**Supporting Table S1:** List of experimentally validated miRNA Gene Targets using miRecords that are increased/decreased in slow IPF biopsies compared with normal lung samples, and rapid IPF biopsies compared with normal lung samples.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | **Validated targets that differ in slow IPF vs. normal lung biopsies** | |
|  |  |  |
|  | **Symbol** | **Name** |
| miR-155 | AGTR1 | Angiotensin II receptor, type 1 |
|  | BACH1 | BTB and CNC homology 1, basic leucine zipper transcription factor 1 |
|  | LDOC1 | Leucine zipper, down-regulated in cancer 1 |
|  | MATR3 | Matrin 3 |
|  | TM6SF1 | Transmembrane 6 superfamily member 1 |
|  | AGTR1 | Angiotensin II receptor, type 1 |
|  | RHOA | Ras homolog gene family, member A |
|  | ETS1 | V-ets erythroblastosis virus E26 oncogene homolog 1 (avian) |
|  | MEIS1 | Meis homeobox 1 |
|  | MAP3K7IP2 | Mitogen-activated protein kinase kinase kinase 7 interacting protein 2 |
|  | CYR61 | Cysteine-rich, angiogenic inducer, 61 |
|  | MyD88 | Myeloid differentiation primary response gene (88) |
|  | FOXO3 | Forkhead box O3 |
|  | SOCS1 | Suppressor of cytokine signaling 1 |
|  | CCND1 | Cyclin D1 |
|  | IKBKE | Inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase epsilon |
|  | KGF |  |
|  | SPI1 | Spleen focus forming virus (SFFV) proviral integration oncogene spi1 |
|  | FADD | Fas (TNFRSF6)-associated via death domain |
|  | JARID2 | Jumonji, AT rich interactive domain 2 |
|  | MeCP2 | Methyl CpG binding protein 2 (Rett syndrome) |
|  | CEBPB | CCAAT/enhancer binding protein (C/EBP), beta |
|  | SHIP |  |
|  | SMAD2 | SMAD family member 2 |
|  |  |  |
| miR-128 | E2F3 | E2F transcription factor 3 |
|  | NTRK3 | Neurotrophic tyrosine kinase, receptor, type 3 |
|  | BMI1 | BMI1 polycomb ring finger oncogene |
|  | ADORA2B | Adenosine A2b receptor |
|  | DBI | Diazepam binding inhibitor (GABA receptor modulator, acyl-Coenzyme A binding protein) |
|  | AGO1 | Argonaute 1 |
|  | LDLR | Low density lipoprotein receptor (familial hypercholesterolemia) |
|  | DCX | Doublecortex; lissencephaly, X-linked (doublecortin) |
|  | RELN | Reelin |
|  | MLL | Myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila) |
|  | AF4 |  |
|  | TXNIP | Thioredoxin interacting protein |
|  |  |  |
| miR-125b | SMO | Smoothened homolog (Drosophila) |
|  | BMF | Bcl2 modifying factor |
|  | BMPR1B | Bone morphogenetic protein receptor, type IB |
|  | HuR |  |
|  | CDK6 | Cyclin-dependent kinase 6 |
|  | CDC25A | Cell division cycle 25 homolog A (S. pombe) |
|  | KRT |  |
|  | ST18 | Suppression of tumorigenicity 18 (breast carcinoma) (zinc finger protein) |
|  | DICER1 | Dicer1, Dcr-1 homolog (Drosophila) |
|  | CDKN2A | Cyclin-dependent kinase inhibitor 2A (melanoma, p16, inhibits CDK4) |
|  |  |  |
| miR-200c | ZEB1 | Zinc finger E-box binding homeobox 1 |
|  | ERRFI1 | ERBB receptor feedback inhibitor 1 |
|  |  |  |
| miR-181b | pcaf | P300/CBP-associated factor |
|  | Tcl1 |  |
|  | VSNL1 | Visinin-like 1 |
|  | GRIA2 | Glutamate receptor, ionotropic, AMPA 2 |
|  | CDX2 | Caudal type homeobox 2 |
|  | GATA6 | GATA binding protein 6 |
|  | NLK | Nemo-like kinase |
|  | ESR1 | Estrogen receptor 1 |
|  | PLAG1 | Pleiomorphic adenoma gene 1 |
|  |  |  |
| miR-210 | Ephrin-A3 |  |
|  | MNT | MAX binding protein |
|  | CASP8AP2 | CASP8 associated protein 2 |
|  |  |  |
| miR-93 | p21 |  |
|  | E2F1 | E2F transcription factor 1 |
|  |  |  |
| miR-376c | none |  |
|  |  |  |
| miR-126 | VCAM-1 |  |
|  | Crk II |  |
|  | p85beta |  |
|  | IRS-1 |  |
|  | VEGF-A |  |
|  | TOM1 | Target of myb1 (chicken) |
|  | prostein |  |
|  |  |  |
| let-7d | DICER1 | Dicer1, Dcr-1 homolog (Drosophila) |
|  | DAD3R |  |
|  | DAD1 | Defender against cell death 1 |
|  | EIF4G2 | Eukaryotic translation initiation factor 4 gamma, 2 |
|  | RABGAP1L | RAB GTPase activating protein 1-like |
|  | SMOX | Spermine oxidase |
|  |  |  |
| miR-29a | DNMT3B | DNA (cytosine-5-)-methyltransferase 3 beta |
|  | SPARC | Secreted protein, acidic, cysteine-rich (osteonectin) |
|  | BACE1 | Beta-site APP-cleaving enzyme 1 |
|  | PIK3R1 | Phosphoinositide-3-kinase, regulatory subunit 1 (p85 alpha) |
|  | CDC42 | Cell division cycle 42 (GTP binding protein, 25kDa) |
|  | B7-H3 |  |
|  | MCL-1 |  |
|  | CXXC6 | CXXC finger 6 |
|  | CDK6 | Cyclin-dependent kinase 6 |
|  | COL3A1 | Collagen, type III, alpha 1 (Ehlers-Danlos syndrome type IV, autosomal dominant) |
|  |  |  |
| miR-186 | FOXO1 | Forkhead box O1 |
|  |  |  |
| miR-103 | FBXW1B |  |
|  | serbp1 | SERPINE1 mRNA binding protein 1 |
|  | ICOS | Inducible T-cell co-stimulator |
|  |  |  |
| miR-424 | NFI-A |  |
|  | PLAG1 | Pleiomorphic adenoma gene 1 |
|  | FGFR1 | Fibroblast growth factor receptor 1 (fms-related tyrosine kinase 2, Pfeiffer syndrome) |
|  | MEK1 |  |
|  | Galectin-3 |  |
|  |  |  |
| miR-222 | KIT | V-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene homolog |
|  | p27Kip1 |  |
|  | p27 |  |
|  | p27Kip1 |  |
|  | ER alpha |  |
|  | BIM |  |
|  | MMP1 | Matrix metallopeptidase 1 (interstitial collagenase) |
|  | SOD2 | Superoxide dismutase 2, mitochondrial |
|  | CDKN1C | Cyclin-dependent kinase inhibitor 1C (p57, Kip2) |
|  | PPP2R2A | Protein phosphatase 2 (formerly 2A), regulatory subunit B, alpha isoform |
|  | c-fos |  |
|  |  |  |
| miR-223 | NFI-A |  |
|  | STMN1 | Stathmin 1/oncoprotein 18 |
|  | LMO2 | LIM domain only 2 (rhombotin-like 1) |
|  | IRS-1 |  |
|  | RhoB | Ras homolog gene family, member B |
|  |  |  |
| miR-302c | ESR1 | Estrogen receptor 1 |
|  |  |  |
| miR-22 | PTEN | Phosphatase and tensin homolog (mutated in multiple advanced cancers 1) |
|  | ESR1 | Estrogen receptor 1 |
|  | PPARA | Peroxisome proliferator-activated receptor alpha |
|  | BMP7 | Bone morphogenetic protein 7 (osteogenic protein 1) |
|  | MAX | MYC associated factor X |
|  |  |  |
| miR-20a | E2F1 | E2F transcription factor 1 |
|  | AML1 |  |
|  | cyclin D1 |  |
|  | BMPRII |  |
|  | BCL2 | B-cell CLL/lymphoma 2 |
|  | MEF2D | Myocyte enhancer factor 2D |
|  | MAP3K12 | Mitogen-activated protein kinase kinase kinase 12 |
|  | JAK1 | Janus kinase 1 (a protein tyrosine kinase) |
|  | BIM |  |
|  | IL-8 |  |
|  |  |  |
| miR-17 | AIB1 |  |
|  | AML1 |  |
|  | VEGF |  |
|  | cyclin D1 |  |
|  | BMPRII |  |
|  | BCL2 | B-cell CLL/lymphoma 2 |
|  | MEF2D | Myocyte enhancer factor 2D |
|  | MAP3K12 | Mitogen-activated protein kinase kinase kinase 12 |
|  | Vim | Vimentin |
|  | CCND1 | Cyclin D1 |
|  | JAK1 | Janus kinase 1 (a protein tyrosine kinase) |
|  | CDKN1A | Cyclin-dependent kinase inhibitor 1A (p21, Cip1) |
|  | EDG1 | Endothelial differentiation, sphingolipid G-protein-coupled receptor, 1 |
|  | BIM |  |
|  | IL-8 |  |
|  |  |  |
| miR-140-5p | VEGF |  |
|  | HDAC4 | Histone deacetylase 4 |
|  | IGFBP-5 |  |
|  |  |  |
| miR-15a | DMTF1 | Cyclin D binding myb-like transcription factor 1 |
|  | BCL2 | B-cell CLL/lymphoma 2 |
|  | VEGF |  |
|  | PDCD4 | Programmed cell death 4 (neoplastic transformation inhibitor) |
|  | RAB21 | RAB21, member RAS oncogene family |
|  | IGSF4 |  |
|  | SCAP2 |  |
|  | Rab9B | RAB9B, member RAS oncogene family |
|  | Tpi1 | Triosephosphate isomerase 1 |
|  | c-Myb |  |
|  | CCND1 | Cyclin D1 |
|  | BMI-1 |  |
|  |  |  |
| miR-30e | UBE2I | Ubiquitin-conjugating enzyme E2I (UBC9 homolog, yeast) |
|  |  |  |
| miR-29b | Tcl1 |  |
|  | MCL1 | Myeloid cell leukemia sequence 1 (BCL2-related) |
|  | DNMT3A | DNA (cytosine-5-)-methyltransferase 3 alpha |
|  | DNMT3B | DNA (cytosine-5-)-methyltransferase 3 beta |
|  | BACE1 | Beta-site APP-cleaving enzyme 1 |
|  | CDC42 | Cell division cycle 42 (GTP binding protein, 25kDa) |
|  | PIK3R1 | Phosphoinositide-3-kinase, regulatory subunit 1 (p85 alpha) |
|  | SP1 | Sp1 transcription factor |
|  | MCL-1 |  |
|  | CXXC6 | CXXC finger 6 |
|  | CDK6 | Cyclin-dependent kinase 6 |
|  | COL1A1 | Collagen, type I, alpha 1 |
|  | SP1 | Sp1 transcription factor |
|  | COL3A1 | Collagen, type III, alpha 1 (Ehlers-Danlos syndrome type IV, autosomal dominant) |
|  |  |  |
| miR-30b | none |  |
|  |  |  |
| miR-29c | DNMT3B | DNA (cytosine-5-)-methyltransferase 3 beta |
|  | COL3A1 | Collagen, type III, alpha 1 (Ehlers-Danlos syndrome type IV, autosomal dominant) |
|  | COL4A1 | Collagen, type IV, alpha 1 |
|  | COL15A1 | Collagen, type XV, alpha 1 |
|  | LAMC1 | Laminin, gamma 1 (formerly LAMB2) |
|  | TDG | Thymine-DNA glycosylase |
|  | FUSIP1 | FUS interacting protein (serine/arginine-rich) 1 |
|  | COL1A1 | Collagen, type I, alpha 1 |
|  | COL1A2 | Collagen, type I, alpha 2 |
|  | COL4A2 | Collagen, type IV, alpha 2 |
|  | fibrillin 1 |  |
|  | CDC42 | Cell division cycle 42 (GTP binding protein, 25kDa) |
|  | PIK3R1 | Phosphoinositide-3-kinase, regulatory subunit 1 (p85 alpha) |
|  |  |  |
| miR-143 | ERK5 |  |
|  | KRAS | V-Ki-ras2 Kirsten rat sarcoma viral oncogene homolog |
|  | ERK5 |  |
|  | FNDC3b | Fibronectin type III domain containing 3B |
|  | DNMT3A | DNA (cytosine-5-)-methyltransferase 3 alpha |
|  |  |  |
| miR-106b | ITCH | Itchy homolog E3 ubiquitin protein ligase (mouse) |
|  | CDKN1A | Cyclin-dependent kinase inhibitor 1A (p21, Cip1) |
|  | E2F1 | E2F transcription factor 1 |
|  |  |  |
| miR-18a | ESR1 | Estrogen receptor 1 |
|  | thbs1 | Thrombospondin 1 |
|  | BIM |  |
|  | CTGF | Connective tissue growth factor |
|  |  |  |
| miR-142-3p | none |  |
|  |  |  |
| miR-142-5p | none |  |
|  |  |  |
| miR-19b | ESR1 | Estrogen receptor 1 |
|  | CTGF | Connective tissue growth factor |
|  |  |  |
| miR-130a | MCSF |  |
|  | MAFB | V-maf musculoaponeurotic fibrosarcoma oncogene homolog B (avian) |
|  | GAX |  |
|  | HOXA5 | Homeobox A5 |
|  |  |  |
| miR-101 | N-MYC |  |
|  | ICOS | Inducible T-cell co-stimulator |
|  | EZH2 | Enhancer of zeste homolog 2 (Drosophila) |
|  | Cox-2 |  |
|  | MCL1 | Myeloid cell leukemia sequence 1 (BCL2-related) |
|  |  |  |
| miR-19a | PTEN | Phosphatase and tensin homolog (mutated in multiple advanced cancers 1) |
|  | BMPRII |  |
|  | NR4A2 | Nuclear receptor subfamily 4, group A, member 2 |
|  | ERBB4 | V-erb-a erythroblastic leukemia viral oncogene homolog 4 (avian) |
|  | ESR1 | Estrogen receptor 1 |
|  | CCND1 | Cyclin D1 |
|  | thbs1 | Thrombospondin 1 |
|  | BIM |  |
|  | CTGF | Connective tissue growth factor |
|  |  |  |
| miR-32 | none |  |
|  |  |  |
| miR-144 | none |  |
|  |  |  |
| miR-141 | Clock | Clock homolog (mouse) |
|  | TGF beta2 |  |
|  | SIP1 | Survival of motor neuron protein interacting protein 1 |
|  | MKK4 |  |
|  | ERBB2IP | Erbb2 interacting protein |
|  | BAP1 | BRCA1 associated protein-1 (ubiquitin carboxy-terminal hydrolase) |
|  | KLHL20 | Kelch-like 20 (Drosophila) |
|  | PTPRD | Protein tyrosine phosphatase, receptor type, D |
|  | ELMO2 | Engulfment and cell motility 2 |
|  | WDR37 | WD repeat domain 37 |
|  | | | |  |  |  |  |  | ER alpha |  |
|  | | | |  |  |  |  |  | BIM |  |
|  | | | |  |  |  |  |  | MMP1 | Matrix metallopeptidase 1 (interstitial collagenase) |
|  | | | |  |  |  |  |  | SOD2 | Superoxide dismutase 2, mitochondrial |
|  | | | |  |  |  |  |  | CDKN1C | Cyclin-dependent kinase inhibitor 1C (p57, Kip2) |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  | | --- | --- | --- | | **Validated targets that differ in rapid IPF biopsies vs. normal lung biopsies** | | | |  |  |  | |  | **Symbol** | **Name** | | miR-423-5p | none |  | |  |  |  | | miR-155 | AGTR1 | Angiotensin II receptor, type 1 | |  | BACH1 | BTB and CNC homology 1, basic leucine zipper transcription factor 1 | |  | LDOC1 | Leucine zipper, down-regulated in cancer 1 | |  | MATR3 | Matrin 3 | |  | TM6SF1 | Transmembrane 6 superfamily member 1 | |  | AGTR1 | Angiotensin II receptor, type 1 | |  | RHOA | Ras homolog gene family, member A | |  | ETS1 | V-ets erythroblastosis virus E26 oncogene homolog 1 (avian) | |  | MEIS1 | Meis homeobox 1 | |  | MAP3K7IP2 | Mitogen-activated protein kinase kinase kinase 7 interacting protein 2 | |  | CYR61 | Cysteine-rich, angiogenic inducer, 61 | |  | MyD88 | Myeloid differentiation primary response gene (88) | |  | FOXO3 | Forkhead box O3 | |  | SOCS1 | Suppressor of cytokine signaling 1 | |  | CCND1 | Cyclin D1 | |  | IKBKE | Inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase epsilon | |  | KGF |  | |  | SPI1 | Spleen focus forming virus (SFFV) proviral integration oncogene spi1 | |  | FADD | Fas (TNFRSF6)-associated via death domain | |  | JARID2 | Jumonji, AT rich interactive domain 2 | |  | MeCP2 | Methyl CpG binding protein 2 (Rett syndrome) | |  | CEBPB | CCAAT/enhancer binding protein (C/EBP), beta | |  | SHIP |  | |  | SMAD2 | SMAD family member 2 | |  |  |  | | miR-128 | E2F3 | E2F transcription factor 3 | |  | NTRK3 | Neurotrophic tyrosine kinase, receptor, type 3 | |  | BMI1 | BMI1 polycomb ring finger oncogene | |  | ADORA2B | Adenosine A2b receptor | |  | DBI | Diazepam binding inhibitor (GABA receptor modulator, acyl-Coenzyme A binding protein) | |  | AGO1 | Argonaute 1 | |  | LDLR | Low density lipoprotein receptor (familial hypercholesterolemia) | |  | DCX | Doublecortex; lissencephaly, X-linked (doublecortin) | |  | RELN | Reelin | |  | MLL | Myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila) | |  | AF4 |  | |  | TXNIP | Thioredoxin interacting protein | |  |  |  | | miR-374b | none |  | |  |  |  | | miR-21 | TPM1 | Tropomyosin 1 (alpha) | |  | PDCD4 | Programmed cell death 4 (neoplastic transformation inhibitor) | |  | CDKN1A | Cyclin-dependent kinase inhibitor 1A (p21, Cip1) | |  | FAS | Fas (TNF receptor superfamily, member 6) | |  | FAM3C | Family with sequence similarity 3, member C | |  | HIPK3 | Homeodomain interacting protein kinase 3 | |  | PRRG4 | Proline rich Gla (G-carboxyglutamic acid) 4 (transmembrane) | |  | ACTA2 | Actin, alpha 2, smooth muscle, aorta | |  | BTG2 | BTG family, member 2 | |  | BMPRII |  | |  | SESN1 | Sestrin 1 | |  | IL-6R |  | |  | SOCS5 | Suppressor of cytokine signaling 5 | |  | Glcci1 | Glucocorticoid induced transcript 1 | |  | APAF1 | Apoptotic peptidase activating factor 1 | |  | SLC16A10 | Solute carrier family 16, member 10 (aromatic amino acid transporter) | |  | SGK3 | Serum/glucocorticoid regulated kinase family, member 3 | |  | RP2 | Retinitis pigmentosa 2 (X-linked recessive) | |  | CDK6 | Cyclin-dependent kinase 6 | |  | CFL2 | Cofilin 2 (muscle) | |  | PDCD4 | Programmed cell death 4 (neoplastic transformation inhibitor) | |  | SERPINB5 | Serpin peptidase inhibitor, clade B (ovalbumin), member 5 | |  | PDCD4 | Programmed cell death 4 (neoplastic transformation inhibitor) | |  | NFIB | Nuclear factor I/B | |  | TIMP3 | TIMP metallopeptidase inhibitor 3 (Sorsby fundus dystrophy, pseudoinflammatory) | |  | RECK | Reversion-inducing-cysteine-rich protein with kazal motifs | |  | MTAP | Methylthioadenosine phosphorylase | |  | PDCD4 | Programmed cell death 4 (neoplastic transformation inhibitor) | |  | SOX5 | SRY (sex determining region Y)-box 5 | |  | MARCKS | Myristoylated alanine-rich protein kinase C substrate | |  | JAG1 | Jagged 1 (Alagille syndrome) | |  | BTG2 | BTG family, member 2 | |  | LRRFIP1 | Leucine rich repeat (in FLII) interacting protein 1 | |  | BMPR2 | Bone morphogenetic protein receptor, type II (serine/threonine kinase) | |  | CDC25A | Cell division cycle 25 homolog A (S. pombe) | |  | PTEN | Phosphatase and tensin homolog (mutated in multiple advanced cancers 1) | |  | E2F1 | E2F transcription factor 1 | |  | TGFBR2 | Transforming growth factor, beta receptor II (70/80kDa) | |  |  |  | | miR-100 | PLK1 | Polo-like kinase 1 (Drosophila) | |  | FGFR3 | Fibroblast growth factor receptor 3 (achondroplasia, thanatophoric dwarfism) | |  | IGF1R | Insulin-like growth factor 1 receptor | |  | raptor |  | |  |  |  | | miR-125b | SMO | Smoothened homolog (Drosophila) | |  | BMF | Bcl2 modifying factor | |  | BMPR1B | Bone morphogenetic protein receptor, type IB | |  | HuR |  | |  | CDK6 | Cyclin-dependent kinase 6 | |  | CDC25A | Cell division cycle 25 homolog A (S. pombe) | |  | KRT |  | |  | ST18 | Suppression of tumorigenicity 18 (breast carcinoma) (zinc finger protein) | |  | DICER1 | Dicer1, Dcr-1 homolog (Drosophila) | |  | CDKN2A | Cyclin-dependent kinase inhibitor 2A (melanoma, p16, inhibits CDK4) | |  |  |  | | miR-140-3p | none |  | |  |  |  | | miR-125a-5p | Lin28 | Lin-28 homolog (C. elegans) | |  | ERBB3 | V-erb-b2 erythroblastic leukemia viral oncogene homolog 3 (avian) | |  | p53 |  | |  | HuR |  | |  | ARID3B | AT rich interactive domain 3B (BRIGHT-like) | |  |  |  | | miR-92a | BMPRII |  | |  | ITGA5 | Integrin, alpha 5 (fibronectin receptor, alpha polypeptide) | |  |  |  | | let-7c | HMGA2 | High mobility group AT-hook 2 | |  | c-MYC |  | |  | TRIM71 | Tripartite motif-containing 71 | |  | HMGA2a |  | |  | TGFBR1 | Transforming growth factor, beta receptor I (activin A receptor type II-like kinase, 53kDa) | |  | EIF3S1 |  | |  | MED28 | Mediator complex subunit 28 | |  | RTCD1 | RNA terminal phosphate cyclase domain 1 | |  |  |  | | miR-181b | Tcl1 |  | |  | VSNL1 | Visinin-like 1 | |  | GRIA2 | Glutamate receptor, ionotropic, AMPA 2 | |  | CDX2 | Caudal type homeobox 2 | |  | GATA6 | GATA binding protein 6 | |  | NLK | Nemo-like kinase | |  | ESR1 | Estrogen receptor 1 | |  | PLAG1 | Pleiomorphic adenoma gene 1 | |  |  |  | | let-7d | DICER1 | Dicer1, Dcr-1 homolog (Drosophila) | |  | DAD3R |  | |  | DAD1 | Defender against cell death 1 | |  | EIF4G2 | Eukaryotic translation initiation factor 4 gamma, 2 | |  | RABGAP1L | RAB GTPase activating protein 1-like | |  | SMOX | Spermine oxidase | |  |  |  | | miR-30c | Ubc9 |  | |  |  |  | | miR-27b | CYP1B1 | Cytochrome P450, family 1, subfamily B, polypeptide 1 | |  | ST14 | Suppression of tumorigenicity 14 (colon carcinoma) | |  | PPARG | Peroxisome proliferator-activated receptor gamma | |  | MMP-13 |  | |  |  |  | | miR-103 | FBXW1B |  | |  | serbp1 | SERPINE1 mRNA binding protein 1 | |  | ICOS | Inducible T-cell co-stimulator | |  |  |  | | miR-30a | KRT7 | Keratin 7 | |  | beclin 1 |  | |  | TNRC6A | Trinucleotide repeat containing 6A | |  |  |  | | miR-424 | NFI-A |  | |  | PLAG1 | Pleiomorphic adenoma gene 1 | |  | FGFR1 | Fibroblast growth factor receptor 1 (fms-related tyrosine kinase 2, Pfeiffer syndrome) | |  | MEK1 |  | |  | Galectin-3 |  | |  |  |  | | miR-22 | PTEN | Phosphatase and tensin homolog (mutated in multiple advanced cancers 1) | |  | ESR1 | Estrogen receptor 1 | |  | PPARA | Peroxisome proliferator-activated receptor alpha | |  | BMP7 | Bone morphogenetic protein 7 (osteogenic protein 1) | |  | MAX | MYC associated factor X | |  |  |  | | miR-186 | FOXO1 | Forkhead box O1 | |  |  |  | | miR-29a | DNMT3B | DNA (cytosine-5-)-methyltransferase 3 beta | |  | SPARC | Secreted protein, acidic, cysteine-rich (osteonectin) | |  | BACE1 | Beta-site APP-cleaving enzyme 1 | |  | PIK3R1 | Phosphoinositide-3-kinase, regulatory subunit 1 (p85 alpha) | |  | CDC42 | Cell division cycle 42 (GTP binding protein, 25kDa) | |  | B7-H3 |  | |  | MCL-1 |  | |  | CXXC6 | CXXC finger 6 | |  | CDK6 | Cyclin-dependent kinase 6 | |  | COL3A1 | Collagen, type III, alpha 1 (Ehlers-Danlos syndrome type IV, autosomal dominant) | |  |  |  | | miR-126 | VCAM-1 |  | |  | Crk II |  | |  | p85beta |  | |  | IRS-1 |  | |  | VEGF-A |  | |  | TOM1 | Target of myb1 (chicken) | |  | prostein |  | |  |  |  | | miR-27a | prohibitin |  | |  | RUNX1 | Runt-related transcription factor 1 (acute myeloid leukemia 1; aml1 oncogene) | |  | GCA | Grancalcin, EF-hand calcium binding protein | |  | PEX7 | Peroxisomal biogenesis factor 7 | |  | FADD | Fas (TNFRSF6)-associated via death domain | |  | FOXO1 | Forkhead box O1 | |  |  |  | | miR-20a | E2F1 | E2F transcription factor 1 | |  | AML1 |  | |  | cyclin D1 |  | |  | BMPRII |  | |  | BCL2 | B-cell CLL/lymphoma 2 | |  | MEF2D | Myocyte enhancer factor 2D | |  | MAP3K12 | Mitogen-activated protein kinase kinase kinase 12 | |  | JAK1 | Janus kinase 1 (a protein tyrosine kinase) | |  | BIM |  | |  | IL-8 |  | |  |  |  | | miR-143 | ERK5 |  | |  | KRAS | V-Ki-ras2 Kirsten rat sarcoma viral oncogene homolog | |  | ERK5 |  | |  | FNDC3b | Fibronectin type III domain containing 3B | |  | DNMT3A | DNA (cytosine-5-)-methyltransferase 3 alpha | |  |  |  | | miR-223 | NFI-A |  | |  | STMN1 | Stathmin 1/oncoprotein 18 | |  | LMO2 | LIM domain only 2 (rhombotin-like 1) | |  | IRS-1 |  | |  | RhoB | Ras homolog gene family, member B | |  |  |  | | miR-17 | AIB1 |  | |  | AML1 |  | |  | VEGF |  | |  | cyclin D1 |  | |  | BMPRII |  | |  | BCL2 | B-cell CLL/lymphoma 2 | |  | MEF2D | Myocyte enhancer factor 2D | |  | MAP3K12 | Mitogen-activated protein kinase kinase kinase 12 | |  | Vim | Vimentin | |  | JAK1 | Janus kinase 1 (a protein tyrosine kinase) | |  | CDKN1A | Cyclin-dependent kinase inhibitor 1A (p21, Cip1) | |  | EDG1 | Endothelial differentiation, sphingolipid G-protein-coupled receptor, 1 | |  | BIM |  | |  | IL-8 |  | |  |  |  | | miR-106b | ITCH | Itchy homolog E3 ubiquitin protein ligase (mouse) | |  | CDKN1A | Cyclin-dependent kinase inhibitor 1A (p21, Cip1) | |  | E2F1 | E2F transcription factor 1 | |  |  |  | | miR-96 | Adcy6 | Adenylate cyclase 6 | |  | Mitf | Microphthalmia-associated transcription factor | |  | HTR1B | 5-hydroxytryptamine (serotonin) receptor 1B | |  | AQP5 | Aquaporin 5 | |  | CELSR2 | Cadherin, EGF LAG seven-pass G-type receptor 2 (flamingo homolog, Drosophila) | |  | ODF2 | Outer dense fiber of sperm tails 2 | |  | MYRIP | Myosin VIIA and Rab interacting protein | |  | RYK | RYK receptor-like tyrosine kinase | |  | IRS-1 |  | |  | FOXO1 | Forkhead box O1 | |  |  |  | | miR-140-5p | VEGF |  | |  | HDAC4 | Histone deacetylase 4 | |  | IGFBP-5 |  | |  |  |  | | miR-15a | DMTF1 | Cyclin D binding myb-like transcription factor 1 | |  | BCL2 | B-cell CLL/lymphoma 2 | |  | VEGF |  | |  | PDCD4 | Programmed cell death 4 (neoplastic transformation inhibitor) | |  | RAB21 | RAB21, member RAS oncogene family | |  | IGSF4 |  | |  | SCAP2 |  | |  | Rab9B | RAB9B, member RAS oncogene family | |  | Tpi1 | Triosephosphate isomerase 1 | |  | c-Myb |  | |  | CCND1 | Cyclin D1 | |  | BMI-1 |  | |  |  |  | | miR-30b | none |  | |  |  |  | | miR-130a | MCSF |  | |  | MAFB | V-maf musculoaponeurotic fibrosarcoma oncogene homolog B (avian) | |  | GAX |  | |  | HOXA5 | Homeobox A5 | |  |  |  | | miR-222 | KIT | V-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene homolog | |  | p27Kip1 |  | |  | p27 |  | |  | p27Kip1 |  | |  | ER alpha |  | |  | BIM |  | |  | MMP1 | Matrix metallopeptidase 1 (interstitial collagenase) | |  | SOD2 | Superoxide dismutase 2, mitochondrial | |  | CDKN1C | Cyclin-dependent kinase inhibitor 1C (p57, Kip2) | |  | PPP2R2A | Protein phosphatase 2 (formerly 2A), regulatory subunit B, alpha isoform | |  | c-fos |  | |  |  |  | | miR-30e | UBE2I | Ubiquitin-conjugating enzyme E2I (UBC9 homolog, yeast) | |  |  |  | | miR-29c | DNMT3B | DNA (cytosine-5-)-methyltransferase 3 beta | |  | COL3A1 | Collagen, type III, alpha 1 (Ehlers-Danlos syndrome type IV, autosomal dominant) | |  | COL4A1 | Collagen, type IV, alpha 1 | |  | COL15A1 | Collagen, type XV, alpha 1 | |  | LAMC1 | Laminin, gamma 1 (formerly LAMB2) | |  | TDG | Thymine-DNA glycosylase | |  | FUSIP1 | FUS interacting protein (serine/arginine-rich) 1 | |  | COL1A1 | Collagen, type I, alpha 1 | |  | COL1A2 | Collagen, type I, alpha 2 | |  | COL4A2 | Collagen, type IV, alpha 2 | |  | fibrillin 1 |  | |  | CDC42 | Cell division cycle 42 (GTP binding protein, 25kDa) | |  | PIK3R1 | Phosphoinositide-3-kinase, regulatory subunit 1 (p85 alpha) | |  |  |  | | miR-18a | ESR1 | Estrogen receptor 1 | |  | thbs1 | Thrombospondin 1 | |  | BIM |  | |  | CTGF | Connective tissue growth factor | |  |  |  | | miR-29b | Tcl1 |  | |  | MCL1 | Myeloid cell leukemia sequence 1 (BCL2-related) | |  | DNMT3A | DNA (cytosine-5-)-methyltransferase 3 alpha | |  | DNMT3B | DNA (cytosine-5-)-methyltransferase 3 beta | |  | BACE1 | Beta-site APP-cleaving enzyme 1 | |  | CDC42 | Cell division cycle 42 (GTP binding protein, 25kDa) | |  | PIK3R1 | Phosphoinositide-3-kinase, regulatory subunit 1 (p85 alpha) | |  | SP1 | Sp1 transcription factor | |  | MCL-1 |  | |  | CXXC6 | CXXC finger 6 | |  | CDK6 | Cyclin-dependent kinase 6 | |  | COL1A1 | Collagen, type I, alpha 1 | |  | SP1 | Sp1 transcription factor | |  | COL3A1 | Collagen, type III, alpha 1 (Ehlers-Danlos syndrome type IV, autosomal dominant) | |  |  |  | | miR-142-5p | none |  | |  |  |  | | miR-144 | none |  | |  |  |  | | miR-423-3p | none |  | |  |  |  | | miR-142-3p | none |  | |  |  |  | | miR-19b | ESR1 | Estrogen receptor 1 | |  | CTGF | Connective tissue growth factor | |  |  |  | | miR-19a | PTEN | Phosphatase and tensin homolog (mutated in multiple advanced cancers 1) | |  | BMPRII |  | |  | NR4A2 | Nuclear receptor subfamily 4, group A, member 2 | |  | ERBB4 | V-erb-a erythroblastic leukemia viral oncogene homolog 4 (avian) | |  | ESR1 | Estrogen receptor 1 | |  | CCND1 | Cyclin D1 | |  | thbs1 | Thrombospondin 1 | |  | BIM |  | |  | CTGF | Connective tissue growth factor | |  |  |  | | miR-32 | none |  | |  |  |  | | miR-101 | N-MYC |  | |  | ICOS | Inducible T-cell co-stimulator | |  | EZH2 | Enhancer of zeste homolog 2 (Drosophila) | |  | Cox-2 |  | |  | MCL1 | Myeloid cell leukemia sequence 1 (BCL2-related) | |  |  |  | | miR-141 | Clock | Clock homolog (mouse) | |  | TGF beta2 |  | |  | SIP1 | Survival of motor neuron protein interacting protein 1 | |  | MKK4 |  | |  | ERBB2IP | Erbb2 interacting protein | |  | BAP1 | BRCA1 associated protein-1 (ubiquitin carboxy-terminal hydrolase) | |  | KLHL20 | Kelch-like 20 (Drosophila) | |  | PTPRD | Protein tyrosine phosphatase, receptor type, D | |  | ELMO2 | Engulfment and cell motility 2 | |  | WDR37 | WD repeat domain 37 | |  |  |  |  |  | PPP2R2A | Protein phosphatase 2 (formerly 2A), regulatory subunit B, alpha isoform |