

FEATURE HIGHLIGHT

microRNA Target Filter

IPA's new microRNA Target Filter enables easy prioritization of experimentally validated and predicted mRNA targets from TargetScan, TarBase, miRecords, and the Ingenuity® Knowledge Base. It's the *only* commercially available tool that lets you upload, analyze, prioritize, filter, and visualize microRNA-mRNA data and relationships, all within a single tool. You can also leverage microRNA and mRNA data in combination with other types of 'omics and high-throughput data for a fully integrated biological analysis.

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Step 1 – To start, select New MicroRNA Target Filter using the blue “new” button at the top left of IPA. The microRNA Target Filter will ask you to upload or select a microRNA dataset.

NEW ▾

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Step 2 – Now you can view your data in the microRNA Target Filter. See below. You will see microRNA names and symbols on the left (**A**), mRNA targets on the right (**B**), the source that describes the target relationship (**C**), and the confidence level of the predicted relationship (not relevant for experimentally demonstrated relationships) (**D**).

microRNA Target Filter

1 microRNA Families have targeting information available.
Filtered to 1 microRNAs targeting 1518 mRNAs.

ADD/REPLACE MRNA DATASET EXPRESSION PAIRING ↕

Details Summary

ADD TO MY PATHWAY ADD TO MY LIST

Use ▾ to filter a column. Add data or more columns using 'Add column(s) + '.

microRNA dataset: mir-373_multi-confidence.txt	Add column(s) +	Relationship	Add column(s) +	mRNA	Add column(s) +
ID	Symbol	Source	Confidence	Symbol	
<input type="checkbox"/> MIMAT0000725	A mir-373	TargetScan Human	Moderate (predicted)	B AADACL3	
<input type="checkbox"/> MIMAT0000725	mir-373	TargetScan Human	High (predicted)	AAK1	
<input type="checkbox"/> MIMAT0000725	mir-373	TargetScan Human	High (predicted)	ABCA1	
<input type="checkbox"/> MIMAT0000725	mir-373	TargetScan Human	Moderate (predicted)	ABCA10	
<input type="checkbox"/> MIMAT0000725	mir-373	TargetScan Human	High (predicted)	ABCG2	
<input type="checkbox"/> MIMAT0000725	mir-373	TargetScan Human	Moderate (predicted)	ABHD15	
<input type="checkbox"/> MIMAT0000725	mir-373	TargetScan Human	Moderate (predicted)	ABHD3	
<input type="checkbox"/> MIMAT0000725	mir-373	TargetScan Human	Moderate (predicted)	ABI2	
<input type="checkbox"/> MIMAT0000725	mir-373	TargetScan Human	High (predicted)	ABI3	

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Step 3 – Use the microRNA Target Filter to identify the relationships most biologically relevant to your experimental conditions.

- Click “Add Columns” within the table to include biological information about the targets such as species, diseases, tissues, pathways, cell lines, molecules, and more. This helps you identify the relationships most biologically relevant to your experimental conditions or research focus.
- Click on “Add/replace mRNA dataset” to focus on targets that have changed expression in your experiment. You may use “Expression Pairing” to find microRNA and target pairs with opposite (or same) expression.

For example: You have microRNA data from metastatic tumor samples and want to know what genes might be targeted by these microRNAs. Once you've uploaded the microRNA data into IPA, use the microRNA Target Filter to focus on targets in cancer or cell growth signaling pathways. If you also have mRNA data from a microarray experiment on the metastasis samples, you can add this mRNA dataset and use expression pairing to focus on targets with expression changes that are opposite to the microRNAs.

(See screenshot on next page)

microRNA Target Filter: melanoma_microRNA_data - CASE STUDY

68 microRNA families have targeting information available. Filtered to 51 microRNAs targeting 32 mRNAs.

ADD/REPLACE MRNA DATASET EXPRESSION PAIRING

Details Summary

ADD TO MY PATHWAY ADD TO MY LIST

Rows: 1 - 131

Use to filter a column. Add data or more columns using 'Add column(s)'



microRNA dataset: melanoma_microRNA_data				mRNA dataset: mRNA Secondary vs Normal						
ID	Symbol	metastatic melanoma (Fold C...	Relationship	Source	Confidence	Expression Pairing	ID	Symbol	Fold Ch...	Molecular Type
<input type="checkbox"/>	hsa-let-7c	let-7 ↓ -3.120	TargetScan Human	High (predicted)	↕	8072015	ADRBK2	↑ 3.394	kinase	
<input type="checkbox"/>	hsa-let-7c	let-7 ↓ -3.120	TargetScan Human	Moderate (predicted)	↕	8067167	AURKA	↑ 2.136	kinase	
<input type="checkbox"/>	hsa-let-7c	let-7 ↓ -3.120	TargetScan Human	High (predicted)	↕	8105121	GHR	↑ 2.052	transmembrane rece	
<input type="checkbox"/>	hsa-let-7c	let-7 ↓ -3.120	TargetScan Human	Moderate (predicted)	↕	7994131	PRKCB	↑ 4.995	kinase	
<input type="checkbox"/>	hsa-miR-206	mir-1 ↑ 1.880	TargetScan Human	Moderate (predicted)	↕	7956301	LRP1	↓ -3.463	transmembrane rece	
<input type="checkbox"/>	hsa-miR-206	mir-1 ↑ 1.880	TargetScan Human	High (predicted)	↕	8008201	NGFR	↓ -2.917	transmembrane rece	
<input type="checkbox"/>	hsa-miR-122	mir-122 ↑ 1.970	TargetScan Human	High (predicted)	↕	7963670	MAP3K12	↓ -3.119	kinase	
<input type="checkbox"/>	hsa-miR-122	mir-122 ↑ 1.970	TargetScan Human	Moderate (predicted)	↕	8157524	TLR4	↓ -6.290	transmembrane rece	
<input type="checkbox"/>	hsa-miR-125a-5p	mir-125 ↓ -1.450	TargetScan Human	Moderate (predicted)	↕	7985213	CHRNA5	↑ 2.965	transmembrane rece	
<input type="checkbox"/>	hsa-miR-125a-5p	mir-125 ↓ -1.450	TargetScan Human	Moderate (predicted)	↕	7994131	PRKCB	↑ 4.995	kinase	
<input type="checkbox"/>	hsa-miR-301a	mir-130 ↑ 3.940	TargetScan Human	Moderate (predicted)	↕	7983360	B2M	↓ -2.162	transmembrane rece	
<input type="checkbox"/>	hsa-miR-301a	mir-130 ↑ 3.940	TargetScan Human	High (predicted)	↕	7963670	MAP3K12	↓ -3.119	kinase	
<input type="checkbox"/>	hsa-miR-212	mir-132 ↑ 1.790	TargetScan Human	Moderate (predicted)	↕	8179519	HLA-DPB1	↓ -10.796	transmembrane rece	
<input type="checkbox"/>	hsa-miR-133b	mir-133 ↑ 2.730	TargetScan Human	High (predicted)	↕	8149733	TNFRSF10B	↓ -2.322	transmembrane rece	
<input type="checkbox"/>	hsa-miR-134	mir-134 ↓ -1.770	TargetScan Human	Moderate (predicted)	↕	7994131	PRKCB	↑ 4.995	kinase	
<input type="checkbox"/>	hsa-miR-140-5p	mir-140 ↓ -1.350	TargetScan Human	Moderate (predicted)	↕	8072015	ADRBK2	↑ 3.394	kinase	
<input type="checkbox"/>	hsa-miR-140-5p	mir-140 ↓ -1.350	TargetScan Human	High (predicted)	↕	7962183	AK4	↑ 2.158	kinase	
<input type="checkbox"/>	hsa-miR-140-5p	mir-140 ↓ -1.350	TargetScan Human	Moderate (predicted)	↕	8067167	AURKA	↑ 2.136	kinase	
<input type="checkbox"/>	hsa-miR-142-5p	mir-142 ↑ 4.460	TargetScan Human	Moderate (predicted)	↕	7983360	B2M	↓ -2.162	transmembrane rece	
<input type="checkbox"/>	hsa-miR-142-5p	mir-142 ↑ 4.460	TargetScan Human	Moderate (predicted)	↕	8099834	TLR1	↓ -3.275	transmembrane rece	
<input type="checkbox"/>	hsa-miR-143	mir-143 ↓ -1.210	TargetScan Human	Moderate (predicted)	↕	8105121	GHR	↑ 2.052	transmembrane rece	

VIEW FILTER SUMMARY SAVE CANCEL

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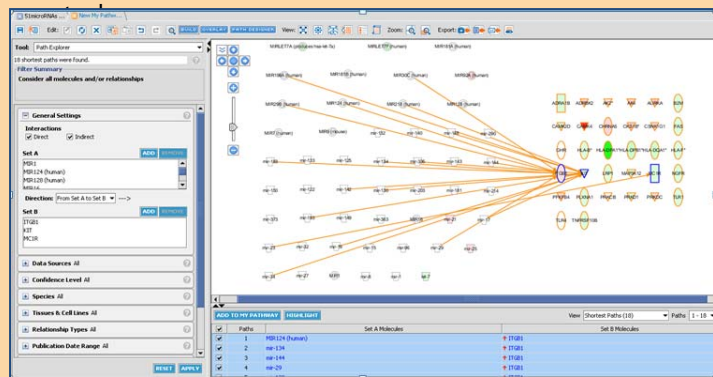
Above, columns have been added to show fold change, expression pairing, molecular type, and pathway. This dataset has also been filtered to include particular molecular types, pathways, and expression pairings. In this example, these filters took a list of 13,690 targets from the data down to just 32 relevant targets for further exploration.

You can filter a column down to selected criteria by using this icon at the top of each column:

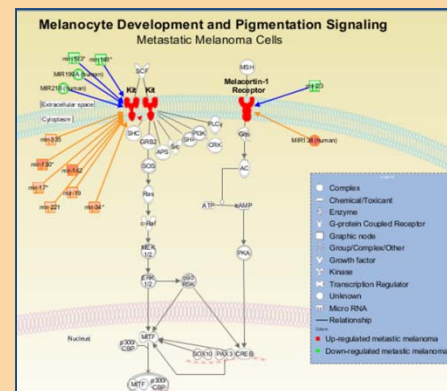
Molecular Type  

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You can click "Add to My Pathway" to send your filtered dataset to a pathway canvas and explore more biological relationships. Here, we have brought in connections between three key target genes of interest in our dataset using IPA's Path Explorer



You can then use Path Designer to create a publication-quality model of microRNA effects – here we show effects on two key regulators in control of melanocyte signaling.



Learn more:

Pre-recorded webinar: See the microRNA Target Filter in action with this dataset at: <https://www1.qotomeeting.com/register/181586040>

Web page: Learn about how IPA can help you understand your microRNA data at: <http://www.ingenuity.com/products/IPA/microRNA.html>