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

Frezzetti *et al.* Upregulation of miR-21 by Ras *in vivo* and its role in tumor growth. Oncogene 2010 PMID: 20956945
Organism: FRTL-5 cells were injected into mice
Targets: miR-21

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

Hollander *et al.* Striatal microRNA controls cocaine intake through CREB signalling. Nature 2010, 466 :197-202. PMID: 20613834
Organism: rat (cannulae, dorsal striatum)
Targets: miR-212

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

Liu *et al.* miR-21 mediates fibrogenic activation of pulmonary fibroblasts and lung fibrosis. J. Exp. Med. 2010, 207: 1589-97. PMID: 20643828
Organism: mouse lung
Targets: miR-21

Najafi-Shoushtari *et al.* MicroRNA-33 and the SREBP host genes cooperate to control cholesterol homeostasis. Science 2010, 328: 1566-9. PMID: 20466882
Organism: mouse
Targets: miR-33

Patrick *et al.* Stress-dependent cardiac remodeling occurs in the absence of microRNA-21 in mice. J. Clin. Invest. 2010, 120: 3912-6. PMID: 20978354
Organism: mouse
Targets: miR-21

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 ZFHX1B. 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.* KSHV-encoded miRNAs target MAF to induce endothelial cell reprogramming. Genes Dev. 2010, 24: 195-205. PMID: 20080955
Cells: lymphatic endothelial cells (LECs)
Targets: Kaposi sarcoma herpes virus (KSHV) microRNAs

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.* TInvolvements 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