proliferation in osteosarcoma cells.	mir-205	hepato-cellular carcinoma	down	MiR-205 modulates abnormal lipid metabolism of hepatoma cells via targeting acyl-CoA synthetase long-chain family member 1 (ACSL1) mRNA.	mir-378	naso-pharyngeal carcinoma	down	MicroRNA-378 functions as an onco-miR in nasopharyngeal carcinoma by repressing TOB2 expression.
mir-132	pancreatic cancer	up	miR-132 and miR-212 are increased in pancreatic cancer and target the retinoblastoma tumor suppressor.	mir-205	hepato-cellular carcinoma	down	Hepatitis B virus X protein inhibits tumor suppressor miR-205 through inducing hypermethylation of miR-205 promoter to enhance carcinogenesis.	mir-378	ovarian cancer	up	MiR-378 as a biomarker for response to anti-angiogenic treatment in ovarian cancer
mir-132	pancreatic carcinoma	down	Downregulation of miR-132 by promoter methylation contributes to pancreatic cancer development.	mir-205	kidney cancer	down	MicroRNA-205 inhibits Src-mediated oncogenic pathways in renal cancer.	mir-378	ovarian cancer	up	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.
mir-133a	bladder cancer	down	MicroRNA-133 inhibits cell proliferation, migration and invasion by targeting epidermal growth factor receptor and its downstream effector proteins in bladder cancer.	mir-205	laryngeal squamous cell carcinoma	down	MicroRNA-205 suppresses proliferation and promotes apoptosis in laryngeal squamous cell carcinoma.	mir-378	renal cell carcinoma	down	A panel of five serum miRNAs as a potential diagnostic tool for early-stage renal cell carcinoma.
mir-133a	bladder cancer	down	The tumour-suppressive function of miR-1 and miR-133a targeting TAGLN2 in bladder cancer.	mir-205	lung cancer	up	Evaluation of dynamic change of serum miR-21 and miR-24 in pre- and post-operative lung carcinoma patients.	mir-378a-3p	colorectal cancer	down	Clinical and biological significance of miR-378a-3p and miR-378a-5p in colorectal cancer.
mir-133a	breast cancer	down	microRNA-133a regulates the cell cycle and proliferation of breast cancer cells by targeting epidermal growth factor receptor through the EGFR/Akt signaling pathway.	mir-205	lung cancer	up	miR-205 regulates A549 cells proliferation by targeting PTEN.	mir-378a-5p	colorectal cancer	down	Clinical and biological significance of miR-378a-3p and miR-378a-5p in colorectal cancer.
mir-133a	colorectal cancer	down	The clinicopathological significance of miR-133a in colorectal cancer.	mir-205	malignant melanoma	down	miRNA-205 suppresses melanoma cell proliferation and induces senescence via regulation of E2F1 protein.	mir-379	breast cancer	down	miR-379 regulates cyclin B1 expression and is decreased in breast cancer.
mir-133a	colorectal cancer	down	Decreased expression of miR-133a correlates with poor prognosis in colorectal cancer patients.	mir-205	malignant melanoma	down	Differential expression of microRNAs during melanoma progression: miR-200c, miR-205 and miR-211 are downregulated in melanoma and act as tumour suppressors.	mir-381	breast cancer	down	Analysis of miR-205 and miR-155 expression in the blood of breast cancer patients.

mir-133a	colorectal cancer	down	MicroRNA-133a suppresses colorectal cancer cell invasion by targeting Fascin1.	mir-205	malignant melanoma	down	Chemically Modified Synthetic microRNA-205 Inhibits the Growth of Melanoma Cells In Vitro and In Vivo.	mir-381	lung adeno-carcinoma	down	MicroRNA-381 represses ID1 and is deregulated in lung adenocarcinoma.
mir-133a	colorectal cancer	down	Candidate microRNA biomarkers in human colorectal cancer: Systematic review profiling studies and experimental validation.	mir-205	non-small cell lung cancer	up	Prognostic value of mature microRNA-21 and microRNA-205 overexpression in non-small cell lung cancer by quantitative real-time RT-PCR.	mir-382	osteosarcoma	down	miR-382 Inhibits Osteosarcoma Metastasis and Relapse by Targeting Y Box-Binding Protein 1.
mir-133a	colorectal cancer	down	Tumor suppressor functions of miR-133a in colorectal cancer.	mir-205	non-small cell lung cancer	up	miR-205 promotes the growth, metastasis and chemoresistance of NSCLC cells by targeting PTEN.	mir-382	osteosarcoma	down	miR-382 inhibits tumor growth and enhance chemosensitivity in osteosarcoma.
mir-133a	esophageal squamous cell carcinoma	down	miR-145, miR-133a and miR-133b: Tumor-suppressive miRNAs target FSCN1 in esophageal squamous cell carcinoma.	mir-205	ovarian cancer	up	The role of miR-205 in the VEGF-mediated promotion of human ovarian cancer cell invasion.	mir-383	breast cancer	down	MicroRNA-383 Regulates the Apoptosis of Tumor Cells through Targeting Gadd45g.
mir-133a	esophageal squamous cell carcinoma	down	CD47 expression regulated by the miR-133a tumor suppressor is a novel prognostic marker in esophageal squamous cell carcinoma.	mir-205	prostate cancer	down	miR-205 is frequently downregulated in prostate cancer and acts as a tumor suppressor by inhibiting tumor growth.	mir-383	glioma	down	Downregulation of miR-383 promotes glioma cell invasion by targeting insulin-like growth factor 1 receptor.
mir-133a	gastric cancer	down	MiR-145, miR-133a and miR-133b inhibit proliferation, migration, invasion and cell cycle progression via targeting transcription factor Sp1 in gastric cancer.	mir-205	prostate cancer	down	Polycomb protein EZH2 suppresses apoptosis by silencing the proapoptotic miR-31.	mir-383	glioma	down	MicroRNA-383 inhibits anchorage-independent growth and induces cell cycle arrest of glioma cells by targeting CCND1.
mir-133a	gastric cancer	down	MicroRNA-133a functions as a tumor suppressor in gastric cancer.	mir-205	prostate cancer	down	MicroRNA-205 inhibits cancer cell migration and invasion via modulation of centromere protein F regulating pathways in prostate cancer.	mir-383	glioma	down	MicroRNA-383 expression regulates proliferation, migration, invasion, and apoptosis in human glioma cells.
mir-133a	gastric cancer	down	Tumor suppressor role of miR-133a in gastric cancer by repressing IGF1R.	mir-205	prostate cancer	down	Downregulation of miR-205 and miR-31 confers resistance to chemotherapy-induced apoptosis in prostate cancer cells.	mir-383	medullo-blastoma	down	MiR-383 is Downregulated in Medulloblastoma and Targets Peroxiredoxin 3 (PRDX3).
mir-133a	gastric cancer	down	MicroRNA-133a inhibits proliferation and invasion, and induces apoptosis in gastric carcinoma cells via targeting fascin actin-bundling protein 1.	mir-205	prostate cancer	down	Epigenetic-induced repression of microRNA-205 is associated with MED1 activation and a poorer prognosis in localized prostate cancer.	mir-3928	osteosarcoma	down	Down-Regulation of miR-3928 Promoted Osteosarcoma Growth.
mir-133a	head and neck squamous cell carcinoma	down	Low-level expression of microRNAs let-7d and miR-205 are prognostic markers of head and neck squamous cell carcinoma.	mir-205	prostate cancer	down	MicroRNA-205, a novel regulator of the anti-apoptotic protein Bcl2, is downregulated in prostate cancer.	mir-409-3p	bladder cancer	down	MicroRNA-409-3p inhibits migration and invasion of bladder cancer cells via targeting c-Met.

mir-133a	head and neck squamous cell carcinoma	down	Tumor suppressive microRNA-133a regulates novel targets: Moesin contributes to cancer cell proliferation and invasion in head and neck squamous cell carcinoma.	mir-205	renal cell carcinoma	down	miRNA-205 Is a Candidate Tumor Suppressor that Targets ZEB2 in Renal Cell Carcinoma.	mir-409-3p	colorectal cancer	down	MicroRNA-409-3p suppresses colorectal cancer invasion and metastasis partly by targeting GAB1 expression.
mir-133a	hepatocellular carcinoma	down	MicroRNA-133a inhibits cell proliferation, colony formation ability, migration and invasion by targeting matrix metallopeptidase 9 in hepatocellular carcinoma.	mir-205	squamous carcinoma	down	MicroRNA expression profiles of esophageal cancer.	mir-409-3p	gastric cancer	down	MicroRNA-409 suppresses tumour cell invasion and metastasis by directly targeting radixin in gastric cancers.
mir-133a	lung squamous cell carcinoma	down	Tumor suppressive microRNA-133a regulates novel molecular networks in lung squamous cell carcinoma.	mir-205-3p	non-small cell lung cancer	up	Relative expressions of miR-205-5p, miR-205-3p, and miR-21 in tissues and serum of non-small cell lung cancer patients.	mir-409-3p	gastric cancer	down	MicroRNA-409-3p regulates cell proliferation and apoptosis by targeting PHF10 in gastric cancer.
mir-133a	non-small cell lung cancer	down	MiR-133a is downregulated in non-small cell lung cancer: a study of clinical significance.	mir-205-5p	non-small cell lung cancer	up	Relative expressions of miR-205-5p, miR-205-3p, and miR-21 in tissues and serum of non-small cell lung cancer patients.	mir-409-3p	lung adenocarcinoma	down	MicroRNA-409-3p functions as a tumor suppressor in human lung adenocarcinoma by targeting c-Met.
mir-133a	osteosarcoma	down	MicroRNA-133a, downregulated in osteosarcoma, suppresses proliferation and promotes apoptosis by targeting Bcl-xL and Mcl-1.	mir-206	breast cancer	down	miR-206 is down-regulated in breast cancer and inhibits cell proliferation through the up-regulation of cyclinD2.	mir-409-3p	ovarian cancer	down	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.
mir-133a	ovarian cancer	down	miR-133a suppresses ovarian cancer cell proliferation by directly targeting insulin-like growth factor 1 receptor.	mir-206	clear cell renal cell cancer	down	Exploring the miRNA-mRNA regulatory network in clear cell renal cell carcinomas by next-generation sequencing expression profiles.	mir-410	gastric cancer	down	MicroRNA-410 Suppresses Migration and Invasion by Targeting MDM2 in Gastric Cancer.
mir-133a	pancreatic cancer	down	miR-133a Functions as a Tumor Suppressor and Directly Targets FSCN1 in Pancreatic Cancer.	mir-206	colorectal cancer	down	microRNA-206 attenuates tumor proliferation and migration involving the downregulation of NOTCH3 in colorectal cancer.	mir-410	oral squamous cell carcinoma	down	Downregulated miR-329 and miR-410 promote the proliferation and invasion of oral squamous cell carcinoma by targeting Wnt-7b.
mir-133a	renal cell carcinoma	down	The functional significance of miR-1 and miR-133a in renal cell carcinoma.	mir-206	gastric cancer	down	MicroRNA-206 suppresses gastric cancer cell growth and metastasis.	mir-410	pancreatic cancer	down	MicroRNA-410 functions as a tumor suppressor by targeting angiotensin II type 1 receptor in pancreatic cancer.
mir-133a-1	prostate cancer	down	microRNA-133 inhibits cell proliferation, migration and invasion in prostate cancer cells by targeting the epidermal growth factor receptor.	mir-206	gastric cancer	down	Activation of PAX3-MET pathways due to miR-206 loss promotes gastric cancer metastasis.	mir-411	ovarian cancer	down	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.

mir-133a-2	prostate cancer	down	microRNA-133 inhibits cell proliferation, migration and invasion in prostate cancer cells by targeting the epidermal growth factor receptor.	mir-206	gastric cancer	down	MiR-206 inhibits gastric cancer proliferation in part by repressing CyclinD2.	mir-421	gastric cancer	up	Increased expression of miR-421 in human gastric carcinoma and its clinical association.
mir-133b	bladder cancer	down	MicroRNA-133 inhibits cell proliferation, migration and invasion by targeting epidermal growth factor receptor and its downstream effector proteins in bladder cancer.	mir-206	gastric cancer	down	Downregulation of microRNA-206 is a potent prognostic marker for patients with gastric cancer.	mir-421	gastric cancer	up	MiR-421 regulates apoptosis of BGC-823 gastric cancer cells by targeting caspase-3.
mir-133b	cervical carcinoma	up	MicroRNA-133b is a key promoter of cervical carcinoma development through the activation of the ERK and AKT1 pathways.	mir-206	hepato-cellular carcinoma	down	MicroRNA-206, down-regulated in hepatocellular carcinoma, suppresses cell proliferation and promotes apoptosis.	mir-421	gastric cancer	up	MicroRNA-421 is a new potential diagnosis biomarker with higher sensitivity and specificity than carcinoembryonic antigen and cancer antigen 125 in gastric cancer.
mir-133b	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-206	hepato-cellular carcinoma	down	MicroRNA-206, down-regulated in hepatocellular carcinoma, suppresses cell proliferation and promotes apoptosis.	mir-421	nasopharyngeal carcinoma	up	miR-421 induces cell proliferation and apoptosis resistance in human nasopharyngeal carcinoma via downregulation of FOXO4.
mir-133b	colorectal cancer	down	miR-133b, a muscle-specific microRNA, is a novel prognostic marker that participates in the progression of human colorectal cancer via regulation of CXCR4 expression.	mir-206	laryngeal squamous cell carcinoma	down	Down-regulation of MiR-206 promotes proliferation and invasion of laryngeal cancer by regulating VEGF expression.	mir-421	neuroblastoma	up	Downregulation of tumor suppressor mental by miR-421 promotes proliferation and migration of neuroblastoma.
mir-133b	esophageal squamous cell carcinoma	down	miR-145, miR-133a and miR-133b: Tumor-suppressive miRNAs target FSCN1 in esophageal squamous cell carcinoma.	mir-206	malignant melanoma	down	MicroRNA-206 induces G1 arrest in melanoma by inhibition of CDK4 and Cyclin D.	mir-422a	colorectal cancer	down	Identification and functional screening of microRNAs highly deregulated in colorectal cancer.
mir-133b	gastric cancer	down	MiR-145, miR-133a and miR-133b inhibit proliferation, migration, invasion and cell cycle progression via targeting transcription factor Sp1 in gastric cancer.	mir-206	medullo-blastoma	down	MiR-206, a Cerebellum Enriched miRNA Is Downregulated in All Medulloblastoma Subgroups and Its Overexpression Is Necessary for Growth Inhibition of Medulloblastoma Cells.	mir-422a	hepatocellular carcinoma	down	A double-negative feedback loop between MicroRNA-422a and FOXG1/Q1/E1 regulates hepatocellular carcinoma tumor growth and metastasis.
mir-133b	gastric cancer	down	The role of microRNA-133b and its target gene FSCN1 in gastric cancer.	mir-206	oral squamous cell carcinoma	down	MiR-206 functions as a tumor suppressor and directly targets K-Ras in human oral squamous cell carcinoma.	mir-423	breast cancer	up	Genetic analysis and preliminary function study of miR-423 in breast cancer.
mir-133b	gastric cancer	down	miR-133b acts as a tumor suppressor and negatively regulates FGFR1 in gastric cancer.	mir-208	esophageal squamous cell carcinoma	up	Mir-208 promotes cell proliferation by repressing SOX6 expression in human esophageal squamous cell	mir-423	hepatocellular carcinoma	up	MicroRNA-423 promotes cell growth and regulates G(1)/S transition by targeting p21Cip1/Waf1 in

							carcinoma.				hepatocellular carcinoma.
mir-133b	gastric cancer	down	MiR-133b is frequently decreased in gastric cancer and its overexpression reduces the metastatic potential of gastric cancer cells.	mir-20a	acute myeloid leukemia	down	HIF-1? downregulates miR-17/20a directly targeting p21 and STAT3: a role in myeloid leukemic cell differentiation.	mir-423-3p	laryngeal carcinoma	up	microRNA-423-3p promotes tumor progression via modulation of AdipoR2 in laryngeal carcinoma.
mir-133b	lung cancer	down	MicroRNA 133B targets pro-survival molecules MCL-1 and BCL2L2 in lung cancer.	mir-20a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-424	cervical cancer	down	Suppressed miR-424 expression via upregulation of target gene Chk1 contributes to the progression of cervical cancer.
mir-133b	prostate cancer	down	microRNA-133 inhibits cell proliferation, migration and invasion in prostate cancer cells by targeting the epidermal growth factor receptor	mir-20a	breast cancer	up	Diagnostic potential of PTEN-targeting miR-214 in the blood of breast cancer patients.	mir-424	chronic lymphocytic leukemia	down	miRs-138 and -424 control palmitoylation-dependent CD95-mediated cell death by targeting acyl protein thioesterases 1 and 2 in chronic lymphocytic leukemia
mir-133b	renal cell carcinoma	down cell lines;	microRNA-133b downregulation and inhibition of cell proliferation, migration and invasion by targeting matrix metallopeptidase-9 in renal cell carcinoma.	mir-20a	breast cancer	up	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.	mir-424	chronic myelogenous leukemia	up	Restoration of miR-424 suppresses BCR-ABL activity and sensitizes CML cells to imatinib treatment.
mir-134	endometrial cancer	down	MicroRNA-134 suppresses endometrial cancer stem cells by targeting POGLUT1 and Notch pathway proteins.	mir-20a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.	mir-424	colon cancer	down	MiR-424/503-Mediated Rictor Upregulation Promotes Tumor Progression.
mir-134	head and neck squamous cell carcinoma	up	miR-134 induces oncogenicity and metastasis in head and neck carcinoma through targeting WWOX gene.	mir-20a	cervical cancer	up	miR-20a promotes migration and invasion by regulating TNKS2 in human cervical cancer cells.	mir-424	colorectal cancer	up	Downregulation of miR-195 correlates with lymph node metastasis and poor prognosis in colorectal cancer.
mir-134	hepatocellular carcinoma	down	Genome-Wide Screening Identified That miR-134 Acts as a Metastasis Suppressor by Targeting Integrin ?1 in Hepatocellular Carcinoma.	mir-20a	cervical cancer	up	Circulating miRNA-20a and miRNA-203 for Screening Lymph Node Metastasis in Early Stage Cervical Cancer	mir-424	endometrial cancer	down	MicroRNA-424 may function as a tumor suppressor in endometrial carcinoma cells by targeting E2F7.
mir-135a	bladder cancer	up	Mir-135a enhances cellular proliferation through post-transcriptionally regulating PHLPP2 and FOXO1 in human bladder cancer.	mir-20a	cervical cancer	up	MiR-20a promotes cervical cancer proliferation and metastasis in vitro and in vivo.	mir-424	hepatocellular carcinoma	down	MicroRNA-424 is down-regulated in hepatocellular carcinoma and suppresses cell migration and invasion through c-Myb.

mir-135a	breast cancer	up	miRNA-135a promotes breast cancer cell migration and invasion by targeting HOXA10.	mir-20a	cholangio-carcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.	mir-424	osteosarcoma	down	Tumor suppressive microRNA-424 inhibits osteosarcoma cell migration and invasion via targeting fatty acid synthase.
mir-135a	colorectal cancer	up	MiR-135a promotes growth and invasion of colorectal cancer via metastasis suppressor 1 in vitro.	mir-20a	colorectal cancer	up	MicroRNA signatures: novel biomarker for colorectal cancer?	mir-424	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
mir-135a	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-20a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-424-5p	hepatocellular carcinoma	down	MiR-424-5p reversed epithelial-mesenchymal transition of anchorage-independent HCC cells by directly targeting ICAT and suppressed HCC progression.
mir-135a	pancreatic ductal adeno-carcinoma	down	MicroRNA-135a inhibits cell proliferation by targeting Bmi1 in pancreatic ductal adenocarcinoma.	mir-20a	esophageal squamous cell carcinoma	up		mir-424-5p	pancreatic cancer	up	MicroRNA-424-5p Suppresses the Expression of SOCS6 in Pancreatic Cancer.
mir-135a	prostate cancer	down	Androgen-regulated microRNA-135a decreases prostate cancer cell migration and invasion through downregulating ROCK1 and ROCK2.	mir-20a	esophageal squamous cell carcinoma	up	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.	mir-425	breast cancer	down	Estrogen mediated-activation of miR-191/425 cluster modulates tumorigenicity of breast cancer cells depending on estrogen receptor status.
mir-135a	renal cell carcinoma	down	Tumor-suppressive microRNA-135a inhibits cancer cell proliferation by targeting the c-MYC oncogene in renal cell carcinoma.	mir-20a	gastric cancer	up	Involvement of miR-20a in Promoting Gastric Cancer Progression by Targeting Early Growth Response 2 (EGR2).	mir-425	gastric cancer	up	NF-kappaB-dependent MicroRNA-425 upregulation promotes gastric cancer cell growth by targeting PTEN upon IL-17 induction.
mir-135a-1	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-20a	glioma	up	[Expression of miR-20a in human glioma tissues and its effect on the proliferation of human glioma cells in vitro].	mir-429	bladder cancer	down	Expression of microRNAs in the Urine of Patients With Bladder Cancer.
mir-135a-2	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-20a	hepato-cellular carcinoma	down	Decrease expression of microRNA-20a promotes cancer cell proliferation and predicts poor survival of hepatocellular carcinoma	mir-429	breast cancer	up	Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes metastatic colonization.
mir-135a-5p	clear cell renal cell cancer	down	Exploring the miRNA-mRNA regulatory network in clear cell renal cell carcinomas by next-generation sequencing expression profiles.	mir-20a	hepato-cellular carcinoma	up	MiR-20a Induces Cell Radioresistance by Activating the PTEN/PI3K/Akt Signaling Pathway in Hepatocellular Carcinoma.	mir-429	breast cancer	down	miR-429 inhibits migration and invasion of breast cancer cells in vitro.

mir-135a-5p	gastric cancer	up	Regulation of BGC-823 cell sensitivity to adriamycin via miRNA-135a-5p.	mir-20a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-429	colon cancer	down	MicroRNA-429 inhibits the migration and invasion of colon cancer cells by targeting PAK6/cofilin signaling
mir-135b	colorectal cancer	up	MicroRNA-135b regulates metastasis suppressor 1 expression and promotes migration and invasion in colorectal cancer	mir-20a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.	mir-429	colorectal cancer	up	MiR-429 is an independent prognostic factor in colorectal cancer and exerts its anti-apoptotic function by targeting SOX2
mir-135b	colorectal cancer	up	Identification of microRNA-135b in Stool as a Potential Noninvasive Biomarker for Colorectal Cancer and Adenoma.	mir-20a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.	mir-429	colorectal carcinoma	down	miR-429 inhibits cells growth and invasion and regulates EMT-related marker genes by targeting Onecut2 in colorectal carcinoma.
mir-135b	colorectal cancer	up	MicroRNA-135b promotes cancer progression by acting as a downstream effector of oncogenic pathways in colon cancer.	mir-20a	malignant melanoma	up	Altered expression of selected microRNAs in melanoma: antiproliferative and proapoptotic activity of miRNA-155.	mir-429	gastric cancer	down	miR-429 modulates the expression of c-myc in human gastric carcinoma cells.
mir-135b	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-20a	malignant melanoma	down	Differential regulation of aggressive features in melanoma cells by members of the miR-17-92 complex.	mir-429	hepatocellular carcinoma	up	MicroRNA-429 Modulates Hepatocellular Carcinoma Prognosis and Tumorigenesis.
mir-135b	colorectal cancer	up	miR-135b Promotes Cancer Progression by Targeting Transforming Growth Factor Beta Receptor II (TGFBR2) in Colorectal Cancer.	mir-20a	mantle cell lymphoma	up	The miRNA-17/92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.	mir-429	hepatocellular carcinoma	up	Epigenetic modification of MiR-429 promotes liver tumour-initiating cell properties by targeting Rb binding protein 4.
mir-135b	colorectal cancer	up	Identification and functional screening of microRNAs highly deregulated in colorectal cancer.	mir-20a	medullo-blastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.	mir-429	lung adenocarcinoma	down	miR-200 Inhibits lung adenocarcinoma cell invasion and metastasis by targeting Flt1/VEGFR1.
mir-135b	colorectal cancer	up	Expression of miR-21, miR-31, miR-96 and miR-135b is correlated with the clinical parameters of colorectal cancer	mir-20a	naso-pharyngeal cancer	up	Circulating miR-17, miR-20a, miR-29c, and miR-223 Combined as Non-Invasive Biomarkers in Nasopharyngeal Carcinoma.	mir-429	malignant melanoma	up	MicroRNA-200 family members differentially regulate morphological plasticity and mode of melanoma cell invasion.
mir-135b	gastric cancer	up	[Clinicopathological significance and function of miR-135b in the occurrence and development of gastric cancer]	mir-20a	osteo-sarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.	mir-429	mesenchymal cancer	down	MicroRNA Expression Profiles in Kaposi's Sarcoma.
mir-135b	lung cancer	up	MicroRNA-135b promotes lung cancer metastasis by regulating multiple targets in the Hippo pathway and LZTS1.	mir-20a	ovarian cancer	up	miR-20a promotes proliferation and invasion by targeting APP in human ovarian cancer cells.	mir-429	non-small cell lung cancer	down	Expression of miR-29c, miR-93, and miR-429 as Potential Biomarkers for Detection of Early Stage Non-Small Lung Cancer.

mir-136	chondro-sarcoma	down	Analysis of microRNAs expressions in chondrosarcoma	mir-20a	ovarian cancer	up	Ovarian tumor-associated microRNA-20a decreases natural killer cell cytotoxicity by downregulating MICA/B expression.	mir-429	oral squamous cell carcinoma	down	MiR-429 inhibits oral squamous cell carcinoma growth by targeting ZEB1
mir-136	glioblastoma	down	Functional profiling of precursor MicroRNAs identifies MicroRNAs essential for glioma proliferation	mir-20a	pituitary carcinoma	up	MicroRNA involvement in a metastatic non-functioning pituitary carcinoma.	mir-429	osteosarcoma	down	Tumor-Suppressing Effects of miR-429 on Human Osteosarcoma
mir-136	glioma	down	MiR-136 promotes apoptosis of glioma cells by targeting AEG-1 and Bcl-2	mir-20a	prostate cancer	up	miR-20a promotes Prostate cancer invasion and migration through targeting ABL2.	mir-429	ovarian cancer	down	Ectopic over-expression of miR-429 induces mesenchymal-to-epithelial transition (MET) and increased drug sensitivity in metastasizing ovarian cancer cells.
mir-136	non-small cell lung cancer	up	Upregulation of miR-136 in human non-small cell lung cancer cells promotes Erk1/2 activation by targeting PPP2R2A	mir-20a-5p	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma	mir-429	ovarian cancer	down	A miR-200 microRNA cluster as prognostic marker in advanced ovarian cancer.
mir-136	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer.	mir-20b	breast cancer	up	MicroRNA-20b promotes cell growth of breast cancer cells partly via targeting phosphatase and tensin homologue (PTEN).	mir-429	prostate cancer	up	Downregulation of microRNA-429 inhibits cell proliferation by targeting p27Kip1 in human prostate cancer cells.
mir-137	anaplastic astrocytoma	down	miR-124 and miR-137 inhibit proliferation of glioblastoma multiforme cells and induce differentiation of brain tumor stem cells.	mir-20b	hepato-cellular carcinoma	up	Crucial Role for Early Growth Response-1 in the Transcriptional Regulation of miR-20b in Breast Cancer.	mir-429	renal cell carcinoma	down	MicroRNA-429 suppresses cell proliferation, epithelial-mesenchymal transition, and metastasis by direct targeting of BMI1 and E2F3 in renal cell carcinoma
mir-137	bladder cancer	up	MicroRNA-137 Upregulation Increases Bladder Cancer Cell Proliferation and Invasion by Targeting PAQR3.	mir-21	adrenal cortical carcinoma	up	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma.	mir-432	ovarian cancer	down	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.
mir-137	colorectal cancer	down	MicroRNA-137, an HMGA1 Target, Suppresses Colorectal Cancer Cell Invasion and Metastasis in Mice by Directly Targeting FMNL2	mir-21	breast cancer	up	Next-generation sequencing of microRNAs for breast cancer detection.	mir-433	gastric cancer	down	Down-regulated miR-9 and miR-433 in human gastric carcinoma.
mir-137	colorectal cancer	down	Overexpression of paxillin induced by miR-137 suppression promotes tumor progression and metastasis in colorectal cancer.	mir-21	breast cancer	up	Quantitative Measurement of Serum MicroRNA-21 Expression in Relation to Breast Cancer Metastasis in Chinese Females.	mir-433	gastric cancer	down	The Tumor Suppressor Roles of miR-433 and miR-127 in Gastric Cancer.

mir-137	gastric cancer	down	miR-137 is frequently down-regulated in gastric cancer and is a negative regulator of Cdc42.	mir-21	breast cancer	up	Diagnostic potential of PTEN-targeting miR-214 in the blood of breast cancer patients.	mir-433	hepatocellular carcinoma	down	MicroRNA-433 inhibits cell proliferation in hepatocellular carcinoma by targeting p21 activated kinase (PAK4).
mir-137	glioblastoma	down	miR-124 and miR-137 inhibit proliferation of glioblastoma multiforme cells and induce differentiation of brain tumor stem cells.	mir-21	breast cancer	up	Tissue specific expression of extracellular microRNA in human breast cancers and normal human breast tissue in vivo.	mir-433	liver cancer	down	The microRNA-433 inhibits liver cancer cell migration by repressing the protein expression and function of cAMP response element binding protein.
mir-137	glioblastoma	down	miR-137 is frequently down-regulated in glioblastoma and is a negative regulator of Cox-2.	mir-21	breast cancer	up	Differential expression of miR-21, miR-125b and miR-191 in breast cancer tissue.	mir-433	oral squamous cell carcinoma	down	miR-433 inhibits oral squamous cell carcinoma (OSCC) cell growth and metastasis by targeting HDAC6.
mir-137	glioblastoma	down	MicroRNA-137 is downregulated in glioblastoma and inhibits the stemness of glioma stem cells by targeting RTVP-1.	mir-21	breast cancer	up	BMP-6 inhibits microRNA-21 expression in breast cancer through repressing deltaEF1 and AP-1.	mir-4423	lung cancer	up	MicroRNA 4423 is a primate-specific regulator of airway epithelial cell differentiation and lung carcinogenesis.
mir-137	glioblastoma	down	Expression of 19 microRNAs in glioblastoma and comparison with other brain neoplasia of grades I-III.	mir-21	breast cancer	up	Circulating microRNA-92a and microRNA-21 as novel minimally invasive biomarkers for primary breast cancer.	mir-4458	hepatocellular carcinoma	down	Tumor-suppressing effect of miR-4458 on human hepatocellular carcinoma
mir-137	glioblastoma	down	MiR-137 inhibits proliferation and angiogenesis of human glioblastoma cells by targeting EZH2.	mir-21	breast cancer	up	Up-regulation of miR-21 by HER2/neu signaling promotes cell invasion.	mir-448	hepatocellular carcinoma	down	Low Expression of miR-448 Induces EMT and Promotes Invasion by Regulating ROCK2 in Hepatocellular Carcinoma
mir-137	glioma	down	Overexpressed miRNA-137 inhibits human glioma cells growth by targeting Rac1.	mir-21	breast cancer	up	The Regulation and Function of miR-21-FOXO3a-miR-34b/c Signaling in Breast Cancer.	mir-4487	colorectal cancer	down	Decreased expression of fecal miR-4478 and miR-1295b-3p in early-stage colorectal cancer.
mir-137	hepatocellular carcinoma	down	FoxO3-regulated microRNA-137 suppresses tumour growth and metastasis in human hepatocellular carcinoma by targeting AKT2.	mir-21	breast cancer	up	MicroRNA-21 regulates breast cancer invasion partly by targeting tissue inhibitor of metalloproteinase 3 expression.	mir-449	gastric cancer	down	miR-449 inhibits cell proliferation and is down-regulated in gastric cancer.
mir-137	hepatocellular carcinoma	down	EDIL3 is a novel regulator of epithelial mesenchymal transition controlling early recurrence of hepatocellular carcinoma.	mir-21	breast cancer	up	Combination of miR-21 with Circulating Tumor Cells Markers Improve Diagnostic Specificity of Metastatic Breast Cancer.	mir-449a	endometrial cancer	down	MiR-449a functions as a tumor suppressor in endometrial cancer by targeting CDC25A.
mir-137	multiple myeloma	down	miR-137 and miR-197 Induce Apoptosis and Suppress Tumorigenicity by Targeting MCL-1 in Multiple Myeloma.	mir-21	cervical cancer	up	Overexpression of miR-21 promotes the proliferation and migration of cervical cancer cells via the inhibition of PTEN.	mir-449a	gastric adeno-carcinoma	down	microRNA-449a functions as a tumor-suppressor in gastric adenocarcinoma by targeting Bcl-2.

mir-137	neuro-blastoma	down	MiR-137 functions as a tumor suppressor in neuroblastoma by downregulating KDM1A.	mir-21	cervical carcinoma	up	MicroRNA-21 promotes cell proliferation and down-regulates the expression of programmed cell death 4 (PDCD4) in HeLa cervical carcinoma cells.	mir-449a	gastric cancer	down	miR-449a Regulates Proliferation and Chemosensitivity to Cisplatin by Targeting Cyclin D1 and BCL2 in SGC7901 Cells.
mir-137	non-small cell lung cancer	down	microRNA-137 functions as a tumor suppressor in human non-small cell lung cancer by targeting SLC22A18.	mir-21	cholangio-carcinoma	up	MicroRNA-21 is overexpressed in human cholangiocarcinoma and regulates programmed cell death 4 and tissue inhibitor of metalloproteinase 3.	mir-449a	gastric cancer	down	miR-449a and CDK6 in gastric carcinoma.
mir-137	ovarian cancer	down	miR-137 suppresses cell growth in ovarian cancer by targeting AEG-1.	mir-21	cholangio-carcinoma	up	PTEN and PDCD4 are bona fide targets of microRNA-21 in human cholangiocarcinoma.	mir-449a	glioblastoma	down	MiR-449a exerts tumor-suppressive functions in human glioblastoma by targeting Myc-associated zinc-finger protein.
mir-137	squamous carcinoma	up	MicroRNA-137 promoter methylation is associated with poorer overall survival in patients with squamous cell carcinoma of the head and neck.	mir-21	cholangio-carcinoma	up	miR-21 Targets 15-PGDH and Promotes Cholangiocarcinoma Growth.	mir-449a	lung cancer	down	Combining microRNA-449a/b with a HDAC inhibitor has a synergistic effect on growth arrest in lung cancer.
mir-137	uveal melanoma	down	Epigenetics, microRNAs, and carcinogenesis: functional role of microRNA-137 in uveal melanoma.	mir-21	cholangio-carcinoma	up	miR-21 Inhibition Reduces Liver Fibrosis and Prevents Tumor Development by Inducing Apoptosis of CD24+ Progenitor Cells.	mir-449a	lung cancer	down	MicroRNA-449a inhibits cell growth in lung cancer and regulates long noncoding RNA nuclear enriched abundant transcript 1.
mir-138	anaplastic thyroid carcinoma	down	Downregulation of miR-138 is associated with overexpression of human telomerase reverse transcriptase protein in human anaplastic thyroid carcinoma cell lines.	mir-21	colon cancer	down	miR-21 and miR-145 cooperation in regulation of colon cancer stem cells.	mir-449a	neuroblastoma	down	microRNA-449a functions as a tumor suppressor in neuroblastoma through inducing cell differentiation and cell cycle arrest.
mir-138	chronic lymphocytic leukemia	down	miRs-138 and -424 control palmitoylation-dependent CD95-mediated cell death by targeting acyl protein thioesterases 1 and 2 in chronic lymphocytic leukemia.	mir-21	colorectal cancer	up	Expression of miR-21, miR-31, miR-96 and miR-135b is correlated with the clinical parameters of colorectal cancer.	mir-449a	non-small cell lung cancer	down	MicroRNA-449a Is Downregulated in Non-Small Cell Lung Cancer and Inhibits Migration and Invasion by Targeting c-Met.
mir-138	chronic myelogenous leukemia	down	BCR-ABL/GATA1/miR-138 mini circuitry contributes to the leukemogenesis of chronic myeloid leukemia.	mir-21	colorectal cancer	up	MiR-21 regulates biological behavior through the PTEN/PI-3 K/Akt signaling pathway in human colorectal cancer cells.	mir-449a	non-small cell lung cancer	down	microRNA-449a Suppresses Non-small Cell Lung Cancer.
mir-138	colorectal cancer	down	Down-regulation of miR-138 promotes colorectal cancer metastasis via directly targeting TWIST2.	mir-21	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-449a	osteosarcoma	down	miRNA-449a is downregulated in osteosarcoma and promotes cell apoptosis by targeting BCL2.

mir-138	esophageal squamous cell carcinoma	down	Downregulation of miR-138 Sustains NF-?B Activation and Promotes Lipid Raft Formation in Esophageal Squamous Cell Carcinoma.	mir-21	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-449a	ovarian cancer	down	MicroRNA-449a reduces cell survival and enhances cisplatin-induced cytotoxicity via downregulation of NOTCH1 in ovarian cancer cells.
mir-138	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-21	colorectal cancer	up	Detection of miR-92a and miR-21 in stool samples as potential screening biomarkers for colorectal cancer and polyps.	mir-449a	prostate cancer	down	miR-449a targets HDAC-1 and induces growth arrest in prostate cancer.
mir-138	head and neck squamous cell carcinoma	down	MicroRNA-138 suppresses invasion and promotes apoptosis in head and neck squamous cell carcinoma cell lines.	mir-21	colorectal cancer	up	Correlation of over-expressions of miR-21 and Notch-1 in human colorectal cancer with clinical stages.	mir-449a	prostate cancer	down	miR-449a causes Rb-dependent cell cycle arrest and senescence in prostate cancer cells.
mir-138	head and neck squamous cell carcinoma	down	Role of microRNA-138 as a potential tumor suppressor in head and neck squamous cell carcinoma.	mir-21	colorectal cancer	up	Increased expression of microRNA-21and its association with chemotherapeutic response in human colorectal cancer.	mir-449b	lung cancer	down	Combining microRNA-449a/b with a HDAC inhibitor has a synergistic effect on growth arrest in lung cancer.
mir-138	head and neck squamous cell carcinoma	down	Down regulation of RhoC by microRNA-138 results in de-activation of FAK, Src and Erk(1/2) signaling pathway in head and neck squamous cell carcinoma.	mir-21	colorectal cancer	up	MicroRNA-21 controls hTERT via PTEN in human colorectal cancer cell proliferation.	mir-4500	non-small cell lung cancer	down	Down-regulation of miR-4500 promoted non-small cell lung cancer growth.
mir-138	hepatocellular carcinoma	down	MiR-138 induces cell cycle arrest by targeting cyclin D3 in hepatocellular carcinoma.	mir-21	colorectal cancer	up	Clinical correlations of miR-21 expression in colorectal cancer patients and effects of its inhibition on DLD1 colon cancer cells.	mir-450a	hepatocellular carcinoma	down	microRNA-450a targets DNA methyltransferase 3a in hepatocellular carcinoma.
mir-138	lung cancer	down	Up-regulation of microRNA-138 induce radiosensitization in lung cancer cells.	mir-21	colorectal carcinoma	up	Altered levels of the onco-microRNA 21 and the tumor-supressor microRNAs 143 and 145 in advanced rectal cancer indicate successful neoadjuvant chemoradiotherapy.	mir-450b-3p	breast cancer	down	Targeting HER3 with miR-450b-3p suppresses breast cancer cells proliferation.
mir-138	naso-pharyngeal carcinoma	down	MiR-138 suppressed nasopharyngeal carcinoma growth and tumorigenesis by targeting the CCND1 oncogene.	mir-21	diffuse large B-cell lymphoma	up	Inhibition of miR-21 Induces Biological and Behavioral Alterations in Diffuse Large B-Cell Lymphoma.	mir-451	bladder cancer	down	miR-451 inhibits invasion and proliferation of bladder cancer by regulating EMT.
mir-138	non-small cell lung cancer	down	MiR-138 Inhibits Tumor Growth Through Repression of EZH2 in Non-Small Cell Lung Cancer.	mir-21	endometrial cancer	up	Highly increased maspin expression corresponds with up-regulation of miR-21 in endometrial cancer: a preliminary report.	mir-451	colorectal carcinoma	down	MicroRNA-451 Inhibits Growth of Human Colorectal Carcinoma Cells via Downregulation of Pi3k/Akt Pathway.
mir-138	non-small cell lung cancer	down	miR-138 inhibits proliferation by targeting 3-phosphoinositide-dependent protein kinase-1 in non-small cell lung cancer cells.	mir-21	esophageal cancer	up	The expression of miR-21 and miR-375 predict prognosis of esophageal cancer.	mir-451	esophageal carcinoma	down	Effect of miR-451 on the Biological Behavior of the Esophageal Carcinoma Cell Line EC9706.

mir-138	non-small cell lung cancer	down	Prognostic potential of microRNA-138 and its target mRNA PDK1 in sera for patients with non-small cell lung cancer.	mir-21	esophageal cancer	up	[Diagnostic values of salivary versus and plasma microRNA-21 for early esophageal cancer].	mir-451	glioma	down	MiRNA-451 plays a role as tumor suppressor in human glioma cells.
mir-138	oral squamous cell carcinoma	down	Altered levels of miR-21, miR-125b-2*, miR-134, miR-155, miR-184, and miR-205 in oral squamous cell carcinoma and association with clinicopathological characteristics.	mir-21	esophageal cancer	up	Alteration of miRNA Expression Correlates with Lifestyle, Social and Environmental Determinants in Esophageal Carcinoma.	mir-451	glioma	down	MicroRNA miR-451 downregulates the PI3K/AKT pathway through CAB39 in human glioma.
mir-138	ovarian cancer	down	MicroRNA-138 suppresses ovarian cancer cell invasion and metastasis by targeting SOX4 and HIF-1?	mir-21	esophageal squamous cell carcinoma	up	miR-21 Down-Regulation Suppresses Cell Growth, Invasion and Induces Cell Apoptosis by Targeting FASL, TIMP3, and RECK Genes in Esophageal Carcinoma	mir-451	hepatocellular carcinoma	down	MicroRNA-451 regulates activating transcription factor72 expression and inhibits liver cancer cell migration.
mir-138	papillary thyroid carcinoma	down	Downregulation of miR-138 is associated with overexpression of human telomerase reverse transcriptase protein in human anaplastic thyroid carcinoma cell lines.	mir-21	esophageal squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.	mir-451	hepatocellular carcinoma	down	miR-451 Inhibits Cell Proliferation in Human Hepatocellular Carcinoma through Direct Suppression of IKK-?
mir-138	renal cell carcinoma	down	MiR-138 induces renal carcinoma cell senescence by targeting EZH2 and is downregulated in human clear cell renal cell carcinoma.	mir-21	esophageal squamous cell carcinoma	up	MicroRNA-21 promotes the proliferation and inhibits apoptosis in Eca109 via activating ERK1/2/MAPK pathway	mir-451	hepatocellular carcinoma	down	miR-451: Potential role as tumor suppressor of human hepatoma cell growth and invasion
mir-138	renal clear cell carcinoma	down	MiR-138 suppresses expression of hypoxia-inducible factor 1? (HIF-1?) in clear cell renal cell carcinoma 786-O cells.	mir-21	esophageal squamous cell carcinoma	up	Relationship between altered expression levels of MIR21, MIR143, MIR145, and MIR205 and clinicopathologic features of esophageal squamous cell carcinoma	mir-451	lung adenocarcinoma	down	Acquisition of radioresistance in docetaxel-resistant human lung adenocarcinoma cells is linked with dysregulation of miR-451/c-Myc-survivin/rad-51 signaling
mir-138	small cell lung cancer	down	MicroRNA-138 Regulates DNA Damage Response in Small Cell Lung Cancer Cells by Directly Targeting H2AX	mir-21	esophageal squamous cell carcinoma	up	Expression, Tissue Distribution and Function of miR-21 in Esophageal Squamous Cell Carcinoma.	mir-451	naso-pharyngeal carcinoma	down	MiR-451 inhibits cell growth and invasion by targeting MIF and is associated with survival in nasopharyngeal carcinoma
mir-139	colorectal cancer	down	Regulation of RAP1B by miR-139 suppresses human colorectal carcinoma cell proliferation	mir-21	esophageal squamous cell carcinoma	up	Circulating microRNAs in plasma of patients with oesophageal squamous cell carcinoma.	mir-451	non-small cell lung cancer	down	Clinical evaluation of microRNA expression profiling in non small cell lung cancer.
mir-139	colorectal cancer	down	Gene module based regulator inference identifying miR-139 as a tumor suppressor in colorectal cancer	mir-21	esophageal squamous cell carcinoma	up	Down-Regulation of PTEN Expression Modulated by Dysregulated miR-21 Contributes to the Progression of Esophageal Cancer.	mir-451	non-small cell lung cancer	down	MicroRNA-451 functions as a tumor suppressor in human non-small cell lung cancer by targeting ras-related protein 14 (RAB14)

mir-139	colorectal carcinoma	down	Regulation of RAP1B by miR-139 suppresses human colorectal carcinoma cell proliferation.	mir-21	esophageal squamous cell carcinoma	down	Serum microRNA-21 is a novel biomarker in patients with esophageal squamous cell carcinoma.	mir-451	non-small cell lung cancer	down	The expression and function of miRNA-451 in non-small cell lung cancer.
mir-139	glioma	down	MiR-139 Inhibits Mcl-1 Expression and Potentiates TMZ-Induced Apoptosis in Glioma.	mir-21	esophageal squamous cell carcinoma	up	Clinical impact of serum exosomal microRNA-21 as a clinical biomarker in human esophageal squamous cell carcinoma.	mir-451	osteosarcoma	down	Tumor-Suppressing Effects of miR451 in Human Osteosarcoma.
mir-139	hepatocellular carcinoma	down	The microRNA miR-139 suppresses metastasis and progression of hepatocellular carcinoma by down-regulating Rho-kinase 2.	mir-21	gastric cancer	up	Oxidative Stress Upregulates PDCD4 Expression in Patients with Gastric Cancer via miR-21.	mir-451	osteosarcoma	down	MiR-451 inhibits cell growth and invasion by targeting CXCL16 and is associated with prognosis of osteosarcoma patients
mir-139	hepatocellular carcinoma	down	Derepression of c-Fos caused by MicroRNA-139 down-regulation contributes to the metastasis of human hepatocellular carcinoma.	mir-21	gastric cancer	up	microRNA-21 promotes tumor proliferation and invasion in gastric cancer by targeting PTEN.	mir-451	osteosarcoma	down	Suppression of liver receptor homolog-1 by microRNA-451 represses the proliferation of osteosarcoma cells.
mir-139	hepatocellular carcinoma	down	miR-139 regulates the proliferation and invasion of hepatocellular carcinoma through the WNT/TCF-4 pathway.	mir-21	gastric cancer	up	Evaluation of MicroRNA Expression Pattern of Gastric Adenocarcinoma Associated with Socioeconomic, Environmental and Lifestyle Factors in Northwestern Hungary.	mir-451a	hypo-pharyngeal squamous cell carcinoma	down	Identification of tumour suppressive microRNA-451a in hypopharyngeal squamous cell carcinoma based on microRNA expression signature.
mir-139-3p	colorectal cancer	up	MicroRNA expression profiles in human colorectal cancers with liver metastases.	mir-21	gastric cancer	up	MicroRNA-21 inhibits Serpini1, a gene with novel tumour suppressive effects in gastric cancer.	mir-452	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.
mir-139-5p	colorectal cancer	down	MiR-139-5p inhibits migration and invasion of colorectal cancer by downregulating AMFR and NOTCH1	mir-21	gastric cancer	up	MicroRNA-21 stimulates gastric cancer growth and invasion by inhibiting the tumor suppressor effects of programmed cell death protein 4 and phosphatase and tensin homolog.	mir-452	glioma	down	Downregulation of miR-452 Promotes Stem-Like Traits and Tumorigenicity of Gliomas.
mir-139-5p	glioblastoma	down	miR-139-5p suppresses cancer cell migration and invasion through targeting ZEB1 and ZEB2 in GBM.	mir-21	gastric cancer	up	miR-21 plays a pivotal role in gastric cancer pathogenesis and progression.	mir-452	hepatocellular carcinoma	up	MicroRNA-452 promotes tumorigenesis in hepatocellular carcinoma by targeting cyclin-dependent kinase inhibitor 1B
mir-139-5p	hepatocellular carcinoma	down	miR-139-5p inhibits epithelial-mesenchymal transition, migration and invasion of hepatocellular carcinoma cells by targeting ZEB1 and ZEB2.	mir-21	gastric cancer	up	miR-21 Is a Promising Novel Biomarker for Lymph Node Metastasis in Patients with Gastric Cancer	mir-454	esophageal cancer	down	Differential expression of miRNAs in esophageal cancer tissue.
mir-140	breast cancer	up	Examining estrogen regulation of cancer stem cells through multicolor lineage tracing.	mir-21	gastric cancer	up	Stromal miR-21 is more important than miR-21 of tumour cells for the progression of gastric cancer.	mir-454	osteosarcoma	down	miR-454 is down-regulated in osteosarcomas and suppresses cell proliferation and invasion by directly

											targeting c-Met.
mir-140	esophageal cancer	down	Down-Regulation of miR-140 Induces EMT and Promotes Invasion by Targeting Slug in Esophageal Cancer.	mir-21	gastric cancer	up	Circulating microRNAs in plasma of patients with gastric cancers.	mir-455	colon cancer	down	MicroRNA-455 inhibits proliferation and invasion of colorectal cancer by targeting RAF proto-oncogene serine/threonine-protein kinase.
mir-140	non-small cell lung cancer	up	Peripheral Blood miR-328 Expression as a Potential Biomarker for the Early Diagnosis of NSCLC.	mir-21	gastric cancer	up	Plasma microRNAs, miR-223, miR-21 and miR-218, as novel potential biomarkers for gastric cancer detection.	mir-455-5p	malignant melanoma	up	Reduced adenosine-to-inosine miR-455-5p editing promotes melanoma growth and metastasis.
mir-140	non-small cell lung cancer	down	miR-140 Suppresses Tumor Growth and Metastasis of Non-Small Cell Lung Cancer by Targeting Insulin-Like Growth Factor 1 Receptor.	mir-21	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-4723-5p	prostate cancer	down	MicroRNA-4723 Inhibits Prostate Cancer Growth through Inactivation of the Abelson Family of Nonreceptor Protein Tyrosine Kinases.
mir-140-3p	chordoma	up	MicroRNA expression profiling reveals the potential function of microRNA-31 in chordomas.	mir-21	gastric cancer	up	Prognostic impact of circulating miR-21 in the plasma of patients with gastric carcinoma.	mir-4782-3p	non-small cell lung cancer	down	miR-4782-3p Inhibited Non-Small Cell Lung Cancer growth via USP14.
mir-140-3p	chordoma	up	Identification of miR-140-3p as a marker associated with poor prognosis in spinal chordoma.	mir-21	glioblastoma	up	Heterogeneous Nuclear Ribonucleoprotein C1/C2 Controls the Metastatic Potential of Glioblastoma by Regulating PDCD4.	mir-483	colorectal cancer	down	Extracellular metabolic energetics can promote cancer progression.
mir-140-5p	colorectal cancer	down	Inhibition of colorectal cancer stem cell survival and invasive potential by miR-140-5p mediated suppression of Smad2 and autophagy.	mir-21	glioblastoma	up	Sulforaphane enhances temozolomide-induced apoptosis due to downregulation of miR-21 via Wnt/beta-catenin signaling in glioblastoma.	mir-483-3p	adrenal cortical carcinoma	up	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma.
mir-140-5p	hepatocellular carcinoma	down	MicroRNA-140-5p suppresses tumor growth and metastasis by targeting TGFBR1 and FGF9 in hepatocellular carcinoma.	mir-21	glioblastoma	up	MicroRNA-21 targets LRRFIP1 and contributes to VM-26 resistance in glioblastoma multiforme.	mir-483-3p	hepatocellular carcinoma	up	Overexpression of miR-483-5p/3p cooperate to inhibit mouse liver fibrosis by suppressing the TGF-? stimulated HSCs in transgenic mice.
mir-140-5p	liver cancer	down	MicroRNA-140-5p suppresses tumor growth and metastasis by targeting TGFBR1 and FGF9 in hepatocellular carcinoma.	mir-21	glioblastoma	up	PDGF-B-mediated downregulation of miR-21: new insights into PDGF signaling in glioblastoma.	mir-483-5p	adrenal cortical carcinoma	up	miR-195 and miR-483-5p Identified as Predictors of Poor Prognosis in Adrenocortical Cancer.
mir-141	bladder cancer	down	Expression of microRNAs in the Urine of Patients With Bladder Cancer.	mir-21	glioblastoma	up	Downregulation of miR-21 inhibits EGFR pathway and suppresses the growth of human glioblastoma cells independent of PTEN status.	mir-483-5p	adrenal cortical carcinoma	up	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma.

mir-141	bladder cancer	up	Circulating microRNAs in serum: novel biomarkers for patients with bladder cancer?	mir-21	glioblastoma	up	Expression of 19 microRNAs in glioblastoma and comparison with other brain neoplasia of grades I-III.	mir-483-5p	glioblastoma	down	MiR-483-5p suppresses the proliferation of glioma cells via directly targeting ERK1.
mir-141	breast cancer	up	Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes metastatic colonization.	mir-21	glioblastoma	up	Co-delivery of as-miR-21 and 5-FU by poly(amidoamine) dendrimer attenuates human glioma cell growth in vitro.	mir-483-5p	glioma	down	MiR-483-5p suppresses the proliferation of glioma cells via directly targeting ERK1.
mir-141	esophageal cancer	up	miR-200a/miR-141 and miR-205 upregulation might be associated with hormone receptor status and prognosis in endometrial carcinomas.	mir-21	glioblastoma	up	MicroRNA-21 Promotes Glioblastoma Tumorigenesis by Down-regulating Insulin-like Growth Factor-binding Protein-3 (IGFBP3).	mir-483-5p	hepatocellular carcinoma	up	Overexpression of miR-483-5p/3p cooperate to inhibit mouse liver fibrosis by suppressing the TGF-? stimulated HSCs in transgenic mice.
mir-141	gastric cancer	down	Down-regulation of miR-141 in gastric cancer and its involvement in cell growth.	mir-21	glioblastoma	up	Downregulation of Pdcd4 by mir-21 facilitates glioblastoma proliferation in vivo.	mir-484	colon cancer	down	MicroRNA-455 inhibits proliferation and invasion of colorectal cancer by targeting RAF proto-oncogene serine/threonine-protein kinase.
mir-141	gastric cancer	down	miR-141 suppresses proliferation and motility of gastric cancer cells by targeting HDGF.	mir-21	glioblastoma	up	MiR-21 up-regulation mediates glioblastoma cancer stem cells apoptosis and proliferation by targeting FASLG.	mir-485-3p	hepatocellular carcinoma	up	MicroRNAs regulate methionine adenosyltransferase 1A expression in hepatocellular carcinoma.
mir-141	gastric cancer	down	The downregulation of miR-200c/141 promotes ZEB1/2 expression and gastric cancer progression.	mir-21	glioblastoma	up	MicroRNA 21 promotes glioma invasion by targeting matrix metalloproteinase regulators.	mir-485-5p	hepatocellular carcinoma	down	Involvement of miR-485-5p in hepatocellular carcinoma progression targeting EMMPRIN.
mir-141	gastric cancer	down	MicroRNA-141 inhibits tumor growth and metastasis in gastric cancer by directly targeting transcriptional co-activator with PDZ-binding motif, TAZ.	mir-21	glioblastoma	down	MicroRNA-21 inhibitor sensitizes human glioblastoma U251 stem cells to chemotherapeutic drug temozolomide.	mir-486	esophageal cancer	down	Differential expression of miRNAs in esophageal cancer tissue.
mir-141	hepatocellular carcinoma	down	miR-141 suppresses the growth and metastasis of HCC cells by targeting E2F3.	mir-21	glioblastoma	up	Delivery of anti-microRNA-21 antisense-oligodeoxynucleotide using amphiphilic peptides for glioblastoma gene therapy.	mir-486	glioma	up	miR-486 sustains NF-?B activity by disrupting multiple NF-?B-negative feedback loops.
mir-141	hepatocellular carcinoma	down	microRNA-141 inhibits cell proliferation and invasion and promotes apoptosis by targeting hepatocyte nuclear factor-3beta in hepatocellular carcinoma cells.	mir-21	glioblastoma	up	MicroRNA-21 targets a network of key tumor-suppressive pathways in glioblastoma cells.	mir-486-3p	retino-blastoma	down	Computational and in vitro Investigation of miRNA-Gene Regulations in Retinoblastoma Pathogenesis. miRNA Mimics Strategy.
mir-141	hepatocellular carcinoma	down	Expression Profile of MicroRNA-200 Family in Hepatocellular Carcinoma With Bile Duct Tumor Thrombus.	mir-21	head and neck cancer	up	MicroRNA alterations in head and neck squamous cell carcinoma.	mir-486-5p	hepatocellular carcinoma	down	MicroRNA-486-5p, which is downregulated in hepatocellular carcinoma, suppresses tumor growth by targeting PIK3R1.

mir-141	lung adeno-carcinoma	down	miR-200 Inhibits lung adenocarcinoma cell invasion and metastasis by targeting Flt1/VEGFR1	mir-21	head and neck cancer	up	[Expression of mir-21 and mir-375 in laryngeal squamous cell carcinoma]	mir-486-5p	lung cancer	down	Downregulation of miR-486-5p contributes to tumor progression and metastasis by targeting proinflammatory ARHGAP5 in lung cancer.
mir-141	malignant melanoma	up	MicroRNA-200 family members differentially regulate morphological plasticity and mode of melanoma cell invasion	mir-21	head and neck squamous cell carcinoma	up	Clusterin Is a Gene-Specific Target of microRNA-21 in Head and Neck Squamous Cell Carcinoma.	mir-490-3p	gastric cancer	down	Epigenetic Silencing of miR-490-3p Reactivates the Chromatin Remodeler SMARCD1 to Promote Helicobacter pylori-Induced Gastric Carcinogenesis
mir-141	mesenchymal cancer	down	MicroRNA Expression Profiles in Kaposi's Sarcoma.	mir-21	head and neck squamous cell carcinoma	up	Co-targeting of multiple microRNAs on factor-inhibiting hypoxia-inducible factor (FIH) gene for the pathogenesis of head and neck carcinomas.	mir-490-3p	hepatocellular carcinoma	up	miR-490-3p Modulates Cell Growth and Epithelial to Mesenchymal Transition of Hepatocellular Carcinoma Cells by Targeting Endoplasmic Reticulum-Golgi Intermediate Compartment Protein 3 (ERGIC3).
mir-141	non-small cell lung cancer	up	High expression of serum miR-21 and tumor miR-200c associated with poor prognosis in patients with lung cancer.	mir-21	head and neck squamous cell carcinoma	up	Low-level expression of microRNAs let-7d and miR-205 are prognostic markers of head and neck squamous cell carcinoma.	mir-490-5p	bladder cancer	down	MicroRNA expression signatures of bladder cancer revealed by deep sequencing.
mir-141	non-small cell lung cancer	up	MicroRNA-141 promotes the proliferation of non-small cell lung cancer cells by regulating expression of PHLPP1 and PHLPP2.	mir-21	head and neck squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.	mir-490-5p	bladder cancer	down	MicroRNA-490-5p inhibits proliferation of bladder cancer by targeting c-Fos.
mir-141	non-small cell lung cancer	up	MicroRNA-141 is a biomarker for progression of squamous cell carcinoma and adenocarcinoma of the lung: clinical analysis of 125 patients.	mir-21	hepato-cellular carcinoma	up	Role of microRNA-155 at early stages of hepatocarcinogenesis induced by choline-deficient and amino acid-defined diet in C57BL/6 mice.	mir-491-5p	cervical cancer	down	MicroRNA-491-5p suppresses cervical cancer cell growth by targeting hTERT.
mir-141	osteosarcoma	down	Tumor-Suppressing Effects of miR-141 in Human Osteosarcoma.	mir-21	hepato-cellular carcinoma	up	MicroRNA-21 promotes hepatocellular carcinoma HepG2 cell proliferation through repression of mitogen-activated protein kinase-kinase 3.	mir-492	hepato-blastoma	up	MicroRNA-492 is processed from the keratin 19 gene and up-regulated in metastatic hepatoblastoma
mir-141	ovarian cancer	down	A miR-200 microRNA cluster as prognostic marker in advanced ovarian cancer.	mir-21	hepato-cellular carcinoma	up	MicroRNA-21 promotes cell proliferation in human hepatocellular carcinoma partly by targeting HEPN1.	mir-493	bladder cancer	down	Tumor suppressor microRNA-493 decreases cell motility and migration ability in human bladder cancer cells by downregulating RhoC and FZD4.
mir-141	ovarian cancer	up	Differential microRNA expression signatures and cell type-specific association with Taxol	mir-21	hepato-cellular carcinoma	up	Circulating microRNAs, miR-21, miR-122, and miR-223, in patients with hepatocellular carcinoma or chronic hepatitis.	mir-493	pituitary carcinoma	up	MicroRNA expression in ACTH-producing pituitary tumors: up-regulation of microRNA-122 and -493 in

			resistance in ovarian cancer cells.								pituitary carcinomas.
mir-141	pancreatic cancer	down	MicroRNA-141, downregulated in pancreatic cancer, inhibited the cell proliferation and invasion by directly targeting MAP4E4.	mir-21	hepato-cellular carcinoma	down	Expression of serum miR-16, let-7f, and miR-21 in patients with hepatocellular carcinoma and their clinical significances.	mir-494	breast cancer	down	miR-494 suppresses the progression of breast cancer in vitro by targeting CXCR4 through the Wnt/beta-catenin signaling pathway.
mir-141	prostate cancer	up	A study of molecular signals deregulating mismatch repair genes in prostate cancer compared to benign prostatic hyperplasia.	mir-21	hepato-cellular carcinoma	up	Anti-miR-21 Suppresses Hepatocellular Carcinoma Growth via Broad Transcriptional Network Deregulation.	mir-494	cervical cancer	up	MicroRNA-494 promotes cervical cancer proliferation through the regulation of PTEN.
mir-141	renal cell carcinoma	down	MicroRNA-141 is downregulated in human renal cell carcinoma and regulates cell survival by targeting CDC25B.	mir-21	hepato-cellular carcinoma	up	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-494	colorectal cancer	up	miR7494 is an independent prognostic factor and promotes cell migration and invasion in colorectal cancer by directly targeting PTEN.
mir-141	renal clear cell carcinoma	down	Genome-wide microRNA expression profiling in renal cell carcinoma: significant down-regulation of miR-141 and miR-200c.	mir-21	hepato-cellular carcinoma	up	Dehydroepiandrosterone-induces miR-21 transcription in HepG2 cells through estrogen receptor ? and androgen receptor.	mir-494	esophageal squamous cell carcinoma	down	Upregulation of miR-494 Inhibits Cell Growth and Invasion and Induces Cell Apoptosis by Targeting Cleft Lip and Palate Transmembrane 1-Like in Esophageal Squamous Cell Carcinoma.
mir-142	breast cancer	up	miR-142 regulates the tumorigenicity of human breast cancer stem cells through the canonical WNT signaling pathway.	mir-21	hepato-cellular carcinoma	up	miR-21 Inhibition Reduces Liver Fibrosis and Prevents Tumor Development by Inducing Apoptosis of CD24+ Progenitor Cells.	mir-494	gastric cancer	down	miR-494 acts as an anti-oncogene in gastric carcinoma by targeting c-myc.
mir-142-3p	acute lymphoblastic leukemia	down	MicroRNA-142-3p inhibits cell proliferation in human acute lymphoblastic leukemia by targeting the MLL-AF4 oncogene.	mir-21	hepato-cellular carcinoma	up	miR-21 promotes migration and invasion by the miR-21-PDCD4-AP-1 feedback loop in human hepatocellular carcinoma.	mir-494	glioma	up	Ionizing radiation-inducible miR-494 promotes glioma cell invasion through EGFR stabilization by targeting p190B RhoGAP.
mir-142-3p	colon cancer	down	MiR-142-3p functions as a tumor suppressor by targeting CD133, ABCG2, and Lgr5 in colon cancer cells.	mir-21	hepato-cellular carcinoma	up	Expression of serum exosomal microRNA-21 in human hepatocellular carcinoma.	mir-494	hepatocellular carcinoma	up	MiR-494 within an oncogenic MicroRNA megacluster regulates G1/S transition in liver tumorigenesis through suppression of MCC.
mir-142-3p	glioblastoma	down	Effect of miR-142-3p on the M2 macrophage and therapeutic efficacy against murine glioblastoma.	mir-21	hepato-cellular carcinoma	up	Thyroid hormone regulation of miR-21 enhances migration and invasion of hepatoma.	mir-494	hepatocellular carcinoma	up	MicroRNA-494 is a master epigenetic regulator of multiple invasion-suppressor microRNAs by targeting ten eleven translocation 1 in invasive

											human hepatocellular carcinoma tumors.
mir-142-3p	hepatocellular carcinoma	down	MicroRNA-142-3p, a new regulator of RAC1, suppresses the migration and invasion of hepatocellular carcinoma cells.	mir-21	hepato-cellular carcinoma	up	miR-21 expression predicts prognosis in hepatocellular carcinoma.	mir-494	hepatocellular carcinoma	up	miR-494 promotes cell proliferation, migration and invasion, and increased sorafenib resistance in hepatocellular carcinoma by targeting PTEN.
mir-142-3p	mantle cell lymphoma	down	microRNA expression profile and identification of miR-29 as a prognostic marker and pathogenetic factor by targeting CDK6 in mantle cell lymphoma.	mir-21	hepato-cellular carcinoma	up	MicroRNA-21 suppresses PTEN and hSulf-1 expression and promotes hepatocellular carcinoma progression through AKT/ERK pathways.	mir-494	non-small cell lung cancer	up	Expression and clinical evidence of miR-494 and PTEN in non-small cell lung cancer.
mir-142-3p	non-small cell lung cancer	up	MiR-142-3p represses TGF-?-induced growth inhibition through repression of TGFR1 in non-small cell lung cancer.	mir-21	hepato-cellular carcinoma	up	Indole-3-carbinol inhibits tumorigenicity of hepatocellular carcinoma cells via suppression of microRNA-21 and upregulation of phosphatase and tensin homolog.	mir-494	non-small cell lung cancer	up	Tumor-derived microRNA-494 promotes angiogenesis in non-small cell lung cancer.
mir-142-3p	osteosarcoma	down	MiR-142-3p Functions as a Potential Tumor Suppressor in Human Osteosarcoma by Targeting HMGA1.	mir-21	hypo-pharyngeal squamous cell carcinoma	up	Altered Expression of miR-21 and PTEN in Human Laryngeal and Hypopharyngeal Squamous Cell Carcinomas.	mir-494	oral cancer	down	miR-494 represses HOXA10 expression and inhibits cell proliferation in oral cancer.
mir-142-5p	clear cell renal cell cancer	up	Exploring the miRNA-mRNA regulatory network in clear cell renal cell carcinomas by next-generation sequencing expression profiles.	mir-21	kidney cancer	up	miR-21 downregulated TCF21 to inhibit KISS1 in renal cancer.	mir-494	ovarian cancer	down	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.
mir-142-5p	lung cancer	down	Uncovering growth-suppressive MicroRNAs in lung cancer.	mir-21	laryngeal carcinoma	up	Regulation of the cell cycle gene, BTG2, by miR-21 in human laryngeal carcinoma.	mir-494	pancreatic ductal adeno-carcinoma	down	
mir-142-5p	malt lymphoma	up	Overexpression of miR-142-5p and miR-155 in gastric mucosa-associated lymphoid tissue (MALT) lymphoma resistant to Helicobacter pylori eradication.	mir-21	laryngeal squamous cell carcinoma	up	Downregulation of miR-21 modulates Ras expression to promote apoptosis and suppress invasion of Laryngeal squamous cell carcinoma.	mir-495	breast cancer	up	miR-495 is upregulated by E12/E47 in breast cancer stem cells, and promotes oncogenesis and hypoxia resistance via downregulation of E-cadherin and REDD1.
mir-142-5p	mantle cell lymphoma	down	microRNA expression profile and identification of miR-29 as a prognostic marker and pathogenetic factor by targeting CDK6 in mantle cell lymphoma.	mir-21	laryngeal squamous cell carcinoma	up	Altered Expression of miR-21 and PTEN in Human Laryngeal and Hypopharyngeal Squamous Cell Carcinomas.	mir-495	breast cancer	down	Downregulated miR-45 Inhibits the G1-S Phase Transition by Targeting Bmi-1 in Breast Cancer.
mir-142-5p	osteosarcoma	down	MicroRNA signatures associate with pathogenesis and progression of osteosarcoma.	mir-21	liver cancer	up	microRNA 21-mediated suppression of Sprouty1 by Pokemon affects liver cancer cell growth and proliferation.	mir-495	glioma	down	MicroRNA-495 inhibits proliferation of glioblastoma multiforme cells by downregulating

											cyclin-dependent kinase 6.
mir-143	bladder cancer	down	MicroRNA-143 as a tumor suppressor for bladder cancer.	mir-21	lung cancer	up	Evaluation of dynamic change of serum miR-21 and miR-24 in pre- and post-operative lung carcinoma patients.	mir-495	hepatocellular carcinoma	up	MicroRNAs regulate methionine adenosyltransferase 1A expression in hepatocellular carcinoma.
mir-143	bladder cancer	down	MicroRNA-143 functions as a tumor suppressor in human bladder cancer T24 cells.	mir-21	lung cancer	up	Differential MicroRNAs Expression in Serum of Patients with Lung Cancer, Pulmonary Tuberculosis, and Pneumonia.	mir-497	adrenal cortical carcinoma	down	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma.
mir-143	bladder cancer	down	Replacement treatment with microRNA-143 and -145 induces synergistic inhibition of the growth of human bladder cancer cells by regulating PI3K/Akt and MAPK signaling pathways.	mir-21	lung cancer	up	Expression and significance of miRNA-21 and BTG2 in lung cancer.	mir-497	breast cancer	down	Analysis of MiR-195 and MiR-497 expression, regulation and role in breast cancer.
mir-143	breast cancer	down	MicroRNA-143 is downregulated in breast cancer and regulates DNA methyltransferases 3A in breast cancer cells.	mir-21	malignant melanoma	up	microRNA-21 is upregulated in malignant melanoma and influences apoptosis of melanocytic cells.	mir-497	cervical cancer	down	MicroRNA-497 is a potential prognostic marker in human cervical cancer and functions as a tumor suppressor by targeting the insulin-like growth factor 1 receptor.
mir-143	cervical cancer	down	miR-143 is downregulated in cervical cancer and promotes apoptosis and inhibits tumor formation by targeting Bcl-2.	mir-21	malignant melanoma	up	MiR-21 enhances melanoma invasiveness via inhibition of tissue inhibitor of metalloproteinases 3 expression: in vivo effects of MiR-21 inhibitor.	mir-497	colorectal cancer	down	MicroRNA-497 and bufalin act synergistically to inhibit colorectal cancer metastasis.
mir-143	colon cancer	down	The Evi1, microRNA-143, K-Ras axis in colon cancer.	mir-21	multiple myeloma	up	Integrative analysis of differential miRNA and functional study of miR-21 by seed-targeting inhibition in multiple myeloma cells in response to berberine.	mir-497	colorectal cancer	up	MicroRNA-497 and bufalin act synergistically to inhibit colorectal cancer metastasis.
mir-143	colon cancer	down	miR-143 overexpression impairs growth of human colon carcinoma xenografts in mice with induction of apoptosis and inhibition of proliferation.	mir-21	naso-pharyngeal carcinoma	up	Activation of miR-21 by STAT3 Induces Proliferation and Suppresses Apoptosis in Nasopharyngeal Carcinoma by Targeting PTEN Gene.	mir-497	colorectal cancer	up	MiR-497 promotes metastasis of colorectal cancer cells through Nrdp1 inhibition.
mir-143	colon cancer	down	Forced expression of miR-143 represses ERK5/c-Myc and p68/p72 signaling in concert with miR-145 in gut tumors of Apc(Min) mice.	mir-21	non-small cell lung cancer	up	High expression of serum miR-21 and tumor miR-200c associated with poor prognosis in patients with lung cancer.	mir-497	colorectal cancer	down	MicroRNA-497 targets insulin-like growth factor 1 receptor and has a tumour suppressive role in human colorectal cancer.

mir-143	colon cancer	down	Tumor suppressors miR-143 and miR-145 and predicted target proteins APIS, ERK5, K-RAS, and IRS-1 are differentially expressed in proximal and distal colon.	mir-21	non-small cell lung cancer	up	Clinical evaluation of microRNA expression profiling in non small cell lung cancer.	mir-497	gastric cancer	down	The putative tumor suppressor microRNA-497 modulates gastric cancer cell proliferation and invasion by repressing eIF4E.
mir-143	colon cancer	down	MicroRNA-143 reduces viability and increases sensitivity to 5-fluorouracil in HCT116 human colorectal cancer cells.	mir-21	non-small cell lung cancer	up	Downregulation of microRNA-21 expression restrains non-small cell lung cancer cell proliferation and migration through upregulation of programmed cell death 4.	mir-497	glioma	up	Hypoxia-induced miR-497 decreases glioma cell sensitivity to TMZ by inhibiting apoptosis.
mir-143	colorectal cancer	down	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-21	non-small cell lung cancer	up	Identification of plasma microRNA-21 as a biomarker for early detection and chemosensitivity of non-small cell lung cancer.	mir-497	hepatocellular carcinoma	down	Checkpoint kinase 1 is negatively regulated by miR-497 in hepatocellular carcinoma.
mir-143	colorectal cancer	down	MicroRNA signatures: novel biomarker for colorectal cancer?	mir-21	non-small cell lung cancer	up	Overexpression of miRNA-21 promotes radiation-resistance of non-small cell lung cancer.	mir-497	kidney cancer	down	Down-regulation of miR-497 is associated with poor prognosis in renal cancer.
mir-143	colorectal cancer	down	Down-regulation of KRAS-interacting miRNA-143 predicts poor prognosis but not response to EGFR-targeted agents in colorectal cancer.	mir-21	non-small cell lung cancer	up	Prognostic significance of serum miRNA-21 expression in human non-small cell lung cancer.	mir-497	non-small cell lung cancer	down	Downregulation of miR-497 promotes tumor growth and angiogenesis by targeting HDGF in non-small cell lung cancer.
mir-143	colorectal cancer	down	RREB1 repressed miR-143/145 modulates KRAS signaling through downregulation of multiple targets.	mir-21	non-small cell lung cancer	up	Let-7g and miR-21 expression in non-small cell lung cancer: Correlation with clinicopathological and molecular features.	mir-497	ovarian cancer	down	MicroRNA-497 inhibition of ovarian cancer cell migration and invasion through targeting of SMAD specific E3 ubiquitin protein ligase 1.
mir-143	colorectal cancer	down	MicroRNA-143 inhibits tumor growth and angiogenesis and sensitizes chemosensitivity to oxaliplatin in colorectal cancers.	mir-21	non-small cell lung cancer	up	[Overexpression of miR-21 promotes proliferation and reduces apoptosis in non-small cell lung cancer].	mir-497	ovarian cancer	down	MicroRNA-497 suppresses angiogenesis by targeting vascular endothelial growth factor A through the PI3K/AKT and MAPK/ERK pathways in ovarian cancer.
mir-143	colorectal cancer	down	The regulation of Toll-like receptor 2 by miR-143 suppresses the invasion and migration of a subset of human colorectal carcinoma cells.	mir-21	non-small cell lung cancer	up	MiR-21 suppresses the anticancer activities of curcumin by targeting PTEN gene in human non-small cell lung cancer A549 cells.	mir-497	pancreatic cancer	down	MiR-497 downregulation contributes to the malignancy of pancreatic cancer and associates with a poor prognosis.
mir-143	colorectal carcinoma	down	MicroRNA-143 targets DNA methyltransferases 3A in colorectal cancer.	mir-21	non-small cell lung cancer	up	Use of Luminex xMAP bead-based suspension array for detecting microRNA in NSCLC tissues and its clinical application.	mir-497	pancreatic cancer	down	Insulin-like growth factor I receptor (IGF-IR) as a target of MiR-497 and plasma IGF-IR levels associated with TNM stage of pancreatic cancer.

mir-143	colorectal carcinoma	down	Altered levels of the onco-microRNA 21 and the tumor-supressor microRNAs 143 and 145 in advanced rectal cancer indicate successful neoadjuvant chemoradiotherapy.	mir-21	non-small cell lung cancer	up	Alteration in Mir-21/PTEN expression modulates gefitinib resistance in non-small cell lung cancer.	mir-497	prostate cancer	down	MicroRNA-497 Suppresses Proliferation and Induces Apoptosis in Prostate Cancer Cells.
mir-143	colorectal carcinoma	down	[Effect of microRNA143 expression on cell proliferation in colonic carcinoma].	mir-21	non-small cell lung cancer	up	Prognostic value of mature microRNA-21 and microRNA-205 overexpression in non-small cell lung cancer by quantitative real-time RT-PCR.	mir-498	colorectal cancer	down	Downregulation of microRNA-498 in colorectal cancers and its cellular effects.
mir-143	endometrial cancer	down	Down-regulation of miR-145 and miR-143 might be associated with DNA methyltransferase 3B overexpression and worse prognosis in endometrioid carcinomas.	mir-21	non-small cell lung cancer	up	Reduction of Plasma MicroRNA-21 is Associated with Chemotherapeutic Response in Patients with Non-small Cell Lung Cancer.	mir-498	ovarian cancer	down	1,25-Dihydroxyvitamin D3 Suppresses Telomerase Expression and Human Cancer Growth through MicroRNA-498.
mir-143	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-21	non-small cell lung cancer	up	MicroRNA-21 (miR-21) regulates cellular proliferation, invasion, migration, and apoptosis by targeting PTEN, RECK and Bcl-2 in lung squamous carcinoma, Gejiu City, China.	mir-498	ovarian cancer	down	MiR-498 regulated FOXO3 expression and inhibited the proliferation of human ovarian cancer cells.
mir-143	esophageal cancer	up	Alteration of miRNA Expression Correlates with Lifestyle, Social and Environmental Determinants in Esophageal Carcinoma.	mir-21	oral cancer	up	MicroRNA-21 Promotes Oral Cancer Invasion via the Wnt/beta-Catenin Pathway by Targeting DKK2.	mir-499-5p	colorectal cancer	up	MicroRNA-499-5p promotes cellular invasion and tumor metastasis in colorectal cancer by targeting FOXO4 and PDCD4.
mir-143	esophageal squamous cell carcinoma	down	MicroRNA-143 functions as a tumor suppressor in human esophageal squamous cell carcinoma.	mir-21	oral squamous cell carcinoma	up	Relationship between microRNA expression levels and histopathological features of dysplasia in oral leukoplakia.	mir-499a-5p	oral squamous cell carcinoma	down	The association between miR-499a polymorphism and oral squamous cell carcinoma progression.
mir-143	gastric cancer	down	Involvement of miR-143 in cisplatin resistance of gastric cancer cells via targeting IGF1R and BCL2.	mir-21	oral squamous cell carcinoma	up	Altered levels of miR-21, miR-125b-2*, miR-134, miR-155, miR-184, and miR-205 in oral squamous cell carcinoma and association with clinicopathological characteristics.	mir-500	gastric cancer	up	MicroRNA-500 sustains nuclear factor-?B activation and induces gastric cancer cell proliferation and resistance to apoptosis.
mir-143	gastric cancer	down	[Expression of miR-143 and miR-145 and their functional study in gastric carcinoma].	mir-21	osteo-sarcoma	up	Identification of Serum MicroRNA-21 as a Biomarker for Chemosensitivity and Prognosis in Human Osteosarcoma.	mir-500	hepatocellular carcinoma	up	MicroRNA-500 as a potential diagnostic marker for hepatocellular carcinoma.
mir-143	gastric cancer	up	Evaluation of MicroRNA Expression Pattern of Gastric Adenocarcinoma Associated with Socioeconomic.	mir-21	osteo-sarcoma	up	MicroRNA-21 is involved in osteosarcoma cell invasion and migration.	mir-501	hepatocellular carcinoma	up	MicroRNA-501 promotes HBV replication by targeting HBXIP.

			Environmental and Lifestyle Factors in Northwestern Hungary.								
mir-143	gastric cancer	down	MicroRNA-143 suppresses gastric cancer cell growth and induces apoptosis by targeting COX-2.	mir-21	osteo-sarcoma	up	A three-plasma miRNA signature serves as novel biomarkers for osteosarcoma.	mir-501-5p	hepatocellular carcinoma	up	MiR-501-5p regulates CYLD expression and promotes cell proliferation in human hepatocellular carcinoma.
mir-143	glioblastoma	down	miR-143 inhibits glycolysis and depletes stemness of glioblastoma stem-like cells.	mir-21	ovarian cancer	up	The inhibition of miR-21 promotes apoptosis and chemosensitivity in ovarian cancer.	mir-502	colon cancer	down	Inhibition of autophagy and tumor growth in colon cancer by miR-502.
mir-143	glioma	down	miR-143 inhibits glycolysis and depletes stemness of glioblastoma stem-like cells.	mir-21	pancreatic cancer	up	MicroRNA-21 is overexpressed in pancreatic cancer and a potential predictor of survival.	mir-502-5p	breast cancer	down	Suppressive role of miR-502-5p in breast cancer via downregulation of TRAF2.
mir-143	hepatocellular carcinoma	down	[miR-143 inhibits proliferation and invasion of hepatocellular carcinoma cells via down-regulation of TLR2 expression].	mir-21	pancreatic cancer	up	MicroRNA-21 modulates biological functions of pancreatic cancer cells including their proliferation, invasion, and chemoresistance.	mir-503	breast cancer	up	MiR-503 inhibited cell proliferation of human breast cancer cells by suppressing CCND1 expression.
mir-143	malignant melanoma	down	MicroRNA-143 targets Syndecan-1 to repress cell growth in melanoma.	mir-21	pancreatic ductal adeno-carcinoma	up	MiR-21 upregulation induced by promoter zone histone acetylation is associated with chemoresistance to gemcitabine and enhanced malignancy of pancreatic cancer cells.	mir-503	colon cancer	down	MiR-424/503-Mediated Rictor Upregulation Promotes Tumor Progression.
mir-143	naso-pharyngeal carcinoma	down	MicroRNA deregulation and pathway alterations in nasopharyngeal carcinoma.	mir-21	pancreatic ductal adeno-carcinoma	up	MicroRNA-21 in pancreatic cancer: correlation with clinical outcome and pharmacologic aspects underlying its role in the modulation of gemcitabine activity.	mir-503	gastric cancer	down	MiR-503 regulates cisplatin resistance of human gastric cancer cell lines by targeting IGF1R and BCL2.
mir-143	naso-pharyngeal carcinoma	down	Identification of miR-143 as a tumour suppressor in nasopharyngeal carcinoma based on microRNA expression profiling.	mir-21	pancreatic ductal adeno-carcinoma	up	Modulation of FoxO1 expression by miR-21 to promote growth of pancreatic ductal adenocarcinoma.	mir-503	gastric cancer	down	microRNA-503 inhibits gastric cancer cell growth and epithelial-to-mesenchymal transition.
mir-143	non-small cell lung cancer	down	miR-143 inhibits cell proliferation by targeting autophagy-related 2B in non-small cell lung cancer H1299 cells.	mir-21	pancreatic ductal adeno-carcinoma	up	Knockdown of microRNA-21 inhibits proliferation and increases cell death by targeting programmed cell death 4 (PDCD4) in pancreatic ductal adenocarcinoma.	mir-503	glioblastoma	down	MicroRNA-503 acts as a tumor suppressor in glioblastoma for multiple antitumor effects by targeting IGF-1R.
mir-143	non-small cell lung cancer	down	miR-143 inhibits NSCLC cell growth and metastasis by targeting Limk1.	mir-21	pancreatic ductal adeno-carcinoma	up	Interplay of miR-21 and FoxO1 modulates growth of pancreatic ductal adenocarcinoma.	mir-503	hepatocellular carcinoma	down	MicroRNA-503 inhibits the G1/S transition by downregulating cyclin D3 and E2F3 in hepatocellular carcinoma.
mir-143	osteosarcoma	down	microRNA-143, down-regulated in osteosarcoma, promotes apoptosis and	mir-21	pancreatic ductal adeno-carcinoma	up	Association of microRNA-21 expression with its targets, PDCD4 and TIMP3, in	mir-503	non-small cell lung cancer	down	Epigenetic silencing of MicroRNA-503 regulates FANCA expression in non-

			suppresses tumorigenicity by targeting Bcl-2				pancreatic ductal adenocarcinoma				small cell lung cancer cell.
mir-143	osteosarcoma	down	A three-plasma miRNA signature serves as novel biomarkers for osteosarcoma.	mir-21	pancreatic ductal adeno-carcinoma	up	MiR-21, miR-34a, miR-198 and miR-217 as diagnostic and prognostic biomarkers for chronic pancreatitis and pancreatic ductal adenocarcinoma.	mir-503	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer.
mir-143	pancreatic ductal adeno-carcinoma	down	XMD8-92 Inhibits Pancreatic Tumor Xenograft Growth via DCLK1-Dependent Mechanism.	mir-21	pancreatic ductal adeno-carcinoma	up	MicroRNAs as diagnostic markers for pancreatic ductal adenocarcinoma and its precursor, pancreatic intraepithelial neoplasm.	mir-503	osteosarcoma	down	MicroRNA-503 acts as a tumor suppressor in osteosarcoma by targeting L1CAM
mir-143	prostate cancer	down	miR-143 interferes with ERK5 signaling, and abrogates prostate cancer progression in mice	mir-21	pancreatic ductal adeno-carcinoma	up	MicroRNA-21 in Pancreatic Ductal Adenocarcinoma Tumor-Associated Fibroblasts Promotes Metastasis.	mir-503	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
mir-143	prostate cancer	down	miR-143 decreases prostate cancer cells proliferation and migration and enhances their sensitivity to docetaxel through suppression of KRAS.	mir-21	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-504	hypo-pharyngeal squamous cell carcinoma	down	microRNA-504 inhibits cancer cell proliferation via targeting CDK6 in hypopharyngeal squamous cell carcinoma.
mir-143	prostate cancer	down	MicroRNA-143 inhibits cell migration and invasion by targeting matrix metalloproteinase 13 in prostate cancer.	mir-21	papillary thyroid carcinoma	up	MicroRNA-21 regulates biological behaviors in papillary thyroid carcinoma by targeting programmed cell death 4.	mir-504	hypopharyngeal squamous cell carcinoma	down	Downregulation of microRNA-504 is associated with poor prognosis in high-grade glioma.
mir-143	prostate cancer	down	The tumor-suppressive microRNA-143/145 cluster inhibits cell migration and invasion by targeting GOLM1 in prostate cancer.	mir-21	prostate cancer	up	MicroRNA-21 inhibits p57Kip2 expression in prostate cancer.	mir-506	gastric cancer	down	MicroRNA-506 inhibits gastric cancer proliferation and invasion by directly targeting Yap1.
mir-143	renal cell carcinoma	down	The tumor-suppressive microRNA-143/145 cluster targets hexokinase-2 in renal cell carcinoma.	mir-21	prostate cancer	up	A study of molecular signals deregulating mismatch repair genes in prostate cancer compared to benign prostatic hyperplasia.	mir-506	hepatocellular carcinoma	down	MiR-506 suppresses proliferation of hepatoma cells through targeting YAP mRNA 3'UTR.
mir-144	bladder cancer	down	miR-144 downregulation increases bladder cancer cell proliferation by targeting EZH2 and regulating Wnt signaling	mir-21	renal cell carcinoma	up	miR-21 downregulated TCF21 to inhibit KISS1 in renal cancer.	mir-506	nasopharyngeal carcinoma	down	MiR-506 suppresses tumor proliferation and invasion by targeting FOXQ1 in nasopharyngeal carcinoma.
mir-144	cholangio-carcinoma	down	MicroRNA-144 suppresses cholangiocarcinoma cell proliferation and invasion through targeting platelet activating factor acetylhydrolase isoform 1b	mir-21	renal cell carcinoma	up	MicroRNA-21 is overexpressed in renal cell carcinoma.	mir-506	oral squamous cell carcinoma	down	MicroRNA-506 suppresses growth and metastasis of oral squamous cell carcinoma via targeting GATA6.

mir-144	gastric cancer	down	MicroRNA-144 inhibits the metastasis of gastric cancer by targeting MET expression.	mir-21	renal cell carcinoma	up	MicroRNA-21 (miR-21) post-transcriptionally downregulates tumor suppressor PDCD4 and promotes cell transformation, proliferation, and metastasis in renal cell carcinoma.	mir-506	renal clear cell carcinoma	down	MiR-506 is down-regulated in clear cell renal cell carcinoma and inhibits cell growth and metastasis via targeting FLOT1.
mir-144	hepatocellular carcinoma	down	miR-144 suppresses the proliferation and metastasis of hepatocellular carcinoma by targeting E2F3.	mir-21	renal cell carcinoma	up	The clinical utility of miR-21 as a diagnostic and prognostic marker for renal cell carcinoma.	mir-506	renal clear cell carcinoma	down	Correction: MiR-506 Is Down-Regulated in Clear Cell Renal Cell Carcinoma and Inhibits Cell Growth and Metastasis via Targeting FLOT1
mir-144	lung cancer	down	MiR-144 Inhibits Proliferation and Induces Apoptosis and Autophagy in Lung Cancer Cells by Targeting TIGAR.	mir-21	retino-blastoma	up	Seed-targeting anti-miR-21 inhibiting malignant progression of retinoblastoma and analysis of their phosphorylation signaling pathways.	mir-508-3p	kidney cancer	down	Identification of miR-508-3p and miR-509-3p that are associated with cell invasion and migration and involved in the apoptosis of renal cell carcinoma.
mir-144	naso-pharyngeal carcinoma	up	MicroRNA-144 promotes cell proliferation, migration and invasion in nasopharyngeal carcinoma through repression of PTEN.	mir-21	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.	mir-509-3p	kidney cancer	down	Identification of miR-508-3p and miR-509-3p that are associated with cell invasion and migration and involved in the apoptosis of renal cell carcinoma.
mir-144	osteosarcoma	down	The downregulation of miR-144 is associated with the growth and invasion of osteosarcoma cells through the regulation of TAGLN expression.	mir-21-3p	hepato-cellular carcinoma	down	MicroRNA-21-3p, a berberine-induced miRNA, directly down-regulates human methionine adenosyltransferases 2A and 2B and inhibits hepatoma cell growth.	mir-509-3p	renal cell carcinoma	down	MicroRNA-509-3p inhibits cancer cell proliferation and migration by targeting the mitogen-activated protein kinase kinase kinase 8 oncogene in renal cell carcinoma
mir-144	osteosarcoma	down	MicroRNA-144 suppresses osteosarcoma growth and metastasis by targeting ROCK1 and ROCK2.	mir-21-5p	clear cell renal cell cancer	up	Exploring the miRNA-mRNA regulatory network in clear cell renal cell carcinomas by next-generation sequencing expression profiles.	mir-509-5p	renal cell carcinoma	down	Tumor suppressive miR-509-5p contributes to cell migration, proliferation and antiapoptosis in renal cell carcinoma.
mir-144	pancreatic ductal adeno-carcinoma	down	XMD8-92 Inhibits Pancreatic Tumor Xenograft Growth via DCLK1-Dependent Mechanism	mir-21-5p	rectal cancer	up	Overexpression of miR-21-5p as a predictive marker for complete tumor regression to neoadjuvant chemoradiotherapy in rectal cancer patients.	mir-510	breast cancer	up	MicroRNA-510 promotes cell and tumor growth by targeting peroxiredoxin 1 in breast cancer.
mir-144	thyroid cancer	down	Down-regulation of miR-144 promotes thyroid cancer cell invasion by targeting ZER1 and ZFB2.	mir-210	adrenal cortical carcinoma	up	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma	mir-5100	lung cancer	up	miR-5100 promotes tumor growth in lung cancer by targeting Rabo.
mir-144	uveal melanoma	down	MiR-144 Inhibits Uveal Melanoma Cell Proliferation and Invasion by Regulating c-Met Expression.	mir-210	bladder cancer	up	Synthetic miRNA-mowers targeting miR-183-96-182 cluster or miR-210 inhibit growth and migration and induce apoptosis in bladder cancer cells.	mir-511	lung adenocarcinoma	down	miR-511 and miR-1297 inhibit human lung adenocarcinoma cell proliferation by targeting oncogene TRIB2.

mir-145	bladder cancer	down	MicroRNA-143 functions as a tumor suppressor in human bladder cancer T24 cells.	mir-210	colorectal cancer	up	Hypoxia-inducible MiR-210 is an independent prognostic factor and contributes to metastasis in colorectal cancer.	mir-512-3p	non-small cell lung cancer	down	Inhibition of RAC1-GEF DOCK3 by miR-512-3p contributes to suppression of metastasis in non-small cell lung cancer.
mir-145	bladder cancer	down	Replacement treatment with microRNA-143 and -145 induces synergistic inhibition of the growth of human bladder cancer cells by regulating PI3K/Akt and MAPK signaling pathways.	mir-210	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-513b	gastric cancer	down	Upregulation of miR-513b inhibits cell proliferation, migration, and promotes apoptosis by targeting high mobility group-box 3 protein in gastric cancer.
mir-145	bladder cancer	down	socs7, a target gene of microRNA-145, regulates interferon-? induction through STAT3 nuclear translocation in bladder cancer cells.	mir-210	esophageal squamous cell carcinoma	down	MiR-210 expression reverses radioresistance of stem-like cells of oesophageal squamous cell carcinoma.	mir-517a	breast cancer	down	Restoration of miR-517a expression induces cell apoptosis in bladder cancer cell lines.
mir-145	bladder cancer	down	Aberrant expression of microRNAs in bladder cancer.	mir-210	esophageal squamous cell carcinoma	down	MicroRNA-210 regulates cancer cell proliferation through targeting fibroblast growth factor receptor-like 1 (FGFRL1).	mir-518a-3p	colorectal cancer	down	Downregulation of miR-518a-3p activates the NIK-dependent NF-?B pathway in colorectal cancer.
mir-145	bladder cancer	down	miR-145 inhibits invasion of bladder cancer cells by targeting PAK1.	mir-210	esophageal squamous cell carcinoma	down	The Role of MicroRNA-210 in Esophageal Squamous Cell Carcinoma.	mir-518b	esophageal squamous cell carcinoma	down	miR-518b is down-regulated, and involved in cell proliferation and invasion by targeting Rap1b in esophageal squamous cell carcinoma.
mir-145	bladder cancer	down	miR-145 induces caspase-dependent and -independent cell death in urothelial cancer cell lines with targeting of an expression signature present in Ta bladder tumors.	mir-210	gastric cancer	down	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-519d	hepatocellular carcinoma	down	MicroRNA-519d targets MKi67 and suppresses cell growth in the hepatocellular carcinoma cell line QGY-7703.
mir-145	breast cancer	down	miR-145 participates with TP53 in a death-promoting regulatory loop and targets estrogen receptor-alpha in human breast cancer cells.	mir-210	glioblastoma	up	Acute hypoxia induces upregulation of microRNA-210 expression in glioblastoma spheroids.	mir-519d	hepatocellular carcinoma	up	In hepatocellular carcinoma miR-519d is up-regulated by p53 and DNA hypomethylation and targets CDKN1A/p21, PTEN, AKT3 and TIMP2.
mir-145	breast cancer	down	MiR-145 inhibits tumor angiogenesis and growth by N-RAS and VEGF.	mir-210	glioma	up	MicroRNA-210 overexpression predicts poorer prognosis in glioma patients.	mir-519d	osteosarcoma	down	CTGF increases matrix metalloproteinases expression and subsequently promotes tumor metastasis in human osteosarcoma through down-regulating miR-519d.
mir-145	breast cancer	down	Analysis of miR-205 and miR-155 expression in the blood of breast cancer patients.	mir-210	glioma	up	MiR-210 up-regulation inhibits proliferation and induces apoptosis in glioma cells by targeting SIN3A.	mir-519d	ovarian cancer	down	MiR-519d represses ovarian cancer cell proliferation and enhances cisplatin-mediated cytotoxicity in vitro by

											targeting XIAP.
mir-145	breast cancer	down	miR-145 inhibits breast cancer cell growth through RTKN.	mir-210	hepato-cellular carcinoma	up	Effects of knockdown of miR-210 in combination with ionizing radiation on human hepatoma xenograft in nude mice.	mir-520a	hepatocellular carcinoma	down	MicroRNA-218 and microRNA-520a inhibit cell proliferation by downregulating E2F2 in hepatocellular carcinoma.
mir-145	cervical cancer	down	Downregulation of microRNA-145 is associated with aggressive progression and poor prognosis in human cervical cancer.	mir-210	hepato-cellular carcinoma	up	Hypoxia-inducible microRNA-210 augments the metastatic potential of tumor cells by targeting vacuole membrane protein 1 in hepatocellular carcinoma.	mir-520a-3p	non-small cell lung cancer	down	The microRNA-520a-3p inhibits proliferation, apoptosis and metastasis by targeting MAP3K2 in non-small cell lung cancer.
mir-145	cervical cancer	down	Glucocorticoid regulation of a novel HPV E6-p53-miR-145 pathway modulates invasion and therapy resistance of cervical cancer cells.	mir-210	kidney cancer	up	miR-210 is a target of hypoxia-inducible factors 1 and 2 in renal cancer, regulates ISCU and correlates with good prognosis.	mir-520b	hepatocellular carcinoma	down	MiR-520b suppresses proliferation of hepatoma cells through targeting ten-eleven translocation 1 (TET1) mRNA.
mir-145	chondro-sarcoma	down	The Epigenetic Regulation of SOX9 by miR-145 in Human Chondrosarcoma.	mir-210	lung cancer	up	MiR-210 promotes a hypoxic phenotype and increases radioresistance in human lung cancer cell lines.	mir-520c	breast cancer	up	The microRNAs miR-373 and miR-520c promote tumour invasion and metastasis.
mir-145	colon cancer	down	Forced expression of miR-143 represses ERK5/c-Myc and p68/p72 signaling in concert with miR-145 in gut tumors of Apc(Min) mice.	mir-210	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-520c-3p	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-145	colon cancer	down	Tumor suppressors miR-143 and miR-145 and predicted target proteins API5, ERK5, K-RAS, and IRS-1 are differentially expressed in proximal and distal colon.	mir-210	malignant melanoma	up	MicroRNA-15b represents an independent prognostic parameter and is correlated with tumor cell proliferation and apoptosis in malignant melanoma.	mir-520c-3p	hepatocellular carcinoma	down	MicroRNA-520c-3p inhibits hepatocellular carcinoma cell proliferation and invasion through induction of cell apoptosis by targeting glypican-3.
mir-145	colon cancer	up	miR-21 and miR-145 cooperation in regulation of colon cancer stem cells.	mir-210	osteo-sarcoma	up	Prognostic evaluation of microRNA-210 expression in pediatric osteosarcoma.	mir-520d-3p	gastric cancer	down	MicroRNA 520d-3p inhibits gastric cancer cell proliferation, migration, and invasion by downregulating EphA2 expression.
mir-145	colon cancer	down	Putative tumor suppressor miR-145 inhibits colon cancer cell growth by targeting oncogene Friend leukemia virus integration 1 gene.	mir-210	ovarian cancer	up	miR-210, a modulator of hypoxia-induced epithelial-mesenchymal transition in ovarian cancer cell.	mir-520g	hepatocellular carcinoma	up	MicroRNA-520g induces epithelial-mesenchymal transition and promotes metastasis of hepatocellular carcinoma by targeting SMAD7.
mir-145	colon cancer	down	MiR-145 directly targets p70S6K1 in cancer cells to inhibit tumor growth and angiogenesis.	mir-210	renal cell carcinoma	up	MiR-210 expression in tumor tissue and in vitro effects of its silencing in renal cell carcinoma.	mir-525-3p	liver cancer	up	MiR-525-3p Enhances the Migration and Invasion of Liver Cancer Cells by Downregulating ZNF395.

mir-145	colorectal cancer	up	Up-regulation of microRNA-145 associates with lymph node metastasis in colorectal cancer.	mir-210	renal clear cell carcinoma	up	Overexpression of miR-210, a downstream target of HIF1?, causes centrosome amplification in renal carcinoma cells.	mir-526b	breast cancer	up	COX-2 Elevates Oncogenic miR-526b in Breast Cancer by EP4 Activation.
mir-145	colorectal cancer	down	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-210	renal clear cell carcinoma	up	miRNA profiling for clear cell renal cell carcinoma: biomarker discovery and identification of potential controls and consequences of miRNA dysregulation.	mir-526b	non-small cell lung cancer	down	By downregulating Ku80, miR-526b suppresses non-small cell lung cancer.
mir-145	colorectal cancer	down	Evaluation of microRNAs-29a, 92a and 145 in colorectal carcinoma as candidate diagnostic markers: An Egyptian pilot study.	mir-210	renal clear cell carcinoma	up	Serum miR-210 as a potential biomarker of early clear cell renal cell carcinoma.	mir-532-5p	malignant melanoma	up	Regulation of RUNX3 tumor suppressor gene expression in cutaneous melanoma.
mir-145	colorectal cancer	down	MicroRNA signatures: novel biomarker for colorectal cancer?	mir-210-3p	glioblastoma	up	Hypoxic signature of microRNAs in glioblastoma: insights from small RNA deep sequencing.	mir-532-5p	ovarian carcinoma	down	MicroRNA expression in ovarian carcinoma and its correlation with clinicopathological features.
mir-145	colorectal cancer	down	MicroRNA-145 suppresses cell migration and invasion by targeting paxillin in human colorectal cancer cells.	mir-211	breast cancer	down	MicroRNA-211, a direct negative regulator of CDC25B expression, inhibits triple-negative breast cancer cells' growth and migration.	mir-532-5p	retinoblastoma	down	Computational and in vitro Investigation of miRNA-Gene Regulations in Retinoblastoma Pathogenesis: miRNA Mimics Strategy.
mir-145	colorectal cancer	down	Candidate microRNA biomarkers in human colorectal cancer: Systematic review profiling studies and experimental validation.	mir-211	colorectal cancer	up	MicroRNA-211 expression promotes colorectal cancer cell growth in vitro and in vivo by targeting tumor suppressor CHD5.	mir-541	pancreatic ductal adenocarcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-145	colorectal cancer	down	RREB1 repressed miR-143/145 modulates KRAS signaling through downregulation of multiple targets.	mir-211	hepato-cellular carcinoma	down	miR-211 suppresses hepatocellular carcinoma by downregulating SATB2.	mir-542-3p	gastric cancer	down	MicroRNA-542-3p suppresses cell growth of gastric cancer cells via targeting oncogene astrocyte-elevated gene-1.
mir-145	colorectal cancer	down	MicroRNA-145 inhibits tumour growth and metastasis in colorectal cancer by targeting fascin-1.	mir-211	malignant melanoma	down	The regulation of miRNA-211 expression and its role in melanoma cell invasiveness.	mir-543	endometrial cancer	down	MicroRNA-543 suppresses endometrial cancer oncogenicity via targeting FAK and TWIST1 expression.
mir-145	colorectal carcinoma	down	Altered levels of the onco-microRNA 21 and the tumor-supressor microRNAs 143 and 145 in advanced rectal cancer indicate successful neoadjuvant chemoradiotherapy.	mir-211	malignant melanoma	down	Intronic miR-211 assumes the tumor suppressive function of its host gene in melanoma.	mir-544	gastric cancer	up	Oncogenic miR-544 is an Important Molecular Target in Gastric Cancer.

mir-145	endometrial cancer	up	Up-regulation of microRNA-145 promotes differentiation by repressing OCT4 in human endometrial adenocarcinoma cells.	mir-211	malignant melanoma	down	Melanoma cell invasiveness is regulated by miR-211 suppression of the BRN2 transcription factor.	mir-545	lung cancer	down	MicroRNA-545 Suppresses Cell Proliferation by Targeting Cyclin D1 and CDK4 in Lung Cancer Cells.
mir-145	endometrial cancer	down	Down-regulation of miR-145 and miR-143 might be associated with DNA methyltransferase 3B overexpression and worse prognosis in endometrioid carcinomas.	mir-211	malignant melanoma	down	Differential expression of microRNAs during melanoma progression: miR-200c, miR-205 and miR-211 are downregulated in melanoma and act as tumour suppressors.	mir-551a	colorectal cancer	down	Extracellular metabolic energetics can promote cancer progression.
mir-145	esophageal squamous cell carcinoma	down	miR-145 inhibits proliferation and invasion of esophageal squamous cell carcinoma in part by targeting c-Myc.	mir-212	colorectal cancer	down	Genetic and Epigenetic Down-regulation of MicroRNA-212 Promotes Colorectal Tumor Metastasis via Dysregulation of MnSOD.	mir-564	chronic myelogenous leukemia	down	Downregulation of miR-31, miR-155, and miR-564 in chronic myeloid leukemia cells.
mir-145	esophageal squamous cell carcinoma	down	Evaluating the miR-302b and miR-145 expression in formalin-fixed paraffin-embedded samples of esophageal squamous cell carcinoma.	mir-212	gastric cancer	down	miR-212 is downregulated and suppresses methyl-CpG-binding protein MeCP2 in human gastric cancer.	mir-566	glioma	up	MicroRNA-566 activates EGFR signaling and its inhibition sensitizes glioblastoma cells to nimotuzumab.
mir-145	esophageal squamous cell carcinoma	down	miR-145, miR-133a and miR-133b: Tumor-suppressive miRNAs target FSCN1 in esophageal squamous cell carcinoma.	mir-212	gastric cancer	down	Down-regulation of miR-212 expression by DNA hypermethylation in human gastric cancer cells.	mir-570	lung cancer	up	MicroRNA-570 promotes lung carcinoma proliferation through targeting tumor suppressor KLF9.
mir-145	esophageal squamous cell carcinoma	up	Relationship between altered expression levels of MIR21, MIR143, MIR145, and MIR205 and clinicopathologic features of esophageal squamous cell carcinoma.	mir-212	hepato-cellular carcinoma	down	Histone Demethylase Retinoblastoma Binding Protein 2 is Overexpressed in Hepatocellular Carcinoma and Negatively Regulated by miR-212.	mir-572	ovarian cancer	up	Upregulation of MiR-572 transcriptionally suppresses SOCS1 and p21 and contributes to human ovarian cancer progression.
mir-145	esophageal squamous cell carcinoma	down	MicroRNA-143 functions as a tumor suppressor in human esophageal squamous cell carcinoma.	mir-212	non-small cell lung cancer	down	miR-212 increases tumor necrosis factor-related apoptosis-inducing ligand sensitivity in non-small cell lung cancer by targeting the antiapoptotic protein PED.	mir-572	renal cell carcinoma	up	A panel of five serum miRNAs as a potential diagnostic tool for early-stage renal cell carcinoma.
mir-145	gastric cancer	down	MiR-145, miR-133a and miR-133b inhibit proliferation, migration, invasion and cell cycle progression via targeting transcription factor Sp1 in gastric cancer.	mir-212	non-small cell lung cancer	up	MiR-212 displays Tumor Promoting properties in NSCLC Cells and targets the Hedgehog Pathway Receptor PTCH1.	mir-573	malignant melanoma	down	miR-573 regulates melanoma progression by targeting the melanoma cell adhesion molecule.
mir-145	gastric cancer	down	[Expression of miR-143 and miR-145 and their functional study in gastric carcinoma].	mir-212	non-small cell lung cancer	up	Synaptic acetylcholinesterase targeted by microRNA-212 functions as a tumor suppressor in non-small cell lung cancer.	mir-574-3p	breast cancer	down	Novel oncogenic function of mesoderm development candidate 1 and its regulation by MiR-574-3p in bladder cancer cell lines.

mir-145	glioblastoma	down	NEDD9, a novel target of miR-145, increases the invasiveness of glioblastoma.	mir-212	osteo-sarcoma	down	MicroRNA-212 inhibits osteosarcoma cells proliferation and invasion by down-regulation of Sox4.	mir-574-3p	esophageal cancer	down	Differential expression of miRNAs in esophageal cancer tissue.
mir-145	glioblastoma	down	Functional profiling of precursor MicroRNAs identifies MicroRNAs essential for glioma proliferation.	mir-212	ovarian cancer	down	MiR-212 exerts suppressive effect on SKOV3 ovarian cancer cells through targeting HBEGF.	mir-574-3p	hepatocellular carcinoma	up	Serum microRNA characterization identifies miR-885-5p as a potential marker for detecting liver pathologies.
mir-145	glioma	down	NEDD9, a novel target of miR-145, increases the invasiveness of glioblastoma.	mir-212	pancreatic cancer	up	miR-132 and miR-212 are increased in pancreatic cancer and target the retinoblastoma tumor suppressor	mir-574-5p	colorectal cancer	down	miR-574-5p negatively regulates MACC-1 expression to suppress colorectal cancer liver metastasis.
mir-145	glioma	down	MiR-145 reduces ADAM17 expression and inhibits in vitro migration and invasion of glioma cells.	mir-212	pancreatic ductal adeno-carcinoma	up	miR-212 promotes pancreatic cancer cell growth and invasion by targeting the hedgehog signaling pathway receptor patched-1.	mir-575	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-145	glioma	down	ROCK1, a novel target of miR-145, promotes glioma cell invasion.	mir-212	prostate cancer	down	A potential regulatory loop between Lin28B:miR?212 in androgen-independent prostate cancer.	mir-576-3p	bladder cancer	down	MicroRNA-576-3p Inhibits Proliferation in Bladder Cancer Cells by Targeting Cyclin D1.
mir-145	glioma	down	miR-145 Inhibits Migration and Invasion of Glioma Stem Cells by Targeting ABCG2.	mir-212-3p	glioblastoma	down	MiR-212-3p inhibits glioblastoma cell proliferation by targeting SGK3.	mir-576-5p	glioblastoma	up	miRNA microarray reveals specific expression in the peripheral blood of glioblastoma patients.
mir-145	hepatocellular carcinoma	down	MiR-145 modulates multiple components of the insulin-like growth factor pathway in hepatocellular carcinoma.	mir-214	bladder cancer	down	MicroRNA-214 Suppresses Oncogenesis and Exerts Impact on Prognosis by Targeting PDRG1 in Bladder Cancer.	mir-577	glioblastoma	down	miR-577 inhibits glioblastoma tumor growth via the Wnt signaling pathway.
mir-145	hepatocellular carcinoma	down	miR-145 suppresses cell invasion in hepatocellular carcinoma cells: miR-145 targets ADAM17.	mir-214	cervical cancer	down	MiR-214 reduces cell survival and enhances cisplatin-induced cytotoxicity via down-regulation of Bcl2l2 in cervical cancer cells.	mir-582-5p	hepatocellular carcinoma	down	miR-582-5p inhibits proliferation of hepatocellular carcinoma by targeting CDK1 and AKT3.
mir-145	hepatocellular carcinoma	down	MicroRNA-145: a promising biomarker for hepatocellular carcinoma (HCC).	mir-214	cervical cancer	down	MicroRNA-214 suppresses growth and invasiveness of cervical cancer cells by targeting UDP-N-acetyl-?-D-galactosamine:polypeptide N-acetylgalactosaminyltransferase 7.	mir-584	glioma	down	MicroRNA-584 functions as a tumor suppressor and targets PTTG1IP in glioma.
mir-145	hepatocellular carcinoma	down	MicroRNA-145 suppresses hepatocellular carcinoma by targeting IRS1 and its downstream Akt signaling.	mir-214	cervical squamous cell carcinoma	down	Down-regulation of miR-124/-214 in cutaneous squamous cell carcinoma mediates abnormal cell proliferation via the induction of ERK.	mir-590-5p	cervical cancer	up	MicroRNA-590 Promotes Cervical Cancer Cell Growth and Invasion by Targeting CHL1.
mir-145	hepatocellular carcinoma	down	MicroRNA-145 inhibits cell proliferation by directly targeting ADAM17 in hepatocellular carcinoma.	mir-214	colon cancer	down	microRNA-214 functions as a tumor suppressor in human colon cancer via the suppression of ADP-ribosylation factor-like protein 2.	mir-590-3p	hepatocellular carcinoma	up	MicroRNA-590-5p regulates proliferation and invasion in human hepatocellular carcinoma cells by targeting TGF-?

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mir-145	hepatocellular carcinoma	down	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its prognu	mir-214	esophageal squamous cell carcinoma	down	MicroRNA-98 and microRNA-214 post-transcriptionally regulate enhancer of zeste homolog 2 and inhibit migration and invasion in human esophageal squamous cell carcinoma	mir-590-5p	hepatocellular carcinoma	down	MiR-590-5P Inhibits Growth of HepG2 Cells via Decrease of S100A10 Expression and Inhibition of the Wnt Pathway
mir-145	kidney cancer	down	MicroRNA-145 Targets the Metalloprotease ADAM17 and Is Suppressed in Renal Cell Carcinoma Patients.	mir-214	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-592	colorectal cancer	up	Up-regulation of miR-592 correlates with tumor progression and poor prognosis in patients with colorectal cancer.
mir-145	liver cancer	down	MiR-145 functions as a tumor suppressor by directly targeting histone deacetylase 2 in liver cancer.	mir-214	gastric cancer	up	Down-regulated miRNA-214 induces a cell cycle G1 arrest in gastric cancer cells by up-regulating the PTEN protein.	mir-601	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-145	lung adeno-carcinoma	down	Restoration of tumour suppressor miR-145 inhibits cancer cell growth in lung adenocarcinoma patients with epidermal growth factor receptor mutation	mir-214	gastric cancer	up	Deregulated microRNAs in gastric cancer tissue-derived mesenchymal stem cells: novel biomarkers and a mechanism for gastric cancer.	mir-603	glioma	up	miR-603 promotes glioma cell growth via Wnt/beta-catenin pathway by inhibiting WIF1 and CTNNBIP1.
mir-145	lung adeno-carcinoma	down	MiR-145 inhibits cell proliferation of human lung adenocarcinoma by targeting EGFR and NUDT1.	mir-214	gastric cancer	up	Hemolysis-free plasma miR-214 as novel biomarker of gastric cancer and is correlated with distant metastasis.	mir-608	chordoma	down	MicroRNA-608 and microRNA-34a regulate chordoma malignancy by targeting EGFR, Bcl-xL and MET.
mir-145	lung adeno-carcinoma	down	microRNA-145 suppresses lung adenocarcinoma-initiating cell proliferation by targeting OCT4.	mir-214	glioma	up	Associations between the Expression of micro-RNA 214 and clinicopathologic parameters of glioma.	mir-610	hepatocellular carcinoma	down	Downregulation of miR-610 promotes proliferation and tumorigenicity and activates Wnt/beta-catenin signaling in human hepatocellular carcinoma
mir-145	lung adeno-carcinoma	down	[miR-145 inhibits lung adenocarcinoma stem cells proliferation by targeting OCT4 gene].	mir-214	hepato-cellular carcinoma	down	Identification of differentially expressed microRNAs in human hepatocellular adenoma associated with type I glycogen storage disease: a potential utility as biomarkers.	mir-610	lung cancer	down	[miR-610 suppresses lung cancer cell proliferation and invasion by targeting GJA3].
mir-145	lung adeno-carcinoma	down	MiR-145 regulates cancer stem-like properties and epithelial-to-mesenchymal transition in lung adenocarcinoma-initiating cells	mir-214	hepato-cellular carcinoma	up	MicroRNA-214 regulates the acquired resistance to gefitinib via the PTEN/AKT pathway in EGFR-mutant cell lines.	mir-612	hepatocellular carcinoma	down	miR-612 suppresses the invasive-metastatic cascade in hepatocellular carcinoma.

mir-145	lung cancer	down	Uncovering growth-suppressive MicroRNAs in lung cancer.	mir-214	hepato-cellular carcinoma	down		mir-613	papillary thyroid carcinoma	down	Integrated analyses of microRNA and mRNA expression profiles in aggressive papillary thyroid carcinoma.
mir-145	lung cancer	down	MicroRNA-145 inhibits lung cancer cell metastasis.	mir-214	hepato-cellular carcinoma	down	Downregulation of microRNA-214 and overexpression of FGFR-1 contribute to hepatocellular carcinoma metastasis.	mir-614	lung cancer	down	[MiR-614 Inhibited Lung Cancer Cell Invasion and Proliferation via Targeting PSA].
mir-145	naso-pharyngeal carcinoma	down	MicroRNA deregulation and pathway alterations in nasopharyngeal carcinoma.	mir-214	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-615-5p	pancreatic cancer	down	MiRNA-615-5p functions as a tumor suppressor in pancreatic ductal adenocarcinoma by targeting AKT2.
mir-145	nasopharyngeal carcinoma	down	miR-145 inhibits invasion and metastasis by directly targeting Smad3 in nasopharyngeal cancer.	mir-214	multiple myeloma	down	Restoration of miR-214 expression reduces growth of myeloma cells through a positive regulation of P53 and inhibition of DNA replication.	mir-615-5p	pancreatic ductal adeno-carcinoma	down	miR-615-5p is epigenetically inactivated and functions as a tumor suppressor in pancreatic ductal adenocarcinoma.
mir-145	nasopharyngeal carcinoma	down	MiR-145 inhibits metastasis by targeting fascin actin-bundling protein 1 in nasopharyngeal carcinoma.	mir-214	naso-pharyngeal carcinoma	up	miR-214 promotes tumorigenesis by targeting lactotransferrin in nasopharyngeal carcinoma.	mir-615-5p	pancreatic ductal adeno-carcinoma	down	Correction: MiRNA-615-5p Functions as a Tumor Suppressor in Pancreatic Ductal Adenocarcinoma by Targeting AKT2.
mir-145	neuro-blastoma	down	NEDD9, a novel target of miR-145, increases the invasiveness of glioblastoma.	mir-214	naso-pharyngeal carcinoma	up	Knockdown of miR-214 Promotes Apoptosis and Inhibits Cell Proliferation in Nasopharyngeal Carcinoma.	mir-616*	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-145	non-small cell lung cancer	down	Low miR-145 silenced by DNA methylation promotes NSCLC cell proliferation, migration and invasion by targeting mucin 1.	mir-214	osteo-sarcoma	up	Upregulated expression of microRNA-214 is linked to tumor progression and adverse prognosis in pediatric osteosarcoma.	mir-622	gastric cancer	down	Down-regulation of miR-622 in gastric cancer promotes cellular invasion and tumor metastasis by targeting ING1 gene.
mir-145	non-small cell lung cancer	down	miRNA-145 inhibits non-small cell lung cancer cell proliferation by targeting c-Myc.	mir-214	ovarian cancer	up	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-622	glioma	down	miR-622 suppresses proliferation, invasion and migration by directly targeting activating transcription factor 2 in glioma cells.
mir-145	non-small cell lung cancer	down	Use of Luminex xMAP bead-based suspension array for detecting microRNA in NSCLC tissues and its clinical application.	mir-214	pancreatic cancer	down	Dysregulation of miR-15a and miR-214 in human pancreatic cancer.	mir-625	colorectal cancer	down	Decreased expression of microRNA-625 is associated with tumor metastasis and poor prognosis in patients with colorectal cancer.
mir-145	non-small cell lung cancer	down	MiR-145 acts as a metastasis suppressor by targeting metadherin in lung cancer.	mir-214	pancreatic cancer	up	Dysregulation of miR-15a and miR-214 in human pancreatic cancer.	mir-625	gastric cancer	down	Down-regulated miR-625 suppresses invasion and metastasis of gastric cancer by targeting ILK.
mir-145	non-small cell lung cancer	down	Low miR-145 expression level is associated with poor pathological differentiation and poor	mir-214	primary cns lymphomas	down	Differential micro-RNA expression in primary CNS and nodal diffuse large B-cell lymphomas.	mir-625	hepatocellular carcinoma	down	miR-625 suppresses tumour migration and invasion by targeting IGF2BP1 in hepatocellular carcinoma.

			prognosis in non-small cell lung cancer.								
mir-145	non-small cell lung cancer	up	Serum miR-125a-5p, miR-145 and miR-146a as diagnostic biomarkers in non-small cell lung cancer.	mir-215	cervical cancer	up	MicroRNA-215 is a potential prognostic marker for cervical cancer.	mir-625*	non-small cell lung cancer	down	Low levels of cell-free circulating miR-361-5p and miR-625* as blood-based markers for discriminating malignant from benign lung tumors.
mir-145	oral squamous cell carcinoma	down	MiR-145 inhibits oral squamous cell carcinoma (OSCC) cell growth by targeting c-Myc and Cdk6.	mir-215	colon cancer	down	Prognostic significance of miR-215 in colon cancer.	mir-626	glioblastoma	up	miRNA microarray reveals specific expression in the peripheral blood of glioblastoma patients
mir-145	oral squamous cell carcinoma	down	Downregulation of miR-145 expression in oral squamous cell carcinomas and its clinical significance	mir-215	colorectal cancer	down	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma	mir-627	colonic adeno-carcinoma	down	MicroRNA-627 Mediates the Epigenetic Mechanisms of Vitamin D to Suppress Proliferation of Human Colorectal Cancer Cells and Growth of Xenograft Tumors in Mice.
mir-145	osteo-sarcoma	down	microRNA-145 inhibits osteosarcoma cell proliferation and invasion by targeting ROCK1	mir-215	colorectal cancer	down	Identification and functional screening of microRNAs highly deregulated in colorectal cancer.	mir-628-5p	prostate cancer	down	Circulatory miR-628-5p is downregulated in prostate cancer patients.
mir-145	osteo-sarcoma	down	miR-145 inhibits osteosarcoma cells proliferation and invasion by targeting ROCK1	mir-215	colorectal cancer	down	microRNA-192, -194 and -215 are frequently downregulated in colorectal cancer.	mir-630	colorectal cancer	up	MicroRNA-630 is a prognostic marker for patients with colorectal cancer
mir-145	osteo-sarcoma	down	MicroRNA-145 targets vascular endothelial growth factor and inhibits invasion and metastasis of osteosarcoma cells.	mir-215	gastric cancer	up	MicroRNA-192 and -215 are upregulated in human gastric cancer in vivo and suppress ALCAM expression in vitro.	mir-630	hepatocellular carcinoma	up	miR-630 Overexpression in Hepatocellular Carcinoma Tissues is Positively Correlated with alpha-Fetoprotein.
mir-145	ovarian cancer	down	MiR-145 is downregulated in human ovarian cancer and modulates cell growth and invasion by targeting p70S6K1 and MUC1.	mir-215	gastric cancer	up	MiR-215 modulates gastric cancer cell proliferation by targeting RB1.	mir-630	lung cancer	down	MiR-630 inhibits proliferation by targeting CDC7 kinase, but maintains the apoptotic balance by targeting multiple modulators in human lung cancer A549 cells.
mir-145	ovarian cancer	down	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-215	gastric cancer	up	MiR-215/192 participates in gastric cancer progression.	mir-630	pancreatic cancer	down	Upregulation of miR-150* and miR-630 Induces Apoptosis in Pancreatic Cancer Cells by Targeting IGF-1R.
mir-145	ovarian cancer	down	miR-145 inhibits tumor growth and metastasis by targeting metadherin in high-grade serous ovarian carcinoma.	mir-215	hepato-cellular carcinoma	up	Serum microRNA characterization identifies miR-885-5p as a potential marker for detecting liver pathologies.	mir-630	renal clear cell carcinoma	up	Up-regulation of miR-630 in clear cell renal cell carcinoma is associated with lower overall survival.

mir-145	ovarian cancer	down	miR-145, targeting high-mobility group A2, is a powerful predictor of patient outcome in ovarian carcinoma.	mir-216a	hepato-cellular carcinoma	up	Androgen pathway stimulates microRNA-216a transcription to suppress the tumor suppressor in lung cancer-1 gene in early hepatocarcinogenesis.	mir-632	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer
mir-145	ovarian cancer	down	MicroRNA-145 Function as a Cell Growth Repressor by Directly Targeting c-Myc in Human Ovarian Cancer.	mir-216a	hepato-cellular carcinoma	up	MiR-216a/217-induced epithelial-mesenchymal transition targets PTEN and SMAD7 to promote drug resistance and recurrence of liver cancer.	mir-637	hepatocellular carcinoma	down	Primate-specific microRNA-637 inhibits tumorigenesis in hepatocellular carcinoma by disrupting signal transducer and activator of transcription 3 signaling
mir-145	pancreatic cancer	down	MicroRNA-145 suppresses cell proliferation, invasion and migration in pancreatic cancer cells by targeting NEDD9.	mir-216a	pancreatic cancer	down	[Expression of miR-216a in pancreatic cancer and its clinical significance].	mir-638	breast cancer	down	miR-638 mediated regulation of BRCA1 affects DNA repair and sensitivity to UV and cisplatin in triple negative breast cancer.
mir-145	pancreatic ductal adeno-carcinoma	down	NMD8-92 Inhibits Pancreatic Tumor Xenograft Growth via DCLK1-Dependent Mechanism.	mir-216a	pancreatic cancer	down	MicroRNA-216a inhibits pancreatic cancer by directly targeting Janus kinase 2.	mir-638	colorectal cancer	down	MicroRNA-638 inhibits cell proliferation, invasion and regulates cell cycle by targeting tetraspanin 1 in human colorectal carcinoma.
mir-145	primary cns lymphomas	down	Differential micro-RNA expression in primary CNS and nodal diffuse large B-cell lymphomas.	mir-216b	breast cancer	down	Regulation of the P2X7R by microRNA-216b in human breast cancer.	mir-638	gastric cancer	down	miR-638 Suppresses Cell Proliferation in Gastric Cancer by Targeting Sp2.
mir-145	prostate cancer	down	The functional significance of microRNA-145 in prostate cancer.	mir-216b	naso-pharyngeal carcinoma	down	miR-216b suppresses tumor growth and invasion by targeting KRAS in nasopharyngeal carcinoma.	mir-638	gastric cancer	down	MicroRNA profiling of human gastric cancer.
mir-145	prostate cancer	down	Restoration of miR-145 expression suppresses cell proliferation, migration and invasion in prostate cancer by targeting FSCN1.	mir-216b	naso-pharyngeal carcinoma	down	[miR-216b suppresses cell proliferation and invasion by targeting PKC? in nasopharyngeal carcinoma cells].	mir-638	malignant melanoma	up	miR-638 promotes melanoma metastasis and protects melanoma cells from apoptosis and autophagy
mir-145	prostate cancer	down	MicroRNA-145 is regulated by DNA methylation and p53 gene mutation in prostate cancer.	mir-217	breast cancer	up	MiR-217 Promotes Tumor Proliferation in Breast Cancer via Targeting DACH1.	mir-639	bladder cancer	up	Circulating microRNAs in serum: novel biomarkers for patients with bladder cancer?
mir-145	prostate cancer	down	The tumor-suppressive microRNA-143/145 cluster inhibits cell migration and invasion by targeting GOLM1 in prostate cancer.	mir-217	gastric cancer	down	microRNA-217 inhibits tumor progression and metastasis by downregulating EZH2 and predicts favorable prognosis in gastric cancer.	mir-642a-5p	prostate cancer	down	Regulation of Expression of Deoxyhypusine Hydroxylase (DOHH), the Enzyme That Catalyzes the Activation of eIF5A, by miR-331-3p and miR-642-5p in Prostate Cancer Cells
mir-145	prostate cancer	down	miR-145 suppress the androgen receptor in prostate cancer cells and correlates to prostate cancer prognosis.	mir-217	hepato-cellular carcinoma	up	MiR-216a/217-induced epithelial-mesenchymal transition targets PTEN and SMAD7 to promote drug resistance and recurrence of liver cancer.	mir-646	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer

mir-145	renal cell carcinoma	down	The tumor-suppressive microRNA-143/145 cluster targets hexokinase-2 in renal cell carcinoma.	mir-217	hepato-cellular carcinoma	down	miR-217 inhibits invasion of hepatocellular carcinoma cells through direct suppression of E2F3.	mir-646	osteosarcoma	down	miRNA-646 suppresses osteosarcoma cell metastasis by downregulating fibroblast growth factor 2 (FGF2).
mir-145	renal cell carcinoma	down	miR-145 functions as tumor suppressor and targets two oncogenes, ANGPT2 and NEDD9, in renal cell carcinoma.	mir-217	lung cancer	down	MicroRNA-217 functions as a tumour suppressor gene and correlates with cell resistance to cisplatin in lung cancer.	mir-646	renal cell carcinoma	down	Downregulated miR-646 in clear cell renal carcinoma correlated with tumour metastasis by targeting the nin one binding protein (NOB1).
mir-145	uveal melanoma	down	MicroRNA 145 may play an important role in uveal melanoma cell growth by potentially targeting insulin receptor substrate-1.	mir-217	osteo-sarcoma	down	MicroRNA-217 regulates WASF3 expression and suppresses tumor growth and metastasis in osteosarcoma.	mir-650	gastric cancer	up	MicroRNA-650 targets ING4 to promote gastric cancer tumorigenicity
mir-1469	lung cancer	down	MiRNA-1469 promotes lung cancer cells apoptosis through targeting STAT5a.	mir-217	osteo-sarcoma	down	The microRNA-217 functions as a tumor suppressor and is frequently downregulated in human osteosarcoma.	mir-650	glioma	up	MicroRNA-650 expression in glioma is associated with prognosis of patients.
mir-146a	breast cancer	down	Expression of microRNA-146 suppresses NF-kappaB activity with reduction of metastatic potential in breast cancer cells.	mir-217	pancreatic ductal adenocarcinoma	down	MicroRNAs as diagnostic markers for pancreatic ductal adenocarcinoma and its precursor, pancreatic intraepithelial neoplasm	mir-650	hepatocellular carcinoma	up	Upregulation of miR-650 is correlated with down-regulation of ING4 and progression of hepatocellular carcinoma
mir-146a	breast cancer	down	Clinical significance of miR-146a in gastric cancer cases.	mir-217	pancreatic ductal adenocarcinoma	down	MiR-21, miR-34a, miR-198 and miR-217 as diagnostic and prognostic biomarkers for chronic pancreatitis and pancreatic ductal adenocarcinoma.	mir-655	esophageal squamous cell carcinoma	down	Mir-655 up-regulation suppresses cell invasion by targeting pituitary tumor-transforming gene-1 in esophageal squamous cell carcinoma.
mir-146a	chronic myelogenous leukemia	down	ApoptomiRs expression modulated by BCR-ABL is linked to CML progression and imatinib resistance.	mir-217	pancreatic ductal adeno-carcinoma	down	The miR-217 microRNA functions as a potential tumor suppressor in pancreatic ductal adenocarcinoma by targeting KRAS.	mir-655	ovarian cancer	down	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.
mir-146a	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-218	bladder cancer	down	MicroRNA-218 inhibits bladder cancer cell proliferation, migration, and invasion by targeting BMI-1.	mir-656	glioma	down	miR-656 inhibits glioma tumorigenesis through repression of BMPR1A
mir-146a	gastric cancer	down	Clinical significance of miR-146a in gastric cancer cases.	mir-218	breast cancer	down	Silencing of miRNA-218 promotes migration and invasion of breast cancer via Slit2-Robo1 pathway.	mir-657	hepatocellular carcinoma	up	MiR-657 promotes tumorigenesis in hepatocellular carcinoma by targeting transducin-like enhancer protein 1 through NF-?B pathways
mir-146a	gastric cancer	down	microRNA-146a targets the L1 cell adhesion molecule and suppresses the metastatic potential of gastric cancer.	mir-218	cervical cancer	down	Circulating microRNA-218 was reduced in cervical cancer and correlated with tumor invasion	mir-660	lung cancer	down	Mir-660 is downregulated in lung cancer patients and its replacement inhibits lung tumorigenesis by targeting MDM2-p53 interaction.

mir-146a	gastric cancer	up	microRNA-146a inhibits G protein-coupled receptor-mediated activation of NF-kappaB by targeting CARD10 and COPS8 in gastric cancer.	mir-218	cervical cancer	down	MicroRNA-218 increases cellular sensitivity to Rapamycin via targeting Rictor in cervical cancer.	mir-663	gastric cancer	down	Tumor-suppressive mir-663 gene induces mitotic catastrophe growth arrest in human gastric cancer cells.
mir-146a	gastric cancer	down	MicroRNA-146a is down-regulated in gastric cancer and regulates cell proliferation and apoptosis.	mir-218	cervical squamous cell carcinoma	down	Tumor suppressive microRNA-218 inhibits cancer cell migration and invasion by targeting focal adhesion pathways in cervical squamous cell carcinoma.	mir-663	glioblastoma	down	miR-663 suppresses oncogenic function of CXCR4 in glioblastoma.
mir-146a	glioma	down	MicroRNA-146a inhibits glioma development by targeting Notch1.	mir-218	chorio-carcinoma	down	MicroRNA-218 inhibits the proliferation of human choriocarcinoma JEG-3 cell line by targeting Fbxw8.	mir-663	lung cancer	up	MicroRNA-663 targets TGFB1 and regulates lung cancer proliferation.
mir-146a	hepato-cellular carcinoma	down	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-218	colorectal cancer	down	MicroRNA-218 Inhibits Cell Cycle Progression and Promotes Apoptosis in Colon Cancer by Downregulating BMI1 Polycomb Ring Finger Oncogene.	mir-663	naso-pharyngeal carcinoma	up	MiR-663, a microRNA targeting p21(WAF1/CIP1), promotes the proliferation and tumorigenesis of nasopharyngeal carcinoma
mir-146a	hepato-cellular carcinoma	down	Synergistic effect of MiR-146a mimic and cetuximab on hepatocellular carcinoma cells.	mir-218	colorectal cancer	down	Decreased expression of miR-218 is associated with poor prognosis in patients with colorectal cancer.	mir-664	hepatocellular carcinoma	up	MicroRNAs regulate methionine adenosyltransferase 1A expression in hepatocellular carcinoma.
mir-146a	hepato-cellular carcinoma	down	microRNA-146a inhibits cancer metastasis by downregulating VEGF through dual pathways in hepatocellular carcinoma.	mir-218	esophageal cancer	down	Serum microRNA-218 is a potential biomarker for esophageal cancer.	mir-668	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer
mir-146a	hepato-cellular carcinoma	up	Serum microRNA characterization identifies miR-885-5p as a potential marker for detecting liver pathologies.	mir-218	esophageal squamous cell carcinoma	up	miR-218 suppresses tumor growth and enhances the chemosensitivity of esophageal squamous cell carcinoma to cisplatin.	mir-675	colon cancer	up	Oncofetal H19-derived miR-675 regulates tumor suppressor RB in human colorectal cancer.
mir-146a	lung cancer	down	Regulation of COX-2 expression by miR-146a in lung cancer cells.	mir-218	esophageal squamous cell carcinoma	down	MicroRNA-218 inhibits the proliferation and metastasis of esophageal squamous cell carcinoma cells by targeting BMI1.	mir-675	glioma	up	Long Non-Coding RNA H19 Promotes Glioma Cell Invasion by Deriving miR-675.
mir-146a	malignant melanoma	down	Altered expression of selected microRNAs in melanoma: antiproliferative and proapoptotic activity of miRNA-155.	mir-218	gastric cancer	down	Plasma microRNAs, miR-223, miR-21 and miR-218, as novel potential biomarkers for gastric cancer detection.	mir-675	hepatocellular carcinoma	down	Downregulation of LncRNAH19 and MiR-675 promotes migration and invasion of human hepatocellular carcinoma cells through AKT/GSK-3?/Cdc25A signaling pathway.

mir-146a	non-small cell lung cancer	down	miR-146a inhibits cell growth, cell migration and induces apoptosis in non-small cell lung cancer cells.	mir-218	gastric cancer	down	Reduced expression of circulating microRNA-218 in gastric cancer and correlation with tumor invasion and prognosis.	mir-675-5p	non-small cell lung cancer	up	Down-regulation of miR-675-5p contributes to tumor progression and development by targeting pro-tumorigenic GPR55 in non-small cell lung cancer.
mir-146a	non-small cell lung cancer	down	MicroRNA-146a rs2910164 polymorphism is associated with susceptibility to non-small cell lung cancer in the Chinese population.	mir-218	gastric cancer	down	MicroRNA-218 is upregulated in gastric cancer after cytoreductive surgery and hyperthermic intraperitoneal chemotherapy and increases chemosensitivity to cisplatin.	mir-7	breast cancer	down	MicroRNA-7 inhibits epithelial-to-mesenchymal transition and metastasis of breast cancer cells via targeting FAK expression.
mir-146a	non-small cell lung cancer	up	Serum miR-125a-5p, miR-145 and miR-146a as diagnostic biomarkers in non-small cell lung cancer.	mir-218	gastric cancer	down	Thermo-chemotherapy induced miR-218 upregulation inhibits the invasion of gastric cancer via targeting Gli2 and E-cadherin.	mir-7	cervical cancer	down	MicroRNA-7 inhibits metastasis and invasion through targeting focal adhesion kinase in cervical cancer.
mir-146a	oral squamous cell carcinoma	up	miR-146a enhances the oncogenicity of oral carcinoma by concomitant targeting of the IRAK1, TRAF6 and NUMB genes.	mir-218	gastric cancer	down	Reduced microRNA-218 expression is associated with high nuclear factor kappa B activation in gastric cancer.	mir-7	colorectal cancer	down	miR-7 inhibits colorectal cancer cell proliferation and induces apoptosis by targeting XRCC2.
mir-146a	pancreatic cancer	down	Clinical significance of miR-146a in gastric cancer cases.	mir-218	gastric cancer	down	[Reduced expression of miR-218 and its significance in gastric cancer].	mir-7	epithelial ovarian cancer	down	Gain-of-function microRNA screens identify miR-193a regulating proliferation and apoptosis in epithelial ovarian cancer cells.
mir-146a	pancreatic cancer	down	miR-146a suppresses invasion of pancreatic cancer cells.	mir-218	gastrointestinal stromal tumor	down	MicroRNA-218 inhibits gastrointestinal stromal tumor cell and invasion by targeting KIT.	mir-7	gastric cancer	down	MicroRNA-7 functions as an anti-metastatic microRNA in gastric cancer by targeting insulin-like growth factor-1 receptor.
mir-146a	papillary thyroid carcinoma	down	MicroRNA-146a targets PRKCE to modulate papillary thyroid tumor development.	mir-218	glioma	down	Expression of microRNA-218 and its clinicopathological and prognostic significance in human glioma cases.	mir-7	glioblastoma	down	microRNA-7 inhibits the epidermal growth factor receptor and the Akt pathway and is down-regulated in glioblastoma.
mir-146a	prostate cancer	down	miR-146a functions as a tumor suppressor in prostate cancer by targeting Rac1.	mir-218	glioma	down	MicroRNA-218 Inhibits Glioma Invasion, Migration, Proliferation and Cancer Stem-like Cell Self-renewal by Targeting the Polycomb Group Gene Bmi1.	mir-7	glioblastoma	down	Expression of 19 microRNAs in glioblastoma and comparison with other brain neoplasia of grades I-III.
mir-146a	prostate cancer	down	Clinical significance of miR-146a in gastric cancer cases.	mir-218	head and neck squamous cell carcinoma	down	Tumor suppressive microRNA-218 inhibits cancer cell migration and invasion through targeting laminin-332 in head and neck squamous cell carcinoma.	mir-7	glioblastoma	down	miR-7 inhibits glioblastoma growth by simultaneously interfering with the PI3K/ATK and Raf/MEK/ERK pathways.
mir-146a	renal cell carcinoma	up	Carbamylated albumin stimulates microRNA-146, which is increased in human renal cell	mir-218	hepato-cellular carcinoma	down	miR-218 modulate hepatocellular carcinoma cell proliferation through PTEN/AKT/PI3K pathway and	mir-7	glioma	down	MicroRNA-sensitive oncolytic measles viruses for cancer-specific vector tropism.

			carcinoma.				HoxA10.				
mir-146a-5p	gastric cancer	down	The clinical significance of downregulation of mir-124-3p, mir-146a-5p, mir-155-5p and mir-335-5p in gastric cancer tumorigenesis.	mir-218	hepato-cellular carcinoma	down	Overexpression of miR-218 inhibits hepatocellular carcinoma cell growth through RET	mir-7	glioma	down	MicroRNA-7 directly targets insulin-like growth factor 1 receptor to inhibit cellular growth and glucose metabolism in gliomas.
mir-146b	anaplastic thyroid carcinoma	up	A 4-MicroRNA signature can discriminate primary lymphomas from anaplastic carcinomas in thyroid cytology smears.	mir-218	hepato-cellular carcinoma	down	MicroRNA-218 and microRNA-520a inhibit cell proliferation by downregulating E2F2 in hepatocellular carcinoma.	mir-7	hepatocellular carcinoma	down	miR-7 inhibits tumor growth and metastasis by targeting the PI3K/AKT pathway in hepatocellular carcinoma
mir-146b	breast cancer	down	STAT3 Induction of miR-146b Forms a Feedback Loop to Inhibit the NF-?B to IL-6 Signaling Axis and STAT3-Driven Cancer Phenotypes.	mir-218	lung cancer	down	MicroRNA-218 is deleted and downregulated in lung squamous cell carcinoma.	mir-7	hepatocellular carcinoma	down	Downregulation of miR-7 upregulates Cullin 5 (CUL5) to facilitate G1/S transition in human hepatocellular carcinoma cells.
mir-146b	breast cancer	down	Expression of microRNA-146 suppresses NF-kappaB activity with reduction of metastatic potential in breast cancer cells.	mir-218	lung cancer	down	MiRNA-218, a new regulator of HMGB1, suppresses cell migration and invasion in non-small cell lung cancer.	mir-7	hepatocellular carcinoma	down	MicroRNA-7 arrests cell cycle in G1 phase by directly targeting CCNE1 in human hepatocellular carcinoma cells.
mir-146b	esophageal cancer	up	Transcriptional regulation of miR-146b by C/EBP? LAP2 in esophageal cancer cells.	mir-218	lung squamous cell carcinoma	down	MicroRNA-218 is deleted and downregulated in lung squamous cell carcinoma.	mir-7	lung cancer	up	EGFR promotes lung tumorigenesis by activating miR-7 through a Ras/ERK/Myc pathway that targets the Ets2 transcriptional repressor ERF.
mir-146b	follicular thyroid carcinoma	up	Differential miRNA expression defines migration and reduced apoptosis in follicular thyroid carcinomas.	mir-218	malignant melanoma	down	Expression patterns of microRNA-218 and its potential functions by targeting CIP2A and BMI1 genes in melanoma.	mir-7	pancreatic cancer	up	Curcumin inhibits cell growth and invasion through up-regulation of miR-7 in pancreatic cancer cells.
mir-146b	glioma	down	microRNA-146b inhibits glioma cell migration and invasion by targeting MMPs.	mir-218	naso-pharyngeal cancer	down	MiR-218 suppresses nasopharyngeal cancer progression through downregulation of survivin and the SLIT2-ROBO1 pathway.	mir-7	renal cell carcinoma	up	Identification of miR-7 as an oncogene in renal cell carcinoma.
mir-146b	malignant melanoma	down	Altered expression of selected microRNAs in melanoma: antiproliferative and prosapoptotic activity of miRNA-155.	mir-218	oral cancer	down	The tumor suppressive microRNA miR-218 targets the mTOR component Rictor and inhibits AKT phosphorylation in oral cancer.	mir-7-5p	glioblastoma	down	MiR-7-5p is frequently downregulated in glioblastoma microvasculature and inhibits vascular endothelial cell proliferation by targeting RAF1.
mir-146b	non-small cell lung cancer	down	Circulating micro-RNA expression profiles in early stage nonsmall cell lung	mir-218	osteo-sarcoma	down	miRNA-218 Inhibits Osteosarcoma Cell Migration and Invasion by Down-	mir-7-5p	glioblastoma	down	miRNA microarray reveals specific expression in the peripheral blood of

			cancer.				regulating of TIAM1, MMP2 and MMP9.				glioblastoma patients.
mir-146b	oral squamous cell carcinoma	up	miR-146a enhances the oncogenicity of oral carcinoma by concomitant targeting of the IRAK1, TRAF6 and NUMB genes.	mir-218	pancreatic ductal adeno-carcinoma	down	Enhancer of Zeste Homolog 2 Silences miR-218 in Human Pancreatic Ductal Adenocarcinoma Cells by Inducing Formation of Heterochromatin.	mir-7-5p	malignant melanoma	down	miRNA-7-5p inhibits melanoma cell migration and invasion
mir-146b	papillary thyroid carcinoma	up	MicroRNA analysis as a potential diagnostic tool for papillary thyroid carcinoma.	mir-218	prostate cancer	down	Tumor-suppressive microRNA-218 inhibits cancer cell migration and invasion via targeting of LASP1 in prostate cancer.	mir-720	acute myeloid leukemia	down	[DNA methylation-mediated epigenetic silencing of miR-720 contributes to leukemogenesis in acute myeloid leukemia]
mir-146b	papillary thyroid carcinoma	up	MicroRNA signature distinguishes the degree of aggressiveness of papillary thyroid carcinoma.	mir-218	prostate cancer	down	microRNA-218 inhibits prostate cancer cell growth and promotes apoptosis by repressing TPD52 expression.	mir-720	breast cancer	down	miR-720 inhibits tumor invasion and migration in breast cancer by targeting TWIST1
mir-146b	papillary thyroid carcinoma	up	Prognostic Implications of miR-146b Expression and Its Functional Role in Papillary Thyroid Carcinoma.	mir-218	renal cell carcinoma	down	MicroRNA-218 Inhibits Cell Migration and Invasion in Renal Cell Carcinoma Through Targeting Caveolin-2 Involved in Focal Adhesion Pathway.	mir-720	colorectal cancer	up	Evaluation of miR-720 prognostic significance in patients with colorectal cancer
mir-146b	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-218	renal clear cell carcinoma	down	miRNA profiling for clear cell renal cell carcinoma: biomarker discovery and identification of potential controls and consequences of miRNA dysregulation.	mir-744	nasopharyngeal carcinoma	up	MiR-744 functions as a proto-oncogene in nasopharyngeal carcinoma progression and metastasis via transcriptional control of ARHGAP5.
mir-146b	primary thyroid lymphoma	up	A 4-MicroRNA signature can discriminate primary lymphomas from anaplastic carcinomas in thyroid cytology smears.	mir-219-5p	glioblastoma	down	miR-219-5p Inhibits Receptor Tyrosine Kinase Pathway by Targeting EGFR in Glioblastoma.	mir-7515	lung cancer	down	The Novel miR-7515 Decreases the Proliferation and Migration of Human Lung Cancer Cells by Targeting c-Met.
mir-146b	renal cell carcinoma	up	Carbamylated albumin stimulates microRNA-146, which is increased in human renal cell carcinoma.	mir-219-5p	glioma	down	miR-219-5p Inhibits Receptor Tyrosine Kinase Pathway by Targeting EGFR in Glioblastoma.	mir-765	prostate cancer	down	miRNA-765 as a Key Mediator for Inhibiting Growth, Migration and Invasion in Fulvestrant-Treated Prostate Cancer
mir-146b-5p	gallbladder carcinoma	down	MicroRNA-146b-5p inhibits the growth of gallbladder carcinoma by targeting epidermal growth factor receptor.	mir-219-5p	hepato-cellular carcinoma	down	MiR-219-5p inhibits hepatocellular carcinoma cell proliferation by targeting glypican-3.	mir-802	osteosarcoma	up	MicroRNA-802 promotes osteosarcoma cell proliferation by targeting p27.
mir-146b-5p	glio-blastoma	down	MiR-146b-5p suppresses EGFR expression and reduces in vitro migration and invasion of glioma	mir-219-5p	papillary thyroid carcinoma	down	miR-219-5p Modulates Cell Growth of Papillary Thyroid Carcinoma by Targeting Estrogen Receptor ?	mir-873	breast cancer	down	
mir-146b-5p	glioma	down	miR-146b-5p inhibits glioma migration and invasion by targeting	mir-22	breast cancer	down	A regulatory loop involving miR-22, Sp1, and c-Myc modulates CD147 expression in	mir-873	glioblastoma	down	MiRNA-873 Inhibits Glioblastoma Tumorigenesis and

			MMP16.				breast cancer invasion and metastasis.				Metastasis by Suppressing the Expression of IGF2BP1.
mir-146b-5p	papillary thyroid carcinoma	up	Integrated analyses of microRNA and mRNA expression profiles in aggressive papillary thyroid carcinoma.	mir-22	breast cancer	down	miR-22 as a prognostic factor targets glucose transporter protein type 1 in breast cancer.	mir-874	breast cancer	down	MicroRNA-874 inhibits cell proliferation and induces apoptosis in human breast cancer by targeting CDK9.
mir-146b-5p	papillary thyroid carcinoma	up	MiR-146b-5p promotes metastasis and induces epithelial-mesenchymal transition in thyroid cancer by targeting ZNRF3.	mir-22	colon cancer	down	MicroRNA-22 regulates hypoxia signaling in colon cancer cells.	mir-874	gastric cancer	down	miR-874 Inhibits cell proliferation, migration and invasion through targeting aquaporin-3 in gastric cancer.
mir-146b-5p	papillary thyroid carcinoma	up	MicroRNA miR-146b-5p regulates signal transduction of TGF-? by repressing SMAD4 in thyroid cancer.	mir-22	colon cancer	down	MicroRNA-22 is induced by vitamin D and contributes to its antiproliferative, antimigratory and gene regulatory effects in colon cancer cells.	mir-874	gastric cancer	down	miR-874 functions as a tumor suppressor by inhibiting angiogenesis through STAT3/VEGF-A pathway in gastric cancer.
mir-147	breast cancer	down	Global microRNA level regulation of EGFR-driven cell-cycle protein network in breast cancer.	mir-22	colon cancer	down	miRNA-22 suppresses colon cancer cell migration and invasion by inhibiting the expression of T-cell lymphoma invasion and metastasis 1 and matrix metalloproteinases 2 and 9.	mir-874	head and neck squamous cell carcinoma	down	Tumour-suppressive microRNA-874 contributes to cell proliferation through targeting of histone deacetylase 1 in head and neck squamous cell carcinoma.
mir-147	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-22	colorectal cancer	down	Clinical significance of miR-22 expression in patients with colorectal cancer.	mir-877	hepatocellular carcinoma	down	Up-regulation of miR-877 induced by paclitaxel inhibits hepatocellular carcinoma cell proliferation though targeting FOXM1.
mir-147	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer.	mir-22	esophageal squamous cell carcinoma	down	Increased miRNA-22 expression sensitizes esophageal squamous cell carcinoma to irradiation.	mir-877	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer.
mir-148a	breast cancer	down	A regulatory circuit of miR-148a/152 and DNMT1 in modulating cell transformation and tumor angiogenesis through IGF-IR and IRS1.	mir-22	esophageal squamous cell carcinoma	down	miR-22 is down-regulated in esophageal squamous cell carcinoma and inhibits cell migration and invasion.	mir-885-5p	hepatocellular carcinoma	up	Serum microRNA characterization identifies miR-885-5p as a potential marker for detecting liver pathologies.
mir-148a	cervical squamous cell carcinoma	down	MiRNAs and their association with locoregional staging and survival following surgery for esophageal carcinoma.	mir-22	gastric cancer	down	miR-22 suppresses the proliferation and invasion of gastric cancer cells by inhibiting CD151.	mir-885-5p	neuroblastoma	down	MicroRNA miR-885-5p targets CDK2 and MCM5, activates p53 and inhibits proliferation and survival.
mir-148a	chordoma	up	MicroRNA expression profiling reveals the potential function of microRNA-31 in chordomas.	mir-22	gastric cancer	down	microRNA-22 acts as a metastasis suppressor by targeting metadherin in gastric cancer.	mir-886-3p	thyroid cancer	down	MiR-886-3p regulates cell proliferation and migration, and is dysregulated in familial non-medullary thyroid cancer.

mir-148a	colorectal cancer	down	MiR-148a promotes apoptosis by targeting Bcl-2 in colorectal cancer.	mir-22	gastric cancer	down	miR-22 is down-regulated in gastric cancer, and its overexpression inhibits cell migration and invasion via targeting transcription factor Sp1.	mir-886-5p	cervical carcinoma	down	MicroRNA miR-886-5p inhibits apoptosis by down-regulating Bax expression in human cervical carcinoma cells.
mir-148a	gastric cancer	down	The role of miR-148a in gastric cancer.	mir-22	gastric cancer	down	Reduced expression of miR-22 in gastric cancer is related to clinicopathologic characteristics or patient prognosis.	mir-892a	colorectal cancer	up	miR-892a regulated PPP2R2A expression and promoted cell proliferation of human colorectal cancer cells.
mir-148a	gastric cancer	up	miR-148a promoted cell proliferation by targeting p27 in gastric cancer cells.	mir-22	hepato-cellular carcinoma	down	microRNA-22, downregulated in hepatocellular carcinoma and correlated with prognosis, suppresses cell proliferation and tumourigenicity.	mir-9	esophageal squamous cell carcinoma	up	MicroRNA-9 promotes tumor metastasis via repressing E-cadherin in esophageal squamous cell carcinoma.
mir-148a	gastric cancer	down	[Impact of miR-148a on the proliferation of gastric carcinoma MKN45 cells and its mechanism].	mir-22	hepato-cellular carcinoma	down	MicroRNA-22 expression in hepatocellular carcinoma and its correlation with ezrin protein.	mir-9	gastric adeno-carcinoma	down	Regulation of the transcription factor NF-kappaB1 by microRNA-9 in human gastric adenocarcinoma.
mir-148a	gastric cancer	down	MicroRNA-148a suppresses tumor cell invasion and metastasis by downregulating ROCK1 in gastric cancer.	mir-22	lung cancer	down	Tumor suppressor miR-22 suppresses lung cancer cell progression through post-transcriptional regulation of ErbB3.	mir-9	gastric cancer	down	Down-regulated miR-9 and miR-433 in human gastric carcinoma.
mir-148a	gastric cancer	down	MicroRNA-148a is silenced by hypermethylation and interacts with DNA methyltransferase 1 in gastric cancer.	mir-22	medullo-blastoma	down	MiR-22 is Frequently Down-regulated in Medulloblastomas, and Inhibits Cell Proliferation via the Novel Target PAPST1.	mir-9	gastric cancer	down	Aberrant hypermethylation of miR-9 genes in gastric cancer.
mir-148a	gastric cancer	down	microRNA-148a suppresses human gastric cancer cell metastasis by reversing epithelial-to-mesenchymal transition.	mir-22	non-small cell lung cancer	up	Circulating miR-22, miR-24 and miR-34a as novel predictive biomarkers to pemetrexed-based chemotherapy in advanced non small cell lung cancer.	mir-9	gastric cancer	down	Development of a novel microRNA promoter microarray for ChIP-on-chip assay to identify epigenetically regulated microRNAs.
mir-148a	gastric cancer	down	MiR-148a is down-regulated in gastric cancer, targets MMP7 and indicates tumor invasiveness and poor prognosis.	mir-22	osteo-sarcoma	down	miR-22 inhibits osteosarcoma cell proliferation and migration by targeting HMGB1 and inhibiting HMGB1-mediated autophagy.	mir-9	gastric cancer	down	microRNA-9 Suppresses the Proliferation, Invasion and Metastasis of Gastric Cancer Cells through Targeting Cyclin D1 and Ets1.
mir-148a	gastro-intestinal cancer	down	MicroRNA-148b is frequently down-regulated in gastric cancer and acts as a tumor suppressor by inhibiting cell proliferation.	mir-22	osteo-sarcoma	down	Downregulation of miR-22 acts as an unfavorable prognostic biomarker in osteosarcoma.	mir-9	gastric cancer	down	Epigenetic silencing of miRNA-9 is correlated with promoter-proximal CpG island hypermethylation in gastric cancer in vitro and in vivo.

mir-148a	glio-blastoma	up	microRNA-148a Is a Prognostic oncomiR That Targets MIG6 and BIM to Regulate EGFR and Apoptosis in Glioblastoma.	mir-22	t-cell lymphoma	down	miRNA-22 suppresses colon cancer cell migration and invasion by inhibiting the expression of T-cell lymphoma invasion and metastasis 1 and matrix metalloproteinases 2 and 9	mir-9	glioma	up	Increased expression of microRNA-9 predicts an unfavorable prognosis in human glioma.
mir-148a	hepato-cellular carcinoma	down	MicroRNA-148a suppresses the epithelial-mesenchymal transition and metastasis of hepatoma cells by targeting Met/Snail signaling	mir-220a	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer.	mir-9	glioma	up	[MiR-9 regulates the expression of CBX7 in human glioma]
mir-148a	hepato-cellular carcinoma	down	microRNA-148a inhibits hepatocellular carcinoma cell invasion by targeting sphingosine-1-phosphate receptor 1.	mir-221	anaplastic thyroid carcinoma	up	A 4-MicroRNA signature can discriminate primary lymphomas from anaplastic carcinomas in thyroid cytology smears.	mir-9	glioma	up	The CREB-miR-9 negative feedback minicircuitry coordinates the migration and proliferation of glioma cells.
mir-148a	naso-pharyngeal carcinoma	down	Silencing of miRNA-148a by hypermethylation activates the integrin-mediated signaling pathway in nasopharyngeal carcinoma.	mir-221	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-9	hepatocellular carcinoma	up	Up-regulation of miR-9 expression predicate advanced clinicopathological features and poor prognosis in patients with hepatocellular carcinoma.
mir-148a	non-small cell lung cancer	down	Decreased miRNA-148a is associated with lymph node metastasis and poor clinical outcomes and functions as a suppressor of tumor metastasis in non-small cell lung cancer.	mir-221	bladder cancer	up	MicroRNA-221 silencing predisposed human bladder cancer cells to undergo apoptosis induced by TRAIL.	mir-9	laryngeal squamous cell carcinoma	up	MicroRNA-9 as a novel prognostic biomarker in human laryngeal squamous cell carcinoma.
mir-148a	non-small cell lung cancer	down	Serum miR-152, miR-148a, miR-148b, and miR-21 as novel biomarkers in non-small cell lung cancer screening.	mir-221	breast cancer	up	TRPS1 targeting by miR-221/222 promotes the epithelial-to-mesenchymal transition in breast cancer.	mir-9	malignant melanoma	down	MicroRNA-9 up-regulates E-cadherin through inhibition of NF-?B1-Snail1 pathway in melanoma.
mir-148a	non-small cell lung cancer	down	MicroRNA-148a suppresses epithelial-to-mesenchymal transition by targeting ROCK1 in non-small cell lung cancer cells.	mir-221	breast cancer	up	From microRNA functions to microRNA therapeutics: Novel targets and novel drugs in breast cancer research and treatment (Review)	mir-9	naso-pharyngeal carcinoma	down	miR-9 targets CXCR4 and functions as a potential tumor suppressor in nasopharyngeal carcinoma
mir-148a	oral squamous cell carcinoma	down	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer.	mir-221	breast cancer	up	miR-221/222 promotes S-phase entry and cellular migration in control of basal-like breast cancer.	mir-9	non-small cell lung cancer	up	Up-regulation of miR-9 expression as a poor prognostic biomarker in patients with non-small cell lung cancer.
mir-148a	ovarian cancer	down	Altered expression of miR-152 and miR-148a in ovarian cancer is related to cell proliferation.	mir-221	colon carcinoma	up	[MicroRNA-221 promotes colon carcinoma cell proliferation in vitro by inhibiting CDKN1C/p57 expression].	mir-9	oral squamous cell carcinoma	down	MicroRNA-9 inhibits the proliferation of oral squamous cell carcinoma cells by suppressing expression of CXCR4 via the Wnt/beta-catenin signaling pathway.

mir-148a	ovarian cancer	down	MicroRNA-148a inhibits migration and invasion of ovarian cancer cells via targeting sphingosine-1-phosphate receptor 1.	mir-221	colorectal cancer	up	MicroRNA-221 inhibits CDKN1C/p57 expression in human colorectal carcinoma.	mir-9	osteosarcoma	up	Serum miR-9 as a prognostic biomarker in patients with osteosarcoma.
mir-148a	pancreatic cancer	down	MiR-148a regulates the growth and apoptosis in pancreatic cancer by targeting CCKBR and Bcl-2.	mir-221	colorectal cancer	up	[MicroRNA-221 controls CDKN1C/P57 expression in human colorectal carcinoma].	mir-9	ovarian cancer	down	MicroRNA-9 inhibits ovarian cancer cell growth through regulation of NF-kappaB1.
mir-148a	pancreatic ductal adeno-carcinoma	down	Knockdown of microRNA-21 inhibits proliferation and increases cell death by targeting programmed cell death 4 (PDCD4) in pancreatic ductal adenocarcinoma.	mir-221	colorectal cancer	up	MicroRNA-221 promotes colorectal cancer cell invasion and metastasis by targeting RECK.	mir-9	ovarian cancer	up	MicroRNA-9 promotes tumorigenesis and mediates sensitivity to cisplatin in primary epithelial ovarian cancer cells.
mir-148a	pancreatic ductal adeno-carcinoma	down	MicroRNA-148a is down-regulated in human pancreatic ductal adenocarcinomas and regulates cell survival by targeting CDC25B.	mir-221	esophageal cancer	up	Alteration of miRNA Expression Correlates with Lifestyle, Social and Environmental Determinants in Esophageal Carcinoma.	mir-9	uveal melanoma	down	MicroRNA-9 suppresses uveal melanoma cell migration and invasion through the NF-?B1 pathway
mir-148a	pancreatic ductal adeno-carcinoma	down	MicroRNAs as diagnostic markers for pancreatic ductal adenocarcinoma and its precursor, pancreatic intraepithelial neoplasm.	mir-221	follicular thyroid carcinoma	up	Differential miRNA expression defines migration and reduced apoptosis in follicular thyroid carcinomas.	mir-92	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.
mir-148b	colorectal cancer	down	MicroRNA-148b suppresses cell growth by targeting cholecystokinin-2 receptor in colorectal cancer.	mir-221	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-92	gastric cancer	up	MicroRNA-92 promotes gastric cancer cell proliferation and invasion through targeting FXR.
mir-148b	gastric cancer	down	MicroRNA-148b is frequently down-regulated in gastric cancer and acts as a tumor suppressor by inhibiting cell proliferation.	mir-221	gastric cancer	up	Increased Expression of MicroRNA-221 in gastric cancer and its clinical significance.	mir-92	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.
mir-148b	hepato-cellular carcinoma	down	MicroRNA-148b expression is decreased in hepatocellular carcinoma and associated with prognosis.	mir-221	gastric cancer	up	Deregulated microRNAs in gastric cancer tissue-derived mesenchymal stem cells: novel biomarkers and a mechanism for gastric cancer.	mir-92	medullo-blastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.
mir-148b	hepato-cellular carcinoma	down	MiR-148b suppresses cell proliferation and invasion in hepatocellular carcinoma by targeting WNT1/beta-catenin pathway.	mir-221	gastrointestinal stromal tumor	down	Down-regulation of miR-221 and miR-222 correlates with pronounced Kit expression in gastrointestinal stromal tumors.	mir-92	neuroblastoma	up	MYCN-regulated miRNA-92 inhibits secretion of the tumor suppressor DICKKOPF-3 (DKK3) in neuroblastoma.

mir-148b	liver cancer	down	microRNA-148b suppresses hepatic cancer stem cell by targeting neuropilin-1.	mir-221	gastrointestinal stromal tumor	down	Multiple sporadic gastrointestinal stromal tumors concomitant with ampullary adenocarcinoma: a case report with KIT and PDGFRA mutational analysis and miR-221/222 expression profile.	mir-92	pancreatic cancer	up	MicroRNA-10a is overexpressed in human pancreatic cancer and involved in its invasiveness partially via suppression of the HOXA1 gene.
mir-148b	non-small cell lung cancer	down	miR-148b functions as a tumor suppressor in non-small cell lung cancer by targeting carcinoembryonic antigen (CEA).	mir-221	glioma	up	MicroRNA-221 targeting PI3-K/Akt signaling axis induces cell proliferation and BCNU resistance in human glioblastoma.	mir-92a	acute promyelocytic leukemia	up	Inhibition of MicroRNA miR-92a Inhibits Cell Proliferation in Human Acute Promyelocytic Leukemia.
mir-148b	non-small cell lung cancer	down	Serum miR-152, miR-148a, miR-148b, and miR-21 as novel biomarkers in non-small cell lung cancer screening.	mir-221	glioma	up	MiR-221/222 promote human glioma cell invasion and angiogenesis by targeting TIMP2.	mir-92a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-148b	non-small cell lung cancer	down	MicroRNA-148b is down-regulated in non-small cell lung cancer and associated with poor survival.	mir-221	glioma	up	Co-suppression of miR-221/222 cluster suppresses human glioma cell growth by targeting p27kip1 in vitro and in vivo.	mir-92a	breast cancer	down	Circulating microRNA-92a and microRNA-21 as novel minimally invasive biomarkers for primary breast cancer.
mir-148b	ovarian cancer	up	Increased expression of miR-148b in ovarian carcinoma and its clinical significance.	mir-221	glioma	up	MiR-221 and miR-222 target PUMA to induce cell survival in glioblastoma.	mir-92a	breast cancer	down	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.
mir-148b	ovarian carcinoma	up	Increased expression of miR-148b in ovarian carcinoma and its clinical significance.	mir-221	glioma	up	Uptake by human glioma cell lines and biological effects of a peptide-nucleic acids targeting miR-221.	mir-92a	breast cancer	down	Downregulation of miR-92a is associated with aggressive breast cancer features and increased tumour macrophage infiltration.
mir-148b	pancreatic cancer	down	miR-148b functions as a tumor suppressor in pancreatic cancer by targeting AMPK71.	mir-221	hepato-cellular carcinoma	up	MiR-221 controls CDKN1C/p57 and CDKN1B/p27 expression in human hepatocellular carcinoma.	mir-92a	breast carcinoma	up	MiR-92 enhances angiogenesis and metastasis by targeting LATS2.
mir-148b	pancreatic cancer	down	MicroRNA-148b and microRNA-152 reactivate tumor suppressor genes through suppression of DNA methyltransferase-1 gene in pancreatic cancer cell lines.	mir-221	hepato-cellular carcinoma	up	Role of microRNA-155 at early stages of hepatocarcinogenesis induced by choline-deficient and amino acid-defined diet in C57BL/6 mice.	mir-92a	cervical cancer	up	miR-92a is upregulated in cervical cancer and promotes cell proliferation and invasion by targeting FBXW7.
mir-149	breast cancer	down	MicroRNA-149 targets GIT1 to suppress integrin signaling and breast cancer metastasis.	mir-221	hepato-cellular carcinoma	up	miR-221&222 regulate TRAIL resistance and enhance tumorigenicity through PTEN and TIMP3 downregulation.	mir-92a	cholangio-carcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.

mir-149	colorectal cancer	down	MicroRNA-149 Suppresses Colorectal Cancer Cell Migration and Invasion by Directly Targeting Forkhead Box Transcription Factor FOXM1.	mir-221	hepato-cellular carcinoma	up	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-92a	colorectal cancer	up	MicroRNA signatures: novel biomarker for colorectal cancer?
mir-149	gastric cancer	down	MicroRNA-149 inhibits proliferation and cell cycle progression through the targeting of ZBTB2 in human gastric cancer.	mir-221	hepato-cellular carcinoma	up	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-92a	colorectal cancer	up	Detection of miR-92a and miR-21 in stool samples as potential screening biomarkers for colorectal cancer and polyps.
mir-149	glio-blastoma	down	miR-128 and miR-149 enhance the chemosensitivity of temozolomide by Rap1B-mediated cytoskeletal remodeling in glioblastoma.	mir-221	hepato-cellular carcinoma	up	Increased MiR-221 expression in hepatocellular carcinoma tissues and its role in enhancing cell growth and inhibiting apoptosis in vitro.	mir-92a	colorectal cancer	up	Overexpression of miR-92a correlates with tumor metastasis and poor prognosis in patients with colorectal cancer.
mir-149	head and neck squamous cell carcinoma	down	The association between genetic polymorphism and the processing efficiency of miR-149 affects the prognosis of patients with head and neck squamous cell carcinoma.	mir-221	liver cancer	up	Bioinformatics analysis identifies miR-221 as a core regulator in hepatocellular carcinoma and its silencing suppresses tumor properties.	mir-92a	colorectal cancer	up	MicroRNA-92a Functions as an Oncogene in Colorectal Cancer by Targeting PTEN.
mir-149	naso-pharyngeal carcinoma	up	miR-149 promotes epithelial-mesenchymal transition and invasion in nasopharyngeal carcinoma cells.	mir-221	malignant melanoma	up	The abrogation of the HOXB7/PBX2 complex induces apoptosis in melanoma through the miR-221&222-c-FOS pathway.	mir-92a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-149	non-small cell lung cancer	down	miR-149 Inhibits Non-Small-Cell Lung Cancer Cells EMT by Targeting FOXM1.	mir-221	non-small cell lung cancer	down	Circulating micro-RNA expression profiles in early stage nonsmall cell lung cancer.	mir-92a	esophageal squamous cell carcinoma	up	microRNA-92a promotes lymph node metastasis of human esophageal squamous cell carcinoma via E-cadherin.
mir-150	adult t-cell leukemia	up	STAT1: A Novel Target of miR-150 and miR-223 Is Involved in the Proliferation of HTLV-I-Transformed and ATL Cells.	mir-221	non-small cell lung cancer	up	MicroRNA-221 promotes human non-small cell lung cancer cell H460 growth.	mir-92a	esophageal squamous cell carcinoma	up	
mir-150	breast cancer	up	miR-150 promotes human breast cancer growth and malignant behavior by targeting the pro-apoptotic purinergic P2X7 receptor.	mir-221	non-small cell lung cancer	up	miR-221&222 regulate TRAIL resistance and enhance tumorigenicity through PTEN and TIMP3 downregulation.	mir-92a	hepatocellular carcinoma	up	Deregulation of miR-92a expression is implicated in hepatocellular carcinoma development.
mir-150	breast cancer	up	miR-142 regulates the tumorigenicity of human breast cancer stem cells through the canonical WNT signaling pathway.	mir-221	oral squamous cell carcinoma	up	miR-221 and miR-222 expression increased the growth and tumorigenesis of oral carcinoma cells.	mir-92a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.

mir-150	chronic lympho-cytic leukemia	up	Opposite prognostic significance of cellular and serum circulating microRNA-150 in Chronic Lymphocytic Leukemia patients.	mir-221	osteo-sarcoma	up	MicroRNA-221 Induces Cell Survival and Cisplatin Resistance through PI3K/Akt Pathway in Human Osteosarcoma.	mir-92a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.
mir-150	chronic myelo-genous leukemia	down	Down-regulation of miR-10a in chronic myeloid leukemia CD34+ cells increases USF2-mediated cell growth.	mir-221	ovarian cancer	up	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-92a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-150	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-221	pancreatic cancer	up	Down-regulation of miR-221 inhibits proliferation of pancreatic cancer cells through up-regulation of PTEN, p27(kip1), p57(kip2), and PUMA.	mir-92a	malignant melanoma	up	Altered expression of selected microRNAs in melanoma: antiproliferative and proapoptotic activity of miRNA-155.
mir-150	esophageal squamous cell carcinoma	down	MiR-150 is associated with poor prognosis in esophageal squamous cell carcinoma via targeting the EMT inducers ZEB1.	mir-221	pancreatic cancer	up	miR-221/222 induces pancreatic cancer progression through the regulation of matrix metalloproteinases.	mir-92a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-150	gastric cancer	up	MiR-150 promotes gastric cancer proliferation by negatively regulating the pro-apoptotic gene EGR2.	mir-221	pancreatic cancer	up	Metformin Causes G1-Phase Arrest via Down-Regulation of MiR-221 and Enhances TRAIL Sensitivity through DR5 Up-Regulation in Pancreatic Cancer Cells.	mir-92a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-150	lung adeno-carcinoma	up	Altered miR-143 and miR-150 expressions in peripheral blood mononuclear cells for diagnosis of non-small cell lung cancer.	mir-221	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-92b	glioblastoma	up	The miR-92b functions as a potential oncogene by targeting on Smad3 in glioblastomas.
mir-150	lung cancer	up	miR-150 promotes the proliferation and migration of lung cancer cells by targeting SRC kinase signalling inhibitor 1.	mir-221	papillary thyroid carcinoma	up	Integrated analyses of microRNA and mRNA expression profiles in aggressive papillary thyroid carcinoma.	mir-92b	glioma	up	MiR-92b inhibitor promoted glioma cell apoptosis via targeting DKK3 and blocking the Wnt/beta-catenin signaling pathway.
mir-150	mantle cell lymphoma	down	microRNA expression profile and identification of miR-29 as a prognostic marker and pathogenetic factor by targeting CDK6 in mantle cell lymphoma.	mir-221	papillary thyroid carcinoma	up	MicroRNA analysis as a potential diagnostic tool for papillary thyroid carcinoma.	mir-92b	non-small cell lung cancer	up	MiR-92b regulates the cell growth, cisplatin chemosensitivity of A549 non small cell lung cancer cell line and target PTEN.
mir-150	non-small cell lung cancer	up	Increased expression of microRNA-150 is associated with poor prognosis in non-small cell lung cancer.	mir-221	papillary thyroid carcinoma	up	In vivo imaging of functional targeting of miR-221 in papillary thyroid carcinoma.	mir-92b	non-small cell lung cancer	up	Inhibition of miR-92b suppresses nonsmall cell lung cancer cells growth and motility by targeting RECK.

mir-150	pancreatic ductal adeno-carcinoma	down	A Decrease in miR-150 Regulates the Malignancy of Pancreatic Cancer by Targeting c-Myb and MUC4	mir-221	papillary thyroid carcinoma	up	In vivo imaging of miR-221 biogenesis in papillary thyroid carcinoma	mir-93	colon cancer	down	Clinical significance of microRNA-93 downregulation in human colon cancer.
mir-150*	colorectal cancer	up	MicroRNA expression profiles in human colorectal cancers with liver metastases.	mir-221	prostate cancer	up	MiR-221 promotes the development of androgen independence in prostate cancer cells via downregulation of HECTD2 and RAB1A	mir-93	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma
mir-150*	pancreatic cancer	down	Upregulation of miR-150* and miR-630 Induces Apoptosis in Pancreatic Cancer Cells by Targeting IGF-1R	mir-221	prostate cancer	down	Downregulation of miR-221, -30d, and -15a contributes to pathogenesis of prostate cancer by targeting Bmi-1.	mir-93	colorectal carcinoma	down	MicroRNA-93 suppress colorectal cancer development via Wnt/beta-catenin pathway downregulating.
mir-150-5p	colorectal cancer	down	MiR-150-5p Suppresses Colorectal Cancer Cell Migration and Invasion through Targeting MUC4	mir-221	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer	mir-93	endometrial cancer	up	TSA Suppresses miR-106b-93-25 Cluster Expression through Downregulation of MYC and Inhibits Proliferation and Induces Apoptosis in Human EMC
mir-150-5p	hepato-cellular carcinoma	down	miR-150-5p inhibits hepatoma cell migration and invasion by targeting MMP14	mir-221	thyroid carcinoma	up	MicroRNAs (miR)-221 and miR-222, both overexpressed in human thyroid papillary carcinomas, regulate p27Kip1 protein levels and cell cycle.	mir-93	glioma	up	[Overexpressed microRNA-93 inhibits the proliferation and promotes apoptosis of A172 glioma cells].
mir-150-5p	pancreatic cancer	down	[MiR-150-5p inhibits the proliferation and promoted apoptosis of pancreatic cancer cells].	mir-221*	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-93	glioma	up	miR-93 promotes cell proliferation in gliomas through activation of PI3K/Akt signaling pathway
mir-151	chronic myelogenous leukemia	down	Down-regulation of miR-10a in chronic myeloid leukemia CD34+ cells increases USF2-mediated cell growth	mir-222	anaplastic thyroid carcinoma	up	A 4-MicroRNA signature can discriminate primary lymphomas from anaplastic carcinomas in thyroid cytology smears.	mir-93	head and neck squamous cell carcinoma	up	Increased expression of miR-93 is associated with poor prognosis in head and neck squamous cell carcinoma.
mir-151-3p	osteo-sarcoma	up	MicroRNA-199a-3p is downregulated in human osteosarcoma and regulates cell proliferation and migration.	mir-222	bladder cancer	up	Increased expression of miR-222 is associated with poor prognosis in bladder cancer.	mir-93	head and neck squamous cell carcinoma	up	Comprehensive MicroRNA profiling for head and neck squamous cell carcinomas.
mir-151-5p	papillary thyroid carcinoma	up	Circulating microRNA profiles as potential biomarkers for diagnosis of papillary thyroid carcinoma.	mir-222	breast cancer	up	Analysis of serum genome-wide microRNAs for breast cancer detection.	mir-93	laryngeal squamous cell carcinoma	up	MicroRNA-93 regulates cyclin G2 expression and plays an oncogenic role in laryngeal squamous cell carcinoma
mir-152	breast cancer	down	A regulatory circuit of miR-148a/152 and DNMT1 in modulating cell transformation and tumor angiogenesis through IGF-IR and IRS1	mir-222	breast cancer	up	miR-221/222 promotes S-phase entry and cellular migration in control of basal-like breast cancer	mir-93	naso-pharyngeal carcinoma	up	MicroRNA-93 promotes cell growth and invasion in nasopharyngeal carcinoma by targeting disabled homolog-2

mir-152	endometrial cancer	down	miR-152 is a tumor suppressor microRNA that is silenced by DNA hypermethylation in endometrial cancer.	mir-222	breast cancer	up	TRPS1 targeting by miR-221/222 promotes the epithelial-to-mesenchymal transition in breast cancer.	mir-93	non-small cell lung cancer	up	Expression of miR-29c, miR-93, and miR-429 as Potential Biomarkers for Detection of Early Stage Non-Small Lung Cancer.
mir-152	gastric cancer	down	miR-152 suppresses gastric cancer cell proliferation and motility by targeting CD151.	mir-222	chondro-sarcoma	down	Analysis of microRNAs expressions in chondrosarcoma.	mir-940	hepatocellular carcinoma	down	MiR-940 inhibits hepatocellular carcinoma growth and correlates with prognosis of hepatocellular carcinoma patients.
mir-152	gastro-intestinal cancer	down	MicroRNA-148b is frequently down-regulated in gastric cancer and acts as a tumor suppressor by inhibiting cell proliferation.	mir-222	chordoma	down	MicroRNA expression profiling reveals the potential function of microRNA-31 in chordomas.	mir-940	prostate cancer	down	MicroRNA-940 suppresses prostate cancer migration and invasion by regulating MIEN1.
mir-152	glioblastoma	down	MiR-152 functions as a tumor suppressor in glioblastoma stem cells by targeting Krüppel-like factor 4.	mir-222	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-941	hepatocellular carcinoma	down	DNA Methylation-mediated Repression of miR-941 Enhances Lysine (K)-specific Demethylase 6B Expression in Hepatoma Cells.
mir-152	glioma	down	MiR-15b and miR-152 reduce glioma cell invasion and angiogenesis via NRP-2 and MMP-3.	mir-222	gastric cancer	up	Increased miR-222 in H. pylori-associated gastric cancer correlated with tumor progression by promoting cancer cell proliferation and targeting RECK.	mir-942	esophageal squamous cell carcinoma	up	miR-942 promotes cancer stem cell-like traits in esophageal squamous cell carcinoma through activation of Wnt/beta-catenin signalling pathway.
mir-152	non-small cell lung cancer	down	MicroRNA-152 targets ADAM17 to suppress NSCLC progression.	mir-222	gastric cancer	up	Deregulated microRNAs in gastric cancer tissue-derived mesenchymal stem cells: novel biomarkers and a mechanism for gastric cancer.	mir-944	cervical cancer	up	Novel functions and targets of miR-944 in human cervical cancer cells.
mir-152	non-small cell lung cancer	down	Serum miR-152, miR-148a, miR-148b, and miR-21 as novel biomarkers in non-small cell lung cancer screening.	mir-222	gastric cancer	up	Circulating miR-222 in plasma and its potential diagnostic and prognostic value in gastric cancer	mir-95	colorectal cancer	up	MicroRNA-95 promotes cell proliferation and targets sorting Nexin 1 in human colorectal carcinoma.
mir-152	ovarian cancer	down	Altered expression of miR-152 and miR-148a in ovarian cancer is related to cell proliferation.	mir-222	gastric cancer	up	miR-222/VGLL4/YAP-TEAD1 regulatory loop promotes proliferation and invasion of gastric cancer cells.	mir-95	colorectal carcinoma	up	MicroRNA-95 promotes cell proliferation and targets sorting Nexin 1 in human colorectal carcinoma.
mir-152	pancreatic cancer	down	MicroRNA-148b and microRNA-152 reactivate tumor suppressor genes through suppression of DNA methyltransferase-1 gene in pancreatic cancer cell lines.	mir-222	gastro-intestinal stromal tumor	down	Down-regulation of miR-221 and miR-222 correlates with pronounced Kit expression in gastrointestinal stromal tumors.	mir-95	non-small cell lung cancer	up	MiR-95 induces proliferation and chemo- or radioresistance through directly targeting sorting nexin1 (SNX1) in non-small cell lung cancer.

mir-153	breast cancer	down	MiR-153 inhibits epithelial-mesenchymal transition by targeting metadherin in human breast cancer.	mir-222	gastro-intestinal stromal tumor	down	Multiple sporadic gastrointestinal stromal tumors concomitant with ampullary adenocarcinoma: a case report with KIT and PDGFRA mutational analysis and miR-221/222 expression profile.	mir-9500	lung cancer	down	The novel miR-9500 regulates the proliferation and migration of human lung cancer cells by targeting Akt1.
mir-153	glioblastoma	down	MicroRNA-153 is tumor suppressive in glioblastoma stem cells.	mir-222	glioblastoma	down	Expression of 19 microRNAs in glioblastoma and comparison with other brain neoplasia of grades I-III	mir-96	bladder cancer	up	MicroRNA expression signatures of bladder cancer revealed by deep sequencing.
mir-153	hepato-cellular carcinoma	up	MicroRNA-153 promotes Wnt/beta-catenin activation in hepatocellular carcinoma through suppression of WWOX.	mir-222	glioma	up	Co-suppression of miR-221/222 cluster suppresses human glioma cell growth by targeting p27kip1 in vitro and in vivo.	mir-96	bladder cancer	up	Synthetic miRNA-mowers targeting miR-183-96-182 cluster or miR-210 inhibit growth and migration and induce apoptosis in bladder cancer cells.
mir-153	lung cancer	down	Suppression of AKT expression by miR-153 produced anti-tumor activity in lung cancer.	mir-222	glioma	up	MiR-221 and miR-222 target PUMA to induce cell survival in glioblastoma.	mir-96	breast cancer	up	Unregulated miR-96 induces cell proliferation in human breast cancer by downregulating transcriptional factor FOXO3a.
mir-153	non-small cell lung cancer	down	MiR-153 inhibits migration and invasion of human non-small-cell lung cancer by targeting ADAM19.	mir-222	glioma	up	MiR-221/222 promote human glioma cell invasion and angiogenesis by targeting TIMP2.	mir-96	breast cancer	up	miR-96 promotes tumor proliferation and invasion by targeting RECK in breast cancer.
mir-153	osteosarcoma	down	MicroRNA-153 inhibits osteosarcoma cells proliferation and invasion by targeting TGF-?2.	mir-222	hepato-cellular carcinoma	up	GNA13 inhibits tumor cell migration and invasion and is post-transcriptionally regulated by miR-222 in hepatocellular carcinoma.	mir-96	chronic myelogenous leukemia	up	Down-regulation of miR-10a in chronic myeloid leukemia CD34+ cells increases USF2-mediated cell growth.
mir-153	ovarian cancer	down	MicroRNA-153 functions as a tumor suppressor by targeting SET7 and ZEB2 in ovarian cancer cells.	mir-222	hepato-cellular carcinoma	up	Role of microRNA-155 at early stages of hepatocarcinogenesis induced by choline-deficient and amino acid-defined diet in C57BL/6 mice.	mir-96	colorectal cancer	up	Expression of miR-21, miR-31, miR-96 and miR-135b is correlated with the clinical parameters of colorectal cancer.
mir-153	prostate cancer	up	Upregulation of miR-153 promotes cell proliferation via downregulation of the PTEN tumor suppressor gene in human prostate cancer.	mir-222	hepato-cellular carcinoma	up	miR-221&222 regulate TRAIL resistance and enhance tumorigenicity through PTEN and TIMP3 downregulation.	mir-96	colorectal cancer	up	MicroRNA-96 promotes the proliferation of colorectal cancer cells and targets tumor protein p53 inducible nuclear protein 1, forkhead box protein O1 (FOXO1) and FOXO3a.
mir-154	colorectal cancer	down	miR-154 suppresses colorectal cancer cell growth and motility by targeting TLR2.	mir-222	hepato-cellular carcinoma	up	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-96	esophageal cancer	up	MiR-96 promotes proliferation and chemo- or radioresistance by down-regulating RECK in esophageal cancer.

mir-154	non-small cell lung cancer	down	miR-154 suppresses non-small cell lung cancer growth in vitro and in vivo.	mir-222	hepato-cellular carcinoma	up	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-96	glioma	up	The miR-183/96/182 Cluster Regulates Oxidative Apoptosis and Sensitizes Cells to Chemotherapy in Gliomas.
mir-154	prostate cancer	down	miR-154 inhibits prostate cancer cell proliferation by targeting CCND2.	mir-222	hepato-cellular carcinoma	up	[Expression of serum microRNAs (miR-222, miR-181, miR-216) in human hepatocellular carcinoma and its clinical significance].	mir-96	glioma	up	miR-96/HBP1/Wnt/beta-catenin regulatory circuitry promotes glioma growth.
mir-155	acute myeloid leukemia	up	Pharmacological targeting of miR-155 via the NEDD8-activating enzyme inhibitor MLN4924 (Pevonedistat) in FLT3-ITD acute myeloid leukemia.	mir-222	malignant melanoma	up	The abrogation of the HOXB7/PBX2 complex induces apoptosis in melanoma through the miR-221&222-c-FOS pathway.	mir-96	hepatocellular carcinoma	up	OncomiR miR-96 and miR-182 promote cell proliferation and invasion through targeting ephrinA5 in hepatocellular carcinoma.
mir-155	anaplastic large-cell lymphoma	up	Oncogenic role of miR-155 in anaplastic large cell lymphoma lacking the t(2;5) translocation.	mir-222	non-small cell lung cancer	up	miR-221&222 regulate TRAIL resistance and enhance tumorigenicity through PTEN and TIMP3 downregulation.	mir-96	hepatocellular carcinoma	up	Wnt/beta-Catenin activates MiR-183/96/182 expression in hepatocellular carcinoma that promotes cell invasion.
mir-155	bladder cancer	up	Correlation of Increased Expression of MicroRNA-155 in Bladder Cancer and Prognosis.	mir-222	non-small cell lung cancer	up	Use of Luminex xMAP bead-based suspension array for detecting microRNA in NSCLC tissues and its clinical application.	mir-96	hepatocellular carcinoma	up	Inhibition of miR-96 expression reduces cell proliferation and clonogenicity of HepG2 hepatoma cells.
mir-155	bladder cancer	up	MicroRNA-155 promotes bladder cancer growth by repressing the tumor suppressor DMTF1.	mir-222	oral squamous cell carcinoma	up	miR-221 and miR-222 expression increased the growth and tumorigenesis of oral carcinoma cells.	mir-96	non-small cell lung cancer	down	Expression of microRNA-96 and its potential functions by targeting FOXO3 in non-small cell lung cancer.
mir-155	bladder cancer	down	Expression of microRNAs in the Urine of Patients With Bladder Cancer.	mir-222	pancreatic cancer	up	miR-221/222 induces pancreatic cancer progression through the regulation of matrix metalloproteinases.	mir-96	ovarian cancer	up	The upregulation of signal transducer and activator of transcription 5-dependent microRNA-182 and microRNA-96 promotes ovarian cancer cell proliferation by targeting forkhead box O3 upon leptin stimul
mir-155	breast cancer	up	Clinical significance of MicoRNA-155 expression in human breast cancer.	mir-222	papillary thyroid carcinoma	up	Integrated analyses of microRNA and mRNA expression profiles in aggressive papillary thyroid carcinoma.	mir-96	ovarian cancer	up	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.
mir-155	breast cancer	up	Analysis of miR-205 and miR-155 expression in the blood of breast cancer patients.	mir-222	papillary thyroid carcinoma	up	MicroRNA analysis as a potential diagnostic tool for papillary thyroid carcinoma.	mir-96	pancreatic cancer	down	miRNA-96 suppresses KRAS and functions as a tumor suppressor gene in pancreatic cancer.
mir-155	breast cancer	up	17?-Estradiol up-regulates miR-155 expression and reduces TP53INP1 expression in MCF-7 breast	mir-222	papillary thyroid carcinoma	up	MicroRNA signature distinguishes the degree of aggressiveness of papillary thyroid carcinoma.	mir-96	prostate cancer	up	miR-96 promotes cell proliferation and clonogenicity by down-regulating of FOXO1 in

			cancer cells.								prostate cancer cells.
mir-155	breast cancer	up	MicroRNA-155 functions as an OncomiR in breast cancer by targeting the suppressor of cytokine signaling 1 gene.	mir-222	papillary thyroid carcinoma	up	Circulating microRNA profiles as potential biomarkers for diagnosis of papillary thyroid carcinoma.	mir-96	prostate cancer	up	Transforming growth factor-? promotes prostate bone metastasis through induction of microRNA-96 and activation of the mTOR pathway.
mir-155	breast cancer	up	miR-155 drives telomere fragility in human breast cancer by targeting TRF1.	mir-222	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-96	prostate cancer	up	miR-183-96-182 cluster is overexpressed in prostate tissue and regulates zinc homeostasis in prostate cells.
mir-155	breast cancer	up	MicroRNA-155 regulates cell survival, growth, and chemosensitivity by targeting FOXO3a in breast cancer.	mir-222	thyroid carcinoma	up	MicroRNAs (miR)-221 and miR-222, both overexpressed in human thyroid papillary carcinomas, regulate p27Kip1 protein levels and cell cycle.	mir-96-5p	colorectal cancer	down	MiR-96-5p influences cellular growth and is associated with poor survival in colorectal cancer patients.
mir-155	breast cancer	up	Role of microRNAs -29b-2, -155, -197 and -205 as diagnostic biomarkers in serum of breast cancer females.	mir-222-3p	endometrial cancer	up		mir-98	breast cancer	down	Breast cancer-specific TRAIL expression mediated by miRNA response elements of let-7 and miR-122.
mir-155	breast cancer	up	[Expression and its clinical significance of miR-155 in human primary breast cancer].	mir-223	acute myeloid leukemia	down	Cell-cycle regulator E2F1 and microRNA-223 comprise an autoregulatory negative feedback loop in acute myeloid leukemia.	mir-98	bronchiolo-alveolar carcinoma	down	let-7 microRNA expression is reduced in bronchioloalveolar carcinoma, a non-invasive carcinoma, and is not correlated with prognosis.
mir-155	cervical cancer	up	Mir-155 promotes cervical cancer cell proliferation through suppression of its target gene LKB1.	mir-223	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-98	colon cancer	down	let-7 microRNA functions as a potential growth suppressor in human colon cancer cells.
mir-155	chronic lymphocytic leukemia	up	Signal Transducer and Activator of Transcription-3 Induces MicroRNA-155 Expression in Chronic Lymphocytic Leukemia.	mir-223	chronic lymphocytic leukemia	down	MicroRNA-223 expression is uniformly down-regulated in B cell lymphoproliferative disorders and is associated with poor survival in patients with chronic lymphocytic leukemia.	mir-98	esophageal squamous cell carcinoma	down	Role of microRNA let-7 and effect to HMGA2 in esophageal squamous cell carcinoma.
mir-155	chronic myelogenous leukemia	down	Downregulation of miR-31, miR-155, and miR-564 in chronic myeloid leukemia cells.	mir-223	chronic lymphocytic leukemia	down	[Expression of microRNA-223 and its clinical value in B lymphoproliferative disorders].	mir-98	esophageal squamous cell carcinoma	down	MicroRNA-9* and microRNA-214 post-transcriptionally regulate enhancer of zeste homolog 2 and inhibit migration and invasion in human esophageal squamous cell carcinoma.
mir-155	clear cell renal cell cancer	up	microRNA-155 silencing inhibits proliferation and migration and induces apoptosis by upregulating BACH1 in renal cancer.	mir-223	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-98	esophageal squamous cell carcinoma	down	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma.

			cells.								
mir-155	colon cancer	up	Correlation between expression of miR-155 in colon cancer and serum carcinoembryonic antigen level and its contribution to recurrence and metastasis forecast.	mir-223	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-98	gastric cancer	up	MicroRNA profiling of human gastric cancer
mir-155	colorectal cancer	up	Upregulation of microRNA-155 promotes the migration and invasion of colorectal cancer cells through the regulation of claudin-1 expression.	mir-223	colorectal cancer	up	MicroRNA-223 functions as an oncogene in human colorectal cancer cells.	mir-98	glioma	down	Overexpression of RECK inhibits cell invasion in glioma cell lines through upregulation of miR-98.
mir-155	cutaneous t-cell lymphoma	up	STAT5-mediated expression of oncogenic miR-155 in cutaneous T-cell lymphoma.	mir-223	colorectal cancer	up	Overexpression of miR-223 correlates with tumor metastasis and poor prognosis in patients with colorectal cancer.	mir-98	hepatocellular carcinoma	down	MicroRNAs in Hepatobiliary and Pancreatic Cancers.
mir-155	diffuse large B-cell lymphoma	up	Coordinated expression of microRNA-155 and predicted target genes in diffuse large B-cell lymphoma.	mir-223	colorectal cancer	up	C/EBP-?-activated microRNA-223 promotes tumour growth through targeting RASA1 in human colorectal cancer.	mir-98	lung cancer	down	Reduced expression of Dicer associated with poor prognosis in lung cancer patients.
mir-155	endometrial cancer	up	Angiotensin II type I receptor and miR-155 in endometrial cancers: synergistic antiproliferative effects of anti-miR-155 and losartan on endometrial cancer cells.	mir-223	endometrial cancer	down	MiR-223 suppresses endometrial carcinoma cells proliferation by targeting IGF-1R.	mir-98	lung cancer	down	Let-7a elevates p21(WAF1) levels by targeting of NtRF and suppresses the growth of A549 lung cancer cells.
mir-155	gallbladder carcinoma	up	High expression of microRNA-155 is associated with the aggressive malignant behavior of gallbladder carcinoma.	mir-223	esophageal adeno-carcinoma	up	MicroRNA 223 is Up-regulated in the Multistep Progression of Barrett's Esophagus and Modulates Sensitivity to Chemotherapy by Targeting PARP1.	mir-98	lung cancer	down	Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival.
mir-155	gastric cancer	down	microRNA-155 is downregulated in gastric cancer cells and involved in cell metastasis.	mir-223	esophageal cancer	down	Differential expression of miRNAs in esophageal cancer tissue.	mir-98	malignant melanoma	down	miR-98 suppresses melanoma metastasis through a negative feedback loop with its target gene IL-6.
mir-155	gastric cancer	down	Downregulation of microRNA-155 accelerates cell growth and invasion by targeting c-myc in human gastric carcinoma cells.	mir-223	esophageal squamous cell carcinoma	up	Clinical significance of serum miR-223, miR-25 and miR-375 in patients with esophageal squamous cell carcinoma.	mir-98	naso-pharyngeal carcinoma	down	MicroRNA let-7 suppresses nasopharyngeal carcinoma cells proliferation through downregulating c-Myc expression.
mir-155	glioma	up	MicroRNA-155 Promotes Glioma Cell Proliferation via the Regulation of MXI1.	mir-223	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-98	neuroblastoma	down	LIN28B induces neuroblastoma and enhances MYCN levels via let-7 suppression.

mir-155	glioma	up	Overexpression of microRNA-155 predicts poor prognosis in glioma patients.	mir-223	gastric cancer	up	MicroRNA-223 functions as an oncogene in human gastric cancer by targeting FBXW7/hCdc4.	mir-98	ovarian cancer	down	EZH2-specific microRNA-98 inhibits human ovarian cancer stem cell proliferation via regulating the pRb-E2F pathway.
mir-155	hepato-cellular carcinoma	up	Role of microRNA-155 at early stages of hepatocarcinogenesis induced by choline-deficient and amino acid-defined diet in C57BL/6 mice.	mir-223	gastric cancer	up	Plasma microRNAs, miR-223, miR-21 and miR-218, as novel potential biomarkers for gastric cancer detection.	mir-98	pancreatic ductal adeno-carcinoma	down	let-7 MicroRNA transfer in pancreatic cancer-derived cells inhibits in vitro cell proliferation but fails to alter tumor progression.
mir-155	hepatocellular carcinoma	up	[Expression and survival prediction of microRNA-155 in hepatocellular carcinoma after liver transplantation].	mir-223	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-99a	bladder cancer	down	microRNA-99a inhibiting cell proliferation, migration and invasion by targeting fibroblast growth factor receptor 3 in bladder cancer.
mir-155	liver cancer	up	TGF-?1 acts through miR-155 to down-regulate TP53INP1 in promoting epithelial-mesenchymal transition and cancer stem cell phenotypes.	mir-223	glioblastoma	up	microRNA-223 promotes the growth and invasion of glioblastoma cells by targeting tumor suppressor PAX6.	mir-99a	bladder cancer	down	microRNA-99a acts as a tumor suppressor and is down-regulated in bladder cancer.
mir-155	lung adeno-carcinoma	up	Potential diagnostic value of miR-155 in serum from lung adenocarcinoma patients.	mir-223	hepato-cellular carcinoma	up	Circulating microRNAs, miR-21, miR-122, and miR-223, in patients with hepatocellular carcinoma or chronic hepatitis.	mir-99a	breast cancer	down	MiR-99a antitumor activity in human breast cancer cells through targeting of mTOR expression.
mir-155	lung cancer	up	Differential MicroRNAs Expression in Serum of Patients with Lung Cancer, Pulmonary Tuberculosis, and Pneumonia.	mir-223	hepato-cellular carcinoma	down	[Role of microRNA-223 and its target gene oncogene c-myc in hepatocellular carcinoma pathogenesis.]	mir-99a	cervical cancer	down	miR-99a and -99b inhibit cervical cancer cell proliferation and invasion by targeting mTOR signaling pathway.
mir-155	lung cancer	up	Inhibition of hypoxia-induced miR-155 radiosensitizes hypoxic lung cancer cells.	mir-223	hepato-cellular carcinoma	down	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-99a	cervical carcinoma	down	miR-99 inhibits cervical carcinoma cell proliferation by targeting TRIB2.
mir-155	lung cancer	up	MiR-155 inhibits the sensitivity of lung cancer cells to cisplatin via negative regulation of Apaf-1 expression.	mir-223	hepato-cellular carcinoma	down	Sulfatide Epigenetically Regulates miR-223 and Promotes the Migration of Human Hepatocellular Carcinoma Cells.	mir-99a	esophageal squamous cell carcinoma	down	MicroRNA-99a/100 promotes apoptosis by targeting mTOR in human esophageal squamous cell carcinoma.
mir-155	malignant melanoma	down	MicroRNA-155 targets the SKI gene in human melanoma cell lines.	mir-223	kidney cancer	up	[Expression of miR-223 in clear cell renal cell carcinoma and its significance].	mir-99a	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.

mir-155	malignant melanoma	down	Altered expression of selected microRNAs in melanoma: antiproliferative and proapoptotic activity of miRNA-155.	mir-223	lung cancer	down	miR-223 functions as a potent tumor suppressor of the Lewis lung carcinoma cell line by targeting insulin-like growth factor-1 receptor and cyclin-dependent kinase 2.	mir-99a	hepatocellular carcinoma	down	MicroRNA-99a inhibits hepatocellular carcinoma growth and correlates with prognosis of patients with hepatocellular carcinoma.
mir-155	malt lymphoma	up	Overexpression of miR-142-5p and miR-155 in gastric mucosa-associated lymphoid tissue (MALT) lymphoma resistant to Helicobacter pylori eradication.	mir-223	mantle cell lymphoma	down	MicroRNA-223 expression is uniformly down-regulated in B cell lymphoproliferative disorders and is associated with poor survival in patients with chronic lymphocytic leukemia.	mir-99a	hepatocellular carcinoma	down	Sequential analysis of multistage hepatocarcinogenesis reveals that miR-100 and PLK1 dysregulation is an early event maintained along tumor progression.
mir-155	mantle cell lymphoma	up	microRNA expression profile and identification of miR-29 as a prognostic marker and pathogenetic factor by targeting CDK6 in mantle cell lymphoma.	mir-223	mantle cell lymphoma	down	[Expression of microRNA-223 and its clinical value in B lymphoproliferative disorders].	mir-99a	lung adeno-carcinoma	down	Clinic significance of microRNA-99a expression in human lung adenocarcinoma.
mir-155	naso-pharyngeal carcinoma	up	MiR-155 up-regulation by LMP1 DNA contributes to increased nasopharyngeal carcinoma cell proliferation and migration.	mir-223	naso-pharyngeal cancer	down	Circulating miR-17, miR-20a, miR-29c, and miR-223 Combined as Non-Invasive Biomarkers in Nasopharyngeal Carcinoma.	mir-99a	mesenchymal cancer	down	MicroRNA Expression Profiles in Kaposi's Sarcoma
mir-155	naso-pharyngeal carcinoma	up	Upregulation of MiR-155 in nasopharyngeal carcinoma is partly driven by LMP1 and LMP2A and downregulates a negative prognostic marker JMJD1A.	mir-223	naso-pharyngeal carcinoma	down	MiR-223 targeting MAFB suppresses proliferation and migration of nasopharyngeal carcinoma cells.	mir-99a	non-small cell lung cancer	down	microRNA-99a is downregulated and promotes proliferation, migration and invasion in non-small cell lung cancer A549 and H1299 cells.
mir-155	non-small cell lung cancer	down	Circulating micro-RNA expression profiles in early stage nonsmall cell lung cancer.	mir-223	splenic marginal zone lymphoma	down	MicroRNA-223 expression is uniformly down-regulated in B cell lymphoproliferative disorders and is associated with poor survival in patients with chronic lymphocytic leukemia.	mir-99a	non-small cell lung cancer	down	miR-99a suppresses the metastasis of human non-small cell lung cancer cells by targeting AKT1 signaling pathway.
mir-155	oral squamous cell carcinoma	up	MicroRNA-155 in oral squamous cell carcinoma: Overexpression, localization, and prognostic potential.	mir-223	splenic marginal zone lymphoma	down	[Expression of microRNA-223 and its clinical value in B lymphoproliferative disorders].	mir-99a	pancreatic cancer	up	Antagonism of microRNA-99a promotes cell invasion and down-regulates E-cadherin expression in pancreatic cancer cells by regulating mammalian target of rapamycin.
mir-155	oral squamous cell carcinoma	up	Upregulation of a potential prognostic biomarker, miR-155, enhances cell proliferation in patients with oral squamous cell carcinoma.	mir-223-3p	prostate cancer	up	MiR-223-3p targeting SEPT6 promotes the biological behavior of prostate cancer.	mir-99b	cervical cancer	down	miR-99a and -99b inhibit cervical cancer cell proliferation and invasion by targeting mTOR signaling pathway.
mir-155	ovarian cancer	down	MicroRNA-155 is a novel suppressor of ovarian cancer-initiating cells that targets CLDN1.	mir-224	breast cancer	up	MicroRNA-224 targets RKIP to control cell invasion and expression of metastasis genes in human breast cancer cells.	mir-99b	cervical carcinoma	down	miR-99 inhibits cervical carcinoma cell proliferation by targeting TRIB2.

mir-155	papillary thyroid carcinoma	up	Upregulated miR-155 in Papillary Thyroid Carcinoma Promotes Tumor Growth by Targeting APC and Activating Wnt/beta-Catenin Signaling.	mir-224	cervical cancer	up	Upregulation of microRNA-224 is associated with aggressive progression and poor prognosis in human cervical cancer.	mir-99b	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.
mir-155	prostate cancer	up	A study of molecular signals deregulating mismatch repair genes in prostate cancer compared to benign prostatic hyperplasia.	mir-224	colorectal cancer	up	Up-regulation of miR-224 promotes cancer cell proliferation and invasion and predicts relapse of colorectal cancer.	mir-99b	lung cancer	down	microRNA-99b acts as a tumor suppressor in non-small cell lung cancer by directly targeting fibroblast growth factor receptor 3.
mir-155	rectal cancer	up	The quantitative analysis by stem-loop real-time PCR revealed the microRNA-34a, microRNA-155 and microRNA-200c overexpression in human colorectal cancer.	mir-224	colorectal cancer	up	Molecular biomarkers and classification models in the evaluation of the prognosis of colorectal cancer.	mir-17	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-155	renal clear cell carcinoma	up	miRNA profiling for clear cell renal cell carcinoma: biomarker discovery and identification of potential controls and consequences of miRNA dysregulation.	mir-224	colorectal cancer	down	MicroRNA-224 suppresses colorectal cancer cell migration by targeting Cdc42.	mir-17	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-155	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.	mir-224	colorectal cancer	up	The clinical and biological significance of MIR-224 expression in colorectal cancer metastasis.	mir-17	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-155-5p	gastric cancer	down	The clinical significance of downregulation of mir-124-3p, mir-146a-5p, mir-155-5p and mir-335-5p in gastric cancer tumorigenesis.	mir-224	colorectal cancer	up	microRNA-224 Promotes Cell Proliferation and Tumor Growth in Human Colorectal Cancer by Repressing PHLPP1 and PHLPP2.	mir-17	esophageal squamous cell carcinoma	up	
mir-15a	breast cancer	down	MiR-15a is underexpressed and inhibits the cell cycle by targeting CCNE1 in breast cancer.	mir-224	gastric cancer	up	[Effect of antisense miR-224 on gastric cancer cell proliferation and apoptosis].	mir-17	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-15a	cervical carcinoma	down	MiR-15a and miR-16 induce autophagy and enhance chemosensitivity of Camptothecin.	mir-224	glioma	up	Upregulation of microRNA-224 confers a poor prognosis in glioma patients.	mir-17	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-15a	chronic lymphocytic leukemia	down	Aberrant microRNA expression in Chinese patients with chronic lymphocytic leukemia.	mir-224	hepato-cellular carcinoma	up	Transcriptional regulation of miR-224 upregulated in human HCCs by NF?B inflammatory pathways.	mir-17	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.

mir-15a	chronic lymphocytic leukemia	down	Defective DROSHA processing contributes to downregulation of MiR-15/-16 in chronic lymphocytic leukemia.	mir-224	hepato-cellular carcinoma	up	Androgen pathway stimulates microRNA-216a transcription to suppress the tumor suppressor in lung cancer-1 gene in early hepatocarcinogenesis.	mir-17	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-15a	chronic lymphocytic leukemia	down	Human microRNA genes are frequently located at fragile sites and genomic regions involved in cancers.	mir-224	hepato-cellular carcinoma	up	MicroRNA-224 is up-regulated in hepatocellular carcinoma through epigenetic mechanisms.	mir-17	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-15a	chronic lymphocytic leukemia	down	miR-15 and miR-16 induce apoptosis by targeting BCL2.	mir-224	hepato-cellular carcinoma	up	miR-224 promotes cell migration and invasion by modulating p-PAK4 and MMP-9 via targeting HOXD10 in human hepatocellular carcinoma.	mir-18a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-15a	colorectal cancer	down	Downregulation of miR-195 correlates with lymph node metastasis and poor prognosis in colorectal cancer.	mir-224	hepato-cellular carcinoma	up	MicroRNA-224 upregulation and AKT activation synergistically predict poor prognosis in patients with hepatocellular carcinoma.	mir-18a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-15a	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-224	hepato-cellular carcinoma	up	Serum microRNA characterization identifies miR-885-5p as a potential marker for detecting liver pathologies.	mir-18a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-15a	lung cancer	down	Histone deacetylases inhibitor trichostatin A increases the expression of Dleu2/miR-15a/16-1 via HDAC3 in non-small cell lung cancer.	mir-224	meningioma	up	MicroRNA-224 targets ERG2 and contributes to malignant progressions of meningioma.	mir-18a	esophageal squamous cell carcinoma	up	
mir-15a	neuro-blastoma	up	miR-15a/16-1 enhances retinoic acid-mediated differentiation of leukemic cells and is up-regulated by retinoic acid.	mir-224	non-small cell lung cancer	down	Decreased microRNA-224 and its clinical significance in non-small cell lung cancer patients.	mir-18a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-15a	neuro-blastoma	up	MicroRNA-15a promotes neuroblastoma migration by targeting reversion-inducing cysteine-rich protein with Kazal motifs (RECK) and regulating matrix metalloproteinase-9 expression.	mir-224	prostate cancer	down	MicroRNA-224 inhibits progression of human prostate cancer by downregulating TRIB1.	mir-18a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.
mir-15a	non-small cell lung cancer	down	MicroRNA-15a induces cell apoptosis and inhibits metastasis by targeting BCL2L2 in non-small cell lung cancer.	mir-224	prostate cancer	down	Tumour-suppressive microRNA-224 inhibits cancer cell migration and invasion via targeting oncogenic TPD52 in prostate cancer.	mir-18a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.

mir-15a	pancreatic cancer	down	Dysregulation of miR-15a and miR-214 in human pancreatic cancer.	mir-224	prostate cancer	down	MicroRNA-224 and its target CAMKK2 synergistically influence tumor progression and patient prognosis in prostate cancer.	mir-18a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-15a	pancreatic cancer	up	Dysregulation of miR-15a and miR-214 in human pancreatic cancer.	mir-224-5p	ovarian cancer	up	Expression of miR-224-5p is associated with the original cisplatin resistance of ovarian papillary serous carcinoma.	mir-18a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-15a	pancreatic ductal adeno-carcinoma	down	miR-15a inhibits cell proliferation and epithelial to mesenchymal transition in pancreatic ductal adenocarcinoma by down-regulating Bmi-1 expression.	mir-2278	chronic mivelo-genous leukemia	down	Revealing genome-wide mRNA and microRNA expression patterns in leukemic cells highlighted "miR-2278" as a tumor suppressor for regain of chemotherapeutic imatinib response due to targeti	mir-19a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-15a	prostate cancer	down	Downregulation of miR-221, -30d, and -15a contributes to pathogenesis of prostate cancer by targeting Bmi-1.	mir-23a	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-19a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-15a	squamous carcinoma	down	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.	mir-23a	breast cancer	up	c-MYC regulated miR-23a~24-2~27a cluster promotes mammary carcinoma cell invasion and hepatic metastasis by targeting Sprouty2.	mir-19a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-15b	chronic lymphocytic leukemia	down	miR-15 and miR-16 induce apoptosis by targeting BCL2.	mir-23a	colon carcinoma	up	[Expression and clinical significance of miR-23a and metastasis suppressor 1 in colon carcinoma].	mir-19a	esophageal squamous cell carcinoma	up	
mir-15b	chronic lymphocytic leukemia	down	Defective DROSHA processing contributes to downregulation of MiR-15/-16 in chronic lymphocytic leukemia.	mir-23a	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-19a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-15b	colorectal cancer	down	Downregulation of miR-195 correlates with lymph node metastasis and poor prognosis in colorectal cancer.	mir-23a	gastric adeno-carcinoma	up	MicroRNA-23a promotes the growth of gastric adenocarcinoma cell line MGC803 and downregulates interleukin-6 receptor.	mir-19a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation
mir-15b	glioma	down	MiR-15b and miR-152 reduce glioma cell invasion and angiogenesis via NRP-2 and MMP-3.	mir-23a	gastric adeno-carcinoma	up	miR-23a targets interferon regulatory factor 1 and modulates cellular proliferation and paclitaxel-induced apoptosis in gastric adenocarcinoma cells.	mir-19a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.

mir-15b	hepatocellular carcinoma	down	Downregulation of microRNA-15b by hepatitis B virus X enhances hepatocellular carcinoma proliferation via fucosyltransferase 2-induced Globo H expression.	mir-23a	gastric cancer	up	MiR-23a in Amplified 19p13.13 Loci Targets Metallothionein 2A and Promotes Growth in Gastric Cancer Cells.	mir-19a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-15b	lung cancer	down	Histone deacetylases inhibitor trichostatin A increases the expression of Dleu2/miR-15a/16-1 via HDAC3 in non-small cell lung cancer.	mir-23a	gastric cancer	up	Upregulation of microRNA-23a/b promotes tumor progression and confers poor prognosis in patients with gastric cancer.	mir-19a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-15b	malignant melanoma	up	MicroRNA-15b represents an independent prognostic parameter and is correlated with tumor cell proliferation and apoptosis in malignant melanoma.	mir-23a	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-19b	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-15b	neuro-blastoma	up	miR-15a/16-1 enhances retinoic acid-mediated differentiation of leukemic cells and is up-regulated by retinoic acid.	mir-23a	glioma	up	Targeting microRNA-23a to inhibit glioma cell invasion via HOXD10.	mir-19b	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-15b	tongue cancer	down	MiR-200b and miR-15b regulate chemotherapy-induced epithelial-mesenchymal transition in human tongue cancer cells by targeting BMI1.	mir-23a	hepato-cellular carcinoma	up	Stat3-mediated activation of miR-23a suppresses gluconeogenesis in hepatocellular carcinoma by downregulating G6PC and PGC-1?	mir-19b	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-16	bladder cancer	down	MicroRNA-16 Inhibits Bladder Cancer Proliferation by Targeting Cyclin D1.	mir-23a	laryngeal cancer	up	High microRNA-23a expression in laryngeal squamous cell carcinoma is associated with poor patient prognosis.	mir-19b	esophageal squamous cell carcinoma	up	
mir-16	breast cancer	down	Downregulation of the tumor-suppressor miR-16 via progestin-mediated oncogenic signaling contributes to breast cancer development.	mir-23a	neuro-blastoma	up	MicroRNA-23a promotes neuroblastoma cell metastasis by targeting CDH1.	mir-19b	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-16	breast cancer	down	Overexpression of microRNA-16 declines cellular growth, proliferation and induces apoptosis in human breast cancer cells.	mir-23a	osteo-sarcoma	down	miR-23a suppresses proliferation of osteosarcoma cells by targeting SATB1.	mir-19b	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.
mir-16	cervical carcinoma	down	MiR-15a and miR-16 induce autophagy and enhance chemosensitivity of Camptothecin.	mir-23a	osteo-sarcoma	down	MiR-23a Functions as a Tumor Suppressor in Osteosarcoma.	mir-19b	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.

mir-16	chronic lymphocytic leukemia	down	Defective DROSHA processing contributes to downregulation of MiR-15/-16 in chronic lymphocytic leukemia.	mir-23a	prostate cancer	down	Downregulation of microRNA-23a suppresses prostate cancer metastasis by targeting the PAK6-LIMK1 signaling pathway.	mir-19b	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-16	chronic myelogenous leukemia	down	ApoptomiRs expression modulated by BCR-ABL is linked to CML progression and imatinib resistance.	mir-23b	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-19b	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-16	colorectal cancer	down	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-23b	bladder cancer	down	MicroRNA-23b functions as a tumor suppressor by regulating Zeb1 in bladder cancer.	mir-20a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-16	colorectal cancer	down	Downregulation of miR-195 correlates with lymph node metastasis and poor prognosis in colorectal cancer.	mir-23b	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-20a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-16	colorectal cancer	down	microRNA-16 represses colorectal cancer cell growth in vitro by regulating the p53/survivin signaling pathway.	mir-23b	gastric cancer	up	Upregulation of microRNA-23a/b promotes tumor progression and confers poor prognosis in patients with gastric cancer.	mir-20a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-16	colorectal cancer	down	Prognostic Significance of MicroRNA-16 Expression in Human Colorectal Cancer.	mir-23b	gastric cancer	down	The reciprocal regulation loop of Notch2 pathway and miR-23b in controlling gastric carcinogenesis.	mir-20a	esophageal squamous cell carcinoma	up	
mir-16	esophageal squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.	mir-23b	glioma	down	miRNA expression profiling in migrating glioblastoma cells: regulation of cell migration and invasion by miR-23b via targeting of Pyk2.	mir-20a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-16	glioma	down	MicroRNA-16 inhibits glioma cell growth and invasion through suppression of BCL2 and the nuclear factor-?B1/MMP9 signaling pathway.	mir-23b	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.	mir-20a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-16	head and neck squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.	mir-23b	prostate cancer	down	miR-23b represses proto-oncogene Src kinase and functions as methylation-silenced tumor suppressor with diagnostic and prognostic significance in prostate cancer.	mir-20a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.

mir-16	hepato-cellular carcinoma	down	Circulating microRNAs as biomarkers for hepatocellular carcinoma.	mir-24	breast cancer	up	Association between mir-24 and mir-378 in formalin-fixed paraffin-embedded tissues of breast cancer.	mir-28a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-16	hepato-cellular carcinoma	down	Expression of serum miR-16, let-7f, and miR-21 in patients with hepatocellular carcinoma and their clinical significances.	mir-24	breast carcinoma	up	MicroRNA miR-24 Enhances Tumor Invasion and Metastasis by Targeting PTPN9 and PTPRF to Promote EGF Signaling.	mir-20a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-16	laryngeal carcinoma	up	MicroRNA-16 targets syntaxin and promotes cell motility in human laryngeal carcinoma cell line HEp-2.	mir-24	gastric cancer	down	Tumor suppressor miR-24 restrains gastric cancer progression by downregulating RegIV.	mir-92a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-16	lung adeno-carcinoma	down	Quercetin Decreases Claudin-2 Expression Mediated by Up-Regulation of microRNA miR-16 in Lung Adenocarcinoma A549 Cells.	mir-24	glioma	up		mir-92a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-16	non-small cell lung cancer	down	Downregulation of miR-16 promotes growth and motility by targeting HDGF in non-small cell lung cancer cells.	mir-24	hepato-cellular carcinoma	up	MicroRNA-24 Modulates Aflatoxin B1-Related Hepatocellular Carcinoma Prognosis and Tumorigenesis.	mir-92a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-16	osteo-sarcoma	down	MicroRNA signatures associate with pathogenesis and progression of osteosarcoma.	mir-24	hepato-cellular carcinoma	up	miR-24 promotes the proliferation and invasion of HCC cells by targeting SOX7.	mir-92a	esophageal squamous cell carcinoma	up	
mir-16	osteo-sarcoma	down	miR-16 inhibits cell proliferation by targeting IGF1R and the Raf1-MEK1/2-ERK1/2 pathway in osteosarcoma.	mir-24	laryngeal squamous cell carcinoma	down	miR-24 functions as a tumor suppressor in Hep2 laryngeal carcinoma cells partly through down-regulation of the S100A8 protein.	mir-92a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-16	pancreatic ductal adeno-carcinoma	down	MicroRNAs Targeting Oncogenes Are Down-Regulated in Pancreatic Malignant Transformation from Benign Tumors.	mir-24	lung cancer	up	Evaluation of dynamic change of serum miR-21 and miR-24 in pre- and post-operative lung carcinoma patients.	mir-92a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.
mir-16	papillary thyroid carcinoma	down	Integrated analyses of microRNA and mRNA expression profiles in aggressive papillary thyroid carcinoma.	mir-24	naso-pharyngeal carcinoma	up	[Clinical significance of plasma miR-24 dysregulation in nasopharyngeal carcinoma].	mir-92a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-16	renal cell carcinoma	up	Upregulated microRNA-16 as an oncogene in renal cell carcinoma.	mir-24	non-small cell lung cancer	up	Upregulation of miR-24 promotes cell proliferation by targeting NAIF1 in non-small cell lung cancer.	mir-92a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.

mir-16	squamous carcinoma	down	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.	mir-24	non-small cell lung cancer	up	Circulating miR-22, miR-24 and miR-34a as novel predictive biomarkers to pemetrexed-based chemotherapy in advanced non small cell lung cancer.	mir-92a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-16-1	chronic lymphocytic leukemia	down	Defective DROSHA processing contributes to downregulation of MiR-15/-16 in chronic lymphocytic leukemia.	mir-24	oral squamous cell carcinoma	up	miR-24 up-regulation in oral carcinoma: positive association from clinical and in vitro analysis.	mmu-mir-290-3p	breast cancer	down	Inherited variation in miR-290 expression suppresses breast cancer progression by targeting the metastasis susceptibility gene Arid4b.
mir-16-1	chronic lymphocytic leukemia	down	miR-15 and miR-16 induce apoptosis by targeting BCL2.	mir-24	oral squamous cell carcinoma	up	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer.	mmu-mir-290-5p	breast cancer	down	Inherited variation in miR-290 expression suppresses breast cancer progression by targeting the metastasis susceptibility gene Arid4b.
mir-16-1	lung cancer	down	Histone deacetylases inhibitor trichostatin A increases the expression of Dlen2/miR-15a/16-1 via HDAC3 in non-small cell lung cancer.	mir-24	osteo-sarcoma	down	MicroRNA-24 inhibits osteosarcoma cell proliferation both in vitro and in vivo by targeting LPAAT?.				

Table 3. Complete list of tumor suppressive miRNAs and their relationship to cancer.

miR	Cancer	Exp	miR	Cancer	Exp	miR	Cancer	Exp	miR	Cancer	Exp	miR	Cancer	Exp
mir-193b	breast cancer	down, cell lines.MDA-MB-231, mCF-7.	mir-127	hepatocellular carcinoma	down	mir-155	malignant melanoma	down	mir-218	gastric cancer	down	mir-34b	chronic lymphocytic leukemia	down
let-7a	breast cancer	down	mir-127	hepatocellular carcinoma	down	mir-155	non-small cell lung cancer	down	mir-218	gastric cancer	down	mir-34b	endometrial serous adenocarcinoma	down
let-7a	breast cancer	down	mir-127-3p	glioblastoma	down	mir-155	ovarian cancer	down	mir-218	gastric cancer	down	mir-34b	gastric cancer	down
let-7a	breast cancer	down	mir-127-3p	osteosarcoma	down	mir-155-5p	gastric cancer	down	mir-218	gastric cancer	down	mir-34b	hepatocellular carcinoma	down
let-7a	chondrosarcoma	down	mir-1271	gastric cancer	down	mir-15a	breast cancer	down	mir-218	gastric cancer	down	mir-34b	lung cancer	down
let-7a	colorectal cancer	down	mir-1271	hepatocellular carcinoma	down	mir-15a	cervical carcinoma	down	mir-218	gastric cancer	down	mir-34b	non-small cell lung cancer	down
let-7a	esophageal squamous cell carcinoma	down	mir-1271	oral squamous cell carcinoma	down	mir-15a	chronic lymphocytic leukemia	down	mir-218	gastrointestinal stromal tumor	down	mir-34b	osteosarcoma	down
let-7a	gastric cancer	down	mir-128	glioblastoma	down	mir-15a	chronic lymphocytic leukemia	down	mir-218	glioma	down	mir-34b	ovarian cancer	down
let-7a	gastric cancer	down	mir-128	glioblastoma	down	mir-15a	chronic lymphocytic leukemia	down	mir-218	glioma	down	mir-34b	ovarian carcinoma	down
let-7a	gastric cancer	down	mir-128	glioblastoma	down	mir-15a	chronic lymphocytic leukemia	down	mir-218	head and neck squamous cell carcinoma	down	mir-34b	pancreatic cancer	down
let-7a	gastric cancer	down	mir-128	glioma	down	mir-15a	colorectal cancer	down	mir-218	hepatocellular carcinoma	down	mir-34b	pancreatic cancer	down
let-7a	gastric cancer	down	mir-128	glioma	down	mir-15a	lung cancer	down	mir-218	hepatocellular carcinoma	down	mir-34b	papillary thyroid carcinoma	down
let-7a	gastric cancer	down	mir-128	glioma	down	mir-15a	non-small cell lung cancer	down	mir-218	hepatocellular carcinoma	down	mir-34b	prostate cancer	down
let-7a	glioma	down	mir-128	glioma	down	mir-15a	pancreatic cancer	down	mir-218	lung cancer	down	mir-34b	uveal melanoma	down
let-7a	nasopharyngeal carcinoma	down	mir-128	glioma	down	mir-15a	pancreatic ductal adenocarcinoma	down	mir-218	lung cancer	down	mir-34c	breast cancer	down
let-7a	non-small cell lung cancer	down	mir-128	glioma	down	mir-15a	prostate cancer	down	mir-218	lung squamous cell carcinoma	down	mir-34c	breast cancer	down

let-7a	osteosarcoma	down	mir-128	head and neck squamous cell carcinoma	down	mir-15a	squamous carcinoma	down	mir-218	malignant melanoma	down	mir-34c	breast cancer	down
let-7a	pancreatic ductal adenocarcinoma	down	mir-128	meningioma	down	mir-15b	chronic lymphocytic leukemia	down	mir-218	nasopharyngeal cancer	down	mir-34c	chronic lymphocytic leukemia	down
let-7a	renal cell carcinoma	down	mir-128	prostate cancer	down	mir-15b	chronic lymphocytic leukemia	down	mir-218	oral cancer	down	mir-34c	colon cancer	down
let-7a-1	breast cancer	down	mir-128	prostate cancer	down	mir-15b	colorectal cancer	down	mir-218	osteosarcoma	down	mir-34c	endometrial cancer	down
let-7a-1	bronchioloalveolar carcinoma	down	mir-128-3p	hepatocellular carcinoma	down	mir-15b	glioma	down	mir-218	pancreatic ductal adenocarcinoma	down	mir-34c	endometrial cancer	down
let-7a-1	colon cancer	down	mir-1280	bladder cancer	down	mir-15b	hepatocellular carcinoma	down	mir-218	prostate cancer	down	mir-34c	gastric cancer	down
let-7a-1	esophageal squamous cell carcinoma	down	mir-1280	malignant melanoma	down	mir-15b	lung cancer	down	mir-218	prostate cancer	down	mir-34c	lung cancer	down
let-7a-1	esophageal squamous cell carcinoma	down	mir-1285	renal cell carcinoma	down	mir-15b	tongue cancer	down	mir-218	renal cell carcinoma	down	mir-34c	lung cancer	down
let-7a-1	hepatocellular carcinoma	down	mir-128a	medulloblastoma	down	mir-16	bladder cancer	down	mir-218	renal clear cell carcinoma	down	mir-34c	malignant melanoma	down
let-7a-1	lung cancer	down	mir-129	breast cancer	down	mir-16	breast cancer	down	mir-219-5p	glioblastoma	down	mir-34c	nasopharyngeal carcinoma	down
let-7a-1	lung cancer	down	mir-129	colorectal cancer	down	mir-16	breast cancer	down	mir-219-5p	glioma	down	mir-34c	osteosarcoma	down
let-7a-1	lung cancer	down	mir-129	glioblastoma	down	mir-16	cervical carcinoma	down	mir-219-5p	hepatocellular carcinoma	down	mir-34c	osteosarcoma	down
let-7a-1	nasopharyngeal carcinoma	down	mir-129	non-small cell lung cancer	down	mir-16	chronic lymphocytic leukemia	down	mir-219-5p	papillary thyroid carcinoma	down	mir-34c	ovarian cancer	down
let-7a-1	neuroblastoma	down	mir-129-1-3p	gastric cancer	down	mir-16	chronic myelogenous leukemia	down	mir-22	breast cancer	down	mir-34c	ovarian carcinoma	down
let-7a-1	pancreatic ductal adenocarcinoma	down	mir-129-2-3p	gastric cancer	down	mir-16	colorectal cancer	down	mir-22	breast cancer	down	mir-34c	pancreatic cancer	down
let-7a-2	breast cancer	down	mir-129-3p	gastric cancer	down	mir-16	colorectal cancer	down	mir-22	colon cancer	down	mir-34c	prostate cancer	down
let-7a-2	bronchioloalveolar carcinoma	down	mir-129-3p	renal cell carcinoma	down	mir-16	colorectal cancer	down	mir-22	colon cancer	down	mir-34c	uveal melanoma	down
let-7a-2	colon cancer	down	mir-129-5p	gastric cancer	down	mir-16	colorectal cancer	down	mir-22	colon cancer	down	mir-34c-3p	glioma	down
let-7a-2	esophageal squamous cell carcinoma	down	mir-129-5p	gastric cancer	down	mir-16	glioma	down	mir-22	colorectal cancer	down	mir-34c-5p	glioma	down
let-7a-2	esophageal squamous cell carcinoma	down	mir-129-5p	hepatocellular carcinoma	down	mir-16	hepatocellular carcinoma	down	mir-22	esophageal squamous cell carcinoma	down	mir-361-3p	non-small cell lung cancer	down

let-7a-2	hepatocellular carcinoma	down	mir-129-5p	laryngeal squamous cell carcinoma	down	mir-16	hepatocellular carcinoma	down	mir-22	esophageal squamous cell carcinoma	down	mir-361-5p	colorectal cancer	down
let-7a-2	lung cancer	down	mir-129-5p	medullary thyroid carcinoma	down	mir-16	lung adenocarcinoma	down	mir-22	gastric cancer	down	mir-361-5p	gastric cancer	down
let-7a-2	lung cancer	down	mir-129-5p	ovarian cancer	down	mir-16	non-small cell lung cancer	down	mir-22	gastric cancer	down	mir-363	head and neck squamous cell carcinoma	down
let-7a-2	lung cancer	down	mir-1291	renal cell carcinoma	down	mir-16	osteosarcoma	down	mir-22	gastric cancer	down	mir-365	colon cancer	down
let-7a-2	nasopharyngeal carcinoma	down	mir-1294	esophageal squamous cell carcinoma	down	mir-16	osteosarcoma	down	mir-22	gastric cancer	down	mir-365	hepatocellular carcinoma	down
let-7a-2	neuroblastoma	down	mir-1295b-3p	colorectal cancer	down	mir-16	pancreatic ductal adenocarcinoma	down	mir-22	hepatocellular carcinoma	down	mir-365	lung cancer	down
let-7a-2	pancreatic ductal adenocarcinoma	down	mir-1296	prostate cancer	down	mir-16	papillary thyroid carcinoma	down	mir-22	hepatocellular carcinoma	down	mir-365	non-small cell lung cancer	down
let-7a-3	breast cancer	down	mir-1297	lung adenocarcinoma	down	mir-16	squamous carcinoma	down	mir-22	lung cancer	down	mir-365b-3p	retinoblastoma	down
let-7a-3	bronchioloalveolar carcinoma	down	mir-1307	colorectal cancer	down	mir-16-1	chronic lymphocytic leukemia	down	mir-22	medulloblastoma	down	mir-367	gastric cancer	down
let-7a-3	colon cancer	down	mir-130a	breast cancer	down	mir-16-1	chronic lymphocytic leukemia	down	mir-22	osteosarcoma	down	mir-370	bladder cancer	down
let-7a-3	esophageal squamous cell carcinoma	down	mir-130a	endometrial cancer	down	mir-16-1	lung cancer	down	mir-22	osteosarcoma	down	mir-370	hepatocellular carcinoma	down
let-7a-3	esophageal squamous cell carcinoma	down	mir-130a	hepatocellular carcinoma	down	mir-16-1-3p	chronic lymphocytic leukemia	down	mir-22	t-cell lymphoma	down	mir-370	laryngeal squamous cell carcinoma	down
let-7a-3	hepatocellular carcinoma	down	mir-130b	colorectal cancer	down	mir-16-2	chronic lymphocytic leukemia	down	mir-220a	oral squamous cell carcinoma	down	mir-370	oral squamous cell carcinoma	down
let-7a-3	lung cancer	down	mir-130b	endometrial cancer	down	mir-16-2	chronic lymphocytic leukemia	down	mir-221	gastrointestinal stromal tumor	down	mir-372	cervical cancer	down
let-7a-3	lung cancer	down	mir-130b	hepatocellular carcinoma	down	mir-16-2	lung cancer	down	mir-221	gastrointestinal stromal tumor	down	mir-372	hepatocellular carcinoma	down
let-7a-3	lung cancer	down	mir-130b	ovarian cancer	down	mir-17	acute myeloid leukemia	down	mir-221	non-small cell lung cancer	down	mir-373	colon cancer	down
let-7a-3	nasopharyngeal carcinoma	down	mir-130b	papillary thyroid carcinoma	down	mir-17	malignant melanoma	down	mir-221	prostate cancer	down	mir-373	non-small cell lung cancer	down
let-7a-3	neuroblastoma	down	mir-130b	prostate cancer	down	mir-17-5p	breast cancer	down	mir-222	chondrosarcoma	down	mir-373	pancreatic cancer	down

let-7a-3	pancreatic ductal adenocarcinoma	down	mir-132	breast cancer	down	mir-17-5p	cervical cancer	down	mir-222	chordoma	down	mir-374a	breast cancer	down
let-7a-3p	prostate cancer	down	mir-132	colorectal cancer	down	mir-17-5p	non-small cell lung cancer	down	mir-222	gastrointestinal stromal tumor	down	mir-374b	prostate cancer	down
let-7b	acute lymphoblastic leukemia	down	mir-132	liver cancer	down	mir-181a	acute myeloid leukemia	down	mir-222	gastrointestinal stromal tumor	down	mir-375	cervical squamous cell carcinoma	down
let-7b	breast cancer	down	mir-132	osteosarcoma	down	mir-181a	breast cancer	down	mir-222	glioblastoma	down	mir-375	colorectal cancer	down
let-7b	breast cancer	down	mir-132	osteosarcoma	down	mir-181a	chronic lymphocytic leukemia	down	mir-223	acute myeloid leukemia	down	mir-375	colorectal cancer	down
let-7b	breast cancer	down	mir-132	pancreatic carcinoma	down	mir-181a	chronic lymphocytic leukemia	down	mir-223	chronic lymphocytic leukemia	down	mir-375	colorectal cancer	down
let-7b	bronchioloalveolar carcinoma	down	mir-133a	bladder cancer	down	mir-181a	gastric cancer	down	mir-223	chronic lymphocytic leukemia	down	mir-375	esophageal cancer	down
let-7b	colon cancer	down	mir-133a	bladder cancer	down	mir-181a	glioma	down	mir-223	endometrial cancer	down	mir-375	esophageal cancer	down
let-7b	esophageal squamous cell carcinoma	down	mir-133a	breast cancer	down	mir-181a	oral squamous cell carcinoma	down	mir-223	esophageal cancer	down	mir-375	esophageal squamous cell carcinoma	down
let-7b	esophageal squamous cell carcinoma	down	mir-133a	colorectal cancer	down	mir-181a-1	glioma	down	mir-223	hepatocellular carcinoma	down	mir-375	esophageal squamous cell carcinoma	down
let-7b	gastric cancer	down	mir-133a	colorectal cancer	down	mir-181a-1	non-small cell lung cancer	down	mir-223	hepatocellular carcinoma	down	mir-375	esophageal squamous cell carcinoma	down
let-7b	gastric cancer	down	mir-133a	colorectal cancer	down	mir-181a-2	glioma	down	mir-223	hepatocellular carcinoma	down	mir-375	gastric cancer	down
let-7b	gastric cancer	down	mir-133a	colorectal cancer	down	mir-181a-2	non-small cell lung cancer	down	mir-223	lung cancer	down	mir-375	gastric cancer	down
let-7b	hepatocellular carcinoma	down	mir-133a	colorectal cancer	down	mir-181a-5p	hepatocellular carcinoma	down	mir-223	mantle cell lymphoma	down	mir-375	gastric cancer	down
let-7b	lung cancer	down	mir-133a	esophageal squamous cell carcinoma	down	mir-181b	chronic lymphocytic leukemia	down	mir-223	mantle cell lymphoma	down	mir-375	gastric cancer	down
let-7b	lung cancer	down	mir-133a	esophageal squamous cell carcinoma	down	mir-181b	chronic lymphocytic leukemia	down	mir-223	nasopharyngeal cancer	down	mir-375	glioma	down
let-7b	lung cancer	down	mir-133a	gastric cancer	down	mir-181b	gastric adenocarcinoma	down	mir-223	nasopharyngeal carcinoma	down	mir-375	head and neck squamous cell carcinoma	down
let-7b	malignant melanoma	down	mir-133a	gastric cancer	down	mir-181b	gastric cancer	down	mir-223	splenic marginal zone lymphoma	down	mir-375	hepatocellular carcinoma	down
let-7b	nasopharyngeal carcinoma	down	mir-133a	gastric cancer	down	mir-181b	glioma	down	mir-223	splenic marginal zone lymphoma	down	mir-375	hepatocellular carcinoma	down
let-7b	neuroblastoma	down	mir-133a	gastric cancer	down	mir-181b	glioma	down	mir-224	colorectal cancer	down	mir-375	laryngeal squamous cell carcinoma	down

let-7b	pancreatic ductal adenocarcinoma	down	mir-133a	head and neck squamous cell carcinoma	down	mir-181b	glioma	down	mir-224	non-small cell lung cancer	down	mir-375	nasopharyngeal carcinoma	down
let-7b	renal clear cell carcinoma	down	mir-133a	head and neck squamous cell carcinoma	down	mir-181b	non-small cell lung cancer	down	mir-224	prostate cancer	down	mir-375	non-small cell lung cancer	down
let-7c	acute myeloid leukemia	down	mir-133a	hepatocellular carcinoma	down	mir-181b-1	glioma	down	mir-224	prostate cancer	down	mir-375	oral cancer	down
let-7c	acute promyelocytic leukemia	down	mir-133a	lung squamous cell carcinoma	down	mir-181b-1	non-small cell lung cancer	down	mir-224	prostate cancer	down	mir-375	oral cancer	down
let-7c	breast cancer	down	mir-133a	non-small cell lung cancer	down	mir-181b-2	glioma	down	mir-2278	chronic myelogenous leukemia	down	mir-375	oral carcinoma	down
let-7c	bronchioloalveolar carcinoma	down	mir-133a	osteosarcoma	down	mir-181b-2	non-small cell lung cancer	down	mir-23a	osteosarcoma	down	mir-375	osteosarcoma	down
let-7c	colon cancer	down	mir-133a	ovarian cancer	down	mir-181b-5p	astrocytoma	down	mir-23a	osteosarcoma	down	mir-375	pancreatic cancer	down
let-7c	esophageal squamous cell carcinoma	down	mir-133a	pancreatic cancer	down	mir-181c	glioma	down	mir-23a	prostate cancer	down	mir-375	pancreatic cancer	down
let-7c	esophageal squamous cell carcinoma	down	mir-133a	renal cell carcinoma	down	mir-181c	neuroblastoma	down	mir-23b	bladder cancer	down	mir-375	pancreatic carcinoma	down
let-7c	hepatocellular carcinoma	down	mir-133a-1	prostate cancer	down	mir-181c	non-small cell lung cancer	down	mir-23b	gastric cancer	down	mir-375	pancreatic ductal adenocarcinoma	down
let-7c	hepatocellular carcinoma	down	mir-133a-2	prostate cancer	down	mir-181d	glioma	down	mir-23b	glioma	down	mir-375	pancreatic ductal adenocarcinoma	down
let-7c	lung cancer	down	mir-133b	bladder cancer	down	mir-181d	glioma	down	mir-23b	prostate cancer	down	mir-375	squamous carcinoma	down
let-7c	lung cancer	down	mir-133b	colorectal cancer	down	mir-181d	non-small cell lung cancer	down	mir-24	gastric cancer	down	mir-376a	chondrosarcoma	down
let-7c	lung cancer	down	mir-133b	esophageal squamous cell carcinoma	down	mir-182	gastric adenocarcinoma	down	mir-24	laryngeal squamous cell carcinoma	down	mir-376a	glioblastoma	down
let-7c	nasopharyngeal carcinoma	down	mir-133b	gastric cancer	down	mir-182	gastric cancer	down	mir-24	osteosarcoma	down	mir-376a	hepatocellular carcinoma	down
let-7c	nasopharyngeal carcinoma	down	mir-133b	gastric cancer	down	mir-182	lung cancer	down	mir-24-3p	colorectal cancer	down	mir-376a	malignant melanoma	down
let-7c	neuroblastoma	down	mir-133b	gastric cancer	down	mir-182	uveal melanoma	down	mir-25	colon cancer	down	mir-376c	malignant melanoma	down
let-7c	non-small cell lung cancer	down	mir-133b	gastric cancer	down	mir-182-5p	renal cell carcinoma	down	mir-25	prostate cancer	down	mir-376c	osteosarcoma	down
let-7c	pancreatic ductal adenocarcinoma	down	mir-133b	lung cancer	down	mir-182b	breast cancer	down	mir-26a	acute myeloid leukemia	down	mir-376c	osteosarcoma	down

let-7c	prostate cancer	down	mir-133b	prostate cancer	down	mir-1826	kidney cancer	down	mir-26a	bladder cancer	down	mir-377	hepatocellular carcinoma	down
let-7c	prostate cancer	down	mir-134	endometrial cancer	down	mir-183	breast cancer	down	mir-26a	breast cancer	down	mir-377	renal clear cell carcinoma	down
let-7c	renal clear cell carcinoma	down	mir-134	hepatocellular carcinoma	down	mir-183	gastric cancer	down	mir-26a	breast cancer	down	mir-378	colorectal cancer	down
let-7d	breast cancer	down	mir-135a	pancreatic ductal adenocarcinoma	down	mir-183	gastric cancer	down	mir-26a	breast cancer	down	mir-378	colorectal cancer	down
let-7d	bronchioloalveolar carcinoma	down	mir-135a	prostate cancer	down	mir-183	osteosarcoma	down	mir-26a	chronic myelogenous leukemia	down	mir-378	gastric cancer	down
let-7d	colon cancer	down	mir-135a	renal cell carcinoma	down	mir-183	retinoblastoma	down	mir-26a	gastric cancer	down	mir-378	gastric cancer	down
let-7d	esophageal squamous cell carcinoma	down	mir-135a-5p	clear cell renal cell cancer	down	mir-184	glioma	down	mir-26a	hepatocellular carcinoma	down	mir-378	nasopharyngeal carcinoma	down
let-7d	esophageal squamous cell carcinoma	down	mir-136	chondrosarcoma	down	mir-184	glioma	down	mir-26a	hepatocellular carcinoma	down	mir-378	renal cell carcinoma	down
let-7d	head and neck squamous cell carcinoma	down	mir-136	glioblastoma	down	mir-184	malignant melanoma	down	mir-26a	hepatocellular carcinoma	down	mir-378a-3p	colorectal cancer	down
let-7d	hepatocellular carcinoma	down	mir-136	glioma	down	mir-184	neuroblastoma	down	mir-26a	hepatocellular carcinoma	down	mir-378a-5p	colorectal cancer	down
let-7d	lung cancer	down	mir-136	oral squamous cell carcinoma	down	mir-184	neuroblastoma	down	mir-26a	hepatocellular carcinoma	down	mir-379	breast cancer	down
let-7d	lung cancer	down	mir-137	anaplastic astrocytoma	down	mir-184	non-small cell lung cancer	down	mir-26a	hepatocellular carcinoma	down	mir-381	breast cancer	down
let-7d	lung cancer	down	mir-137	colorectal cancer	down	mir-185	breast cancer	down	mir-26a	hepatocellular carcinoma	down	mir-381	lung adenocarcinoma	down
let-7d	nasopharyngeal carcinoma	down	mir-137	colorectal cancer	down	mir-185	breast cancer	down	mir-26a	lung cancer	down	mir-382	osteosarcoma	down
let-7d	neuroblastoma	down	mir-137	gastric cancer	down	mir-185	esophageal squamous cell carcinoma	down	mir-26a	malignant melanoma	down	mir-382	osteosarcoma	down
let-7d	oral cancer	down	mir-137	glioblastoma	down	mir-185	gastric cancer	down	mir-26a	oral squamous cell carcinoma	down	mir-383	breast cancer	down
let-7d	pancreatic ductal adenocarcinoma	down	mir-137	glioblastoma	down	mir-185	glioma	down	mir-26a	osteosarcoma	down	mir-383	glioma	down
let-7d	pancreatic ductal adenocarcinoma	down	mir-137	glioblastoma	down	mir-185	hepatocellular carcinoma	down	mir-26a	papillary thyroid carcinoma	down	mir-383	glioma	down
let-7d	renal cell carcinoma	down	mir-137	glioblastoma	down	mir-185	malignant melanoma	down	mir-26a	primary thyroid lymphoma	down	mir-383	glioma	down
let-7e	breast cancer	down	mir-137	glioblastoma	down	mir-186	colon carcinoma	down	mir-26a	prostate cancer	down	mir-383	medulloblastoma	down

let-7e	bronchioloalveolar carcinoma	down	mir-137	glioma	down	mir-186	non-small cell lung cancer	down	mir-26a	prostate cancer	down	mir-3928	osteosarcoma	down
let-7e	colon cancer	down	mir-137	hepatocellular carcinoma	down	mir-186	non-small cell lung cancer	down	mir-26b	breast cancer	down	mir-409-3p	bladder cancer	down
let-7e	esophageal squamous cell carcinoma	down	mir-137	hepatocellular carcinoma	down	mir-187	prostate cancer	down	mir-26b	breast cancer	down	mir-409-3p	colorectal cancer	down
let-7e	esophageal squamous cell carcinoma	down	mir-137	multiple myeloma	down	mir-188-5p	hepatocellular carcinoma	down	mir-26b	breast cancer	down	mir-409-3p	gastric cancer	down
let-7e	hepatocellular carcinoma	down	mir-137	neuroblastoma	down	mir-188-5p	prostate cancer	down	mir-26b	colorectal cancer	down	mir-409-3p	gastric cancer	down
let-7e	lung cancer	down	mir-137	non-small cell lung cancer	down	mir-18a	bladder cancer	down	mir-26b	glioma	down	mir-409-3p	lung adenocarcinoma	down
let-7e	lung cancer	down	mir-137	ovarian cancer	down	mir-18a	colorectal cancer	down	mir-26b	hepatocellular carcinoma	down	mir-409-3p	ovarian cancer	down
let-7e	lung cancer	down	mir-137	uveal melanoma	down	mir-18b	malignant melanoma	down	mir-26b	lung cancer	down	mir-410	gastric cancer	down
let-7e	nasopharyngeal carcinoma	down	mir-138	anaplastic thyroid carcinoma	down	mir-191	breast cancer	down	mir-26b	non-small cell lung cancer	down	mir-410	oral squamous cell carcinoma	down
let-7e	neuroblastoma	down	mir-138	chronic lymphocytic leukemia	down	mir-191	colorectal cancer	down	mir-26b	oral squamous cell carcinoma	down	mir-410	pancreatic cancer	down
let-7e	pancreatic ductal adenocarcinoma	down	mir-138	chronic myelogenous leukemia	down	mir-192	bladder cancer	down	mir-26b	osteosarcoma	down	mir-411	ovarian cancer	down
let-7f	glioma	down	mir-138	colorectal cancer	down	mir-192	bladder cancer	down	mir-26b	osteosarcoma	down	mir-422a	colorectal cancer	down
let-7f	hepatocellular carcinoma	down	mir-138	esophageal squamous cell carcinoma	down	mir-192	colon cancer	down	mir-26b	prostate cancer	down	mir-422a	hepatocellular carcinoma	down
let-7f-1	breast cancer	down	mir-138	head and neck squamous cell carcinoma	down	mir-192	colorectal cancer	down	mir-27a	acute leukemia	down	mir-424	cervical cancer	down
let-7f-1	bronchioloalveolar carcinoma	down	mir-138	head and neck squamous cell carcinoma	down	mir-192	colorectal cancer	down	mir-27a	colorectal cancer	down	mir-424	chronic lymphocytic leukemia	down
let-7f-1	colon cancer	down	mir-138	head and neck squamous cell carcinoma	down	mir-192	epithelial ovarian cancer	down	mir-27a	esophageal squamous cell carcinoma	down	mir-424	colon cancer	down
let-7f-1	esophageal squamous cell carcinoma	down	mir-138	hepatocellular carcinoma	down	mir-192	lung cancer	down	mir-27a	esophageal squamous cell carcinoma	down	mir-424	endometrial cancer	down
let-7f-1	esophageal squamous cell carcinoma	down	mir-138	lung cancer	down	mir-193a	epithelial ovarian cancer	down	mir-27a	glioma	down	mir-424	hepatocellular carcinoma	down
let-7f-1	hepatocellular carcinoma	down	mir-138	nasopharyngeal carcinoma	down	mir-193a-3p	breast cancer	down	mir-27a	non-small cell lung cancer	down	mir-424	osteosarcoma	down

let-7f-1	lung cancer	down	mir-138	non-small cell lung cancer	down	mir-193a-3p	lung cancer	down	mir-27a	small cell lung cancer	down	mir-424-5p	hepatocellular carcinoma	down
let-7f-1	lung cancer	down	mir-138	non-small cell lung cancer	down	mir-193a-5p	colorectal cancer	down	mir-27a*	head and neck squamous cell carcinoma	down	mir-425	breast cancer	down
let-7f-1	lung cancer	down	mir-138	non-small cell lung cancer	down	mir-193b	breast cancer	down	mir-27b	non-small cell lung cancer	down	mir-429	bladder cancer	down
let-7f-1	nasopharyngeal carcinoma	down	mir-138	oral squamous cell carcinoma	down	mir-193b	hepatocellular carcinoma	down	mir-28-3p	colorectal cancer	down	mir-429	breast cancer	down
let-7f-1	neuroblastoma	down	mir-138	ovarian cancer	down	mir-193b	malignant melanoma	down	mir-28-5p	colorectal cancer	down	mir-429	colon cancer	down
let-7f-1	pancreatic ductal adenocarcinoma	down	mir-138	papillary thyroid carcinoma	down	mir-193b	non-small cell lung cancer	down	mir-28-5p	renal cell carcinoma	down	mir-429	colorectal carcinoma	down
let-7f-2	breast cancer	down	mir-138	renal cell carcinoma	down	mir-193b	primary cns lymphomas	down	mir-29a	acute myeloid leukemia	down	mir-429	gastric cancer	down
let-7f-2	bronchioloalveolar carcinoma	down	mir-138	renal clear cell carcinoma	down	mir-194	colorectal cancer	down	mir-29a	cervical squamous cell carcinoma	down	mir-429	lung adenocarcinoma	down
let-7f-2	colon cancer	down	mir-138	small cell lung cancer	down	mir-194	colorectal cancer	down	mir-29a	gastric cancer	down	mir-429	mesenchymal cancer	down
let-7f-2	esophageal squamous cell carcinoma	down	mir-139	colorectal cancer	down	mir-194	gastric cancer	down	mir-29a	gastric cancer	down	mir-429	non-small cell lung cancer	down
let-7f-2	esophageal squamous cell carcinoma	down	mir-139	colorectal cancer	down	mir-194	gastric cancer	down	mir-29a	gastric cancer	down	mir-429	oral squamous cell carcinoma	down
let-7f-2	hepatocellular carcinoma	down	mir-139	colorectal carcinoma	down	mir-194	lung cancer	down	mir-29a	gastric cancer	down	mir-429	osteosarcoma	down
let-7f-2	lung cancer	down	mir-139	glioma	down	mir-194	osteosarcoma	down	mir-29a	gastric cancer	down	mir-429	ovarian cancer	down
let-7f-2	lung cancer	down	mir-139	hepatocellular carcinoma	down	mir-195	adrenal cortical carcinoma	down	mir-29a	head and neck squamous cell carcinoma	down	mir-429	ovarian cancer	down
let-7f-2	lung cancer	down	mir-139	hepatocellular carcinoma	down	mir-195	adrenal cortical carcinoma	down	mir-29a	hepatocellular carcinoma	down	mir-429	renal cell carcinoma	down
let-7f-2	nasopharyngeal carcinoma	down	mir-139	hepatocellular carcinoma	down	mir-195	bladder cancer	down	mir-29a	hepatocellular carcinoma	down	mir-432	ovarian cancer	down
let-7f-2	neuroblastoma	down	mir-139-5p	colorectal cancer	down	mir-195	breast cancer	down	mir-29a	hepatocellular carcinoma	down	mir-433	gastric cancer	down
let-7f-2	pancreatic ductal adenocarcinoma	down	mir-139-5p	glioblastoma	down	mir-195	breast cancer	down	mir-29a	hepatocellular carcinoma	down	mir-433	gastric cancer	down
let-7g	breast cancer	down	mir-139-5p	hepatocellular carcinoma	down	mir-195	breast cancer	down	mir-29a	mantle cell lymphoma	down	mir-433	hepatocellular carcinoma	down
let-7g	breast cancer	down	mir-140	esophageal cancer	down	mir-195	chronic lymphocytic leukemia	down	mir-29a	mesenchymal cancer	down	mir-433	liver cancer	down

let-7g	bronchioloalveolar carcinoma	down	mir-140	non-small cell lung cancer	down	mir-195	chronic lymphocytic leukemia	down	mir-29a	monocytic leukemia	down	mir-433	oral squamous cell carcinoma	down
let-7g	colon cancer	down	mir-140-5p	colorectal cancer	down	mir-195	colorectal cancer	down	mir-29a	neuroblastoma	down	mir-4458	hepatocellular carcinoma	down
let-7g	esophageal squamous cell carcinoma	down	mir-140-5p	hepatocellular carcinoma	down	mir-195	colorectal cancer	down	mir-29a	non-small cell lung cancer	down	mir-448	hepatocellular carcinoma	down
let-7g	esophageal squamous cell carcinoma	down	mir-140-5p	liver cancer	down	mir-195	colorectal cancer	down	mir-29a	oral squamous cell carcinoma	down	mir-4487	colorectal cancer	down
let-7g	gastric cancer	down	mir-141	bladder cancer	down	mir-195	esophageal squamous cell carcinoma	down	mir-29a-3p	gastric cancer	down	mir-449	gastric cancer	down
let-7g	hepatocellular carcinoma	down	mir-141	gastric cancer	down	mir-195	gastric cancer	down	mir-29b	chronic lymphocytic leukemia	down	mir-449a	endometrial cancer	down
let-7g	hepatocellular carcinoma	down	mir-141	gastric cancer	down	mir-195	glioblastoma	down	mir-29b	colorectal cancer	down	mir-449a	gastric adenocarcinoma	down
let-7g	lung cancer	down	mir-141	gastric cancer	down	mir-195	glioma	down	mir-29b	esophageal squamous cell carcinoma	down	mir-449a	gastric cancer	down
let-7g	lung cancer	down	mir-141	gastric cancer	down	mir-195	hepatocellular carcinoma	down	mir-29b	gastric cancer	down	mir-449a	gastric cancer	down
let-7g	lung cancer	down	mir-141	hepatocellular carcinoma	down	mir-195	hepatocellular carcinoma	down	mir-29b	gastric cancer	down	mir-449a	glioblastoma	down
let-7g	nasopharyngeal carcinoma	down	mir-141	hepatocellular carcinoma	down	mir-195	hepatocellular carcinoma	down	mir-29b	glioblastoma	down	mir-449a	lung cancer	down
let-7g	neuroblastoma	down	mir-141	hepatocellular carcinoma	down	mir-195	lung cancer	down	mir-29b	lung adenocarcinoma	down	mir-449a	lung cancer	down
let-7g	pancreatic ductal adenocarcinoma	down	mir-141	lung adenocarcinoma	down	mir-195	lung cancer	down	mir-29b	mantle cell lymphoma	down	mir-449a	neuroblastoma	down
let-7g-5p	glioblastoma	down	mir-141	mesenchymal cancer	down	mir-195	non-small cell lung cancer	down	mir-29b	monocytic leukemia	down	mir-449a	non-small cell lung cancer	down
let-7i	breast cancer	down	mir-141	osteosarcoma	down	mir-195	non-small cell lung cancer	down	mir-29b	non-small cell lung cancer	down	mir-449a	non-small cell lung cancer	down
let-7i	bronchioloalveolar carcinoma	down	mir-141	ovarian cancer	down	mir-195	non-small cell lung cancer	down	mir-29b	non-small cell lung cancer	down	mir-449a	osteosarcoma	down
let-7i	colon cancer	down	mir-141	pancreatic cancer	down	mir-195	osteosarcoma	down	mir-29b	non-small cell lung cancer	down	mir-449a	ovarian cancer	down
let-7i	esophageal squamous cell carcinoma	down	mir-141	renal cell carcinoma	down	mir-195	osteosarcoma	down	mir-29b	osteosarcoma	down	mir-449a	prostate cancer	down
let-7i	esophageal squamous cell carcinoma	down	mir-141	renal clear cell carcinoma	down	mir-195	papillary thyroid carcinoma	down	mir-29b	prostate cancer	down	mir-449a	prostate cancer	down
let-7i	hepatocellular carcinoma	down	mir-142-3p	acute lymphoblastic leukemia	down	mir-195-5p	hepatocellular carcinoma	down	mir-29b-1	gastric cancer	down	mir-449b	lung cancer	down

let-7i	hepatocellular carcinoma	down	mir-142-3p	colon cancer	down	mir-199a	colorectal cancer	down	mir-29b-1	head and neck squamous cell carcinoma	down	mir-4500	non-small cell lung cancer	down
let-7i	lung cancer	down	mir-142-3p	glioblastoma	down	mir-197	esophageal cancer	down	mir-29b-1	hepatocellular carcinoma	down	mir-450a	hepatocellular carcinoma	down
let-7i	lung cancer	down	mir-142-3p	hepatocellular carcinoma	down	mir-197	gastric cancer	down	mir-29b-1	hepatocellular carcinoma	down	mir-450b-3p	breast cancer	down
let-7i	lung cancer	down	mir-142-3p	mantle cell lymphoma	down	mir-197	hepatocellular carcinoma	down	mir-29b-1	hepatocellular carcinoma	down	mir-451	bladder cancer	down
let-7i	nasopharyngeal carcinoma	down	mir-142-3p	osteosarcoma	down	mir-197	multiple myeloma	down	mir-29b-1	mesenchymal cancer	down	mir-451	colorectal carcinoma	down
let-7i	neuroblastoma	down	mir-142-5p	lung cancer	down	mir-197	uterine leiomyoma	down	mir-29b-1-5p	mesenchymal cancer	down	mir-451	esophageal carcinoma	down
let-7i	ovarian cancer	down	mir-142-5p	mantle cell lymphoma	down	mir-1974	adrenal cortical carcinoma	down	mir-29b-2	gastric cancer	down	mir-451	glioma	down
let-7i	pancreatic ductal adenocarcinoma	down	mir-142-5p	osteosarcoma	down	mir-198	colorectal cancer	down	mir-29b-2	head and neck squamous cell carcinoma	down	mir-451	glioma	down
mir-1	bladder cancer	down	mir-143	bladder cancer	down	mir-198	hepatocellular carcinoma	down	mir-29b-2	hepatocellular carcinoma	down	mir-451	hepatocellular carcinoma	down
mir-1	bladder cancer	down	mir-143	bladder cancer	down	mir-198	lung cancer	down	mir-29b-2	hepatocellular carcinoma	down	mir-451	hepatocellular carcinoma	down
mir-1	chordoma	down	mir-143	bladder cancer	down	mir-198	pancreatic cancer	down	mir-29b-2	hepatocellular carcinoma	down	mir-451	hepatocellular carcinoma	down
mir-1	chordoma	down	mir-143	breast cancer	down	mir-199a	chondrosarcoma	down	mir-29b-2	mesenchymal cancer	down	mir-451	lung adenocarcinoma	down
mir-1	colorectal cancer	down	mir-143	cervical cancer	down	mir-199a	hepatocellular carcinoma	down	mir-29c	bladder cancer	down	mir-451	nasopharyngeal carcinoma	down
mir-1	esophageal squamous cell carcinoma	down	mir-143	colon cancer	down	mir-199a	hepatocellular carcinoma	down	mir-29c	esophageal squamous cell carcinoma	down	mir-451	non-small cell lung cancer	down
mir-1	gastric cancer	down	mir-143	colon cancer	down	mir-199a	hepatocellular carcinoma	down	mir-29c	gastric cancer	down	mir-451	non-small cell lung cancer	down
mir-1	head and neck squamous cell carcinoma	down	mir-143	colon cancer	down	mir-199a	hepatocellular carcinoma	down	mir-29c	gastric cancer	down	mir-451	non-small cell lung cancer	down
mir-1	head and neck squamous cell carcinoma	down	mir-143	colon cancer	down	mir-199a	kidney cancer	down	mir-29c	gastric cancer	down	mir-451	osteosarcoma	down
mir-1	hepatocellular carcinoma	down	mir-143	colon cancer	down	mir-199a	non-small cell lung cancer	down	mir-29c	gastric cancer	down	mir-451	osteosarcoma	down
mir-1	kidney cancer	down	mir-143	colorectal cancer	down	mir-199a	ovarian cancer	down	mir-29c	gastric cancer	down	mir-451	osteosarcoma	down
mir-1	lung cancer	down	mir-143	colorectal cancer	down	mir-199a	ovarian cancer	down	mir-29c	gastric cancer	down	mir-451a	hypopharyngeal squamous cell carcinoma	down

mir-1	nasopharyngeal carcinoma	down	mir-143	colorectal cancer	down	mir-199a	primary cns lymphomas	down	mir-29c	gastric cancer	down	mir-452	glioma	down
mir-1	non-small cell lung cancer	down	mir-143	colorectal cancer	down	mir-199a-3p	gastric cancer	down	mir-29c	glioma	down	mir-454	esophageal cancer	down
mir-1	osteosarcoma	down	mir-143	colorectal cancer	down	mir-199a-3p	glioma	down	mir-29c	head and neck squamous cell carcinoma	down	mir-454	osteosarcoma	down
mir-1	renal cell carcinoma	down	mir-143	colorectal cancer	down	mir-199a-3p	kidney cancer	down	mir-29c	hepatocellular carcinoma	down	mir-455	colon cancer	down
mir-100	breast cancer	down	mir-143	colorectal carcinoma	down	mir-199a-3p	osteosarcoma	down	mir-29c	hepatocellular carcinoma	down	mir-4723-5p	prostate cancer	down
mir-100	breast cancer	down	mir-143	colorectal carcinoma	down	mir-199a-3p	osteosarcoma	down	mir-29c	hepatocellular carcinoma	down	mir-4782-3p	non-small cell lung cancer	down
mir-100	cervical carcinoma	down	mir-143	colorectal carcinoma	down	mir-199a-3p	osteosarcoma	down	mir-29c	hepatocellular carcinoma	down	mir-483	colorectal cancer	down
mir-100	chondrosarcoma	down	mir-143	endometrial cancer	down	mir-199a-3p	papillary thyroid carcinoma	down	mir-29c	hepatocellular carcinoma	down	mir-483-5p	glioblastoma	down
mir-100	chondrosarcoma	down	mir-143	esophageal squamous cell carcinoma	down	mir-199a-3p	renal cell carcinoma	down	mir-29c	hepatocellular carcinoma	down	mir-483-5p	glioma	down
mir-100	colon cancer	down	mir-143	gastric cancer	down	mir-199a-5p	colorectal cancer	down	mir-29c	lung cancer	down	mir-484	colon cancer	down
mir-100	colorectal cancer	down	mir-143	gastric cancer	down	mir-199a-5p	hepatocellular carcinoma	down	mir-29c	mantle cell lymphoma	down	mir-485-5p	hepatocellular carcinoma	down
mir-100	colorectal cancer	down	mir-143	gastric cancer	down	mir-199a-5p	hepatocellular carcinoma	down	mir-29c	mesenchymal cancer	down	mir-486	esophageal cancer	down
mir-100	esophageal squamous cell carcinoma	down	mir-143	glioblastoma	down	mir-199a-5p	hepatocellular carcinoma	down	mir-29c	nasopharyngeal cancer	down	mir-486-3p	retinoblastoma	down
mir-100	esophageal squamous cell carcinoma	down	mir-143	glioma	down	mir-199b	choriocarcinoma	down	mir-29c	nasopharyngeal carcinoma	down	mir-486-5p	hepatocellular carcinoma	down
mir-100	glioblastoma	down	mir-143	hepatocellular carcinoma	down	mir-199b	follicular thyroid carcinoma	down	mir-29c	non-small cell lung cancer	down	mir-486-5p	lung cancer	down
mir-100	hepatocellular carcinoma	down	mir-143	malignant melanoma	down	mir-199b	hepatocellular carcinoma	down	mir-29c	pancreatic cancer	down	mir-490-3p	gastric cancer	down
mir-100	hepatocellular carcinoma	down	mir-143	nasopharyngeal carcinoma	down	mir-199b	hepatocellular carcinoma	down	mir-300	breast cancer	down	mir-490-5p	bladder cancer	down
mir-100	mesenchymal cancer	down	mir-143	nasopharyngeal carcinoma	down	mir-199b	prostate cancer	down	mir-300	head and neck squamous cell carcinoma	down	mir-490-5p	bladder cancer	down
mir-100	non-small cell lung cancer	down	mir-143	non-small cell lung cancer	down	mir-199b-5p	breast cancer	down	mir-301a	endometrial cancer	down	mir-491-5p	cervical cancer	down
mir-100	oral squamous cell carcinoma	down	mir-143	non-small cell lung cancer	down	mir-199b-5p	hepatocellular carcinoma	down	mir-301b	endometrial cancer	down	mir-493	bladder cancer	down
mir-100	osteosarcoma	down	mir-143	osteosarcoma	down	mir-199b-5p	medulloblastoma	down	mir-302a	colon cancer	down	mir-494	breast cancer	down

mir-100	ovarian cancer	down	mir-143	osteosarcoma	down	mir-199b-5p	mesenchymal cancer	down	mir-302a	prostate cancer	down	mir-494	esophageal squamous cell carcinoma	down
mir-100	ovarian carcinoma	down	mir-143	pancreatic ductal adenocarcinoma	down	mir-19a-3p	breast cancer	down	mir-302b	esophageal squamous cell carcinoma	down	mir-494	gastric cancer	down
mir-100	prostate cancer	down	mir-143	prostate cancer	down	mir-200a	bladder cancer	down	mir-302b	gastric adenocarcinoma	down	mir-494	oral cancer	down
mir-101	bladder cancer	down	mir-143	prostate cancer	down	mir-200a	breast cancer	down	mir-302b	hepatocellular carcinoma	down	mir-494	ovarian cancer	down
mir-101	bladder cancer	down	mir-143	prostate cancer	down	mir-200a	gastric adenocarcinoma	down	mir-302b	hepatocellular carcinoma	down	mir-494	pancreatic ductal adenocarcinoma	down
mir-101	cervical carcinoma	down	mir-143	prostate cancer	down	mir-200a	gastric adenocarcinoma	down	mir-302c	hepatocellular carcinoma	down	mir-495	breast cancer	down
mir-101	cholangiocarcinoma	down	mir-143	renal cell carcinoma	down	mir-200a	glioma	down	mir-30a	breast cancer	down	mir-495	glioma	down
mir-101	colon cancer	down	mir-144	bladder cancer	down	mir-200a	hepatocellular carcinoma	down	mir-30a	breast cancer	down	mir-497	adrenal cortical carcinoma	down
mir-101	colon cancer	down	mir-144	cholangiocarcinoma	down	mir-200a	hepatocellular carcinoma	down	mir-30a	breast cancer	down	mir-497	breast cancer	down
mir-101	colorectal cancer	down	mir-144	gastric cancer	down	mir-200a	hepatocellular carcinoma	down	mir-30a	breast cancer	down	mir-497	cervical cancer	down
mir-101	endometrial cancer	down	mir-144	hepatocellular carcinoma	down	mir-200a	hepatocellular carcinoma	down	mir-30a	chondrosarcoma	down	mir-497	colorectal cancer	down
mir-101	endometrial cancer	down	mir-144	lung cancer	down	mir-200a	lung adenocarcinoma	down	mir-30a	colorectal carcinoma	down	mir-497	colorectal cancer	down
mir-101	esophageal squamous cell carcinoma	down	mir-144	osteosarcoma	down	mir-200a	meningioma	down	mir-30a	hepatocellular carcinoma	down	mir-497	gastric cancer	down
mir-101	gastric cancer	down	mir-144	osteosarcoma	down	mir-200a	mesenchymal cancer	down	mir-30a	non-small cell lung cancer	down	mir-497	hepatocellular carcinoma	down
mir-101	gastric cancer	down	mir-144	pancreatic ductal adenocarcinoma	down	mir-200a	neuroblastoma	down	mir-30a	non-small cell lung cancer	down	mir-497	kidney cancer	down
mir-101	gastric cancer	down	mir-144	thyroid cancer	down	mir-200a	ovarian cancer	down	mir-30a	prostate cancer	down	mir-497	non-small cell lung cancer	down
mir-101	gastric cancer	down	mir-144	uveal melanoma	down	mir-200a	pancreatic ductal adenocarcinoma	down	mir-30a	renal cell carcinoma	down	mir-497	ovarian cancer	down
mir-101	glioblastoma	down	mir-145	bladder cancer	down	mir-200a	renal cell carcinoma	down	mir-30a-3p	colorectal cancer	down	mir-497	ovarian cancer	down

mir-101	glioblastoma	down	mir-145	bladder cancer	down	mir-200b	astrocytoma	down	mir-30a-3p	hepatocellular carcinoma	down	mir-497	pancreatic cancer	down
mir-101	hepatocellular carcinoma	down	mir-145	bladder cancer	down	mir-200b	bladder cancer	down	mir-30a-5p	colon carcinoma	down	mir-497	pancreatic cancer	down
mir-101	hepatocellular carcinoma	down	mir-145	bladder cancer	down	mir-200b	breast cancer	down	mir-30a-5p	gastric cancer	down	mir-497	prostate cancer	down
mir-101	hepatocellular carcinoma	down	mir-145	bladder cancer	down	mir-200b	breast cancer	down	mir-30b	colorectal cancer	down	mir-498	colorectal cancer	down
mir-101	hepatocellular carcinoma	down	mir-145	bladder cancer	down	mir-200b	cholangiocarcinoma	down	mir-30b	esophageal cancer	down	mir-498	ovarian cancer	down
mir-101	hepatocellular carcinoma	down	mir-145	breast cancer	down	mir-200b	esophageal squamous cell carcinoma	down	mir-30b	gastric cancer	down	mir-498	ovarian cancer	down
mir-101	liver cancer	down	mir-145	breast cancer	down	mir-200b	gastric cancer	down	mir-30b	non-small cell lung cancer	down	mir-499a-5p	oral squamous cell carcinoma	down
mir-101	lung cancer	down	mir-145	breast cancer	down	mir-200b	glioma	down	mir-30b	prostate cancer	down	mir-502	colon cancer	down
mir-101	malignant melanoma	down	mir-145	breast cancer	down	mir-200b	glioma	down	mir-30c	acute myeloid leukemia	down	mir-502-5p	breast cancer	down
mir-101	nasopharyngeal carcinoma	down	mir-145	cervical cancer	down	mir-200b	glioma	down	mir-30c	endometrial cancer	down	mir-503	colon cancer	down
mir-101	non-small cell lung cancer	down	mir-145	cervical cancer	down	mir-200b	hepatocellular carcinoma	down	mir-30c	endometrial cancer	down	mir-503	gastric cancer	down
mir-101	non-small cell lung cancer	down	mir-145	chondrosarcoma	down	mir-200b	lung adenocarcinoma	down	mir-30c	non-small cell lung cancer	down	mir-505	gastric cancer	down
mir-101	osteosarcoma	down	mir-145	colon cancer	down	mir-200b	mesenchymal cancer	down	mir-30c	non-small cell lung cancer	down	mir-505	glioblastoma	down
mir-101	ovarian carcinoma	down	mir-145	colon cancer	down	mir-200b	nasopharyngeal carcinoma	down	mir-30c	renal cell carcinoma	down	mir-505	hepatocellular carcinoma	down
mir-101	pancreatic cancer	down	mir-145	colon cancer	down	mir-200b	ovarian cancer	down	mir-30c-1	prostate cancer	down	mir-505	non-small cell lung cancer	down
mir-101	papillary thyroid carcinoma	down	mir-145	colon cancer	down	mir-200b	pancreatic ductal adenocarcinoma	down	mir-30c-2	prostate cancer	down	mir-505	oral squamous cell carcinoma	down
mir-101	papillary thyroid carcinoma	down	mir-145	colorectal cancer	down	mir-200b	prostate cancer	down	mir-30d	non-small cell lung cancer	down	mir-505	osteosarcoma	down
mir-101	prostate cancer	down	mir-145	colorectal cancer	down	mir-200b	prostate cancer	down	mir-30d	prostate cancer	down	mir-504	hypopharyngeal squamous cell carcinoma	down
mir-101	retinoblastoma	down	mir-145	colorectal cancer	down	mir-200b	tongue cancer	down	mir-30d	prostate cancer	down	mir-504	hypopharyngeal squamous cell carcinoma	down
mir-103a	gastric cancer	down	mir-145	colorectal cancer	down	mir-200c	bladder cancer	down	mir-30d	renal cell carcinoma	down	mir-506	gastric cancer	down

mir-105	hepatocellular carcinoma	down	mir-145	colorectal cancer	down	mir-200c	breast cancer	down	mir-30d-5p	non-small cell lung cancer	down	mir-506	hepatocellular carcinoma	down
mir-105	prostate cancer	down	mir-145	colorectal cancer	down	mir-200c	cholangiocarcinoma	down	mir-30e	chronic myelogenous leukemia	down	mir-506	nasopharyngeal carcinoma	down
mir-106a	cervical squamous cell carcinoma	down	mir-145	colorectal cancer	down	mir-200c	colon cancer	down	mir-30e	prostate cancer	down	mir-506	oral squamous cell carcinoma	down
mir-106a	glioblastoma	down	mir-145	colorectal carcinoma	down	mir-200c	colorectal cancer	down	mir-30e-5p	non-small cell lung cancer	down	mir-506	renal clear cell carcinoma	down
mir-106a	glioma	down	mir-145	endometrial cancer	down	mir-200c	gastric cancer	down	mir-31	breast cancer	down	mir-506	renal clear cell carcinoma	down
mir-106a	non-small cell lung cancer	down	mir-145	esophageal squamous cell carcinoma	down	mir-200c	gastric cancer	down	mir-31	breast cancer	down	mir-508-3p	kidney cancer	down
mir-106a*	renal cell carcinoma	down	mir-145	esophageal squamous cell carcinoma	down	mir-200c	head and neck squamous cell carcinoma	down	mir-31	chordoma	down	mir-509-3p	kidney cancer	down
mir-106a-5p	clear cell renal cell cancer	down	mir-145	esophageal squamous cell carcinoma	down	mir-200c	hepatocellular carcinoma	down	mir-31	chronic myelogenous leukemia	down	mir-509-3p	renal cell carcinoma	down
mir-107	acute promyelocytic leukemia	down	mir-145	esophageal squamous cell carcinoma	down	mir-200c	hepatocellular carcinoma	down	mir-31	gastric cancer	down	mir-509-5p	renal cell carcinoma	down
mir-107	breast cancer	down	mir-145	gastric cancer	down	mir-200c	lung adenocarcinoma	down	mir-31	glioblastoma	down	mir-511	lung adenocarcinoma	down
mir-107	glioma	down	mir-145	gastric cancer	down	mir-200c	malignant melanoma	down	mir-31	glioblastoma	down	mir-512-3p	non-small cell lung cancer	down
mir-107	glioma	down	mir-145	glioblastoma	down	mir-200c	malignant melanoma	down	mir-31	liver cancer	down	mir-513b	gastric cancer	down
mir-107	glioma	down	mir-145	glioblastoma	down	mir-200c	malignant melanoma	down	mir-31	malignant melanoma	down	mir-517a	breast cancer	down
mir-107	head and neck squamous cell carcinoma	down	mir-145	glioma	down	mir-200c	mesenchymal cancer	down	mir-31	malignant melanoma	down	mir-518a-3p	colorectal cancer	down
mir-107	head and neck squamous cell carcinoma	down	mir-145	glioma	down	mir-200c	ovarian cancer	down	mir-31	medulloblastoma	down	mir-518b	esophageal squamous cell carcinoma	down
mir-107	non-small cell lung cancer	down	mir-145	glioma	down	mir-200c	ovarian cancer	down	mir-31	prostate cancer	down	mir-519d	hepatocellular carcinoma	down
mir-107	prostate carcinoma	down	mir-145	glioma	down	mir-200c	pancreatic ductal adenocarcinoma	down	mir-31	prostate cancer	down	mir-519d	osteosarcoma	down
mir-10a	breast cancer	down	mir-145	hepatocellular carcinoma	down	mir-200c	renal clear cell carcinoma	down	mir-3189-3p	astrocytoma	down	mir-519d	ovarian cancer	down
mir-10a	chronic myelogenous	down	mir-145	hepatocellular carcinoma	down	mir-200c	renal clear cell carcinoma	down	mir-3189-3p	glioblastoma	down	mir-520a	hepatocellular carcinoma	down

	leukemia													
mir-10a	gastric cancer	down	mir-145	hepatocellular carcinoma	down	mir-202	follicular lymphoma	down	mir-32	non-small cell lung cancer	down	mir-520a-3p	non-small cell lung cancer	down
mir-10b	breast cancer	down	mir-145	hepatocellular carcinoma	down	mir-202	hepatocellular carcinoma	down	mir-32	non-small cell lung cancer	down	mir-520b	hepatocellular carcinoma	down
mir-10b	gastric cancer	down	mir-145	hepatocellular carcinoma	down	mir-202-3p	colorectal carcinoma	down	mir-32	oral squamous cell carcinoma	down	mir-520c-3p	hepatocellular carcinoma	down
mir-1180	bladder cancer	down	mir-145	hepatocellular carcinoma	down	mir-202-3p	gastric cancer	down	mir-32	osteosarcoma	down	mir-520d-3p	gastric cancer	down
mir-1181	pancreatic cancer	down	mir-145	kidney cancer	down	mir-203	basal cell carcinoma	down	mir-320	colon cancer	down	mir-526b	non-small cell lung cancer	down
mir-1207-5p	gastric cancer	down	mir-145	liver cancer	down	mir-203	bladder cancer	down	mir-320	glioblastoma	down	mir-532-5p	ovarian carcinoma	down
mir-122	breast cancer	down	mir-145	lung adenocarcinoma	down	mir-203	bladder cancer	down	mir-320	glioma	down	mir-532-5p	retinoblastoma	down
mir-122	breast cancer	down	mir-145	lung adenocarcinoma	down	mir-203	cervical cancer	down	mir-320	osteosarcoma	down	mir-542-3p	gastric cancer	down
mir-122	gastric cancer	down	mir-145	lung adenocarcinoma	down	mir-203	cervical cancer	down	mir-320a	colon cancer	down	mir-543	endometrial cancer	down
mir-122	glioma	down	mir-145	lung adenocarcinoma	down	mir-203	colorectal cancer	down	mir-320a	colorectal cancer	down	mir-545	lung cancer	down
mir-122	hepatocellular carcinoma	down	mir-145	lung adenocarcinoma	down	mir-203	esophageal adenocarcinoma	down	mir-320a	colorectal cancer	down	mir-551a	colorectal cancer	down
mir-122	hepatocellular carcinoma	down	mir-145	lung cancer	down	mir-203	esophageal cancer	down	mir-320a	colorectal cancer	down	mir-564	chronic myelogenous leukemia	down
mir-122	hepatocellular carcinoma	down	mir-145	lung cancer	down	mir-203	esophageal cancer	down	mir-320a	glioblastoma	down	mir-573	malignant melanoma	down
mir-122	hepatocellular carcinoma	down	mir-145	nasopharyngeal carcinoma	down	mir-203	esophageal squamous cell carcinoma	down	mir-320a	nasopharyngeal carcinoma	down	mir-574-3p	breast cancer	down
mir-122	hepatocellular carcinoma	down	mir-145	nasopharyngeal carcinoma	down	mir-203	esophageal squamous cell carcinoma	down	mir-320c	bladder cancer	down	mir-574-3p	esophageal cancer	down
mir-122	hepatocellular carcinoma	down	mir-145	nasopharyngeal carcinoma	down	mir-203	glioma	down	mir-323-5p	oral squamous cell carcinoma	down	mir-574-5p	colorectal cancer	down
mir-122	hepatocellular carcinoma	down	mir-145	neuroblastoma	down	mir-203	hepatocellular carcinoma	down	mir-324-3p	nasopharyngeal carcinoma	down	mir-576-3p	bladder cancer	down
mir-122	hepatocellular carcinoma	down	mir-145	non-small cell lung cancer	down	mir-203	kidney cancer	down	mir-324-3p	nasopharyngeal carcinoma	down	mir-577	glioblastoma	down
mir-122	liver cancer	down	mir-145	non-small cell lung cancer	down	mir-203	laryngeal squamous cell carcinoma	down	mir-326	chronic myelogenous leukemia	down	mir-582-5p	hepatocellular carcinoma	down

mir-122	osteosarcoma	down	mir-145	non-small cell lung cancer	down	mir-203	lung cancer	down	mir-326	glioblastoma	down	mir-584	glioma	down
mir-1228*	gastric cancer	down	mir-145	non-small cell lung cancer	down	mir-203	lung cancer	down	mir-326	glioma	down	mir-590-5p	hepatocellular carcinoma	down
mir-122a	gastrointestinal cancer	down	mir-145	non-small cell lung cancer	down	mir-203	malignant melanoma	down	mir-326	glioma	down	mir-608	chordoma	down
mir-122a	hepatocellular carcinoma	down	mir-145	oral squamous cell carcinoma	down	mir-203	malignant melanoma	down	mir-326	glioma	down	mir-610	hepatocellular carcinoma	down
mir-122a	hepatocellular carcinoma	down	mir-145	oral squamous cell carcinoma	down	mir-203	malignant melanoma	down	mir-328	colorectal cancer	down	mir-610	lung cancer	down
mir-122a	hepatocellular carcinoma	down	mir-145	osteosarcoma	down	mir-203	malignant melanoma	down	mir-328	gastric cancer	down	mir-612	hepatocellular carcinoma	down
mir-1236	bladder cancer	down	mir-145	osteosarcoma	down	mir-203	pancreatic cancer	down	mir-328	glioma	down	mir-613	papillary thyroid carcinoma	down
mir-1236	hepatocellular carcinoma	down	mir-145	osteosarcoma	down	mir-203	prostate cancer	down	mir-329	gastric cancer	down	mir-614	lung cancer	down
mir-124	anaplastic astrocytoma	down	mir-145	ovarian cancer	down	mir-203	prostate cancer	down	mir-329	oral squamous cell carcinoma	down	mir-615-5p	pancreatic cancer	down
mir-124	breast cancer	down	mir-145	ovarian cancer	down	mir-203	rhabdomyosarcoma	down	mir-330	glioblastoma	down	mir-615-5p	pancreatic ductal adenocarcinoma	down
mir-124	breast cancer	down	mir-145	ovarian cancer	down	mir-203	squamous carcinoma	down	mir-330	prostate cancer	down	mir-615-5p	pancreatic ductal adenocarcinoma	down
mir-124	breast cancer	down	mir-145	ovarian cancer	down	mir-204	gastric cancer	down	mir-330	prostate cancer	down	mir-622	gastric cancer	down
mir-124	breast cancer	down	mir-145	ovarian cancer	down	mir-204	glioma	down	mir-331-3p	gastric cancer	down	mir-622	glioma	down
mir-124	breast cancer	down	mir-145	pancreatic cancer	down	mir-204	malignant melanoma	down	mir-331-3p	glioblastoma	down	mir-625	colorectal cancer	down
mir-124	breast cancer	down	mir-145	pancreatic ductal adenocarcinoma	down	mir-204	nasopharyngeal carcinoma	down	mir-331-3p	prostate cancer	down	mir-625	gastric cancer	down
mir-124	breast cancer	down	mir-145	primary cns lymphomas	down	mir-204	non-small cell lung cancer	down	mir-331-3p	prostate cancer	down	mir-625	hepatocellular carcinoma	down
mir-124	cervical squamous cell carcinoma	down	mir-145	prostate cancer	down	mir-204	non-small cell lung cancer	down	mir-335	adrenal cortical carcinoma	down	mir-625*	non-small cell lung cancer	down
mir-124	colorectal cancer	down	mir-145	prostate cancer	down	mir-204	osteosarcoma	down	mir-335	breast cancer	down	mir-627	colonic adenocarcinoma	down
mir-124	colorectal cancer	down	mir-145	prostate cancer	down	mir-204	renal clear cell carcinoma	down	mir-335	breast cancer	down	mir-628-5p	prostate cancer	down
mir-124	colorectal cancer	down	mir-145	prostate cancer	down	mir-204	retinoblastoma	down	mir-335	breast cancer	down	mir-630	lung cancer	down

mir-124	colorectal cancer	down	mir-145	prostate cancer	down	mir-204-3p	hepatocellular carcinoma	down	mir-335	cervical cancer	down	mir-630	pancreatic cancer	down
mir-124	colorectal cancer	down	mir-145	renal cell carcinoma	down	mir-204-5p	colorectal cancer	down	mir-335	chondrosarcoma	down	mir-632	oral squamous cell carcinoma	down
mir-124	colorectal cancer	down	mir-145	renal cell carcinoma	down	mir-204-5p	gastric cancer	down	mir-335	hepatocellular carcinoma	down	mir-637	hepatocellular carcinoma	down
mir-124	colorectal cancer	down	mir-145	uveal melanoma	down	mir-204-5p	papillary thyroid carcinoma	down	mir-335	hepatocellular carcinoma	down	mir-638	breast cancer	down
mir-124	colorectal cancer	down	mir-1469	lung cancer	down	mir-205	bladder cancer	down	mir-335	mesenchymal cancer	down	mir-638	colorectal cancer	down
mir-124	esophageal cancer	down	mir-146a	breast cancer	down	mir-205	breast cancer	down	mir-335	neuroblastoma	down	mir-638	gastric cancer	down
mir-124	gastric cancer	down	mir-146a	breast cancer	down	mir-205	breast cancer	down	mir-335	non-small cell lung cancer	down	mir-638	gastric cancer	down
mir-124	gastric cancer	down	mir-146a	chronic myelogenous leukemia	down	mir-205	breast cancer	down	mir-335	osteosarcoma	down	mir-642a-5p	prostate cancer	down
mir-124	gastric cancer	down	mir-146a	gastric cancer	down	mir-205	endometrial cancer	down	mir-335	ovarian cancer	down	mir-646	oral squamous cell carcinoma	down
mir-124	glioblastoma	down	mir-146a	gastric cancer	down	mir-205	gastric cancer	down	mir-335	ovarian cancer	down	mir-646	osteosarcoma	down
mir-124	glioblastoma	down	mir-146a	gastric cancer	down	mir-205	glioma	down	mir-335	pancreatic cancer	down	mir-646	renal cell carcinoma	down
mir-124	glioma	down	mir-146a	glioma	down	mir-205	glioma	down	mir-335	primary gallbladder carcinoma	down	mir-655	esophageal squamous cell carcinoma	down
mir-124	glioma	down	mir-146a	hepatocellular carcinoma	down	mir-205	head and neck squamous cell carcinoma	down	mir-335	renal clear cell carcinoma	down	mir-655	ovarian cancer	down
mir-124	glioma	down	mir-146a	hepatocellular carcinoma	down	mir-205	hepatocellular carcinoma	down	mir-335-5p	gastric cancer	down	mir-656	glioma	down
mir-124	hepatocellular carcinoma	down	mir-146a	hepatocellular carcinoma	down	mir-205	hepatocellular carcinoma	down	mir-337	pancreatic ductal adenocarcinoma	down	mir-660	lung cancer	down
mir-124	hepatocellular carcinoma	down	mir-146a	lung cancer	down	mir-205	kidney cancer	down	mir-338	gastric cancer	down	mir-663	gastric cancer	down
mir-124	hepatocellular carcinoma	down	mir-146a	malignant melanoma	down	mir-205	laryngeal squamous cell carcinoma	down	mir-338	oral squamous cell carcinoma	down	mir-663	glioblastoma	down
mir-124	medulloblastoma	down	mir-146a	non-small cell lung cancer	down	mir-205	malignant melanoma	down	mir-338-3p	colorectal cancer	down	mir-668	oral squamous cell carcinoma	down
mir-124	nasopharyngeal carcinoma	down	mir-146a	non-small cell lung cancer	down	mir-205	malignant melanoma	down	mir-338-3p	colorectal carcinoma	down	mir-675	hepatocellular carcinoma	down
mir-124	neuroblastoma	down	mir-146a	pancreatic cancer	down	mir-205	malignant melanoma	down	mir-338-3p	gastric cancer	down	mir-7	breast cancer	down

mir-124	non-small cell lung cancer	down	mir-146a	pancreatic cancer	down	mir-205	prostate cancer	down	mir-338-3p	gastric cancer	down	mir-7	cervical cancer	down
mir-124	non-small cell lung cancer	down	mir-146a	papillary thyroid carcinoma	down	mir-205	prostate cancer	down	mir-338-3p	gastric cancer	down	mir-7	colorectal cancer	down
mir-124	non-small cell lung cancer	down	mir-146a	prostate cancer	down	mir-205	prostate cancer	down	mir-338-3p	hepatocellular carcinoma	down	mir-7	epithelial ovarian cancer	down
mir-124	oral squamous cell carcinoma	down	mir-146a	prostate cancer	down	mir-205	prostate cancer	down	mir-338-3p	hepatocellular carcinoma	down	mir-7	gastric cancer	down
mir-124	osteosarcoma	down	mir-146a-5p	gastric cancer	down	mir-205	prostate cancer	down	mir-338-3p	hepatocellular carcinoma	down	mir-7	glioblastoma	down
mir-124	osteosarcoma	down	mir-146b	breast cancer	down	mir-205	prostate cancer	down	mir-338-3p	liver cancer	down	mir-7	glioblastoma	down
mir-124	ovarian cancer	down	mir-146b	breast cancer	down	mir-205	renal cell carcinoma	down	mir-338-3p	neuroblastoma	down	mir-7	glioblastoma	down
mir-124	pancreatic cancer	down	mir-146b	glioma	down	mir-205	squamous carcinoma	down	mir-338-3p	non-small cell lung cancer	down	mir-7	glioma	down
mir-124	prostate cancer	down	mir-146b	malignant melanoma	down	mir-206	breast cancer	down	mir-339-5p	breast cancer	down	mir-7	glioma	down
mir-124-3p	astrocytoma	down	mir-146b	non-small cell lung cancer	down	mir-206	clear cell renal cell cancer	down	mir-33a	hepatocellular carcinoma	down	mir-7	hepatocellular carcinoma	down
mir-124-3p	bladder cancer	down	mir-146b-5p	gallbladder carcinoma	down	mir-206	colorectal cancer	down	mir-33a	lung cancer	down	mir-7	hepatocellular carcinoma	down
mir-124-3p	gastric cancer	down	mir-146b-5p	glioblastoma	down	mir-206	gastric cancer	down	mir-33a	malignant melanoma	down	mir-7	hepatocellular carcinoma	down
mir-124-3p	glioma	down	mir-146b-5p	glioma	down	mir-206	gastric cancer	down	mir-33b	breast cancer	down	mir-7-5p	glioblastoma	down
mir-1247	pancreatic cancer	down	mir-147	breast cancer	down	mir-206	gastric cancer	down	mir-33b	osteosarcoma	down	mir-7-5p	glioblastoma	down
mir-124a	acute lymphoblastic leukemia	down	mir-147	oral squamous cell carcinoma	down	mir-206	gastric cancer	down	mir-340	glioblastoma	down	mir-7-5p	malignant melanoma	down
mir-124a	epithelial ovarian cancer	down	mir-148a	breast cancer	down	mir-206	hepatocellular carcinoma	down	mir-340	glioblastoma	down	mir-720	acute myeloid leukemia	down
mir-124a	glioblastoma	down	mir-148a	cervical squamous cell carcinoma	down	mir-206	hepatocellular carcinoma	down	mir-340	non-small cell lung cancer	down	mir-720	breast cancer	down
mir-124a	glioma	down	mir-148a	colorectal cancer	down	mir-206	laryngeal squamous cell carcinoma	down	mir-340	osteosarcoma	down	mir-7515	lung cancer	down
mir-1250	oral squamous cell carcinoma	down	mir-148a	gastric cancer	down	mir-206	malignant melanoma	down	mir-342	acute promyelocytic leukemia	down	mir-765	prostate cancer	down
mir-1258	breast cancer	down	mir-148a	gastric cancer	down	mir-206	medulloblastoma	down	mir-342	colorectal cancer	down	mir-873	breast cancer	down
mir-1258	breast cancer	down	mir-148a	gastric cancer	down	mir-206	oral squamous cell carcinoma	down	mir-342	glioblastoma	down	mir-873	glioblastoma	down

mir-125a	colorectal cancer	down	mir-148a	gastric cancer	down	mir-20a	acute myeloid leukemia	down	mir-342-3p	cervical cancer	down	mir-874	breast cancer	down
mir-125a	glioblastoma	down	mir-148a	gastric cancer	down	mir-20a	hepatocellular carcinoma	down	mir-342-3p	non-small cell lung cancer	down	mir-874	gastric cancer	down
mir-125a-3p	gastric cancer	down	mir-148a	gastric cancer	down	mir-20a	malignant melanoma	down	mir-345	colorectal cancer	down	mir-874	gastric cancer	down
mir-125a-3p	non-small cell lung cancer	down	mir-148a	gastrointestinal cancer	down	mir-21	colon cancer	down	mir-34a	b-cell lymphoma	down	mir-874	head and neck squamous cell carcinoma	down
mir-125a-3p	non-small cell lung cancer	down	mir-148a	hepatocellular carcinoma	down	mir-21	esophageal squamous cell carcinoma	down	mir-34a	bladder cancer	down	mir-877	hepatocellular carcinoma	down
mir-125a-5p	breast cancer	down	mir-148a	hepatocellular carcinoma	down	mir-21	glioblastoma	down	mir-34a	breast cancer	down	mir-877	oral squamous cell carcinoma	down
mir-125a-5p	glioblastoma	down	mir-148a	nasopharyngeal carcinoma	down	mir-21	hepatocellular carcinoma	down	mir-34a	breast cancer	down	mir-885-5p	neuroblastoma	down
mir-125a-5p	non-small cell lung cancer	down	mir-148a	non-small cell lung cancer	down	mir-21-3p	hepatocellular carcinoma	down	mir-34a	breast cancer	down	mir-886-3p	thyroid cancer	down
mir-125b	bladder cancer	down	mir-148a	non-small cell lung cancer	down	mir-210	esophageal squamous cell carcinoma	down	mir-34a	breast cancer	down	mir-886-5p	cervical carcinoma	down
mir-125b	bladder cancer	down	mir-148a	non-small cell lung cancer	down	mir-210	esophageal squamous cell carcinoma	down	mir-34a	breast cancer	down	mir-9	gastric adenocarcinoma	down
mir-125b	breast cancer	down	mir-148a	oral squamous cell carcinoma	down	mir-210	esophageal squamous cell carcinoma	down	mir-34a	cervical carcinoma	down	mir-9	gastric cancer	down
mir-125b	breast cancer	down	mir-148a	ovarian cancer	down	mir-210	gastric cancer	down	mir-34a	chordoma	down	mir-9	gastric cancer	down
mir-125b	breast cancer	down	mir-148a	ovarian cancer	down	mir-211	breast cancer	down	mir-34a	choriocarcinoma	down	mir-9	gastric cancer	down
mir-125b	breast cancer	down	mir-148a	pancreatic cancer	down	mir-211	hepatocellular carcinoma	down	mir-34a	choriocarcinoma	down	mir-9	gastric cancer	down
mir-125b	breast cancer	down	mir-148a	pancreatic ductal adenocarcinoma	down	mir-211	malignant melanoma	down	mir-34a	colon cancer	down	mir-9	gastric cancer	down
mir-125b	chronic lymphocytic leukemia	down	mir-148a	pancreatic ductal adenocarcinoma	down	mir-211	malignant melanoma	down	mir-34a	colon cancer	down	mir-9	malignant melanoma	down
mir-125b	glioblastoma	down	mir-148a	pancreatic ductal adenocarcinoma	down	mir-211	malignant melanoma	down	mir-34a	colorectal cancer	down	mir-9	nasopharyngeal carcinoma	down
mir-125b	glioma	down	mir-148b	colorectal cancer	down	mir-211	malignant melanoma	down	mir-34a	colorectal cancer	down	mir-9	oral squamous cell carcinoma	down

mir-125b	hepatocellular carcinoma	down	mir-148b	gastric cancer	down	mir-212	colorectal cancer	down	mir-34a	colorectal cancer	down	mir-9	ovarian cancer	down
mir-125b	hepatocellular carcinoma	down	mir-148b	hepatocellular carcinoma	down	mir-212	gastric cancer	down	mir-34a	endometrial cancer	down	mir-9	uveal melanoma	down
mir-125b	hepatocellular carcinoma	down	mir-148b	hepatocellular carcinoma	down	mir-212	gastric cancer	down	mir-34a	esophageal squamous cell carcinoma	down	mir-92a	breast cancer	down
mir-125b	hepatocellular carcinoma	down	mir-148b	liver cancer	down	mir-212	hepatocellular carcinoma	down	mir-34a	gastric cancer	down	mir-92a	breast cancer	down
mir-125b	hepatocellular carcinoma	down	mir-148b	non-small cell lung cancer	down	mir-212	non-small cell lung cancer	down	mir-34a	gastric cancer	down	mir-92a	breast cancer	down
mir-125b	hepatocellular carcinoma	down	mir-148b	non-small cell lung cancer	down	mir-212	osteosarcoma	down	mir-34a	gastric cancer	down	mir-93	colon cancer	down
mir-125b	malignant melanoma	down	mir-148b	non-small cell lung cancer	down	mir-212	ovarian cancer	down	mir-34a	gastric cancer	down	mir-93	colorectal carcinoma	down
mir-125b	malignant melanoma	down	mir-148b	pancreatic cancer	down	mir-212	prostate cancer	down	mir-34a	gastric cancer	down	mir-940	hepatocellular carcinoma	down
mir-125b	oral squamous cell carcinoma	down	mir-148b	pancreatic cancer	down	mir-212-3p	glioblastoma	down	mir-34a	gastric cancer	down	mir-940	prostate cancer	down
mir-125b	osteosarcoma	down	mir-149	breast cancer	down	mir-214	bladder cancer	down	mir-34a	glioblastoma	down	mir-941	hepatocellular carcinoma	down
mir-125b	ovarian cancer	down	mir-149	colorectal cancer	down	mir-214	cervical cancer	down	mir-34a	glioblastoma	down	mir-9500	lung cancer	down
mir-125b	ovarian cancer	down	mir-149	gastric cancer	down	mir-214	cervical cancer	down	mir-34a	glioblastoma	down	mir-96	non-small cell lung cancer	down
mir-125b	ovarian cancer	down	mir-149	glioblastoma	down	mir-214	cervical squamous cell carcinoma	down	mir-34a	glioma	down	mir-96	pancreatic cancer	down
mir-126	bladder cancer	down	mir-149	head and neck squamous cell carcinoma	down	mir-214	colon cancer	down	mir-34a	glioma	down	mir-96-5p	colorectal cancer	down
mir-126	breast cancer	down	mir-149	non-small cell lung cancer	down	mir-214	esophageal squamous cell carcinoma	down	mir-34a	glioma	down	mir-98	breast cancer	down
mir-126	colon cancer	down	mir-150	chronic myelogenous leukemia	down	mir-214	hepatocellular carcinoma	down	mir-34a	head and neck squamous cell carcinoma	down	mir-98	bronchioloalveolar carcinoma	down
mir-126	colon cancer	down	mir-150	esophageal squamous cell carcinoma	down	mir-214	hepatocellular carcinoma	down	mir-34a	hepatocellular carcinoma	down	mir-98	colon cancer	down
mir-126	colon cancer	down	mir-150	mantle cell lymphoma	down	mir-214	hepatocellular carcinoma	down	mir-34a	hepatocellular carcinoma	down	mir-98	esophageal squamous cell carcinoma	down
mir-126	colorectal cancer	down	mir-150	pancreatic ductal adenocarcinoma	down	mir-214	multiple myeloma	down	mir-34a	hepatocellular carcinoma	down	mir-98	esophageal squamous cell carcinoma	down
mir-126	colorectal cancer	down	mir-150*	pancreatic cancer	down	mir-214	pancreatic cancer	down	mir-34a	hepatocellular carcinoma	down	mir-98	esophageal squamous cell carcinoma	down

mir-126	colorectal cancer	down	mir-150-5p	colorectal cancer	down	mir-214	primary cns lymphomas	down	mir-34a	hepatocellular carcinoma	down	mir-98	glioma	down
mir-126	colorectal cancer	down	mir-150-5p	hepatocellular carcinoma	down	mir-215	colon cancer	down	mir-34a	lung cancer	down	mir-98	hepatocellular carcinoma	down
mir-126	esophageal cancer	down	mir-150-5p	pancreatic cancer	down	mir-215	colorectal cancer	down	mir-34a	malignant melanoma	down	mir-98	lung cancer	down
mir-126	esophageal squamous cell carcinoma	down	mir-151	chronic myelogenous leukemia	down	mir-215	colorectal cancer	down	mir-34a	malignant melanoma	down	mir-98	lung cancer	down
mir-126	gastric cancer	down	mir-152	breast cancer	down	mir-215	colorectal cancer	down	mir-34a	malignant melanoma	down	mir-98	lung cancer	down
mir-126	gastric cancer	down	mir-152	endometrial cancer	down	mir-216a	pancreatic cancer	down	mir-34a	malignant melanoma	down	mir-98	malignant melanoma	down
mir-126	gastric cancer	down	mir-152	gastric cancer	down	mir-216a	pancreatic cancer	down	mir-34a	neuroblastoma	down	mir-98	nasopharyngeal carcinoma	down
mir-126	gastric cancer	down	mir-152	gastrointestinal cancer	down	mir-216b	breast cancer	down	mir-34a	neuroblastoma	down	mir-98	neuroblastoma	down
mir-126	gastric cancer	down	mir-152	glioblastoma	down	mir-216b	nasopharyngeal carcinoma	down	mir-34a	non-small cell lung cancer	down	mir-98	ovarian cancer	down
mir-126	hepatocellular carcinoma	down	mir-152	glioma	down	mir-216b	nasopharyngeal carcinoma	down	mir-34a	non-small cell lung cancer	down	mir-98	pancreatic ductal adenocarcinoma	down
mir-126	hepatocellular carcinoma	down	mir-152	non-small cell lung cancer	down	mir-217	gastric cancer	down	mir-34a	oral cancer	down	mir-99a	bladder cancer	down
mir-126	malignant mesothelioma	down	mir-152	non-small cell lung cancer	down	mir-217	hepatocellular carcinoma	down	mir-34a	osteosarcoma	down	mir-99a	bladder cancer	down
mir-126	non-small cell lung cancer	down	mir-152	ovarian cancer	down	mir-217	lung cancer	down	mir-34a	osteosarcoma	down	mir-99a	breast cancer	down
mir-126	non-small cell lung cancer	down	mir-152	pancreatic cancer	down	mir-217	osteosarcoma	down	mir-34a	osteosarcoma	down	mir-99a	cervical cancer	down
mir-126	non-small cell lung cancer	down	mir-153	breast cancer	down	mir-217	osteosarcoma	down	mir-34a	ovarian cancer	down	mir-99a	cervical carcinoma	down
mir-126	non-small cell lung cancer	down	mir-153	glioblastoma	down	mir-217	pancreatic ductal adenocarcinoma	down	mir-34a	ovarian cancer	down	mir-99a	esophageal squamous cell carcinoma	down
mir-126	non-small cell lung cancer	down	mir-153	lung cancer	down	mir-217	pancreatic ductal adenocarcinoma	down	mir-34a	pancreatic cancer	down	mir-99a	hepatocellular carcinoma	down
mir-126	oral squamous cell carcinoma	down	mir-153	non-small cell lung cancer	down	mir-217	pancreatic ductal adenocarcinoma	down	mir-34a	pancreatic cancer	down	mir-99a	hepatocellular carcinoma	down
mir-126	osteosarcoma	down	mir-153	osteosarcoma	down	mir-218	bladder cancer	down	mir-34a	prostate cancer	down	mir-99a	lung adenocarcinoma	down

mir-126	osteosarcoma	down	mir-153	ovarian cancer	down	mir-218	breast cancer	down	mir-34a	prostate cancer	down	mir-99a	mesenchymal cancer	down
mir-126	pancreatic ductal adenocarcinoma	down	mir-154	colorectal cancer	down	mir-218	cervical cancer	down	mir-34a	prostate cancer	down	mir-99a	non-small cell lung cancer	down
mir-126	renal cell carcinoma	down	mir-154	non-small cell lung cancer	down	mir-218	cervical cancer	down	mir-34a	renal cell carcinoma	down	mir-99a	non-small cell lung cancer	down
mir-126	small cell lung cancer	down	mir-154	prostate cancer	down	mir-218	cervical squamous cell carcinoma	down	mir-34a	renal cell carcinoma	down	mir-99b	cervical cancer	down
mir-126*	non-small cell lung cancer	down	mir-155	bladder cancer	down	mir-218	choriocarcinoma	down	mir-34a	renal cell carcinoma	down	mir-99b	cervical carcinoma	down
mir-1266	gastric cancer	down	mir-155	chronic myelogenous leukemia	down	mir-218	colorectal cancer	down	mir-34a	retinoblastoma	down	mir-99b	lung cancer	down
mir-127	breast cancer	down	mir-155	gastric cancer	down	mir-218	colorectal cancer	down	mir-34a	uveal melanoma	down	mmu-mir-290-3p	breast cancer	down
mir-127	breast cancer	down	mir-155	gastric cancer	down	mir-218	esophageal cancer	down	mir-34a-5p	colorectal cancer	down	mmu-mir-290-5p	breast cancer	down
mir-127	gastric cancer	down	mir-155	malignant melanoma	down	mir-218	esophageal squamous cell carcinoma	down	mir-34b	breast cancer	down	mir-133b	renal cell carcinoma	down cell lines.
									mir-34b	breast cancer	down	mir-29b	gastric cancer	down

Table 4. List of examples of oncogenic miRNA relationships to cancer.

miR	Cancer	Exp.	Reference	miR	Cancer	Exp.	Reference	miR	Cancer	Exp.	Reference
let-7a	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-193b	malignant melanoma	up	miR-193b Regulates Mcl-1 in Melanoma.	mir-223	glioblastoma	up	microRNA-223 promotes the growth and invasion of glioblastoma cells by targeting tumor suppressor PAX6.
let-7a	papillary thyroid carcinoma	up	Circulating microRNA profiles as potential biomarkers for diagnosis of papillary thyroid carcinoma.	mir-194	pancreatic ductal adenocarcinoma	up	Upregulation of miR-194 contributes to tumor growth and progression in pancreatic ductal adenocarcinoma.	mir-223	hepatocellular carcinoma	up	Circulating microRNAs, miR-21, miR-122, and miR-223, in patients with hepatocellular carcinoma or chronic hepatitis
mir-100	esophageal squamous cell carcinoma	up	MicroRNA-100 promotes migration and invasion through mammalian target of rapamycin in esophageal squamous cell carcinoma.	mir-195	neuroblastoma	up	miR-15a/16-1 enhances retinoic acid-mediated differentiation of leukemic cells and is up-regulated by retinoic acid.	mir-223	kidney cancer	up	[Expression of miR-223 in clear cell renal cell carcinoma and its significance]
mir-100	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-195-5p	osteosarcoma	up	Identification of a plasma four-microRNA panel as potential noninvasive biomarker for osteosarcoma.	mir-223-3p	prostate cancer	up	MiR-223-3p targeting SEPT6 promotes the biological behavior of prostate cancer.
mir-100	renal cell carcinoma	up	Overexpression of microRNA-100 predicts an unfavorable prognosis in renal cell carcinoma.	mir-196a	breast cancer	up	MicroRNA-196a post-transcriptionally upregulates the UBE2C proto-oncogene and promotes cell proliferation in breast cancer.	mir-224	breast cancer	up	MicroRNA-224 targets RKIP to control cell invasion and expression of metastasis genes in human breast cancer cells.
mir-101	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-196a	cervical cancer	up	MicroRNA-196a promotes cervical cancer proliferation through the regulation of FOXO1 and p27(Kip1).	mir-224	cervical cancer	up	Upregulation of microRNA-224 is associated with aggressive progression and poor prognosis in human cervical cancer.
mir-103	colorectal cancer	up	PER3, a novel target of miR-103, plays a suppressive role in colorectal cancer in vitro.	mir-196a	colorectal cancer	up	Upregulation of microRNA-196a and microRNA-196b cooperatively correlate with aggressive progression and unfavorable prognosis in patients with colorectal cancer.	mir-224	colorectal cancer	up	Up-regulation of miR-224 promotes cancer cell proliferation and invasion and predicts relapse of colorectal cancer.
mir-103	colorectal cancer	up	MicroRNA-103 Promotes Colorectal Cancer by Targeting Tumor Suppressor DICER and PTEN.	mir-196a	esophageal adenocarcinoma	up	MicroRNAs in Barrett's esophagus and esophageal adenocarcinoma.	mir-224	colorectal cancer	up	Molecular biomarkers and classification models in the evaluation of the prognosis of colorectal cancer.
mir-103	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-196a	gastric cancer	up	MiR-196a Is Up-regulated in Gastric cancer and Promotes Cell proliferation by Down-regulating p27kip1.	mir-224	colorectal cancer	up	The clinical and biological significance of MIR-224 expression in colorectal cancer metastasis.
mir-103a-3p	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-196a	gastrointestinal stromal tumor	up	Upregulation of miR-196a and HOTAIR Drive Malignant Character in Gastrointestinal Stromal Tumors.	mir-224	colorectal cancer	up	microRNA-224 Promotes Cell Proliferation and Tumor Growth in Human Colorectal Cancer by Repressing PHLPP1 and PHLPP2.

mir-106a	colorectal cancer	up	[Expression of plasma miR-106a in colorectal cancer and its clinical significance]	mir-196a	glioblastoma	up	MiR-196a exerts its oncogenic effect in glioblastoma multiforme by inhibition of I?B? both in vitro and in vivo.	mir-224	gastric cancer	up	[Effect of antisense miR-224 on gastric cancer cell proliferation and apoptosis]
mir-106a	colorectal cancer	up	Candidate microRNA biomarkers in human colorectal cancer: Systematic review profiling studies and experimental validation.	mir-196a	head and neck squamous cell carcinoma	up	MicroRNA-196a promotes an oncogenic effect in head and neck cancer cells by suppressing annexin A1 and enhancing radioresistance.	mir-224	glioma	up	Upregulation of microRNA-224 confers a poor prognosis in glioma patients.
mir-106a	endometrial cancer	up	TSA Suppresses miR-106b-93-25 Cluster Expression through Downregulation of MYC and Inhibits Proliferation and Induces Apoptosis in Human EMC	mir-196a	non-small cell lung cancer	up	MicroRNA-196a promotes non-small cell lung cancer cell proliferation and invasion through targeting HOXA5.	mir-224	hepatocellular carcinoma	up	Transcriptional regulation of miR-224 upregulated in human HCCs by NF?B inflammatory pathways
mir-106a	gastric cancer	up	Circulating microRNAs in plasma of patients with gastric cancers.	mir-196a	pancreatic cancer	up	MiR-196a Promotes Pancreatic Cancer Progression by Targeting Nuclear Factor Kappa-B-Inhibitor Alpha.	mir-224	hepatocellular carcinoma	up	Androgen pathway stimulates microRNA-216a transcription to suppress the tumor suppressor in lung cancer-1 gene in early hepatocarcinogenesis.
mir-106a	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-196a	pancreatic ductal adenocarcinoma	up	MicroRNAs as diagnostic markers for pancreatic ductal adenocarcinoma and its precursor, pancreatic intraepithelial neoplasm.	mir-224	hepatocellular carcinoma	up	MicroRNA-224 is up-regulated in hepatocellular carcinoma through epigenetic mechanisms.
mir-106a	gastric cancer	up	miR-106a is frequently upregulated in gastric cancer and inhibits the extrinsic apoptotic pathway by targeting FAS.	mir-196a	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.	mir-224	hepatocellular carcinoma	up	miR-224 promotes cell migration and invasion by modulating p-PAK4 and MMP-9 via targeting HOXD10 in human hepatocellular carcinoma.
mir-106a	gastric cancer	up	Prognostic impact of circulating miR-21 in the plasma of patients with gastric carcinoma.	mir-196a*	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-224	hepatocellular carcinoma	up	MicroRNA-224 upregulation and AKT activation synergistically predict poor prognosis in patients with hepatocellular carcinoma.
mir-106a	gastric cancer	up	miR-106a confers cisplatin resistance by regulating PTEN/Akt pathway in gastric cancer cells.	mir-196a-1	glioblastoma	up	MiRNA-196 is upregulated in glioblastoma but not in anaplastic astrocytoma and has prognostic significance.	mir-224	hepatocellular carcinoma	up	Serum microRNA characterization identifies miR-885-5p as a potential marker for detecting liver pathologies.
mir-106a	gastric cancer	up	MicroRNA-106a targets TIMP2 to regulate invasion and metastasis of gastric cancer.	mir-196a-1	oral cancer	up	OncomiR-196 promotes an invasive phenotype in oral cancer through the NME4-JNK-TIMP1-MMP signaling pathway.	mir-224	meningioma	up	MicroRNA-224 targets ERG2 and contributes to malignant progressions of meningioma.
mir-106a	ovarian cancer	up	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.	mir-196a-1	oral squamous cell carcinoma	up	miR-196a Overexpression and miR-196a2 Gene Polymorphism Are Prognostic Predictors of Oral Carcinomas.	mir-224-5p	ovarian cancer	up	Expression of miR-224-5p is associated with the original cisplatin resistance of ovarian papillary serous carcinoma.

mir-106b	gastric cancer	up	Circulating microRNAs in plasma of patients with gastric cancers	mir-196a-2	glioblastoma	up	MiRNA-196 is upregulated in glioblastoma but not in anaplastic astrocytoma and has prognostic significance.	mir-23a	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.
mir-106b	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-196a-2	oral cancer	up	OncomiR-196 promotes an invasive phenotype in oral cancer through the NME4-JNK-TIMP1-MMP signaling pathway.	mir-23a	breast cancer	up	c-MYC regulated miR-23a~24-2~27a cluster promotes mammary carcinoma cell invasion and hepatic metastasis by targeting Sprouty2.
mir-106b	gastric cancer	up	Prognostic impact of circulating miR-21 in the plasma of patients with gastric carcinoma.	mir-196a-2	oral squamous cell carcinoma	up	miR-196a Overexpression and miR-196a2 Gene Polymorphism Are Prognostic Predictors of Oral Carcinomas.	mir-23a	colon carcinoma	up	[Expression and clinical significance of miR-23a and metastasis suppressor 1 in colon carcinoma].
mir-106b	glioma	up	Down-regulation of miR-106b suppresses the growth of human glioma cells.	mir-196a-5p	gastric cancer	up	Clinical significance of upregulation of mir-196a-5p in gastric cancer and enriched KEGG pathway analysis of target genes.	mir-23a	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.
mir-106b	head and neck squamous cell carcinoma	up	Comprehensive MicroRNA profiling for head and neck squamous cell carcinomas.	mir-196b	colorectal cancer	up	Upregulation of microRNA-196a and microRNA-196b cooperatively correlate with aggressive progression and unfavorable prognosis in patients with colorectal cancer.	mir-23a	gastric adenocarcinoma	up	MicroRNA-23a promotes the growth of gastric adenocarcinoma cell line MGC803 and downregulates interleukin-6 receptor
mir-106b	hepatocellular carcinoma	up	Over-expression of miR-106b promotes cell migration and metastasis in hepatocellular carcinoma by activating epithelial-mesenchymal transition process.	mir-196b	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-23a	gastric adenocarcinoma	up	miR-23a targets interferon regulatory factor 1 and modulates cellular proliferation and paclitaxel-induced apoptosis in gastric adenocarcinoma cells
mir-106b	hepatocellular carcinoma	up	Upregulation of microRNA-106b is associated with poor prognosis in hepatocellular carcinoma	mir-196b	gastric cancer	up	Transcriptional regulation of miR-196b by ETS2 in gastric cancer cells	mir-23a	gastric cancer	up	MiR-23a in Amplified 19p13.13 Loci Targets Metallothionein 2A and Promotes Growth in Gastric Cancer Cells.
mir-106b	laryngeal carcinoma	up	MiR-106b promotes cell proliferation via targeting RB in laryngeal carcinoma.	mir-196b	gastric cancer	up	Epigenetic regulation of miR-196b expression in gastric cancer.	mir-23a	gastric cancer	up	Upregulation of microRNA-23a/b promotes tumor progression and confers poor prognosis in patients with gastric cancer.
mir-106b	laryngeal carcinoma	up	MicroRNA-106b regulates the tumor suppressor RUNX3 in laryngeal carcinoma cells.	mir-196b	glioblastoma	up	MiRNA-196 is upregulated in glioblastoma but not in anaplastic astrocytoma and has prognostic significance.	mir-23a	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3
mir-106b	medulloblastoma	up	miR-106b is overexpressed in medulloblastomas and interacts directly with PTEN.	mir-196b	glioblastoma	up	Upregulation of miR-196b confers a poor prognosis in glioblastoma patients via inducing a proliferative phenotype.	mir-23a	glioma	up	Targeting microRNA-23a to inhibit glioma cell invasion via HOXD10.

mir-106b	pituitary carcinoma	up	MicroRNA involvement in a metastatic non-functioning pituitary carcinoma.	mir-196b	oral cancer	up	OncomiR-196 promotes an invasive phenotype in oral cancer through the NME4-JNK-TIMP1-MMP signaling pathway.	mir-23a	hepatocellular carcinoma	up	Stat3-mediated activation of miR-23a suppresses gluconeogenesis in hepatocellular carcinoma by downregulating G6PC and PGC-1?
mir-106b-5p	glioma	up	MicroRNA-106b-5p boosts glioma tumorigenesis by targeting multiple tumor suppressor genes.	mir-196b	oral squamous cell carcinoma	up	miR-196a Overexpression and miR-196a2 Gene Polymorphism Are Prognostic Predictors of Oral Carcinomas.	mir-23a	laryngeal cancer	up	High microRNA-23a expression in laryngeal squamous cell carcinoma is associated with poor patient prognosis
mir-107	gastric cancer	up	MicroRNA-107 promotes proliferation of gastric cancer cells by targeting cyclin dependent kinase 8	mir-197	breast cancer	up	Role of microRNAs -29b-2, -155, -197 and -205 as diagnostic biomarkers in serum of breast cancer females.	mir-23a	neuroblastoma	up	MicroRNA-23a promotes neuroblastoma cell metastasis by targeting CDH1.
mir-107	gastric cancer	up	MicroRNA-107, an oncogene microRNA that regulates tumour invasion and metastasis by targeting DICER1 in gastric cancer.	mir-197	follicular thyroid carcinoma	up	A limited set of human MicroRNA is deregulated in follicular thyroid carcinoma.	mir-23b	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers
mir-107	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3	mir-197	lung cancer	up	Differential MicroRNAs Expression in Serum of Patients with Lung Cancer, Pulmonary Tuberculosis, and Pneumonia	mir-23b	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3
mir-107	gastric cancer	up	Upregulation of MicroRNA-107 induces proliferation in human gastric cancer cells by targeting the transcription factor FOXO1.	mir-198	pancreatic ductal adenocarcinoma	up	MiR-21, miR-34a, miR-198 and miR-217 as diagnostic and prognostic biomarkers for chronic pancreatitis and pancreatic ductal adenocarcinoma.	mir-23b	gastric cancer	up	Upregulation of microRNA-23a/b promotes tumor progression and confers poor prognosis in patients with gastric cancer.
mir-10a	cervical cancer	up	MicroRNA-10a targets CHL1 and promotes cell growth, migration and invasion in human cervical cancer cells.	mir-199a	gastric cancer	up	miR-199a regulates the tumor suppressor mitogen-activated protein kinase kinase kinase 11 in gastric cancer.	mir-23b	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
mir-10a	gastric cancer	up	miRNA expression profile in primary gastric cancers and paired lymph node metastases indicates that miR-10a plays a role in metastasis from primary gastric cancer to lymph nodes.	mir-199a-3p	esophageal adenocarcinoma	up	MicroRNA 223 is Up-regulated in the Multistep Progression of Barrett's Esophagus and Modulates Sensitivity to Chemotherapy by Targeting PARP1.	mir-24	breast cancer	up	Association between mir-24 and mir-378 in formalin-fixed paraffin-embedded tissues of breast cancer.
mir-10a	pancreatic cancer	up	MicroRNA-10a is overexpressed in human pancreatic cancer and involved in its invasiveness partially via suppression of the HOXA1 gene.	mir-199a-3p	gastric cancer	up	MiR-199a-3p promotes gastric cancer progression by targeting ZHX1.	mir-24	breast carcinoma	up	MicroRNA miR-24 Enhances Tumor Invasion and Metastasis by Targeting PTPN9 and PTPRE to Promote EGF Signaling
mir-10b	bladder cancer	up	MicroRNA-10b promotes migration and invasion through KLF4 and HOXD10 in human bladder cancer.	mir-199a-3p	osteosarcoma	up	Identification of a plasma four-microRNA panel as potential noninvasive biomarker for osteosarcoma.	mir-24	glioma	up	MiR-24 regulates the proliferation and invasion of glioma by ST7L via ?-catenin/Tcf-4 signaling

mir-10b	breast cancer	up	Exosome-mediated transfer of miR-10b promotes cell invasion in breast cancer.	mir-199a-5p	esophageal adenocarcinoma	up	MicroRNA 223 is Up-regulated in the Multistep Progression of Barrett's Esophagus and Modulates Sensitivity to Chemotherapy by Targeting PARP1.	mir-24	hepatocellular carcinoma	up	MicroRNA-24 Modulates Aflatoxin B1-Related Hepatocellular Carcinoma Prognosis and Tumorigenesis.
mir-10b	colorectal cancer	up	MicroRNA-10b is upregulated and has an invasive role in colorectal cancer through enhanced Rhoc expression.	mir-199a-5p	gastric cancer	up	Up-regulated miR-199a-5p in gastric cancer functions as an oncogene and targets klotho.	mir-24	hepatocellular carcinoma	up	miR-24 promotes the proliferation and invasion of HCC cells by targeting SOX7.
mir-10b	esophageal cancer	up	MicroRNA-10b promotes migration and invasion through KLF4 in human esophageal cancer cell lines.	mir-199b-3p	esophageal adenocarcinoma	up	MicroRNA 223 is Up-regulated in the Multistep Progression of Barrett's Esophagus and Modulates Sensitivity to Chemotherapy by Targeting PARP1.	mir-24	lung cancer	up	Evaluation of dynamic change of serum miR-21 and miR-24 in pre- and post-operative lung carcinoma patients.
mir-10b	gastric cancer	up	miR-10b promotes cell invasion through RhoC-AKT signaling pathway by targeting HOXD10 in gastric cancer.	mir-199b-5p	papillary thyroid carcinoma	up	Expression profile and clinical significance of microRNAs in papillary thyroid carcinoma.	mir-24	nasopharyngeal carcinoma	up	[Clinical significance of plasma miR-24 dysregulation in nasopharyngeal carcinoma].
mir-10b	gastric cancer	up	Clinicopathologic significance of miR-10b expression in gastric carcinoma.	mir-19a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-24	non-small cell lung cancer	up	Upregulation of miR-24 promotes cell proliferation by targeting NAIF1 in non-small cell lung cancer.
mir-10b	glioblastoma	up	Oncogenic effects of miR-10b in glioblastoma stem cells.	mir-19a	bladder cancer	up	miR-19a acts as an oncogenic microRNA and is up-regulated in bladder cancer.	mir-24	non-small cell lung cancer	up	Circulating miR-22, miR-24 and miR-34a as novel predictive biomarkers to pemetrexed-based chemotherapy in advanced non small cell lung cancer.
mir-10b	glioblastoma	up	Expression of 19 microRNAs in glioblastoma and comparison with other brain neoplasia of grades I-III.	mir-19a	breast cancer	up	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.	mir-24	oral squamous cell carcinoma	up	miR-24 up-regulation in oral carcinoma: positive association from clinical and in vitro analysis.
mir-10b	glioma	up	MicroRNA-10b induces glioma cell invasion by modulating MMP-14 and uPAR expression via HOXD10.	mir-19a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.	mir-24	oral squamous cell carcinoma	up	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer.
mir-10b	hepatocellular carcinoma	up	miR-10b is overexpressed in hepatocellular carcinoma and promotes cell proliferation, migration and invasion through RhoC, uPAR and MMPs.	mir-19a	cervical cancer	up	MicroRNA-19a and -19b regulate cervical carcinoma cell proliferation and invasion by targeting CUL5.	mir-24-2-5p	breast cancer	up	c-MYC regulated miR-23a~24-2~27a cluster promotes mammary carcinoma cell invasion and hepatic metastasis by targeting Sprouty2.

mir-10b	hepatocellular carcinoma	up	MicroRNA-10b promotes migration and invasion through CADM1 in human hepatocellular carcinoma cells.	mir-19a	cholangiocarcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.	mir-24-3p	breast cancer	up	miRNA-24-3p promotes cell proliferation and inhibits apoptosis in human breast cancer by targeting p27Kip1.
mir-10b	lung cancer	up	microRNA miR-10b inhibition reduces cell proliferation and promotes apoptosis in non-small cell lung cancer (NSCLC) cells.	mir-19a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-24-3p	glioma	up	miR-24-3p and miR-27a-3p promote cell proliferation in glioma cells via cooperative regulation of MXI1.
mir-10b	nasopharyngeal carcinoma	up	Over-expression of miR-10b in NPC patients, correlation with LMP1 and Twist1.	mir-19a	esophageal squamous cell carcinoma	up		mir-25	cervical carcinoma	up	[miR-25 promotes cell proliferation by targeting RECK in human cervical carcinoma HeLa cells].
mir-10b	nasopharyngeal carcinoma	up	miR-10b Promotes Migration and Invasion in Nasopharyngeal Carcinoma Cells.	mir-19a	gastric cancer	up	MicroRNA-19a/b regulates multidrug resistance in human gastric cancer cells by targeting PTEN.	mir-25	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.
mir-10b	non-small cell lung cancer	up	microRNA miR-10b inhibition reduces cell proliferation and promotes apoptosis in non-small cell lung cancer (NSCLC) cells.	mir-19a	gastric cancer	up	miR-19a Promotes Cell Growth and Tumorigenesis through Targeting SOCS1 in Gastric Cancer.	mir-25	colorectal cancer	up	The expression of miR-25 is increased in colorectal cancer and is associated with patient prognosis.
mir-10b	non-small cell lung cancer	up	MicroRNA-10b indicates a poor prognosis of non-small cell lung cancer and targets E-cadherin.	mir-19a	gastric cancer	up	MiR-19a/b modulate the metastasis of gastric cancer cells by targeting the tumour suppressor MXD1.	mir-25	endometrial cancer	up	TSA Suppresses miR-106b-93-25 Cluster Expression through Downregulation of MYC and Inhibits Proliferation and Induces Apoptosis in Human EMC.
mir-10b	oral cancer	up	Oncogenic function and early detection potential of miRNA-10b in oral cancer as identified by microRNA profiling.	mir-19a	gastric cancer	up	MiR-19a promotes epithelial-mesenchymal transition through PI3K/AKT pathway in gastric cancer.	mir-25	esophageal squamous cell carcinoma	up	MicroRNA-25 promotes cell migration and invasion in esophageal squamous cell carcinoma.
mir-10b	pancreatic cancer	up	MicroRNA-10b is overexpressed in pancreatic cancer, promotes its invasiveness, and correlates with a poor prognosis.	mir-19a	gastric cancer	up	MiR-19a promotes epithelial-mesenchymal transition through PI3K/AKT pathway in gastric cancer.	mir-25	esophageal squamous cell carcinoma	up	Clinical significance of serum miR-223, miR-25 and miR-375 in patients with esophageal squamous cell carcinoma.
mir-10b	pancreatic cancer	up	MicroRNA-10b is overexpressed in pancreatic cancer.	mir-19a	glioma	up	miR-19a and miR-19b Overexpression in Gliomas.	mir-25	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.
mir-10b	pancreatic ductal adenocarcinoma	up	microRNAs as markers of survival and chemoresistance in pancreatic ductal adenocarcinoma.	mir-19a	glioma	up	MicroRNA-19a promotes glioma cell growth by repressing LRIG1.	mir-25	gastric cancer	up	miR-25 promotes gastric cancer cells growth and motility by targeting RECK.
mir-10b	pancreatic ductal adenocarcinoma	up	microRNA-10b enhances pancreatic cancer cell invasion by suppressing TIF30 expression and promoting EGF and TGF-? actions.	mir-19a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.	mir-25	gastric cancer	up	MicroRNA-25 promotes gastric cancer migration, invasion and proliferation by directly targeting transducer of ERBB2, 1 and correlates with poor survival.

mir-1179	colorectal cancer	up	MicroRNA expression profiles in human colorectal cancers with liver metastases	mir-19a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-25	glioma	up	miR-25 promotes glioma cell proliferation by targeting CDKN1C
mir-1179	esophageal squamous cell carcinoma	up	miR-1179 promotes cell invasion through SLIT2/ROBO1 axis in esophageal squamous cell carcinoma	mir-19a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation	mir-25	head and neck squamous cell carcinoma	up	Comprehensive MicroRNA profiling for head and neck squamous cell carcinomas
mir-122	hepatocellular carcinoma	up	Circulating microRNAs, miR-21, miR-122, and miR-223, in patients with hepatocellular carcinoma or chronic hepatitis	mir-19a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.	mir-25	hepatocellular carcinoma	up	Upregulation of microRNA-25 associates with prognosis in hepatocellular carcinoma.
mir-122	hepatocellular carcinoma	up	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-19a	medulloblastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.	mir-25	non-small cell lung cancer	up	Downregulation of miR-25 modulates non-small cell lung cancer cells by targeting CDC42
mir-122	hepatocellular carcinoma	up	Epigenetic regulation of miR-122 by PPAR? and hepatitis B virus X protein in hepatocellular carcinoma cells	mir-19a	neuroblastoma	up	MYCN-regulated microRNAs repress estrogen receptor-alpha (ESR1) expression and neuronal differentiation in human neuroblastoma.	mir-25	non-small cell lung cancer	up	miR-25 targets the modulator of apoptosis 1 gene in lung cancer.
mir-122	pituitary carcinoma	up	MicroRNA expression in ACTH-producing pituitary tumors: up-regulation of microRNA-122 and -493 in pituitary carcinomas.	mir-19a	non-small cell lung cancer	up	Serum miR-19a expression correlates with worse prognosis of patients with non-small cell lung cancer.	mir-25	ovarian cancer	up	MiR-25 regulates apoptosis by targeting Bim in human ovarian cancer.
mir-122	renal clear cell carcinoma	up	miRNA profiling for clear cell renal cell carcinoma: biomarker discovery and identification of potential controls and consequences of miRNA dysregulation.	mir-19a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.	mir-25	ovarian cancer	up	MiR-25 promotes ovarian cancer proliferation and motility by targeting LATS2.
mir-1228	hepatocellular carcinoma	up	miR-1228 promotes the proliferation and metastasis of hepatoma cells through a p53 forward feedback loop	mir-19b	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-25	small cell lung cancer	up	MicroRNA-25 regulates small cell lung cancer cell development and cell cycle through cyclin E2.
mir-1229	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-19b	breast cancer	up	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.	mir-26a	cholangiocarcinoma	up	MicroRNA-26a promotes cholangiocarcinoma growth by activating ?-catenin.

mir-1233	renal cell carcinoma	up	MicroRNAs in renal cell carcinoma: diagnostic implications of serum miR-1233 levels.	mir-19b	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.	mir-26a	glioma	up	MicroRNA-26a Promotes Tumor Growth and Angiogenesis in Glioma by Directly Targeting Prohibitin
mir-1246	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-19b	cervical cancer	up	MicroRNA-19a and -19b regulate cervical carcinoma cell proliferation and invasion by targeting CUL5.	mir-26a	ovarian cancer	up	MiR-26a promotes ovarian cancer proliferation and tumorigenesis
mir-124a	mantle cell lymphoma	up	microRNA expression profile and identification of miR-29 as a prognostic marker and pathogenetic factor by targeting CDK6 in mantle cell lymphoma	mir-19b	cholangiocarcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.	mir-26b	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers
mir-1259	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-19b	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-27a	breast cancer	up	c-MYC regulated miR-23a~24-2~27a cluster promotes mammary carcinoma cell invasion and hepatic metastasis by targeting Sprouty2
mir-125a	breast cancer	up	MicroRNA-125a influences breast cancer stem cells by targeting leukemia inhibitory factor receptor which regulates the hippo signaling pathway	mir-19b	esophageal squamous cell carcinoma	up		mir-27a	colorectal cancer	up	Novel evidence for curcumin and boswellic acid induced chemoprevention through regulation of miR-34a and miR-27a in colorectal cancer
mir-125a-5p	non-small cell lung cancer	up	Serum miR-125a-5p, miR-145 and miR-146a as diagnostic biomarkers in non-small cell lung cancer.	mir-19b	gastric cancer	up	MiR-19a/b modulate the metastasis of gastric cancer cells by targeting the tumour suppressor MXD1.	mir-27a	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue
mir-125b	acute myeloid leukemia	up	[miR-125b promotes proliferation of human acute myeloid leukemia cells by targeting Bak1].	mir-19b	gastric cancer	up	MicroRNA-19a/b regulates multidrug resistance in human gastric cancer cells by targeting PTEN.	mir-27a	gastric adenocarcinoma	up	MicroRNA-27a functions as an oncogene in gastric adenocarcinoma by targeting prohibitin.
mir-125b	follicular cancer	up	MicroRNA expression profiling is a potential diagnostic tool for thyroid cancer.	mir-19b	glioma	up	miR-19a and miR-19b Overexpression in Gliomas.	mir-27a	gastric cancer	up	Down-regulation of miR-27a might inhibit proliferation and drug resistance of gastric cancer cells.
mir-125b	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-19b	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.	mir-27a	gastric cancer	up	miR-27 promotes human gastric cancer cell metastasis by inducing epithelial-to-mesenchymal transition.
mir-125b	gastric cancer	up	MiR-125b promotes cell migration and invasion by targeting PPP1CA-Rb signal pathways in gastric cancer, resulting in a poor prognosis.	mir-19b	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.	mir-27a	hepatocellular carcinoma	up	MiR-27a promotes hepatocellular carcinoma cell proliferation through suppression of its target gene peroxisome proliferator-activated receptor γ.
mir-125b	glioblastoma	up	miR-125b promotes cell proliferation by directly targeting Lin28 in glioblastoma stem cells with low expression levels of miR-	mir-19b	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and	mir-27a	laryngeal carcinoma	up	MicroRNA-27a promotes proliferation and suppresses apoptosis by targeting PLK2 in laryngeal carcinoma

			125b.				invasion.				
mir-125b	glioma	up	miR-125b Inhibits Connexin43 and Promotes Glioma Growth.	mir-19b	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.	mir-27a	liver cancer	up	Adipose tissue-secreted miR-27a promotes liver cancer by targeting FOXO1 in obese individuals.
mir-125b	glioma	up	MiR-125b expression affects the proliferation and apoptosis of human glioma cells by targeting Bmf.	mir-19b	medulloblastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.	mir-27a	osteosarcoma	up	Diagnostic and prognostic potentials of microRNA-27a in osteosarcoma.
mir-125b	neuroblastoma	up	MicroRNA-125b is a novel negative regulator of p53.	mir-19b	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma	mir-27a	osteosarcoma	up	MicroRNA-27a Promotes Proliferation, Migration and Invasion by Targeting MAP2K4 in Human Osteosarcoma Cells.
mir-125b	oral squamous cell carcinoma	up	[Expression and clinical significance of plasma microRNA-125b level in patients with oral squamous cell carcinoma].	mir-200a	breast cancer	up	Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes metastatic colonization.	mir-27a	ovarian cancer	up	Oncogenic MicroRNA-27a is a Target for Genistein in Ovarian Cancer Cells.
mir-125b	prostate cancer	up	Widespread deregulation of microRNA expression in human prostate cancer.	mir-200a	breast cancer	up	MicroRNA-200a Promotes Anoikis Resistance and Metastasis by Targeting YAP1 in Human Breast Cancer.	mir-27a	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
mir-125b	prostate cancer	up	Oncomir miR-125b suppresses p14(ARF) to modulate p53-dependent and p53-independent apoptosis in prostate cancer.	mir-200a	esophageal adenocarcinoma	up	Gastric adenocarcinoma has a unique microRNA signature not present in esophageal adenocarcinoma	mir-27a	pancreatic cancer	up	Genistein Inhibits Cell Growth and Invasion Through Regulation of MiR-27a in Pancreatic Cancer Cells.
mir-125b-1-3p	mesenchymal cancer	up	miR-29 Acts as a Decoy in Sarcomas to Protect the Tumor Suppressor A20 mRNA from Degradation by HuR.	mir-200a	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-27a	renal cell carcinoma	up	miR-27a promotes cell proliferation and metastasis in renal cell carcinoma.
mir-125b-2*	colorectal cancer	up	MicroRNA expression profiles in human colorectal cancers with liver metastases.	mir-200a	esophageal cancer	up	miR-200a/miR-141 and miR-205 upregulation might be associated with hormone receptor status and prognosis in endometrial carcinomas.	mir-27a	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.
mir-126	gastric cancer	up	MicroRNA-126 inhibits SOX2 expression and contributes to gastric carcinogenesis.	mir-200a	malignant melanoma	up	MicroRNA-200 family members differentially regulate morphological plasticity and mode of melanoma cell invasion.	mir-27a-3p	glioma	up	miR-24-3p and miR-27a-3p promote cell proliferation in glioma cells via cooperative regulation of MXI1.

mir-126	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-200a	non-small cell lung cancer	up	MiR-200a enhances the migrations of A549 and SK-MES-1 cells by regulating the expression of TSPAN1.	mir-27b	gastric cancer	up	miR-27 promotes human gastric cancer cell metastasis by inducing epithelial-to-mesenchymal transition.
mir-126	oral squamous cell carcinoma	up	Downregulation of miR-126 induces angiogenesis and lymphangiogenesis by activation of VEGF-A in oral cancer.	mir-200a	ovarian cancer	up	Upregulation of microRNA-200a associates with tumor proliferation, CSCs phenotype and chemosensitivity in ovarian cancer.	mir-27b	glioma	up	Expression and function of miR-27b in human glioma
mir-126-5p	acute myeloid leukemia	up	Upregulation of microRNA-126-5p is associated with drug resistance to cytarabine and poor prognosis in AML patients.	mir-200b	breast cancer	up	Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes metastatic colonization.	mir-27b	glioma	up	MicroRNA-27b inhibits Spry2 expression and promotes cell invasion in glioma U251 cells.
mir-1260b	renal cell carcinoma	up	Genistein downregulates onco-miR-1260b and inhibits Wnt-signalling in renal cancer cells.	mir-200b	colorectal cancer	up	microRNA-200b and microRNA-200c promote colorectal cancer cell proliferation via targeting the reversion-inducing cysteine-rich protein with Kazal motifs	mir-27b	oral squamous cell carcinoma	up	Genomewide Study of Salivary MicroRNAs for Detection of Oral Cancer
mir-1269	hepatocellular carcinoma	up	Upregulated MiR-1269 in hepatocellular carcinoma and its clinical significance.	mir-200b	endometrial cancer	up	MicroRNA-200b is overexpressed in endometrial adenocarcinomas and enhances MMP2 activity by downregulating TIMP2 in human endometrial cancer cell line HEC-1A cells.	mir-27b	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
mir-1269	hepatocellular carcinoma	up	MicroRNA-1269 promotes proliferation in human hepatocellular carcinoma via downregulation of FOXO1	mir-200b	gastric cancer	up	MicroRNA-200b Regulates Cell Proliferation, Invasion, and Migration by Directly Targeting ZEB2 in Gastric Carcinoma.	mir-28-3p	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue
mir-1269a	colorectal cancer	up	miR-1269 promotes metastasis and forms a positive feedback loop with TGF-?.	mir-200b	malignant melanoma	up	MicroRNA-200 family members differentially regulate morphological plasticity and mode of melanoma cell invasion.	mir-296-5p	gastric cancer	up	MicroRNA-296-5p increases proliferation in gastric cancer through repression of Caudal-related homeobox 1.
mir-127-3p	glioblastoma	up	MicroRNA-127-3p promotes glioblastoma cell migration and invasion by targeting the tumor-suppressor gene SEPT7.	mir-200c	breast cancer	up	Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes metastatic colonization.	mir-29a	acute myeloid leukemia	up	microRNA-29a induces aberrant self-renewal capacity in hematopoietic progenitors, biased myeloid development, and acute myeloid leukemia
mir-1274a	gastric cancer	up	The role of microRNA-1274a in the tumorigenesis of gastric cancer: accelerating cancer cell proliferation and migration via directly targeting FOXO4	mir-200c	colon cancer	up	The roles of miR-200c in colon cancer and associated molecular mechanisms.	mir-29a	breast cancer	up	Next-generation sequencing of microRNAs for breast cancer detection.

mir-128	acute lymphoblastic leukemia	up	Distinctive microRNA signature is associated with the diagnosis and prognosis of acute leukemia.	mir-200c	colorectal cancer	up	MicroRNA-200c modulates epithelial-to-mesenchymal transition (EMT) in human colorectal cancer metastasis.	mir-29a	breast cancer	up	microRNA-29 negatively regulates EMT regulator N-myc interactor in breast cancer.
mir-128	acute myeloid leukemia	up	Distinctive microRNA signature is associated with the diagnosis and prognosis of acute leukemia.	mir-200c	colorectal cancer	up	Plasma miR-200c and miR-18a as potential biomarkers for the detection of colorectal carcinoma.	mir-29a	colorectal cancer	up	microRNA expression profile in stage III colorectal cancer: Circulating miR-18a and miR-29a as promising biomarkers.
mir-128	osteosarcoma	up	MicroRNA-128 promotes proliferation in osteosarcoma cells by downregulating PTEN.	mir-200c	colorectal cancer	up	microRNA-200b and microRNA-200c promote colorectal cancer cell proliferation via targeting the reversion-inducing cysteine-rich protein with Kazal motifs.	mir-29a	colorectal cancer	up	MicroRNA-29a promotes colorectal cancer metastasis by regulating matrix metalloproteinase 2 and E-cadherin via KLF4.
mir-1280	non-small cell lung cancer	up	Upregulation of MiR-1280 Expression in Non-small Cell Lung Cancer Tissues.	mir-200c	endometrial cancer	up	The interactions between MicroRNA-200c and BRD7 in endometrial carcinoma.	mir-29a	colorectal cancer	up	Evaluation of microRNAs-29a, 92a and 145 in colorectal carcinoma as candidate diagnostic markers: An Egyptian pilot study.
mir-128a	hepatocellular carcinoma	up	[miR-128a is up-regulated in hepatocellular carcinoma and promotes tumor cell proliferation by targeting RND3].	mir-200c	malignant melanoma	up	MicroRNA-200 family members differentially regulate morphological plasticity and mode of melanoma cell invasion.	mir-29b-1	breast cancer	up	microRNA-29 negatively regulates EMT regulator N-myc interactor in breast cancer.
mir-1290	colon cancer	up	Up-regulation of microRNA-1290 impairs cytokinesis and affects the reprogramming of colon cancer cells.	mir-200c	non-small cell lung cancer	up	Expression of microRNA miR-126 and miR-200c is associated with prognosis in patients with non-small cell lung cancer.	mir-29b-2	breast cancer	up	microRNA-29 negatively regulates EMT regulator N-myc interactor in breast cancer.
mir-1290	esophageal squamous cell carcinoma	up	MicroRNA-1290 promotes esophageal squamous cell carcinoma cell proliferation and metastasis.	mir-200c	non-small cell lung cancer	up	High expression of serum miR-21 and tumor miR-200c associated with poor prognosis in patients with lung cancer.	mir-29c	breast cancer	up	microRNA-29 negatively regulates EMT regulator N-myc interactor in breast cancer.
mir-1301	liver cancer	up	Identification of miRNAs that specifically target tumor suppressive KLF6-FL rather than oncogenic KLF6-SV1 isoform.	mir-200c	ovarian cancer	up	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.	mir-29c	non-small cell lung cancer	up	Expression of miR-29c, miR-93, and miR-429 as Potential Biomarkers for Detection of Early Stage Non-Small Lung Cancer.
mir-1303	gastric cancer	up	miR-1303 Targets Claudin-18 Gene to Modulate Proliferation and Invasion of Gastric Cancer Cells.	mir-200c	ovarian cancer	up	miR-200c modulates ovarian cancer cell metastasis potential by targeting zinc finger E-box-binding homeobox 2 (ZEB2) expression.	mir-29c	non-small cell lung cancer	up	Circulating micro-RNA expression profiles in early stage nonsmall cell lung cancer.
mir-130a	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-200c	rectal cancer	up	The quantitative analysis by stem-loop real-time PCR revealed the microRNA-34a, microRNA-155 and microRNA-200c overexpression in human colorectal cancer.	mir-300	osteosarcoma	up	Up-Regulation of MiR-300 Promotes Proliferation and Invasion of Osteosarcoma by Targeting BRD7.

mir-130a	hepatocellular carcinoma	up	Upregulated miR-130a increases drug resistance by regulating RUNX3 and Wnt signaling in cisplatin-treated HCC cell	mir-203	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers	mir-301a	colorectal cancer	up	MicroRNA-301a promotes migration and invasion by targeting TGFBR2 in human colorectal cancer.
mir-130b	colorectal cancer	up	MicroRNA-130b Promotes Tumor Development and Is Associated with Poor Prognosis in Colorectal Cancer	mir-203	breast cancer	up	Anti-miR-203 Upregulates SOCS3 Expression in Breast Cancer Cells and Enhances Cisplatin Chemosensitivity.	mir-301a	colorectal cancer	up	MiR-301a promotes colorectal cancer cell growth and invasion by directly targeting SOCS6.
mir-130b	colorectal cancer	up	MicroRNA-130b Promotes Tumor Development and Is Associated with Poor Prognosis in Colorectal Cancer	mir-203	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma	mir-301a	gastric cancer	up	Overexpressed miR-301a promotes cell proliferation and invasion by targeting RUNX3 in gastric cancer
mir-130b	esophageal squamous cell carcinoma	up	MiR-130b plays an oncogenic role by repressing PTEN expression in esophageal squamous cell carcinoma cells.	mir-203	esophageal cancer	up	Alteration of miRNA Expression Correlates with Lifestyle, Social and Environmental Determinants in Esophageal Carcinoma.	mir-301a	gastric cancer	up	Abnormal expression of miR-301a in gastric cancer associated with progression and poor prognosis.
mir-130b	hepatocellular carcinoma	up	Identification of differentially expressed microRNAs in human hepatocellular adenoma associated with type I glycogen storage disease: a potential utility as biomarkers.	mir-203	hypopharyngeal cancer	up	Effect of microRNA-203 on tumor growth in human hypopharyngeal squamous cell carcinoma.	mir-301a	hepatocellular carcinoma	up	miR-301a Is a Candidate Oncogene that Targets the Homeobox Gene Cax in Human Hepatocellular Carcinoma.
mir-130b	hepatocellular carcinoma	up	High expression of microRNA-130b correlates with poor prognosis of patients with hepatocellular carcinoma	mir-203	pancreatic adenocarcinoma	up	MicroRNA-203 expression as a new prognostic marker of pancreatic adenocarcinoma.	mir-301a	pancreatic adenocarcinoma	up	miR-301a as an NF-?B activator in pancreatic cancer cells.
mir-130b*	gastric cancer	up	MicroRNA profiling of human gastric cancer	mir-203	pancreatic ductal adenocarcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.	mir-301a	pancreatic cancer	up	miR-301a promotes pancreatic cancer cell proliferation by directly inhibiting Bim expression
mir-132	glioma	up	Upregulation of miR-132 expression in glioma and its clinical significance	mir-203	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.	mir-301a-3p	pancreatic cancer	up	MicroRNA-301a-3p promotes pancreatic cancer progression via negative regulation of SMAD4.
mir-132	pancreatic cancer	up	miR-132 and miR-212 are increased in pancreatic cancer and target the retinoblastoma tumor suppressor.	mir-203a	renal cell carcinoma	up	miR-203a regulates proliferation, migration, and apoptosis by targeting glycogen synthase kinase-3? in human renal cell carcinoma.	mir-301b	pancreatic carcinoma	up	MicroRNA-301b promotes cell invasiveness through targeting TP63 in pancreatic carcinoma cells.
mir-133b	cervical carcinoma	up	MicroRNA-133b is a key promoter of cervical carcinoma development through the activation of the ERK and AKT1 pathways	mir-204	prostate cancer	up	Mechanisms and functional consequences of PDEF protein expression loss during prostate cancer progression.	mir-302f	gastric cancer	up	MicroRNA profiling of human gastric cancer

mir-133b	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-204-5p	colorectal cancer	up	miR-204-5p expression in colorectal cancer: an autophagy-associated gene.	mir-30a-5p	esophageal squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.
mir-134	head and neck squamous cell carcinoma	up	miR-134 induces oncogenicity and metastasis in head and neck carcinoma through targeting WWOX gene.	mir-205	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-30a-5p	glioma	up	Analysis of miR-30a-5p Expression in Human Gliomas.
mir-135a	bladder cancer	up	Mir-135a enhances cellular proliferation through post-transcriptionally regulating PHLPP2 and FOXO1 in human bladder cancer.	mir-205	breast cancer	up	Role of microRNAs -29b-2, -155, -197 and -205 as diagnostic biomarkers in serum of breast cancer females.	mir-30a-5p	head and neck squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.
mir-135a	breast cancer	up	miRNA-135a promotes breast cancer cell migration and invasion by targeting HOXA10.	mir-205	cervical cancer	up	Serum microRNA-205 as a novel biomarker for cervical cancer patients.	mir-30b	medulloblastoma	up	Amplification and overexpression of miR-30b, miR-30d and KHDRBS3 at 8q24.22-q24.23 in medulloblastoma.
mir-135a	colorectal cancer	up	MiR-135a promotes growth and invasion of colorectal cancer via metastasis suppressor 1 in vitro.	mir-205	cervical cancer	up	miR-205 Expression Promotes Cell Proliferation and Migration of Human Cervical Cancer Cells.	mir-30b-5p	pancreatic ductal adenocarcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-135a	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-205	cervical squamous cell carcinoma	up	miRNAs expression profiling to distinguish lung squamous-cell carcinoma from adenocarcinoma subtypes.	mir-30d	hepatocellular carcinoma	up	MicroRNA-30d promotes tumor invasion and metastasis by targeting Galpha12 in hepatocellular carcinoma.
mir-135a-1	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-205	endometrial cancer	up	miR-205 promotes tumor proliferation and invasion through targeting ESRRG in endometrial carcinoma.	mir-30d	lung cancer	up	Evaluation of dynamic change of serum miR-21 and miR-24 in pre- and post-operative lung carcinoma patients.
mir-135a-2	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-205	esophageal cancer	up	Alteration of miRNA Expression Correlates with Lifestyle, Social and Environmental Determinants in Esophageal Carcinoma.	mir-30d	medulloblastoma	up	Amplification and overexpression of miR-30b, miR-30d and KHDRBS3 at 8q24.22-q24.23 in medulloblastoma.
mir-135a-5p	gastric cancer	up	Regulation of BGC-823 cell sensitivity to adriamycin via miRNA-135a-5p.	mir-205	esophageal cancer	up	miR-200a/miR-141 and miR-205 upregulation might be associated with hormone receptor status and prognosis in endometrial carcinomas.	mir-30e	glioma	up	Ionizing radiation-inducible miR-30e promotes glioma cell invasion through EGFR stabilization by directly targeting CBL-B.
mir-135b	colorectal cancer	up	MicroRNA-135b regulates metastasis suppressor 1 expression and promotes migration and invasion in colorectal cancer.	mir-205	lung cancer	up	Evaluation of dynamic change of serum miR-21 and miR-24 in pre- and post-operative lung carcinoma patients.	mir-30e*	glioma	up	MicroRNA-30e* promotes human glioma cell invasiveness in an orthotopic xenotransplantation model by disrupting the NF-?B/I?B? negative feedback loop

mir-135b	colorectal cancer	up	Identification of microRNA-135b in Stool as a Potential Noninvasive Biomarker for Colorectal Cancer and Adenoma.	mir-205	lung cancer	up	miR-205 regulates A549 cells proliferation by targeting PTEN.	mir-31	cervical cancer	up	miR-31 functions as an oncogene in cervical cancer.
mir-135b	colorectal cancer	up	MicroRNA-135b promotes cancer progression by acting as a downstream effector of oncogenic pathways in colon cancer.	mir-205	non-small cell lung cancer	up	Prognostic value of mature microRNA-21 and microRNA-205 overexpression in non-small cell lung cancer by quantitative real-time RT-PCR.	mir-31	cervical cancer	up	MiR-31 is an independent prognostic factor and functions as an oncomir in cervical cancer via targeting ARID1A.
mir-135b	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-205	non-small cell lung cancer	up	miR-205 promotes the growth, metastasis and chemoresistance of NSCLC cells by targeting PTEN.	mir-31	colon cancer	up	The tumor suppressor gene RhoBTB1 is a novel target of miR-31 in human colon cancer.
mir-135b	colorectal cancer	up	miR-135b Promotes Cancer Progression by Targeting Transforming Growth Factor Beta Receptor II (TGFBR2) in Colorectal Cancer.	mir-205	ovarian cancer	up	The role of miR-205 in the VEGF-mediated promotion of human ovarian cancer cell invasion.	mir-31	colorectal cancer	up	MicroRNA signatures: novel biomarker for colorectal cancer?
mir-135b	colorectal cancer	up	Identification and functional screening of microRNAs highly deregulated in colorectal cancer.	mir-205-3p	non-small cell lung cancer	up	Relative expressions of miR-205-5p, miR-205-3p, and miR-21 in tissues and serum of non-small cell lung cancer patients.	mir-31	colorectal cancer	up	Expression of miR-21, miR-31, miR-96 and miR-135b is correlated with the clinical parameters of colorectal cancer.
mir-135b	colorectal cancer	up	Expression of miR-21, miR-31, miR-96 and miR-135b is correlated with the clinical parameters of colorectal cancer.	mir-205-5p	non-small cell lung cancer	up	Relative expressions of miR-205-5p, miR-205-3p, and miR-21 in tissues and serum of non-small cell lung cancer patients.	mir-31	colorectal cancer	up	Elevated microRNA-31 expression regulates colorectal cancer progression by repressing its target gene SATB2.
mir-135b	gastric cancer	up	[Clinicopathological significance and function of miR-135b in the occurrence and development of gastric cancer].	mir-208	esophageal squamous cell carcinoma	up	Mir-208 promotes cell proliferation by repressing SOX6 expression in human esophageal squamous cell carcinoma.	mir-31	colorectal cancer	up	Identification of microRNA-135b in Stool as a Potential Noninvasive Biomarker for Colorectal Cancer and Adenoma.
mir-135b	lung cancer	up	MicroRNA-135b promotes lung cancer metastasis by regulating multiple targets in the Hippo pathway and LZTS1.	mir-20a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-31	colorectal cancer	up	Clinicopathological significance of microRNA-31, -143 and -145 expression in colorectal cancer.
mir-136	non-small cell lung cancer	up	Upregulation of miR-136 in human non-small cell lung cancer cells promotes Erk1/2 activation by targeting PPP2R2A.	mir-20a	breast cancer	up	Diagnostic potential of PTEN-targeting miR-214 in the blood of breast cancer patients.	mir-31	colorectal cancer	up	SATB1 and 2 in colorectal cancer.
mir-137	bladder cancer	up	MicroRNA-137 Upregulation Increases Bladder Cancer Cell Proliferation and Invasion by Targeting PAQR3.	mir-20a	breast cancer	up	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.	mir-31	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.

mir-137	squamous carcinoma	up	MicroRNA-137 promoter methylation is associated with poorer overall survival in patients with squamous cell carcinoma of the head and neck.	mir-20a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.	mir-31	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue
mir-138	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-20a	cervical cancer	up	miR-20a promotes migration and invasion by regulating TNKS2 in human cervical cancer cells.	mir-31	esophageal squamous cell carcinoma	up	The oncogenetic role of microRNA-31 as a potential biomarker in oesophageal squamous cell carcinoma
mir-139-5p	colorectal cancer	up	MicroRNA expression profiles in human colorectal cancers with liver metastases.	mir-20a	cervical cancer	up	Circulating miRNA-20a and miRNA-203 for Screening Lymph Node Metastasis in Early Stage Cervical Cancer	mir-31	head and neck squamous cell carcinoma	up	Co-targeting of multiple microRNAs on factor-inhibiting hypoxia-inducible factor (FIH) gene for the pathogenesis of head and neck carcinomas.
mir-140	breast cancer	up	Examining estrogen regulation of cancer stem cells through multicolor lineage tracing.	mir-20a	cervical cancer	up	MiR-20a promotes cervical cancer proliferation and metastasis in vitro and in vivo.	mir-31	hepatocellular carcinoma	up	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its prognos
mir-140	non-small cell lung cancer	up	Peripheral Blood miR-328 Expression as a Potential Biomarker for the Early Diagnosis of NSCLC.	mir-20a	cholangiocarcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.	mir-31	lung adenocarcinoma	up	MicroRNA-31 Predicts the Presence of Lymph Node Metastases and Survival in Patients with Lung Adenocarcinoma.
mir-140-3p	chordoma	up	MicroRNA expression profiling reveals the potential function of microRNA-31 in chordomas.	mir-20a	colorectal cancer	up	MicroRNA signatures: novel biomarker for colorectal cancer?	mir-31	non-small cell lung cancer	up	Use of Luminex xMAP bead-based suspension array for detecting microRNA in NSCLC tissues and its clinical application.
mir-140-3p	chordoma	up	Identification of miR-140-3p as a marker associated with poor prognosis in spinal chordoma.	mir-20a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-31	oral carcinoma	up	Exploiting salivary miR-31 as a clinical biomarker of oral squamous cell carcinoma.
mir-141	bladder cancer	up	Circulating microRNAs in serum: novel biomarkers for patients with bladder cancer?	mir-20a	esophageal squamous cell carcinoma	up		mir-31	oral carcinoma	up	Dysregulation of miR-31 and miR-375 expression is associated with clinical outcomes in oral carcinoma.
mir-141	breast cancer	up	Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes metastatic colonization	mir-20a	esophageal squamous cell carcinoma	up	Expression of circulating microRNA-20a and let-7a in esophageal squamous cell carcinoma	mir-31	oral squamous cell carcinoma	up	miR-31 is up-regulated in oral premalignant epithelium and contributes to the immortalization of normal oral keratinocytes
mir-141	esophageal cancer	up	miR-200a/miR-141 and miR-205 upregulation might be associated with hormone receptor status and prognosis in endometrial carcinomas.	mir-20a	gastric cancer	up	Involvement of miR-20a in Promoting Gastric Cancer Progression by Targeting Early Growth Response 2 (EGR2).	mir-31	oral squamous cell carcinoma	up	EGF up-regulates miR-31 through the C/EBP? signal cascade in oral carcinoma.

mir-141	malignant melanoma	up	MicroRNA-200 family members differentially regulate morphological plasticity and mode of melanoma cell invasion.	mir-20a	glioma	up	[Expression of miR-20a in human glioma tissues and its effect on the proliferation of human glioma cells in vitro].	mir-31	pancreatic ductal adenocarcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-141	non-small cell lung cancer	up	High expression of serum miR-21 and tumor miR-200c associated with poor prognosis in patients with lung cancer.	mir-20a	hepatocellular carcinoma	up	MiR-20a Induces Cell Radioresistance by Activating the PTEN/PI3K/Akt Signaling Pathway in Hepatocellular Carcinoma.	mir-31	prostate cancer	up	Screening Biomarkers of Prostate Cancer by Integrating microRNA and mRNA Microarrays.
mir-141	non-small cell lung cancer	up	MicroRNA-141 promotes the proliferation of non-small cell lung cancer cells by regulating expression of PHLPP1 and PHLPP2	mir-20a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-3127	hepatocellular carcinoma	up	MicroRNA-3127 promotes cell proliferation and tumorigenicity in hepatocellular carcinoma by disrupting of PI3K/AKT negative regulation.
mir-141	non-small cell lung cancer	up	MicroRNA-141 is a biomarker for progression of squamous cell carcinoma and adenocarcinoma of the lung: clinical analysis of 125 patients.	mir-20a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.	mir-32	acute myeloid leukemia	up	MicroRNA-32 upregulation by 1,25-dihydroxyvitamin D3 in human myeloid leukemia cells leads to Bim targeting and inhibition of AraC-induced apoptosis.
mir-141	ovarian cancer	up	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.	mir-20a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.	mir-32	colorectal cancer	up	The relationship between and clinical significance of MicroRNA-32 and phosphatase and tensin homologue expression in colorectal cancer.
mir-141	prostate cancer	up	A study of molecular signals deregulating mismatch repair genes in prostate cancer compared to benign prostatic hyperplasia.	mir-20a	malignant melanoma	up	Altered expression of selected microRNAs in melanoma: antiproliferative and proapoptotic activity of miRNA-155.	mir-32	hepatocellular carcinoma	up	MiR-32 induces cell proliferation, migration, and invasion in hepatocellular carcinoma by targeting PTEN.
mir-142	breast cancer	up	miR-142 regulates the tumorigenicity of human breast cancer stem cells through the canonical WNT signaling pathway.	mir-20a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.	mir-320a	osteosarcoma	up	Identification of a plasma four-microRNA panel as potential noninvasive biomarker for osteosarcoma.
mir-142-3p	non-small cell lung cancer	up	MiR-142-3p represses TGF-?-induced growth inhibition through repression of TGFBR1 in non-small cell lung cancer.	mir-20a	medulloblastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.	mir-320b	colorectal cancer	up	MicroRNA-320b promotes colorectal cancer proliferation and invasion by competing with its homologous microRNA-320a
mir-142-5p	clear cell renal cell cancer	up	Exploring the miRNA-mRNA regulatory network in clear cell renal cell carcinomas by next-generation sequencing expression profiles.	mir-20a	nasopharyngeal cancer	up	Circulating miR-17, miR-20a, miR-29c, and miR-223 Combined as Non-Invasive Biomarkers in Nasopharyngeal Carcinoma.	mir-326	colorectal cancer	up	MicroRNA-326 functions as a tumor suppressor in colorectal cancer by targeting the nin one binding protein.

mir-142-5p	malt lymphoma	up	Overexpression of miR-142-5p and miR-155 in gastric mucosa-associated lymphoid tissue (MALT) lymphoma resistant to Helicobacter pylori eradication.	mir-20a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.	mir-328	glioma	up	MiR-328 promotes glioma cell invasion via SFRP1-dependent Wnt-signaling activation.
mir-143	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-20a	ovarian cancer	up	miR-20a promotes proliferation and invasion by targeting APP in human ovarian cancer cells.	mir-328	non-small cell lung cancer	up	Peripheral Blood miR-328 Expression as a Potential Biomarker for the Early Diagnosis of NSCLC.
mir-143	esophageal cancer	up	Alteration of miRNA Expression Correlates with Lifestyle, Social and Environmental Determinants in Esophageal Carcinoma.	mir-20a	ovarian cancer	up	Ovarian tumor-associated microRNA-20a decreases natural killer cell cytotoxicity by downregulating MICA/B expression.	mir-330-3p	esophageal squamous cell carcinoma	up	MicroRNA-330-3p functions as an oncogene in human esophageal cancer by targeting programmed cell death 4.
mir-143	gastric cancer	up	Evaluation of MicroRNA Expression Pattern of Gastric Adenocarcinoma Associated with Socioeconomic, Environmental and Lifestyle Factors in Northwestern Hungary.	mir-20a	pituitary carcinoma	up	MicroRNA involvement in a metastatic non-functioning pituitary carcinoma.	mir-330-3p	non-small cell lung cancer	up	miR-330-3p controls cell proliferation by targeting early growth response 2 in non-small-cell lung cancer.
mir-144	nasopharyngeal carcinoma	up	MicroRNA-144 promotes cell proliferation, migration and invasion in nasopharyngeal carcinoma through repression of PTEN.	mir-20a	prostate cancer	up	miR-20a promotes Prostate cancer invasion and migration through targeting AEG-2.	mir-331	acute myeloid leukemia	up	Expression of microRNA-331 can be used as a predictor for response to therapy and survival in acute myeloid leukemia patients.
mir-145	colon cancer	up	miR-21 and miR-145 cooperation in regulation of colon cancer stem cells.	mir-20a-5p	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-331-3p	hepatocellular carcinoma	up	Serum miR-182 and miR-331-3p as diagnostic and prognostic markers in patients with hepatocellular carcinoma.
mir-145	colorectal cancer	up	Up-regulation of microRNA-145 associates with lymph node metastasis in colorectal cancer.	mir-20b	breast cancer	up	MicroRNA-20b promotes cell growth of breast cancer cells partly via targeting phosphatase and tensin homologue (PTEN).	mir-335	astrocytoma	up	Targeting oncogenic miR-335 inhibits growth and invasion of malignant astrocytoma cells.
mir-145	endometrial cancer	up	Up-regulation of microRNA-145 promotes differentiation by repressing OCT4 in human endometrial adenocarcinoma cells.	mir-20b	hepatocellular carcinoma	up	Crucial Role for Early Growth Response-1 in the Transcriptional Regulation of miR-20b in Breast Cancer.	mir-335	glioma	up	Tumor microRNA-335 expression is associated with poor prognosis in human glioma.
mir-145	esophageal squamous cell carcinoma	up	Relationship between altered expression levels of MIR21, MIR143, MIR145, and MIR205 and clinicopathologic features of esophageal squamous cell carcinoma.	mir-21	adrenal cortical carcinoma	up	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma.	mir-335	meningioma	up	miR-335 promotes cell proliferation by directly targeting Rb1 in meningiomas.
mir-145	non-small cell lung cancer	up	Serum miR-125a-5p, miR-145 and miR-146a as diagnostic biomarkers in non-small cell lung cancer.	mir-21	breast cancer	up	Next-generation sequencing of microRNAs for breast cancer detection.	mir-337-3p	gastric cancer	up	MicroRNA profiling of human gastric cancer.

mir-146a	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-21	breast cancer	up	Quantitative Measurement of Serum MicroRNA-21 Expression in Relation to Breast Cancer Metastasis in Chinese Females.	mir-339	non-small cell lung cancer	up	Peripheral Blood miR-328 Expression as a Potential Biomarker for the Early Diagnosis of NSCLC.
mir-146a	gastric cancer	up	microRNA-146a inhibits G protein-coupled receptor-mediated activation of NF-kappaB by targeting CARD10 and COPS8 in gastric cancer.	mir-21	breast cancer	up	Diagnostic potential of PTEN-targeting miR-214 in the blood of breast cancer patients.	mir-339-5p	papillary thyroid carcinoma	up	microRNA-339-5p modulates Na+/I- symporter-mediated radioiodide uptake.
mir-146a	hepatocellular carcinoma	up	Serum microRNA characterization identifies miR-885-5p as a potential marker for detecting liver pathologies.	mir-21	breast cancer	up	Tissue specific expression of extracellular microRNA in human breast cancers and normal human breast tissue in vivo.	mir-33a	glioma	up	miR-33a promotes glioma-initiating cell self-renewal via PKA and NOTCH pathways.
mir-146a	non-small cell lung cancer	up	Serum miR-125a-5p, miR-145 and miR-146a as diagnostic biomarkers in non-small cell lung cancer.	mir-21	breast cancer	up	Differential expression of miR-21, miR-125b and miR-191 in breast cancer tissue.	mir-340	glioblastoma	up	miRNA microarray reveals specific expression in the peripheral blood of glioblastoma patients.
mir-146a	oral squamous cell carcinoma	up	miR-146a enhances the oncogenicity of oral carcinoma by concomitant targeting of the IRAK1, TRAF6 and NUMB genes.	mir-21	breast cancer	up	BMP-6 inhibits microRNA-21 expression in breast cancer through repressing deltaEF1 and AP-1.	mir-340*	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-146a	renal cell carcinoma	up	Carbamylated albumin stimulates microRNA-146, which is increased in human renal cell carcinoma.	mir-21	breast cancer	up	Circulating microRNA-92a and microRNA-21 as novel minimally invasive biomarkers for primary breast cancer.	mir-345	oral squamous cell carcinoma	up	Relationship between microRNA expression levels and histopathological features of dysplasia in oral leukoplakia.
mir-146b	anaplastic thyroid carcinoma	up	A 4-MicroRNA signature can discriminate primary lymphomas from anaplastic carcinomas in thyroid cytology smears.	mir-21	breast cancer	up	Up-regulation of miR-21 by HER2/neu signaling promotes cell invasion.	mir-346	follicular thyroid carcinoma	up	A limited set of human MicroRNA is deregulated in follicular thyroid carcinoma.
mir-146b	esophageal cancer	up	Transcriptional regulation of miR-146b by C/EBP? LAP2 in esophageal cancer cells.	mir-21	breast cancer	up	The Regulation and Function of miR-21-FOXO3a-miR-34b/c Signaling in Breast Cancer.	mir-346	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
mir-146b	follicular thyroid carcinoma	up	Differential miRNA expression defines migration and reduced apoptosis in follicular thyroid carcinomas.	mir-21	breast cancer	up	MicroRNA-21 regulates breast cancer invasion partly by targeting tissue inhibitor of metalloproteinase 3 expression.	mir-34a	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-146b	oral squamous cell carcinoma	up	miR-146a enhances the oncogenicity of oral carcinoma by concomitant targeting of the IRAK1, TRAF6 and NUMB genes.	mir-21	breast cancer	up	Combination of miR-21 with Circulating Tumor Cells Markers Improve Diagnostic Specificity of Metastatic Breast Cancer.	mir-34a	non-small cell lung cancer	up	Circulating miR-22, miR-24 and miR-34a as novel predictive biomarkers to pemetrexed-based chemotherapy in advanced non small cell lung cancer.
mir-146b	papillary thyroid carcinoma	up	MicroRNA analysis as a potential diagnostic tool for papillary thyroid carcinoma.	mir-21	cervical cancer	up	Overexpression of miR-21 promotes the proliferation and migration of cervical cancer cells via the inhibition of PTEN.	mir-34a	pancreatic ductal adenocarcinoma	up	MiR-21, miR-34a, miR-198 and miR-217 as diagnostic and prognostic biomarkers for chronic pancreatitis and pancreatic ductal

											adenocarcinoma.
mir-146b	papillary thyroid carcinoma	up	MicroRNA signature distinguishes the degree of aggressiveness of papillary thyroid carcinoma.	mir-21	cervical carcinoma	up	MicroRNA-21 promotes cell proliferation and down-regulates the expression of programmed cell death 4 (PDCD4) in HeLa cervical carcinoma cells.	mir-34a	papillary thyroid carcinoma	up	MiR-34a targets GAS1 to promote cell proliferation and inhibit apoptosis in papillary thyroid carcinoma via PI3K/Akt/Bad pathway.
mir-146b	papillary thyroid carcinoma	up	Prognostic Implications of miR-146b Expression and Its Functional Role in Papillary Thyroid Carcinoma.	mir-21	cholangiocarcinoma	up	MicroRNA-21 is overexpressed in human cholangiocarcinoma and regulates programmed cell death 4 and tissue inhibitor of metalloproteinase 3.	mir-34a	rectal cancer	up	The quantitative analysis by stem-loop real-time PCR revealed the microRNA-34a, microRNA-155 and microRNA-200c overexpression in human colorectal cancer.
mir-146b	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-21	cholangiocarcinoma	up	PTEN and PDCD4 are bona fide targets of microRNA-21 in human cholangiocarcinoma.	mir-34a	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.
mir-146b	primary thyroid lymphoma	up	A 4-MicroRNA signature can discriminate primary lymphomas from anaplastic carcinomas in thyroid cytology smears.	mir-21	cholangiocarcinoma	up	miR-21 Targets 15-PGDH and Promotes Cholangiocarcinoma Growth.	mir-362	renal cell carcinoma	up	A panel of five serum miRNAs as a potential diagnostic tool for early-stage renal cell carcinoma.
mir-146b	renal cell carcinoma	up	Carbamylated albumin stimulates microRNA-146, which is increased in human renal cell carcinoma.	mir-21	cholangiocarcinoma	up	miR-21 Inhibition Reduces Liver Fibrosis and Prevents Tumor Development by Inducing Apoptosis of CD24+ Progenitor Cells.	mir-362-3p	gastric cancer	up	Erratum to: Anti-miR-362-3p Inhibits Migration and Invasion of Human Gastric Cancer Cells by Its Target CD82.
mir-146b-5p	papillary thyroid carcinoma	up	Integrated analyses of microRNA and mRNA expression profiles in aggressive papillary thyroid carcinoma.	mir-21	colorectal cancer	up	Expression of miR-21, miR-31, miR-96 and miR-135b is correlated with the clinical parameters of colorectal cancer.	mir-362-3p	gastric cancer	up	Anti-miR-362-3p Inhibits Migration and Invasion of Human Gastric Cancer Cells by Its Target CD82.
mir-146b-5p	papillary thyroid carcinoma	up	MiR-146b-5p promotes metastasis and induces epithelial-mesenchymal transition in thyroid cancer by targeting ZNRF3.	mir-21	colorectal cancer	up	MiR-21 regulates biological behavior through the PTEN/PI-3 K/Akt signaling pathway in human colorectal cancer cells.	mir-362-3p	hepatocellular carcinoma	up	Upregulation of miR-362-3p modulates proliferation and anchorage-independent growth by directly targeting Tob2 in hepatocellular carcinoma.
mir-146b-5p	papillary thyroid carcinoma	up	MicroRNA miR-146b-5p regulates signal transduction of TGF-? by repressing SMAD4 in thyroid cancer.	mir-21	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-362-5p	hepatocellular carcinoma	up	MicroRNA-362-5p promotes tumor growth and metastasis by targeting CYLD in hepatocellular carcinoma
mir-147	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-21	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-367	pancreatic cancer	up	miR-367 promotes epithelial-to-mesenchymal transition and invasion of pancreatic ductal adenocarcinoma cells by targeting the Smad7-TGF-

											? signalling pathway
mir-148a	chordoma	up	MicroRNA expression profiling reveals the potential function of microRNA-31 in chordomas.	mir-21	colorectal cancer	up	Detection of miR-92a and miR-21 in stool samples as potential screening biomarkers for colorectal cancer and polyps.	mir-369-5p	pancreatic ductal adenocarcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-148a	gastric cancer	up	miR-148a promoted cell proliferation by targeting p27 in gastric cancer cells.	mir-21	colorectal cancer	up	Correlation of over-expressions of miR-21 and Notch-1 in human colorectal cancer with clinical stages.	mir-370	acute myeloid leukemia	up	Integration of SNP and mRNA arrays with microRNA profiling reveals that MiR-370 is upregulated and targets NF1 in acute myeloid leukemia
mir-148a	glioblastoma	up	microRNA-148a Is a Prognostic oncomiR That Targets MIG6 and BIM to Regulate EGFR and Apoptosis in Glioblastoma	mir-21	colorectal cancer	up	Increased expression of microRNA-21and its association with chemotherapeutic response in human colorectal cancer.	mir-370	gastric cancer	up	Overexpression of miR-370 and downregulation of its novel target TGF?-RII contribute to the progression of gastric carcinoma
mir-148b	ovarian cancer	up	Increased expression of miR-148b in ovarian carcinoma and its clinical significance.	mir-21	colorectal cancer	up	MicroRNA-21 controls hTERT via PTEN in human colorectal cancer cell proliferation.	mir-370	gastric cancer	up	Upregulation of miR-370 contributes to the progression of gastric carcinoma via suppression of FOXO1
mir-148b	ovarian carcinoma	up	Increased expression of miR-148b in ovarian carcinoma and its clinical significance.	mir-21	colorectal cancer	up	Clinical correlations of miR-21 expression in colorectal cancer patients and effects of its inhibition on DLD1 colon cancer cells.	mir-371-5p	hepatocellular carcinoma	up	miR-371-5p down-regulates pre mRNA processing factor 4 homolog B (PRPF4B) and facilitates the G1/S transition in human hepatocellular carcinoma cells
mir-149	nasopharyngeal carcinoma	up	miR-149 promotes epithelial-mesenchymal transition and invasion in nasopharyngeal carcinoma cells.	mir-21	colorectal carcinoma	up	Altered levels of the onco-microRNA 21 and the tumor-supressor microRNAs 143 and 145 in advanced rectal cancer indicate successful neoadjuvant chemoradiotherapy.	mir-372	epithelial ovarian cancer	up	Gain-of-function microRNA screens identify miR-193a regulating proliferation and apoptosis in epithelial ovarian cancer cells.
mir-150	adult t-cell leukemia	up	STAT1: A Novel Target of miR-150 and miR-223 Is Involved in the Proliferation of HTLV-I-Transformed and ATL Cells.	mir-21	diffuse large B-cell lymphoma	up	Inhibition of miR-21 Induces Biological and Behavioral Alterations in Diffuse Large B-Cell Lymphoma	mir-372	glioma	up	Correlation of microrna-372 upregulation with poor prognosis in human glioma
mir-150	breast cancer	up	miR-150 promotes human breast cancer growth and malignant behavior by targeting the pro-apoptotic purinergic P2X7 receptor.	mir-21	endometrial cancer	up	Highly increased maspin expression corresponds with up-regulation of miR-21 in endometrial cancer: a preliminary report.	mir-372	head and neck squamous cell carcinoma	up	miR-372 inhibits p62 in head and neck squamous cell carcinoma in vitro and in vivo.
mir-150	breast cancer	up	miR-142 regulates the tumorigenicity of human breast cancer stem cells through the canonical WNT signaling pathway.	mir-21	esophageal cancer	up	The expression of miR-21 and miR-375 predict prognosis of esophageal cancer.	mir-372	hepatocellular carcinoma	up	Upregulation of microRNA-372 associates with tumor progression and prognosis in hepatocellular carcinoma

mir-150	chronic lymphocytic leukemia	up	Opposite prognostic significance of cellular and serum circulating microRNA-150 in Chronic Lymphocytic Leukemia patients.	mir-21	esophageal cancer	up	[Diagnostic values of salivary versus and plasma microRNA-21 for early esophageal cancer].	mir-373	breast cancer	up	The microRNAs miR-373 and miR-520c promote tumour invasion and metastasis
mir-150	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-21	esophageal cancer	up	Alteration of miRNA Expression Correlates with Lifestyle, Social and Environmental Determinants in Esophageal Carcinoma	mir-373	cervical carcinoma	up	MicroRNA-373 functions as an oncogene and targets YOD1 gene in cervical cancer.
mir-150	gastric cancer	up	MiR-150 promotes gastric cancer proliferation by negatively regulating the pro-apoptotic gene EGR2	mir-21	esophageal squamous cell carcinoma	up	miR-21 Down-Regulation Suppresses Cell Growth, Invasion and Induces Cell Apoptosis by Targeting FASL, TIMP3, and RECK Genes in Esophageal Carcinoma.	mir-373	epithelial ovarian cancer	up	Gain-of-function microRNA screens identify miR-193a regulating proliferation and apoptosis in epithelial ovarian cancer cells
mir-150	lung adenocarcinoma	up	Altered miR-143 and miR-150 expressions in peripheral blood mononuclear cells for diagnosis of non-small cell lung cancer	mir-21	esophageal squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.	mir-373	esophageal squamous cell carcinoma	up	MicroRNA-373 (miR-373) post-transcriptionally regulates large tumor suppressor, homolog 2 (LATS2) and stimulates proliferation in human esophageal cancer.
mir-150	lung cancer	up	miR-150 promotes the proliferation and migration of lung cancer cells by targeting SRC kinase signalling inhibitor 1.	mir-21	esophageal squamous cell carcinoma	up	MicroRNA-21 promotes the proliferation and inhibits apoptosis in Eca109 via activating ERK1/2/MAPK pathway.	mir-373	gastric adenocarcinoma	up	MicroRNA-373 is upregulated and targets TNFAIP1 in human gastric cancer, contributing to tumorigenesis
mir-150	non-small cell lung cancer	up	Increased expression of microRNA-150 is associated with poor prognosis in non-small cell lung cancer	mir-21	esophageal squamous cell carcinoma	up	Relationship between altered expression levels of MIR21, MIR143, MIR145, and MIR205 and clinicopathologic features of esophageal squamous cell carcinoma.	mir-373	hepatocellular carcinoma	up	MicroRNA-373, a new regulator of protein phosphatase 6, functions as an oncogene in hepatocellular carcinoma
mir-150*	colorectal cancer	up	MicroRNA expression profiles in human colorectal cancers with liver metastases.	mir-21	esophageal squamous cell carcinoma	up	Expression, Tissue Distribution and Function of miR-21 in Esophageal Squamous Cell Carcinoma.	mir-374a	gastric cancer	up	miR-374a promotes cell proliferation, migration and invasion by targeting SRCIN1 in gastric cancer
mir-151-5p	osteosarcoma	up	MicroRNA-199a-3p is downregulated in human osteosarcoma and regulates cell proliferation and migration.	mir-21	esophageal squamous cell carcinoma	up	Circulating microRNAs in plasma of patients with oesophageal squamous cell carcinoma.	mir-374a-5p	osteosarcoma	up	Identification of a plasma four-microRNA panel as potential noninvasive biomarker for osteosarcoma
mir-151-5p	papillary thyroid carcinoma	up	Circulating microRNA profiles as potential biomarkers for diagnosis of papillary thyroid carcinoma.	mir-21	esophageal squamous cell carcinoma	up	Down-Regulation of PTEN Expression Modulated by Dysregulated miR-21 Contributes to the Progression of Esophageal Cancer.	mir-375	non-small cell lung cancer	up	Claudin-1 is a novel target of miR-375 in non-small-cell lung cancer.

mir-153	hepatocellular carcinoma	up	MicroRNA-153 promotes Wnt/?-catenin activation in hepatocellular carcinoma through suppression of WWOX.	mir-21	esophageal squamous cell carcinoma	up	Clinical impact of serum exosomal microRNA-21 as a clinical biomarker in human esophageal squamous cell carcinoma.	mir-376a	pancreatic ductal adenocarcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-153	prostate cancer	up	Upregulation of miR-153 promotes cell proliferation via downregulation of the PTEN tumor suppressor gene in human prostate cancer.	mir-21	gastric cancer	up	Oxidative Stress Upregulates PDCD4 Expression in Patients with Gastric Cancer via miR-21.	mir-377	gastric cancer	up	MicroRNA-377 predicts poor clinical outcome of gastric cancer and induces tumorigenesis by targeting multiple tumor-suppressor genes
mir-155	acute myeloid leukemia	up	Pharmacological targeting of miR-155 via the NEDD8-activating enzyme inhibitor MLN4924 (Pevonedistat) in FLT3-ITD acute myeloid leukemia	mir-21	gastric cancer	up	microRNA-21 promotes tumor proliferation and invasion in gastric cancer by targeting PTEN.	mir-378	acute myeloid leukemia	up	Overexpression of miR-378 is frequent and may affect treatment outcomes in patients with acute myeloid leukemia
mir-155	anaplastic large-cell lymphoma	up	Oncogenic role of miR-155 in anaplastic large cell lymphoma lacking the t(2;5) translocation.	mir-21	gastric cancer	up	Evaluation of MicroRNA Expression Pattern of Gastric Adenocarcinoma Associated with Socioeconomic, Environmental and Lifestyle Factors in Northwestern Hungary.	mir-378	breast cancer	up	Association between mir-24 and mir-378 in formalin-fixed paraffin-embedded tissues of breast cancer.
mir-155	bladder cancer	up	Correlation of Increased Expression of MicroRNA-155 in Bladder Cancer and Prognosis.	mir-21	gastric cancer	up	MicroRNA-21 inhibits Serpini1, a gene with novel tumour suppressive effects in gastric cancer.	mir-378	ovarian cancer	up	MiR-378 as a biomarker for response to anti-angiogenic treatment in ovarian cancer.
mir-155	bladder cancer	up	MicroRNA-155 promotes bladder cancer growth by repressing the tumor suppressor OMTF1.	mir-21	gastric cancer	up	MicroRNA-21 stimulates gastric cancer growth and invasion by inhibiting the tumor suppressor effects of programmed cell death protein 4 and phosphatase and tensin homolog.	mir-378	ovarian cancer	up	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.
mir-155	breast cancer	up	Clinical significance of MicoRNA-155 expression in human breast cancer.	mir-21	gastric cancer	up	miR-21 plays a pivotal role in gastric cancer pathogenesis and progression.	mir-421	gastric cancer	up	Increased expression of miR-421 in human gastric carcinoma and its clinical association.
mir-155	breast cancer	up	Analysis of miR-205 and miR-155 expression in the blood of breast cancer patients.	mir-21	gastric cancer	up	miR-21 Is a Promising Novel Biomarker for Lymph Node Metastasis in Patients with Gastric Cancer.	mir-421	gastric cancer	up	MiR-421 regulates apoptosis of BGC-823 gastric cancer cells by targeting caspase-3.
mir-155	breast cancer	up	17?-Estradiol up-regulates miR-155 expression and reduces TP53INP1 expression in MCF-7 breast cancer cells.	mir-21	gastric cancer	up	Stromal miR-21 is more important than miR-21 of tumour cells for the progression of gastric cancer.	mir-421	gastric cancer	up	MicroRNA-421 is a new potential diagnosis biomarker with higher sensitivity and specificity than carcinoembryonic antigen and cancer antigen 125 in gastric cancer.
mir-155	breast cancer	up	MicroRNA-155 functions as an OncomiR in breast cancer by targeting the suppressor of cytokine signaling 1 gene.	mir-21	gastric cancer	up	Circulating microRNAs in plasma of patients with gastric cancers.	mir-421	nasopharyngeal carcinoma	up	miR-421 induces cell proliferation and apoptosis resistance in human nasopharyngeal carcinoma via

											downregulation of FOXO4.
mir-155	breast cancer	up	miR-155 drives telomere fragility in human breast cancer by targeting TRF1	mir-21	gastric cancer	up	Plasma microRNAs, miR-223, miR-21 and miR-218, as novel potential biomarkers for gastric cancer detection.	mir-421	neuroblastoma	up	Downregulation of tumor suppressor mesin by miR-421 promotes proliferation and migration of neuroblastoma.
mir-155	breast cancer	up	MicroRNA-155 regulates cell survival, growth, and chemosensitivity by targeting FOXO3a in breast cancer.	mir-21	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-423	breast cancer	up	Genetic analysis and preliminary function study of miR-423 in breast cancer.
mir-155	breast cancer	up	Role of microRNAs -29b-2, -155, -197 and -205 as diagnostic biomarkers in serum of breast cancer females.	mir-21	gastric cancer	up	Prognostic impact of circulating miR-21 in the plasma of patients with gastric carcinoma.	mir-423	hepatocellular carcinoma	up	MicroRNA-423 promotes cell growth and regulates G(1)/S transition by targeting p21Cip1/Waf1 in hepatocellular carcinoma.
mir-155	breast cancer	up	[Expression and its clinical significance of miR-155 in human primary breast cancer].	mir-21	glioblastoma	up	Heterogeneous Nuclear Ribonucleoprotein C1/C2 Controls the Metastatic Potential of Glioblastoma by Regulating PDCD4.	mir-423-3p	laryngeal carcinoma	up	microRNA-423-3p promotes tumor progression via modulation of AdipoR2 in laryngeal carcinoma.
mir-155	cervical cancer	up	Mir-155 promotes cervical cancer cell proliferation through suppression of its target gene LKB1.	mir-21	glioblastoma	up	Sulforaphane enhances temozolomide-induced apoptosis due to downregulation of miR-21 via Wnt/?-catenin signaling in glioblastoma.	mir-424	chronic myelogenous leukemia	up	Restoration of miR-424 suppresses BCR-ABL activity and sensitizes CML cells to imatinib treatment.
mir-155	chronic lymphocytic leukemia	up	Signal Transducer and Activator of Transcription-3 Induces MicroRNA-155 Expression in Chronic Lymphocytic Leukemia.	mir-21	glioblastoma	up	MicroRNA-21 targets LRRFIP1 and contributes to VM-26 resistance in glioblastoma multiforme.	mir-424	colorectal cancer	up	Downregulation of miR-195 correlates with lymph node metastasis and poor prognosis in colorectal cancer.
mir-155	clear cell renal cell cancer	up	microRNA-155 silencing inhibits proliferation and migration and induces apoptosis by upregulating BACH1 in renal cancer cells.	mir-21	glioblastoma	up	PDGF-B-mediated downregulation of miR-21: new insights into PDGF signaling in glioblastoma.	mir-424	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
mir-155	colon cancer	up	Correlation between expression of miR-155 in colon cancer and serum carcinoembryonic antigen level and its contribution to recurrence and metastasis forecast.	mir-21	glioblastoma	up	Downregulation of miR-21 inhibits EGFR pathway and suppresses the growth of human glioblastoma cells independent of PTEN status.	mir-424-5p	pancreatic cancer	up	MicroRNA-424-5p Suppresses the Expression of SOCS6 in Pancreatic Cancer.
mir-155	colorectal cancer	up	Upregulation of microRNA-155 promotes the migration and invasion of colorectal cancer cells through the regulation of claudin-1 expression.	mir-21	glioblastoma	up	Expression of 19 microRNAs in glioblastoma and comparison with other brain neoplasia of grades I-III.	mir-425	gastric cancer	up	NF-kappaB-dependent MicroRNA-425 upregulation promotes gastric cancer cell growth by targeting PTEN upon IL-1? induction.
mir-155	cutaneous t-cell lymphoma	up	STAT5-mediated expression of oncogenic miR-155 in cutaneous T-cell lymphoma.	mir-21	glioblastoma	up	Co-delivery of as-miR-21 and 5-FU by poly(amidoamine) dendrimer attenuates human	mir-429	breast cancer	up	Direct targeting of Sec23a by miR-200s influences cancer cell secretome and promotes

							glioma cell growth in vitro.				metastatic colonization.
mir-155	diffuse large B-cell lymphoma	up	Coordinated expression of microRNA-155 and predicted target genes in diffuse large B-cell lymphoma.	mir-21	glioblastoma	up	MicroRNA-21 Promotes Glioblastoma Tumorigenesis by Down-regulating Insulin-like Growth Factor-binding Protein-3 (IGFBP3).	mir-429	colorectal cancer	up	MiR-429 is an independent prognostic factor in colorectal cancer and exerts its anti-apoptotic function by targeting SOX2.
mir-155	endometrial cancer	up	Angiotensin II type I receptor and miR-155 in endometrial cancers: synergistic antiproliferative effects of anti-miR-155 and losartan on endometrial cancer cells.	mir-21	glioblastoma	up	Downregulation of Pdcd4 by mir-21 facilitates glioblastoma proliferation in vivo.	mir-429	hepatocellular carcinoma	up	MicroRNA-429 Modulates Hepatocellular Carcinoma Prognosis and Tumorigenesis.
mir-155	gallbladder carcinoma	up	High expression of microRNA-155 is associated with the aggressive malignant behavior of gallbladder carcinoma.	mir-21	glioblastoma	up	MiR-21 up-regulation mediates glioblastoma cancer stem cells apoptosis and proliferation by targeting FASLG.	mir-429	hepatocellular carcinoma	up	Epigenetic modification of MiR-429 promotes liver tumour-initiating cell properties by targeting Rb binding protein 4.
mir-155	glioma	up	MicroRNA-155 Promotes Glioma Cell Proliferation via the Regulation of MXI1.	mir-21	glioblastoma	up	MicroRNA 21 promotes glioma invasion by targeting matrix metalloproteinase regulators.	mir-429	malignant melanoma	up	MicroRNA-200 family members differentially regulate morphological plasticity and mode of melanoma cell invasion.
mir-155	glioma	up	Overexpression of microRNA-155 predicts poor prognosis in glioma patients.	mir-21	glioblastoma	up	Delivery of anti-microRNA-21 antisense-oligodeoxynucleotide using amphiphilic peptides for glioblastoma gene therapy.	mir-429	prostate cancer	up	Downregulation of microRNA-429 inhibits cell proliferation by targeting p27Kip1 in human prostate cancer cells.
mir-155	hepatocellular carcinoma	up	Role of microRNA-155 at early stages of hepatocarcinogenesis induced by choline-deficient and amino acid-defined diet in C57BL/6 mice.	mir-21	glioblastoma	up	MicroRNA-21 targets a network of key tumor-suppressive pathways in glioblastoma cells.	mir-4423	lung cancer	up	MicroRNA 4423 is a primate-specific regulator of airway epithelial cell differentiation and lung carcinogenesis.
mir-155	hepatocellular carcinoma	up	[Expression and survival prediction of microRNA-155 in hepatocellular carcinoma after liver transplantation].	mir-21	head and neck cancer	up	MicroRNA alterations in head and neck squamous cell carcinoma.	mir-452	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.
mir-155	liver cancer	up	TGF-?1 acts through miR-155 to down-regulate TP53INP1 in promoting epithelial-mesenchymal transition and cancer stem cell phenotypes.	mir-21	head and neck cancer	up	[Expression of mir-21 and mir-375 in laryngeal squamous cell carcinoma].	mir-452	hepatocellular carcinoma	up	MicroRNA-452 promotes tumorigenesis in hepatocellular carcinoma by targeting cyclin-dependent kinase inhibitor 1B.
mir-155	lung adenocarcinoma	up	Potential diagnostic value of miR-155 in serum from lung adenocarcinoma patients.	mir-21	head and neck squamous cell carcinoma	up	Clusterin Is a Gene-Specific Target of microRNA-21 in Head and Neck Squamous Cell Carcinoma.	mir-455-5p	malignant melanoma	up	Reduced adenosine-to-inosine miR-455-5p editing promotes melanoma growth and metastasis.
mir-155	lung cancer	up	Differential MicroRNAs Expression in Serum of Patients with Lung Cancer, Pulmonary Tuberculosis, and Pneumonia.	mir-21	head and neck squamous cell carcinoma	up	Co-targeting of multiple microRNAs on factor-inhibiting hypoxia-inducible factor (FIH) gene for the pathogenesis of head and	mir-483-3p	adrenal cortical carcinoma	up	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma.

							neck carcinomas.				
mir-155	lung cancer	up	Inhibition of hypoxia-induced miR-155 radiosensitizes hypoxic lung cancer cells.	mir-21	head and neck squamous cell carcinoma	up	Low-level expression of microRNAs let-7d and miR-205 are prognostic markers of head and neck squamous cell carcinoma.	mir-483-3p	hepatocellular carcinoma	up	Overexpression of miR-483-5p/3p cooperate to inhibit mouse liver fibrosis by suppressing the TGF-? stimulated HSCs in transgenic mice.
mir-155	lung cancer	up	MiR-155 inhibits the sensitivity of lung cancer cells to cisplatin via negative regulation of Apaf-1 expression.	mir-21	head and neck squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.	mir-483-5p	adrenal cortical carcinoma	up	miR-195 and miR-483-5p Identified as Predictors of Poor Prognosis in Adrenocortical Cancer.
mir-155	malt lymphoma	up	Overexpression of miR-142-5p and miR-155 in gastric mucosa-associated lymphoid tissue (MALT) lymphoma resistant to Helicobacter pylori eradication.	mir-21	hepatocellular carcinoma	up	Role of microRNA-155 at early stages of hepatocarcinogenesis induced by choline-deficient and amino acid-defined diet in C57BL/6 mice.	mir-483-5p	adrenal cortical carcinoma	up	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma.
mir-155	mantle cell lymphoma	up	microRNA expression profile and identification of miR-29 as a prognostic marker and pathogenetic factor by targeting CDK6 in mantle cell lymphoma.	mir-21	hepatocellular carcinoma	up	MicroRNA-21 promotes hepatocellular carcinoma HepG2 cell proliferation through repression of mitogen-activated protein kinase-kinase 3.	mir-483-5p	hepatocellular carcinoma	up	Overexpression of miR-483-5p/3p cooperate to inhibit mouse liver fibrosis by suppressing the TGF-? stimulated HSCs in transgenic mice.
mir-155	nasopharyngeal carcinoma	up	MiR-155 up-regulation by LMP1 DNA contributes to increased nasopharyngeal carcinoma cell proliferation and migration.	mir-21	hepatocellular carcinoma	up	MicroRNA-21 promotes cell proliferation in human hepatocellular carcinoma partly by targeting HEPN1.	mir-485-3p	hepatocellular carcinoma	up	MicroRNAs regulate methionine adenosyltransferase 1A expression in hepatocellular carcinoma.
mir-155	nasopharyngeal carcinoma	up	Upregulation of MiR-155 in nasopharyngeal carcinoma is partly driven by LMP1 and LMP2A and downregulates a negative prognostic marker JMJD1A.	mir-21	hepatocellular carcinoma	up	Circulating microRNAs, miR-21, miR-122, and miR-223, in patients with hepatocellular carcinoma or chronic hepatitis.	mir-486	glioma	up	miR-486 sustains NF-?B activity by disrupting multiple NF-?B-negative feedback loops.
mir-155	oral squamous cell carcinoma	up	MicroRNA-155 in oral squamous cell carcinoma: Overexpression, localization, and prognostic potential.	mir-21	hepatocellular carcinoma	up	Anti-miR-21 Suppresses Hepatocellular Carcinoma Growth via Broad Transcriptional Network Deregulation.	mir-490-3p	hepatocellular carcinoma	up	miR-490-3p Modulates Cell Growth and Epithelial to Mesenchymal Transition of Hepatocellular Carcinoma Cells by Targeting Endoplasmic Reticulum-Golgi Intermediate Compartment Protein 3 (ERGIC3).

mir-155	oral squamous cell carcinoma	up	Upregulation of a potential prognostic biomarker, miR-155, enhances cell proliferation in patients with oral squamous cell carcinoma.	mir-21	hepatocellular carcinoma	up	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-492	hepatoblastoma	up	MicroRNA-492 is processed from the keratin 19 gene and up-regulated in metastatic hepatoblastoma.
mir-155	papillary thyroid carcinoma	up	Upregulated miR-155 in Papillary Thyroid Carcinoma Promotes Tumor Growth by Targeting APC and Activating Wnt/?-Catenin Signaling	mir-21	hepatocellular carcinoma	up	Dehydroepiandrosterone-induces miR-21 transcription in HepG2 cells through estrogen receptor ? and androgen receptor.	mir-493	pituitary carcinoma	up	MicroRNA expression in ACTH-producing pituitary tumors: up-regulation of microRNA-122 and -493 in pituitary carcinomas.
mir-155	prostate cancer	up	A study of molecular signals deregulating mismatch repair genes in prostate cancer compared to benign prostatic hyperplasia	mir-21	hepatocellular carcinoma	up	miR-21 Inhibition Reduces Liver Fibrosis and Prevents Tumor Development by Inducing Apoptosis of CD24+ Progenitor Cells.	mir-494	cervical cancer	up	MicroRNA-494 promotes cervical cancer proliferation through the regulation of PTEN.
mir-155	rectal cancer	up	The quantitative analysis by stem-loop real-time PCR revealed the microRNA-34a, microRNA-155 and microRNA-200c overexpression in human colorectal cancer.	mir-21	hepatocellular carcinoma	up	miR-21 promotes migration and invasion by the miR-21-PDCD4-AP-1 feedback loop in human hepatocellular carcinoma.	mir-494	colorectal cancer	up	miR?494 is an independent prognostic factor and promotes cell migration and invasion in colorectal cancer by directly targeting PTEN.
mir-155	renal clear cell carcinoma	up	miRNA profiling for clear cell renal cell carcinoma: biomarker discovery and identification of potential controls and consequences of miRNA dysregulation.	mir-21	hepatocellular carcinoma	up	Expression of serum exosomal microRNA-21 in human hepatocellular carcinoma.	mir-494	glioma	up	Ionizing radiation-inducible miR-494 promotes glioma cell invasion through EGFR stabilization by targeting p190B RhoGAP.
mir-155	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.	mir-21	hepatocellular carcinoma	up	Thyroid hormone regulation of miR-21 enhances migration and invasion of hepatoma.	mir-494	hepatocellular carcinoma	up	MiR-494 within an oncogenic MicroRNA megacluster regulates G1/S transition in liver tumorigenesis through suppression of MCC.
mir-15a	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-21	hepatocellular carcinoma	up	miR-21 expression predicts prognosis in hepatocellular carcinoma.	mir-494	hepatocellular carcinoma	up	MicroRNA-494 is a master epigenetic regulator of multiple invasion-suppressor microRNAs by targeting ten eleven translocation 1 in invasive human hepatocellular carcinoma tumors.
mir-15a	neuroblastoma	up	miR-15a/16-1 enhances retinoic acid-mediated differentiation of leukemic cells and is up-regulated by retinoic acid.	mir-21	hepatocellular carcinoma	up	MicroRNA-21 suppresses PTEN and hSulf-1 expression and promotes hepatocellular carcinoma progression through AKT/ERK pathways.	mir-494	hepatocellular carcinoma	up	miR-494 promotes cell proliferation, migration and invasion, and increased sorafenib resistance in hepatocellular carcinoma by targeting PTEN.

mir-15a	neuroblastoma	up	MicroRNA-15a promotes neuroblastoma migration by targeting reversion-inducing cysteine-rich protein with Kazal motifs (RECK) and regulating matrix metalloproteinase-9 expression.	mir-21	hepatocellular carcinoma	up	Indole-3-carbinol inhibits tumorigenicity of hepatocellular carcinoma cells via suppression of microRNA-21 and upregulation of phosphatase and tensin homolog.	mir-494	non-small cell lung cancer	up	Expression and clinical evidence of miR-494 and PTEN in non-small cell lung cancer.
mir-15a	pancreatic cancer	up	Dysregulation of miR-15a and miR-214 in human pancreatic cancer.	mir-21	hypopharyngeal squamous cell carcinoma	up	Altered Expression of miR-21 and PTEN in Human Laryngeal and Hypopharyngeal Squamous Cell Carcinomas.	mir-494	non-small cell lung cancer	up	Tumor-derived microRNA-494 promotes angiogenesis in non-small cell lung cancer.
mir-15b	malignant melanoma	up	MicroRNA-15b represents an independent prognostic parameter and is correlated with tumor cell proliferation and apoptosis in malignant melanoma.	mir-21	kidney cancer	up	miR-21 downregulated TCF21 to inhibit KISS1 in renal cancer.	mir-495	breast cancer	up	miR-495 is upregulated by E12/E47 in breast cancer stem cells, and promotes oncogenesis and hypoxia resistance via downregulation of E-cadherin and REDD1.
mir-15b	neuroblastoma	up	miR-15a/16-1 enhances retinoic acid-mediated differentiation of leukemic cells and is up-regulated by retinoic acid.	mir-21	laryngeal carcinoma	up	Regulation of the cell cycle gene, BTG2, by miR-21 in human laryngeal carcinoma.	mir-495	hepatocellular carcinoma	up	MicroRNAs regulate methionine adenosyltransferase 1A expression in hepatocellular carcinoma.
mir-16	esophageal squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.	mir-21	laryngeal squamous cell carcinoma	up	Downregulation of miR-21 modulates Ras expression to promote apoptosis and suppress invasion of Laryngeal squamous cell carcinoma.	mir-497	colorectal cancer	up	MicroRNA-497 and bufalin act synergistically to inhibit colorectal cancer metastasis.
mir-16	head and neck squamous cell carcinoma	up	Expression of microRNAs in squamous cell carcinoma of human head and neck and the esophagus: miR-205 and miR-21 are specific markers for HNSCC and ESCC.	mir-21	laryngeal squamous cell carcinoma	up	Altered Expression of miR-21 and PTEN in Human Laryngeal and Hypopharyngeal Squamous Cell Carcinomas.	mir-497	colorectal cancer	up	MiR-497 promotes metastasis of colorectal cancer cells through Nrdp1 inhibition.
mir-16	laryngeal carcinoma	up	MicroRNA-16 targets syntaxin and promotes cell motility in human laryngeal carcinoma cell line HEp-2.	mir-21	liver cancer	up	microRNA 21-mediated suppression of Sprouty1 by Pokemon affects liver cancer cell growth and proliferation.	mir-497	glioma	up	Hypoxia-induced miR-497 decreases glioma cell sensitivity to TMZ by inhibiting apoptosis.
mir-16	renal cell carcinoma	up	Upregulated microRNA-16 as an oncogene in renal cell carcinoma.	mir-21	lung cancer	up	Evaluation of dynamic change of serum miR-21 and miR-24 in pre- and post-operative lung carcinoma patients.	mir-499-5p	colorectal cancer	up	MicroRNA-499-5p promotes cellular invasion and tumor metastasis in colorectal cancer by targeting FOXO4 and PDCD4.
mir-16-1	neuroblastoma	up	miR-15a/16-1 enhances retinoic acid-mediated differentiation of leukemic cells and is up-regulated by retinoic acid.	mir-21	lung cancer	up	Differential MicroRNAs Expression in Serum of Patients with Lung Cancer, Pulmonary Tuberculosis, and Pneumonia.	mir-500	gastric cancer	up	MicroRNA-500 sustains nuclear factor-?B activation and induces gastric cancer cell proliferation and resistance to apoptosis.
mir-16-2	neuroblastoma	up	miR-15a/16-1 enhances retinoic acid-mediated differentiation of leukemic cells and is up-regulated by	mir-21	lung cancer	up	Expression and significance of miRNA-21 and BTG2 in lung cancer.	mir-500	hepatocellular carcinoma	up	MicroRNA-500 as a potential diagnostic marker for hepatocellular carcinoma.

			retinoic acid.								
mir-17	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-21	malignant melanoma	up	microRNA-21 is upregulated in malignant melanoma and influences apoptosis of melanocytic cells.	mir-501	hepatocellular carcinoma	up	MicroRNA-501 promotes HBV replication by targeting HBXIP.
mir-17	breast cancer	up	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.	mir-21	malignant melanoma	up	MiR-21 enhances melanoma invasiveness via inhibition of tissue inhibitor of metalloproteinases 3 expression: in vivo effects of MiR-21 inhibitor.	mir-501-5p	hepatocellular carcinoma	up	MiR-501-5p regulates CYLD expression and promotes cell proliferation in human hepatocellular carcinoma.
mir-17	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.	mir-21	multiple myeloma	up	Integrative analysis of differential miRNA and functional study of miR-21 by seed-targeting inhibition in multiple myeloma cells in response to berberine.	mir-503	breast cancer	up	MiR-503 inhibited cell proliferation of human breast cancer cells by suppressing CCND1 expression.
mir-17	cholangiocarcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.	mir-21	nasopharyngeal carcinoma	up	Activation of miR-21 by STAT3 Induces Proliferation and Suppresses Apoptosis in Nasopharyngeal Carcinoma by Targeting PTEN Gene.	mir-503	ovarian cancer	up	MicroRNAs overexpressed in ovarian ALDH1-positive cells are associated with chemoresistance.
mir-17	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-21	non-small cell lung cancer	up	High expression of serum miR-21 and tumor miR-200c associated with poor prognosis in patients with lung cancer.	mir-510	breast cancer	up	MicroRNA-510 promotes cell and tumor growth by targeting peroxiredoxin1 in breast cancer.
mir-17	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-21	non-small cell lung cancer	up	Clinical evaluation of microRNA expression profiling in non small cell lung cancer.	mir-5100	lung cancer	up	miR-5100 promotes tumor growth in lung cancer by targeting Rab6.
mir-17	colorectal carcinoma	up	Up-regulated miR-17 promotes cell proliferation, tumour growth and cell cycle progression by targeting the RND3 tumour suppressor gene in colorectal carcinoma.	mir-21	non-small cell lung cancer	up	Downregulation of microRNA-21 expression restrains non-small cell lung cancer cell proliferation and migration through upregulation of programmed cell death 4.	mir-519d	hepatocellular carcinoma	up	In hepatocellular carcinoma miR-519d is up-regulated by p53 and DNA hypomethylation and targets CDKN1A/p21, PTEN, AKT3 and TIMP2.
mir-17	esophageal squamous cell carcinoma	up		mir-21	non-small cell lung cancer	up	Identification of plasma microRNA-21 as a biomarker for early detection and chemosensitivity of non-small cell lung cancer.	mir-520c	breast cancer	up	The microRNAs miR-373 and miR-520c promote tumour invasion and metastasis.
mir-17	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-21	non-small cell lung cancer	up	Overexpression of miRNA-21 promotes radiation-resistance of non-small cell lung cancer.	mir-520c-3p	gastric cancer	up	MicroRNA profiling of human gastric cancer.

mir-17	gastric cancer	up	Overexpression of miR-17 in gastric cancer is correlated with proliferation-associated oncogene amplification.	mir-21	non-small cell lung cancer	up	Prognostic significance of serum miRNA-21 expression in human non-small cell lung cancer.	mir-520g	hepatocellular carcinoma	up	MicroRNA-520g induces epithelial-mesenchymal transition and promotes metastasis of hepatocellular carcinoma by targeting SMAD7.
mir-17	gastric cancer	up	Inhibition of microRNA-17/20a suppresses cell proliferation in gastric cancer by modulating UBE2C expression.	mir-21	non-small cell lung cancer	up	Let-7g and miR-21 expression in non-small cell lung cancer: Correlation with clinicopathological and molecular features.	mir-525-3p	liver cancer	up	MiR-525-3p Enhances the Migration and Invasion of Liver Cancer Cells by Downregulating ZNF395
mir-17	glioma	up	Identification and functional characterization of microRNAs involved in the malignant progression of gliomas.	mir-21	non-small cell lung cancer	up	[Overexpression of miR-21 promotes proliferation and reduces apoptosis in non-small cell lung cancer].	mir-526b	breast cancer	up	COX-2 Elevates Oncogenic miR-526b in Breast Cancer by EP4 Activation.
mir-17	glioma	up	Increased expression of microRNA-17 predicts poor prognosis in human glioma.	mir-21	non-small cell lung cancer	up	MiR-21 suppresses the anticancer activities of curcumin by targeting PTEN gene in human non-small cell lung cancer A549 cells.	mir-532-5p	malignant melanoma	up	Regulation of RUNX3 tumor suppressor gene expression in cutaneous melanoma.
mir-17	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.	mir-21	non-small cell lung cancer	up	Use of Luminex xMAP bead-based suspension array for detecting microRNA in NSCLC tissues and its clinical application.	mir-541	pancreatic ductal adenocarcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.
mir-17	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.	mir-21	non-small cell lung cancer	up	Alteration in Mir-21/PTEN expression modulates gefitinib resistance in non-small cell lung cancer.	mir-544	gastric cancer	up	Oncogenic miR-544 is an important Molecular Target in Gastric Cancer
mir-17	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-21	non-small cell lung cancer	up	Prognostic value of mature microRNA-21 and microRNA-205 overexpression in non-small cell lung cancer by quantitative real-time RT-PCR.	mir-566	glioma	up	MicroRNA-566 activates EGFR signaling and its inhibition sensitizes glioblastoma cells to nimotuzumab
mir-17	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-21	non-small cell lung cancer	up	Reduction of Plasma MicroRNA-21 is Associated with Chemotherapeutic Response in Patients with Non-small Cell Lung Cancer.	mir-570	lung cancer	up	MicroRNA-570 promotes lung carcinoma proliferation through targeting tumor suppressor KLF9
mir-17	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.	mir-21	non-small cell lung cancer	up	MicroRNA-21 (miR-21) regulates cellular proliferation, invasion, migration, and apoptosis by targeting PTEN, RECK and Bcl-2 in lung squamous carcinoma, Gejiu City, China.	mir-572	ovarian cancer	up	Upregulation of MiR-572 transcriptionally suppresses SOCS1 and p21 and contributes to human ovarian cancer progression.

mir-17	medulloblastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.	mir-21	oral cancer	up	MicroRNA-21 Promotes Oral Cancer Invasion via the Wnt/?-Catenin Pathway by Targeting DKK2.	mir-572	renal cell carcinoma	up	A panel of five serum miRNAs as a potential diagnostic tool for early-stage renal cell carcinoma.
mir-17	nasopharyngeal cancer	up	Circulating miR-17, miR-20a, miR-29c, and miR-223 Combined as Non-Invasive Biomarkers in Nasopharyngeal Carcinoma.	mir-21	oral squamous cell carcinoma	up	Relationship between microRNA expression levels and histopathological features of dysplasia in oral leukoplakia.	mir-574-3p	hepatocellular carcinoma	up	Serum microRNA characterization identifies miR-885-5p as a potential marker for detecting liver pathologies.
mir-17	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.	mir-21	oral squamous cell carcinoma	up	Altered levels of miR-21, miR-125b-2*, miR-134, miR-155, miR-184, and miR-205 in oral squamous cell carcinoma and association with clinicopathological characteristics.	mir-575	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-17-5p	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-21	osteosarcoma	up	Identification of Serum MicroRNA-21 as a Biomarker for Chemosensitivity and Prognosis in Human Osteosarcoma.	mir-576-5p	glioblastoma	up	miRNA microarray reveals specific expression in the peripheral blood of glioblastoma patients
mir-17-5p	breast cancer	up	miR-17-5p promotes human breast cancer cell migration and invasion through suppression of HBP1.	mir-21	osteosarcoma	up	MicroRNA-21 is involved in osteosarcoma cell invasion and migration.	mir-590-5p	cervical cancer	up	MicroRNA-590 Promotes Cervical Cancer Cell Growth and Invasion by Targeting CBL1.
mir-17-5p	gastric cancer	up	Circulating microRNAs in plasma of patients with gastric cancers.	mir-21	osteosarcoma	up	A three-plasma miRNA signature serves as novel biomarkers for osteosarcoma.	mir-590-5p	hepatocellular carcinoma	up	MicroRNA-590-5p regulates proliferation and invasion in human hepatocellular carcinoma cells by targeting TGF-? RII.
mir-17-5p	gastric cancer	up	Prognostic impact of circulating miR-21 in the plasma of patients with gastric carcinoma.	mir-21	ovarian cancer	up	The inhibition of miR-21 promotes apoptosis and chemosensitivity in ovarian cancer.	mir-592	colorectal cancer	up	Up-regulation of miR-592 correlates with tumor progression and poor prognosis in patients with colorectal cancer.
mir-17-5p	gastric cancer	up	miR-17-5p promotes proliferation by targeting SOCS6 in gastric cancer cells.	mir-21	pancreatic cancer	up	MicroRNA-21 is overexpressed in pancreatic cancer and a potential predictor of survival.	mir-601	gastric cancer	up	MicroRNA profiling of human gastric cancer.
mir-17-5p	hepatocellular carcinoma	up	miR-17-5p Promotes migration of human hepatocellular carcinoma cells through the p38 mitogen-activated protein kinase-heat shock protein 27 pathway.	mir-21	pancreatic cancer	up	MicroRNA-21 modulates biological functions of pancreatic cancer cells including their proliferation, invasion, and chemoresistance.	mir-603	glioma	up	miR-603 promotes glioma cell growth via Wnt/?-catenin pathway by inhibiting WIF1 and CTNNBIP1.

mir-17-5p	hepatocellular carcinoma	up	miR-17-5p as a novel prognostic marker for hepatocellular carcinoma	mir-21	pancreatic ductal adenocarcinoma	up	MiR-21 upregulation induced by promoter zone histone acetylation is associated with chemoresistance to gemcitabine and enhanced malignancy of pancreatic cancer cells.	mir-616*	gastric cancer	up	MicroRNA profiling of human gastric cancer
mir-17-5p	malignant melanoma	up	Regulation of cancer aggressive features in melanoma cells by microRNAs	mir-21	pancreatic ductal adenocarcinoma	up	MicroRNA-21 in pancreatic cancer: correlation with clinical outcome and pharmacologic aspects underlying its role in the modulation of gemcitabine activity.	mir-626	glioblastoma	up	miRNA microarray reveals specific expression in the peripheral blood of glioblastoma patients.
mir-17-5p	malignant melanoma	up	Altered expression of selected microRNAs in melanoma: antiproliferative and proapoptotic activity of miRNA-155.	mir-21	pancreatic ductal adenocarcinoma	up	Modulation of FoxO1 expression by miR-21 to promote growth of pancreatic ductal adenocarcinoma.	mir-630	colorectal cancer	up	MicroRNA-630 is a prognostic marker for patients with colorectal cancer.
mir-17-5p	pancreatic cancer	up	miR-17-5p Inhibitor Enhances Chemosensitivity to Gemcitabine Via Upregulating Bim Expression in Pancreatic Cancer Cells.	mir-21	pancreatic ductal adenocarcinoma	up	Knockdown of microRNA-21 inhibits proliferation and increases cell death by targeting programmed cell death 4 (PDCD4) in pancreatic ductal adenocarcinoma.	mir-630	hepatocellular carcinoma	up	miR-630 Overexpression in Hepatocellular Carcinoma Tissues is Positively Correlated with Alpha-Fetoprotein.
mir-17-5p	pancreatic cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-21	pancreatic ductal adenocarcinoma	up	Interplay of miR-21 and FoxO1 modulates growth of pancreatic ductal adenocarcinoma	mir-630	renal clear cell carcinoma	up	Up-regulation of miR-630 in clear cell renal cell carcinoma is associated with lower overall survival.
mir-17-5p	pancreatic cancer	up	MicroRNA-10a is overexpressed in human pancreatic cancer and involved in its invasiveness partially via suppression of the HOXA1 gene.	mir-21	pancreatic ductal adenocarcinoma	up	Association of microRNA-21 expression with its targets, PDCD4 and TIMP3, in pancreatic ductal adenocarcinoma.	mir-638	malignant melanoma	up	miR-638 promotes melanoma metastasis and protects melanoma cells from apoptosis and autophagy.
mir-17-5p	pituitary carcinoma	up	MicroRNA involvement in a metastatic non-functioning pituitary carcinoma	mir-21	pancreatic ductal adenocarcinoma	up	MiR-21, miR-34a, miR-198 and miR-217 as diagnostic and prognostic biomarkers for chronic pancreatitis and pancreatic ductal adenocarcinoma.	mir-639	bladder cancer	up	Circulating microRNAs in serum: novel biomarkers for patients with bladder cancer?
mir-181a	acute promyelocytic leukemia	up	PML/RAR? -regulated miR-181a/b cluster targets the tumor suppressor RASSF1A in Acute Promyelocytic Leukemia.	mir-21	pancreatic ductal adenocarcinoma	up	MicroRNAs as diagnostic markers for pancreatic ductal adenocarcinoma and its precursor, pancreatic intraepithelial neoplasm.	mir-650	gastric cancer	up	MicroRNA-650 targets ING4 to promote gastric cancer tumorigenicity.
mir-181a	breast cancer	up	Transforming growth factor-? regulates the sphere-initiating stem cell-like feature in breast cancer through miRNA-181 and ATM.	mir-21	pancreatic ductal adenocarcinoma	up	MicroRNA-21 in Pancreatic Ductal Adenocarcinoma Tumor-Associated Fibroblasts Promotes Metastasis.	mir-650	glioma	up	MicroRNA-650 expression in glioma is associated with prognosis of patients

mir-181a	cervical cancer	up	MicroRNA-181a enhances the chemoresistance of human cervical squamous cell carcinoma to cisplatin by targeting PRKCD.	mir-21	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-650	hepatocellular carcinoma	up	Upregulation of miR-650 is correlated with down-regulation of ING4 and progression of hepatocellular carcinoma.
mir-181a	colon cancer	up	miR-181a mediates metabolic shift in colon cancer cells via the PTEN/AKT pathway.	mir-21	papillary thyroid carcinoma	up	MicroRNA-21 regulates biological behaviors in papillary thyroid carcinoma by targeting programmed cell death 4.	mir-657	hepatocellular carcinoma	up	MiR-657 promotes tumorigenesis in hepatocellular carcinoma by targeting transducin-like enhancer protein 1 through NF-?B pathways.
mir-181a	colorectal cancer	up	MicroRNA-181a promotes tumor growth and liver metastasis in colorectal cancer by targeting the tumor suppressor WIF-1.	mir-21	prostate cancer	up	MicroRNA-21 inhibits p57Kip2 expression in prostate cancer.	mir-663	lung cancer	up	MicroRNA-663 targets TGFB1 and regulates lung cancer proliferation.
mir-181a	gastric cancer	up	MicroRNA-181a promotes gastric cancer by negatively regulating tumor suppressor KLF6.	mir-21	prostate cancer	up	A study of molecular signals deregulating mismatch repair genes in prostate cancer compared to benign prostatic hyperplasia.	mir-663	nasopharyngeal carcinoma	up	MiR-663, a microRNA targeting p21(WAF1/CIP1), promotes the proliferation and tumorigenesis of nasopharyngeal carcinoma.
mir-181a	gastric cancer	up	Genetic polymorphism at miR-181a binding site contributes to gastric cancer susceptibility.	mir-21	renal cell carcinoma	up	miR-21 downregulated TCF21 to inhibit KISS1 in renal cancer.	mir-664	hepatocellular carcinoma	up	MicroRNAs regulate methionine adenosyltransferase 1A expression in hepatocellular carcinoma.
mir-181a	glioma	up	MiR-181a regulates blood-tumor barrier permeability by targeting Krüppel-like factor 6.	mir-21	renal cell carcinoma	up	MicroRNA-21 is overexpressed in renal cell carcinoma.	mir-675	colon cancer	up	Oncofetal H19-derived miR-675 regulates tumor suppressor RB in human colorectal cancer.
mir-181a	hepatocellular carcinoma	up	Up-regulated MicroRNA-181a induces carcinogenesis in Hepatitis B virus-related hepatocellular carcinoma by targeting E2F5.	mir-21	renal cell carcinoma	up	MicroRNA-21 (miR-21) post-transcriptionally downregulates tumor suppressor PDCD4 and promotes cell transformation, proliferation, and metastasis in renal cell carcinoma.	mir-675	glioma	up	Long Non-Coding RNA H19 Promotes Glioma Cell Invasion by Deriving miR-675.
mir-181a	hepatocellular carcinoma	up	Polycyclic aromatic hydrocarbon (PAH)-mediated upregulation of hepatic microRNA-181 family promotes cancer cell migration by targeting MAPK phosphatase-5, regulating the activation of p38 MAPK.	mir-21	renal cell carcinoma	up	The clinical utility of miR-21 as a diagnostic and prognostic marker for renal cell carcinoma.	mir-675-5p	non-small cell lung cancer	up	Down-regulation of miR-675-5p contributes to tumor progression and development by targeting pro-tumorigenic GPR55 in non-small cell lung cancer.
mir-181a	osteosarcoma	up	MicroRNA signatures associate with pathogenesis and progression of osteosarcoma.	mir-21	retinoblastoma	up	Seed-targeting anti-miR-21 inhibiting malignant progression of retinoblastoma and analysis of their phosphorylation signaling pathways.	mir-7	lung cancer	up	EGFR promotes lung tumorigenesis by activating miR-7 through a Ras/ERK/Myc pathway that targets the Ets2 transcriptional repressor ERF.

mir-181a	osteosarcoma	up	MicroRNA 181a improves proliferation and invasion, suppresses apoptosis of osteosarcoma cell.	mir-21	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.	mir-7	pancreatic cancer	up	Curcumin inhibits cell growth and invasion through up-regulation of miR-7 in pancreatic cancer cells.
mir-181a	pancreatic cancer	up	LPS Induced miR-181a Promotes Pancreatic Cancer Cell Migration via Targeting PTEN and MAP2K4.	mir-21-5p	clear cell renal cell cancer	up	Exploring the miRNA-mRNA regulatory network in clear cell renal cell carcinomas by next-generation sequencing expression profiles.	mir-7	renal cell carcinoma	up	Identification of miR-7 as an oncogene in renal cell carcinoma.
mir-181a-1	hepatocellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-21-5p	rectal cancer	up	Overexpression of miR-21-5p as a predictive marker for complete tumor regression to neoadjuvant chemoradiotherapy in rectal cancer patients.	mir-720	colorectal cancer	up	Evaluation of miR-720 prognostic significance in patients with colorectal cancer.
mir-181a-1	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-210	adrenal cortical carcinoma	up	The role of microRNA deregulation in the pathogenesis of adrenocortical carcinoma.	mir-744	nasopharyngeal carcinoma	up	MiR-744 functions as a proto-oncogene in nasopharyngeal carcinoma progression and metastasis via transcriptional control of ARHGAP5.
mir-181a-1	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-210	bladder cancer	up	Synthetic miRNA-mowers targeting miR-183-96-182 cluster or miR-210 inhibit growth and migration and induce apoptosis in bladder cancer cells.	mir-802	osteosarcoma	up	MicroRNA-802 promotes osteosarcoma cell proliferation by targeting p27.
mir-181a-2	hepatocellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-210	colorectal cancer	up	Hypoxia-inducible MiR-210 is an independent prognostic factor and contributes to metastasis in colorectal cancer.	mir-885-5p	hepatocellular carcinoma	up	Serum microRNA characterization identifies miR-885-5p as a potential marker for detecting liver pathologies.
mir-181a-2	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-210	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.	mir-892a	colorectal cancer	up	miR-892a regulated PPP2R2A expression and promoted cell proliferation of human colorectal cancer cells.
mir-181a-2	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-210	glioblastoma	up	Acute hypoxia induces upregulation of microRNA-210 expression in glioblastoma spheroids.	mir-9	esophageal squamous cell carcinoma	up	MicroRNA-9 promotes tumor metastasis via repressing E-cadherin in esophageal squamous cell carcinoma.
mir-181a-2*	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-210	glioma	up	MicroRNA-210 overexpression predicts poorer prognosis in glioma patients.	mir-9	glioma	up	Increased expression of microRNA-9 predicts an unfavorable prognosis in human glioma.
mir-181a-5p	gastric cancer	up	miR-181a-5p Expression and Effects on Cell Proliferation in Gastric Cancer.	mir-210	glioma	up	MiR-210 up-regulation inhibits proliferation and induces apoptosis in glioma cells by targeting SIN3A.	mir-9	glioma	up	[MiR-9 regulates the expression of CBX7 in human glioma].

mir-181b	acute promyelocytic leukemia	up	PML/RAR? -regulated miR-181a/b cluster targets the tumor suppressor RASSF1A in Acute Promyelocytic Leukemia	mir-210	hepatocellular carcinoma	up	Effects of knockdown of miR-210 in combination with ionizing radiation on human hepatoma xenograft in nude mice.	mir-9	glioma	up	The CREB-miR-9 negative feedback minicircuitry coordinates the migration and proliferation of glioma cells.
mir-181b	breast cancer	up	Transforming growth factor-? regulates the sphere-initiating stem cell-like feature in breast cancer through miRNA-181 and ATM.	mir-210	hepatocellular carcinoma	up	Hypoxia-inducible microRNA-210 augments the metastatic potential of tumor cells by targeting vacuole membrane protein 1 in hepatocellular carcinoma.	mir-9	hepatocellular carcinoma	up	Up-regulation of miR-9 expression predicate advanced clinicopathological features and poor prognosis in patients with hepatocellular carcinoma.
mir-181b	cervical cancer	up	miR-181b promotes cell proliferation and reduces apoptosis by repressing the expression of adenylyl cyclase 9 (AC9) in cervical cancer cells.	mir-210	kidney cancer	up	miR-210 is a target of hypoxia-inducible factors 1 and 2 in renal cancer, regulates ISCU and correlates with good prognosis.	mir-9	laryngeal squamous cell carcinoma	up	MicroRNA-9 as a novel prognostic biomarker in human laryngeal squamous cell carcinoma.
mir-181b	hepatocellular carcinoma	up	Polycyclic aromatic hydrocarbon (PAH)-mediated upregulation of hepatic microRNA-181 family promotes cancer cell migration by targeting MAPK phosphatase-5, regulating the activation of p38 MAPK.	mir-210	lung cancer	up	MiR-210 promotes a hypoxic phenotype and increases radioresistance in human lung cancer cell lines.	mir-9	non-small cell lung cancer	up	Up-regulation of miR-9 expression as a poor prognostic biomarker in patients with non-small cell lung cancer.
mir-181b	oral squamous cell carcinoma	up	Relationship between microRNA expression levels and histopathological features of dysplasia in oral leukoplakia.	mir-210	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-9	osteosarcoma	up	Serum miR-9 as a prognostic biomarker in patients with osteosarcoma.
mir-181b	osteosarcoma	up	MicroRNA signatures associate with pathogenesis and progression of osteosarcoma.	mir-210	malignant melanoma	up	MicroRNA-15b represents an independent prognostic parameter and is correlated with tumor cell proliferation and apoptosis in malignant melanoma.	mir-9	ovarian cancer	up	MicroRNA-9 promotes tumorigenesis and mediates sensitivity to cisplatin in primary epithelial ovarian cancer cells.
mir-181b	ovarian cancer	up	MicroRNA-181b promotes ovarian cancer cell growth and invasion by targeting LATS2.	mir-210	osteosarcoma	up	Prognostic evaluation of microRNA-210 expression in pediatric osteosarcoma.	mir-92	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.
mir-181b	prostate cancer	up	MicroRNA-181b expression in prostate cancer tissues and its influence on the biological behavior of the prostate cancer cell line PC-3.	mir-210	ovarian cancer	up	miR-210, a modulator of hypoxia-induced epithelial-mesenchymal transition in ovarian cancer cell.	mir-92	gastric cancer	up	MicroRNA-92 promotes gastric cancer cell proliferation and invasion through targeting FXR.
mir-181b	retinoblastoma	up	Hypoxia-induced miR-181b enhances angiogenesis of retinoblastoma cells by targeting PDCD10 and GATA6.	mir-210	renal cell carcinoma	up	MiR-210 expression in tumor tissue and in vitro effects of its silencing in renal cell carcinoma.	mir-92	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.

mir-181b-1	hepatocellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-210	renal clear cell carcinoma	up	Overexpression of miR-210, a downstream target of HIF1?, causes centrosome amplification in renal carcinoma cells.	mir-92	medulloblastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.
mir-181b-1	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-210	renal clear cell carcinoma	up	miRNA profiling for clear cell renal cell carcinoma: biomarker discovery and identification of potential controls and consequences of miRNA dysregulation.	mir-92	neuroblastoma	up	MYCN-regulated miRNA-92 inhibits secretion of the tumor suppressor DICKKOPF-3 (DKK3) in neuroblastoma.
mir-181b-1	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-210	renal clear cell carcinoma	up	Serum miR-210 as a potential biomarker of early clear cell renal cell carcinoma.	mir-92	pancreatic cancer	up	MicroRNA-10a is overexpressed in human pancreatic cancer and involved in its invasiveness partially via suppression of the HOXA1 gene.
mir-181b-2	hepatocellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-210-3p	glioblastoma	up	Hypoxic signature of microRNAs in glioblastoma: insights from small RNA deep sequencing.	mir-92a	acute promyelocytic leukemia	up	Inhibition of MicroRNA miR-92a Inhibits Cell Proliferation in Human Acute Promyelocytic Leukemia
mir-181b-2	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-211	colorectal cancer	up	MicroRNA-211 expression promotes colorectal cancer cell growth in vitro and in vivo by targeting tumor suppressor CHD5.	mir-92a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-181b-2	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-212	non-small cell lung cancer	up	MiR-212 displays Tumor Promoting properties in NSCLC Cells and targets the Hedgehog Pathway Receptor PTCH1.	mir-92a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-181c	gastric cancer	up	Upregulation of MicroRNA 181c Expression in Gastric Cancer Tissues and Plasma.	mir-212	non-small cell lung cancer	up	Synaptic acetylcholinesterase targeted by microRNA-212 functions as a tumor suppressor in non-small cell lung cancer.	mir-92a	cervical cancer	up	miR-92a is upregulated in cervical cancer and promotes cell proliferation and invasion by targeting FBXW7.
mir-181c	hepatocellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-212	pancreatic cancer	up	miR-132 and miR-212 are increased in pancreatic cancer and target the retinoblastoma tumor suppressor.	mir-92a	cholangiocarcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.
mir-181c	osteosarcoma	up	MicroRNA signatures associate with pathogenesis and progression of osteosarcoma.	mir-212	pancreatic ductal adenocarcinoma	up	miR-212 promotes pancreatic cancer cell growth and invasion by targeting the hedgehog signaling pathway receptor patched-1.	mir-92a	colorectal cancer	up	MicroRNA signatures: novel biomarker for colorectal cancer?

mir-181c	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-214	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-92a	colorectal cancer	up	Detection of miR-92a and miR-21 in stool samples as potential screening biomarkers for colorectal cancer and polyps.
mir-181c	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-214	gastric cancer	up	Down-regulated miRNA-214 induces a cell cycle G1 arrest in gastric cancer cells by up-regulating the PTEN protein.	mir-92a	colorectal cancer	up	Overexpression of miR-92a correlates with tumor metastasis and poor prognosis in patients with colorectal cancer.
mir-181d	hepatocellular carcinoma	up	Identification of microRNA-181 by genome-wide screening as a critical player in EpCAM-positive hepatic cancer stem cells.	mir-214	gastric cancer	up	Deregulated microRNAs in gastric cancer tissue-derived mesenchymal stem cells: novel biomarkers and a mechanism for gastric cancer.	mir-92a	colorectal cancer	up	MicroRNA-92a Functions as an Oncogene in Colorectal Cancer by Targeting PTEN.
mir-181d	hepatocellular carcinoma	up	Polycyclic aromatic hydrocarbon (PAH)-mediated upregulation of hepatic microRNA-181 family promotes cancer cell migration by targeting MAPK phosphatase-5, regulating the activation of p38 MAPK.	mir-214	gastric cancer	up	Hemolysis-free plasma miR-214 as novel biomarker of gastric cancer and is correlated with distant metastasis.	mir-92a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-181d	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-214	glioma	up	Associations between the Expression of micro-RNA 214 and clinicopathologic parameters of glioma.	mir-92a	esophageal squamous cell carcinoma	up	microRNA-92a promotes lymph node metastasis of human esophageal squamous cell carcinoma via E-cadherin.
mir-181d	prostate cancer	up	microRNA-181 promotes prostate cancer cell proliferation by regulating DAX-1 expression.	mir-214	hepatocellular carcinoma	up	MicroRNA-214 regulates the acquired resistance to gefitinib via the PTEN/AKT pathway in EGFR-mutant cell lines.	mir-92a	esophageal squamous cell carcinoma	up	
mir-182	bladder cancer	up	Synthetic miRNA-mowers targeting miR-183-96-182 cluster or miR-210 inhibit growth and migration and induce apoptosis in bladder cancer cells.	mir-214	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-92a	hepatocellular carcinoma	up	Deregulation of miR-92a expression is implicated in hepatocellular carcinoma development.
mir-182	breast cancer	up	Up-regulation of miR-182 by β-catenin in breast cancer increases tumorigenicity and invasiveness by targeting the matrix metalloproteinase inhibitor RECK.	mir-214	nasopharyngeal carcinoma	up	miR-214 promotes tumorigenesis by targeting lactotransferrin in nasopharyngeal carcinoma.	mir-92a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-182	breast cancer	up	Suppression of MIM by microRNA-182 activates RhoA and promotes breast cancer metastasis.	mir-214	nasopharyngeal carcinoma	up	Knockdown of miR-214 Promotes Apoptosis and Inhibits Cell Proliferation in Nasopharyngeal Carcinoma.	mir-92a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.

mir-182	breast cancer	up	Higher expression of circulating miR-182 as a novel biomarker for breast cancer.	mir-214	osteosarcoma	up	Upregulated expression of microRNA-214 is linked to tumor progression and adverse prognosis in pediatric osteosarcoma.	mir-92a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-182	colorectal adenocarcinoma	up	Enhanced miR-182 transcription is a predictor of poor overall survival in colorectal adenocarcinoma patients.	mir-214	ovarian cancer	up	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-92a	malignant melanoma	up	Altered expression of selected microRNAs in melanoma: antiproliferative and proapoptotic activity of miRNA-155.
mir-182	colorectal cancer	up	miR-182 promotes cell growth and invasion by targeting forkhead box F2 transcription factor in colorectal cancer.	mir-214	pancreatic cancer	up	Dysregulation of miR-15a and miR-214 in human pancreatic cancer.	mir-92a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-182	colorectal cancer	up	Up-regulation of miR-182 expression in colorectal cancer tissues and its prognostic value.	mir-215	cervical cancer	up	MicroRNA-215 is a potential prognostic marker for cervical cancer.	mir-92a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-182	colorectal cancer	up	microRNA-182 targets special AT-rich sequence-binding protein 2 to promote colorectal cancer proliferation and metastasis.	mir-215	gastric cancer	up	MicroRNA-192 and -215 are upregulated in human gastric cancer in vivo and suppress ALCAM expression in vitro.	mir-92b	glioblastoma	up	The miR-92b functions as a potential oncogene by targeting on Smad3 in glioblastomas.
mir-182	colorectal cancer	up	Circulating miR-182 is a biomarker of colorectal adenocarcinoma progression.	mir-215	gastric cancer	up	MiR-215 modulates gastric cancer cell proliferation by targeting RB1.	mir-92b	glioma	up	MiR-92b inhibitor promoted glioma cell apoptosis via targeting DKK3 and blocking the Wnt/beta-catenin signaling pathway.
mir-182	colorectal cancer	up	SATB1 and 2 in colorectal cancer.	mir-215	gastric cancer	up	MiR-215/192 participates in gastric cancer progression.	mir-92b	non-small cell lung cancer	up	MiR-92b regulates the cell growth, cisplatin chemosensitivity of A549 non small cell lung cancer cell line and target PTEN.
mir-182	colorectal carcinoma	up	Increased expression of miRNA-182 in colorectal carcinoma: an independent and tissue-specific prognostic factor.	mir-215	hepatocellular carcinoma	up	Serum microRNA characterization identifies miR-885-5p as a potential marker for detecting liver pathologies.	mir-92b	non-small cell lung cancer	up	Inhibition of miR-92b suppresses nonsmall cell lung cancer cells growth and motility by targeting RECK.
mir-182	endometrial cancer	up	MicroRNA-182 Promotes Tumor Cell Growth by Targeting Transcription Elongation Factor A-like 7 in Endometrial Carcinoma.	mir-216a	hepatocellular carcinoma	up	Androgen pathway stimulates microRNA-216a transcription to suppress the tumor suppressor in lung cancer-1 gene in early hepatocarcinogenesis.	mir-93	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.
mir-182	gallbladder carcinoma	up	TGF-? upregulates miR-182 expression to promote gallbladder cancer metastasis by targeting CADM1.	mir-216a	hepatocellular carcinoma	up	MiR-216a/217-induced epithelial-mesenchymal transition targets PTEN and SMAD7 to promote drug resistance and recurrence of liver cancer.	mir-93	endometrial cancer	up	TSA Suppresses miR-106b-93-25 Cluster Expression through Downregulation of MYC and Inhibits Proliferation and Induces Apoptosis in Human EMC

mir-182	glioma	up	The miR-183/96/182 Cluster Regulates Oxidative Apoptosis and Sensitizes Cells to Chemotherapy in Gliomas.	mir-217	breast cancer	up	MiR-217 Promotes Tumor Proliferation in Breast Cancer via Targeting DACH1.	mir-93	glioma	up	[Overexpressed microRNA-93 inhibits the proliferation and promotes apoptosis of A172 glioma cells].
mir-182	glioma	up	miR-182 as a prognostic marker for glioma progression and patient survival.	mir-217	hepatocellular carcinoma	up	MiR-216a/217-induced epithelial-mesenchymal transition targets PTEN and SMAD7 to promote drug resistance and recurrence of liver cancer.	mir-93	glioma	up	miR-93 promotes cell proliferation in gliomas through activation of PI3K/Akt signaling pathway.
mir-182	hepatocellular carcinoma	up	OncomiR miR-96 and miR-182 promote cell proliferation and invasion through targeting ephrinA5 in hepatocellular carcinoma.	mir-218	esophageal squamous cell carcinoma	up	miR-218 suppresses tumor growth and enhances the chemosensitivity of esophageal squamous cell carcinoma to cisplatin.	mir-93	head and neck squamous cell carcinoma	up	Increased expression of miR-93 is associated with poor prognosis in head and neck squamous cell carcinoma
mir-182	hepatocellular carcinoma	up	Wnt/?-Catenin activates MiR-183/96/182 expression in hepatocellular carcinoma that promotes cell invasion.	mir-22	non-small cell lung cancer	up	Circulating miR-22, miR-24 and miR-34a as novel predictive biomarkers to pemetrexed-based chemotherapy in advanced non small cell lung cancer.	mir-93	head and neck squamous cell carcinoma	up	Comprehensive MicroRNA profiling for head and neck squamous cell carcinomas.
mir-182	hepatocellular carcinoma	up	Serum miR-182 and miR-331-3p as diagnostic and prognostic markers in patients with hepatocellular carcinoma.	mir-221	anaplastic thyroid carcinoma	up	A 4-MicroRNA signature can discriminate primary lymphomas from anaplastic carcinomas in thyroid cytology smears.	mir-93	laryngeal squamous cell carcinoma	up	MicroRNA-93 regulates cyclin G2 expression and plays an oncogenic role in laryngeal squamous cell carcinoma.
mir-182	hepatocellular carcinoma	up	MicroRNA-182 downregulates metastasis suppressor 1 and contributes to metastasis of hepatocellular carcinoma.	mir-221	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers	mir-93	nasopharyngeal carcinoma	up	MicroRNA-93 promotes cell growth and invasion in nasopharyngeal carcinoma by targeting disabled homolog-2.
mir-182	hepatocellular carcinoma	up	MiR-182 is up-regulated and targeting Cebpa in hepatocellular carcinoma.	mir-221	bladder cancer	up	MicroRNA-221 silencing predisposed human bladder cancer cells to undergo apoptosis induced by TRAIL.	mir-93	non-small cell lung cancer	up	Expression of miR-29c, miR-93, and miR-429 as Potential Biomarkers for Detection of Early Stage Non-Small Lung Cancer.
mir-182	lung cancer	up	Differential MicroRNAs Expression in Serum of Patients with Lung Cancer, Pulmonary Tuberculosis, and Pneumonia.	mir-221	breast cancer	up	TRPS1 targeting by miR-221/222 promotes the epithelial-to-mesenchymal transition in breast cancer.	mir-942	esophageal squamous cell carcinoma	up	miR-942 promotes cancer stem cell-like traits in esophageal squamous cell carcinoma through activation of Wnt/?-catenin signalling pathway.
mir-182	lung cancer	up	Downregulation of microRNA-182 inhibits cell growth and invasion by targeting programmed cell death 4 in human lung adenocarcinoma cells.	mir-221	breast cancer	up	From microRNA functions to microRNA therapeutics: Novel targets and novel drugs in breast cancer research and treatment (Review).	mir-944	cervical cancer	up	Novel functions and targets of miR-944 in human cervical cancer cells.
mir-182	malignant melanoma	up	Aberrant miR-182 expression promotes melanoma metastasis by repressing FOXO3 and microphthalmia-associated transcription	mir-221	breast cancer	up	miR-221/222 promotes S-phase entry and cellular migration in control of basal-like breast cancer.	mir-95	colorectal cancer	up	MicroRNA-95 promotes cell proliferation and targets sorting Nexin 1 in human colorectal carcinoma.

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mir-182	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-221	colon carcinoma	up	[MicroRNA-221 promotes colon carcinoma cell proliferation in vitro by inhibiting CDKN1C/p57 expression].	mir-95	colorectal carcinoma	up	MicroRNA-95 promotes cell proliferation and targets sorting Nexin 1 in human colorectal carcinoma.
mir-182	mesenchymal cancer	up	MicroRNA-182 drives metastasis of primary sarcomas by targeting multiple genes.	mir-221	colorectal cancer	up	MicroRNA-221 inhibits CDKN1C/p57 expression in human colorectal carcinoma.	mir-95	non-small cell lung cancer	up	MiR-95 induces proliferation and chemo- or radioresistance through directly targeting sorting nexin1 (SNX1) in non-small cell lung cancer
mir-182	ovarian cancer	up	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-221	colorectal cancer	up	[MicroRNA-221 controls CDKN1C/P57 expression in human colorectal carcinoma]	mir-96	bladder cancer	up	MicroRNA expression signatures of bladder cancer revealed by deep sequencing
mir-182	ovarian cancer	up	Anti-MiR-182 reduces ovarian cancer burden, invasion and metastasis: An in vivo study in orthotopic xenografts of nude mice	mir-221	colorectal cancer	up	MicroRNA-221 promotes colorectal cancer cell invasion and metastasis by targeting RECK.	mir-96	bladder cancer	up	Synthetic miRNA-mowers targeting miR-183-96-182 cluster or miR-210 inhibit growth and migration and induce apoptosis in bladder cancer cells
mir-182	ovarian cancer	up	The upregulation of signal transducer and activator of transcription 5-dependent microRNA-182 and microRNA-96 promotes ovarian cancer cell proliferation by targeting forkhead box O3 upon leptin stimul	mir-221	esophageal cancer	up	Alteration of miRNA Expression Correlates with Lifestyle, Social and Environmental Determinants in Esophageal Carcinoma	mir-96	breast cancer	up	Unregulated miR-96 induces cell proliferation in human breast cancer by downregulating transcriptional factor FOXO3a.
mir-182	ovarian carcinoma	up	MicroRNA-182 promotes cell growth, invasion and chemoresistance by targeting programmed cell death 4 (PDCD4) in human ovarian carcinomas.	mir-221	follicular thyroid carcinoma	up	Differential miRNA expression defines migration and reduced apoptosis in follicular thyroid carcinomas.	mir-96	breast cancer	up	miR-96 promotes tumor proliferation and invasion by targeting RECK in breast cancer.
mir-182	papillary thyroid carcinoma	up	miR-182 targets CHL1 and controls tumor growth and invasion in papillary thyroid carcinoma.	mir-221	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-96	chronic myelogenous leukemia	up	Down-regulation of miR-10a in chronic myeloid leukemia CD34+ cells increases USF2-mediated cell growth.
mir-182	prostate cancer	up	miR-183-96-182 cluster is overexpressed in prostate tissue and regulates zinc homeostasis in prostate cells.	mir-221	gastric cancer	up	Increased Expression of MicroRNA-221 in gastric cancer and its clinical significance.	mir-96	colorectal cancer	up	Expression of miR-21, miR-31, miR-96 and miR-135b is correlated with the clinical parameters of colorectal cancer.

mir-182	prostate cancer	up	Overexpressed microRNA-182 promotes proliferation and invasion in prostate cancer PC-3 cells by down-regulating N-myc downstream regulated gene 1 (NDRG1).	mir-221	gastric cancer	up	Deregulated microRNAs in gastric cancer tissue-derived mesenchymal stem cells: novel biomarkers and a mechanism for gastric cancer.	mir-96	colorectal cancer	up	MicroRNA-96 promotes the proliferation of colorectal cancer cells and targets tumor protein p53 inducible nuclear protein 1, forkhead box protein O1 (FOXO1) and FOXO3a.
mir-182-5p	bladder cancer	up	Oncogenic miRNA-182-5p targets Smad4 and RECK in human bladder cancer.	mir-221	glioma	up	MicroRNA-221 targeting PI3-K/Akt signaling axis induces cell proliferation and BCNU resistance in human glioblastoma.	mir-96	esophageal cancer	up	MiR-96 promotes proliferation and chemo- or radioresistance by down-regulating RECK in esophageal cancer.
mir-182-5p	prostate cancer	up	MicroRNA-182-5p Promotes Cell Invasion and Proliferation by Down Regulating FOXF2, RECK and MTSS1 Genes in Human Prostate Cancer.	mir-221	glioma	up	MiR-221/222 promote human glioma cell invasion and angiogenesis by targeting TIMP2.	mir-96	glioma	up	The miR-183/96/182 Cluster Regulates Oxidative Apoptosis and Sensitizes Cells to Chemotherapy in Gliomas.
mir-183	bladder cancer	up	MicroRNA expression signatures of bladder cancer revealed by deep sequencing.	mir-221	glioma	up	Co-suppression of miR-221/222 cluster suppresses human glioma cell growth by targeting p27kip1 in vitro and in vivo.	mir-96	glioma	up	miR-96/HBP1/Wnt/?-catenin regulatory circuitry promotes glioma growth.
mir-183	bladder cancer	up	Synthetic miRNA-mowers targeting miR-183-96-182 cluster or miR-210 inhibit growth and migration and induce apoptosis in bladder cancer cells.	mir-221	glioma	up	MiR-221 and miR-222 target PUMA to induce cell survival in glioblastoma.	mir-96	hepatocellular carcinoma	up	OncomiR miR-96 and miR-182 promote cell proliferation and invasion through targeting ephrinA5 in hepatocellular carcinoma.
mir-183	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-221	glioma	up	Uptake by human glioma cell lines and biological effects of a peptide-nucleic acids targeting miR-221.	mir-96	hepatocellular carcinoma	up	Wnt/?-Catenin activates MiR-183/96/182 expression in hepatocellular carcinoma that promotes cell invasion.
mir-183	colorectal cancer	up	Overexpression of microRNA-183 in human colorectal cancer and its clinical significance.	mir-221	hepatocellular carcinoma	up	MiR-221 controls CDKN1C/p57 and CDKN1B/p27 expression in human hepatocellular carcinoma.	mir-96	hepatocellular carcinoma	up	Inhibition of miR-96 expression reduces cell proliferation and clonogenicity of HepG2 hepatoma cells.
mir-183	colorectal cancer	up	Plasma miR-183 predicts recurrence and prognosis in patients with colorectal cancer.	mir-221	hepatocellular carcinoma	up	Role of microRNA-155 at early stages of hepatocarcinogenesis induced by choline-deficient and amino acid-defined diet in C57BL/6 mice.	mir-96	ovarian cancer	up	The upregulation of signal transducer and activator of transcription 5-dependent microRNA-182 and microRNA-96 promotes ovarian cancer cell proliferation by targeting forkhead box O3 upon leptin stimul
mir-183	esophageal cancer	up	miRNA-183 suppresses apoptosis and promotes proliferation in esophageal cancer by targeting PDCD4.	mir-221	hepatocellular carcinoma	up	miR-221&222 regulate TRAIL resistance and enhance tumorigenicity through PTEN and TIMP3 downregulation.	mir-96	ovarian cancer	up	Differential microRNA expression signatures and cell type-specific association with Taxol resistance in ovarian cancer cells.

mir-183	esophageal squamous cell carcinoma	up	MicroRNA-183 promotes proliferation and invasion in oesophageal squamous cell carcinoma by targeting programmed cell death 4.	mir-221	hepatocellular carcinoma	up	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-96	prostate cancer	up	miR-96 promotes cell proliferation and clonogenicity by down-regulating of FOXO1 in prostate cancer cells.
mir-183	follicular thyroid carcinoma	up	Differential miRNA expression defines migration and reduced apoptosis in follicular thyroid carcinomas.	mir-221	hepatocellular carcinoma	up	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-96	prostate cancer	up	Transforming growth factor-? promotes prostate bone metastasis through induction of microRNA-96 and activation of the mTOR pathway
mir-183	gastric cancer	up	MicroRNA-183 inhibits apoptosis and promotes proliferation and invasion of gastric cancer cells by targeting PDCD4.	mir-221	hepatocellular carcinoma	up	Increased MiR-221 expression in hepatocellular carcinoma tissues and its role in enhancing cell growth and inhibiting apoptosis in vitro.	mir-96	prostate cancer	up	miR-183-96-182 cluster is overexpressed in prostate tissue and regulates zinc homeostasis in prostate cells.
mir-183	glioma	up	The miR-183/96/182 Cluster Regulates Oxidative Apoptosis and Sensitizes Cells to Chemotherapy in Gliomas.	mir-221	liver cancer	up	Bioinformatics analysis identifies miR-221 as a core regulator in hepatocellular carcinoma and its silencing suppresses tumor properties.	mir-98	gastric cancer	up	MicroRNA profiling of human gastric cancer
mir-183	hepatocellular carcinoma	up		mir-221	malignant melanoma	up	The abrogation of the HOXB7/PBX2 complex induces apoptosis in melanoma through the miR-221&222-c-FOS pathway.	mir-99a	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.
mir-183	hepatocellular carcinoma	up	miR-183 inhibits TGF-beta1-induced apoptosis by downregulation of PDCD4 expression in human hepatocellular carcinoma cells.	mir-221	non-small cell lung cancer	up	MicroRNA-221 promotes human non-small cell lung cancer cell H460 growth.	mir-99a	pancreatic cancer	up	Antagonism of microRNA-99a promotes cell invasion and down-regulates E-cadherin expression in pancreatic cancer cells by regulating mammalian target of rapamycin.
mir-183	hepatocellular carcinoma	up	Expression and Significance of MicroRNA-183 in Hepatocellular Carcinoma.	mir-221	non-small cell lung cancer	up	miR-221&222 regulate TRAIL resistance and enhance tumorigenicity through PTEN and TIMP3 downregulation.	mir-99b	esophageal cancer	up	Differential expression of miRNAs in esophageal cancer tissue.
mir-183	kidney cancer	up	microRNA-183 plays as oncogenes by increasing cell proliferation, migration and invasion via targeting protein phosphatase 2A in renal cancer cells.	mir-221	oral squamous cell carcinoma	up	miR-221 and miR-222 expression increased the growth and tumorigenesis of oral carcinoma cells.	mir-17	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-183	medullary thyroid carcinoma	up	MicroRNA profiling of sporadic and hereditary medullary thyroid cancer identifies predictors of nodal metastasis, prognosis, and potential therapeutic targets.	mir-221	osteosarcoma	up	MicroRNA-221 Induces Cell Survival and Cisplatin Resistance through PI3K/Akt Pathway in Human Osteosarcoma.	mir-17	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.

mir-183	papillary thyroid carcinoma	up	miR-183 regulates biological behavior in papillary thyroid carcinoma by targeting the programmed cell death 4.	mir-221	ovarian cancer	up	Micro-RNAs and ovarian cancer: the state of art and perspectives of clinical research.	mir-17	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-183	prostate cancer	up	miR-183-96-182 cluster is overexpressed in prostate tissue and regulates zinc homeostasis in prostate cells.	mir-221	pancreatic cancer	up	Down-regulation of miR-221 inhibits proliferation of pancreatic cancer cells through up-regulation of PTEN, p27(kip1), p57(kip2), and PUMA.	mir-17	esophageal squamous cell carcinoma	up	
mir-183	prostate cancer	up	microRNA-183 is an oncogene targeting Dkk-3 and SMAD4 in prostate cancer	mir-221	pancreatic cancer	up	miR-221/222 induces pancreatic cancer progression through the regulation of matrix metalloproteinases.	mir-17	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-183-3p	lung cancer	up	Up-regulation of microRNA-183-3p is a potent prognostic marker for lung adenocarcinoma of female non-smokers.	mir-221	pancreatic cancer	up	Metformin Causes G1-Phase Arrest via Down-Regulation of MiR-221 and Enhances TRAIL Sensitivity through DR5 Up-Regulation in Pancreatic Cancer Cells.	mir-17	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-184	head and neck squamous cell carcinoma	up	Co-targeting of multiple microRNAs on factor-inhibiting hypoxia-inducible factor (FIH) gene for the pathogenesis of head and neck carcinomas.	mir-221	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-17	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.
mir-184	hepatocellular carcinoma	up	Mir-184 Post-Transcriptionally Regulates SOX7 Expression and Promotes Cell Proliferation in Human Hepatocellular Carcinoma.	mir-221	papillary thyroid carcinoma	up	Integrated analyses of microRNA and mRNA expression profiles in aggressive papillary thyroid carcinoma.	mir-17	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-184	hepatocellular carcinoma	up	MicroRNA-184 inhibits cell proliferation and invasion, and specifically targets TNFAIP2 in Glioma.	mir-221	papillary thyroid carcinoma	up	MicroRNA analysis as a potential diagnostic tool for papillary thyroid carcinoma.	mir-17	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-184	squamous carcinoma	up	MicroRNA-184 inhibits cell proliferation and invasion, and specifically targets TNFAIP2 in Glioma.	mir-221	papillary thyroid carcinoma	up	In vivo imaging of functional targeting of miR-221 in papillary thyroid carcinoma.	mir-18a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-185	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-221	papillary thyroid carcinoma	up	In vivo imaging of miR-221 biogenesis in papillary thyroid carcinoma.	mir-18a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-185	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-221	prostate cancer	up	MiR-221 promotes the development of androgen independence in prostate cancer cells via downregulation of HECTD2 and RAB1A.	mir-18a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.

mir-186	pancreatic ductal adenocarcinoma	up	miR-186 and 326 Predict the Prognosis of Pancreatic Ductal Adenocarcinoma and Affect the Proliferation and Migration of Cancer Cells.	mir-221	squamous carcinoma	up	Unique MicroRNA Expression Profiles in Cervical Cancer.	mir-18a	esophageal squamous cell carcinoma	up	
mir-18a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-221	thyroid carcinoma	up	MicroRNAs (miR)-221 and miR-222, both overexpressed in human thyroid papillary carcinomas, regulate p27Kip1 protein levels and cell cycle.	mir-18a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-18a	breast cancer	up	MicroRNA expression profiles in human breast cancer cells after multifraction and single-dose radiation treatment.	mir-221*	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-18a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.
mir-18a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.	mir-222	anaplastic thyroid carcinoma	up	A 4-MicroRNA signature can discriminate primary lymphomas from anaplastic carcinomas in thyroid cytology smears.	mir-18a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-18a	cholangiocarcinoma	up	miR-17-92 cluster promotes cholangiocarcinoma growth: evidence for PTEN as downstream target and IL-6/Stat3 as upstream activator.	mir-222	bladder cancer	up	Increased expression of miR-222 is associated with poor prognosis in bladder cancer.	mir-18a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-18a	colon cancer	up	MicroRNA-18a Attenuates DNA Damage Repair through Suppressing the Expression of Ataxia Telangiectasia Mutated in Colorectal Cancer.	mir-222	breast cancer	up	Analysis of serum genome-wide microRNAs for breast cancer detection.	mir-18a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-18a	colorectal cancer	up	microRNA expression profile in stage III colorectal cancer: Circulating miR-18a and miR-29a as promising biomarkers.	mir-222	breast cancer	up	miR-221/222 promotes S-phase entry and cellular migration in control of basal-like breast cancer.	mir-19a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-18a	colorectal cancer	up	Plasma miR-200c and miR-18a as potential biomarkers for the detection of colorectal carcinoma.	mir-222	breast cancer	up	TRPS1 targeting by miR-221/222 promotes the epithelial-to-mesenchymal transition in breast cancer.	mir-19a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-18a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.	mir-222	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-19a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-18a	esophageal squamous cell carcinoma	up		mir-222	gastric cancer	up	Increased miR-222 in H. pylori-associated gastric cancer correlated with tumor progression by promoting cancer cell proliferation and targeting RECK.	mir-19a	esophageal squamous cell carcinoma	up	

mir-18a	esophageal squamous cell carcinoma	up	Clinical impact of circulating miR-18a in plasma of patients with oesophageal squamous cell carcinoma.	mir-222	gastric cancer	up	Deregulated microRNAs in gastric cancer tissue-derived mesenchymal stem cells: novel biomarkers and a mechanism for gastric cancer.	mir-19a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-18a	gastric cancer	up	Diagnostic and prognostic value of circulating miR-18a in the plasma of patients with gastric cancer.	mir-222	gastric cancer	up	Circulating miR-222 in plasma and its potential diagnostic and prognostic value in gastric cancer	mir-19a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-18a	gastric cancer	up	MicroRNA profiling of human gastric cancer.	mir-222	gastric cancer	up	miR-222/VGLL4/YAP-TEAD1 regulatory loop promotes proliferation and invasion of gastric cancer cells.	mir-19a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.
mir-18a	glioblastoma	up	MiR-18a regulates the proliferation, migration and invasion of human glioblastoma cell by targeting neogenin.	mir-222	glioma	up	Co-suppression of miR-221/222 cluster suppresses human glioma cell growth by targeting p27kip1 in vitro and in vivo.	mir-19a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-18a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.	mir-222	glioma	up	MiR-221 and miR-222 target PUMA to induce cell survival in glioblastoma.	mir-19a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-18a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.	mir-222	glioma	up	MiR-221/222 promote human glioma cell invasion and angiogenesis by targeting TIMP2.	mir-19b	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-18a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.	mir-222	hepatocellular carcinoma	up	GNAI3 inhibits tumor cell migration and invasion and is post-transcriptionally regulated by miR-222 in hepatocellular carcinoma.	mir-19b	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-18a	malignant melanoma	up	Comparative analysis of melanoma deregulated miRNAs in the medaka and Xiphophorus pigment cell cancer models.	mir-222	hepatocellular carcinoma	up	Role of microRNA-155 at early stages of hepatocarcinogenesis induced by choline-deficient and amino acid-defined diet in C57BL/6 mice.	mir-19b	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-18a	malignant melanoma	up	Altered expression of selected microRNAs in melanoma: antiproliferative and proapoptotic activity of miRNA-155.	mir-222	hepatocellular carcinoma	up	miR-221&222 regulate TRAIL resistance and enhance tumorigenicity through PTEN and TIMP3 downregulation.	mir-19b	esophageal squamous cell carcinoma	up	

mir-18a	mantle cell lymphoma	up	The miRNA-17/92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.	mir-222	hepatocellular carcinoma	up	Expression of microRNAs, miR-21, miR-31, miR-122, miR-145, miR-146a, miR-200c, miR-221, miR-222, and miR-223 in patients with hepatocellular carcinoma or intrahepatic cholangiocarcinoma and its progno	mir-19b	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-18a	medulloblastoma	up	The miR-17/92 polycistron is up-regulated in sonic hedgehog-driven medulloblastomas and induced by N-myc in sonic hedgehog-treated cerebellar neural precursors.	mir-222	hepatocellular carcinoma	up	MicroRNAs in Hepatobiliary and Pancreatic Cancers.	mir-19b	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.
mir-18a	nasopharyngeal carcinoma	up	miR-18a promotes malignant progression by impairing microRNA biogenesis in nasopharyngeal carcinoma	mir-222	hepatocellular carcinoma	up	[Expression of serum microRNAs (miR-222, miR-181, miR-216) in human hepatocellular carcinoma and its clinical significance].	mir-19b	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-18a	neuroblastoma	up	MYCN-regulated microRNAs repress estrogen receptor-alpha (ESR1) expression and neuronal differentiation in human neuroblastoma	mir-222	malignant melanoma	up	The abrogation of the HOXB7/PBX2 complex induces apoptosis in melanoma through the miR-221&222-c-FOS pathway.	mir-19b	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-18a	non-small cell lung cancer	up	Peripheral Blood miR-328 Expression as a Potential Biomarker for the Early Diagnosis of NSCLC.	mir-222	non-small cell lung cancer	up	miR-221&222 regulate TRAIL resistance and enhance tumorigenicity through PTEN and TIMP3 downregulation.	mir-19b	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-18a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.	mir-222	non-small cell lung cancer	up	Use of Luminex xMAP bead-based suspension array for detecting microRNA in NSCLC tissues and its clinical application.	mir-20a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-18a	pancreatic cancer	up	Novel diagnostic value of circulating miR-18a in plasma of patients with pancreatic cancer.	mir-222	oral squamous cell carcinoma	up	miR-221 and miR-222 expression increased the growth and tumorigenesis of oral carcinoma cells.	mir-20a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-18a	pancreatic ductal adenocarcinoma	up	Circulating MicroRNAs in Serum of Human K-ras Oncogene Transgenic Rats With Pancreatic Ductal Adenocarcinomas.	mir-222	pancreatic cancer	up	miR-221/222 induces pancreatic cancer progression through the regulation of matrix metalloproteinases.	mir-20a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-18a	prostate cancer	up	MicroRNA-18a is elevated in prostate cancer and promotes tumorigenesis through suppressing STK4 in vitro and in vivo	mir-222	papillary thyroid carcinoma	up	Integrated analyses of microRNA and mRNA expression profiles in aggressive papillary thyroid carcinoma	mir-20a	esophageal squamous cell carcinoma	up	

mir-18b	breast cancer	up	microRNA-18b is upregulated in breast cancer and modulates genes involved in cell migration.	mir-222	papillary thyroid carcinoma	up	MicroRNA analysis as a potential diagnostic tool for papillary thyroid carcinoma.	mir-20a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-190b	hepatocellular carcinoma	up	Up-Regulation of MicroRNA-190b Plays a Role for Decreased IGF-1 That Induces Insulin Resistance in Human Hepatocellular Carcinoma.	mir-222	papillary thyroid carcinoma	up	MicroRNA signature distinguishes the degree of aggressiveness of papillary thyroid carcinoma.	mir-20a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-191	breast cancer	up	Differential expression of miR-21, miR-125b and miR-191 in breast cancer tissue.	mir-222	papillary thyroid carcinoma	up	Circulating microRNA profiles as potential biomarkers for diagnosis of papillary thyroid carcinoma.	mir-20a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.
mir-191	breast cancer	up	HIF-inducible miR-191 promotes migration in breast cancer through complex regulation of TGF?-signaling in hypoxic microenvironment.	mir-222	papillary thyroid carcinoma	up	Expression of miRNAs in Papillary Thyroid Carcinomas Is Associated with BRAF Mutation and Clinicopathological Features in Chinese Patients.	mir-20a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-191	colorectal cancer	up	miR-191 promotes tumorigenesis of human colorectal cancer through targeting C/EBP?.	mir-222	thyroid carcinoma	up	MicroRNAs (miR)-221 and miR-222, both overexpressed in human thyroid papillary carcinomas, regulate p27Kip1 protein levels and cell cycle.	mir-20a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-191	colorectal carcinoma	up	MicroRNA-191 correlates with poor prognosis of colorectal carcinoma and plays multiple roles by targeting tissue inhibitor of metalloprotease 3.	mir-222-3p	endometrial cancer	up		mir-92a	b-cell lymphoma	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-191	colorectal carcinoma	up	MicroRNA-191 correlates with poor prognosis of colorectal carcinoma and plays multiple roles by targeting tissue inhibitor of metalloprotease 3.	mir-223	bladder cancer	up	Micro-RNA profiling in kidney and bladder cancers.	mir-92a	breast carcinoma	up	MiR-93 enhances angiogenesis and metastasis by targeting LATS2.
mir-191	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.	mir-223	colorectal cancer	up	Association of microRNA expression with microsatellite instability status in colorectal adenocarcinoma.	mir-92a	colorectal cancer	up	MicroRNA expression profiling of exfoliated colonocytes isolated from feces for colorectal cancer screening.
mir-191	hepatocellular carcinoma	up	Hypomethylation of the miR-191 locus causes high expression of mir-191 and promotes the epithelial-to-mesenchymal transition in hepatocellular carcinoma.	mir-223	colorectal cancer	up	Circulating Exosomal microRNAs as Biomarkers of Colon Cancer.	mir-92a	esophageal squamous cell carcinoma	up	

mir-191	osteosarcoma	up	MicroRNA-199a-3p is downregulated in human osteosarcoma and regulates cell proliferation and migration.	mir-223	colorectal cancer	up	MicroRNA-223 functions as an oncogene in human colorectal cancer cells.	mir-92a	lung cancer	up	A polycistronic microRNA cluster, miR-17-92, is overexpressed in human lung cancers and enhances cell proliferation.
mir-191	osteosarcoma	up	MicroRNA-191 promotes osteosarcoma cells proliferation by targeting checkpoint kinase 2.	mir-223	colorectal cancer	up	Overexpression of miR-223 correlates with tumor metastasis and poor prognosis in patients with colorectal cancer.	mir-92a	lung cancer	up	Apoptosis induction by antisense oligonucleotides against miR-17-5p and miR-20a in lung cancers overexpressing miR-17-92.
mir-191	pancreatic cancer	up	MicroRNA-191 promotes pancreatic cancer progression by targeting USP10.	mir-223	colorectal cancer	up	C/EBP-?-activated microRNA-223 promotes tumour growth through targeting RASA1 in human colorectal cancer.	mir-92a	lung cancer	up	MicroRNA miR-17-5p is overexpressed in pancreatic cancer, associated with a poor prognosis, and involved in cancer cell proliferation and invasion.
mir-192	gastric cancer	up	MicroRNA-192 and -215 are upregulated in human gastric cancer in vivo and suppress ALCAM expression in vitro.	mir-223	esophageal adenocarcinoma	up	MicroRNA 223 is Up-regulated in the Multistep Progression of Barrett's Esophagus and Modulates Sensitivity to Chemotherapy by Targeting PARP1.	mir-92a	mantle cell lymphoma	up	The miRNA-17?92 cluster mediates chemoresistance and enhances tumor growth in mantle cell lymphoma via PI3K/AKT pathway activation.
mir-192	gastric cancer	up	Plasma miR-122 and miR-192 as potential novel biomarkers for the early detection of distant metastasis of gastric cancer.	mir-223	esophageal squamous cell carcinoma	up	Clinical significance of serum miR-223, miR-25 and miR-375 in patients with esophageal squamous cell carcinoma.	mir-92a	osteosarcoma	up	Upregulation of microRNA-17-92 cluster associates with tumor progression and prognosis in osteosarcoma.
mir-192	gastric cancer	up	MiR-215/192 participates in gastric cancer progression.	mir-223	gastric cancer	up	miRNA-223 promotes gastric cancer invasion and metastasis by targeting tumor suppressor EPB41L3.				
mir-192	pancreatic ductal adenocarcinoma	up	Diagnostic and biological significance of microRNA-192 in pancreatic ductal adenocarcinoma.	mir-223	gastric cancer	up	MicroRNA-223 functions as an oncogene in human gastric cancer by targeting FBXW7/hCdc4.				
mir-193a-5p	renal cell carcinoma	up	A panel of five serum miRNAs as a potential diagnostic tool for early-stage renal cell carcinoma.	mir-223	gastric cancer	up	Plasma microRNAs, miR-223, miR-21 and miR-218, as novel potential biomarkers for gastric cancer detection.				
mir-193b	glioma	up	miR-193b promotes cell proliferation by targeting Smad3 in human glioma.	mir-223	gastric cancer	up	MicroRNA profiling of human gastric cancer.				

Table 5. Summary of microRNA/MMP linked interactions in cancer.

microRNA	MMP type and target molecule	Cancer type	Phenotype	Pathway
let-7	MMP-9	Melanoma	Cell proliferation and migration	-
let-7	MMP-14, ERK1/2 activation	Pancreatic ductal adenocarcinoma	NA	ERK1/2 activation, TGF-β1 signaling
let-7	Focal adhesion kinase (FAK), AKT, ERK, MMP-2 and MMP-9	Glioblastoma	Migration and invasion	AKT and ERK
miR-9	MMP-2, MMP-9 and VEGFA	Uveal melanoma	Migration and invasion	NF-κB1 signaling
miR-9	MMP-14	Neuroblastoma	Invasion, metastasis, and angiogenesis	-
miR-10b	MMP-9, E-cadherin and vimentin	Nasopharyngeal carcinoma cells	Proliferation, migration, invasion	-
miR-10b	MMP-14 and uPAR	Glioma	Cell invasiveness	-
miR-10b	MMP-2, EGFR.	Glioblastoma multiforme	Apoptosis invasion and migration	EGFR pathways
miR-15b	MMP-3	Glioma	Cell invasiveness	MEK-ERK pathway
miR-17	MMP-3	Hepatocellular carcinoma	Migration and invasion	p-AKT
miR-21	RECK, MMP-9	Prostate cancer	NA	-
miR-21	Phospho-c-Jun, MMP-2, MMP-9	Hepatocellular carcinoma	Migration and invasion	-
miR-21	RECK, MMP-2	Glioma	Apoptosis, migration, and invasiveness	-
miR-21	MMP-2, EGFR.	Glioblastoma multiforme	Apoptosis invasion and migration	EGFR pathways
miR-26a	MMP-2	Lung cancer	Migration, invasion and metastasis	AKT phosphorylation
miR-29b	MMP-2	Colon cancer	Migration	-
miR-29b	MMP-2	Hepatocellular carcinoma	Tumor angiogenesis, invasion, and metastasis	VEGFR-2-signaling
miR-29b	MMP-2, Mcl-1, COL1A1, and COL4A1	Prostate cancer	invasion and metastasis	-
miR-29c	MMP-2	Nerve sheath tumours	Cell invasion and migration	-
miR-30d	SOCS1, phospho-STAT3, MMP-2 and MMP-9	Prostate cancer	Proliferation and invasion	STAT3 signalling
miR-34a	Fra-1, p53 MMP-1 and MMP-9	Colon cancer	Migration and invasion	-
miR-92a	MMP-2 and -9	Lung cancer	Migration and invasion	STAT3 signaling
miR-101	Enhancer of zeste homolog 2 (EZH2), CDH1 and MMP-2	Lung cancer	Cell invasiveness	-
miR-106b	MMP-2	Breast cancer	Migration and invasion	ERK signaling cascade
miR-125b	MMP-2 and MMP-9	Glioblastoma	Invasion	-
miR-133	MMP-14	Lung cancer	Cell proliferation, migration and invasion	-
miR-138	RhoC, MMP-2 and MMP-9	Cholangiocarcinoma	Proliferation, migration and invasion	p-ERK signaling
miR-139	IGF-IR and MMP-2	Colorectal cancer	Migration, invasion and metastasis	IGF-IR/MEK/ERK signaling
miR-143	MMP-13	Prostate cancer	Migration and invasion	-
miR-143	MMP-2 and MMP-9	Pancreatic cancer	Migration and invasion	-
miR-143	MMP-13	Osteosarcoma	Cell invasiveness	-

microRNA	MMP type and target molecule	Cancer type	Phenotype	Pathway
miR-145	Ets1, MMP-1 and -9	Gastric cancer	Invasion, metastasis, and angiogenesis	-
miR-146a	MMP-1, uPA, and uPAR	Brain cancer	Migration, invasion and metastasis	-
miR-146a	MMP-16	Colon cancer	Invasion	-
miR-149	MMP-2 and CyclinD1	Glioma	Proliferation and invasion	AKT signaling
miR-152	MMP-3	Glioma	Cell invasiveness	MEK-ERK pathway
miR-181b	MMP-2 and MMP-9	Hepatocellular carcinomas	Migration and invasion	TGF- β, Smad signaling
miR-182	MMP-9, RECK	Breast cancer	cell invasion and colony formation ability	-
miR-196b	Vimentin, MMP-2 and MMP-9	Gastric cancer	Migration and invasion	-
miR-203	MMP-9 and Robo1	Glioblastoma	Proliferation, migration, and invasion	ERK phosphorylation
miR-206	MMP-2 and MMP-9	Breast cancer	Invasion and migration	-
miR-211	MMP-9	Glioblastoma multiforme	Cell invasion and migration	-
miR-218	LEF1, MMP-2, -7 and -9	Glioblastoma multiforme	Invasion	-
miR-218	MMP-9	Gliomas	Cell invasiveness	IKK-β/NF-κB pathway
miR-224	MMP-9 via targeting HOXD10	Human hepatocellular carcinoma	Migration and invasion	-
miR-338-3p	SMO and MMP-9	Hepatocellular carcinoma	Invasion and metastasis	-
miR-340	MMP-2 and MMP-9	Breast cancer	Tumor cell growth, migration, and invasion	-
miR-430	ERK, MMP-2 and MMP-9	Bladder cancer	Proliferation, migration and colony formation ability	-
miR-451	Akt1, CyclinD1, MMP-2, MMP-9 and Bcl-2	Glioblastoma	Proliferation, invasion and apoptosis	PI3K/AKT signaling
miR-491	MMP-9	Hepatocellular carcinoma	Migration	-
miR-491-5p	MMP-9	Glioblastoma multiforme	Invasion	-
miRNA-590-3p	PI3K, Akt, MMP-2 and MMP-9	Bladder cancer	Proliferation, migration and colony-formation	PI3K, Akt signaling
miR-874	MMP-2 and -9, Aquaporin-3	Human gastric cancer	Cell migration and invasion assays and in vivo tumorigenicity	-
miR-874	MMP-2 and uPA	Non-small cell lung cancer	Tumor cell invasiveness and in vivo tumor growth	-
miR-885-5p	MMP-9	Glioblastoma multiforme	Invasion	-

Table 6. Target proteases and cancers associated with their overexpression.

Family	Protease	Location	Cancer
Cysteine Cathepsins	General	Intracellular, lysosomes	Most
	Cathepsin K	Extracellular, bone	Breast
	Cathepsin B	Extracellular and pericellular under pathological conditions	Breast, cervix, colon, colorectal, gastric, head and neck, liver, lung, melanoma, ovarian, pancreatic, prostate, thyroid
	Cathepsin L		Breast, colorectal
Aspartic Cathepsins	Cathepsin E	Endosomal structures, ER, Golgi	Cervical, gastric, lung, pancreas adenocarcinomas
	Cathepsin D	Lysosome	Breast, colorectal, ovarian
Kallikreins (hK)	General	Intracellular, secreted	Most
	hK1		
	PSA (hK 3)		Prostate, ovarian
	hK10		Colon, ovarian, pancreatic, head and neck
	hK15		Ovarian, prostate
Serine Proteases	uPA, uPAR	Membrane, Pericellular	Cervical, colorectal, gastric, prostate
Caspases		Intracellular	
MMPs	General	Extracellular	Most
	MMP-1, -8, -13		Breast
	MMP-2, -9		Breast, colorectal, lung, malignant gliomas, ovarian
	MMP-14	Membrane	Breast
ADAM		Extracellular	

Table 7. List of selected oncogenes associated with human malignancy

Gene Name	Gene Locus	Malignancies associated with	Comments
ABL1 (ABL)	9q34.1	Chronic myeloid leukemia	see tyrosine kinase Abelson murine leukemia protein
ABL2 (ABLL,ARG)	1q24-q25	acute myeloid leukemia	Member of the tyrosine kinase family. Important for synapse assembly and remodeling
AKAP13 (HT31, LBC BRX)	15q24-q25	breast cancer	Blast crisis oncogene
ARAF1	Xp11.4-p11.2	angioimmunoblastic lymphadenopathy with dysproteinemia	Serine/threonine kinase
ARHGEF5 (TIM)	7q33-q35	Breast cancer	Codes for protein that controls cytoskeletal organization through regulation of small GTP-binding proteins
ATF1	12q13	ATF1/EWS fusion gene associated with malignant melanoma of soft parts (MMSP) ATF1/FUS with histiocytoma.	Codes for cAMP-dependent transcription factor-1
AXL	19q13.1-q13.2	Chronic myelogenous leukemia	transforming gene to acute leukemia
BCL2	18q21.3	Burkitt lymphoma, follicular lymphoma	Mediator of apoptosis. Translocation is marker of poorer therapeutic response
BRAF (BRAF1, RAFB1)	7q34	Hairy cell leukemia, Malignant melanoma, thyroid papillary cancer, thyroid anaplastic carcinoma, bowel cancer, adenocarcinoma of lung, non-Hogkins lymphoma	see proto-oncogenes
BRCA1	17q21	Hereditary breast-ovarian cancer syndrome. Familial Breast cancer, Papillary serous carcinoma of the peritoneum (PSCP), Prostate cancer	see BRCA1.
BRCA2(FANCD1)	13q12.3	Familial Breast cancer, prostate cancer, pancreatic cancer	see BRCA2
BRIP1	17q22.2	Ovarian cancer, breast cancer	BRCA1 interacting protein C-terminal helicase 1 which is important in normal double-strand break repair
CBL (CBL2)	11q23.3		see proto-oncogenes
CSF1R (CSF-1, FMS, MCSF)	5q33.2-q33.3	Type M4 acute myeloblastic leukemia and chronic myelomonocytic leukemia	Codes for colony-stimulating factor-1 receptor, otherwise known as macrophage colony-stimulating factor
DAPK1 (DAPK)	9q34.1	Bladder cancer	Codes for death-associated protein kinase a positive mediators of apoptosis induced by gamma-interferon.
DEK (D6S231E)	6p23	DEK/NUP214(DEK/CAN) fusion gene associated with acute myeloid leukemia	Codes for DNA binding protein involved in transcriptional regulation and signal transduction as a component of the splicing complex that remains associated with spliced exons.

Gene Name	Gene Locus	Malignancies associated with	Comments
DUSP6 (MKP3,PYST1)	12q22-q23	Non-small cell lung cancer, pancreatic cancer	Codes for member of mitogen-activated protein (MAP) kinase family and has key role in cellular signal transduction
EGF			see proto-oncogenes
EGFR (ERBB, ERBB1)			see proto-oncogenes
ERBB3 (HER3)	12q13	Non-small cell lung cancer	elevated ERBB3 mRNA levels in breast cancer
ERG			see proto-oncogenes
ETS1			see proto-oncogenes
ETS2		Acute myeloid leukemia	Codes for a transcription factor
EWSR1 (EWS, ES, PNE,)	22q12	EWS/ERG in Ewing sarcoma, esthesioneurobiastoma EWS/FEV fusion gene in Ewing sarcoma, EWS/ZNF278 in small round cell sarcoma, EWS/FLI1 in Ewing sarcoma , EWS/ATF1 in malignant melanoma of soft parts(MMSP EWS/WT1 in desmoplastic small round cell tumor	Ewing sarcoma breakpoint 1 gene
FES (FPS)	15q26.1	B cell lymphoma, acute promyelocytic leukemia, bladder carcinoma, lung cancer, breast cancer, colon cancer, neuroblastoma, pre-B lymphocyte neoplasm, plasmacytoma, multiple myeloma, T cell lymphoma, sarcoma	Codes for a tyrosine-specific protein kinase with a role in regulating immune response
FGF4 (HSTF1, KFGF)	11q13	Stomach cancer, kaposi sarcoma	A fibroblast growth factor Important in limb development.
FGFR1			see proto-oncogenes
FGFR1OP (FOP)	6q27	FGFR1/FGFR1OP2 fusion gene in non-Hodgkin lymphoma	
FLCN	17p11.2	Renal cancer, bowel cancer	see FFCN
FOS (c-fos)	14q24.3		see proto-oncogenes
FRAP1			see tumor suppressors
FUS (TLS)	16p11.2		see proto-oncogenes
HRAS	11p15.5		see proto-oncogenes.
GLI1	12q13.2-q13.3	Glioma, myxoid liposarcoma, salivary gland tumor	Codes for a Kruppel (Kr) zinc finger protein
GLI2	2q14	Glioma	Codes for a Kruppel (Kr) zinc finger protein
GPC3	Xq26	Germ cell cancer, Hepatocellular cancer	see GPC3
HER2 (ERBB2, TKR1, NEU)	17q21.1	Breast cancer, lung cancer	see HER2. Targeted by Trastuzumab.
HGF (SF)	7q21.1	Prostate cancer, renal cancer	Codes for hepatocyte growth factor (hepatopoietin A, scatter factor) which is upregulated in many malignancies

Gene Name	Gene Locus	Malignancies associated with	Comments
IRF4 (LSIRF, MUM1)	6p25-p23	B-cell lymphoma, B-cell leukemia, Multiple myeloma	Codes for an interferon regulatory factor essential for lymphocyte function
JUNB	19p13.2		see proto-oncogenes
KIT(SCFR)	4q12	Gastrointestinal stromal tumor (GISTs), mast cell leukemia, mastocytosis, seminoma and dysgerminoma	Transmembrane tyrosine kinase receptor for stem cell factor (SCFR) is required for haematopoiesis, melanogenesis and gametogenesis. Mutations cause piebaldism.
KRAS2 (RASK2)	12p12.1		see proto-oncogenes.
LCK	1p35-p34.3	Non-small cell lung cancer, Neuroblastoma, non-Hodgkin lymphoma	codes for lymphocyte specific protein tyrosine kinase
LCO	2q14-q21	Hepatocellular carcinoma	
MAP3K8(TPL2, COT, EST)	10p11.2	Ewings sarcoma, adenocarcinoma of lung, thyroid carcinoma	Codes for a serine-threonine protein kinase.
MCF2 (DBL)	Xq27	Breast cancer	Codes for a GDP-GTP exchange factor that modulates the activity of small GTPases of the Rho family
MDM2	12q14.3-q15	Multiple	MDM2 acts as a major regulator of the tumor suppressor p53 by targeting its destruction. Direct association of p53 with the protein MDM2 results in ubiquitination and subsequent degradation of p53
MET(HGFR, RCCP2)	7q31		see proto-oncogenes
MLH type genes			see proto-oncogenes
MMD	17q	Non small cell lung cancer, hepatocellular carcinoma, colon cancer	Codes for monocyte to macrophage differentiation associated protein.
MOS (MSV)	8q11	Burkitt lymphoma, acute myeloblastic leukemia	Function in man unknown. Above associations indirect but analogous gene to Moloney murine sarcoma virus.
MRAS (RRAS3)	3q22.3	Activated in many tumors	Codes for a RAS GTP-binding protein membrane-anchored, intracellular signal transducer
MSH type genes			see proto-oncogenes
MYB (AMV)	6q22	Alterations found in more than a third of human solid tumor lines	Encodes for proteins critical to hematopoietic cell proliferation and development
MYC	8q24.12-q24.13	Burkitt lymphoma Over expression in many malignancies, possibly associated with angiogenic, invasive promoting properties in excess.	A transcription factor that promotes cell proliferation
MYCL1 (LMYC)	1p34.3	Small cell lung cancer, adenocarcinoma of lung, neuroblastoma	
MYCN	2p24.1	Neuroblastomas	Overlaps with NMYC and is transcribed from opposite DNA strand

Gene Name	Gene Locus	Malignancies associated with	Comments
NCOA4 (ELE1, ARA70, PTC3)	10q11.2	Prostate cancer	Interacts with the androgen receptor in presence of dihydrotestosterone
NF1 type genes			see tumor suppressors
NMYC	2p24	Neuroblastomas, retinoblastoma	Overlaps with MYCN and is transcribed from opposite DNA strand. Probably a DNA-binding protein.
NRAS	1p13.2		see proto-oncogenes.
NTRK1 (TRK, TRKA)	1q21-q22		see proto-oncogenes.
NUP214 (CAN, D9S46E)	9q34.1	NUP214/DEK fusion gene associated with acute myeloid leukemia, NUP214/ABL1 associated with T-cell acute lymphoblastic leukemia (T-ALL).	Codes for nucleoporin component of the vertebrate nuclear pore complex.
OVC	9p24	Ovarian adenocarcinoma	Abnormal in about 40% ovarian adenocarcinoma
TP53 (P53)	17p13.1		see tumor suppressors
PALB2	16p12	Breast cancer	see PALB2
PAX3 (HUP2) STAT1	2q35	Alveolar rhabdomyosarcoma	Transcriptions factor, causes some forms of Waardenburg syndrome and regulates RET.
PDGFB (SIS)			see proto-oncogenes
PIM genes			see proto-oncogenes
PML (MYL)	15q22		see tumour suppressors
PMS (PMSL) genes			see tumour suppressors
PPM1D (WIP1)	17q22-q23	Breast cancer, Osteosarcoma	Codes for a serine/threonine protein phosphatase that attenuates apoptosis and facilitates transformation of primary cells in cooperation with RAS
PTEN (MMAC1)	10q23.31		see tumor suppressors
PVT1	8q24	Burkitt lymphoma	
RAF1 (CRAF)	3p25	Stomach cancer, renal cancer, glioblastoma, laryngeal cancer	A regulator of endothelial cell survival during angiogenesis. Activated RAF counteracts apoptosis by suppressing the activation of mammalian sterile 20-like kinase (MST2).
RB1 (RB)	13q14.1-q14.2	Retinoblastoma, osteogenic sarcoma, small cell carcinoma of lung, bladder cancer	see RB1
RET	10q11.2	Multiple endocrine neoplasia type 2a and 2b and Medullary thyroid carcinoma	see RET
RRAS2 (TC21)	11pter-p15.5	Teratocarcinoma, ovarian cancer	Single point mutation activates its oncogene potential
ROS1 (ROS, MCF3)	6q22	Glioblastoma and probably others	ROS1/FIG fusion protein is a tyrosine kinase found in astrocytoma
SMAD type genes			see tumor suppressors

Gene Name	Gene Locus	Malignancies associated with	Comments
SMARCB1 (SNF5, INI1)	22q11		see tumor suppressors
SMURF1	7q21.1-q31.1	Pancreatic cancer	Codes for a HECT domain E3 ubiquitin ligase that regulates tumor cell plasticity and motility through degradation of RhoA
SRC (AVS)	20q12-q13	hepatic metastatic bowel cancer, colon cancer, leukemia	Intracellular communication regulator protein. Mutations are activating, transforming, tumorigenic, and metastasis-promoting
STAT1	2q32.2-q32.3	Non-small cell lung cancer	see STAT1
STAT3	17q21	Epithelial cancers	Codes signal protein that induces cell transformation through a combined inhibition of apoptosis and cell-cycle activation
STAT5	17q11.2	Permissive for a wide range of malignancies	Codes signal protein that induces cell transformation through a combined inhibition of apoptosis and cell-cycle activation
TDGF1 (CRGF)	3p23-p21	teratocarcinoma	Probably codes for signaling protein for mesoderm development
TGFBR2	3p22		see proto-oncogenes
THRA (ERBA, EAR7 etc)			see proto-oncogenes
TFG (TRKT3)	3q11-q12	Papillary thyroid carcinoma	Chimeric oncogene with NTRK1 proto-oncogene
TIF1 (TRIM24, TIF1A)	7q32-q34	Fusion genes associated with papillary thyroid carcinoma and myeloproliferative disorder	Codes for transcriptional intermediary factor 1
TNC (TN, HXB)	9q33	Neurofibromatosis type 1, Pancreatic cancer	see TNC
TRK	1q21-q22		see proto-oncogenes
TUSC3	8p22		see tumor suppressors
USP6 (TRE2)	17p13	Multiple cancers	Codes for a ubiquitin-specific protease found only in primates
WNT1 (INT1)	12q12-q13		see proto-oncogenes
WT1	11p13	Wilms tumour, over expressed in breast and lung cancer, myelodysplastic syndrome and acute myeloid leukemia	A zinc finger DNA-binding protein acting as a transcriptional activator or repressor depending on intracellular context
VHL	3p26-p25		see tumor suppressors

Table 8. Tumor suppresor miRs that are downregulated in specific cancer types

Bladder	Brain (Astrocytoma, Glioblastoma, Glioma)	Breast	Cervical	Colon Cancer	Endometrial	Gastrologic (Esophageal, Stomach)	Kidney	Liver (Hepatocellular Carcinoma)	Lung	Melanoma	Oral Cancer	Ovarian	Pancreatic	Prostate	Retinoblastoma
mir-1	let-7g-5p	mir-193b	mir-143	let-7a-1	mir-101	mir-125b	mir-1	let-7a-1	mir-1297	let-7b	let-7d	let-7i	mir-101	let-7a-3p	mir-101
mir-101	mir-100	let-7a	mir-145	let-7a-2	mir-130a	mir-138	mir-145	let-7a-2	mir-141	mir-101	mir-218	mir-100	mir-1181	let-7c	mir-183
mir-1180	mir-101	let-7a-1	mir-17-5p	let-7a-3	mir-130b	mir-15a	mir-1826	let-7a-3	mir-145	mir-125b	mir-34a	mir-124	mir-124	mir-100	mir-204
mir-1236	mir-106a	let-7a-2	mir-203	let-7b	mir-134	mir-15b	mir-199a	let-7b	mir-16	mir-1280	mir-375	mir-125b	mir-1247	mir-101	mir-34a
mir-124-3p	mir-124	let-7a-3	mir-214	let-7c	mir-143	mir-16	mir-199a-3p	let-7c	mir-200a	mir-143	mir-494	mir-129-5p	mir-133a	mir-105	mir-365b-3p
mir-125b	mir-124a	let-7b	mir-218	let-7d	mir-145	mir-16-1	mir-203	let-7d	mir-200b	mir-146a	mir-100	mir-130b	mir-141	mir-124	mir-486-3p
mir-126	mir-125a	let-7c	mir-335	let-7e	mir-152	mir-16-1-3p	mir-205	let-7e	mir-200c	mir-146b	mir-124	mir-133a	mir-145	mir-128	mir-532-5p
mir-1280	mir-125a-5p	let-7d	mir-342-3p	let-7f-1	mir-205	mir-16-2	mir-497	let-7f	mir-29b	mir-155	mir-1250	mir-137	mir-146a	mir-1296	
mir-133a	mir-125b	let-7e	mir-372	let-7f-2	mir-223	mir-181a	mir-508-3p	let-7f-1	mir-381	mir-17	mir-125b	mir-138	mir-148a	mir-130b	
mir-133b	mir-127-3p	let-7f-1	mir-424	let-7g	mir-301a	mir-181b	mir-509-3p	let-7f-2	mir-409-3p	mir-184	mir-126	mir-141	mir-148b	mir-133a-1	
mir-141	mir-128	let-7f-2	mir-491-5p	let-7i	mir-301b	mir-195	let-7a	let-7g	mir-429	mir-185	mir-1271	mir-145	mir-150*	mir-133a-2	
mir-143	mir-129	let-7g	mir-497	mir-100	mir-30c	mir-223	let-7d	let-7i	mir-451	mir-18b	mir-136	mir-148a	mir-150-5p	mir-133b	
mir-144	mir-136	let-7i	mir-7	mir-101	mir-34a	mir-29b	mir-106a*	mir-1	mir-511	mir-193b	mir-138	mir-152	mir-152	mir-135a	
mir-145	mir-137	mir-100	mir-99a	mir-126	mir-34c	mir-34b	mir-126	mir-100	mir-99a	mir-200c	mir-145	mir-153	mir-15a	mir-143	
mir-155	mir-139-5p	mir-107	mir-99b	mir-142-3p	mir-424	mir-34c	mir-1285	mir-101	let-7a-1	mir-203	mir-147	mir-155	mir-198	mir-145	
mir-16	mir-142-3p	mir-10a	mir-100	mir-143	mir-449a	mir-424	mir-129-3p	mir-105	let-7a-2	mir-204	mir-148a	mir-199a	mir-203	mir-146a	
mir-18a	mir-143	mir-10b	mir-101	mir-145	mir-543	mir-10a	mir-1291	mir-122	let-7a-3	mir-205	mir-181a	mir-200a	mir-214	mir-154	
mir-192	mir-145	mir-122	mir-15a	mir-192	mir-34b	mir-146a	mir-133a	mir-122a	let-7b	mir-206	mir-206	mir-200b	mir-216a	mir-15a	
mir-195	mir-146b-3p	mir-124	mir-16	mir-200c		mir-150	mir-135a	mir-1236	let-7c	mir-20a	mir-220a	mir-200c	mir-29c	mir-187	
mir-200a	mir-149	mir-1258	mir-34a	mir-21		mir-151	mir-138	mir-124	let-7d	mir-211	mir-26a	mir-212	mir-335	mir-188-5p	
mir-200b	mir-152	mir-125a-5p	mir-886-5p	mir-214		mir-155	mir-141	mir-125b	let-7e	mir-218	mir-26b	mir-335	mir-34a	mir-199b	
mir-200c	mir-153	mir-125b	mir-106a	mir-215		mir-2278	mir-143	mir-126	let-7f-1	mir-26a	mir-29a	mir-34a	mir-34b	mir-200b	
mir-203	mir-195	mir-126	mir-124	mir-22		mir-26a	mir-182-5p	mir-127	let-7f-2	mir-31	mir-32	mir-34b	mir-34c	mir-203	
mir-205	mir-21	mir-127	mir-148a	mir-25		mir-30e	mir-200a	mir-127i	let-7g	mir-33a	mir-323-5p	mir-34c	mir-373	mir-205	
mir-214	mir-212-3p	mir-129	mir-29a	mir-302a		mir-31	mir-218	mir-128-3p	let-7i	mir-34a	mir-329	mir-409-3p	mir-375	mir-212	
mir-218	mir-219-5p	mir-130a	mir-375	mir-320		mir-326	mir-28-5p	mir-129-5p	mir-1	mir-34c	mir-338	mir-411	mir-410	mir-218	
mir-23b	mir-222	mir-132		mir-320a		mir-564	mir-30a	mir-130a	mir-101	mir-376a	mir-370	mir-429	mir-497	mir-221	
mir-26a	mir-29b	mir-133a		mir-34a		mir-27a	mir-30c	mir-130b	mir-133b	mir-376c	mir-410	mir-432	mir-615-5p	mir-224	
mir-29c	mir-31	mir-143		mir-34c		let-7b	mir-30d	mir-133a	mir-138	mir-573	mir-429	mir-449a	mir-630	mir-23a	
mir-320c	mir-3189-3p	mir-145		mir-365		mir-124a	mir-34a	mir-134	mir-142-5p	mir-7-5p	mir-433	mir-494	mir-96	mir-23b	
mir-34a	mir-320	mir-146a		mir-373		mir-142-3p	mir-378	mir-137	mir-144	mir-9	mir-499a-5p	mir-497	mir-132	mir-25	
mir-370	mir-320a	mir-146b		mir-424		let-7c	mir-429	mir-138	mir-1469	mir-98	mir-503	mir-498	let-7a	mir-26a	
mir-409-3p	mir-326	mir-147		mir-429		mir-17	mir-509-5p	mir-139	mir-146a		mir-506	mir-519d	let-7a-1	mir-26b	

Bladder	Brain (Astrocytoma, Glioblastoma, Glioma)	Breast	Cervical	Colon/ Colorectal	Endometrial	Hematological (Leukemia, Lymphoma, Myeloma)	Kidney	Liver (Hepatocellular Carcinoma)	Lung	Melanoma	Oral Cancer	Ovarian	Pancreatic	Prostate	Retino-blastoma
mir-429	mir-330	mir-148a		mir-455		mir-20a	mir-646	mir-139-5p	mir-153		mir-632	mir-655	let-7a-2	mir-29b	
mir-451	mir-331-3p	mir-149		mir-484		mir-29a	mir-133b	mir-140-5p	mir-15a		mir-646	mir-9	let-7a-3	mir-302a	
mir-490-5p	mir-340	mir-152		mir-502		mir-30c	let-7b	mir-141	mir-15b		mir-668	mir-98	let-7b	mir-30a	
mir-493	mir-342	mir-153		mir-503		mir-720	let-7c	mir-142-3p	mir-16-1		mir-877	mir-101	let-7c	mir-30b	
mir-576-3p	mir-34a	mir-15a		mir-93		mir-107	mir-200c	mir-143	mir-16-2		mir-9	mir-532-5p	let-7d	mir-30c-1	
mir-99a	mir-376a	mir-16		mir-98		mir-342	mir-204	mir-144	mir-182			mir-124a	let-7e	mir-30c-2	
	mir-449a	mir-17-5p		mir-186		mir-34a	mir-335	mir-145	mir-192			mir-192	let-7f-1	mir-30d	
	mir-483-5p	mir-181a		mir-30a-5p		mir-202	mir-377	mir-146a	mir-193a-3p			mir-193a	let-7f-2	mir-30e	
	mir-503	mir-1826		mir-627		mir-142-5p	mir-506	mir-148a	mir-194			mir-7	let-7g	mir-31	
	mir-577	mir-183		let-7a		mir-29c		mir-148b	mir-195				let-7i	mir-330	
	mir-663	mir-185		mir-1		mir-145		mir-150-5p	mir-198				mir-126	mir-331-3p	
	mir-7	mir-191		mir-124		mir-193b		mir-15b	mir-203				mir-135a	mir-34a	
	mir-7-5p	mir-193a-3p		mir-125a		mir-199a		mir-16	mir-217				mir-143	mir-34b	
	mir-873	mir-195		mir-129		mir-214		mir-181a-5p	mir-218				mir-144	mir-34c	
	let-7a	mir-199b-5p		mir-1295b-3p		mir-22		mir-185	mir-22				mir-150	mir-374b	
	let-7f	mir-19a-3p		mir-1307		mir-137		mir-188-5p	mir-223				mir-16	mir-449a	
	mir-107	mir-200a		mir-130b		mir-197		mir-193b	mir-26a				mir-200a	mir-4725-5p	
	mir-122	mir-200b		mir-132				mir-195	mir-26b				mir-200b	mir-497	
	mir-124-5p	mir-200c		mir-133a				mir-195-5p	mir-29c				mir-200c	mir-628-5p	
	mir-139	mir-205		mir-133b				mir-197	mir-33a				mir-217	mir-642a-5p	
	mir-146a	mir-206		mir-137				mir-198	mir-34a				mir-218	mir-765	
	mir-146b	mir-211		mir-138				mir-199a	mir-34b				mir-337	mir-940	
	mir-15b	mir-216b		mir-139				mir-199a-5p	mir-34c				mir-493		
	mir-16	mir-218		mir-139-5p				mir-199b	mir-365				mir-98		
	mir-181a	mir-22		mir-140-5p				mir-199b-5p	mir-449a						
	mir-181a-1	mir-26a		mir-148a				mir-200a	mir-449b						
	mir-181a-2	mir-26b		mir-148b				mir-200b	mir-486-5p						
	mir-181b	mir-300		mir-149				mir-200c	mir-545						
	mir-181b-1	mir-30a		mir-150-5p				mir-202	mir-610						
	mir-181b-2	mir-31		mir-154				mir-203	mir-614						
	mir-181c	mir-335		mir-15a				mir-204-3p	mir-630						
	mir-181d	mir-339-5p		mir-15b				mir-205	mir-660						
	mir-184	mir-33b		mir-16				mir-206	mir-7515						
	mir-185	mir-34a		mir-18a				mir-20a	mir-9500						

Bladder	Brain (Astrocytoma, Glioblastoma, Glioma)	Breast	Cervical	Colon/ Colorectal	Endometrial	Hematological (Leukemia, Lymphoma, Myeloma)	Kidney	Liver (Hepatocellular Carcinoma)	Lung	Melanoma	Oral Cancer	Ovarian	Pancreatic	Prostate	Retinoblastoma
	mir-199a-3p	mir-34b		mir-191				mir-21	mir-98						
	mir-200a	mir-34c		mir-193a-5p				mir-21-3p	mir-99b						
	mir-200b	mir-374a		mir-194				mir-211	mir-133a						
	mir-203	mir-379		mir-195				mir-212	let-7a						
	mir-204	mir-381		mir-196a				mir-214	mir-100						
	mir-205	mir-383		mir-198				mir-217	mir-106a						
	mir-218	mir-425		mir-199a-5p				mir-218	mir-107						
	mir-23b	mir-429		mir-203				mir-219-5p	mir-124						
	mir-26b	mir-450b-3p		mir-204-5p				mir-22	mir-125a-3p						
	mir-27a	mir-494		mir-206				mir-223	mir-125a-5p						
	mir-29c	mir-495		mir-212				mir-26a	mir-126						
	mir-328	mir-497		mir-218				mir-26b	mir-126*						
	mir-34c-3p	mir-502-5p		mir-224				mir-29a	mir-129						
	mir-34c-5p	mir-517a		mir-24-3p				mir-29b-1	mir-137						
	mir-375	mir-574-3p		mir-26b				mir-29b-2	mir-140						
	mir-383	mir-638		mir-27a				mir-29c	mir-143						
	mir-451	mir-7		mir-28-3p				mir-302b	mir-146b						
	mir-452	mir-720		mir-28-5p				mir-302c	mir-148a						
	mir-495	mir-873		mir-29b				mir-30a	mir-148b						
	mir-584	mir-874		mir-30a-3p				mir-30a-3p	mir-149						
	mir-622	mir-92a		mir-30b				mir-335	mir-152						
	mir-656	mir-98		mir-328				mir-338-3p	mir-154						
	mir-98	mir-99a		mir-338-3p				mir-33a	mir-155						
	mir-124-3p	mmu-mir-290-3p		mir-342				mir-34a	mir-17-5p						
	mir-181b-5p	mmu-mir-290-5p		mir-345				mir-34b	mir-181a-1						
	mir-200b			mir-34a-5p				mir-365	mir-181a-2						
	mir-3189-3p			mir-361-5p				mir-370	mir-181b						
				mir-375				mir-372	mir-181b-1						
				mir-378				mir-375	mir-181b-2						
				mir-378a-3p				mir-376a	mir-181c						
				mir-378a-5p				mir-377	mir-181d						
				mir-409-3p				mir-422a	mir-184						
				mir-422a				mir-424	mir-186						

Bladder	Brain (Astrocytoma, Glioblastoma, Glioma)	Breast	Cervical	Colon/ Colorectal	Endometrial	Hematological (Leukemia, Lymphoma, Myeloma)	Kidney	Liver (Hepatocellular Carcinoma)	Lung	Melanoma	Oral Cancer	Ovarian	Pancreatic	Prostate	Retinoblastoma
				mir-4487				mir-424-5p	mir-193b						
				mir-483				mir-433	mir-199a						
				mir-497				mir-4458	mir-204						
				mir-498				mir-448	mir-212						
				mir-518a-3p				mir-450a	mir-221						
				mir-551a				mir-451	mir-224						
				mir-574-5p				mir-485-5p	mir-27a						
				mir-625				mir-486-5p	mir-27b						
				mir-628				mir-497	mir-29a						
				mir-7				mir-503	mir-30a						
				mir-96-5p				mir-506	mir-30b						
				mir-202-3p				mir-519d	mir-30c						
				mir-30a				mir-520a	mir-30d						
				mir-451				mir-520b	mir-30d-5p						
								mir-520c-3p	mir-30e-5p						
								mir-582-5p	mir-32						
								mir-590-5p	mir-335						
								mir-610	mir-338-3p						
								mir-612	mir-340						
								mir-625	mir-342-3p						
								mir-637	mir-361-3p						
								mir-675	mir-373						
								mir-7	mir-375						
								mir-877	mir-4500						
								mir-940	mir-4782-3p						
								mir-941	mir-497						
								mir-98	mir-503						
								mir-99a	mir-512-3p						
								mir-132	mir-520a-3p						
								mir-31	mir-526b						
									mir-625*						
									mir-96						

CLAIMS:

1. A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication.

2. The oncolytic virus of claim 1, wherein the virus is a herpes simplex virus, an adenovirus, a polio virus, a vaccinia virus, a measles virus, a vesicular stomatitis virus, an orthomyxovirus, a parvovirus, a maraba virus or a coxsackievirus.

3. The oncolytic virus of claim 1 or 2, wherein the virus is a herpes simplex virus and wherein the one or more viral genes required for viral replication is selected from the group consisting of UL1, UL5, UL6, UL7, UL8, UL9, UL11, UL12, UL14, UL15, UL17, UL18, UL19, UL20, UL22, UL25, UL26, UL26.5, UL27, UL28, UL29, UL30, UL31, UL32, UL33, UL34, UL35, UL36, UL37, UL38, UL39, UL40, UL42, UL48, UL49, UL52, UL53, UL54, ICP0, ICP4, ICP22, ICP27, ICP47, gamma-34.5, US3, US4, US5, US6, US7, US8, US9, US10, US11, and US12.

4. The oncolytic virus of any of claims 1-3, wherein the tumor-suppressive miR target sequence is a target sequence for a miR selected from Table 3.

5. The oncolytic virus of any of claims 1-4, wherein the one or more tumor-suppressive miR target sequences is incorporated into the 5' untranslated region (UTR) or 3' UTR of the one or more viral genes required for viral replication.

6. The oncolytic virus of any of claims 1-5, wherein replication of the virus is reduced or attenuated in a first cell compared to replication of the virus in a second cell.

7. The oncolytic virus of claim 6, wherein the first cell has an increased expression of a tumor-suppressive miR capable of binding to the one or more tumor-suppressive miR target sequences compared to the expression of the tumor-suppressive miR in the second cell.

8. The oncolytic virus of claim 7, wherein the expression level of the tumor-suppressive miR in the first cell is at least 5% greater than the expression level of the tumor-suppressive miR in the second cell.

9. The oncolytic virus of claim 6, wherein the first cell is a non-cancerous cell.

10. The oncolytic virus of claim 6, wherein the second cell has a reduced expression of a tumor-suppressive miR capable of binding to the one or more tumor-suppressive miR target sequences compared to the expression of the tumor-suppressive miR in the first cell.

11. The oncolytic virus of claim 10, wherein the expression level of the tumor-suppressive miR in the second cell is at least 5% less than the expression level of the tumor-suppressive miR in the first cell.

12. The oncolytic virus of claim 6, wherein the second cell is a cancerous cell.

13. The oncolytic virus of any of claims 1-12, comprising tumor-suppressive miR target sequences for miR-124, miR-451a, miR-143-3p, and miR-559.

14. The oncolytic virus of claim 13, for treating pancreatic, lung, and/or colon cancer.

15. The oncolytic virus of any of claims 1-12, comprising tumor-suppressive miR target sequences for miR-124, miR-451, miR-143-3p, miR-1, and miR-559.

16. The oncolytic virus of any of claims 1-12, comprising tumor-suppressive miR target sequences for miR-124, miR-451, miR-145-5p, and miR-559.

17. The oncolytic virus of claim 15 and/or 16, for treating a tumor derived from any type of cancer.

18. The oncolytic virus of any of claims 1-12, comprising tumor-suppressive miR target sequences for miR-205p, miR-141-5p, miR-31-5p, and miR-124.

19. The oncolytic virus of any of claims 1-18, wherein the tumor-suppressive miR target sequences are inserted into the ICP4, ICP27, UL19, and/or UL30 locus.

20. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-136-3p, miR-432-5p, miR-1-3p, miR-127-3p, miR-379-5p, miR-493-5p, miR-223-5p, miR-223-5p, miR-136-5p, miR-451a, miR-487b-3p, miR-370-3p, miR-410-3p, miR-431-3p, miR-4485-3p, miR-4485-5p, miR-127-5p, miR-409-3p, miR-338-3p, miR-559, miR-411-5p, miR-133a-5p, miR-143-3p, miR-376b-3p, miR-758-3p, miR-1, miR-101, miR-1180, miR-1236, miR-124-3p, miR-125b, miR-126, miR-1280, miR-133a, miR-133b, miR-141, miR-143, miR-144, miR-145, miR-155, miR-16, miR-18a, miR-192, miR-195, miR-200a, miR-200b, miR-200c, miR-203, miR-205, miR-214, miR-218, miR-23b, miR-26a, miR-29c, miR-320c, miR-34a, miR-370, miR-409-3p, miR-429, miR-451b, miR-490-5p, miR-493, miR-576-3p, and/or miR-99a.

21. The oncolytic virus of claim 20 for treating bladder cancer.

22. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-1251-5p, miR-219a-5p, miR-219a-2-3p, miR-124-3p, miR-448, miR-138-2-3p, miR-490-5p, miR-129-1-3p, miR-1264, miR-3943, miR-490-3p, miR-383-5p, miR-133b, miR-129-2-3p, miR-128-2-5p, miR-133a-3p, miR-129-5p, miR-1-3p, miR-885-3p, miR-124-5p, miR-759, miR-7158-3p, miR-770-5p, miR-135a-5p, miR-885-5p, let-7g-5p, miR-100, miR-101, miR-106a, miR-124, miR-124a, miR-125a, miR-125a-5p, miR-125b, miR-127-3p, miR-128, miR-129, miR-136, miR-137, miR-139-5p, miR-142-3p, miR-143, miR-145, miR-146b-5p, miR-149, miR-152, miR-153, miR-195, miR-21, miR-212-3p, miR-219-5p, miR-222, miR-29b, miR-31, miR-3189-3p, miR-320, miR-320a, miR-326, miR-330, miR-331-3p, miR-340, miR-342, miR-34a, miR-376a, miR-449a, miR-483-5p, miR-503, miR-577, miR-663, miR-7, miR-7-5p, miR-873, let-7a, let-7f, miR-107, miR-122, miR-124-5p, miR-139, miR-146a, miR-146b, miR-15b, miR-16, miR-181a, miR-181a-1, miR-181a-2, miR-181b, miR-181b-

1, miR-181b-2, miR-181c, miR-181d, miR-184, miR-185, miR-199a-3p, miR-200a, miR-200b, miR-203, miR-204, miR-205, miR-218, miR-23b, miR-26b, miR-27a, miR-29c, miR-328, miR-34c-3p, miR-34c-5p, miR-375, miR-383, miR-451, miR-452, miR-495, miR-584, miR-622, miR-656, miR-98, miR-124-3p, miR-181b-5p, miR-200b, and/or miR-3189-3p.

23. The oncolytic virus of claim 22 for treating brain cancer.

24. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-10b-5p, miR-126-3p, miR-145-3p, miR-451a, miR-199b-5p, miR-5683, miR-3195, miR-3182, miR-1271-5p, miR-204-5p, miR-409-5p, miR-136-5p, miR-514a-5p, miR-559, miR-483-3p, miR-1-3p, miR-6080, miR-144-3p, miR-10b-3p, miR-6130, miR-6089, miR-203b-5p, miR-4266, miR-4327, miR-5694, miR-193b, let-7a, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-100, miR-107, miR-10a, miR-10b, miR-122, miR-124, miR-1258, miR-125a-5p, miR-125b, miR-126, miR-127, miR-129, miR-130a, miR-132, miR-133a, miR-143, miR-145, miR-146a, miR-146b, miR-147, miR-148a, miR-149, miR-152, miR-153, miR-15a, miR-16, miR-17-5p, miR-181a, miR-1826, miR-183, miR-185, miR-191, miR-193a-3p, miR-195, miR-199b-5p, miR-19a-3p, miR-200a, miR-200b, miR-200c, miR-205, miR-206, miR-211, miR-216b, miR-218, miR-22, miR-26a, miR-26b, miR-300, miR-30a, miR-31, miR-335, miR-339-5p, miR-33b, miR-34a, miR-34b, miR-34c, miR-374a, miR-379, miR-381, miR-383, miR-425, miR-429, miR-450b-3p, miR-494, miR-495, miR-497, miR-502-5p, miR-517a, miR-574-3p, miR-638, miR-7, miR-720, miR-873, miR-874, miR-92a, miR-98, miR-99a, mmu-miR-290-3p, and/or mmu-miR-290-5p.

25. The oncolytic virus of claim 24 for treating breast cancer.

26. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-143, miR-145, miR-17-5p, miR-203, miR-214, miR-218, miR-335, miR-342-3p, miR-372, miR-424, miR-491-5p, miR-497, miR-7, miR-99a, miR-99b, miR-100, miR-101, miR-15a, miR-16, miR-34a, miR-886-5p, miR-106a, miR-124, miR-148a, miR-29a, and/or miR-375.

27. The oncolytic virus of claim 26 for treating cervical cancer.

28. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-133a-5p, miR-490-5p, miR-124-3p, miR-137, miR-655-3p, miR-376c-3p, miR-369-5p, miR-490-3p, miR-432-5p, miR-487b-3p, miR-342-3p, miR-223-3p, miR-136-3p, miR-136-3p, miR-143-5p, miR-1-3p, miR-214-3p, miR-143-3p, miR-199a-3p, miR-199b-3p, miR-451a, miR-127-3p, miR-133a-3p, miR-145-5p, miR-145-3p, miR-199a-5p, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-100, miR-101, miR-126, miR-142-3p, miR-143, miR-145, miR-192, miR-200c, miR-21, miR-214, miR-215, miR-22, miR-25, miR-302a, miR-320, miR-320a, miR-34a, miR-34c, miR-365, miR-373, miR-424, miR-429, miR-455, miR-484, miR-502, miR-503, miR-93, miR-98, miR-186, miR-30a-5p, miR-627, let-7a, miR-1, miR-124, miR-125a, miR-129, miR-1295b-3p, miR-1307, miR-130b, miR-132, miR-133a, miR-133b, miR-137, miR-138, miR-139, miR-139-5p, miR-140-5p, miR-148a, miR-148b, miR-149, miR-150-5p, miR-154, miR-15a, miR-15b, miR-16, miR-18a, miR-191, miR-193a-5p, miR-194, miR-195, miR-196a, miR-198, miR-199a-5p, miR-203, miR-204-5p, miR-206, miR-212, miR-218, miR-224, miR-24-3p, miR-26b, miR-27a, miR-28-3p, miR-28-5p, miR-29b, miR-30a-3p, miR-30b, miR-328, miR-338-3p, miR-342, miR-345, miR-34a-5p, miR-361-5p, miR-375, miR-378, miR-378a-3p, miR-378a-5p, miR-409-3p, miR-422a, miR-4487, miR-483, miR-497, miR-498, miR-518a-3p, miR-551a, miR-574-5p, miR-625, miR-638, miR-7, miR-96-5p, miR-202-3p, miR-30a, and/or miR-451.

29. The oncolytic virus of claim 28 for treating colon or colorectal cancer.

30. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-101, miR-130a, miR-130b, miR-134, miR-143, miR-145, miR-152, miR-205, miR-223, miR-301a, miR-301b, miR-30c, miR-34a, miR-34c, miR-424, miR-449a, miR-543, and/or miR-34b inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

31. The oncolytic virus of claim 30 for treating endometrial cancer.

32. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-125b, miR-138, miR-15a, miR-15b, miR-16, miR-16-1, miR-16-1-3p, miR-16-2, miR-181a, miR-181b, miR-195, miR-223, miR-29b, miR-34b, miR-34c, miR-424, miR-10a, miR-146a, miR-150, miR-151, miR-155, miR-2278, miR-26a, miR-30e, miR-31, miR-326, miR-564, miR-27a, let-7b, miR-124a, miR-142-3p, let-7c, miR-17, miR-20a, miR-29a, miR-30c, miR-720, miR-107, miR-342, miR-34a, miR-202, miR-142-5p, miR-29c, miR-145, miR-193b, miR-199a, miR-214, miR-22, miR-137, and/or miR-197 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

33. The oncolytic virus of claim 32 for treating hematologic cancer.

34. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-1, miR-145, miR-1826, miR-199a, miR-199a-3p, miR-203, miR-205, miR-497, miR-508-3p, miR-509-3p, let-7a, let-7d, miR-106a*, miR-126, miR-1285, miR-129-3p, miR-1291, miR-133a, miR-135a, miR-138, miR-141, miR-143, miR-182-5p, miR-200a, miR-218, miR-28-5p, miR-30a, miR-30c, miR-30d, miR-34a, miR-378, miR-429, miR-509-5p, miR-646, miR-133b, let-7b, let-7c, miR-200c, miR-204, miR-335, miR-377, and/or miR-506 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

35. The oncolytic virus of claim 34 for treating kidney cancer.

36. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f, let-7f-1, let-7f-2, let-7g, let-7i, miR-1, miR-100, miR-101, miR-105, miR-122, miR-122a, miR-1236, miR-124, miR-125b, miR-126, miR-127, miR-1271, miR-128-3p, miR-129-5p, miR-130a, miR-130b, miR-133a, miR-134, miR-137, miR-138, miR-139, miR-139-5p, miR-140-5p, miR-141, miR-142-3p, miR-143, miR-144, miR-145, miR-146a, miR-148a, miR-148b, miR-150-5p, miR-15b, miR-16, miR-181a-5p, miR-185, miR-188-5p, miR-193b, miR-195, miR-195-5p, miR-197, miR-198, miR-199a, miR-199a-5p, miR-199b, miR-199b-5p, miR-200a, miR-200b, miR-200c, miR-202, miR-203, miR-204-3p, miR-205, miR-206, miR-20a, miR-21, miR-21-3p, miR-

211, miR-212, miR-214, miR-217, miR-218, miR-219-5p, miR-22, miR-223, miR-26a, miR-26b, miR-29a, miR-29b-1, miR-29b-2, miR-29c, miR-302b, miR-302c, miR-30a, miR-30a-3p, miR-335, miR-338-3p, miR-33a, miR-34a, miR-34b, miR-365, miR-370, miR-372, miR-375, miR-376a, miR-377, miR-422a, miR-424, miR-424-5p, miR-433, miR-4458, miR-448, miR-450a, miR-451, miR-485-5p, miR-486-5p, miR-497, miR-503, miR-506, miR-519d, miR-520a, miR-520b, miR-520c-3p, miR-582-5p, miR-590-5p, miR-610, miR-612, miR-625, miR-637, miR-675, miR-7, miR-877, miR-940, miR-941, miR-98, miR-99a, miR-132, and/or miR-31 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

37. The oncolytic virus of claim 36 for treating liver cancer.

38. The oncolytic virus of claim 37, wherein the liver cancer is hepatocellular carcinoma.

39. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-143-3p, miR-126-3p, miR-126-5p, miR-1266-3p, miR-6130, miR-6080, miR-511-5p, miR-143-5p, miR-223-5p, miR-199b-5p, miR-199a-3p, miR-199b-3p, miR-451a, miR-142-5p, miR-144, miR-150-5p, miR-142-3p, miR-214-3p, miR-214-5p, miR-199a-5p, miR-145-3p, miR-145-5p, miR-1297, miR-141, miR-145, miR-16, miR-200a, miR-200b, miR-200c, miR-29b, miR-381, miR-409-3p, miR-429, miR-451, miR-511, miR-99a, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-1, miR-101, miR-133b, miR-138, miR-142-5p, miR-144, miR-1469, miR-146a, miR-153, miR-15a, miR-15b, miR-16-1, miR-16-2, miR-182, miR-192, miR-193a-3p, miR-194, miR-195, miR-198, miR-203, miR-217, miR-218, miR-22, miR-223, miR-26a, miR-26b, miR-29c, miR-33a, miR-34a, miR-34b, miR-34c, miR-365, miR-449a, miR-449b, miR-486-5p, miR-545, miR-610, miR-614, miR-630, miR-660, miR-7515, miR-9500, miR-98, miR-99b, miR-133a, let-7a, miR-100, miR-106a, miR-107, miR-124, miR-125a-3p, miR-125a-5p, miR-126, miR-126*, miR-129, miR-137, miR-140, miR-143, miR-146b, miR-148a, miR-148b, miR-149, miR-152, miR-154, miR-155, miR-17-5p, miR-181a-1, miR-181a-2, miR-181b, miR-181b-1, miR-181b-2, miR-181c, miR-181d, miR-184, miR-186, miR-193b, miR-199a, miR-204, miR-212, miR-221, miR-224, miR-27a, miR-27b, miR-29a, miR-30a, miR-30b, miR-30c, miR-30d, miR-30d-5p, miR-30e-5p, miR-32, miR-335, miR-338-3p, miR-340, miR-342-3p, miR-361-3p, miR-373, miR-375, miR-

4500, miR-4782-3p, miR-497, miR-503, miR-512-3p, miR-520a-3p, miR-526b, miR-625*, and/or miR-96 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

40. The oncolytic virus of claim 39 for treating lung cancer.

41. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for let-7b, miR-101, miR-125b, miR-1280, miR-143, miR-146a, miR-146b, miR-155, miR-17, miR-184, miR-185, miR-18b, miR-193b, miR-200c, miR-203, miR-204, miR-205, miR-206, miR-20a, miR-211, miR-218, miR-26a, miR-31, miR-33a, miR-34a, miR-34c, miR-376a, miR-376c, miR-573, miR-7-5p, miR-9, and/or miR-98 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

42. The oncolytic virus of claim 41 for treating melanoma.

43. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for let-7d, miR-218, miR-34a, miR-375, miR-494, miR-100, miR-124, miR-1250, miR-125b, miR-126, miR-1271, miR-136, miR-138, miR-145, miR-147, miR-148a, miR-181a, miR-206, miR-220a, miR-26a, miR-26b, miR-29a, miR-32, miR-323-5p, miR-329, miR-338, miR-370, miR-410, miR-429, miR-433, miR-499a-5p, miR-503, miR-506, miR-632, miR-646, miR-668, miR-877, and/or miR-9 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

44. The oncolytic virus of claim 43 for treating oral cancer.

45. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for let-7i, miR-100, miR-124, miR-125b, miR-129-5p, miR-130b, miR-133a, miR-137, miR-138, miR-141, miR-145, miR-148a, miR-152, miR-153, miR-155, miR-199a, miR-200a, miR-200b, miR-200c, miR-212, miR-335, miR-34a, miR-34b, miR-34c, miR-409-3p, miR-411, miR-429, miR-432, miR-449a, miR-494, miR-497, miR-498, miR-519d,

miR-655, miR-9, miR-98, miR-101, miR-532-5p, miR-124a, miR-192, miR-193a, and/or miR-7 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

46. The oncolytic virus of claim 45 for treating ovarian cancer.

47. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-216a-5p, miR-802, miR-217, miR-145-3p, miR-143-3p, miR-451a, miR-375, miR-214-3p, miR-216b-3p, miR-432-5p, miR-216a-3p, miR-199b-5p, miR-199a-5p, miR-136-3p, miR-216b-5p, miR-136-5p, miR-145-5p, miR-127-3p, miR-199a-3p, miR-199b-3p, miR-559, miR-129-2-3p, miR-4507, miR-1-3p, miR-148a-3p, miR-101, miR-1181, miR-124, miR-1247, miR-133a, miR-141, miR-145, miR-146a, miR-148a, miR-148b, miR-150*, miR-150-5p, miR-152, miR-15a, miR-198, miR-203, miR-214, miR-216a, miR-29c, miR-335, miR-34a, miR-34b, miR-34c, miR-373, miR-375, miR-410, miR-497, miR-615-5p, miR-630, miR-96, miR-132, let-7a, let-7a-1, let-7a-2, let-7a-3, let-7b, let-7c, let-7d, let-7e, let-7f-1, let-7f-2, let-7g, let-7i, miR-126, miR-135a, miR-143, miR-144, miR-150, miR-16, miR-200a, miR-200b, miR-200c, miR-217, miR-218, miR-337, miR-494, and/or miR-98 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

48. The oncolytic virus of claim 47 for treating pancreatic cancer.

49. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for let-7a-3p, let-7c, miR-100, miR-101, miR-105, miR-124, miR-128, miR-1296, miR-130b, miR-133a-1, miR-133a-2, miR-133b, miR-135a, miR-143, miR-145, miR-146a, miR-154, miR-15a, miR-187, miR-188-5p, miR-199b, miR-200b, miR-203, miR-205, miR-212, miR-218, miR-221, miR-224, miR-23a, miR-23b, miR-25, miR-26a, miR-26b, miR-29b, miR-302a, miR-30a, miR-30b, miR-30c-1, miR-30c-2, miR-30d, miR-30e, miR-31, miR-330, miR-331-3p, miR-34a, miR-34b, miR-34c, miR-374b, miR-449a, miR-4723-5p, miR-497, miR-628-5p, miR-642a-5p, miR-765, and/or miR-940 inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

50. The oncolytic virus of claim 49 for treating prostate cancer.

51. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-101, miR-183, miR-204, miR-34a, miR-365b-3p, miR-486-3p, and/or miR-532-5p inserted into the 5' UTR or 3' UTR of one or more viral genes required for viral replication.

52. The oncolytic virus of claim 51 for treating retinoblastoma.

53. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-143-3p, miR-133b, miR-1264, miR-448, miR-1298-5p, miR-490-5p, miR-138-2-3p, miR-144-3p, miR-144-5p, miR-150-5p, miR-129-1-3p, miR-559, miR-1-3-p, miR-143-5p, miR-223-3p, miR-3943, miR-338-3p, miR-124-3p, miR-219a-5p, miR-219a-2-3p, miR-451a, miR-142-5p, miR-133a-3p, miR-145-5p, and/or miR-145-3p.

54. The oncolytic virus of claim 53 for treating glioblastoma.

55. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-143-3p, miR-223-3p, miR-6080, miR-208b-3p, miR-206, miR-133a-5p, miR-133b, miR-199a-5p, miR-199b-5p, miR-145-3p, miR-145-5p, miR-150-5p, miR-142-3p, miR-144-3p, miR-144-5p, miR-338-3p, miR-214-3p, miR-559, miR-133a-3p, miR-1-3p, miR-126-3p, miR-142-5p, miR-451a, miR-199a-3p, and/or miR-199b-3p.

56. The oncolytic virus of claim 55 for treating head and neck cancer.

57. The oncolytic virus of any of claims 1-12, wherein the tumor-suppressive miR target sequence is a target sequence for miR-133b, miR-208b-3p, miR-6130, miR-141-5p, miR-31-3p, miR-1293, miR-129-2-3p, miR-129-5p, miR-124-3p, miR-219a-5p, miR-219a-2-3p, miR-490-3p, miR-488-3p, miR-935, miR-124-5p, miR-122-3p, miR-122-5p, miR-1-3p, miR-133a-3p, miR-375, miR-141-3p, miR-31-5p, miR-205-5p, miR-200c-3p, and/or miR-203a-3p.

58. The oncolytic virus of claim 57 for treating a Schwannoma.

59. A recombinant oncolytic virus comprising one or more of:

(a) one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication;

(b) one or more polynucleotides encoding one or more proteins or oligonucleotides, wherein the proteins or oligonucleotides reduce the expression or inhibit the function of a miR, a gene, or a TIMP;

(c) at least one protease-activated antibody; and/or

(d) a polynucleotide encoding at least one protease activated antibody.

60. The oncolytic virus of claim 59, wherein the miR of (b) is an oncogenic miR or a microenvironment remodeling miR.

61. The oncolytic virus of claim 60, wherein the oncogenic miR is selected from the miRs listed in Table 4.

62. The oncolytic virus of claim 59, wherein the gene of (b) is an oncogenic gene.

63. The oncolytic virus of claim 62, wherein the oncogenic gene is selected from the genes listed in Table 7.

64. The oncolytic virus of claim 60, wherein the microenvironment remodeling miR is selected from the miRs listed in Table 5.

65. The oncolytic virus of claim 59, wherein the TIMP of (b) is selected from TIMP1, TIMP2, TIMP3 and TIMP4.

66. The oncolytic virus of claim 59, wherein the oligonucleotide of (b) is an shRNA or a decoy oligonucleotide.

67. The oncolytic virus of claim 59, wherein the protein of (b) is a nuclease, a bispecific T-cell engager (BiTE), an anti-immunosuppressive protein, or an immunogenic antigen.

68. The oncolytic virus of claim 67, wherein the nuclease is selected from a Clustered Regulatory Interspaced Short Palindromic Repeats (CRISPR)-associated endonuclease, a zinc-finger nuclease (ZFN) or a Transcription activator-like effector nuclease (TALEN).

69. The oncolytic virus of claim 68, wherein the CRISPR-associated endonuclease is selected from SpCas9, SpCas9-HF1, SpCas9-HF2, SpCas9-HF3, SpCas9-HF4, SaCas9, FnCpf, FnCas9, eSpCas9, C2C1, C2C3, Cpf1, Casl, CaslB, Cas2, Cas3, Cas4, Cas5, Cas6, Cas7, Cas8, Cas9, Cas10, Csyl, Csy2, Csy3, Csel, Cse2, Cscl, Csc2, Csa5, Csn2, Csm2, Csm3, Csm4, Csm5, Csm6, Cmrl, Cmr3, Cmr4, Cmr5, Cmr6, Csbl, Csb2, Csb3, Csxl7, Csxl4, Csx10, Csx16, CsaX, Csx3, Csxl, Csxl5, Csfl, Csf2, Csf3, and Csf4.

70. The oncolytic virus of claim 69, further comprising a heterologous polynucleotide encoding an tracr-RNA (trRNA) and a crispr-RNA (crRNA), wherein the crRNA is targeted to a genomic DNA sequence encoding a miR or a TIMP and wherein the trRNA facilitates binding and activation of a CRISPR-associated endonuclease

71. The oncolytic virus of claim 67, wherein the anti-immunosuppressive protein is an anti-regulatory T-cell (Treg) protein or an anti-myeloid-derived suppressor cell (MDSC) protein.

72. The oncolytic virus of claim 67, wherein the anti-immunosuppressive protein is a VHH-derived blocker or a VHH-derived BiTE.

73. The oncolytic virus of claim 59, wherein the protein of (b) induces an anti-tumor immune response.

74. The oncolytic virus of claim 73, wherein the protein is selected from EpCAM, folate, IFNβ, anti-CTLA-4, anti-PD1, A2A, anti-FGF2, anti-FGFR/FGFR2b, anti-SEMA4D, CCL5, CD137, CD200, CD38, CD44, CSF-1R, CXCL10, CXCL13, endothelin B Receptor, IL-12, IL-

15, IL-2, IL-21, IL-35, ISRE7, LFA-1, NG2 (also known as SPEG4), a SMAD protein, STING, TGFβ, and VCAM1.

75. The oncolytic virus of claim 59, wherein the at least one protease-activated antibody of (c) or (d) is incorporated into a viral glycoprotein envelope.

76. The oncolytic virus of claim 59 or 75, wherein the protease-activated antibody is activated by a protease selected from a cysteine cathepsin, an aspartic cathepsin, a kallikrein (hK), a serine protease, a caspase, a matrix metalloproteinase (MMP), and a disintegrin metalloproteinase (ADAM).

77. The oncolytic virus of claim 76, wherein the protease is selected from cathepsin K, cathepsin B, cathepsin L, cathepsin E, cathepsin D, hK1, PSA (hK3), hK10, hK15, uPA, uPAR, MMP-1, MMP-2, MMP-3, MMP-7, MMP-8, MMP-9, MMP-10, MMP-11, MMP-12, MMP-13, MMP-14, MMP-15, MMP-16, MMP-17, MMP-18, MMP-19, MMP-20, MMP-21, MMP-23A, MMP-23B, MMP-24, MMP-25, MMP-26, MMP-27, MMP-28, or a protease listed in Table 6.

78. The oncolytic virus of claim 59 or 75, wherein the protease-activated antibody binds to a protein expressed more highly by a cancer cell or in a cancer microenvironment than by a non-cancer cell or in a non-cancer microenvironment.

79. The oncolytic virus of claim 78, wherein the protease-activated antibody binds NKG2D, c-met, HGFR, CD8, heparan sulfate, VSPG4 (also known as NG2), EGFR, EGFRvIII, CD133, CXCR4, carcinoembryonic antigen (CEA), CLC-3, annexin II, human transferrin receptor, or EpCAM.

80. The oncolytic virus of any of claims 59-79, wherein the miR target sequence of (a), the one or more polynucleotides of (b), and/or or the one or more polynucleotides of (d) is inserted into a gene locus of the viral genome.

81. The oncolytic virus of claim 80, wherein the virus is a herpes simplex virus and wherein the at least one polynucleotide is inserted into or between one or more viral gene loci selected from the group consisting of the internal repeat joint region (comprising one copy each of the diploid genes ICP0, ICP34.5, LAT, ICP4, and the ICP47 promoter), ICP0, LAT, UL1, UL5, UL6, UL7, UL8, UL9, UL11, UL12, UL14, UL15, UL17, UL18, UL19, UL20, UL22, UL25, UL26, UL26.5, UL27, UL28, UL29, UL30, UL31, UL32, UL33, UL34, UL35, UL36, UL37, UL38, UL39, UL40, UL42, UL48, UL49, UL52, UL53, UL54, ICP0, ICP4, ICP22, ICP27, ICP47, gamma-34.5, US3, US4, US5, US6, US7, US8, US9, US10, US11, and US12.

82. A nucleic acid molecule encoding the oncolytic virus of any of the preceding claims.

83. A viral stock comprising the oncolytic virus of any of claims 1-81.

84. A composition comprising the oncolytic virus of any of claims 1-81 and a pharmaceutically-acceptable carrier.

85. A method of killing a cancerous cell, comprising exposing the cancerous cell to the oncolytic virus of any of claims 1-81 or compositions thereof under conditions sufficient for the oncolytic virus to infect and replicate within said cancerous cell, and wherein replication of the oncolytic virus within the cancerous cell results in cell death.

86. The method of claim 85, wherein the cancerous cell has a reduced expression of a tumor-suppressive miR capable of binding to the one or more tumor-suppressive miR-target sequences compared to the expression of the tumor-suppressive miR in a non-cancerous cell.

87. The oncolytic virus of claim 86, wherein the expression level of the tumor-suppressive miR in the cancerous cell is at least 5% less than the expression level the tumor-suppressive miR in the non-cancerous cell.

88. The method of any of claims 85-87, wherein replication of the oncolytic virus is increased or maintained in cancerous cells with a reduced expression of the tumor-suppressive miR capable of binding to the one or more tumor-suppressive miR-target sequences.

89. The method of claim 88, wherein the viral replication is at least 5% greater in the cancerous cells compared to the viral replication in the non-cancerous cell.

90. The method of any of claims 85-89, wherein the cell is *in vivo*.

91. The method of claim 90, wherein the cell is within a tumor.

92. A method of treating cancer in a subject in need thereof, comprising administering the oncolytic virus of any of claims 1-81 or compositions thereof to the subject.

93. The method of any one of claims 85-92, wherein the subject is a mouse, a rat, a rabbit, a cat, a dog, a horse, a non-human primate, or a human.

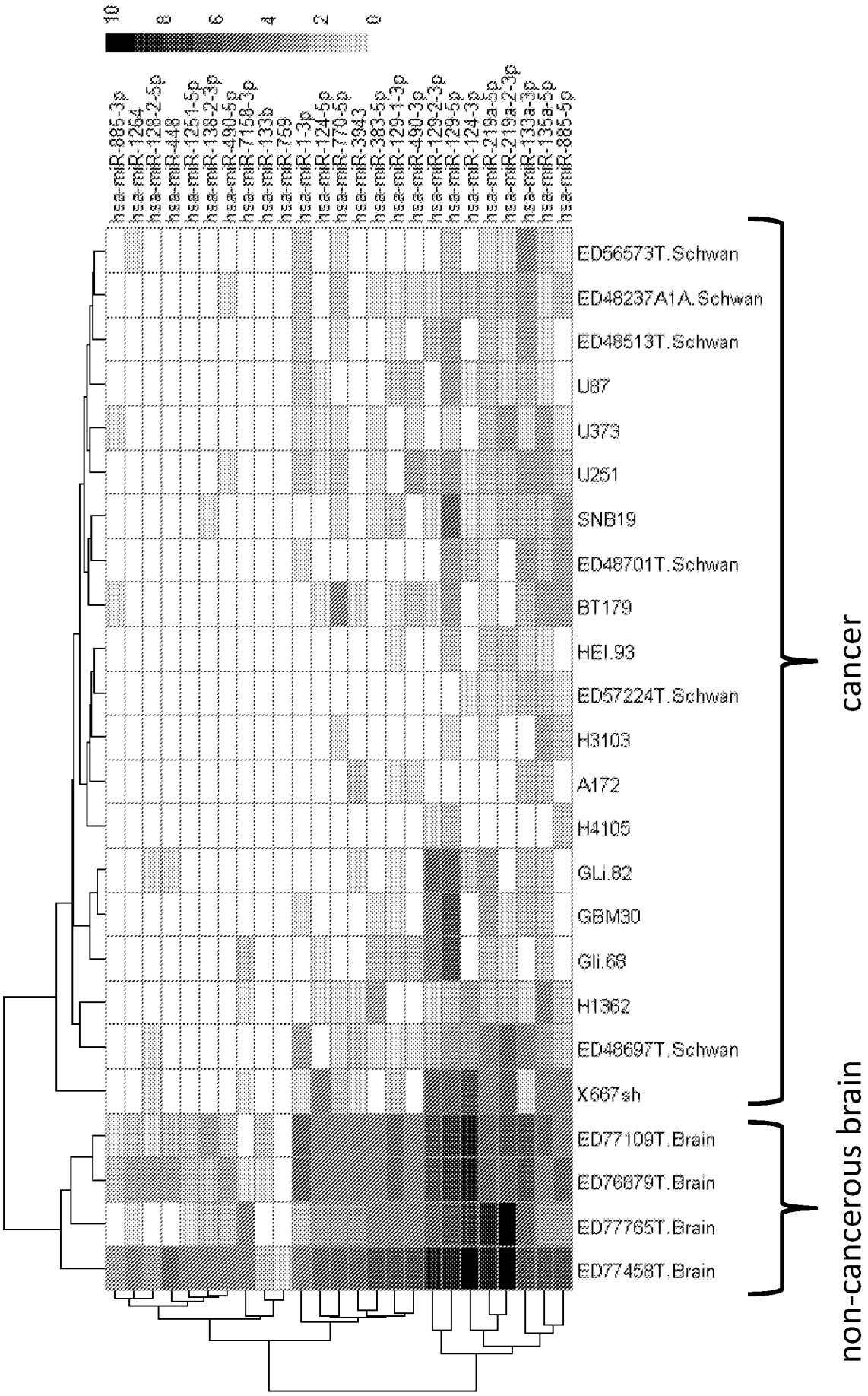
94. The method of claim 92 or 93, wherein the oncolytic virus or compositions thereof are administered intravenously, subcutaneously, intratumorally, intramuscularly, or intranasally.

95. The method of claim 92, wherein the cancer is selected from lung cancer, breast cancer, ovarian cancer, cervical cancer, prostate cancer, testicular cancer, colorectal cancer, colon cancer, pancreatic cancer, liver cancer, gastric cancer, head and neck cancer, thyroid cancer, malignant glioma, glioblastoma, melanoma, B-cell chronic lymphocytic leukemia, diffuse large B-cell lymphoma (DLBCL), and marginal zone lymphoma (MZL).

96. The method of claim 95, wherein the lung cancer is small cell lung cancer or non-small cell lung cancer.

97. The method of claim 96, wherein the liver cancer is hepatocellular carcinoma (HCC).

FIG. 1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hsa-miR-1264
hsa-miR-128-2-5p
hsa-miR-448
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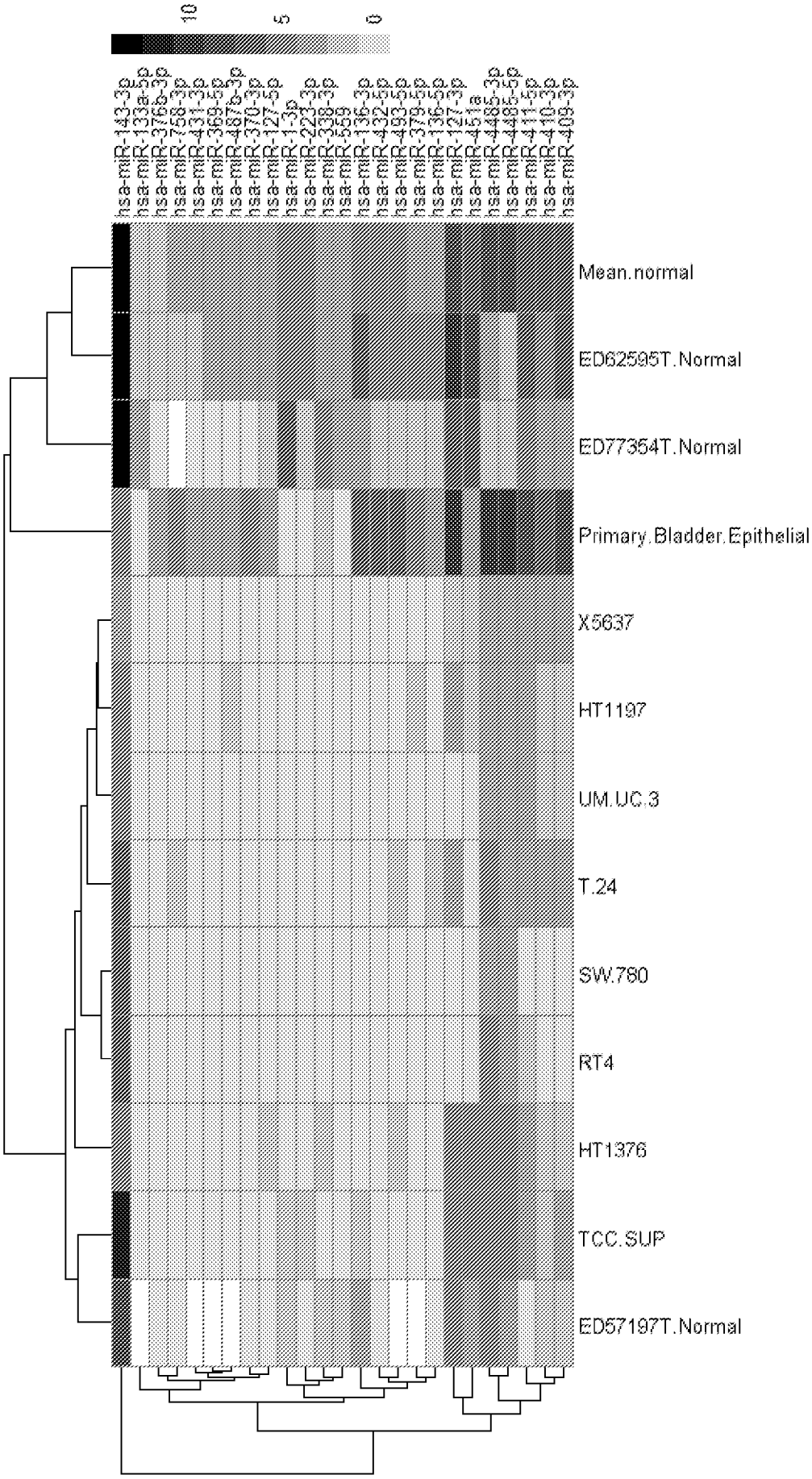
hsa-miR-138-2-3p
hsa-miR-490-5p
hsa-miR-7158-3p
hsa-miR-133b
hsa-miR-759
hsa-miR-1-3p
hsa-miR-124-5p
hsa-miR-770-5p
hsa-miR-3943
hsa-miR-383-5p
hsa-miR-129-1-3p
hsa-miR-490-3p
hsa-miR-129-2-3p
hsa-miR-129-5p
hsa-miR-124-3p
hsa-miR-219a-5p
hsa-miR-219a-2-3p
hsa-miR-133a-3p
hsa-miR-135a-5p
hsa-miR-885-5p
ED56573T.Schwan
ED48237A1A.Schwan
ED48513T.Schwan
U87
U373
U251
SNB19
ED48701T.Schwan
BT179
HEI.93
ED57224T.Schwan
H3103
A172
H4105
GLI.82
GBM30
Gli.68
H1362
ED48697T.Schwan
X667sh
ED77109T.Brain
ED76879T.Brain
ED77765T.Brain
ED77458T.Brain
cancer
non-cancerous brain

FIG. 2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5
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hsa-miR-143-3p
hsa-miR-133a-5p
hsa-miR-376a-3p
hsa-miR-758-3p
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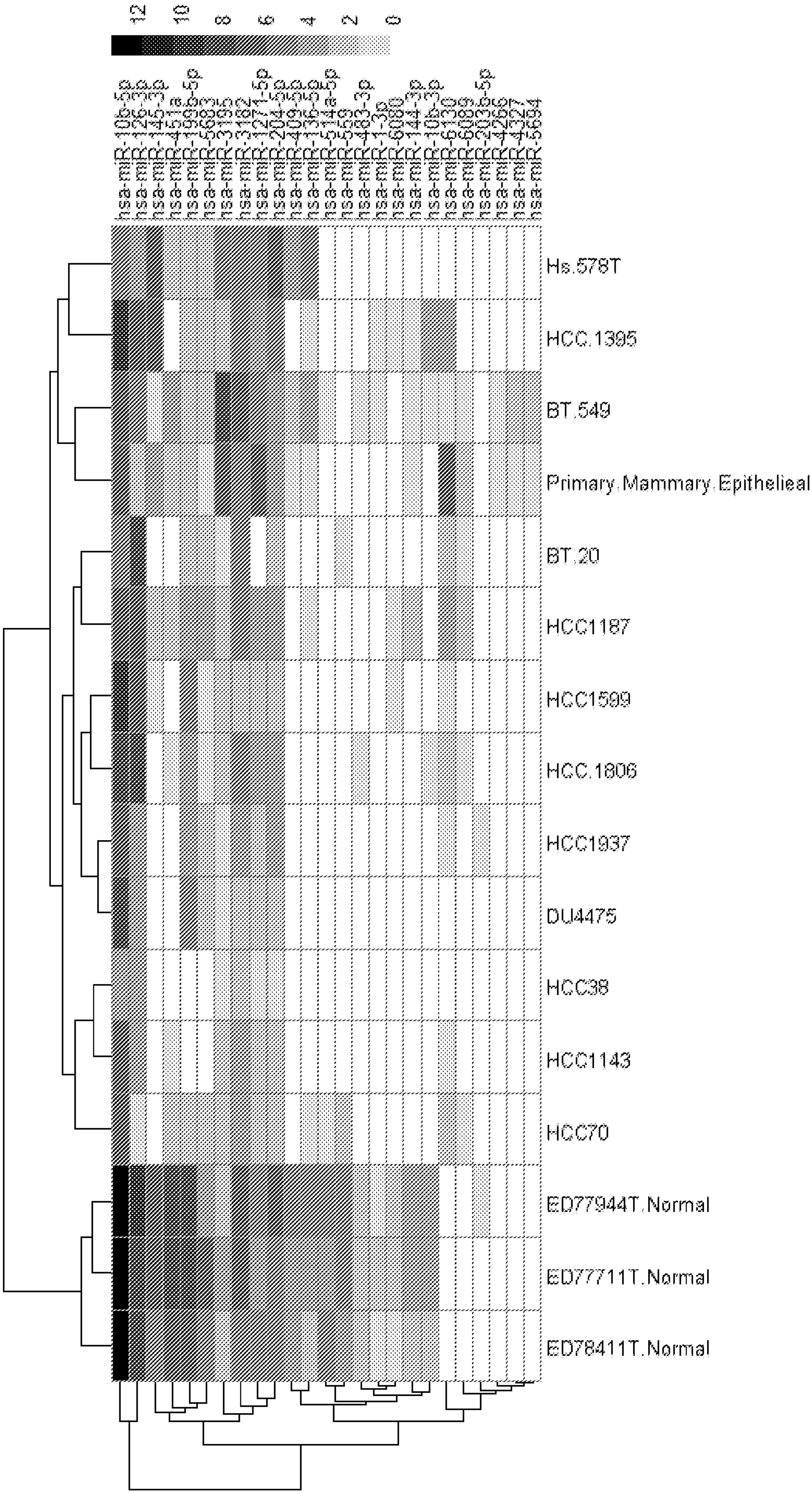
hsa-miR-369-5p
hsa-miR-487a-3p
hsa-miR-370-3p
hsa-miR-127-5p
hsa-miR-1-3p
hsa-miR-223-3p
hsa-miR-338-3p
hsa-miR-559
hsa-miR-136-3p
hsa-miR-432-5p
hsa-miR-493-5p
hsa-miR-379-5p
hsa-miR-136-5p
hsa-miR-127-3p
hsa-miR-451a
hsa-miR-485-3p
hsa-miR-448
hsa-miR-411-5p
hsa-miR-410-3p
hsa-miR-409-3p
Mean.normal
ED62595T.Normal
ED77354T.Normal
Primary.Bladder.Epithelial
X5637
HT1197
UM.UC.3
T.24
SW.780
RT4
HT1376
TCC.SUP
ED57197T.Normal

FIG. 3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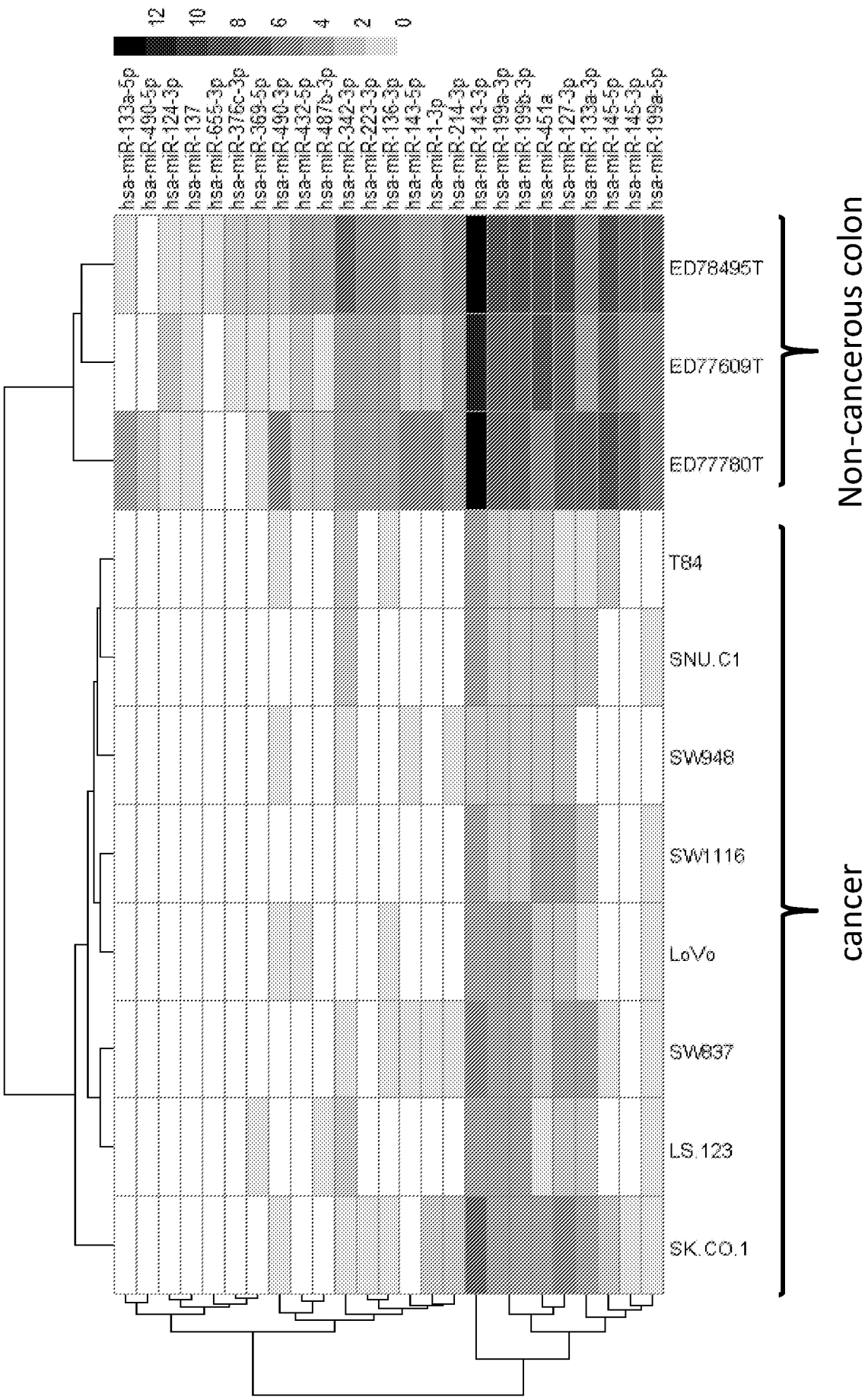
10
8
6
4
2
0
hsa-miR-10b-5p
hsa-miR-126-3p
hsa-miR-145-3p
hsa-miR-451a
hsa-miR-199b-5p
hsa-miR-5683
hsa-miR-3195
hsa-miR-3182
hsa-miR-1271-5p
hsa-miR-204-5p
hsa-miR-409-5p
hsa-miR-136-5p
hsa-miR-514a-5p
hsa-miR-559
hsa-miR-483-3p
hsa-miR-1-3p
hsa-miR-6080
hsa-miR-144-3p
hsa-miR-10b-3p
hsa-miR-6130
hsa-miR-6089
hsa-miR-203b-5p
hsa-miR-4266
hsa-miR-4327
hsa-miR-5694
Hs.578T
HCC.1395
BT.549
Primary.Mammary.Epithelieal
BT.20
HCC1187
HCC1599
HCC.1806
HCC1937
DU4475
HCC38
HCC1143
HCC70
ED77944T.Normal
ED77711T.Normal
ED78411T.Normal

FIG. 4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6
4
2
0
hsa-miR-133a-5p
hsa-miR-490-5p
hsa-miR-124-3p
hsa-miR-137
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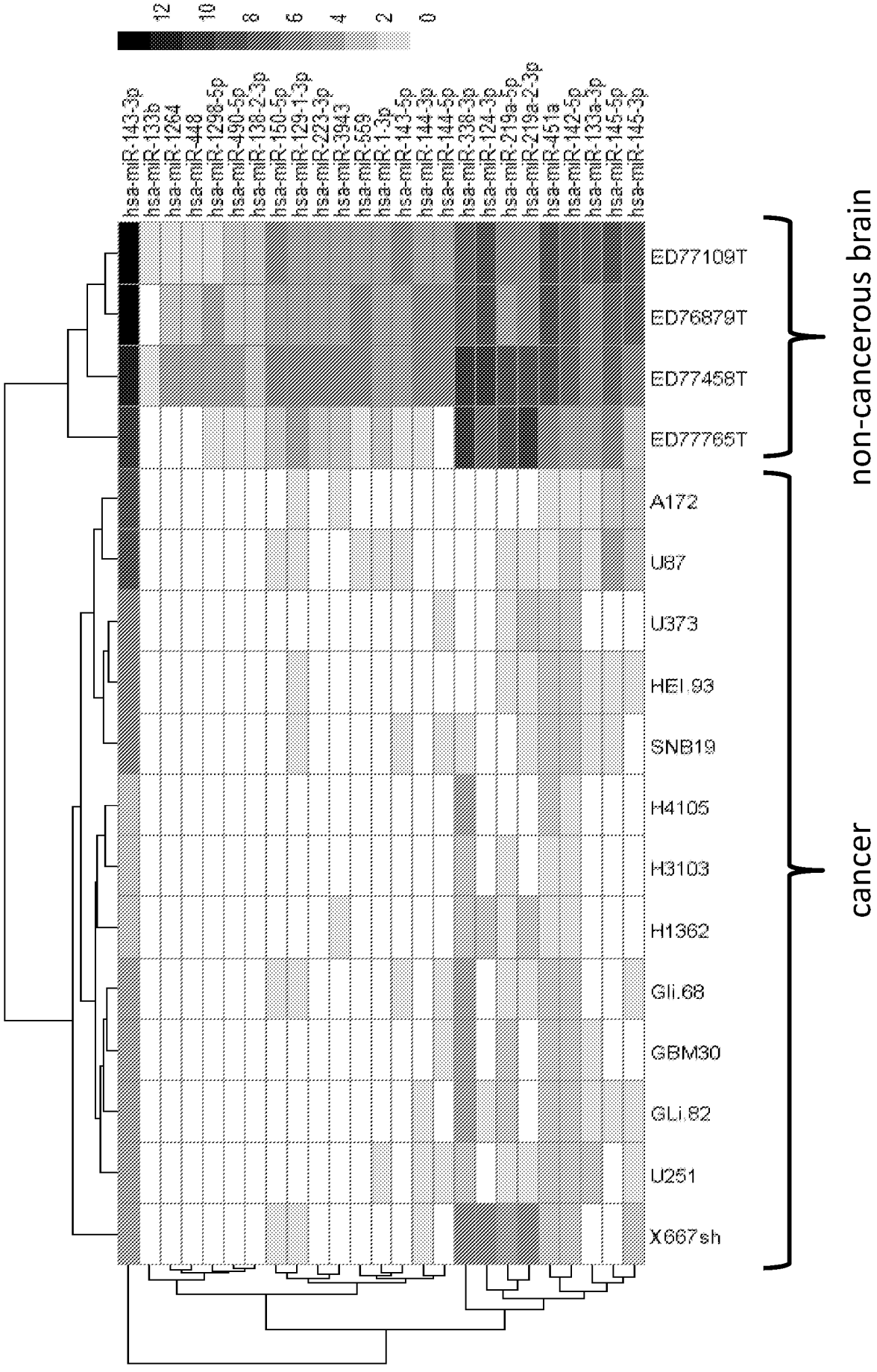
hsa-miR-369-5p
hsa-miR-490-3p
hsa-miR-432-5p
hsa-miR-487b-3p
hsa-miR-342-3p
hsa-miR-223-3p
hsa-miR-136-3p
hsa-miR-143-5p
hsa-miR-1-3p
hsa-miR-214-3p
hsa-miR-143-3p
hsa-miR-199a-3p
hsa-miR-199b-3p
hsa-miR-451a
hsa-miR-127-3p
hsa-miR-133a-3p
hsa-miR-145-5p
hsa-miR-145-3p
hsa-miR-199a-5p
ED78495T
ED77609T
ED77780T
T84
SNU.C1
SW948
SW1116
LoVo
SW837
LS.123
SK.CO.1
Non-cancerous colon
cancer

FIG. 5


12
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6
4
2
0
hsa-miR-143-3p
hsa-miR-133b
hsa-miR-1264
hsa-miR-448
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hsa-miR-490-5p
hsa-miR-138-2-3p
hsa-miR-150-5p
hsa-miR-129-1-3p
hsa-miR-223-3p
hsa-miR-3943
hsa-miR-559
hsa-miR-1-3p
hsa-miR-143-5p
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hsa-miR-144-5p
hsa-miR-338-3p
hsa-miR-124-3p
hsa-miR-219a-5p
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hsa-miR-451a
hsa-miR-142-5p
hsa-miR-133a-3p
hsa-miR-145-5p
hsa-miR-145-3p
ED77109T
ED76879T
ED77458T
ED77765T
A172
U87
U373
HEI.93
SNB19
H4105
H3103
H1362
Gli.68
GBM30
GLi.82
U251
X667sh
non-cancerous brain
cancer

FIG. 6

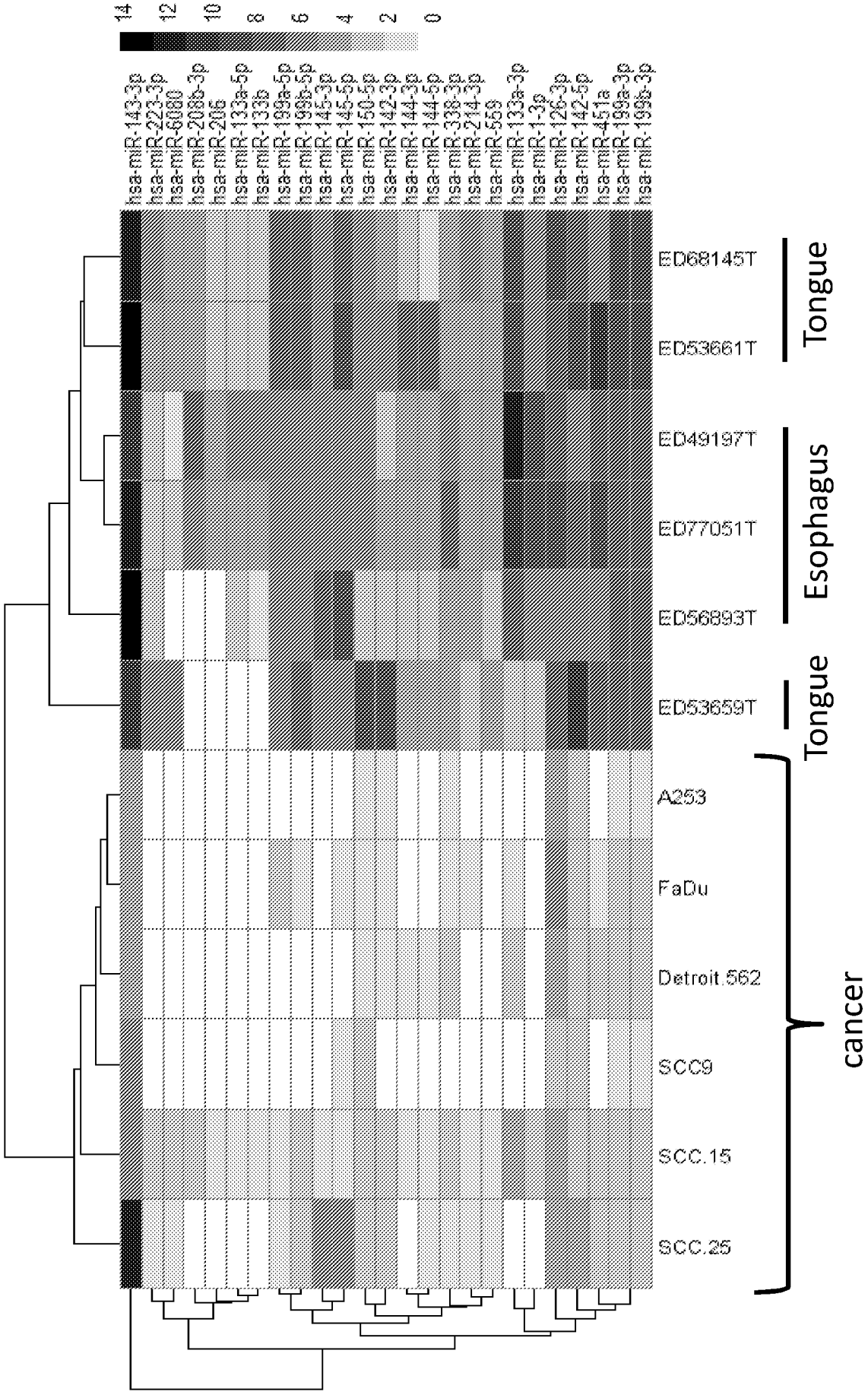
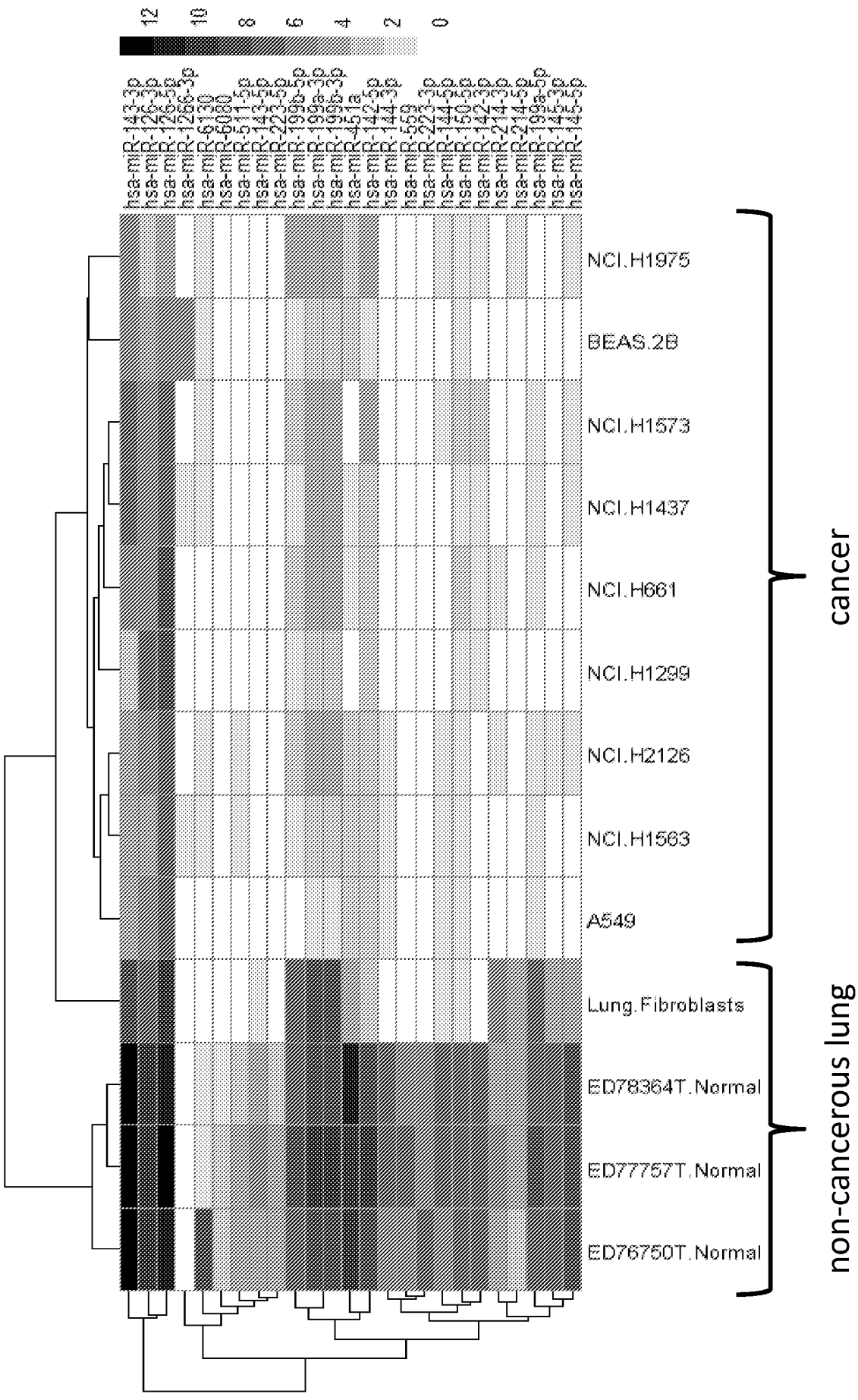

14
12
10
8
6
4
2
0
hsa-miR-143-3p
hsa-miR-223-3p
hsa-miR-6080
hsa-miR-208b-3p
hsa-miR-206
hsa-miR-133a-5p
hsa-miR-133b
hsa-miR-199a-5p
hsa-miR-199b-5p
hsa-miR-145-3p
hsa-miR-145-5p
hsa-miR-150-5p
hsa-miR-142-3p
hsa-miR-144-3p
hsa-miR-144-5p
hsa-miR-338-3p
hsa-miR-214-3p
hsa-miR-559
hsa-miR-133a-3p
hsa-miR-1-3p
hsa-miR-126-3p
hsa-miR-142-5p
hsa-miR-451a
hsa-miR-199a-3p
hsa-miR-199b-3p
ED68145T
ED53661T
ED49197T
ED77051T
ED56893T
ED53659T
A253
FaDu
Detroit.562
SCC9
SCC.15
SCC.25
Tongue
Esophagus
Tongue
cancer

FIG. 7


12
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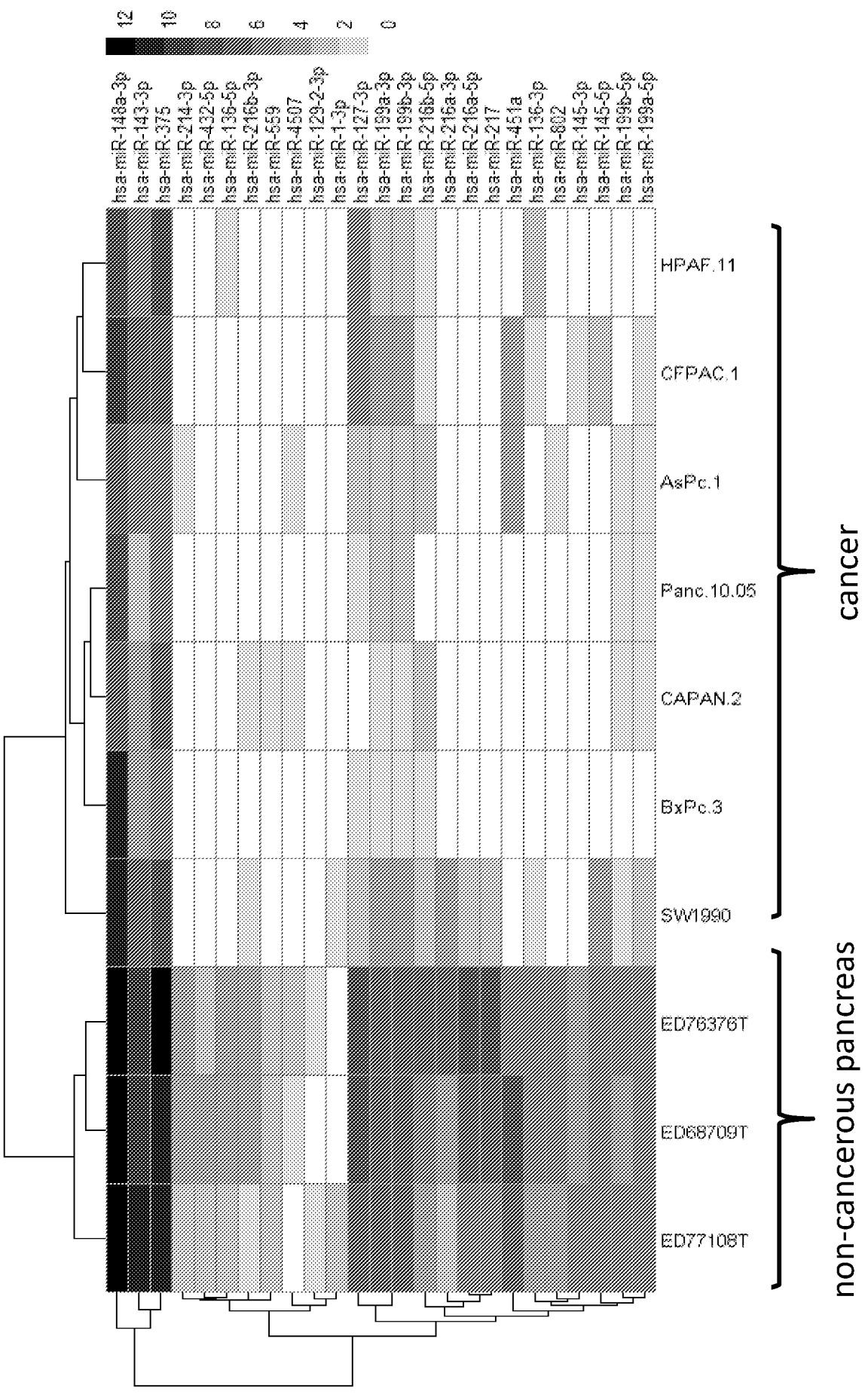
8
6
4
2
0
NCI.H1975
BEAS.2B
NCI.H1573
NCI.H1437
NCI.H661
NCI.H1299
NCI.H2126
NCI.H1563
A549
Lung.Fibroblasts
ED78364T.Normal
ED77757T.Normal
ED76750T.Normal
cancer
non-cancerous lung

FIG. 8


12
10
8
6
4
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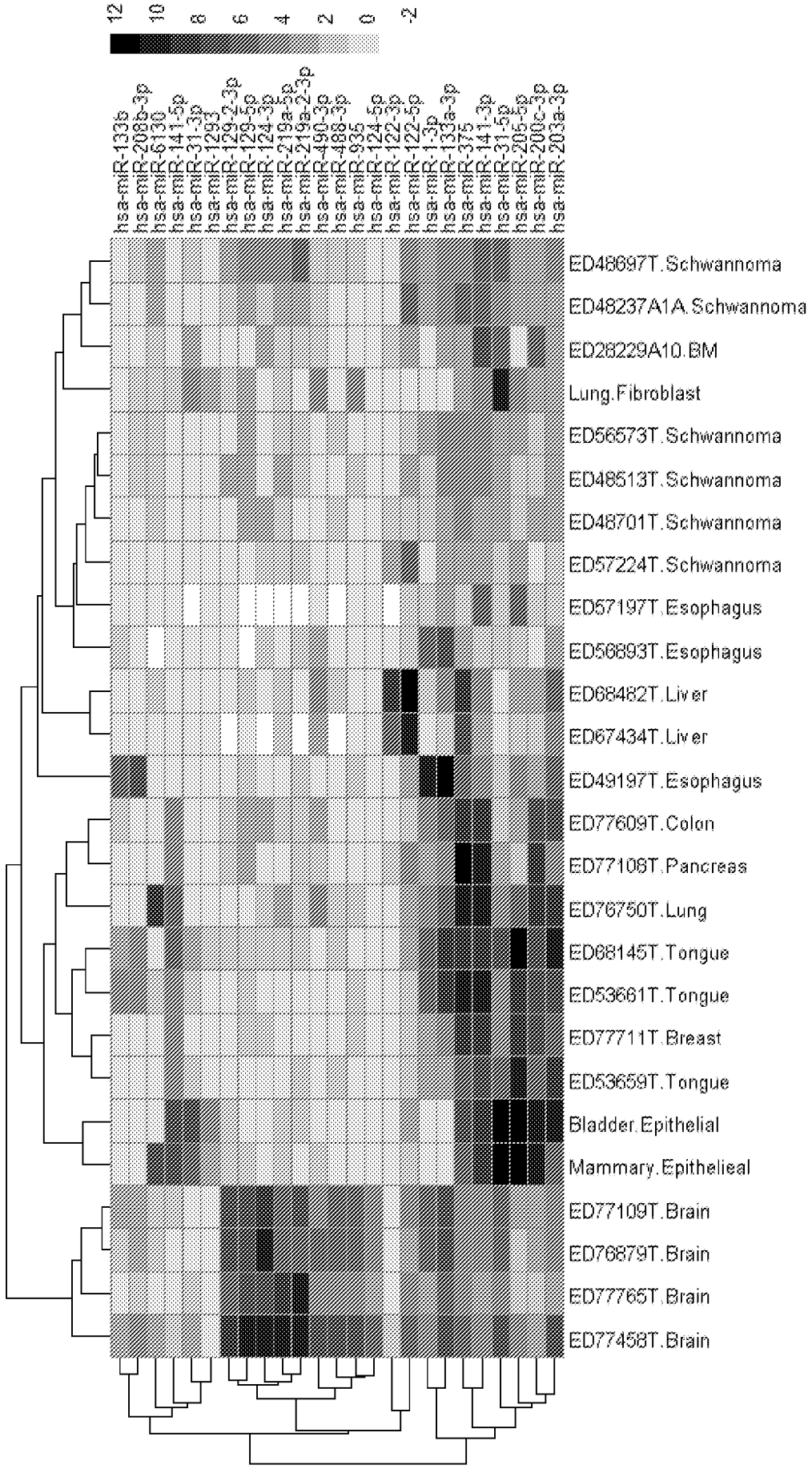
hsa-miR-148a-3p
hsa-miR-143-3p
hsa-miR-375
hsa-miR-214-3p
hsa-miR-432-5p
hsa-miR-136-5p
hsa-miR-216b-3p
hsa-miR-559
hsa-miR-4507
hsa-miR-129-2-3p
hsa-miR-1-3p
hsa-miR-127-3p
hsa-miR-199a-3p
hsa-miR-199b-3p
hsa-miR-216b-5p
hsa-miR-216a-3p
hsa-miR-216a-5p
hsa-miR-217
hsa-miR-451a
hsa-miR-136-3p
hsa-miR-802
hsa-miR-145-3p
hsa-miR-145-5p
hsa-miR-199b-5p
hsa-miR-199a-5p
HPAF.11
CFPAC.1
AsPc.1
Panc.10.05
CAPAN.2
BxPc.3
SW1990
ED76376T
ED68709T
ED77108T
cancer
non-cancerous pancreas

FIG. 9



All non-Schwannoma = non-cancerous tissue
BM = non-cancerous bone marrow

FIG. 10

miR-451a		
Tissue	Norm	CA
Bladder	1402.9	21.1
Breast	2262.1	3.9
Colon	3606.9	22.0
Glioma	4269.7	16.7
H & N	11919.8	10.3
Lung	31442.0	10.5
Pancreatic	1035.8	13.3

FIG. 11

miR-1		
Tissue	Norm	CA
Bladder	175.0	0.8
Breast	3.0	0.3
Colon	149.3	1.6
Glioma	75.2	1.0
H & N	2846.6	2.6
Lung	73.3	1.4
Pancreatic	4.1	0.4

FIG. 12

miR-559		
Tissue	Norm	CA
Bladder	14.0	0.4
Breast	88.4	0.9
Colon	40.8	2.1
Glioma	162.7	0.4
H & N	71.2	2.2
Lung	548.3	0.1
Pancreatic	13.3	0.5

FIG. 13

145-5p		
Tissue	Norm	CA
Bladder	971.5	39.8
Breast	406.1	106.6
Colon	1177.3	0.5
Glioma	2399.2	7.2
H & N	690.9	30.4
Lung	1547.5	1.0
Pancreatic	81.7	0.5

FIG. 14

143-3p		
Tissue	Norm	CA
Bladder	489028.8	14904.6
Breast	125943.9	91543.1*
Colon	509955.6	193.9
Glioma	514114.8	1248.6
H & N	331034.2	20706.2
Lung	436136.8	390.9
Pancreatic	25557.0	269.8

miR-143-3p Breast counts		miR-143-3p H & N counts	
BT-549	132.1	FaDu	144.5
DU4475	20.1	SCC-15	214.2
HCC-1395	503387.3	SCC-25	123445.7
HCC-1806	39.7	SCC9	242.2
HCC1143	1011.5	A253	54.6
HCC1187	4737.7	Detroit-562	136.4
HCC1599	1858.7		
HCC1937	33.2		
HCC38	21.9		
HCC70	174.9		
Hs-578T	495642.8		
BT-20	46.9		

FIG. 15A

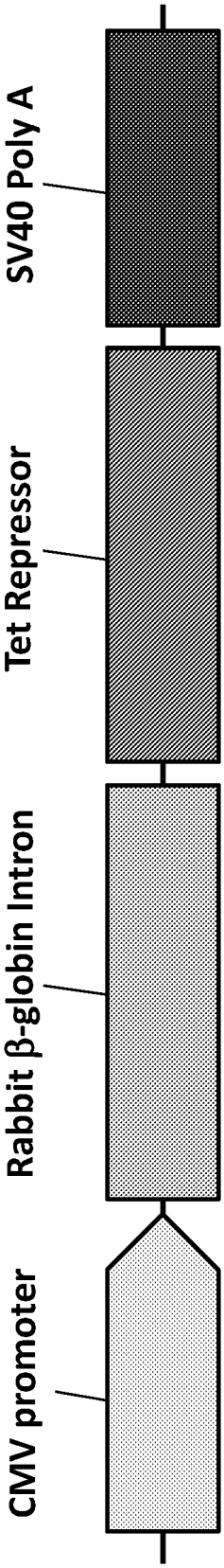


FIG. 15B

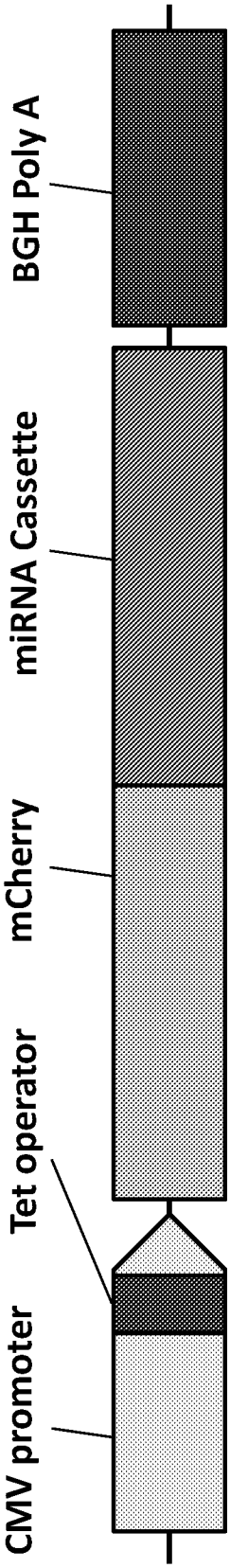


FIG. 15C

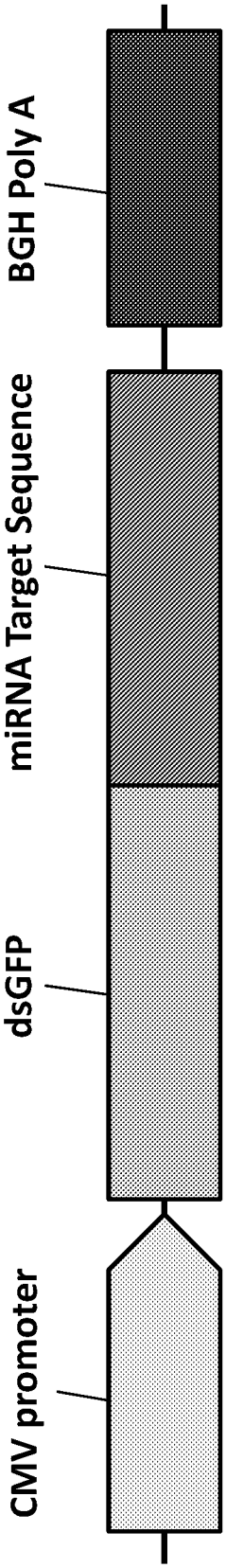


FIG. 16

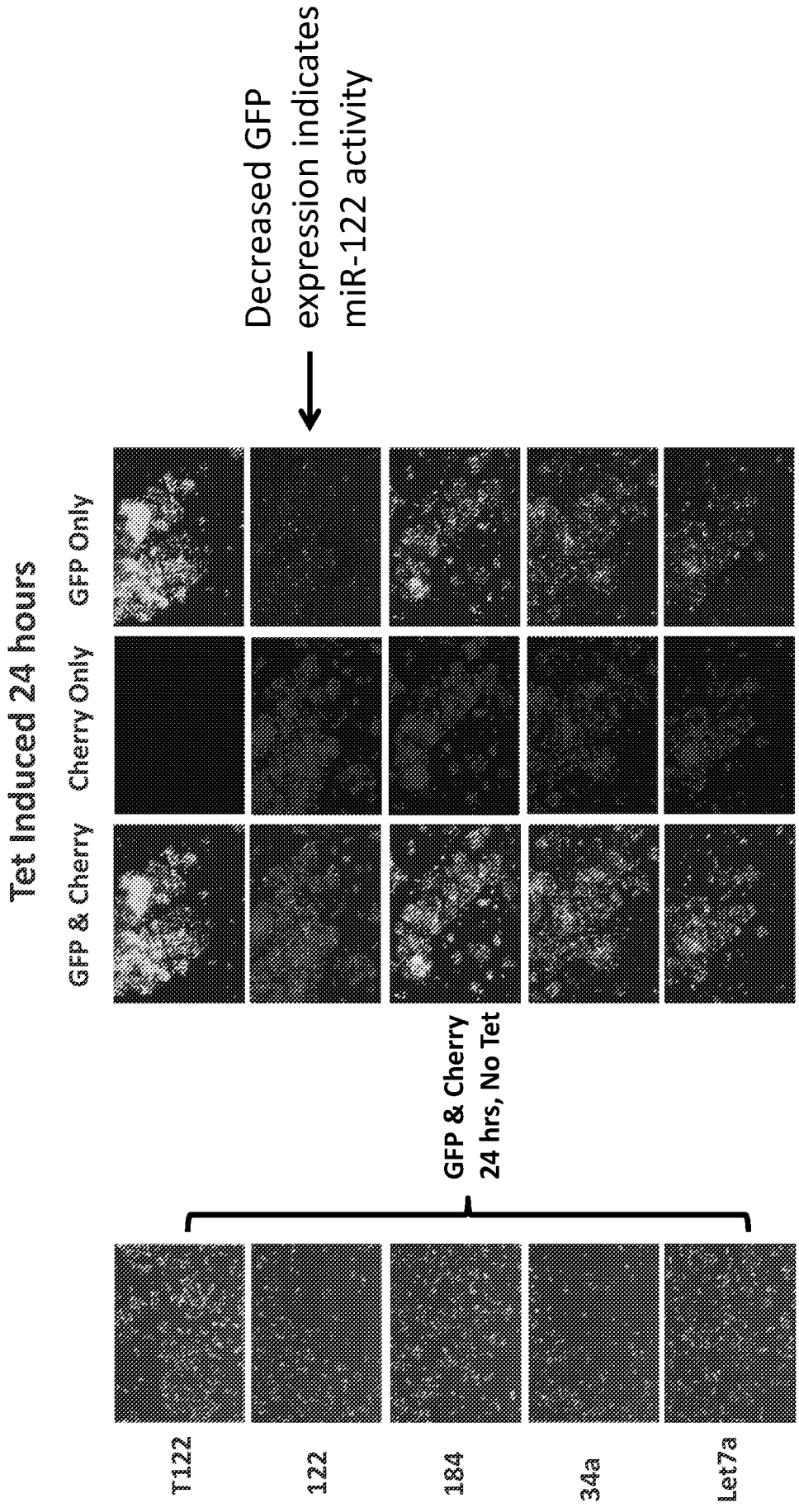
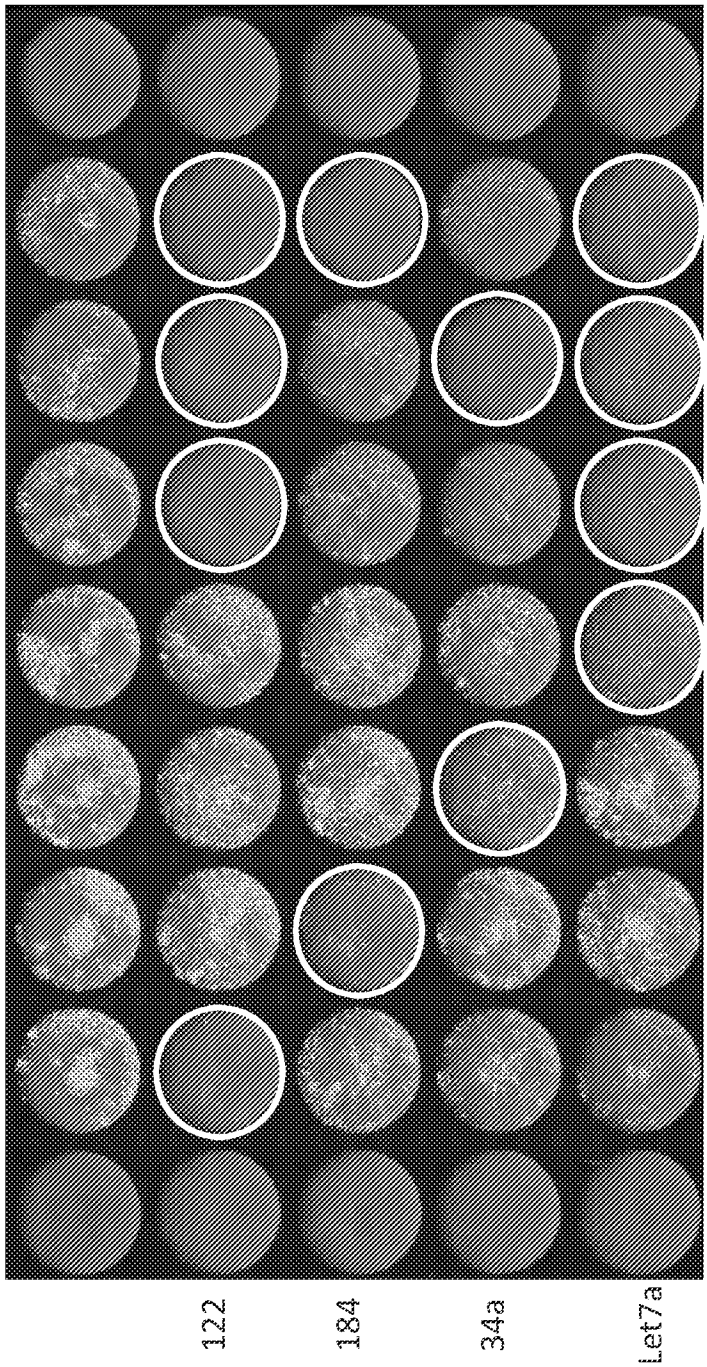

Decreased GFP expression indicates miR-122 activity
Tet Induced 24 hours
GFP & Cherry
Cherry Only
GFP Only
GFP & Cherry 24 hrs, No Tet
T122
122
184
34a
Let7a

FIG. 17



* Circled wells indicate reduced GFP expression levels

FIG. 18

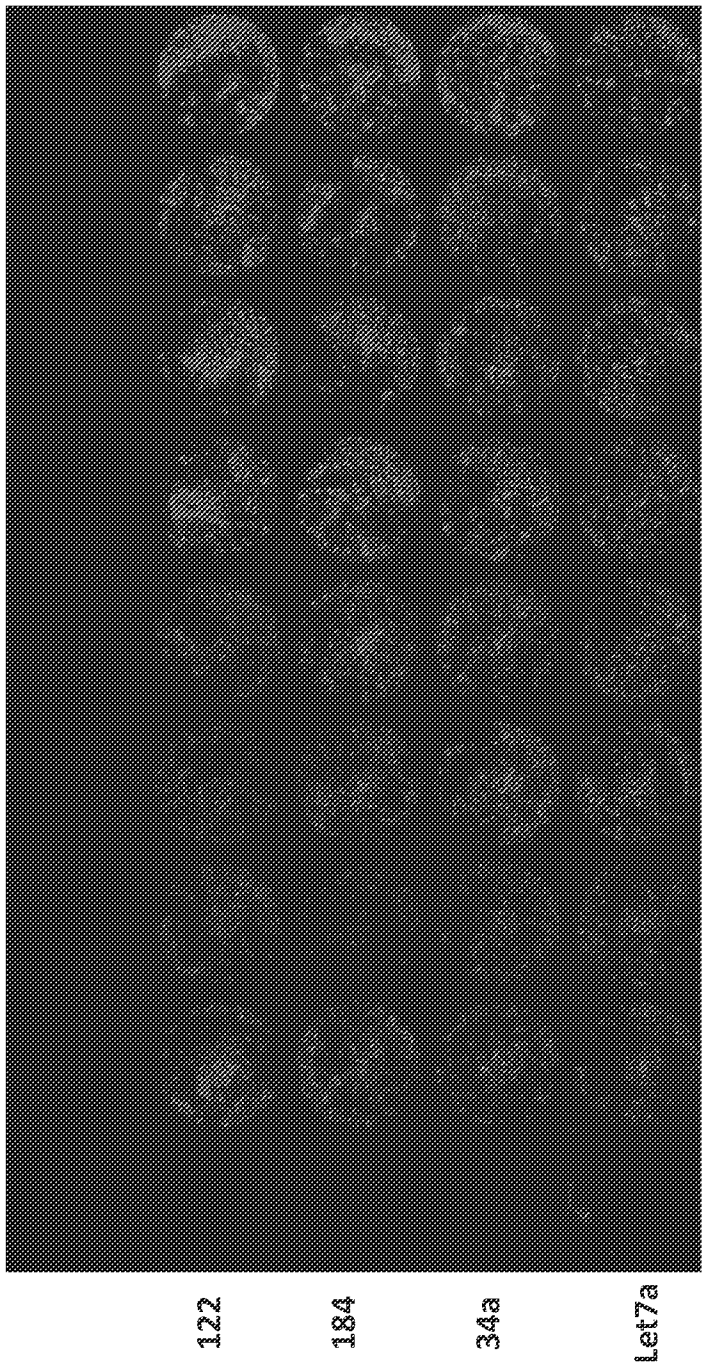

T122
T184
T34a
TLet7a
T122 TLet7a
T122, T34a TLet7a
T122, T184 TLet7a
122
184
34a
Let7a

FIG. 19

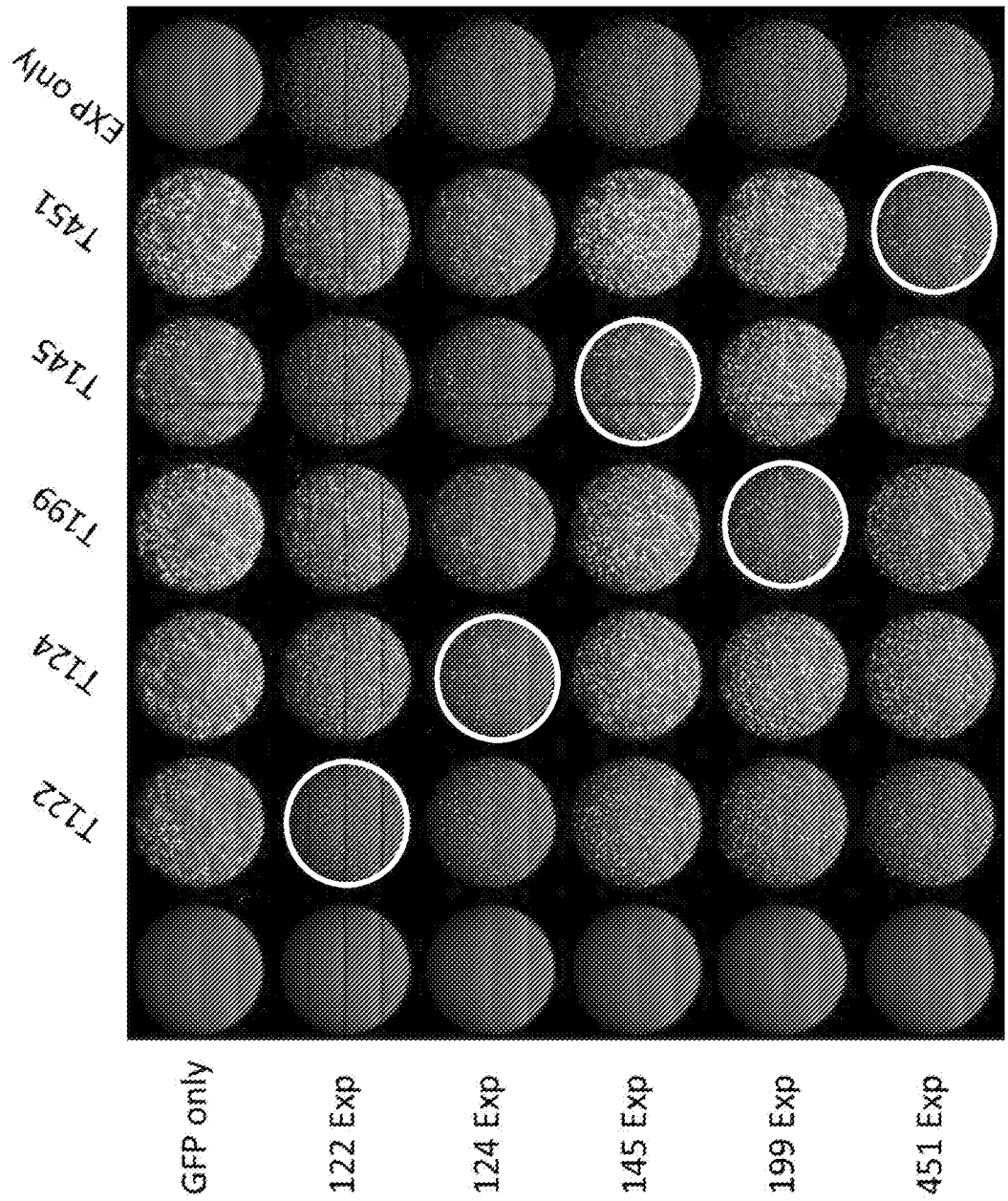

T122
T124
T199
T145
T451
EXP only
GFP only
122 Exp
124 Exp
145 Exp
199 Exp
451 Exp
* Circled wells indicate reduced GFP expression levels

FIG. 20

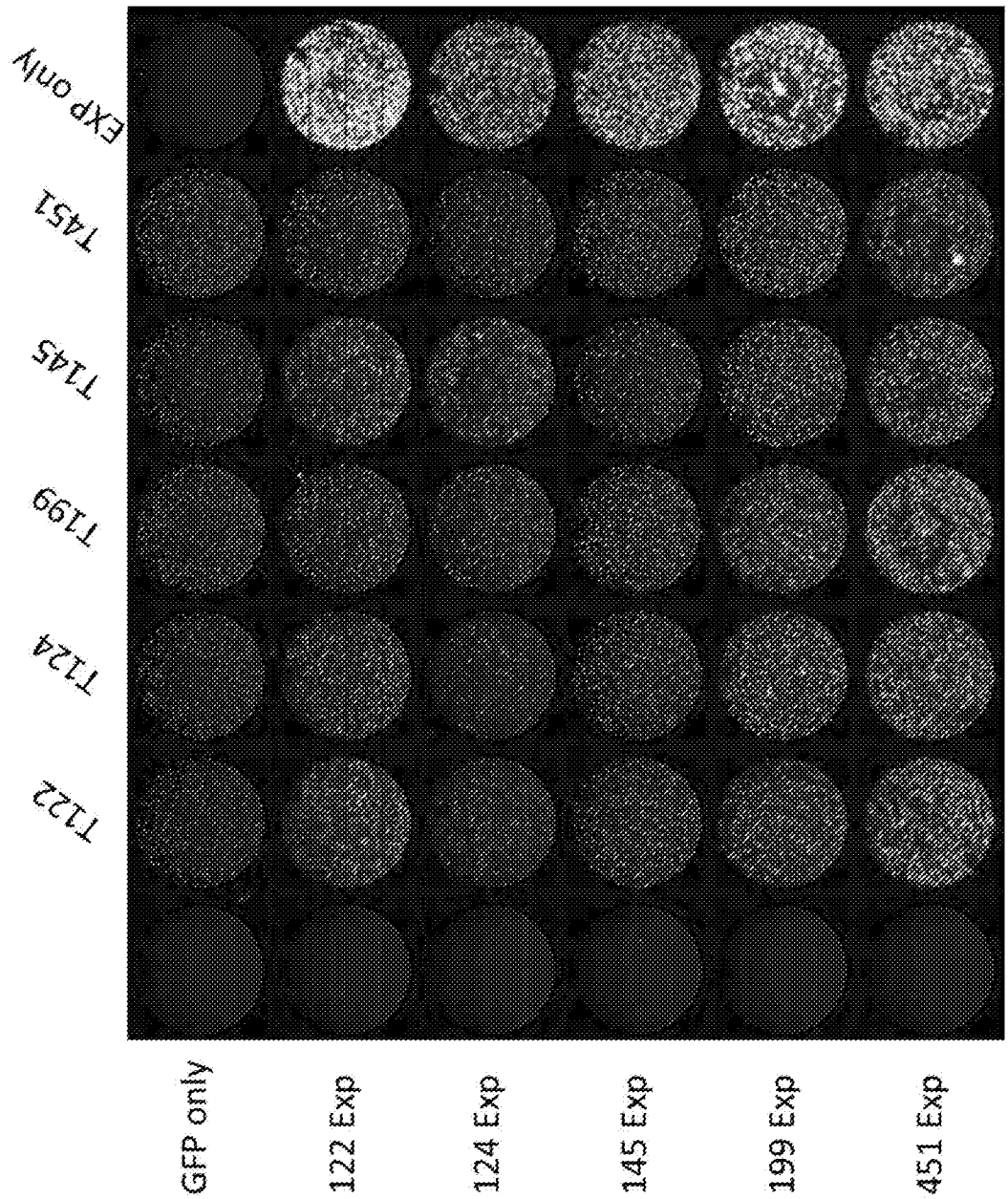

GFP only
122 Exp
124 Exp
145 Exp
199 Exp
451 Exp
122
124
199
145
451
EXP only

FIG. 21

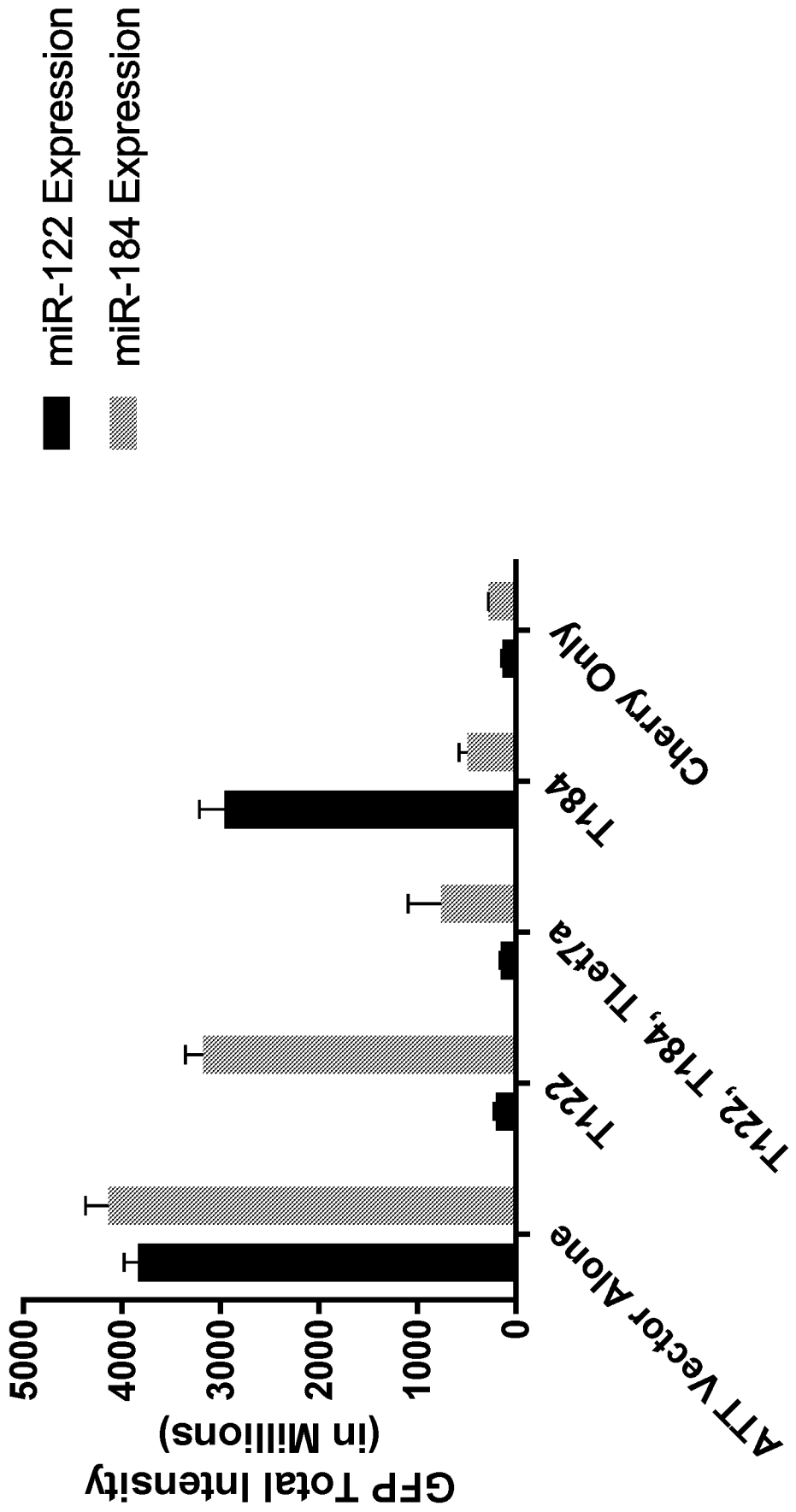

122-184
miR-122 Expression
miR-184 Expression
GFP Total Intensity
(in Millions)
5000
4000
3000
2000
1000
0
ATT Vector Alone
T122
T122, T184, TLet7a
T184
Cherry Only

FIG. 22

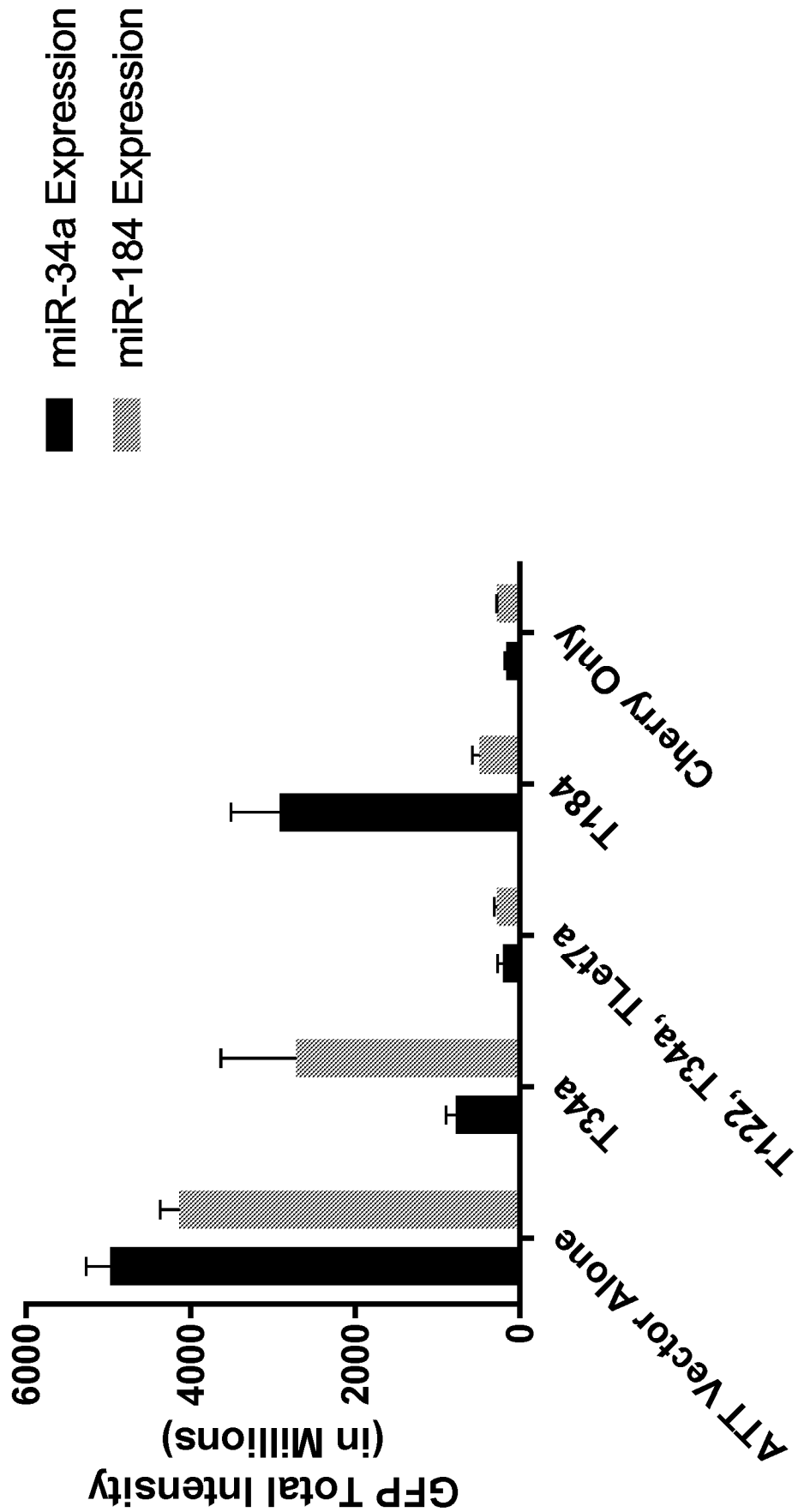

34a-184
miR-34a Expression
miR-184 Expression
GFP Total Intensity
(in Millions)
6000
4000
2000
0
ATT Vector Alone
T34a
T122, T34a, TLet7a
T184
Cherry Only

FIG. 23

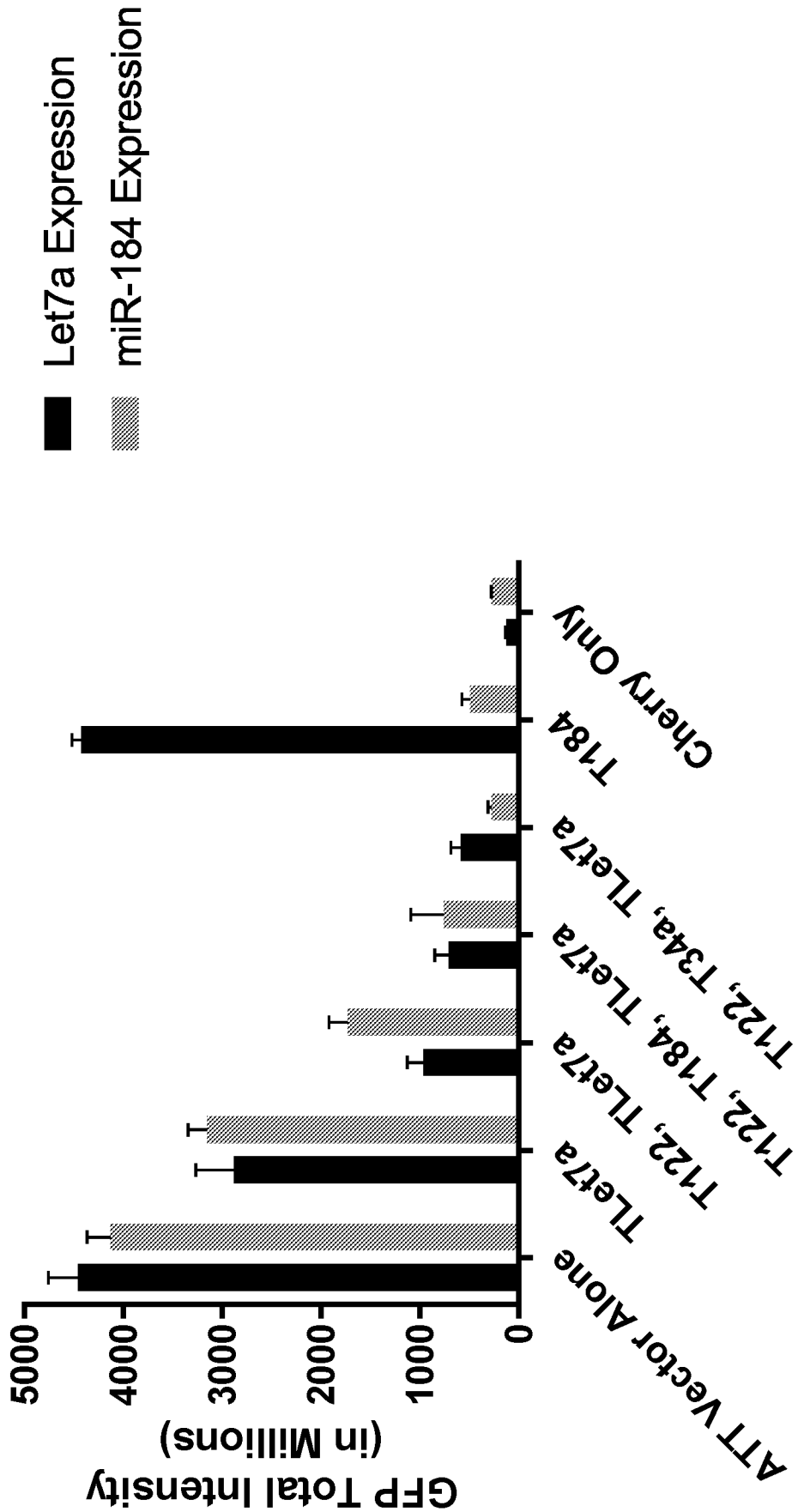

Let7a-184
Let7a Expression
miR-184 Expression
GFP Total Intensity
(in Millions)
5000
4000
3000
2000
1000
0
ATT Vector Alone
Tle7a
T122, Tle7a
T122, T184, Tle7a
T122, T34a, Tle7a
T184
Cherry Only

FIG. 24

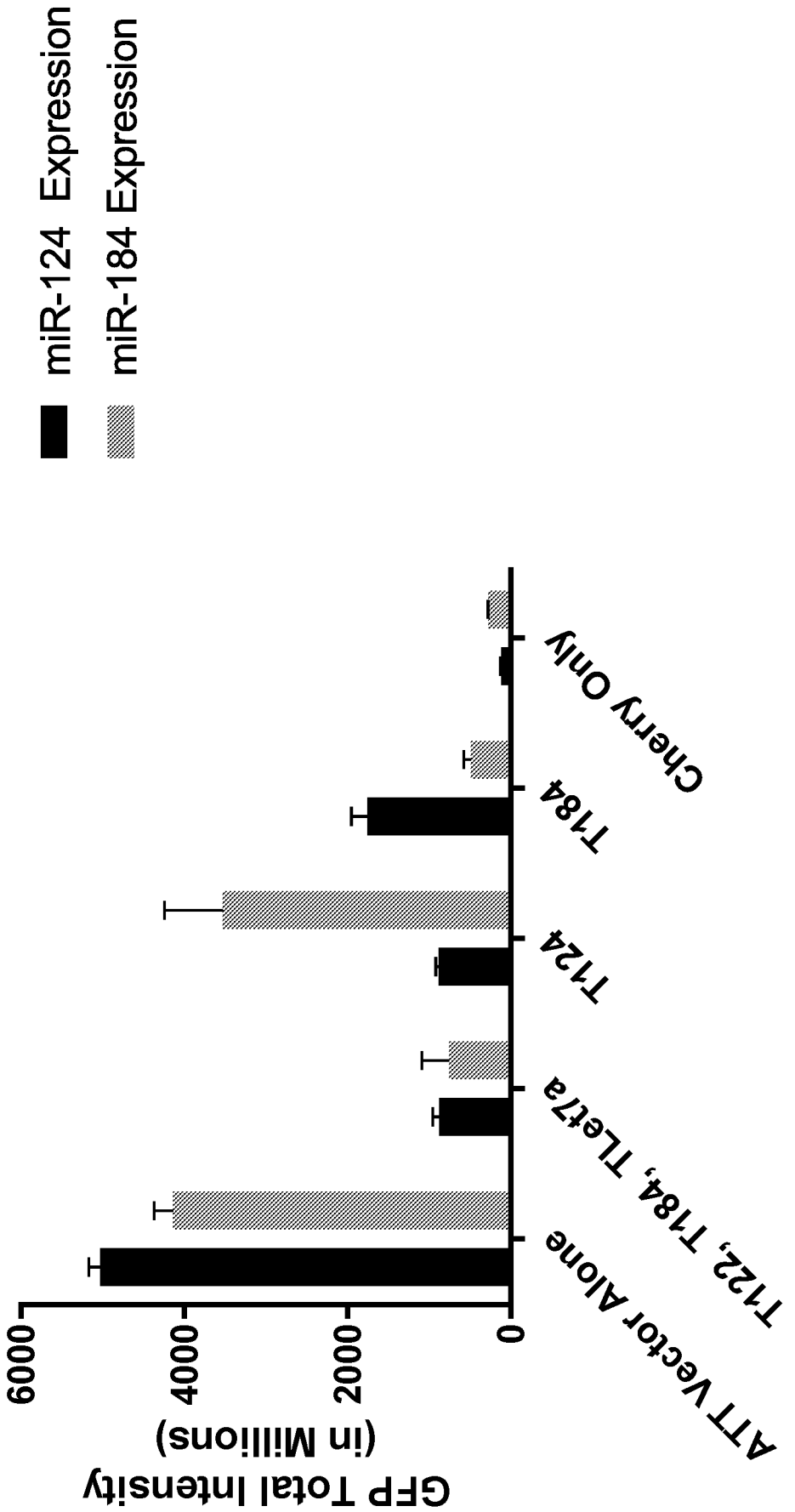

124-184
miR-124 Expression
miR-184 Expression
GFP Total Intensity
(in Millions)
6000
4000
2000
0
ATT Vector Alone
T122, T184, TLetTa
T124
T184
Cherry Only

FIG. 25

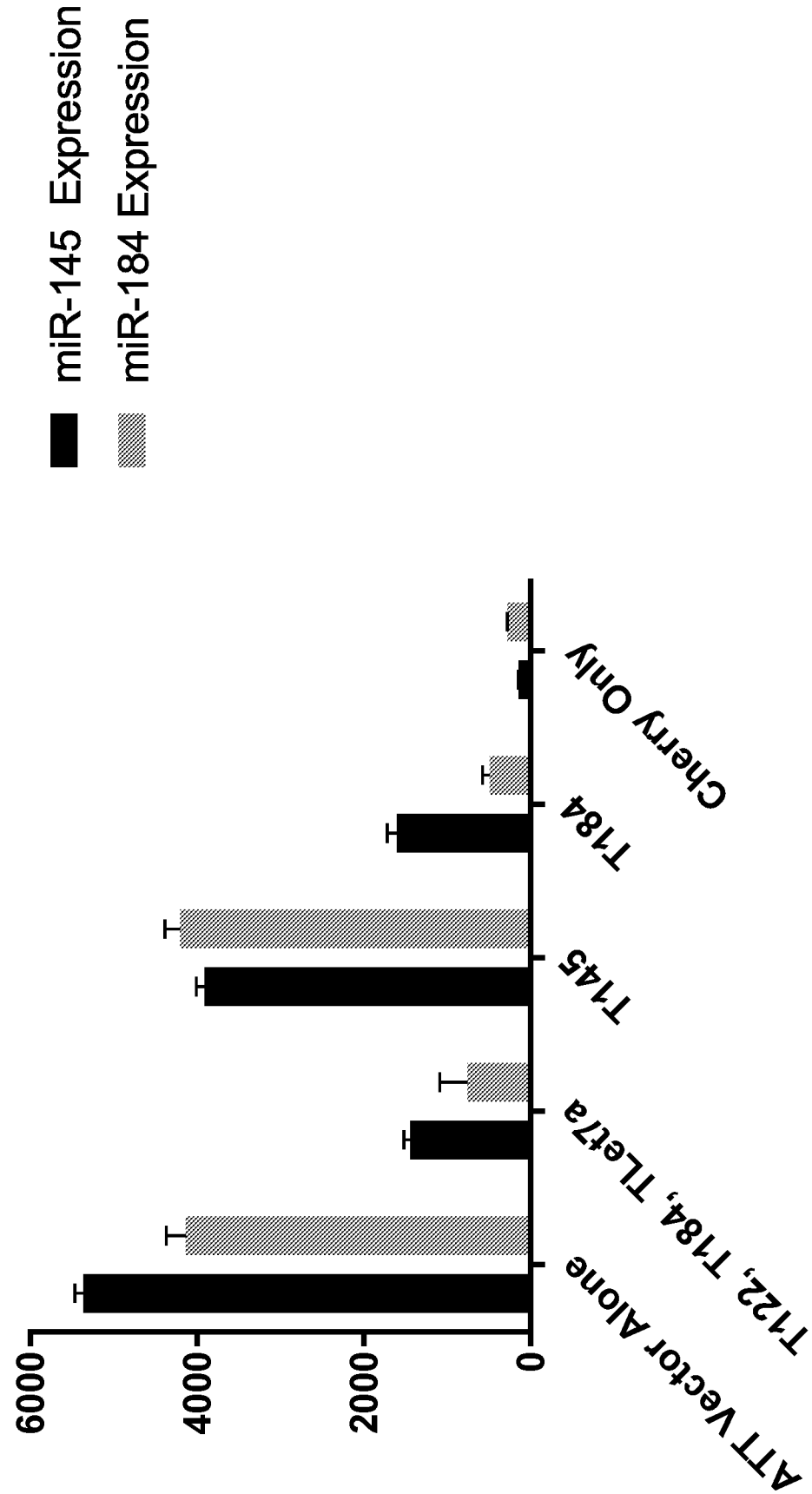

145-184
miR-145 Expression
miR-184 Expression
6000
4000
2000
0
ATT Vector Alone
T122, T184, TLet7a
T145
T184
Cherry Only

FIG. 26

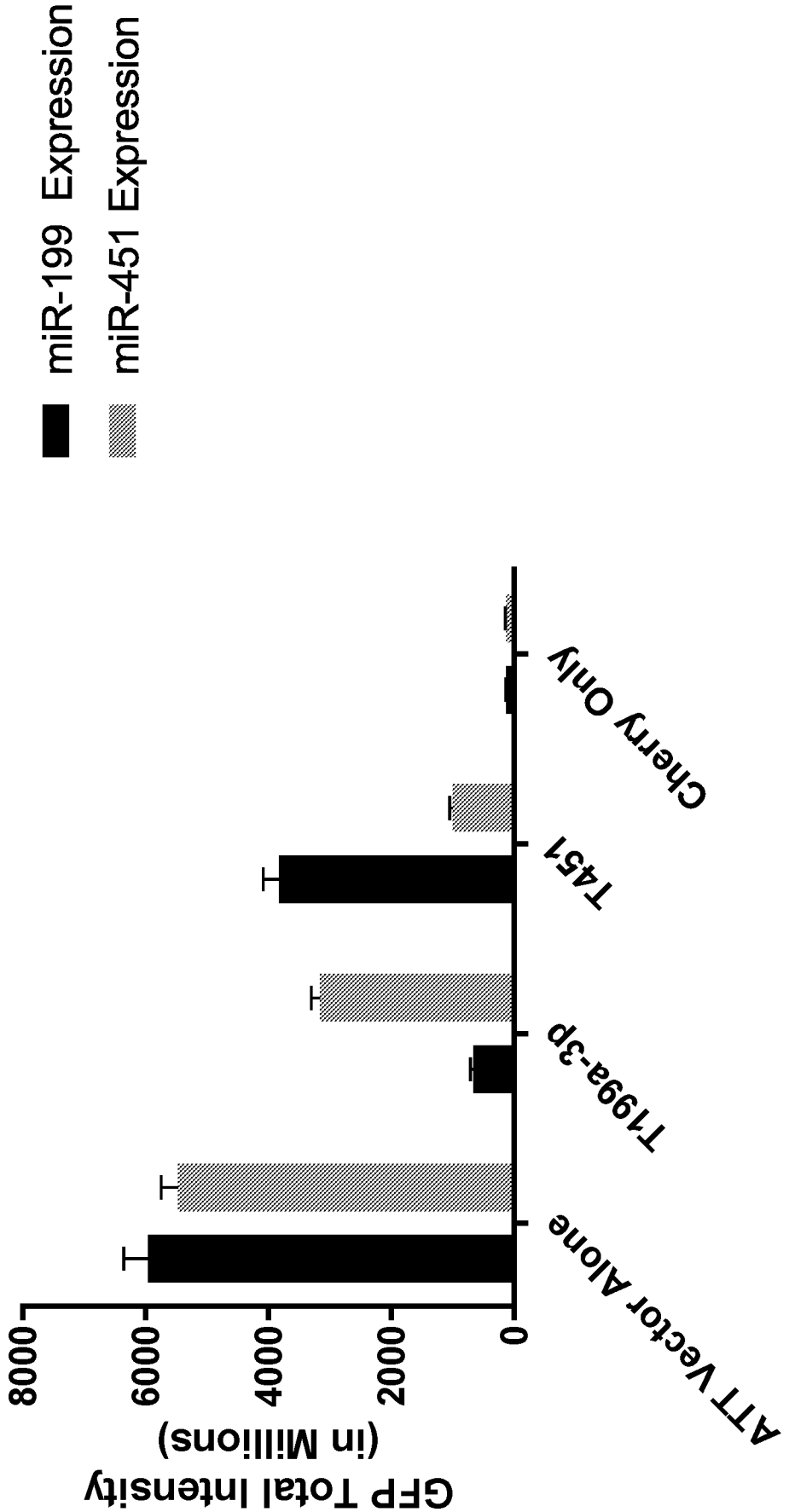

199-451
miR-199 Expression
miR-451 Expression
GFP Total Intensity
(in Millions)
8000
6000
4000
2000
0
ATT Vector Alone
T199a-3p
T451
Cherry Only

FIG. 27

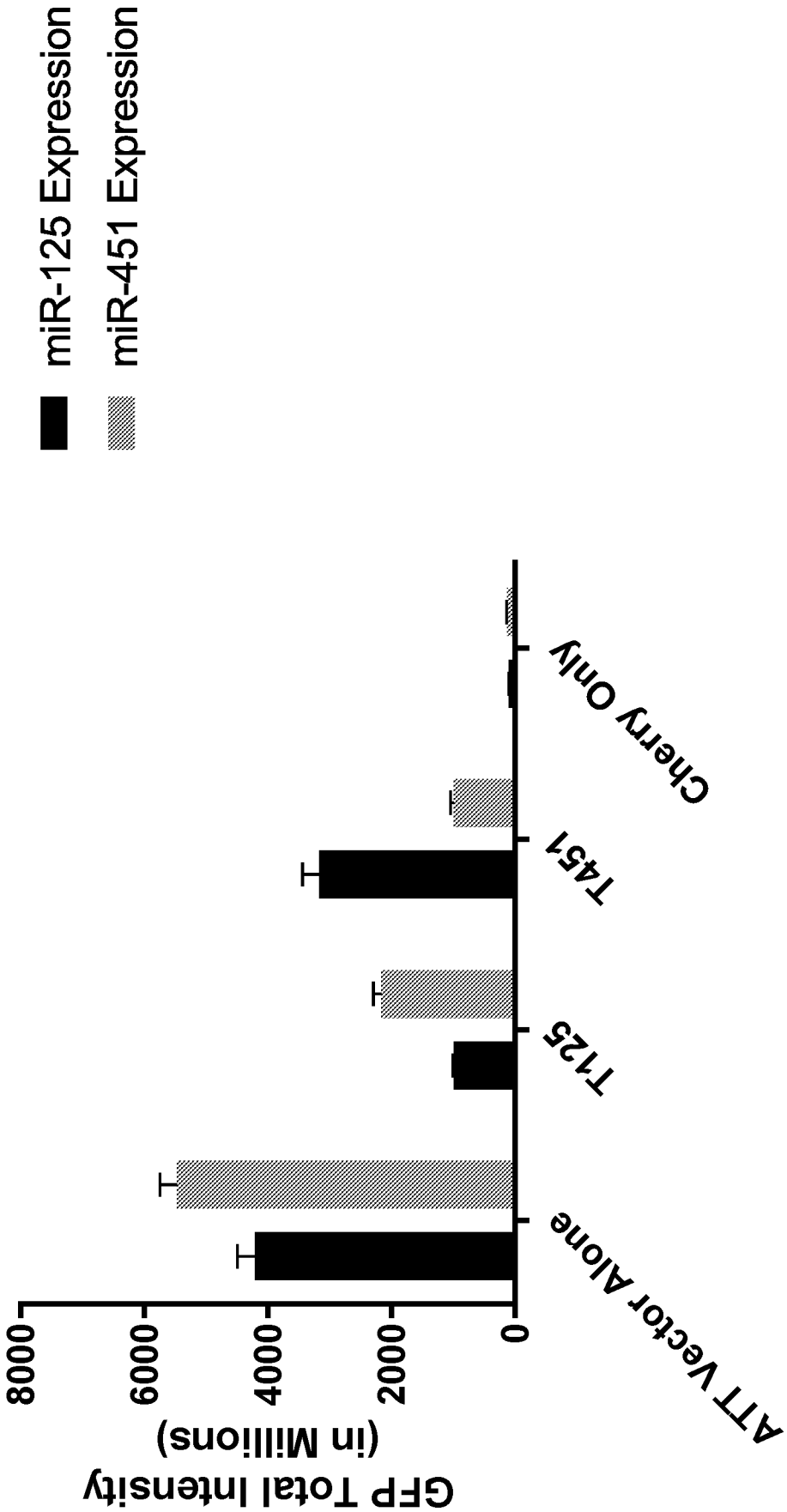

125-451
miR-125 Expression
miR-451 Expression
GFP Total Intensity
(in Millions)
8000
6000
4000
2000
0
ATT Vector Alone
T125
T451
Cherry Only

FIG. 28

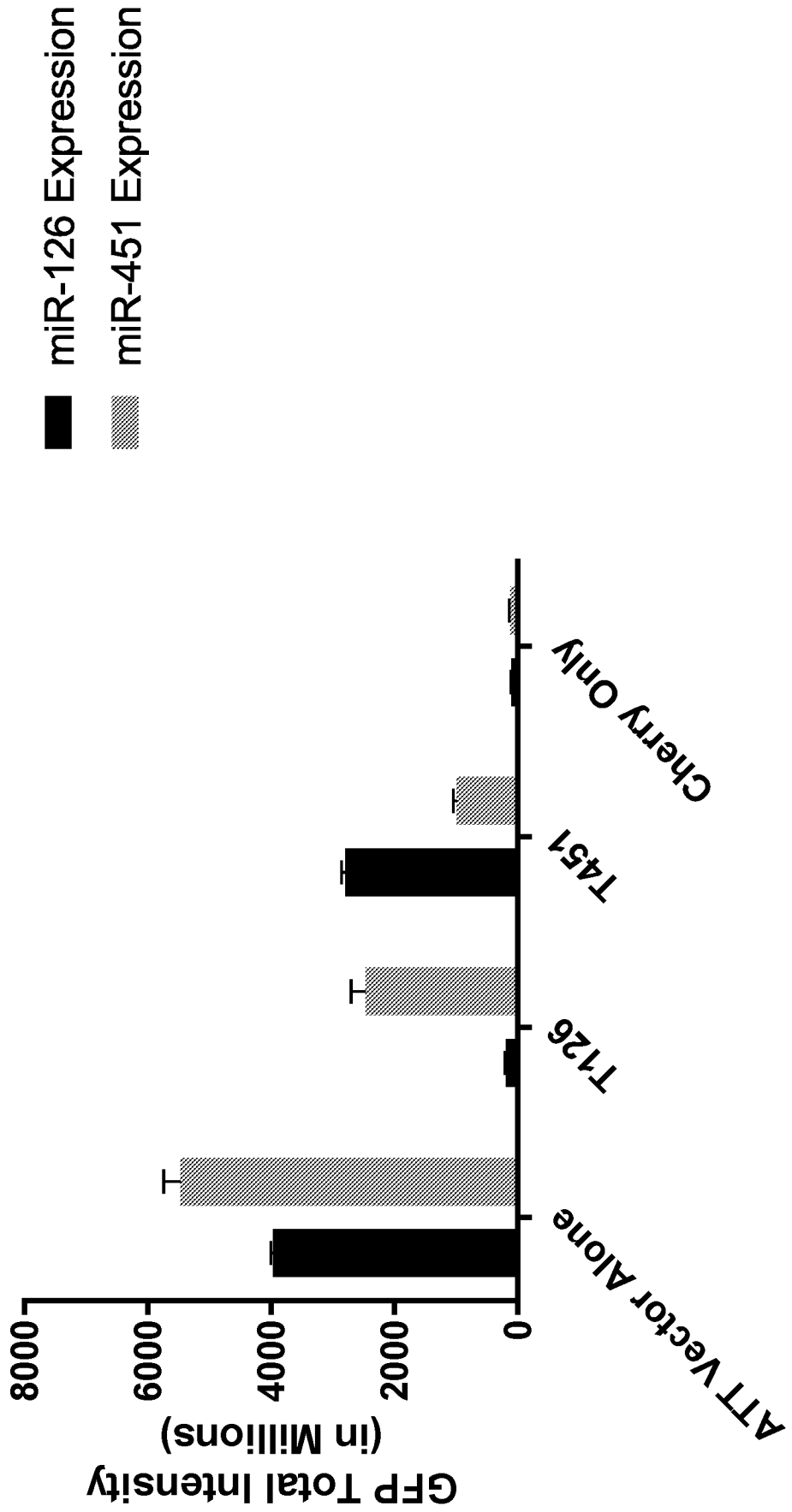

126-451
miR-126 Expression
miR-451 Expression
GFP Total Intensity
(in Millions)
8000
6000
4000
2000
0
ATT Vector Alone
T126
T451
Cherry Only

FIG. 29

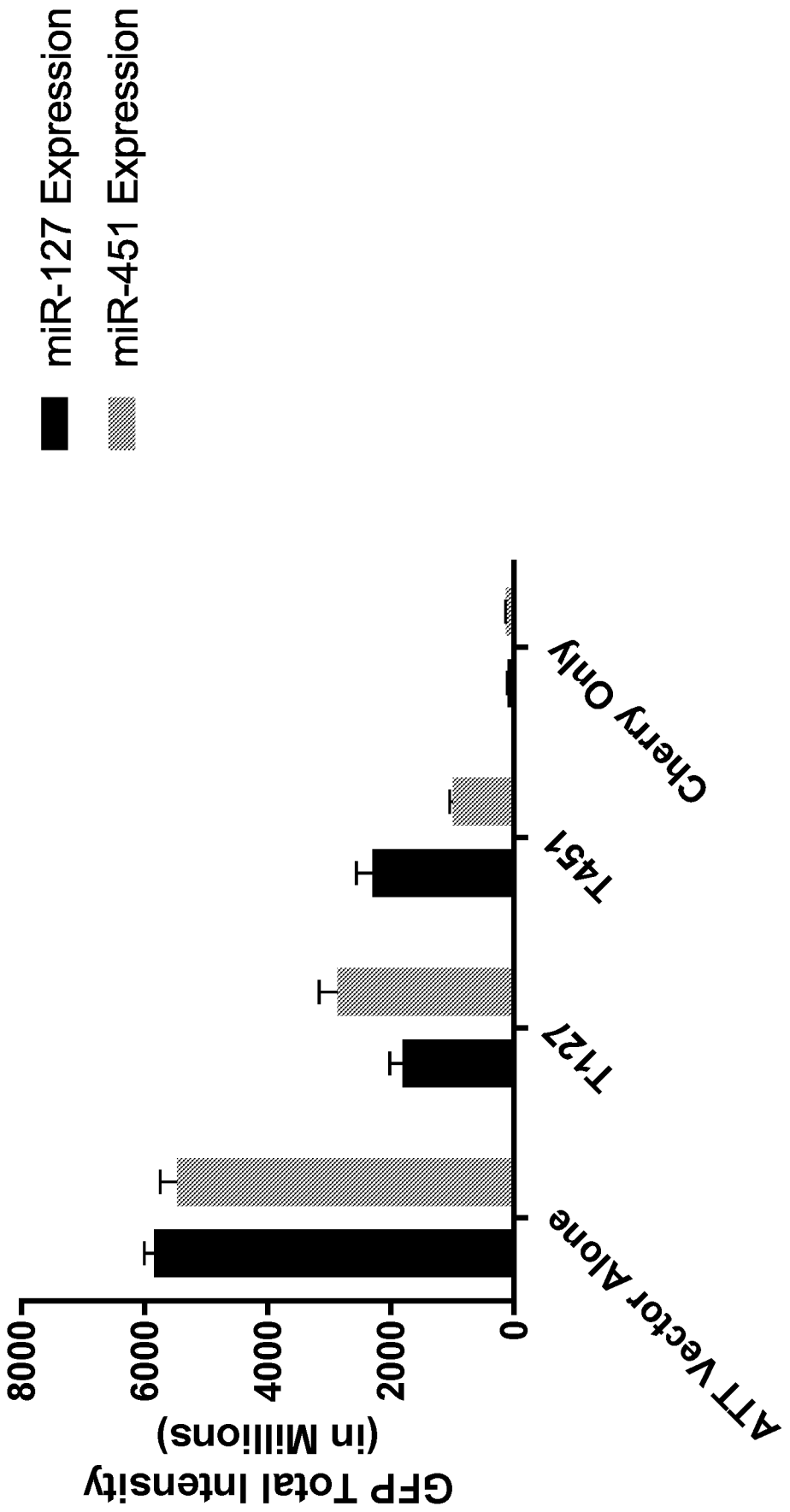

127-451
miR-127 Expression
miR-451 Expression
GFP Total Intensity
(in Millions)
8000
6000
4000
2000
0
ATT Vector Alone
T127
T451
Cherry Only

FIG. 30

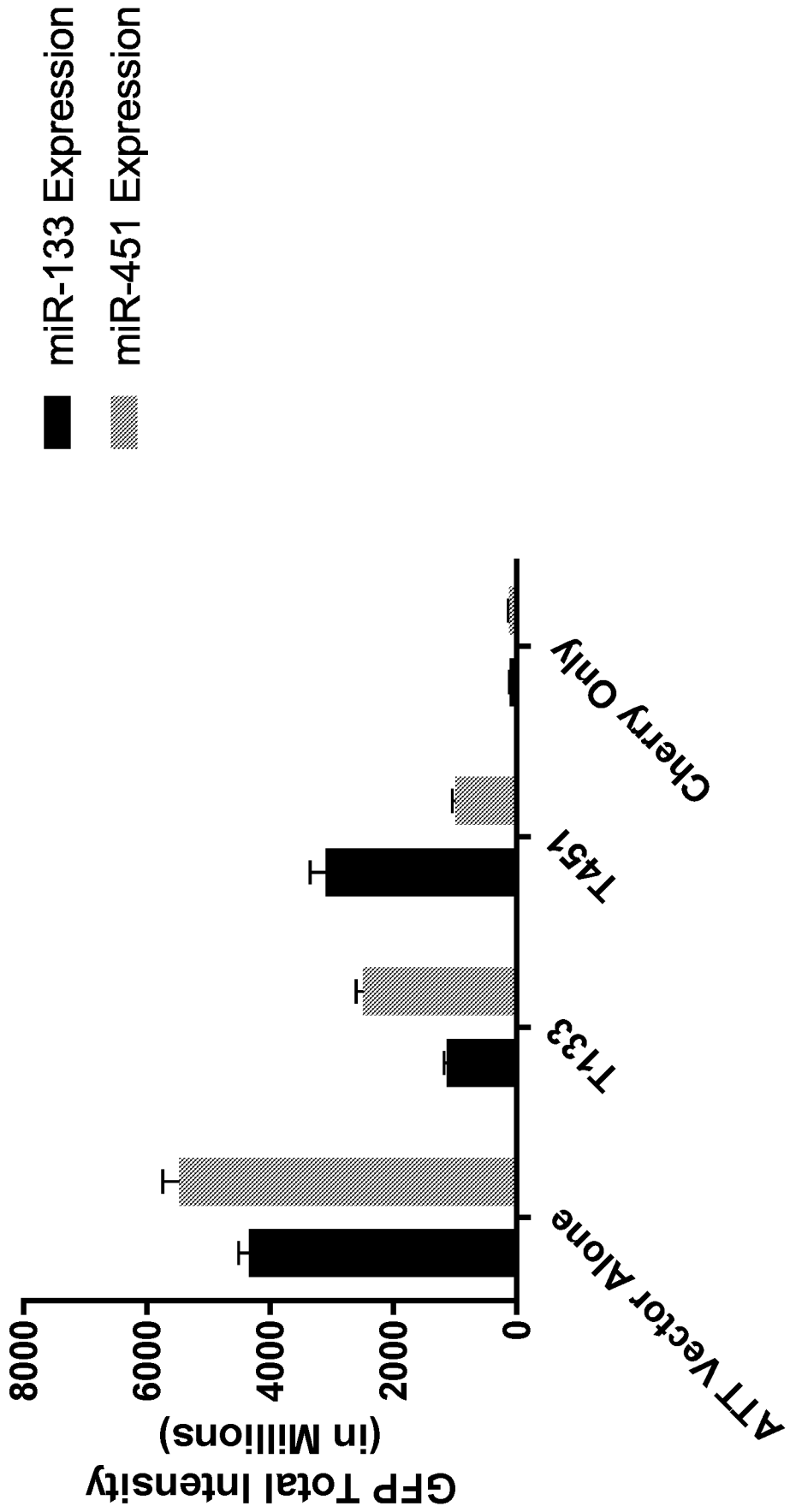

133-451
miR-133 Expression
miR-451 Expression
GFP Total Intensity
(in Millions)
8000
6000
4000
2000
0
ATT Vector Alone
T133
T451
Cherry Only

FIG. 31

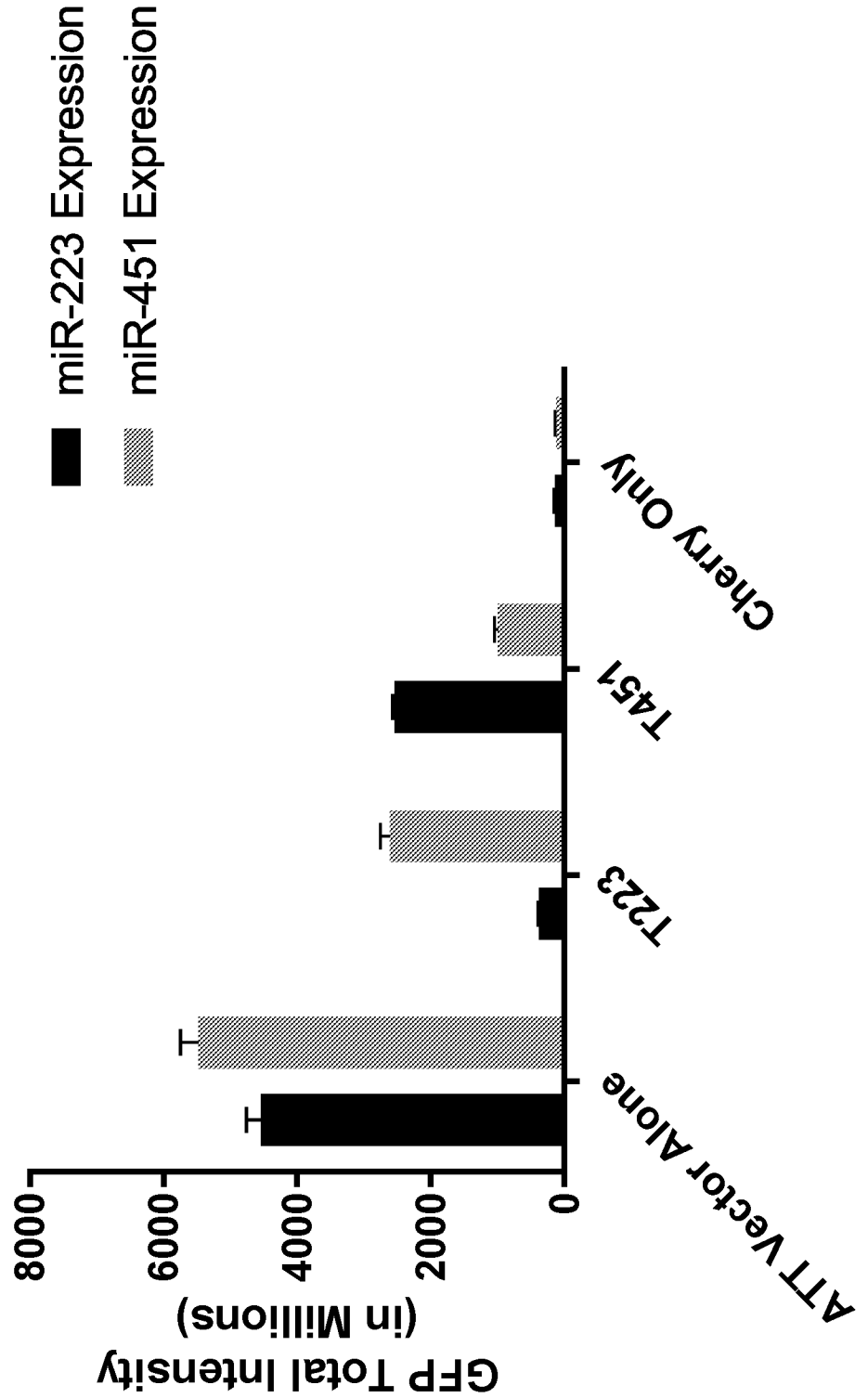

223-451
miR-223 Expression
miR-451 Expression
GFP Total Intensity
(in Millions)
8000
6000
4000
2000
0
ATT Vector Alone
T223
T451
Cherry Only

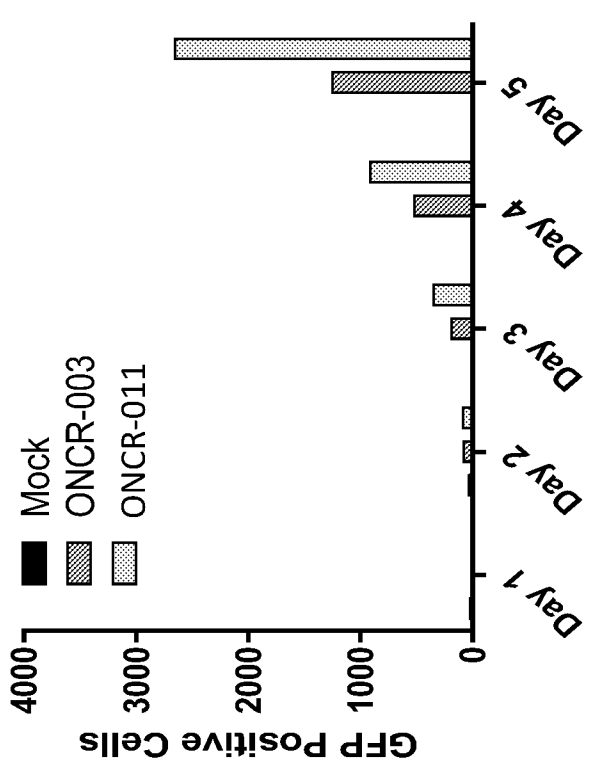
FIG. 32

Construct	ICP27 miRNA site	ICP4 miRNA site
ONCR-003	None	124
ONCR-010	122, 34a, Let7	124
ONCR-011	125a-5p	124
ONCR-012	143-3p	124
ONCR-013	145-5p	124
ONCR-014	199a-5p	124
ONCR-015	1-3p	124
ONCR-016	133a-3p	124
ONCR-017	223-3p	124
ONCR-018	451a	124
ONCR-019	126-3p	124
ONCR-020	127a-3p	124
ONCR-021	133b	124
ONCR-022	134-3p	124

FIG. 33

Vector	ICP4 miRNA site	ICP27 miRNA site
ONCR-003	miR-124	None
ONCR-011	miR-124	miR-125

Cells	miR 125a	miR 124
PM-Lung	>3000	<100
H & N CA	<100	<100



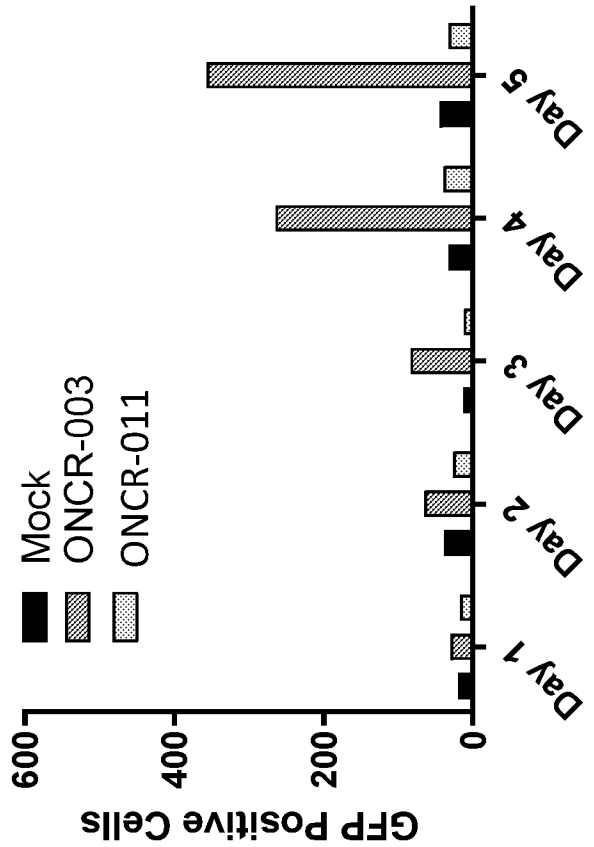


FIG. 34

Vector	ICP4 miRNA site	ICP27 miRNA site
ONCR-003	miR-124	None
ONCR-011	miR-T124	miR-T125

Cells	miR 125a	miR 124
PM-Lung	>3000	<100
H & N CA	<100	<100

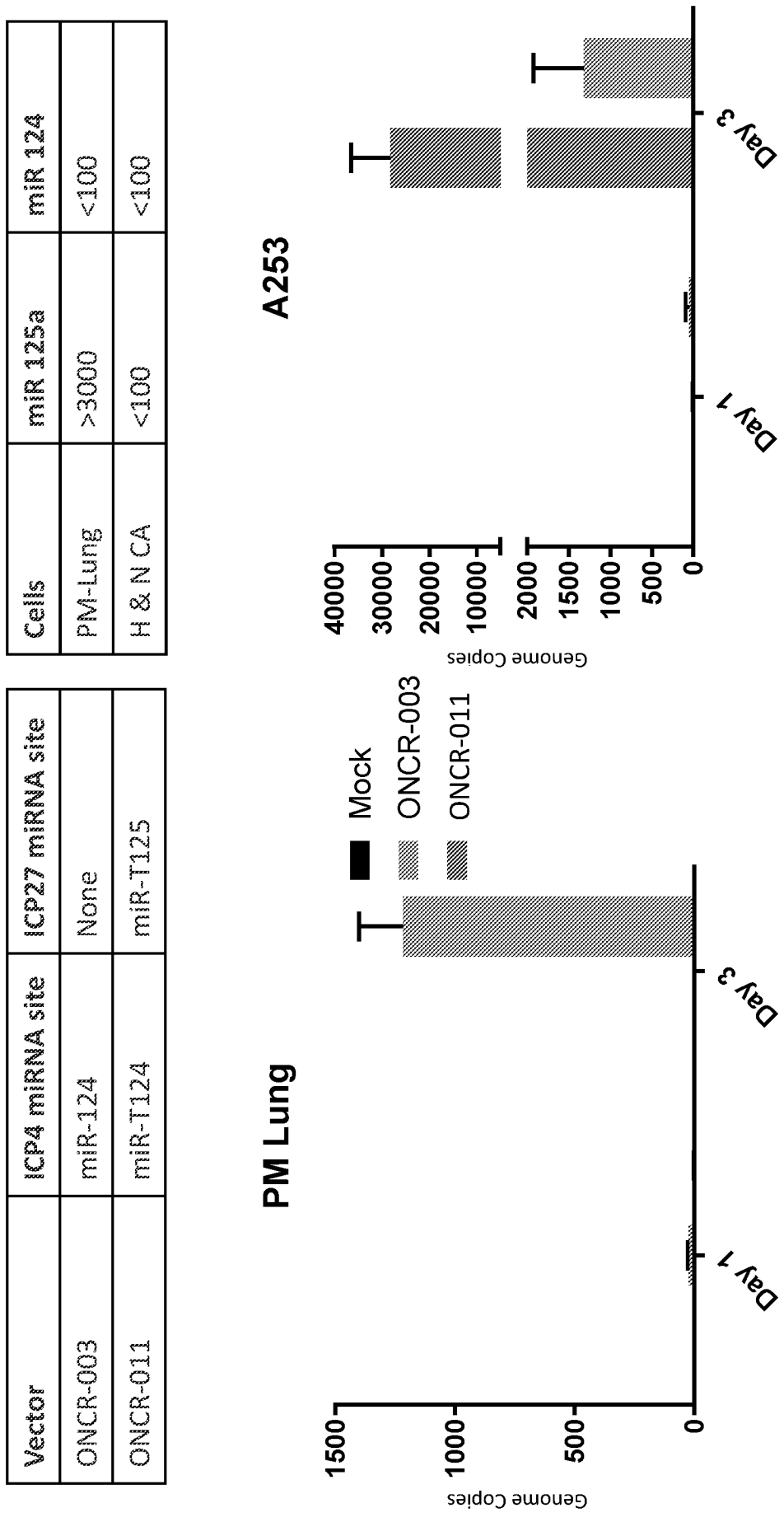


FIG. 35

Vector	ICP4 miRNA site	ICP27 miRNA site
ONCR-013	miR-124	miR-145-5p

Cells	miRNA counts
A253	0
HCC1395	4487

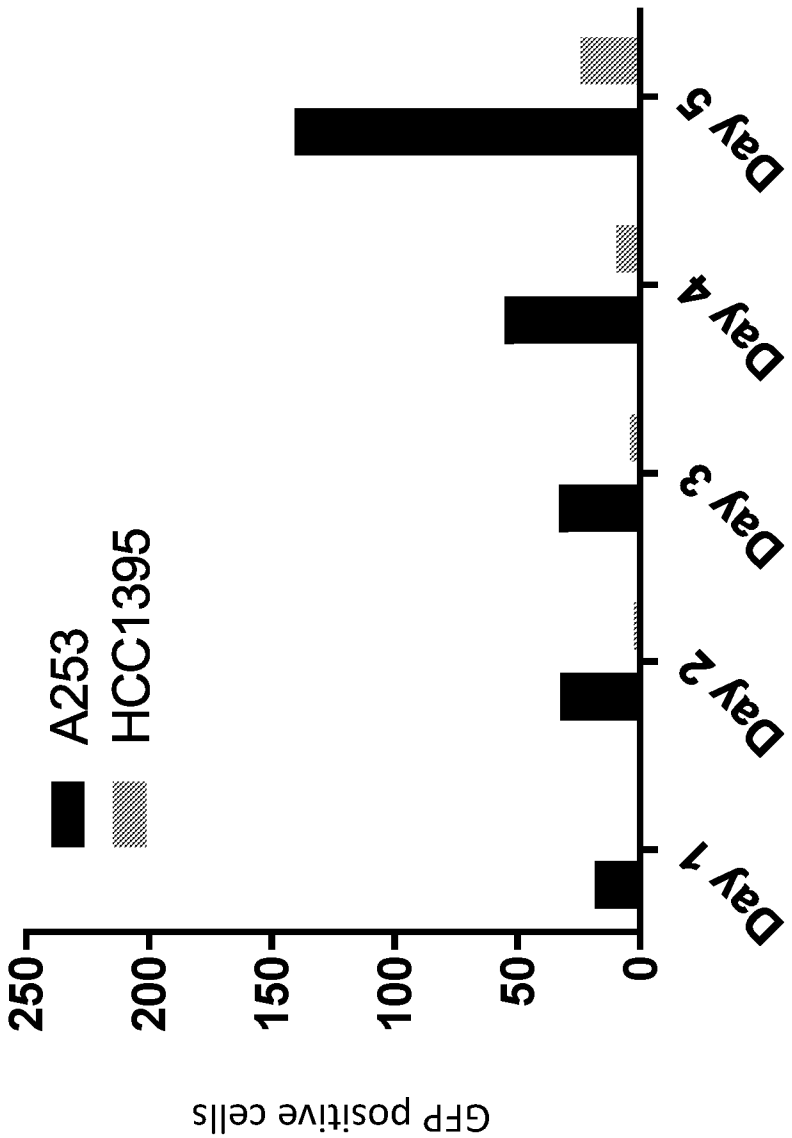


FIG. 36

Vector	ICP4 miRNA site	ICP27 miRNA site
ONCR-013	miR-124	miR-145-5p

Cells	miRNA counts
A253	0
HCC1395	4487

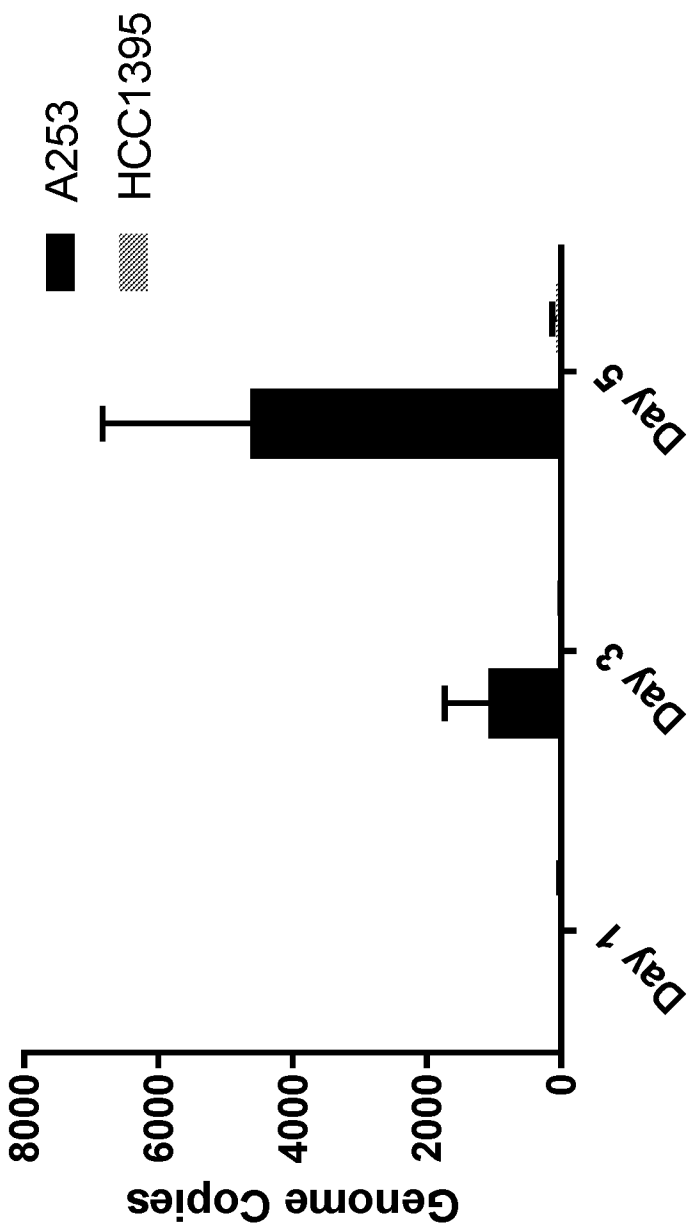


FIG. 37

Vector	ICP4 miRNA site	ICP27 miRNA site
ONCR-003	miR-124	None
ONCR-012	miR-124	miR-143-3p
ONCR-014	miR-124	miR-199a-5p

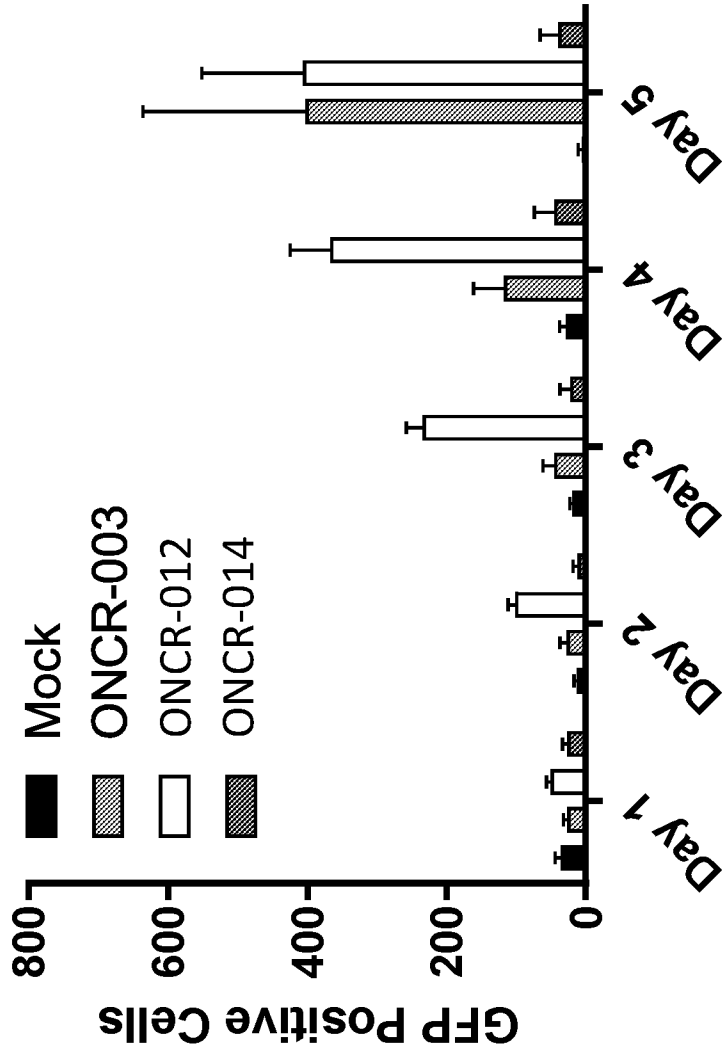


FIG. 38

Vector	ICP4 miRNA site	ICP27 miRNA site
ONCR-003	miR-124	None
ONCR-012	miR-124	miR-143-3p
ONCR-014	miR-124	miR-199a-5p

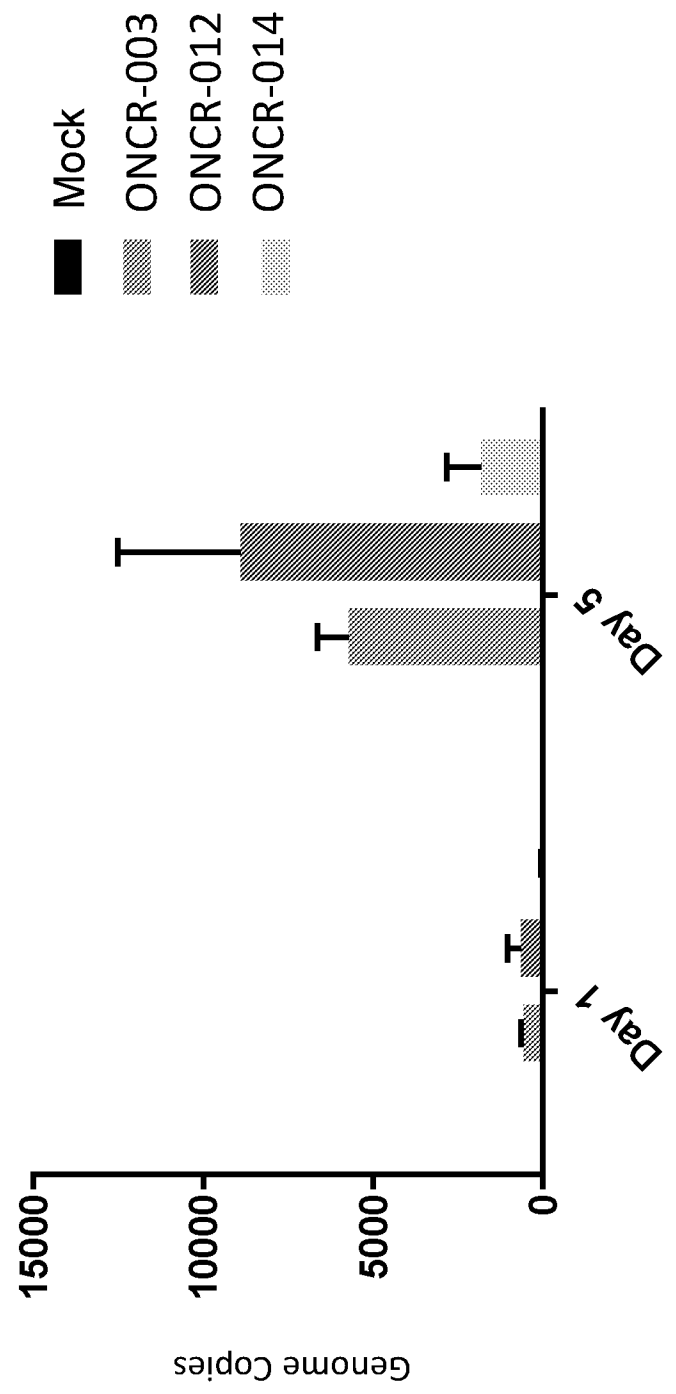


FIG. 39

gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

ICP4:TmiRNA: insertion of miRNA target sequences (e.g. let-7, miR-34a, miR-101, miR-125b, miR-145, etc.) into the 3' UTR of the remaining ICP4 gene (also may be placed in 5' UTR)

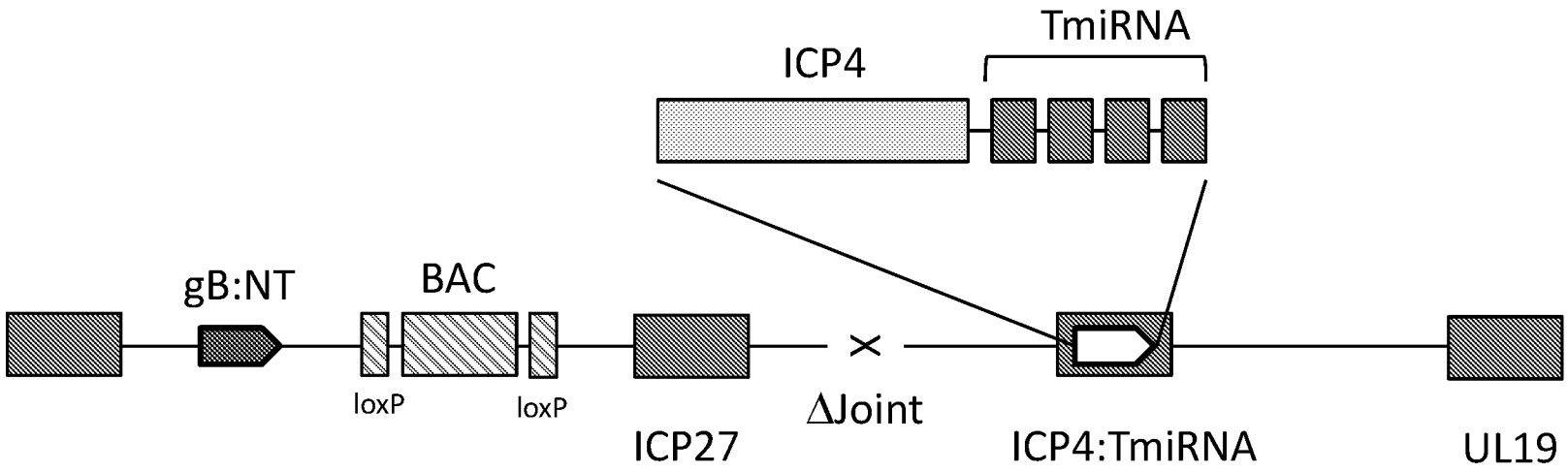


FIG. 40

gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

ICP27:TmiRNA: insertion of miRNA target sequences (e.g. let-7, miR-34a, miR-101, miR-125b, miR-145, etc.) into the 3' UTR of the ICP27 gene (also may be placed in 5' UTR)

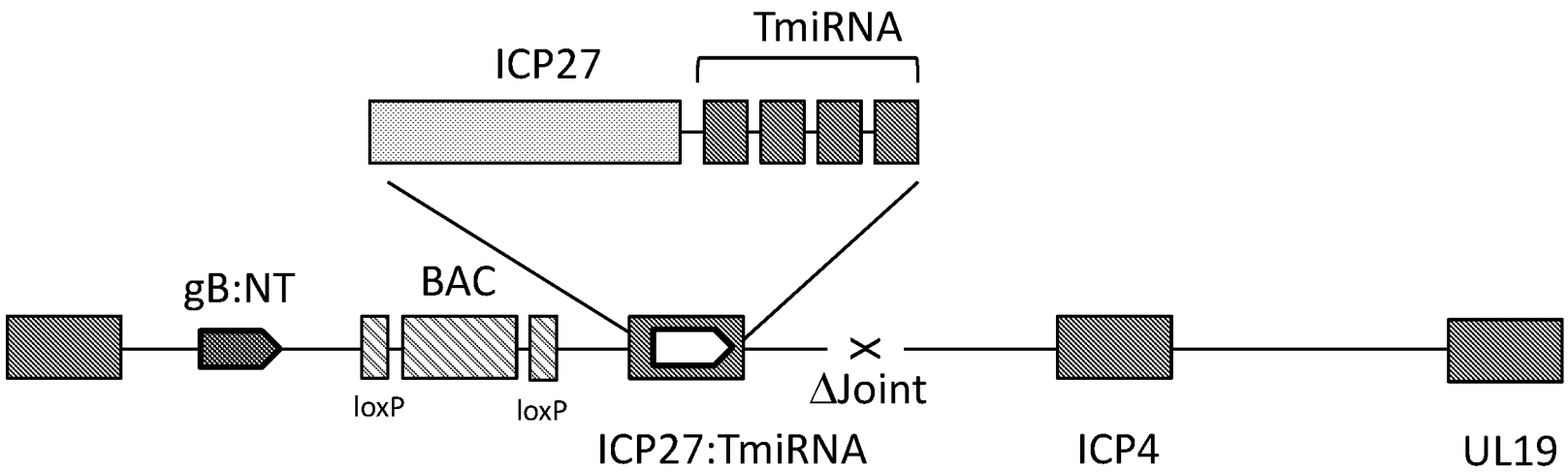


FIG. 41

gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

UL19:TmiRNA: insertion of miRNA target sequences (e.g. let-7, miR-34a, miR-101, miR-125b, miR-145, etc.) into the 3' UTR of the UL19 gene (also may be placed in 5' UTR)

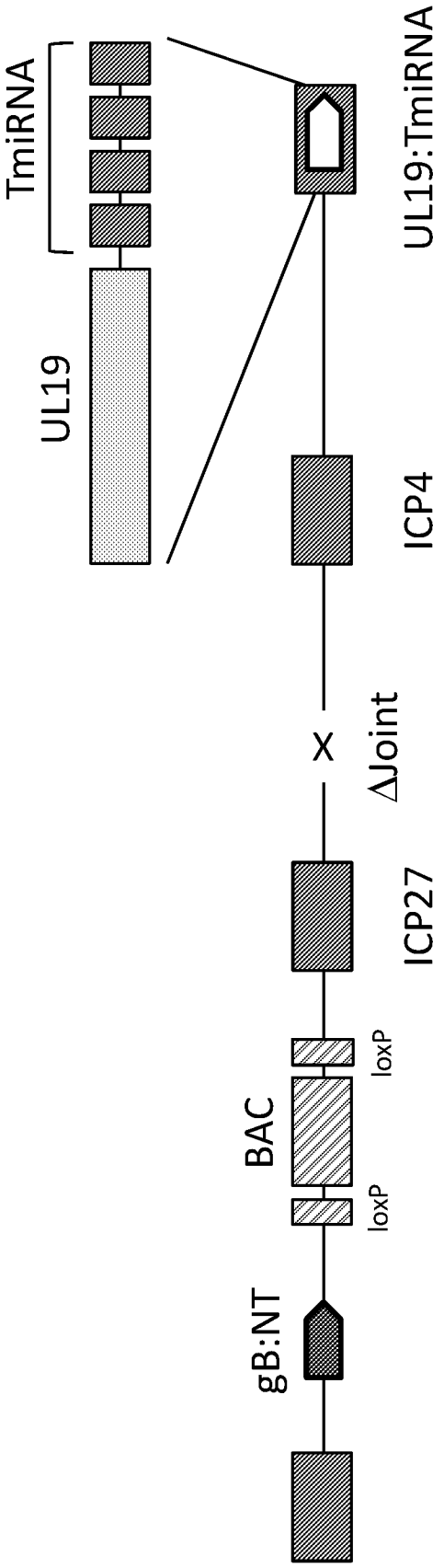


FIG. 42

gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

UL19:TmiRNA & ICP27:TmiRNA: insertion of miRNA target sequences (e.g. let-7, miR-34a, miR-101, miR-125b, miR-145, etc.) into the 3' UTR of the UL19 and ICP27 genes (also may be placed in 5' UTR)

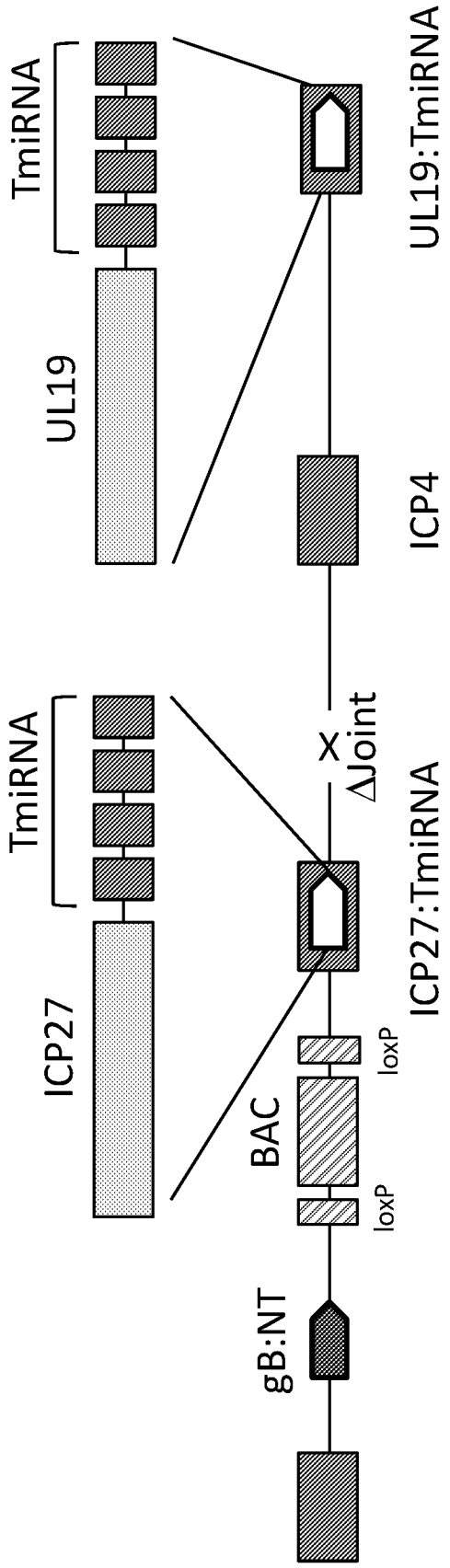


FIG. 43

gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

UL19:TmiRNA & ICP4:TmiRNA: insertion of miRNA target sequences (e.g. let-7, miR-34a, miR-101, miR-125b, miR-145, etc.) into the 3' UTR of the UL19 and ICP4 genes (also may be placed in 5' UTR)

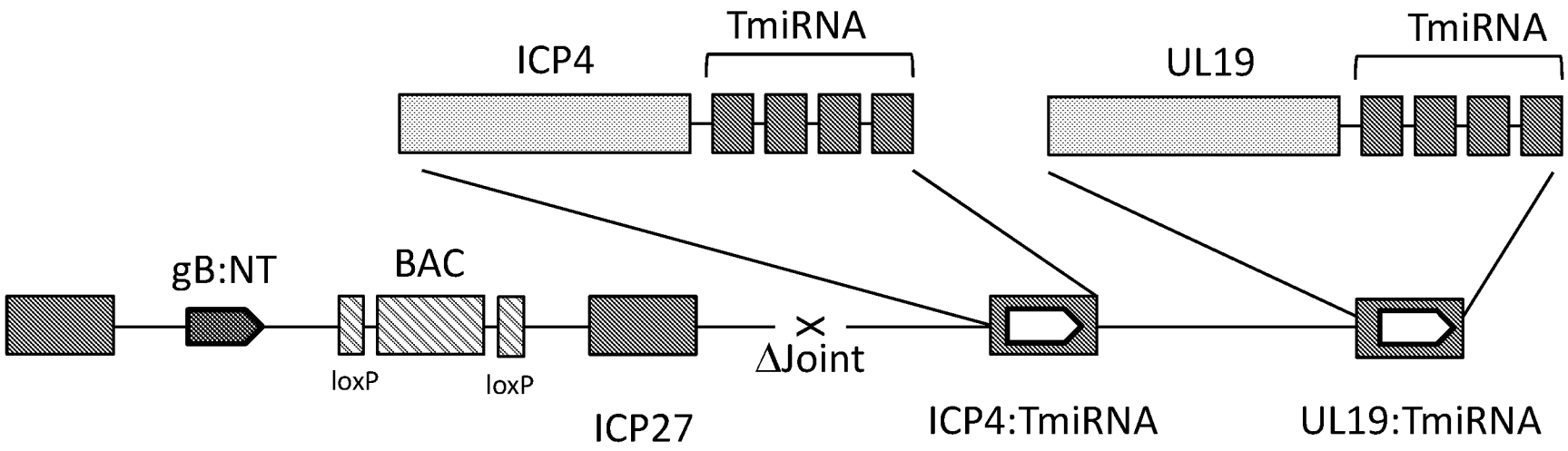


FIG. 44

gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

UL19:TmiRNA, ICP27:TmiRNA, & ICP4:TmiRNA: insertion of miRNA target sequences (e.g. let-7, miR-34a, miR-101, miR-125b, miR-145, etc.) into the 3' UTR of the UL19, ICP27, and ICP4 genes (also may be placed in 5' UTR)

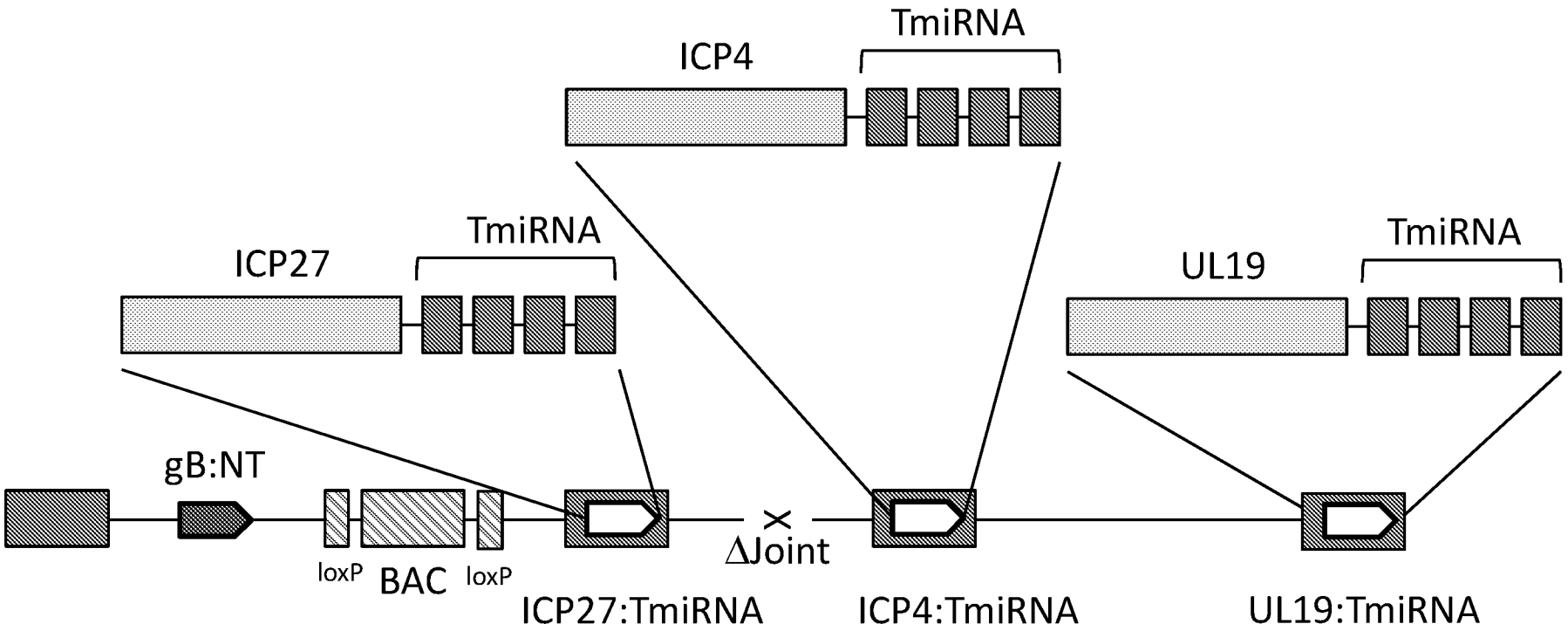


FIG. 45

gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

ICP4:TmiRNA: insertion of tumor suppressor miRNA target sequences (e.g. let-7, miR-34a, miR-101, miR-125b, miR-145) into the 3' UTR of the remaining ICP4 gene (also may be placed in 5' UTR)

Pol II promoter: Constitutive (CAG, UbC, EF1α, PGK) or cell-specific (e.g. TRPV1, Nav1.7, hSYN)

Endonuclease: CRISPR associated endonuclease (e.g. SpCas9, SaCas9, FnCpf1, FnCas9, etc.)

Poly(A): polyadenylation signal (e.g. bGH)

gRNA: Single crRNA-trRNA fusion (DR-crRNA-DR-trRNA); crRNA targeted to oncogenic microRNA (e.g. miR-17, miR-21, miR-155)

Pol III promoter: E.g. U6, H1, 7SK

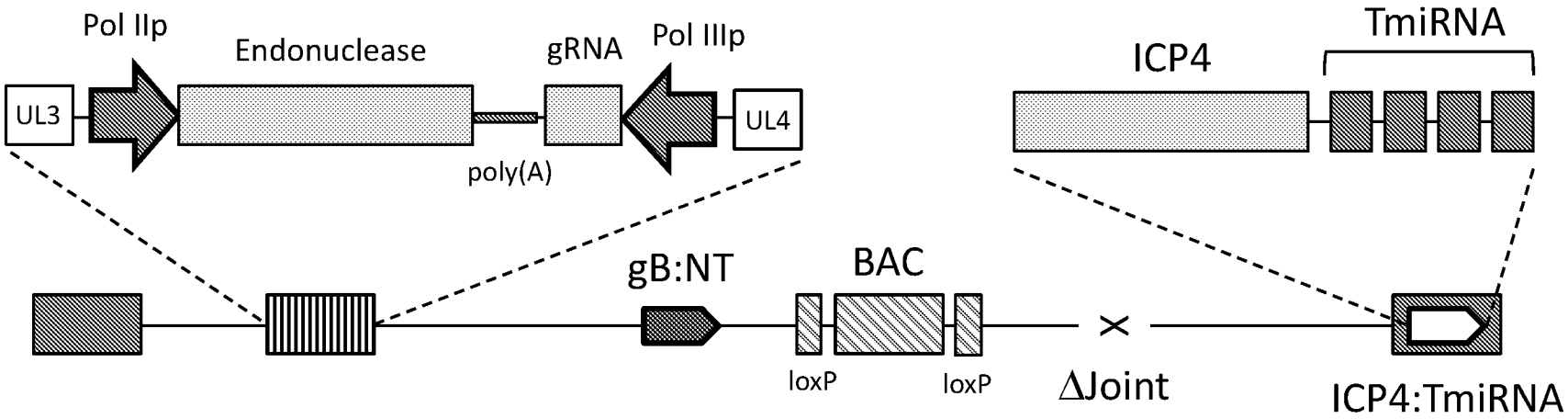


FIG. 46

gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

ICP4:TmiRNA: insertion of tumor suppressor miRNA target sequences (e.g. let-7, miR-34a, miR-101, miR-125b, miR-145) into the 3' UTR of the remaining ICP4 gene (also may be placed in 5' UTR)

Pol II promoter: Constitutive (CAG, UbC, EF1α, PGK) or cell-specific (e.g. TRPV1, Nav1.7, hSYN)

Endonuclease: CRISPR associated endonuclease (e.g. SpCas9, SaCas9, FnCpf1, FnCas9, etc.)

Poly(A): polyadenylation signal (e.g. bGH)

gRNA1: Single crRNA-trRNA fusion (DR-crRNA-DR-trRNA); crRNA targeted to oncogenic microRNA (e.g. miR-17, miR-21, miR-155).

gRNA2: crRNA targeted to microenvironment remodeling miRNA (e.g. miR-143, miR-218) or TIMP (e.g. TIMP1, TIMP2).

Pol III promoter: E.g. U6, H1, 7SK

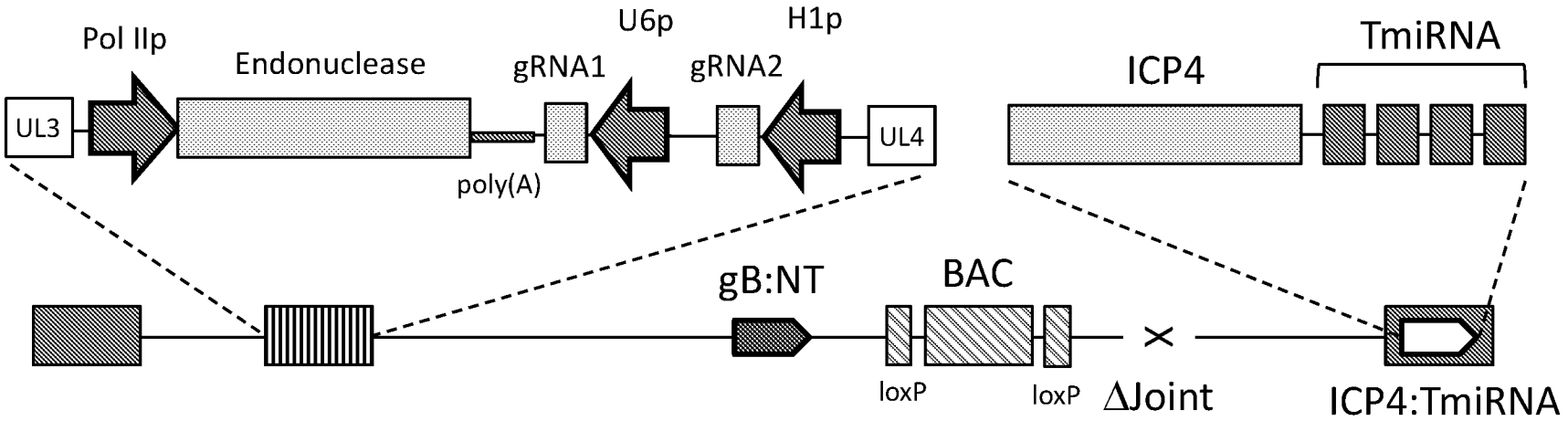


FIG. 47

gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

ICP4:TmiRNA: insertion of miR-124 target sequence cassette into the 3' UTR of the remaining ICP4 gene (also may be placed in 5' UTR)

ICP27:TmiRNA: insertion of miR-451a, miR-143-3p, and miR-559 target sequence cassettes into the 3' UTR of the ICP-27 gene (also may be placed in 5' UTR)

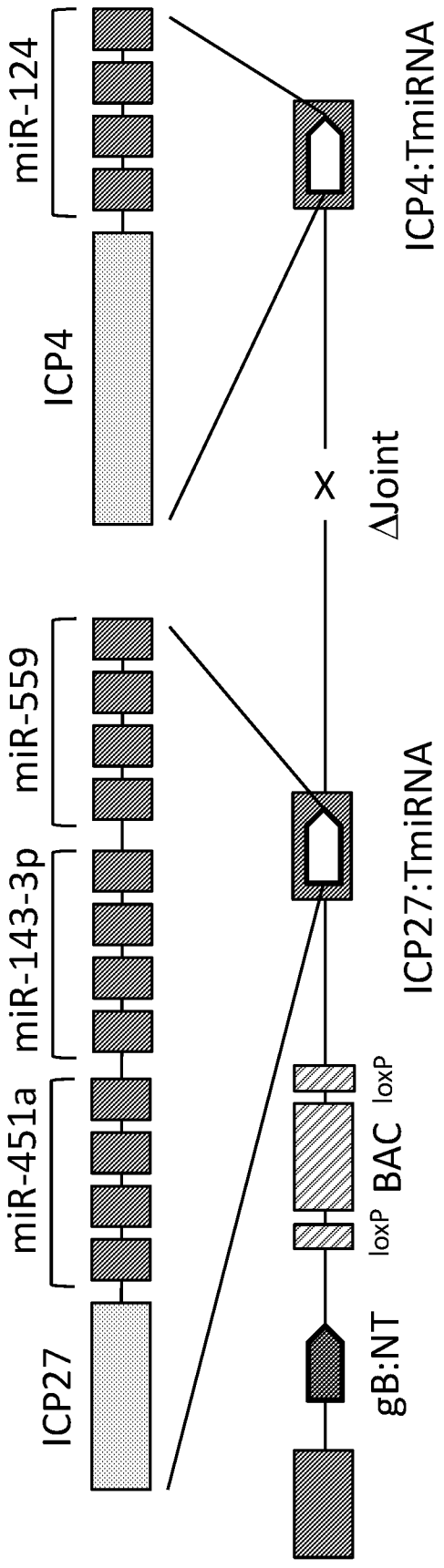


FIG. 48

gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

ICP4:TmiRNA: insertion of miR-124 target sequence cassette into the 3' UTR of the remaining ICP4 gene (also may be placed in 5' UTR)

ICP27:TmiRNA: insertion of miR-451a, miR-145-5p, and miR-559 target sequence cassettes into the 3' UTR of the ICP-27 gene (also may be placed in 5' UTR)

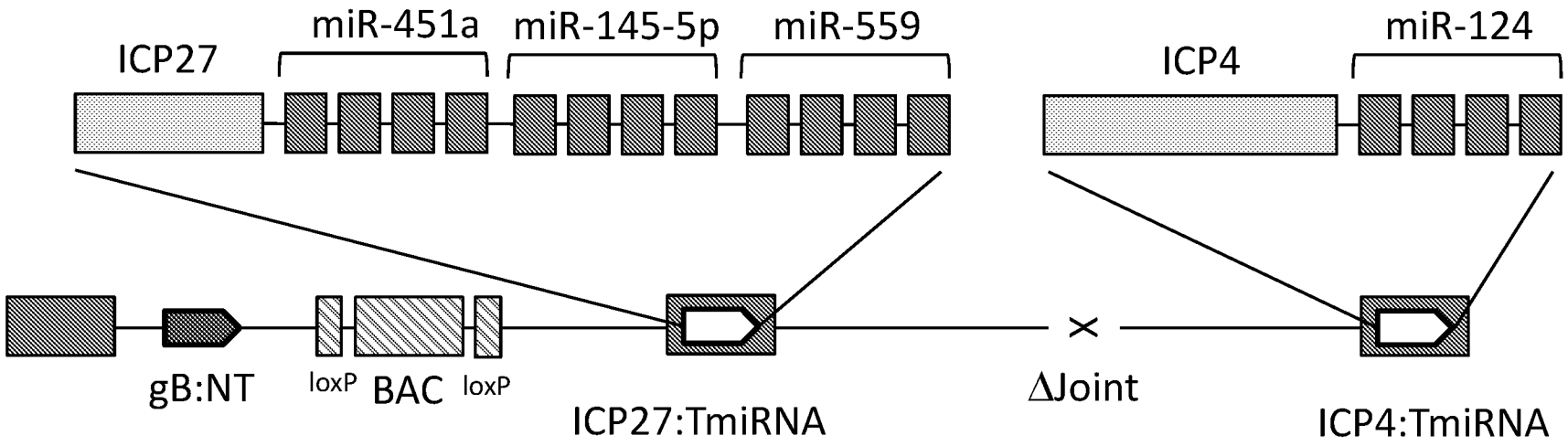


FIG. 49

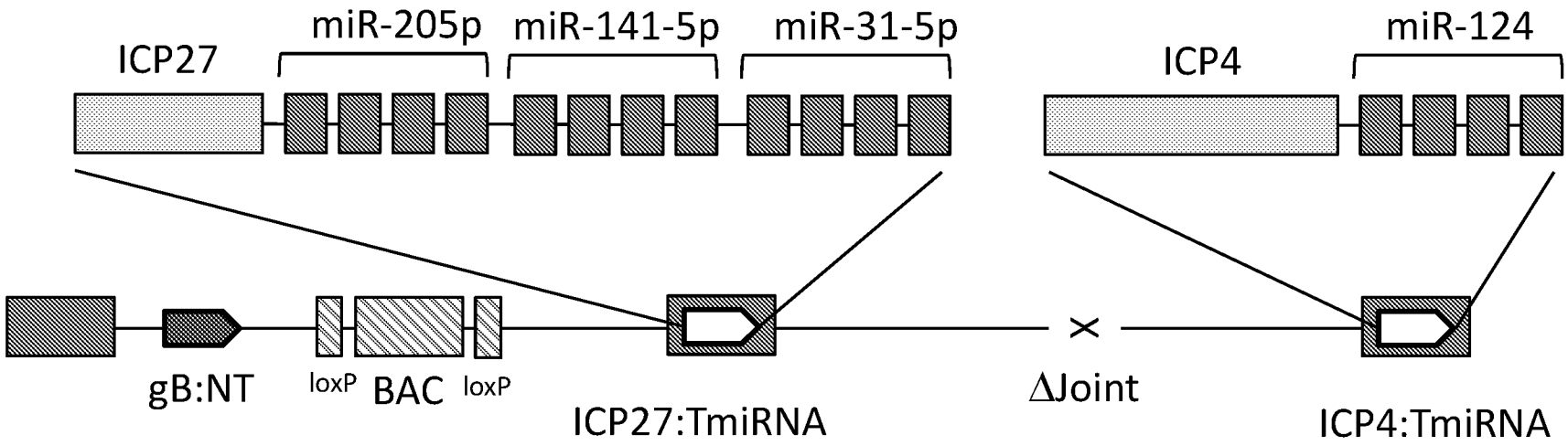
gB:NT: virus entry-enhancing double mutation in gB gene

BAC: loxP-flanked choramphenicol-resistance and lacZ sequences

Δjoint: deletion of the complete internal repeat region including one copy of the ICP4 gene

ICP4:TmiRNA: insertion of miR-124 target sequence cassette into the 3' UTR of the remaining ICP4 gene (also may be placed in 5' UTR)

ICP27:TmiRNA: insertion of miR-205p, miR-141-5p, and miR-31-5p target sequence cassettes into the 3' UTR of the ICP-27 gene (also may be placed in 5' UTR)



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/015417

Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of a sequence listing:

   a. [X] forming part of the international application as filed:

      [X] in the form of an Annex C/ST.25 text file.

      [ ] on paper or in the form of an image file.

   b. [ ] furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. [ ] furnished subsequent to the international filing date for the purposes of international search only:

      [ ] in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      [ ] on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

2. [ ] In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/015417

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

3, 81(completely); 1, 2, 4-80, 82-97(partially)

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/015417

A. CLASSIFICATION OF SUBJECT MATTER
INV. C12N7/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JHY-MING LI ET AL: "MicroRNA-145 regulates oncolytic herpes simplex virus-1 for selective killing of human non-small cell lung cancer cells", VIROLOGY JOURNAL, BIOMED CENTRAL, LONDON, GB, vol. 10, no. 1, 22 July 2013 (2013-07-22), page 241, XP021158054, ISSN: 1743-422X, DOI: 10.1186/1743-422X-10-241 page 2, right-hand column, paragraph 2 - page 7, right-hand column, paragraph 3 -----	1-12,19, 20,22, 24,26, 28,30, 32,34, 36,39, 40,43, 45,47, 49, 59-61, 64,67, 80-96

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 March 2017	19/05/2017

Name and mailing address of the ISA/	Authorized officer
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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 3, 81(completely); 1, 2, 4-80, 82-97(partially)

   A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication wherein the virus is a herpes simplex virus (HSV) and wherein the oncolytic HSV optionally combines the features of claim 59 (b)-(d); the uses thereof.

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2. claims: 1, 2, 4-80, 82-97(all partially)

   A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication wherein the virus is an adenovirus and the uses thereof and wherein the oncolytic adenovirus optionally combines the features of claim 59 (b)-(d); the uses thereof.

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3. claims: 1, 2, 4-80, 82-97(all partially)

   A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication wherein the virus is a polio virus and the uses thereof and wherein the oncolytic polio virus optionally combines the features of claim 59 (b)-(d); the uses thereof.

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4. claims: 1, 2, 4-80, 82-97(all partially)

   A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication wherein the virus is a vaccinia virus and the uses thereof and wherein the oncolytic vaccinia virus optionally combines the features of claim 59 (b)-(d); the uses thereof.

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5. claims: 1, 2, 4-80, 82-97(all partially)

   A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication wherein the virus is a measles virus and the uses thereof and wherein the oncolytic measles virus optionally combines the features of claim 59 (b)-(d); the uses thereof.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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6. claims: 1, 2, 4-80, 82-97(all partially)

A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication wherein the virus is a vesicular stomatitis virus and the uses thereof and wherein the oncolytic vesicular stomatitis virus optionally combines the features of claim 59 (b)-(d); the uses thereof.

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7. claims: 1, 2, 4-80, 82-97(all partially)

A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication wherein the virus is an orthomyxovirus and the uses thereof and wherein the oncolytic orthomyxovirus optionally combines the features of claim 59 (b)-(d); the uses thereof.

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8. claims: 1, 2, 4-80, 82-97(all partially)

A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication wherein the virus is a parvovirus and the uses thereof and wherein the oncolytic parvovirus optionally combines the features of claim 59 (b)-(d); the uses thereof.

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9. claims: 1, 2, 4-80, 82-97(all partially)

A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication wherein the virus is a maraba virus and the uses thereof and wherein the oncolytic maraba virus optionally combines the features of claim 59 (b)-(d); the uses thereof.

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10. claims: 1, 2, 4-80, 82-97(all partially)

A recombinant oncolytic virus comprising one or more copies of one or more tumor-suppressive micro-RNA (miR) target sequences inserted into a locus of one or more viral genes required for viral replication wherein the virus is a coxackievirus and the uses thereof and wherein the oncolytic coxackievirus optionally combines the features of claim 59 (b)-(d); the uses thereof.

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11. claims: 59-80, 82-97(all partially)

A recombinant oncolytic virus comprising one or more of: (b) polynucleotides encoding one or more proteins or oligonucleotides, wherein the proteins or oligonucleotides reduce the expression or inhibit the function of a miR, a gene, or a TIMP, also in combination with (c) at least one protease-activated antibody and/or (d) a polynucleotide encoding at least one protease activated antibody.

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12. claims: 59-80, 82-97(all partially)

A recombinant oncolytic virus comprising at least one protease-activated antibody, also in combination with (d) a polynucleotide encoding at least one protease activated antibody.

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13. claims: 59-80, 82-97(all partially)

A recombinant oncolytic virus comprising a polynucleotide encoding at least one protease activated antibody.
