

# miRNA Feature Overview

TRANSFAC® + PROTEOME™

miRNAs are small RNAs that post-transcriptionally regulate gene expression through sequence-specific binding that typically promotes mRNA degradation or prevents mRNA translation. In recent years aberrant miRNA expression has been linked to numerous diseases, fueling research into these important regulators and their targets.

BIOBASE integrates high quality literature-curated content describing the functional attributes of human, mouse and rat miRNAs with structural data from miRBase to enable easy look up and retrieval of information for a single miRNA or lists of miRNAs. Additional vertebrate species are included for comparison purposes, but are not annotated.

The screenshot shows the BIOBASE search interface. At the top, there is a search bar with 'hsa-miR-125a-5p' entered and a 'search' button. Below the search bar, there are options to 'Hide search options' and 'Limit search to'. Under 'Limit search to', there are radio buttons for 'Genes and proteins', 'miRNAs' (which is selected and circled in red), 'Diseases', 'Pathways', and 'Drugs'. Below this, there are options to 'Search miRNA by' with radio buttons for 'Name' (selected and circled in red) and 'Identifier'. There is also a 'Search which species?' dropdown menu set to 'Search all species'. A red circle '1' is placed over the 'Name' radio button, and a red circle '2' is placed over the 'Search all species' dropdown. At the bottom, there is a link for 'miRNAs search help' and a note about view statistics for PROTEOME 2012.4 and TRANSFAC 2012.4.

## Looking up miRNAs

1 Use the miRNAs Name or Identifier quick search to look up a single miRNA.

2 Use the "Upload a list of miRNAs in bulk" option to look up a list of miRNAs.

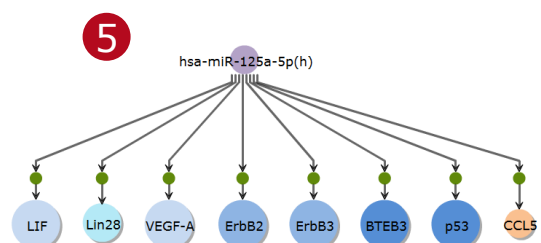
Agilent, Exiqon, Taqman and miRBase identifiers are supported.

3 Click the linked name to view the desired miRNA Report (described on the next page).

The screenshot shows the search results page for 'hsa-miR-125a-5p'. At the top, there is a '2 miRNA' header and a 'Select results and view as:' section with various visualization options like Pathfinder, Ontology, Match, FASTA, and Profiles. Below this, there are options to 'Save these results' and 'Export these results'. A red circle '3' is placed over the 'Mark all on page' checkbox. A red circle '4' is placed over the 'miRNA Targets' dropdown menu, which is open and shows options like 'miRNA Targets', 'mRNA Regulation', 'miRNA Targets', 'Functional Attributes', and 'Disease'. A red circle '5' is placed over the 'Pathfinder' icon. Below the search options, there is a table with columns for 'Input', 'Name', 'Species/Taxon', and 'Description'. Two miRNAs are listed: 'hsa-miR-125a-5p' and 'hsa-miR-125b-5p', both from Human. The descriptions provide details about their biological functions and associated diseases.

4 Use the "miRNA Targets" or "Disease" option in the search results to quickly identify targets or diseases that are shared by the miRNAs in your list (miRNA Targets option for TRANSFAC® only).

5 View miRNA-target interaction networks in the Pathfinder visualization tool (TRANSFAC® only).



**Introduction** what is this?

1

**Description**

hsa-miR-125a-5p, a mature miRNA that induces cell proliferation, cell migration, and apoptotic signaling pathway, downregulated in non-small cell lung cancer

**Synonyms**

miR-125a-5p; hsa-miR-125a-5p; hsa-miR-125a

**Encoded by**

**Gene:** MIR125A

**Stem loop:** hsa-mir-125a

2

**Biomarker Associations** what is this?

Diseases associated with hsa-miR-125a-5p (6 entries)

Disease details-all	Significance	Type of Association					Indication		
		Causal	Correlative	Preventative	Negative	Disease Mechanism	Prognosis	Therapeutic Target	
Lung Neoplasms	6 associations	2 associations	4 associations			1 associations	1 associations		
Carcinoma, Non-Small-Cell Lung	2 associations						2 associations		
Idiopathic Pulmonary Fibrosis	1 associations		1 associations				1 associations		
Carcinoma, Basal Cell	1 associations		1 associations						
Sezary Syndrome	1 associations		1 associations						

Diseases associations shared between hsa-miR-125a-5p and its targets

Disease	Target(s) with shared disease association	Change in miRNA expression
Carcinoma, Basal Cell	↑ TP53	↑
Carcinoma, Non-Small-Cell Lung	↓ VEGFA, ↑ ERBB2, ↓ TP53	↓
Glioblastoma		-
Idiopathic Pulmonary Fibrosis		-
Lung Neoplasms	- ERBB3, - LIF, ↓ VEGFA, ↑ ERBB2, ↓ PDN, ↓ TP53, - NTRK3	↑

**Gene Ontology** what is this?

3

**Biological process**

positive regulation of apoptotic process [E], positive regulation of apoptotic signaling pathway [E], positive regulation of cell proliferation [E]... details

**Expression** what is this?

4

**Tissue expression**

brain	breast	colon	heart	intestine	kidney	liver	lung	<input checked="" type="checkbox"/>
muscle	ovary	pancreas	placenta	spleen	stomach	testis	thymus	<input type="checkbox"/>

 View organ or tissue, cell type, and tumor type entries in detail

**Transcriptional Regulation** what is this?

5

**Regulation of MIR125A gene expression**

View in vivo fragments within the vicinity of the MIR125A gene that are bound by transcription factors (6 entries)

Identifier	Location	Binding Factor
FR000083061	52197223..52197697	Sp1(h)
FR000085449	52196800..52197171	Sp1(h)
FR000102256	52196764..52197171	Sp1(h)
FR000110369	52196381..52196842	Sp1(h)
FR000133690	52197223..52198139	Sp1(h)

**RNA Features** what is this?

6

**Encoding gene:** MIR125A

**Stem-loop:** hsa-mir-125a

**Host gene:** none

**miR cluster:** hsa-let-7a, hsa-mir-99b

**miR family:** miR-125, miR-10 [Find all family members](#)

**Sequence:** UCCCUAGACCCUUAACCGUGA

[FASTA](#) [MIMAT0000443](#)

**TargetScan seed family:** miR-125a-5p/125b-5p/351/670/4319 (CCUJGAG) [Find all family members](#)

**Species conservation, determined by TargetScan seed family membership:**

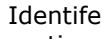




- Canis lupus familiaris : cfa-miR-125a, cfa-mir-125b
- Gallus gallus : gga-miR-125b
- Human : hsa-miR-125b-5p, hsa-mir-4319
- Macaca mulatta : mm1-miR-125b, mm1-miR-125a-5p, mm1-mir-670
- Mouse : mmu-miR-125b-5p, mmu-mir-125a-5p, mmu-mir-351-5p
- Rat : rno-miR-125b-5p, rno-mir-125a-5p, rno-mir-351-5p

**mRNA Targets** what is this?

7

mRNAs targeted by hsa-miR-125a-5p (13 entries)

 Load in Pathfinder

miRNA	Region	Location within mRNA	Binding site details	Experimental details	Effect
ERBB2(h)	3'-UTR	17 to 44	HSSNEU_21		increase of mRNA decay
ERBB3(h)	3'-UTR	12 to 26	HSSERBB3_02		increase of mRNA decay
KLF13(h)	3' UTR	1609 to 1623	HSSKLF13_04		increase of mRNA decay
KLF13(h)	3' UTR	242 to 255	HSSKLF13_05		increase of mRNA decay
LIF(h)	3'-UTR	1009 to 1015, from stop codon	HSSLIF_01		predicted

# miRNA Report Overview

1 The Introduction section provides a description and synonyms for the miRNA.

2 The Biomarker Associations section provides a summary of miRNA-disease relationships (for human miRNAs only). Disease associations shared between the miRNA and its targets are given for concurrent subscribers of TRANSFAC® and PROTEOME™.

3 The Gene Ontology section describes functional attributes of the miRNA.

4 The Expression section provides information about the organs, tissues, cells and tumors in which the miRNA is expressed.

5 The Transcriptional Regulation section describes features of the gene which contribute to its regulation (TRANSFAC® only).

6 The RNA Features section provides information about the host gene, whether the miRNA gene is part of a miR cluster, its genomic location, miR family and TargetScan seed family membership, as well as information about the RNA sequence.

7 The mRNA Targets section lists the miRNAs experimentally demonstrated targets with links to the detailed Site Report (TRANSFAC® only).

Identifier and Reference sections are not displayed.