

miRCURY LNA™ microRNA Inhibitors

Selected publications - *in vivo* inhibition

Bessard *et al.* RNAi-mediated ERK2 knockdown inhibits growth of tumor cells *in vitro* and *in vivo*. *Oncogene* 2008, 27: 5315-25. PMID: [18521085](#)

Cells/Organisms: FAO (Rat hepatoma), FI (rat biliary epithelial), nude mice

Targets: ERK2

Corsten *et al.* MicroRNA-21 knockdown disrupts glioma growth *in vivo* and displays synergistic cytotoxicity with neural precursor cell delivered S-TRAIL in human gliomas. *Cancer Res.* 2007, 67: 8994-9000. PMID: [17908999](#)

Cells: U87 (human glioma cells); U87-Fluc-DsRed2 glioma cells implanted in the brains of nude mice

Targets: miR-21

Elmén *et al.* LNA-mediated microRNA silencing in non-human primates. *Nature* 2008, 452: 896-9. PMID: [18368051](#)

Cells/Organisms: Huh-7 (human hepatoma) / African green monkey; mouse,

Targets: miR-122

Elmén *et al.* Antagonism of microRNA-122 in mice by systemically administered LNA-antimiR leads to up-regulation of a large set of predicted target mRNAs in the liver. *Nucleic Acids Res.* 2008, 36: 1153-62. PMID: [18158304](#)

Cells/Organisms: Huh-7 (human hepatoma) / mouse

Targets: miR-122

Fu *et al.* Mir-144 selectively regulates embryonic alpha-hemoglobin synthesis during primitive erythropoiesis.

Blood 2009, 113: 1340-9. PMID: [18941117](#)

Organism: Zebrafish embryos

Targets: miR-144

Gebeshuber *et al.* miR-29a suppresses tristetraprolin, which is a regulator of epithelial polarity and metastasis.

EMBO Rep. 2009, 10: 400-5. PMID: [19247375](#)

Cells: RasXT (mouse breast) cells were injected into mice

Targets: miR-29a

Kato *et al.* TGF-beta activates Akt kinase through a microRNA-dependent amplifying circuit targeting PTEN. *Nat.*

Cell Biol. 2009, 11: 881-9. PMID: [19543271](#)

Organism: mouse (subcutaneously injected, accumulation in the kidney)

Targets: miR-192

Lanford *et al.* Therapeutic silencing of microRNA-122 in primates with chronic hepatitis C virus infection. *Science* 2009, 327: 198-201. PMID: [19965718](#)

Organism: Chimpanzee (intravenous injection)

Targets: miR-122

Worm *et al.* Silencing of microRNA-155 in mice during acute inflammatory response leads to derepression of c/ebp Beta and down-regulation of G-CSF. *Nucleic Acids Res.* 2009. PMID: [19596814](#)

Cells/Organism: THP1 (Human acute monocytic leukemia cell line)/ mouse (tail vein injection, accumulation in the spleen)

Targets: miR-155



Selected publications - *in vitro* inhibition

Bessard *et al.* RNAi-mediated ERK2 knockdown inhibits growth of tumor cells *in vitro* and *in vivo*. *Oncogene* 2008, 27: 5315-25. PMID: [18521085](#)
Cells/Organisms: FAO (Rat hepatoma), FI (rat biliary epithelial), nude mice
Targets: ERK2

Boutz *et al.* MicroRNAs regulate the expression of the alternative splicing factor nPTB during muscle development. *Genes Dev.* 2007, 21: 71-84. PMID: [17210790](#)
Cells: C2C12 (Mouse myoblast)
Targets: miR-133

Boyerinas *et al.* Identification of let-7-regulated oncofetal genes. *Cancer Res.* 2008, 68: 2587-91. PMID: [18413726](#)
Cells: HeLa
Targets: let-7

Braun *et al.* p53-Responsive microRNAs 192 and 215 are capable of inducing cell cycle arrest. *Cancer Res.* 2008, 68: 10094-104. PMID: [19074875](#)
Cells: A549 (carcinomic human alveolar basal epithelial)
Targets: miR-192

Ceppi *et al.* MicroRNA-155 modulates the interleukin-1 signaling pathway in activated human monocyte-derived dendritic cells. *Proc. Natl. Acad. Sci. USA.* 2009, 106: 2735-40. PMID: [19193853](#)
Cells: primary human monocyte-derived dendritic cells
Targets: miR-155

Chan *et al.* MicroRNA-21 is an antiapoptotic factor in human glioblastoma cells. *Cancer Res.* 2005, 65: 6029-33. PMID: [16024602](#)
Cells: U87, A172, LN229, LN308 (Human glioblastoma)
Targets: miR-21

Chen *et al.* The genomic analysis of erythrocyte microRNA expression in sickle cell diseases. *PLoS ONE* 2008, 3: e2360. PMID: [18523662](#)
Cells: human reticulocytes
Targets: miR-20a, miR-320

Christoffersen *et al.* miR-200b mediates post-transcriptional repression of ZFX1B. *RNA* 2007, 13: 1172-8. PMID: [17585049](#)
Cells: HEK293 (Human Embryonic Kidney 293)
Targets: miR-200b

Corsten *et al.* MicroRNA-21 knockdown disrupts glioma growth *in vivo* and displays synergistic cytotoxicity with neural precursor cell delivered S-TRAIL in human gliomas. *Cancer Res.* 2007, 67: 8994-9000. PMID: [17908999](#)
Cells: U87 (human glioma cells); U87-Fluc-DsRed2 glioma cells implanted in the brains of nude mice
Targets: miR-21



Davis *et al.* Improved targeting of miRNA with antisense oligonucleotides. *Nucleic Acids Res.* 2006, 34: 2294-304. PMID: [16690972](#)

Cells: HeLa

Targets: miR-21

Dyrskjøt *et al.* Genomic profiling of microRNAs in bladder cancer: miR-129 is associated with poor outcome and promotes cell death *in vitro*. *Cancer Res.* 2009, 69: 4851-60. PMID: [19487295](#)

Cells: Human urinary bladder transitional cell carcinoma (T24, SW780, HT1376, RT4, and J82), immortalized human bladder epithelium (HU609 and HCV29)

Targets: miR-129

Elmén *et al.* LNA-mediated microRNA silencing in non-human primates. *Nature* 2008, 452: 896-9. PMID: [18368051](#)

Cells/Organisms: Huh-7 (human hepatoma) / African green monkey; mouse,

Targets: miR-122

Elmén *et al.* Antagonism of microRNA-122 in mice by systemically administered LNA-antimiR leads to up-regulation of a large set of predicted target mRNAs in the liver. *Nucleic Acids Res.* 2008, 36: 1153-62. PMID: [18158304](#)

Cells/Organisms: Huh-7 (human hepatoma) / mouse

Targets: miR-122

Fabani & Gait. miR-122 targeting with LNA/2'-O-methyl oligonucleotide mixmers, peptide nucleic acids (PNA), and PNA-peptide conjugates. *RNA* 2008, 14: 336-46. PMID: [18073344](#)

Cells: Huh-7 (human hepatoma), primary rat hepatocytes

Targets: miR-122

Fasanaro *et al.* MicroRNA-210 modulates endothelial cell response to hypoxia and inhibits the receptor tyrosine kinase ligand Ephrin-A3. *J. Biol. Chem.* 2008, 283: 15878-83. PMID: [18417479](#)

Cells: HUVEC (Human Umbilical Vein Endothelial)

Targets: miR-210

Fazi *et al.* A minicircuitry comprised of microRNA-223 and transcription factors NFI-A and C/EBPalpha regulates human granulopoiesis. *Cell* 2005, 123: 819-31. PMID: [16325577](#)

Cells: NB4 (human acute promyelocytic leukemia [APL])

Targets: miR-126, miR-223

Ferretti *et al.* Concerted microRNA control of Hedgehog signalling in cerebellar neuronal progenitor and tumour cells. *EMBO J.* 27: 2616-27. PMID: [18756266](#)

Cells: MEFs (mouse embryo primary fibroblasts), MB (human medulloblastoma), GCP (Primary cerebellar granule cell precursor)

Targets: miR-125b, miR-324-5p, miR-326

Frankel *et al.* Programmed cell death 4 (PDCD4) is an important functional target of the microRNA miR-21 in breast cancer cells. *J. Biol. Chem.* 2008, 283: 1026-33. PMID: [17991735](#)

Cells: HEK293 (human embryonic kidney), MCF7 (human breast cancer)

Targets: miR-21



Galardi *et al.* miR-221 and miR-222 expression affects the proliferation potential of human prostate carcinoma cell lines by targeting p27Kip1. *J. Biol. Chem.* 2007, 282: 23716-24. PMID: [17569667](#)
Cells: PC3 (human prostate cancer)
Targets: miR-221, miR-222

Gao *et al.* c-Myc suppression of miR-23a/b enhances mitochondrial glutaminase expression and glutamine metabolism. *Nature.* 2009, 458: 762-5. PMID: [19219026](#)
Cells: P493 (human lymphoma) cells
Targets: miR-23a, miR-23b

Gebeshuber *et al.* miR-29a suppresses tristetraprolin, which is a regulator of epithelial polarity and metastasis. *EMBO Rep.* 2009, 10: 400-5. PMID: [19247375](#)
Cells: RasXT (mouse breast) cells were injected into mice
Targets: miR-29a

Ghosh *et al.* MicroRNA-mediated up-regulation of an alternatively polyadenylated variant of the mouse cytoplasmic β -actin gene. *Nucleic Acids Res.* 2008, 26: 6318-32. PMID: [18835850](#)
Cells: Neuro-2a (mouse neuroblastoma)
Targets: miR-34a, miR-34b-5b

Greenberger *et al.* A RNA antagonist of hypoxia-inducible factor-1alpha, EZN-2968, inhibits tumor cell growth. *Mol. Cancer Ther.* 2008, 7: 3598-608. PMID: [18974394](#)
Cells/Organisms: 15PC3, PC3, DU145 (human prostate), U373 (glioblastoma)/ mouse
Targets: HIF-1alpha mRNA

Hansen *et al.* SPC3042: a proapoptotic survivin inhibitor. *Mol. Cancer Ther.* 2008, 7: 2736-45. PMID: [18790754](#)
Cells: 15PC3 (human prostate cancer), PC3 (mouse prostate)
Targets: survivin

Haraguchi *et al.* Vectors expressing efficient RNA decoys achieve the long-term suppression of specific microRNA activity in mammalian cells. *Nucleic Acids Res.* 2009, 37: e43. PMID: [19223327](#)
Source: Human colon cancer cells
targets: miR-21

Inomata *et al.* MicroRNA-17-92 down-regulates expression of distinct targets in different B-cell lymphoma subtypes. *Blood.* 2009, 113: 396-402. PMID: [18941111](#)
Cells: Jeko-1 (Human lymphoma) cells
Targets: miR-17, miR-19a, miR-20a

Karaa *et al.* The VEGF IRESes are differentially susceptible to translation inhibition by miR-16. *RNA.* 2009, 15: 249-54. PMID: [19144909](#)
Cells: HeLa (Human cervical) cells
Targets: miR-16



Kocerha *et al.* MicroRNA-219 modulates NMDA receptor-mediated neurobehavioral dysfunction. Proc. Natl. Acad. Sci. USA 2009, 106: 3507-12. PMID: [19196972](#)
Cells: P19 (mouse embryonic carcinoma cells)
Targets: miR-219

Lin *et al.* Involvements of microRNAs in hydrogen peroxide-mediated gene regulation and cellular injury response in vascular smooth muscle cells. J. Biol. Chem. 2009, 284: 7903-13. PMID: [19158092](#)
Cells: rat vascular smooth muscle cells (VSMC)
Targets: miR-21

Linsley *et al.* Transcripts targeted by the microRNA-16 family cooperatively regulate cell cycle progression. Mol. Cell Biol. 2007, 27: 2240-52. PMID: [17242205](#)
Cells: HCT116 Dicer ex5, DLD-1 Dicer ex5 (colon cancer)
Targets: miR-16, miR-106b

Mayer *et al.* The structure of NoRC-associated RNA is crucial for targeting the chromatin remodelling complex NoRC to the nucleolus. EMBO Rep. 2008, 9: 774-80. PMID: [18600236](#)
Cells: NIH3T3 (mouse fibroblast)
Targets: pRNA (NoRC-associated RNA)

Mott *et al.* mir-29 regulates Mcl-1 protein expression and apoptosis. Oncogene 2007, 26: 6133-40. PMID: [17404574](#)
Cells: KMCH (human cholangiocarcinoma), H69 (non-malignant cholangiocyte)
Targets: miR-29b

Naguibneva *et al.* The microRNA miR-181 targets the homeobox protein Hox-A11 during mammalian myoblast differentiation. Nat. Cell Biol. 2006, 8: 278-84. PMID: [16489342](#)
Cells: C2C12 (mouse myoblasts)
Targets: miR-181

Naguibneva *et al.* An LNA-based loss-of-function assay for micro-RNAs. Biomed. Pharmacother. 2006, 60: 633-8. PMID: [16962735](#)
Cells: C2C12 (mouse myoblasts), H1299 (human lung cancer)
Targets: miR-125b

Nicolas *et al.* Experimental identification of microRNA-140 targets by silencing and overexpressing miR-140. RNA 2008, 14: 2513-20. PMID: [18945805](#)
Cells: 3T3 (mouse fibroblasts), C3H10T1/2 (mouse), DF1 (chicken fibroblasts)
Targets: miR-140, miR-449

Papagiannakopoulos *et al.* MicroRNA-21 targets a network of key tumor-suppressive pathways in glioblastoma cells. Cancer Res. 2008, 68: 8164-72. PMID: [18829576](#)
Cells: U251 and U87 (human glioblastoma)
Targets: miR-21

Park *et al.* The miR-200 family determines the epithelial phenotype of cancer cells by targeting the E-cadherin repressors ZEB1 and ZEB2. Genes Dev. 2008, 22: 894-907. PMID: [18381893](#)
Cells: HCT116 (human colon cancer)
Targets: miR-200 family members



Perez *et al.* MicroRNA-mediated species-specific attenuation of influenza A virus. Nat. Biotechnol. 2009, 27: 572-6. PMID: [19483680](#)

Cells: HEK293 (human embryonic kidney) cells
Targets: miR-93

Petrocca *et al.* E2F1-regulated microRNAs impair TGFbeta-dependent cell-cycle arrest and apoptosis in gastric cancer. Cancer Cell 2008, 13: 272-86. PMID: [18328430](#)

Cells: Snu-16 (gastric cancer), AGS, MKN-74 cells
Targets: miR-106b, miR-93

Rosa *et al.* The miR-430/427/302 family controls mesendodermal fate specification via species-specific target selection. Dev. Cell 2009, 16: 517-27. PMID: [19386261](#)

Cells: Human embryonic stem (RUES2) cells
Target: miR-302

Sachdeva *et al.* p53 represses c-Myc through induction of the tumor suppressor miR-145. Proc. Natl. Acad. Sci. USA 2009, 106: 3207-12. PMID: [19202062](#)

Cells: Human colon cancer (HCT-116) cells
Targets: miR-145

Schepeler *et al.* Diagnostic and prognostic microRNAs in stage II colon cancer. Cancer Res. 2008, 68: 6416-24. PMID: [18676867](#)

Cells: LS174T, DLD1, HCT116 (human colon carcinoma)
Targets: miR-20a, miR-92, miR-145

Selbach *et al.* Widespread changes in protein synthesis induced by microRNAs. Nature 2008, 455: 58-63. PMID: [18668040](#)

Cells: HeLa
Targets: let-7b

Siegel *et al.* A functional screen implicates microRNA-138-dependent regulation of the depalmitoylation enzyme APT1 in dendritic spine morphogenesis. Nat. Cell Biol. 2009, 11: 705-16. PMID: [19465924](#)

Cells: rat hippocampal neurons
Targets: miR-138

Taguchi *et al.* Identification of hypoxia-inducible factor-1 alpha as a novel target for miR-17-92 microRNA cluster. Cancer Res. 2008, 68: 5540-5. PMID: [18632605](#)

Cells: ACC-LC-172, Calu6 (human lung cancer)
Targets: miR-20

Talotta *et al.* An autoregulatory loop mediated by miR-21 and PDCD4 controls the AP-1 activity in RAS transformation. Oncogene. 2009, 28: 73-84. PMID: [18850008](#)

Cells: FRTL-5-ER/RAS cells
Targets: miR-21

Tavazoie *et al.* Endogenous human microRNAs that suppress breast cancer metastasis. Nature 2008, 451: 147-52. PMID: [18185580](#)

Cells: MDA-MB-231 (human breast cancer)
Targets: miR-159, miR-199a*, miR-335



Thermann & Hentze. *Drosophila* miR2 induces pseudo-polysomes and inhibits translation initiation. Nature 2007, 447: 875-8. PMID: [17507927](#)
Cells: *Drosophila melanogaster* embryo extract
Targets: miR-2

Triboulet et al. Suppression of microRNA-silencing pathway by HIV-1 during virus replication. Science 2007, 315: 1579-82. PMID: [17322031](#)
Cells: Jurkat
Targets: miR-17-5p, miR-20a

Worm et al. Silencing of microRNA-155 in mice during acute inflammatory response leads to derepression of c/ebp Beta and down-regulation of G-CSF. Nucleic Acids Res. 2009. PMID: [19596814](#)
Cells/Organism: THP1 (Human acute monocytic leukemia cell line)/ mouse (tail vein injection, accumulation in the spleen)
Targets: miR-155

Xia et al. microRNA-146b inhibits glioma cell migration and invasion by targeting MMPs. Brain Res. 2009, 1269: 158-65. PMID: [19265686](#)
Cells: U373 cells
Targets: miR-146b

Xiao et al. Lymphoproliferative disease and autoimmunity in mice with increased miR-17-92 expression in lymphocytes. Nat. Immunol. 2008, 9: 405-14. PMID: [18327259](#)
Cells: HeLa
Targets: miR-17-5p, miR-19, miR-92

Xu et al. MicroRNA-145 regulates OCT4, SOX2, and KLF4 and represses pluripotency in human embryonic stem cells. Cell 2009, 137: 647-58. PMID: [19409607](#)
Cells: Human embryonic stem (hESC) cells
targets: miR-145

Yi et al. A skin microRNA promotes differentiation by repressing 'stemness'. Nature 2008, 452 :225-9. PMID: [18311128](#)
Cells: Primary mouse keratinocytes
Targets: miR-203

Zhan et al. MicroRNA expression dynamics during murine and human erythroid differentiation. Exp. Hematol. 2007, 35: 1015-25. PMID: [17588470](#)
Cells: MEL (murine erythroleukemia)
Targets: miR-451

