

## eAppendix

### *MiRNAs selection and analysis*

We selected 14 miRNAs that have been previously reported as involved in processes related to inflammation,<sup>1–5</sup> endothelial dysfunction,<sup>6,7</sup> and atherosclerosis.<sup>8–11</sup> Total RNA was extracted from stored frozen buffy coat of 7 mL whole blood, using TRIzol<sup>®</sup> (Invitrogen, Carlsbad, CA), as per manufacturer's instructions. RNA purity and concentration were determined using a NanoDrop ND-1000 Spectrophotometer (Rockland, DE).

We used stem-loop quantitative real-time RT-PCR<sup>12</sup> to detect and quantify 14 miRNAs. In the reverse transcription step, we used TaqMan<sup>®</sup> MicroRNA Reverse Transcription Kit (Applied Biosystems) and custom 96 well plates pre-spotted with specific miRNA stem-loop primers (Applied Biosystems). Real-time polymerase chain reaction (PCR) was performed using TaqMan<sup>®</sup> custom 384 well plates (Applied Biosystems) and TaqMan<sup>®</sup> Universal PCR Master Mix (Applied Biosystems). All PCR runs were performed in triplicate on a 7900HT Fast Real-Time PCR System (Applied Biosystems) (95°C for 10 min and 40 cycles of 95°C for 15 sec and 60°C for 1 min) in 10µl final volume. Normalization was performed using two endogenous control miRNAs, *RNU24* and *RNU48*. The threshold cycle (Ct) was defined as the fractional cycle number at which the fluorescence passes the fixed threshold. The relative gene expression was calculated via a  $2^{-\Delta\Delta C_t}$  method.<sup>13</sup> Blood samples for miRNAs were analyzed in two batches (20 participants in the first and 146 in the second one). Data are presented as the relative quantity of target miRNA, normalized to endogenous controls and a calibrator built as a pool of 8/20 and 20/146 random samples in each batch, respectively. DataAssist<sup>TM</sup> Software (Applied Biosystems) was employed to provide relative quantification analysis of miRNAs expression.

### *SNPs selection and genotyping*

SNPs were selected based on previously published works investigating modification of effects of PM<sub>2.5</sub> and traffic pollutants on health outcomes.<sup>14,15</sup> Genotyping was performed using multiplex PCR assays designed with Sequenom Spectro DESIGNER software (Sequenom, Inc., San Diego, CA). The extension product was then spotted onto a 384-well spectroCHIP before analysis in the MALDITOF mass spectrometer (Sequenom, Inc.). Duplication was performed on 5% of the samples. The 6 SNPs analyzed for this study were all successfully genotyped. After genotyping,

we excluded those SNPs for which fewer than 3 participants were homozygous variant carriers [rs13078 in DICER, rs197414 in Gem-associated protein 3 (GEMIN3)], leaving a total of 4 SNPs in 2 genes (rs7813, rs910925 and rs1062923 in GEMIN4, rs1640299 in DGCR8).

#### *Statistical methods*

We investigated the effect of exposure to PM<sub>2.5</sub> on miRNAs levels within the population. The effects of black carbon, organic carbon and SO<sub>4</sub><sup>2-</sup> were also assessed to determine whether certain sources/types of particle pollution such as traffic and coal combustion produced different effects. We also examined gene-by-environment interactions between pollutants and selected SNPs in miRNA-related genes. We tested for nonlinearity using penalized splines in generalized linear models. Linear regression multivariate models were constructed to estimate the effects of each air pollutant. MiRNAs measurements were natural-log-transformed to improve normality. The following adjusting variables were selected a priori, based on previous work investigating associations between miRNAs and particles in foundry workers<sup>16</sup>: age, body mass index (BMI), cigarette smoking (never, former, current), and pack-years. We adjusted for percent of granulocytes (to control for possible shifts in leukocyte differential count), date, and seasonality (using sine and cosine). We first determined for each pollutant the most representative time window to be used in our main analysis to examine the association of investigated pollutants with 14 miRNAs. We then examined SNP-by-pollutant cross-product terms for the selected pollutants' time window to assess gene-by-environment interactions, only for those miRNAs that we found associated with pollutants. To reduce the number of tested associations we examined only the recessive model of inheritance.

All statistical analyses were carried out using R 2.12.1 (R Foundation for Statistical Computing, Vienna, Austria). All effect estimates ( $\beta$ ) and their 95% confidence intervals (CI) are presented as percent changes per-interquartile-range (IQR) change of pollutant at each averaging time period, using the formula  $(e^{\beta * IQR} - 1) \times 100$ .

#### *Sensitivity analyses*

Because blood samples for SNPs genotyping was available in a subset of participants, we restricted our analysis of the association between miRNA and pollutants to participants with some or all miRNA-related SNPs. Moreover, since blood samples for miRNAs were analyzed in

two batches, results from the two groups may differ. We therefore controlled for batch in joint analyses and performed a sensitivity analysis restricting to the group with more participants.

In order to account for potential population stratification, we ran a sensitivity analysis by restricting to persons of the most represented race based on self-report. Moreover, to take into account differences in the distance from the monitoring site to the participant's residence, we performed a sensitivity analysis by restricting to the 95% of people living closest to the monitoring site.

#### *In silico pathway analysis*

MiRNAs that were significantly associated with the pollutants were further investigated, together with their target genes, with GeneGO pathways enrichment analysis in MetaCore™ v6.9 (GeneGo Inc.), a web-based computational platform for multiple applications in systems biology. Enrichment analysis consists of matching a list of gene IDs with gene IDs in GeneGO pathway map and GeneGO process ontologies, and then calculating the probability for a particular mapping of an experiment to an ontology term to arise by chance. In MetaCore the probability for a particular mapping of an experiment to an ontology term (or a built network) to arise by chance, considering the numbers of genes in experiment versus the number of genes in the ontology term (or network) within the full set of all genes on the ontology (or network), is calculated using the basic equation for hypergeometric distribution (eEquation 1). MetaCore analyses are based on MetaBase, a proprietary database of mammalian biology that contains over 6 million manually curated experimental findings on protein-protein, protein-DNA and protein-compound interactions, metabolic and signaling pathways, supported by proprietary ontologies and controlled vocabulary.

Experimentally validated target genes were obtained from miRTarBase v3.5,<sup>17</sup> a database of miRNA-target interactions that are collected by surveying pertinent literature, as well as on predicted targets from TargetScan v6.2.<sup>18</sup> TargetScan uses an algorithm to calculate the Total Context Score (TCS) for each predicted miRNA hit as a measure of targeting efficacy, i.e. the sum of the site-type, 3' pairing, local AU and position contribution, and corresponds to the  $\log_2$  ratio of expected regulation in experimental systems<sup>19</sup>. In order to reduce the false-positive rate, predicted targets with a TCS lower than -0.2 were considered biologically relevant and

acceptable for analysis. All analyses in MetaCore were filtered on human data. We set a false discovery rate (FDR) threshold at a level of 0.05 for all experiment.

#### *MiRNA-target expression correlation*

Since only small portions of validated target messenger RNAs (mRNAs) are known for each miRNA and the prediction algorithm can provide false-positive results,<sup>20</sup> we also tested the expression correlation of miRNAs and predicted targets included in the pathways analysis (i.e. targets from TargetScan with Total Context Score lower than -0.2), using the data available in the MirGator v3.0.<sup>21</sup> MirGator is a public database that collects 73 deep-sequencing datasets on human samples from Gene Expression Omnibus,<sup>22</sup> Short Read Archive<sup>23</sup> and The Cancer Genome Atlas archives.<sup>24</sup> In MirGator the correlation coefficient is calculated using the Spearman rank correlation on deep-sequencing data of mRNA-seq and miRNA-seq from the same sample.

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**eEquation 1.** Basic Equation for Hypergeometric Distribution.

$$p - Value = \frac{R! n! (N - R)! (N - n)!}{N!} \sum_{i=\max(r,R+n-N)}^{\min(n,R)} \frac{1}{i! (R - i)! (n - i)! (N - R - n + 1)!}$$

Abbreviations:  $N$ , total number of nodes in MetaCore database;  $R$ , number of the network objects corresponding to the genes and proteins in your list;  $n$ , total number of nodes in each small network generated from your list;  $r$ , number of nodes with data in each small network generated from your list.

**eTable 1:** Daily concentration of pollutants and Spearman's correlation coefficients ( $\rho$ ).

	# obs.	Mean (SD)	Median (25 <sup>th</sup> -75 <sup>th</sup> )	PM <sub>2.5</sub>	BC	OC	SO <sub>4</sub> <sup>2-</sup>	Spearman's $\rho$
<b>PM<sub>2.5</sub> [μg/m<sup>3</sup>]</b>	153	8.74 (4.99)	7.38 (5.56 – 10.23)		1			
<b>BC [μg/m<sup>3</sup>]</b>	153	0.71 (0.39)	0.64 (0.45 – 0.84)	0.717 **		1		
<b>OC [μg/m<sup>3</sup>]</b>	132	3.50 (1.25)	3.29( 2.48 – 4.11)	0.725 **	0.686 **		1	
<b>SO<sub>4</sub><sup>2-</sup> [μg/m<sup>3</sup>]</b>	152	2.22 (1.90)	1.73 (0.92 – 2.65)	0.931 **	0.578 **	0.578 **	1	

\*p<0.05; \*\*p<0.01

**eTable 2.** Percentage change in fourteen candidate miRNAs for an IQR change in each pollutant in different exposure windows.

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-1	OC	1-d	1.63	-17.8	-41.4	15.4
		2-d	1.56	-33.8	-53.5	-5.7
		7-d	1.24	-28.1	-54.1	12.7
		14-d	1.24	-22.6	-52.8	27.1
		21-d	1.09	-16.7	-48.5	34.8
		28-d	1.14	-21.8	-57.0	42.4
BC		4-h	0.76	-13.0	-32.0	11.4
		1-d	0.38	-7.0	-25.4	16.0
		2-d	0.34	-11.2	-30.1	12.8
		7-d	0.26	-19.8	-44.0	14.8
		14-d	0.21	0.9	-29.4	44.3
		21-d	0.18	-0.5	-31.0	43.3
PM <sub>2.5</sub>		4-h	4.16	-16.3	-28.7	-1.8
		1-d	4.67	-15.6	-32.1	4.9
		2-d	3.82	-23.2	-36.9	-6.5
		7-d	3.83	-33.2	-50.2	-10.2
		14-d	3.04	-20.7	-38.7	2.7
		21-d	3.15	-16.0	-37.7	13.3

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-1	$\text{PM}_{2.5}$	28-d	3.02	-20.8	-42.2	8.6
		1-d	1.73	-16.4	-32.5	3.4
		2-d	1.47	-24.8	-38.2	-8.4
		7-d	1.10	-24.7	-39.4	-6.3
		14-d	1.16	-18.7	-37.5	5.8
		21-d	1.24	-16.9	-38.7	12.6
miR-125a-5p	OC	28-d	0.92	-16.6	-35.0	7.0
		1-d	1.63	1.1	-20.2	28.0
		2-d	1.56	-6.2	-26.9	20.4
		7-d	1.24	-6.3	-31.6	28.4
		14-d	1.24	-4.4	-32.3	35.1
		21-d	1.09	-0.5	-28.9	39.2
	BC	28-d	1.14	12.6	-26.5	72.5
		4-h	0.76	0.4	-14.7	18.2
		1-d	0.38	0.5	-13.1	16.2
		2-d	0.34	-4.1	-18.1	12.3
PM <sub>2.5</sub>	PM <sub>2.5</sub>	7-d	0.26	-14.3	-32.3	8.5
		14-d	0.21	-18.6	-35.5	2.7
		21-d	0.18	-21.5	-38.1	-0.5
		28-d	0.13	-13.7	-29.1	4.9
		4-h	4.16	-7.3	-16.6	3.1

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-125a-5p	PM <sub>2.5</sub>	1-d	4.67	-9.6	-21.6	4.3
		2-d	3.82	-11.3	-22.2	1.1
		7-d	3.83	-16.3	-31.3	1.9
		14-d	3.04	-16.4	-29.4	-1.0
		21-d	3.15	-15.7	-30.7	2.5
		28-d	3.02	-12.4	-28.9	7.8
SO <sub>4</sub> <sup>2-</sup>		1-d	1.73	-10.4	-22.2	3.1
		2-d	1.47	-12.0	-22.8	0.4
		7-d	1.10	-11.4	-23.4	2.4
		14-d	1.16	-17.6	-30.6	-2.2
		21-d	1.24	-17.8	-32.6	0.3
		28-d	0.92	-12.0	-25.3	3.6
miR-125b	OC	1-d	1.63	5.3	-18.6	36.1
		2-d	1.56	9.0	-17.0	43.2
		7-d	1.24	8.9	-22.6	53.3
		14-d	1.24	7.9	-26.0	57.3
		21-d	1.09	13.7	-21.2	63.9
		28-d	1.14	21.8	-23.4	93.7
BC		4-h	0.76	2.6	-14.3	22.9
		1-d	0.38	3.4	-12.0	21.4
		2-d	0.34	2.3	-14.1	21.9

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-125b	BC	7-d	0.26	-10.6	-31.2	16.3
		14-d	0.21	-11.3	-31.6	14.9
		21-d	0.18	-7.7	-29.2	20.4
		28-d	0.13	-3.4	-22.4	20.2
	PM <sub>2.5</sub>	4-h	4.16	-7.0	-17.3	4.6
		1-d	4.67	-7.5	-21.1	8.4
		2-d	3.82	-5.8	-18.6	9.1
		7-d	3.83	-11.3	-28.7	10.5
		14-d	3.04	-10.7	-26.1	7.9
		21-d	3.15	-5.3	-23.9	17.7
		28-d	3.02	-1.4	-21.8	24.3
		SO <sub>4</sub> <sup>2-</sup>	1.73	-8.4	-21.6	7.0
	OC	1-d	1.47	-6.3	-19.1	8.5
		7-d	1.10	-6.3	-20.3	10.3
		14-d	1.16	-9.2	-25.1	10.1
		21-d	1.24	-5.1	-24.0	18.6
		28-d	0.92	-1.6	-18.1	18.1
		1-d	1.63	-17.0	-34.5	5.2
		2-d	1.56	-24.3	-41.0	-3.0
		7-d	1.24	-24.2	-44.7	3.9
		14-d	1.24	-24.4	-46.5	6.8

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-126	OC	21-d	1.09	-18.0	-41.5	15.0
		28-d	1.14	-12.0	-42.6	34.9
	BC	4-h	0.76	-4.7	-19.3	12.6
		1-d	0.38	-5.2	-18.2	10.0
		2-d	0.34	-9.9	-23.2	5.8
		7-d	0.26	-23.6	-39.8	-3.0
		14-d	0.21	-23.3	-39.4	-2.9
	PM <sub>2.5</sub>	21-d	0.18	-23.1	-39.6	-2.1
		28-d	0.13	-18.9	-33.5	-1.1
		4-h	4.16	-10.3	-19.5	-0.1
SO <sub>4</sub> <sup>2-</sup>	PM <sub>2.5</sub>	1-d	4.67	-15.2	-26.6	-2.1
		2-d	3.82	-18.0	-28.1	-6.5
		7-d	3.83	-24.6	-38.1	-8.1
		14-d	3.04	-23.1	-35.1	-8.9
		21-d	3.15	-21.2	-35.3	-4.0
	SO <sub>4</sub> <sup>2-</sup>	28-d	3.02	-19.4	-34.7	-0.5
		1-d	1.73	-14.9	-26.1	-1.9
		2-d	1.47	-17.2	-27.5	-5.5
		7-d	1.10	-18.4	-29.5	-5.6
		14-d	1.16	-23.2	-35.4	-8.7
		21-d	1.24	-22.5	-36.6	-5.3

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-126	$\text{SO}_4^{2-}$	28-d	0.92	-16.4	-29.2	-1.3
miR-128	OC	1-d	1.63	-8.3	-29.2	18.8
		2-d	1.56	-3.8	-26.9	26.6
		7-d	1.24	-1.4	-30.3	39.5
		14-d	1.24	-9.2	-37.8	32.7
		21-d	1.09	-1.8	-32.1	42.2
	BC	28-d	1.14	3.1	-35.5	64.7
		4-h	0.76	4.3	-12.6	24.5
		1-d	0.38	6.2	-9.3	24.3
		2-d	0.34	3.0	-13.3	22.2
		7-d	0.26	-12.4	-32.2	13.3
$\text{PM}_{2.5}$	$\text{PM}_{2.5}$	14-d	0.21	-17.9	-36.2	5.8
		21-d	0.18	-18.0	-36.7	6.3
		28-d	0.13	-13.8	-30.4	6.6
		4-h	4.16	-7.1	-17.2	4.3
		1-d	4.67	-9.0	-22.1	6.3
	$\text{PM}_{2.5}$	2-d	3.82	-6.9	-19.4	7.4
		7-d	3.83	-13.2	-30.0	7.6
		14-d	3.04	-16.4	-30.5	0.5
		21-d	3.15	-13.7	-30.3	6.7
		28-d	3.02	-11.8	-29.6	10.6

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-128	$\text{SO}_4^{2-}$	1-d	1.73	-9.6	-22.4	5.4
		2-d	1.47	-7.3	-19.7	7.1
		7-d	1.10	-6.8	-20.5	9.3
		14-d	1.16	-15.0	-29.5	2.5
		21-d	1.24	-13.3	-30.2	7.7
		28-d	0.92	-10.1	-24.8	7.5
miR-135a	OC	1-d	1.63	-18.6	-37.2	5.5
		2-d	1.56	-28.4	-45.4	-6.1
		7-d	1.24	-30.1	-50.5	-1.4
		14-d	1.24	-23.9	-48.1	11.6
		21-d	1.09	-24.7	-48.1	9.2
		28-d	1.14	-28.6	-55.2	14.0
BC	BC	4-h	0.76	-10.2	-25.0	7.6
		1-d	0.38	-7.0	-20.9	9.3
		2-d	0.34	-10.7	-25.0	6.4
		7-d	0.26	-26.3	-43.1	-4.4
		14-d	0.21	-13.2	-33.1	12.7
		21-d	0.18	-21.8	-40.0	2.0
$\text{PM}_{2.5}$	$\text{PM}_{2.5}$	4-h	4.16	-11.4	-21.2	-0.4
		1-d	4.67	-15.3	-27.7	-0.8

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-135a	PM <sub>2.5</sub>	2-d	3.82	-19.4	-30.2	-7.0
		7-d	3.83	-29.3	-42.9	-12.4
		14-d	3.04	-22.4	-35.6	-6.5
		21-d	3.15	-23.9	-38.6	-5.6
		28-d	3.02	-23.0	-38.8	-3.2
SO <sub>4</sub> <sup>2-</sup>		1-d	1.73	-14.6	-27.0	-0.2
		2-d	1.47	-18.0	-29.0	-5.2
		7-d	1.10	-19.4	-31.3	-5.4
		14-d	1.16	-19.7	-33.7	-2.9
		21-d	1.24	-22.4	-37.8	-3.3
miR-146a	OC	28-d	0.92	-17.6	-31.3	-1.3
		1-d	1.63	1.9	-22.0	33.2
		2-d	1.56	-14.0	-35.2	14.0
		7-d	1.24	-20.0	-44.0	14.2
		14-d	1.24	-9.7	-39.7	35.2
	BC	21-d	1.09	5.4	-28.7	56.0
		28-d	1.14	33.2	-17.6	115.2
		4-h	0.76	-4.5	-21.4	16.0
		1-d	0.38	-0.4	-16.3	18.5
		2-d	0.34	-7.0	-23.0	12.3
		7-d	0.26	-27.5	-45.2	-4.2

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-146a	BC	14-d	0.21	-26.3	-44.1	-2.8
		21-d	0.18	-29.7	-47.0	-6.8
		28-d	0.13	-18.5	-35.5	3.0
	$\text{PM}_{2.5}$	4-h	4.16	-14.3	-24.4	-2.9
		1-d	4.67	-17.8	-30.6	-2.6
		2-d	3.82	-22.1	-33.2	-9.2
		7-d	3.83	-34.2	-47.6	-17.4
		14-d	3.04	-27.0	-40.2	-10.9
		21-d	3.15	-22.0	-38.1	-1.5
		28-d	3.02	-15.1	-33.8	9.0
SO <sub>4</sub> <sup>2-</sup>	1-d	1.73	-20.3	-32.5	-6.0	
		2-d	1.47	-23.8	-34.6	-11.1
		7-d	1.10	-24.4	-36.2	-10.4
	21-d	1.16	-25.6	-39.3	-8.9	
		1.24	-21.9	-38.4	-1.0	
		0.92	-11.7	-27.4	7.5	
		1-d	1.63	-13.3	-44.6	35.7
		2-d	1.56	6.1	-34.0	70.5
		7-d	1.24	-0.3	-45.2	81.3
miR-147	OC	14-d	1.24	-9.2	-53.4	76.7
		21-d	1.09	7.4	-44.0	105.8

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-147	OC	28-d	1.14	13.0	-50.6	158.6
		4-h	0.76	15.4	-15.3	57.2
		1-d	0.38	6.7	-19.1	40.8
		2-d	0.34	8.0	-20.1	45.9
		7-d	0.26	-8.5	-41.7	43.7
		14-d	0.21	-18.8	-48.0	26.8
		21-d	0.18	-14.3	-45.7	35.3
		28-d	0.13	-11.2	-38.9	29.2
		PM <sub>2.5</sub>	4.16	-19.3	-34.0	-1.4
		4-h	4.67	-19.8	-38.9	5.2
SO <sub>4</sub> <sup>2-</sup>	SO <sub>4</sub> <sup>2-</sup>	1-d	3.82	-10.1	-30.1	15.6
		2-d	3.83	-19.5	-44.8	17.4
		7-d	3.04	-18.2	-40.9	13.2
		14-d	3.15	-14.7	-41.4	24.0
		21-d	3.02	-15.2	-43.0	26.2
		28-d	1.73	-20.9	-39.4	3.3
		2-d	1.47	-12.6	-32.1	12.5
		7-d	1.10	-12.6	-33.9	15.5
		14-d	1.16	-15.2	-39.0	18.1
		21-d	1.24	-14.0	-41.3	26.1
		28-d	0.92	-11.4	-35.2	21.3

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-155	OC	1-d	1.63	-2.9	-20.4	18.5
		2-d	1.56	-14.6	-30.7	5.3
		7-d	1.24	-16.8	-36.0	8.1
		14-d	1.24	-13.7	-35.1	14.8
		21-d	1.09	-15.1	-35.7	12.1
		28-d	1.14	-12.6	-38.4	23.9
BC		4-h	0.76	9.1	-4.9	25.1
		1-d	0.38	10.7	-2.0	25.1
		2-d	0.34	2.4	-10.4	17.0
		7-d	0.26	-13.1	-28.8	6.1
		14-d	0.21	-13.4	-28.9	5.5
		21-d	0.18	-16.6	-31.8	2.0
PM <sub>2.5</sub>		4-h	4.16	-4.0	-12.3	5.0
		1-d	4.67	-6.8	-17.4	5.3
		2-d	3.82	-12.0	-21.2	-1.8
		7-d	3.83	-20.8	-32.8	-6.7
		14-d	3.04	-19.3	-29.9	-7.1
		21-d	3.15	-18.6	-30.9	-4.1
SO <sub>4</sub> <sup>2-</sup>		28-d	3.02	-16.2	-29.7	-0.3
		1-d	1.73	-10.1	-20.1	1.2

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-155	$\text{SO}_4^{2-}$	2-d	1.47	-14.5	-23.4	-4.5
		7-d	1.10	-15.6	-25.2	-4.7
		14-d	1.16	-19.9	-30.6	-7.6
		21-d	1.24	-20.7	-32.8	-6.3
		28-d	0.92	-14.6	-25.5	-2.0
miR-21	OC	1-d	1.63	-12.0	-33.4	16.3
		2-d	1.56	-25.8	-44.5	-0.7
		7-d	1.24	-28.6	-50.6	3.1
		14-d	1.24	-14.9	-43.7	28.5
		21-d	1.09	-4.7	-36.1	42.1
	BC	28-d	1.14	6.1	-35.5	74.6
		4-h	0.76	-11.3	-27.0	7.6
		1-d	0.38	-7.8	-22.5	9.7
		2-d	0.34	-13.5	-28.3	4.3
		7-d	0.26	-35.3	-50.8	-14.8
	$\text{PM}_{2.5}$	14-d	0.21	-24.1	-42.5	0.2
		21-d	0.18	-25.1	-43.6	-0.5
		28-d	0.13	-18.3	-35.3	3.3
		4-h	4.16	-12.9	-23.2	-1.2
		1-d	4.67	-18.0	-30.7	-2.8
		2-d	3.82	-21.8	-33.0	-8.9

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-21	PM <sub>2.5</sub>	7-d	3.83	-34.7	-48.0	-18.1
		14-d	3.04	-24.4	-38.1	-7.6
		21-d	3.15	-21.0	-37.4	-0.2
		28-d	3.02	-16.7	-35.1	6.8
	SO <sub>4</sub> <sup>2-</sup>	1-d	1.73	-20.3	-32.5	-6.1
		2-d	1.47	-22.7	-33.7	-9.9
		7-d	1.10	-24.5	-36.3	-10.5
		14-d	1.16	-24.0	-38.0	-6.8
		21-d	1.24	-23.2	-39.4	-2.7
		28-d	0.92	-15.0	-30.1	3.4
	OC	1-d	1.63	-14.1	-39.6	22.0
		2-d	1.56	-15.5	-41.7	22.7
		7-d	1.24	2.3	-36.1	63.8
		14-d	1.24	1.1	-40.2	71.0
		21-d	1.09	13.8	-31.8	89.9
		28-d	1.14	37.6	-27.2	160.0
miR-218	BC	4-h	0.76	10.4	-14.3	42.3
		1-d	0.38	3.6	-17.4	30.0
		2-d	0.34	-3.5	-24.6	23.4
		7-d	0.26	-22.8	-46.6	11.5
		14-d	0.21	-31.0	-51.9	-1.0

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-218	BC	21-d	0.18	-25.4	-48.6	8.1
		28-d	0.13	-10.6	-34.2	21.6
		PM <sub>2.5</sub>	4-h	4.16	-12.1	-25.5
		1-d	4.67	-19.7	-35.7	0.2
		2-d	3.82	-17.0	-32.4	1.8
		7-d	3.83	-26.5	-45.8	-0.1
		14-d	3.04	-22.2	-40.3	1.4
		21-d	3.15	-13.9	-36.6	17.0
		28-d	3.02	-6.6	-32.6	29.3
		SO <sub>4</sub> <sup>2-</sup>	1-d	1.73	-19.2	0.5
		2-d	1.47	-16.1	-31.7	3.0
		7-d	1.10	-17.0	-33.9	4.1
		14-d	1.16	-20.3	-39.1	4.3
		21-d	1.24	-12.7	-36.1	19.4
		28-d	0.92	-3.7	-25.5	24.6
miR-222	OC	1-d	1.63	-1.3	-19.8	21.6
		2-d	1.56	-5.0	-23.9	18.4
		7-d	1.24	-9.7	-31.4	18.8
		14-d	1.24	-10.1	-33.2	21.0
		21-d	1.09	-2.6	-27.1	30.0
		28-d	1.14	7.2	-25.5	54.4

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-222	BC	4-h	0.76	4.7	-9.7	21.5
		1-d	0.38	4.1	-8.9	18.8
		2-d	0.34	-0.9	-14.2	14.5
		7-d	0.26	-16.9	-32.9	2.9
		14-d	0.21	-18.6	-34.1	0.6
		21-d	0.18	-18.1	-34.0	1.7
PM <sub>2.5</sub>	PM <sub>2.5</sub>	4-h	4.16	-8.5	-16.9	0.8
		1-d	4.67	-11.3	-22.1	1.0
		2-d	3.82	-11.7	-21.6	-0.6
		7-d	3.83	-19.9	-32.9	-4.3
		14-d	3.04	-16.4	-28.3	-2.5
		21-d	3.15	-13.0	-27.2	4.0
SO <sub>4</sub> <sup>2-</sup>	SO <sub>4</sub> <sup>2-</sup>	1-d	1.73	-12.6	-22.9	-0.9
		2-d	1.47	-13.2	-23.0	-2.3
		7-d	1.10	-12.8	-23.6	-0.5
		14-d	1.16	-14.8	-27.2	-0.4
		21-d	1.2	-13.1	-27.5	4.3
		28-d	0.9	-6.9	-19.9	8.1
miR-9	OC	1-d	1.63	-4.5	-21.5	16.3

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-9	OC	2-d	1.56	-22.2	-36.5	-4.6
		7-d	1.24	-19.0	-37.5	5.1
		14-d	1.24	-11.0	-34.1	20.2
		21-d	1.09	-6.5	-30.2	25.2
		28-d	1.14	-11.5	-38.9	28.2
BC	BC	4-h	0.76	-6.0	-18.6	8.5
		1-d	0.38	-7.7	-18.8	4.9
		2-d	0.34	-14.0	-25.0	-1.3
		7-d	0.26	-25.7	-39.4	-8.9
		14-d	0.21	-17.4	-32.7	1.4
PM <sub>2.5</sub>	PM <sub>2.5</sub>	21-d	0.18	-15.2	-31.3	4.7
		28-d	0.13	-10.4	-24.7	6.5
		4-h	4.16	-5.3	-13.8	4.0
		1-d	4.67	-10.4	-21.0	1.6
		2-d	3.82	-16.4	-25.4	-6.4
SO <sub>4</sub> <sup>2-</sup>	SO <sub>4</sub> <sup>2-</sup>	7-d	3.83	-22.1	-34.4	-7.6
		14-d	3.04	-16.1	-27.7	-2.6
		21-d	3.15	-13.7	-27.4	2.6
		28-d	3.02	-14.1	-28.5	3.1
		1-d	1.73	-12.2	-22.4	-0.7
		2-d	1.47	-16.0	-25.1	-5.9

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-9	$\text{SO}_4^{2-}$	7-d	1.10	-15.0	-25.1	-3.5
		14-d	1.16	-15.0	-26.9	-1.1
		21-d	1.24	-13.8	-27.7	2.8
		28-d	0.92	-11.5	-23.4	2.2
miR-96	OC	1-d	1.63	9.4	-22.8	55.1
		2-d	1.56	13.7	-21.4	64.6
		7-d	1.24	-13.2	-45.6	38.4
		14-d	1.24	-21.3	-53.0	31.8
		21-d	1.09	-16.8	-49.7	37.6
		28-d	1.14	-12.7	-53.6	64.3
		BC	0.76	1.4	-20.4	29.2
PM <sub>2.5</sub>	PM <sub>2.5</sub>	4-h	0.38	-1.4	-20.6	22.5
		1-d	0.34	-4.9	-24.8	20.3
		2-d	0.26	-25.8	-47.7	5.3
		7-d	0.21	-13.7	-39.1	22.3
		14-d	0.18	-19.5	-43.6	15.0
		21-d	0.13	-19.7	-40.0	7.4
		28-d	4.16	-3.9	-18.0	12.7
		4-h	4.67	-9.4	-26.8	12.2
		1-d	3.82	-7.6	-24.1	12.6
		7-d	3.83	-22.8	-42.4	3.5

MiR	Pollutant	MA	IQR	% change	C.I. 95%	
			( $\mu\text{g}/\text{m}^3$ )		lower	higher
miR-96	PM <sub>2.5</sub>	14-d	3.04	-19.3	-37.3	4.0
		21-d	3.15	-26.7	-45.1	-2.1
		28-d	3.02	-27.5	-46.7	-1.5
	SO <sub>4</sub> <sup>2-</sup>	1-d	1.73	-10.4	-27.4	10.6
		2-d	1.47	-10.0	-26.1	9.6
		7-d	1.10	-17.6	-33.6	2.3
		14-d	1.16	-17.7	-36.4	6.5
		21-d	1.24	-26.2	-45.0	-0.8
		28-d	0.92	-24.0	-40.3	-3.2

**eTable 3:** Estimated Change in MiR-146a and -21 for a 1  $\mu\text{g}/\text{m}^3$  in 7-days PM<sub>2.5</sub> Compared to Covariates Included in the Model a Priori Based on Literature ( $n = 153$ ).

<b>Covariate</b>	<b>miR-146a</b>		<b>miR-21</b>		
	<b><math>\beta</math></b>	<b>95% C.I.</b>	<b><math>\beta</math></b>	<b>95% C.I.</b>	
7d PM <sub>2.5</sub>	-0.109	-0.169 to -0.050	-0.111	-0.171 to -0.052	
age	-0.006	-0.037 to 0.025	0.014	-0.016 to 0.045	
bmi	0.024	-0.012 to 0.061	0.043	0.007 to 0.08	
smoking status	current	0.81	-0.848 to 2.469	1.342	-0.316 to 2.999
	former	-0.066	-0.517 to 0.385	0.239	-0.211 to 0.69
packyrs		0.002	-0.008 to 0.012	0.001	-0.009 to 0.011
granul		-0.015	-0.038 to 0.008	-0.004	-0.027 to 0.018

**Table e4.** MiRNA/mRNA<sup>a</sup> couples inversely correlated ( $r < -0.5$ ) in one or more deep sequencing datasets in MirGator.

	MirGator Datasets showing inverse miRNA/mRNA correlation						
	0	1	2	3	5	6	7
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
miR-1	152 (59%)	69 (27%)	31 (12%)	5 (2%)	2 (1%)	0 (0%)	0 (0%)
miR-126	12 (63%)	7 (37%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
miR-135a	134 (52%)	83 (32%)	23 (9%)	18 (7%)	0 (0%)	0 (0%)	0 (0%)
miR-146a	56 (75%)	14 (19%)	4 (5%)	1 (1%)	0 (0%)	0 (0%)	0 (0%)
miR-155	84 (2%)	37 (2%)	6 (2%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)
miR-21	76 (63%)	26 (21%)	16 (13%)	3 (2%)	0 (0%)	0 (0%)	0 (0%)
miR-222	131 (62%)	66 (31%)	14 (7%)	0 (0%)	1 (0%)	0 (0%)	0 (0%)
miR-9	103 (45%)	74 (32%)	38 (17%)	7 (3%)	5 (2%)	0 (0%)	1 (0%)

<sup>a</sup> TargetScan predicted targets with TCS lower than -0.20.

**eTable 5:** GeneGo Pathways Enriched in miR-1 Target Genes

#	Maps		Ratio <sup>a</sup>	-log(p)	FDR
1	Cardiac Hypertrophy_NF-AT signaling in Cardiac Hypertrophy	<a href="#">7</a>	65	4.805	<0.05
2	Development_Role of HDAC and calcium/calmodulin-dependent kinase (CaMK) in control of skeletal myogenesis	<a href="#">6</a>	54	4.263	<0.05
3	Transcription_Role of heterochromatin protein 1 (HP1) family in transcriptional silencing	<a href="#">4</a>	22	3.837	<0.05
4	Transport_Clathrin-coated vesicle cycle	<a href="#">6</a>	71	3.594	<0.05
5	Immune response_Function of MEF2 in T lymphocytes	<a href="#">5</a>	50	3.412	<0.05
6	Cardiac Hypertrophy_Ca(2+)-dependent NF-AT signaling in Cardiac Hypertrophy	<a href="#">5</a>	57	3.146	<0.05
7	Development_Regulation of epithelial-to-mesenchymal transition (EMT)	<a href="#">5</a>	64	2.916	≥0.05
8	Role of alpha-6/beta-4 integrins in carcinoma progression	<a href="#">4</a>	45	2.625	≥0.05
9	Transport_RAB5A regulation pathway	<a href="#">3</a>	25	2.439	≥0.05
10	Signal transduction_Activation of PKC via G-Protein coupled receptor	<a href="#">4</a>	52	2.395	≥0.05
11	Cell adhesion_ECM remodeling	<a href="#">4</a>	52	2.395	≥0.05
12	Development_Transcription regulation of granulocyte development	<a href="#">3</a>	32	2.133	≥0.05
13	Development_EGFR signaling via small GTPases	<a href="#">3</a>	33	2.096	≥0.05
14	LRRK2 in neurons in Parkinson's disease	<a href="#">3</a>	33	2.096	≥0.05
15	Muscle contraction_Regulation of eNOS activity in endothelial cells	<a href="#">4</a>	65	2.051	≥0.05
16	Development_EPO-induced Jak-STAT pathway	<a href="#">3</a>	35	2.024	≥0.05

17	Development_TGF-beta-dependent induction of EMT via SMADs	<u>3</u>	35	2.024	$\geq 0.05$
18	Development_Role of nicotinamide in G-CSF-induced granulopoiesis	<u>2</u>	12	2.021	$\geq 0.05$
19	Cell adhesion_PLAU signaling	<u>3</u>	39	1.895	$\geq 0.05$
20	CFTR folding and maturation (norm and CF)	<u>2</u>	14	1.889	$\geq 0.05$
21	Cytoskeleton remodeling_Role of PKA in cytoskeleton reorganisation	<u>3</u>	40	1.865	$\geq 0.05$
22	Transport_ACM3 in salivary glands	<u>3</u>	42	1.808	$\geq 0.05$
23	Development_Activation of Erk by ACM1, ACM3 and ACM5	<u>3</u>	44	1.754	$\geq 0.05$
24	Signal transduction_Calcium signaling	<u>3</u>	45	1.727	$\geq 0.05$
25	Development_GDNF family signaling	<u>3</u>	46	1.702	$\geq 0.05$
26	Development_Endothelin-1/EDNRA transactivation of EGFR	<u>3</u>	46	1.702	$\geq 0.05$
27	Muscle contraction_GPCRs in the regulation of smooth muscle tone	<u>4</u>	83	1.691	$\geq 0.05$
28	Development_PIP3 signaling in cardiac myocytes	<u>3</u>	47	1.677	$\geq 0.05$
29	Normal wtCFTR traffic / Sorting endosome formation	<u>2</u>	18	1.677	$\geq 0.05$
30	Cell adhesion_Integrin-mediated cell adhesion and migration	<u>3</u>	48	1.653	$\geq 0.05$
31	Cytoskeleton remodeling_Alpha-1A adrenergic receptor-dependent inhibition of PI3K	<u>2</u>	19	1.632	$\geq 0.05$
32	wtCFTR and delta508 traffic / Clathrin coated vesicles formation (norm and CF)	<u>2</u>	19	1.632	$\geq 0.05$
33	Signal transduction_IP3 signaling	<u>3</u>	49	1.63	$\geq 0.05$
34	wtCFTR and delta508-CFTR traffic / Generic schema (norm and CF)	<u>3</u>	50	1.607	$\geq 0.05$

35	Chemotaxis_Inhibitory action of lipoxins on IL-8- and Leukotriene B4-induced neutrophil migration	<a href="#">3</a>	51	1.584	$\geq 0.05$
36	Some pathways of EMT in cancer cells	<a href="#">3</a>	51	1.584	$\geq 0.05$
37	Development_Endothelin-1/EDNRA signaling	<a href="#">3</a>	53	1.541	$\geq 0.05$
38	Transcription_CREM signaling in testis	<a href="#">2</a>	22	1.512	$\geq 0.05$
39	Airway smooth muscle contraction in asthma	<a href="#">3</a>	56	1.48	$\geq 0.05$
40	Development_Keratinocyte differentiation	<a href="#">3</a>	56	1.48	$\geq 0.05$
41	Delta508-CFTR traffic / Sorting endosome formation in CF	<a href="#">2</a>	23	1.476	$\geq 0.05$
42	Inhibitory action of Lipoxins on neutrophil migration	<a href="#">3</a>	57	1.46	$\geq 0.05$
43	Development_Glucocorticoid receptor signaling	<a href="#">2</a>	24	1.442	$\geq 0.05$
44	Cell cycle_Initiation of mitosis	<a href="#">2</a>	25	1.409	$\geq 0.05$
45	Cytoskeleton remodeling_Cytoskeleton remodeling	<a href="#">4</a>	102	1.405	$\geq 0.05$
46	Chondroitin sulfate and dermatan sulfate metabolism	<a href="#">3</a>	60	1.404	$\geq 0.05$
47	Neurophysiological process_Dopamine D2 receptor transactivation of PDGFR in CNS	<a href="#">2</a>	26	1.378	$\geq 0.05$
48	Cell adhesion_Cadherin-mediated cell adhesion	<a href="#">2</a>	26	1.378	$\geq 0.05$
49	dGTP metabolism	<a href="#">3</a>	64	1.334	$\geq 0.05$
50	Development_Mu-type opioid receptor regulation of proliferation	<a href="#">2</a>	28	1.32	$\geq 0.05$
51	Cytoskeleton remodeling_TGF, WNT and cytoskeletal remodeling	<a href="#">4</a>	111	1.293	$\geq 0.05$
52	Muscle contraction_S1P2 receptor-mediated smooth muscle contraction	<a href="#">2</a>	30	1.266	$\geq 0.05$
53	Neurophysiological process_Kappa-type opioid receptor in transmission of nerve impulses	<a href="#">2</a>	30	1.266	$\geq 0.05$
54	Immune response_ETV3 affect on CSF1-promoted	<a href="#">2</a>	31	1.24	$\geq 0.05$

	macrophage differentiation				
55	Cytoskeleton remodeling_Reverse signaling by ephrin B	<u>2</u>	31	1.24	$\geq 0.05$
56	Protein folding and maturation_B Bradykinin / Kallidin maturation	<u>2</u>	32	1.216	$\geq 0.05$
57	NAD metabolism	<u>4</u>	119	1.203	$\geq 0.05$
58	Development_Angiotensin activation of ERK	<u>2</u>	33	1.192	$\geq 0.05$
59	Nicotine signaling in glutamatergic neurons	<u>2</u>	33	1.192	$\geq 0.05$
60	Signal transduction_Activin A signaling regulation	<u>2</u>	33	1.192	$\geq 0.05$
61	Oxidative stress_Role of ASK1 under oxidative stress	<u>2</u>	34	1.169	$\geq 0.05$
62	Neurophysiological process_GABA-B receptor signaling in presynaptic nerve terminals	<u>2</u>	34	1.169	$\geq 0.05$
63	ATP/ITP metabolism	<u>4</u>	124	1.15	$\geq 0.05$
64	Cell adhesion_Plasmin signaling	<u>2</u>	35	1.147	$\geq 0.05$
65	Development_Regulation of telomere length and cellular immortalization	<u>2</u>	35	1.147	$\geq 0.05$
66	Neurophysiological process_EphB receptors in dendritic spine morphogenesis and synaptogenesis	<u>2</u>	35	1.147	$\geq 0.05$
67	Influence of low doses of Arsenite on Glucose stimulated Insulin secretion in pancreatic cells	<u>2</u>	36	1.126	$\geq 0.05$
68	Cell adhesion_Role of tetraspanins in the integrin-mediated cell adhesion	<u>2</u>	37	1.105	$\geq 0.05$
69	Development_Beta-adrenergic receptors transactivation of EGFR	<u>2</u>	37	1.105	$\geq 0.05$
70	Transcription_Sin3 and NuRD in transcription regulation	<u>2</u>	38	1.085	$\geq 0.05$
71	Nicotine signaling in GABAergic neurons	<u>2</u>	39	1.066	$\geq 0.05$
72	Development_Oxytocin receptor signaling	<u>2</u>	40	1.047	$\geq 0.05$
73	Development_VEGF-family signaling	<u>2</u>	41	1.028	$\geq 0.05$

74	Apoptosis and survival_BAD phosphorylation	<u>2</u>	42	1.011	$\geq 0.05$
75	Signal transduction_JNK pathway	<u>2</u>	42	1.011	$\geq 0.05$
76	Development_ACM2 and ACM4 activation of ERK	<u>2</u>	43	0.994	$\geq 0.05$
77	Pentose phosphate pathway/ Rodent version	<u>2</u>	43	0.994	$\geq 0.05$
78	Signal transduction_AKT signaling	<u>2</u>	43	0.994	$\geq 0.05$
79	Protein folding and maturation_Angiotensin system maturation \ Human version	<u>2</u>	43	0.994	$\geq 0.05$
80	Nicotine signaling in dopaminergic neurons, Pt. 2 - axon terminal	<u>2</u>	43	0.994	$\geq 0.05$
81	cAMP/ Ca(2+)-dependent Insulin secretion	<u>2</u>	43	0.994	$\geq 0.05$
82	Transport_Intracellular cholesterol transport in norm	<u>3</u>	90	0.983	$\geq 0.05$
83	GTP-XTP metabolism	<u>3</u>	90	0.983	$\geq 0.05$
84	Pentose phosphate pathway	<u>2</u>	44	0.977	$\geq 0.05$
85	Hypoxia-induced EMT in cancer and fibrosis	<u>1</u>	9	0.968	$\geq 0.05$
86	Cell adhesion_Ephrin signaling	<u>2</u>	45	0.961	$\geq 0.05$
87	Neurophysiological process_Receptor-mediated axon growth repulsion	<u>2</u>	45	0.961	$\geq 0.05$
88	Neurophysiological process_Glutamate regulation of Dopamine D1A receptor signaling	<u>2</u>	45	0.961	$\geq 0.05$
89	Development_Adiponectin signaling	<u>2</u>	45	0.961	$\geq 0.05$
90	Cell adhesion_Histamine H1 receptor signaling in the interruption of cell barrier integrity	<u>2</u>	45	0.961	$\geq 0.05$
91	Transcription_Androgen Receptor nuclear signaling	<u>2</u>	45	0.961	$\geq 0.05$
92	Development_Ligand-independent activation of ESR1 and ESR2	<u>2</u>	45	0.961	$\geq 0.05$
93	Immune response_PGE2 signaling in immune response	<u>2</u>	45	0.961	$\geq 0.05$

94	Nicotine signaling in chromaffin cells	<a href="#">2</a>	46	0.945	$\geq 0.05$
95	Mechanisms of CFTR activation by S-nitrosoglutathione (normal and CF)	<a href="#">2</a>	46	0.945	$\geq 0.05$
96	Development_TGF-beta-dependent induction of EMT via RhoA, PI3K and ILK.	<a href="#">2</a>	46	0.945	$\geq 0.05$
97	Development_Angiotensin activation of Akt	<a href="#">2</a>	46	0.945	$\geq 0.05$
98	Signal transduction_PTEN pathway	<a href="#">2</a>	46	0.945	$\geq 0.05$
99	dATP/dITP metabolism	<a href="#">3</a>	95	0.931	$\geq 0.05$
100	Transcription_CREB pathway	<a href="#">2</a>	47	0.929	$\geq 0.05$
101	Development_TGF-beta-dependent induction of EMT via MAPK	<a href="#">2</a>	47	0.929	$\geq 0.05$
102	Nicotine signaling in dopaminergic neurons, Pt. 1 - cell body	<a href="#">2</a>	48	0.914	$\geq 0.05$
103	Protein folding and maturation_Angiotensin system maturation \ Rodent version	<a href="#">2</a>	48	0.914	$\geq 0.05$
104	Cytoskeleton remodeling_Integrin outside-in signaling	<a href="#">2</a>	49	0.899	$\geq 0.05$
105	Apoptosis and survival_HTR1A signaling	<a href="#">2</a>	50	0.885	$\geq 0.05$
106	Nicotine signaling in cholinergic neurons	<a href="#">2</a>	50	0.885	$\geq 0.05$
107	Immune response_NFAT in immune response	<a href="#">2</a>	51	0.871	$\geq 0.05$
108	Immune response_T cell receptor signaling pathway	<a href="#">2</a>	52	0.858	$\geq 0.05$
109	Transport_Macropinocytosis	<a href="#">1</a>	12	0.851	$\geq 0.05$
110	Transport_RAB1A regulation pathway	<a href="#">1</a>	12	0.851	$\geq 0.05$
111	Apoptosis and survival_Role of PKR in stress-induced apoptosis	<a href="#">2</a>	53	0.844	$\geq 0.05$
112	Immune response_CD28 signaling	<a href="#">2</a>	54	0.831	$\geq 0.05$
113	Immune response_HSP60 and HSP70/ TLR signaling pathway	<a href="#">2</a>	54	0.831	$\geq 0.05$

114	Development_FGFR signaling pathway	<u>2</u>	54	0.831	$\geq 0.05$
115	Delta508-CFTR traffic / ER-to-Golgi in CF	<u>1</u>	13	0.819	$\geq 0.05$
116	Cytoskeleton remodeling_RalB regulation pathway	<u>1</u>	13	0.819	$\geq 0.05$
117	Normal wtCFTR traffic / ER-to-Golgi	<u>1</u>	13	0.819	$\geq 0.05$
118	Muscle contraction_ACM regulation of smooth muscle contraction	<u>2</u>	56	0.806	$\geq 0.05$
119	Cell adhesion_Integrin inside-out signaling	<u>2</u>	56	0.806	$\geq 0.05$
120	Cytoskeleton remodeling_FAK signaling	<u>2</u>	57	0.794	$\geq 0.05$
121	Development_Ligand-dependent activation of the ESR1/AP-1 pathway	<u>1</u>	14	0.789	$\geq 0.05$
122	Regulation of CFTR activity (norm and CF)	<u>2</u>	58	0.782	$\geq 0.05$
123	Development_Thyroliberin signaling	<u>2</u>	60	0.759	$\geq 0.05$
124	Muscle contraction_Oxytocin signaling in uterus and mammary gland	<u>2</u>	62	0.737	$\geq 0.05$
125	Development_Alpha-2 adrenergic receptor activation of ERK	<u>2</u>	62	0.737	$\geq 0.05$
126	Development_EGFR signaling pathway	<u>2</u>	63	0.727	$\geq 0.05$
127	Transport_Macropinocytosis regulation by growth factors	<u>2</u>	63	0.727	$\geq 0.05$
128	Immune response_IL-15 signaling	<u>2</u>	64	0.716	$\geq 0.05$
129	Development_Role of IL-8 in angiogenesis	<u>2</u>	65	0.706	$\geq 0.05$
130	Transcription_Assembly of RNA Polymerase II preinitiation complex on TATA-less promoters	<u>1</u>	18	0.691	$\geq 0.05$
131	Development_NOTCH-induced EMT	<u>1</u>	19	0.67	$\geq 0.05$
132	Immune response_Gastrin in inflammatory response	<u>2</u>	69	0.667	$\geq 0.05$
133	Glutathione metabolism / Rodent version	<u>2</u>	70	0.658	$\geq 0.05$

134	Neurophysiological process_Olfactory transduction	<u>1</u>	20	0.65	$\geq 0.05$
135	Cytoskeleton remodeling_Role of Activin A in cytoskeleton remodeling	<u>1</u>	20	0.65	$\geq 0.05$
136	Development_FGF2-dependent induction of EMT	<u>1</u>	20	0.65	$\geq 0.05$
137	Reproduction_GnRH signaling	<u>2</u>	72	0.64	$\geq 0.05$
138	Role of prenatal nicotine exposure in inhibition of pancreatic beta cells differentiation and function	<u>1</u>	21	0.632	$\geq 0.05$
139	Cell cycle_Cell cycle (generic schema)	<u>1</u>	21	0.632	$\geq 0.05$
140	Cell cycle_Chromosome condensation in prometaphase	<u>1</u>	21	0.632	$\geq 0.05$
141	Atherosclerosis_Role of ZNF202 in regulation of expression of genes involved in Atherosclerosis	<u>1</u>	21	0.632	$\geq 0.05$
142	Transport_ACM3 signaling in lacrimal glands	<u>2</u>	75	0.614	$\geq 0.05$
143	Cell cycle_Role of 14-3-3 proteins in cell cycle regulation	<u>1</u>	22	0.614	$\geq 0.05$
144	Cell cycle_Sister chromatid cohesion	<u>1</u>	22	0.614	$\geq 0.05$
145	Immune response_MIF-mediated glucocorticoid regulation	<u>1</u>	22	0.614	$\geq 0.05$
146	Cytoskeleton remodeling_CDC42 in cellular processes	<u>1</u>	22	0.614	$\geq 0.05$
147	Immune response _CCR3 signaling in eosinophils	<u>2</u>	77	0.598	$\geq 0.05$
148	Cholesterol and Sphingolipids transport / Recycling to plasma membrane in lung (normal and CF)	<u>1</u>	23	0.597	$\geq 0.05$
149	Development_ERK5 in cell proliferation and neuronal survival	<u>1</u>	23	0.597	$\geq 0.05$
150	Cytoskeleton remodeling_Regulation of actin cytoskeleton by Rho GTPases	<u>1</u>	23	0.597	$\geq 0.05$
151	Proteolysis_Putative ubiquitin pathway	<u>1</u>	23	0.597	$\geq 0.05$
152	Development_EGFR signaling via PIP3	<u>1</u>	23	0.597	$\geq 0.05$

153	G-protein signaling_Cross-talk between Ras-family GTPases	<u>1</u>	23	0.597	$\geq 0.05$
154	Cell adhesion_Endothelial cell contacts by non-junctional mechanisms	<u>1</u>	24	0.581	$\geq 0.05$
155	Proteolysis_Role of Parkin in the Ubiquitin-Proteasomal Pathway	<u>1</u>	24	0.581	$\geq 0.05$
156	Immune response_IL-27 signaling pathway	<u>1</u>	24	0.581	$\geq 0.05$
157	Development_Dopamine D2 receptor transactivation of EGFR	<u>1</u>	24	0.581	$\geq 0.05$
158	G-protein signaling_M-RAS regulation pathway	<u>1</u>	24	0.581	$\geq 0.05$
159	Neurophysiological process_NMDA-dependent postsynaptic long-term potentiation in CA1 hippocampal neurons	<u>2</u>	80	0.574	$\geq 0.05$
160	G-protein signaling_TC21 regulation pathway	<u>1</u>	25	0.566	$\geq 0.05$
161	G-protein signaling_K-RAS regulation pathway	<u>1</u>	25	0.566	$\geq 0.05$
162	Development_Leptin signaling via JAK/STAT and MAPK cascades	<u>1</u>	25	0.566	$\geq 0.05$
163	G-protein signaling_R-RAS regulation pathway	<u>1</u>	25	0.566	$\geq 0.05$
164	Apoptosis and survival_Apoptotic Activin A signaling	<u>1</u>	25	0.566	$\geq 0.05$
165	Development_Angiotensin signaling via beta-Arrestin	<u>1</u>	25	0.566	$\geq 0.05$
166	Neurophysiological process_GABA-B receptor signaling at postsynaptic sides of synapses	<u>1</u>	26	0.552	$\geq 0.05$
167	Apoptosis and survival_NGF signaling pathway	<u>1</u>	26	0.552	$\geq 0.05$
168	Cell adhesion_Endothelial cell contacts by junctional mechanisms	<u>1</u>	26	0.552	$\geq 0.05$
169	Development_VEGF signaling via VEGFR2 - generic cascades	<u>2</u>	84	0.545	$\geq 0.05$
170	Regulation of degradation of deltaF508 CFTR in CF	<u>1</u>	27	0.538	$\geq 0.05$

171	Transcription_Role of Akt in hypoxia induced HIF1 activation	<a href="#">1</a>	27	0.538	$\geq 0.05$
172	Translation _Regulation of translation initiation	<a href="#">1</a>	27	0.538	$\geq 0.05$
173	Neurophysiological process_GABA-A receptor life cycle	<a href="#">1</a>	27	0.538	$\geq 0.05$
174	Muscle contraction_nNOS Signaling in Skeletal Muscle	<a href="#">1</a>	28	0.525	$\geq 0.05$
175	Development_Delta-type opioid receptor signaling via G-protein alpha-14	<a href="#">1</a>	28	0.525	$\geq 0.05$
176	Neurophysiological process_Role of CDK5 in presynaptic signaling	<a href="#">1</a>	28	0.525	$\geq 0.05$
177	Development_Regulation of CDK5 in CNS	<a href="#">1</a>	28	0.525	$\geq 0.05$
178	Immune response_Antigen presentation by MHC class I	<a href="#">1</a>	28	0.525	$\geq 0.05$
179	Development_Thrombospondin-1 signaling	<a href="#">1</a>	28	0.525	$\geq 0.05$
180	PDGF activation of prostacyclin synthesis	<a href="#">1</a>	29	0.512	$\geq 0.05$
181	Neurophysiological process_nNOS signaling in neuronal synapses	<a href="#">1</a>	29	0.512	$\geq 0.05$
182	Apoptosis and survival_p53-dependent apoptosis	<a href="#">1</a>	29	0.512	$\geq 0.05$
183	Role of Diethylhexyl Phthalate and Tributyltin in fat cell differentiation	<a href="#">1</a>	29	0.512	$\geq 0.05$
184	Apoptosis and survival_Granzyme A signaling	<a href="#">1</a>	30	0.5	$\geq 0.05$
185	Cholesterol and Sphingolipids transport / Influx to the early endosome in lung (normal and CF)	<a href="#">1</a>	30	0.5	$\geq 0.05$
186	Development_G-CSF-induced myeloid differentiation	<a href="#">1</a>	30	0.5	$\geq 0.05$
187	Role of prenatal nicotine exposure in apoptosis and proliferation of pancreatic beta cells	<a href="#">1</a>	30	0.5	$\geq 0.05$
188	Regulation of lipid metabolism_RXR-dependent regulation of lipid metabolism via PPAR, RAR and VDR	<a href="#">1</a>	30	0.5	$\geq 0.05$
189	Transcription_Ligand-dependent activation of the ESR1/SP pathway	<a href="#">1</a>	30	0.5	$\geq 0.05$

190	Neurophysiological process _Visual perception	<a href="#">1</a>	30	0.5	$\geq 0.05$
191	Cytoskeleton remodeling_RalA regulation pathway	<a href="#">1</a>	30	0.5	$\geq 0.05$
192	Cell adhesion_Gap junctions	<a href="#">1</a>	30	0.5	$\geq 0.05$
193	Cytoskeleton remodeling_Fibronectin-binding integrins in cell motility	<a href="#">1</a>	31	0.488	$\geq 0.05$
194	Glycolysis and gluconeogenesis p. 2	<a href="#">1</a>	31	0.488	$\geq 0.05$
195	Immune response_IL-3 activation and signaling pathway	<a href="#">1</a>	31	0.488	$\geq 0.05$
196	Influence of low doses of Arsenite on glucose uptake in adipocytes	<a href="#">1</a>	31	0.488	$\geq 0.05$
197	Apoptosis and survival_Role of IAP-proteins in apoptosis	<a href="#">1</a>	31	0.488	$\geq 0.05$
198	Putative pathways for stimulation of fat cell differentiation by Bisphenol A	<a href="#">1</a>	32	0.477	$\geq 0.05$
199	Glycolysis and gluconeogenesis p. 2/ Rodent version	<a href="#">1</a>	32	0.477	$\geq 0.05$
200	Cell cycle_Role of Nek in cell cycle regulation	<a href="#">1</a>	32	0.477	$\geq 0.05$
201	Development_Angiotensin signaling via STATs	<a href="#">1</a>	32	0.477	$\geq 0.05$
202	G-protein signaling_Regulation of CDC42 activity	<a href="#">1</a>	33	0.466	$\geq 0.05$
203	Development_BMP signaling	<a href="#">1</a>	33	0.466	$\geq 0.05$
204	Apoptosis and survival_Caspase cascade	<a href="#">1</a>	33	0.466	$\geq 0.05$
205	G-protein signaling_N-RAS regulation pathway	<a href="#">1</a>	33	0.466	$\geq 0.05$
206	Normal and pathological TGF-beta-mediated regulation of cell proliferation	<a href="#">1</a>	33	0.466	$\geq 0.05$
207	Cannabinoid receptor signaling in nicotine addiction	<a href="#">1</a>	34	0.456	$\geq 0.05$
208	Cell adhesion_Alpha-4 integrins in cell migration and adhesion	<a href="#">1</a>	34	0.456	$\geq 0.05$
209	Development_HGF-dependent inhibition of TGF-beta-induced EMT	<a href="#">1</a>	34	0.456	$\geq 0.05$

210	Signal transduction_Erk Interactions: Inhibition of Erk	<a href="#">1</a>	34	0.456	$\geq 0.05$
211	G-protein signaling_RhoA regulation pathway	<a href="#">1</a>	34	0.456	$\geq 0.05$
212	Apoptosis and survival_Cytoplasmic/mitochondrial transport of proapoptotic proteins Bid, Bmf and Bim	<a href="#">1</a>	34	0.456	$\geq 0.05$
213	Chemotaxis_CXCR4 signaling pathway	<a href="#">1</a>	34	0.456	$\geq 0.05$
214	Development_NOTCH1-mediated pathway for NF-KB activity modulation	<a href="#">1</a>	34	0.456	$\geq 0.05$
215	wtCFTR and deltaF508 traffic / Membrane expression (norm and CF)	<a href="#">1</a>	34	0.456	$\geq 0.05$
216	Development_Angiopoietin - Tie2 signaling	<a href="#">1</a>	35	0.446	$\geq 0.05$
217	Inhibitory action of Lipoxin A4 on PDGF, EGF and LTD4 signaling	<a href="#">1</a>	35	0.446	$\geq 0.05$
218	Development_Growth hormone signaling via STATs and PLC/IP3	<a href="#">1</a>	35	0.446	$\geq 0.05$
219	Cell adhesion_Chemokines and adhesion	<a href="#">2</a>	100	0.445	$\geq 0.05$
220	G-protein signaling_Rac2 regulation pathway	<a href="#">1</a>	36	0.436	$\geq 0.05$
221	Development_Lipoxin inhibitory action on PDGF, EGF and LTD4 signaling	<a href="#">1</a>	36	0.436	$\geq 0.05$
222	G-protein signaling_H-RAS regulation pathway	<a href="#">1</a>	37	0.427	$\geq 0.05$
223	Development_MAG-dependent inhibition of neurite outgrowth	<a href="#">1</a>	37	0.427	$\geq 0.05$
224	Development_Delta-type opioid receptor mediated cardioprotection	<a href="#">1</a>	37	0.427	$\geq 0.05$
225	Immune response_Role of integrins in NK cells cytotoxicity	<a href="#">1</a>	38	0.417	$\geq 0.05$
226	Transcription_Role of AP-1 in regulation of cellular metabolism	<a href="#">1</a>	38	0.417	$\geq 0.05$
227	Glycolysis and gluconeogenesis p. 2 / Human version	<a href="#">1</a>	38	0.417	$\geq 0.05$

228	Cell cycle_Regulation of G1/S transition (part 1)	<a href="#">1</a>	38	0.417	$\geq 0.05$
229	Cell adhesion_Cell-matrix glycoconjugates	<a href="#">1</a>	38	0.417	$\geq 0.05$
230	Cytoskeleton remodeling_ACM3 and ACM4 in keratinocyte migration	<a href="#">1</a>	38	0.417	$\geq 0.05$
231	Signal transduction_cAMP signaling	<a href="#">1</a>	38	0.417	$\geq 0.05$
232	Regulation of lipid metabolism_Regulation of lipid metabolism via LXR, NF-Y and SREBP	<a href="#">1</a>	38	0.417	$\geq 0.05$
233	Apoptosis and survival_APRIL and BAFF signaling	<a href="#">1</a>	39	0.409	$\geq 0.05$
234	HIV-1 signaling via CCR5 in macrophages and T lymphocytes	<a href="#">1</a>	39	0.409	$\geq 0.05$
235	Development_ERBB-family signaling	<a href="#">1</a>	39	0.409	$\geq 0.05$
236	Transcription_Receptor-mediated HIF regulation	<a href="#">1</a>	39	0.409	$\geq 0.05$
237	Translation _Regulation of EIF2 activity	<a href="#">1</a>	39	0.409	$\geq 0.05$
238	Dibromoethane metabolism	<a href="#">1</a>	39	0.409	$\geq 0.05$
239	Translation_Non-genomic (rapid) action of Androgen Receptor	<a href="#">1</a>	40	0.4	$\geq 0.05$
240	Neurophysiological process_Delta-type opioid receptor in the nervous system	<a href="#">1</a>	40	0.4	$\geq 0.05$
241	Neurophysiological process_ACM1 and ACM2 in neuronal membrane polarization	<a href="#">1</a>	40	0.4	$\geq 0.05$
242	Development_Role of Activin A in cell differentiation and proliferation	<a href="#">1</a>	40	0.4	$\geq 0.05$
243	G-protein signaling_Rap1A regulation pathway	<a href="#">1</a>	40	0.4	$\geq 0.05$
244	Development_Neurotrophin family signaling	<a href="#">1</a>	40	0.4	$\geq 0.05$
245	Neurophysiological process_Netrin-1 in regulation of axon guidance	<a href="#">1</a>	41	0.392	$\geq 0.05$
246	N-Glycan biosynthesis p2	<a href="#">1</a>	41	0.392	$\geq 0.05$

247	Vitamin B3 (nicotinamide) metabolism	<a href="#">1</a>	41	0.392	$\geq 0.05$
248	Immune response_HMGB1 release from the cell	<a href="#">1</a>	41	0.392	$\geq 0.05$
249	Cholesterol and Sphingolipids transport / Transport from Golgi and ER to the apical membrane (normal and CF)	<a href="#">1</a>	41	0.392	$\geq 0.05$
250	Immune response_Neurotensin-induced activation of IL-8 in colonocytes	<a href="#">1</a>	42	0.384	$\geq 0.05$
251	Leucine, isoleucine and valine metabolism	<a href="#">1</a>	42	0.384	$\geq 0.05$
252	Immune response_PIP3 signaling in B lymphocytes	<a href="#">1</a>	42	0.384	$\geq 0.05$
253	Immune response_IL-7 signaling in B lymphocytes	<a href="#">1</a>	43	0.376	$\geq 0.05$
254	Regulation of metabolism_Role of Adiponectin in regulation of metabolism	<a href="#">1</a>	43	0.376	$\geq 0.05$
255	Development_Angiotensin signaling via PYK2	<a href="#">1</a>	43	0.376	$\geq 0.05$
256	Neurophysiological process_Melatonin signaling	<a href="#">1</a>	43	0.376	$\geq 0.05$
257	Immune response_HTR2A-induced activation of cPLA2	<a href="#">1</a>	43	0.376	$\geq 0.05$
258	Apoptosis and survival_TNFR1 signaling pathway	<a href="#">1</a>	43	0.376	$\geq 0.05$
259	Development_S1P3 receptor signaling pathway	<a href="#">1</a>	43	0.376	$\geq 0.05$
260	Chemotaxis_C5a-induced chemotaxis	<a href="#">1</a>	43	0.376	$\geq 0.05$
261	Development_Notch Signaling Pathway	<a href="#">1</a>	43	0.376	$\geq 0.05$
262	Development_VEGF signaling and activation	<a href="#">1</a>	43	0.376	$\geq 0.05$
263	Immune response_IL-13 signaling via JAK-STAT	<a href="#">1</a>	44	0.369	$\geq 0.05$
264	Immune response_IL-5 signalling	<a href="#">1</a>	44	0.369	$\geq 0.05$
265	Immune response_IL-1 signaling pathway	<a href="#">1</a>	44	0.369	$\geq 0.05$
266	Regulation of lipid metabolism_Regulation of lipid metabolism by niacin and isoprenaline	<a href="#">1</a>	45	0.362	$\geq 0.05$
267	Trichloroethylene metabolism/Rodent version	<a href="#">1</a>	45	0.362	$\geq 0.05$
268	Bromobenzene metabolism/Rodent version	<a href="#">1</a>	45	0.362	$\geq 0.05$

269	Development_Activation of ERK by Alpha-1 adrenergic receptors	<a href="#">1</a>	45	0.362	$\geq 0.05$
270	G-protein signaling_Regulation of cAMP levels by ACM	<a href="#">1</a>	45	0.362	$\geq 0.05$
271	Neurophysiological process_ACM regulation of nerve impulse	<a href="#">1</a>	46	0.354	$\geq 0.05$
272	Development_Hedgehog signaling	<a href="#">1</a>	46	0.354	$\geq 0.05$
273	Development_G-Proteins mediated regulation MAPK-ERK signaling	<a href="#">1</a>	46	0.354	$\geq 0.05$
274	Chemotaxis_Lipoxin inhibitory action on fMLP-induced neutrophil chemotaxis	<a href="#">1</a>	46	0.354	$\geq 0.05$
275	Immune response_ICOS pathway in T-helper cell	<a href="#">1</a>	46	0.354	$\geq 0.05$
276	Immune response_NF-AT signaling and leukocyte interactions	<a href="#">1</a>	46	0.354	$\geq 0.05$
277	Immune response_Inhibitory action of Lipoxins on pro-inflammatory TNF-alpha signaling	<a href="#">1</a>	46	0.354	$\geq 0.05$
278	Neurophysiological process_Circadian rhythm	<a href="#">1</a>	47	0.348	$\geq 0.05$
279	Development_Leptin signaling via PI3K-dependent pathway	<a href="#">1</a>	47	0.348	$\geq 0.05$
280	Transport_Alpha-2 adrenergic receptor regulation of ion channels	<a href="#">1</a>	47	0.348	$\geq 0.05$
281	Development_WNT5A signaling	<a href="#">1</a>	47	0.348	$\geq 0.05$
282	Development_HGF signaling pathway	<a href="#">1</a>	47	0.348	$\geq 0.05$
283	Immune response_Histamine H1 receptor signaling in immune response	<a href="#">1</a>	48	0.341	$\geq 0.05$
284	Regulation of metabolism_Triiodothyronine and Thyroxine signaling	<a href="#">1</a>	48	0.341	$\geq 0.05$
285	Muscle contraction_Relaxin signaling pathway	<a href="#">1</a>	48	0.341	$\geq 0.05$
286	Development_Melanocyte development and	<a href="#">1</a>	49	0.334	$\geq 0.05$

	pigmentation				
287	Development_PEDF signaling	<u>1</u>	49	0.334	$\geq 0.05$
288	Neurophysiological process_Long-term depression in cerebellum	<u>1</u>	49	0.334	$\geq 0.05$
289	Inhibitory action of Lipoxins on Superoxide production in neutrophils	<u>1</u>	49	0.334	$\geq 0.05$
290	Neurophysiological process_Corticoliberin signaling via CRHR1	<u>1</u>	50	0.328	$\geq 0.05$
291	Immune response_Histamine signaling in dendritic cells	<u>1</u>	50	0.328	$\geq 0.05$
292	Mucin expression in CF via TLRs, EGFR signaling pathways	<u>1</u>	50	0.328	$\geq 0.05$
293	Development_GM-CSF signaling	<u>1</u>	50	0.328	$\geq 0.05$
294	Development_EDNRB signaling	<u>1</u>	50	0.328	$\geq 0.05$
295	Immune response_C5a signaling	<u>1</u>	50	0.328	$\geq 0.05$
296	Immune response_Inhibitory action of lipoxins on superoxide production induced by IL-8 and Leukotriene B4 in neutrophils	<u>1</u>	50	0.328	$\geq 0.05$
297	Immune response_IL-13 signaling via PI3K-ERK	<u>1</u>	50	0.328	$\geq 0.05$
298	Signal transduction_PKA signaling	<u>1</u>	51	0.322	$\geq 0.05$
299	Development_Beta-adrenergic receptors signaling via cAMP	<u>1</u>	52	0.316	$\geq 0.05$
300	Development_IGF-1 receptor signaling	<u>1</u>	52	0.316	$\geq 0.05$
301	Development_FGF-family signaling	<u>1</u>	52	0.316	$\geq 0.05$
302	Immune response_Antiviral actions of Interferons	<u>1</u>	52	0.316	$\geq 0.05$
303	Development_A1 receptor signaling	<u>1</u>	53	0.31	$\geq 0.05$
304	Apoptosis and survival_Endoplasmic reticulum stress response pathway	<u>1</u>	53	0.31	$\geq 0.05$

305	Translation _Regulation of EIF4F activity	<a href="#">1</a>	53	0.31	$\geq 0.05$
306	Cell cycle_Influence of Ras and Rho proteins on G1/S Transition	<a href="#">1</a>	53	0.31	$\geq 0.05$
307	Translation_Translation regulation by Alpha-1 adrenergic receptors	<a href="#">1</a>	53	0.31	$\geq 0.05$
308	Folic acid metabolism	<a href="#">1</a>	53	0.31	$\geq 0.05$
309	Immune response_HMGB1/RAGE signaling pathway	<a href="#">1</a>	53	0.31	$\geq 0.05$
310	Membrane-bound ESR1: interaction with G-proteins signaling	<a href="#">1</a>	54	0.304	$\geq 0.05$
311	Immune response_TLR signaling pathways	<a href="#">1</a>	54	0.304	$\geq 0.05$
312	Immune response _IFN gamma signaling pathway	<a href="#">1</a>	54	0.304	$\geq 0.05$
313	Immune response_CCL2 signaling	<a href="#">1</a>	54	0.304	$\geq 0.05$
314	Immune response_BCR pathway	<a href="#">1</a>	54	0.304	$\geq 0.05$
315	PGE2 pathways in cancer	<a href="#">1</a>	55	0.299	$\geq 0.05$
316	Proline metabolism	<a href="#">1</a>	55	0.299	$\geq 0.05$
317	Apoptosis and survival_NO synthesis and signaling	<a href="#">1</a>	55	0.299	$\geq 0.05$
318	Immune response_Fc epsilon RI pathway	<a href="#">1</a>	55	0.299	$\geq 0.05$
319	Muscle contraction_Regulation of eNOS activity in cardiomyocytes	<a href="#">1</a>	56	0.293	$\geq 0.05$
320	Regulation of lipid metabolism_Insulin regulation of glycogen metabolism	<a href="#">1</a>	56	0.293	$\geq 0.05$
321	Immune response_CCR5 signaling in macrophages and T lymphocytes	<a href="#">1</a>	58	0.283	$\geq 0.05$
322	Triacylglycerol metabolism p.1	<a href="#">1</a>	59	0.278	$\geq 0.05$
323	Immune response_Immunological synapse formation	<a href="#">1</a>	59	0.278	$\geq 0.05$
324	Transcription_Role of VDR in regulation of genes involved in osteoporosis	<a href="#">1</a>	61	0.268	$\geq 0.05$

325	Phospholipid metabolism p.1	<a href="#">1</a>	61	0.268	$\geq 0.05$
326	Development_Gastrin in cell growth and proliferation	<a href="#">1</a>	62	0.264	$\geq 0.05$
327	Heparan sulfate/heparin metabolism	<a href="#">1</a>	62	0.264	$\geq 0.05$
328	Glutathione metabolism	<a href="#">1</a>	64	0.255	$\geq 0.05$
329	Glutathione metabolism / Human version	<a href="#">1</a>	65	0.25	$\geq 0.05$
330	TTP metabolism	<a href="#">1</a>	66	0.246	$\geq 0.05$
331	Polyamine metabolism	<a href="#">1</a>	68	0.238	$\geq 0.05$
332	Immune response_CD16 signaling in NK cells	<a href="#">1</a>	69	0.234	$\geq 0.05$
333	Urea cycle	<a href="#">1</a>	70	0.23	$\geq 0.05$
334	Regulation of lipid metabolism_Stimulation of Arachidonic acid production by ACM receptors	<a href="#">1</a>	72	0.222	$\geq 0.05$
335	Regulation of lipid metabolism_Alpha-1 adrenergic receptors signaling via arachidonic acid	<a href="#">1</a>	73	0.219	$\geq 0.05$
336	Chemotaxis_Leukocyte chemotaxis	<a href="#">1</a>	75	0.211	$\geq 0.05$
337	dCTP/dUTP metabolism	<a href="#">1</a>	75	0.211	$\geq 0.05$
338	(L)-Arginine metabolism	<a href="#">1</a>	75	0.211	$\geq 0.05$
339	Blood coagulation_GPIb-IX-V-dependent platelet activation	<a href="#">1</a>	76	0.208	$\geq 0.05$
340	Cholesterol Biosynthesis	<a href="#">1</a>	88	0.172	$\geq 0.05$
341	Sphingolipid metabolism	<a href="#">1</a>	91	0.164	$\geq 0.05$
342	Sphingolipid metabolism / Human version	<a href="#">1</a>	92	0.161	$\geq 0.05$
343	Histidine-glutamate-glutamine metabolism	<a href="#">1</a>	95	0.154	$\geq 0.05$
344	Arginine metabolism/ Rodent version	<a href="#">1</a>	97	0.149	$\geq 0.05$
345	Heme metabolism	<a href="#">1</a>	100	0.143	$\geq 0.05$
346	ATP metabolism	<a href="#">1</a>	106	0.13	$\geq 0.05$

347	CTP/UTP metabolism	<u>1</u>	108	0.127	$\geq 0.05$
348	Histidine-glutamate-glutamine and proline metabolism/ Rodent version	<u>1</u>	120	0.106	$\geq 0.05$

<sup>a</sup>ratio between miRNA target genes and total genes in the pathway.

**eTable 6:** GeneGo Pathways Enriched in miR-126 Target Genes.

#	Maps	Ratio <sup>a</sup>	-log(p)	FDR
1	Transcription_Ligand-dependent activation of the ESR1/SP pathway	<u>3</u>	30	4.992 <0.05
2	Cell adhesion_Alpha-4 integrins in cell migration and adhesion	<u>3</u>	34	4.825 <0.05
3	Transcription_Receptor-mediated HIF regulation	<u>3</u>	39	4.643 <0.05
4	Development_VEGF signaling and activation	<u>3</u>	43	4.514 <0.05
5	Role of alpha-6/beta-4 integrins in carcinoma progression	<u>3</u>	45	4.455 <0.05
6	Cytoskeleton remodeling_FAK signaling	<u>3</u>	57	4.145 <0.05
7	Cell adhesion_Chemokines and adhesion	<u>3</u>	100	3.418 <0.05
8	Cytoskeleton remodeling_Cytoskeleton remodeling	<u>3</u>	102	3.393 <0.05
9	Development_EGFR signaling via PIP3	<u>2</u>	23	3.295 <0.05
10	Cytoskeleton remodeling_TGF, WNT and cytoskeletal remodeling	<u>3</u>	111	3.285 <0.05
11	Development_Cross-talk between VEGF and Angiopoietin 1 signaling pathways	<u>2</u>	26	3.187 <0.05
12	Possible influence of low doses of Arsenite on glucose uptake in muscle	<u>2</u>	28	3.123 <0.05
13	DNA damage_Brca1 as a transcription regulator	<u>2</u>	30	3.062 <0.05
14	Immune response_IL-4 - antiapoptotic action	<u>2</u>	30	3.062 <0.05
15	Influence of low doses of Arsenite on glucose uptake in adipocytes	<u>2</u>	31	3.034 <0.05
16	Cell cycle_Role of Nek in cell cycle regulation	<u>2</u>	32	3.006 <0.05
17	Development_Angiopoietin - Tie2 signaling	<u>2</u>	35	2.928 <0.05
18	Cell adhesion_Plasmin signaling	<u>2</u>	35	2.928 <0.05

19	Immune response_IL-9 signaling pathway	<u>2</u>	36	2.903	<0.05
20	Transcription_P53 signaling pathway	<u>2</u>	39	2.834	<0.05
21	Translation _Regulation of EIF2 activity	<u>2</u>	39	2.834	<0.05
22	Development_VEGF-family signaling	<u>2</u>	41	2.791	<0.05
23	Immune response_HMGB1 release from the cell	<u>2</u>	41	2.791	<0.05
24	Translation_Insulin regulation of translation	<u>2</u>	42	2.77	<0.05
25	Apoptosis and survival_BAD phosphorylation	<u>2</u>	42	2.77	<0.05
26	Apoptosis and survival_Anti-apoptotic action of Gastrin	<u>2</u>	43	2.75	<0.05
27	Signal transduction_AKT signaling	<u>2</u>	43	2.75	<0.05
28	Immune response_IL-4 signaling pathway	<u>2</u>	44	2.73	<0.05
29	Development_Flt3 signaling	<u>2</u>	44	2.73	<0.05
30	Development_Ligand-independent activation of ESR1 and ESR2	<u>2</u>	45	2.711	<0.05
31	Development_Membrane-bound ESR1: interaction with growth factors signaling	<u>2</u>	45	2.711	<0.05
32	Development_GDNF family signaling	<u>2</u>	46	2.692	<0.05
33	Signal transduction_PTEN pathway	<u>2</u>	46	2.692	<0.05
34	Development_Endothelin-1/EDNRA transactivation of EGFR	<u>2</u>	46	2.692	<0.05
35	Regulation of lipid metabolism_Insulin signaling:generic cascades	<u>2</u>	47	2.673	<0.05
36	Transcription_CREB pathway	<u>2</u>	47	2.673	<0.05
37	Development_Leptin signaling via PI3K-dependent pathway	<u>2</u>	47	2.673	<0.05
38	Development_PIP3 signaling in cardiac myocytes	<u>2</u>	47	2.673	<0.05
39	Development_HGF signaling pathway	<u>2</u>	47	2.673	<0.05
40	Development_PEDF signaling	<u>2</u>	49	2.637	<0.05

41	Development_GM-CSF signaling	<a href="#">2</a>	50	2.62	<0.05
42	Development_IGF-1 receptor signaling	<a href="#">2</a>	52	2.586	<0.05
43	G-protein signaling_Proinsulin C-peptide signaling	<a href="#">2</a>	52	2.586	<0.05
44	Cell cycle_Influence of Ras and Rho proteins on G1/S Transition	<a href="#">2</a>	53	2.57	<0.05
45	Immune response_HMGB1/RAGE signaling pathway	<a href="#">2</a>	53	2.57	<0.05
46	Translation _Regulation of EIF4F activity	<a href="#">2</a>	53	2.57	<0.05
47	Immune response_CCL2 signaling	<a href="#">2</a>	54	2.554	<0.05
48	Development_Role of HDAC and calcium/calmodulin-dependent kinase (CaMK) in control of skeletal myogenesis	<a href="#">2</a>	54	2.554	<0.05
49	Development_FGFR signaling pathway	<a href="#">2</a>	54	2.554	<0.05
50	Regulation of lipid metabolism_Insulin regulation of glycogen metabolism	<a href="#">2</a>	56	2.523	<0.05
51	Development_Prolactin receptor signaling	<a href="#">2</a>	58	2.493	<0.05
52	Development_c-Kit ligand signaling pathway during hemopoiesis	<a href="#">2</a>	61	2.45	<0.05
53	Development_Gastrin in cell growth and proliferation	<a href="#">2</a>	62	2.436	<0.05
54	Transcription_PPAR Pathway	<a href="#">2</a>	63	2.422	<0.05
55	Development_Role of IL-8 in angiogenesis	<a href="#">2</a>	65	2.395	<0.05
56	Cardiac Hypertrophy_NF-AT signaling in Cardiac Hypertrophy	<a href="#">2</a>	65	2.395	<0.05
57	Muscle contraction_Regulation of eNOS activity in endothelial cells	<a href="#">2</a>	65	2.395	<0.05
58	Immune response_Gastrin in inflammatory response	<a href="#">2</a>	69	2.345	<0.05
59	Development_VEGF signaling via VEGFR2 - generic cascades	<a href="#">2</a>	84	2.178	<0.05
60	Regulation of lipid metabolism_Insulin regulation of fatty	<a href="#">2</a>	89	2.129	<0.05

	acid metabolism				
61	Apoptosis and survival_DNA-damage-induced apoptosis	1	15	1.656	$\geq 0.05$
62	Immune response_Oncostatin M signaling via JAK-Stat in mouse cells	1	18	1.578	$\geq 0.05$
63	Translation_IL-2 regulation of translation	1	20	1.533	$\geq 0.05$
64	Immune response_Oncostatin M signaling via JAK-Stat in human cells	1	20	1.533	$\geq 0.05$
65	DNA damage_Inhibition of telomerase activity and cellular senescence	1	20	1.533	$\geq 0.05$
66	Development_FGF2-dependent induction of EMT	1	20	1.533	$\geq 0.05$
67	Cell cycle_Cell cycle (generic schema)	1	21	1.512	$\geq 0.05$
68	Atherosclerosis_Role of ZNF202 in regulation of expression of genes involved in Atherosclerosis	1	21	1.512	$\geq 0.05$
69	Cytoskeleton remodeling_ESR1 action on cytoskeleton remodeling and cell migration	1	22	1.492	$\geq 0.05$
70	Immune response_MIF-mediated glucocorticoid regulation	1	22	1.492	$\geq 0.05$
71	Apoptosis and survival_NO signaling in survival	1	24	1.455	$\geq 0.05$
72	Cytoskeleton remodeling_Role of PDGFs in cell migration	1	24	1.455	$\geq 0.05$
73	Development_Dopamine D2 receptor transactivation of EGFR	1	24	1.455	$\geq 0.05$
74	Immune response_IL-23 signaling pathway	1	25	1.437	$\geq 0.05$
75	Development_Leptin signaling via JAK/STAT and MAPK cascades	1	25	1.437	$\geq 0.05$
76	Immune response_IL-10 signaling pathway	1	26	1.42	$\geq 0.05$
77	Cell cycle_Regulation of G1/S transition (part 2)	1	26	1.42	$\geq 0.05$
78	Apoptosis and survival_NGF signaling pathway	1	26	1.42	$\geq 0.05$
79	Transcription_Role of Akt in hypoxia induced HIF1	1	27	1.404	$\geq 0.05$

	activation				
80	Development_Thrombospondin-1 signaling	1	28	1.389	$\geq 0.05$
81	Cell cycle_Role of SCF complex in cell cycle regulation	1	29	1.374	$\geq 0.05$
82	Apoptosis and survival_nAChR in apoptosis inhibition and cell cycle progression	1	29	1.374	$\geq 0.05$
83	Apoptosis and survival_NGF activation of NF-kB	1	29	1.374	$\geq 0.05$
84	Apoptosis and survival_p53-dependent apoptosis	1	29	1.374	$\geq 0.05$
85	Development_G-CSF-induced myeloid differentiation	1	30	1.359	$\geq 0.05$
86	Cytoskeleton remodeling_Fibronectin-binding integrins in cell motility	1	31	1.345	$\geq 0.05$
87	Cytoskeleton remodeling_Reverse signaling by ephrin B	1	31	1.345	$\geq 0.05$
88	Development_Transactivation of PDGFR in non-neuronal cells by Dopamine D2 receptor	1	31	1.345	$\geq 0.05$
89	Development_Inhibition of angiogenesis by PEDF	1	31	1.345	$\geq 0.05$
90	Putative pathways for stimulation of fat cell differentiation by Bisphenol A	1	32	1.332	$\geq 0.05$
91	Development_Transcription regulation of granulocyte development	1	32	1.332	$\geq 0.05$
92	Development_PDGF signaling via STATs and NF-kB	1	32	1.332	$\geq 0.05$
93	Cell cycle_Start of DNA replication in early S phase	1	32	1.332	$\geq 0.05$
94	Development_EGFR signaling via small GTPases	1	33	1.319	$\geq 0.05$
95	Development_Activation of astroglial cells proliferation by ACM3	1	33	1.319	$\geq 0.05$
96	Cell cycle_ESR1 regulation of G1/S transition	1	33	1.319	$\geq 0.05$
97	Apoptosis and survival_Caspase cascade	1	33	1.319	$\geq 0.05$
98	Development_CNTF receptor signaling	1	34	1.306	$\geq 0.05$

99	CCR4-dependent immune cell chemotaxis in asthma and atopic dermatitis	<a href="#">1</a>	34	1.306	$\geq 0.05$
100	Chemotaxis_CCR4-induced chemotaxis of immune cells	<a href="#">1</a>	34	1.306	$\geq 0.05$
101	Mechanism of action of CCR4 antagonists in asthma and atopic dermatitis (Variant 1)	<a href="#">1</a>	34	1.306	$\geq 0.05$
102	Methionine metabolism	<a href="#">1</a>	34	1.306	$\geq 0.05$
103	Chemotaxis_CXCR4 signaling pathway	<a href="#">1</a>	34	1.306	$\geq 0.05$
104	G-protein signaling_G-Protein alpha-q signaling cascades	<a href="#">1</a>	34	1.306	$\geq 0.05$
105	Signal transduction_Erk Interactions: Inhibition of Erk	<a href="#">1</a>	34	1.306	$\geq 0.05$
106	Apoptosis and survival_Role of CDK5 in neuronal death and survival	<a href="#">1</a>	34	1.306	$\geq 0.05$
107	G-protein signaling_G-Protein beta/gamma signaling cascades	<a href="#">1</a>	34	1.306	$\geq 0.05$
108	Development_Role of CDK5 in neuronal development	<a href="#">1</a>	34	1.306	$\geq 0.05$
109	Development_Growth hormone signaling via STATs and PLC/IP3	<a href="#">1</a>	35	1.294	$\geq 0.05$
110	Development_Regulation of telomere length and cellular immortalization	<a href="#">1</a>	35	1.294	$\geq 0.05$
111	Inhibitory action of Lipoxin A4 on PDGF, EGF and LTD4 signaling	<a href="#">1</a>	35	1.294	$\geq 0.05$
112	Immune response_Regulation of T cell function by CTLA-4	<a href="#">1</a>	36	1.282	$\geq 0.05$
113	Development_SSTR2 in regulation of cell proliferation	<a href="#">1</a>	36	1.282	$\geq 0.05$
114	G-protein signaling_Rac2 regulation pathway	<a href="#">1</a>	36	1.282	$\geq 0.05$
115	Development_Lipoxin inhibitory action on PDGF, EGF and LTD4 signaling	<a href="#">1</a>	36	1.282	$\geq 0.05$
116	G-protein signaling_G-Protein alpha-12 signaling pathway	<a href="#">1</a>	37	1.27	$\geq 0.05$
117	Development_Beta-adrenergic receptors transactivation of EGFR	<a href="#">1</a>	37	1.27	$\geq 0.05$

118	Development_Delta-type opioid receptor mediated cardioprotection	<a href="#">1</a>	37	1.27	$\geq 0.05$
119	Apoptosis and survival_Anti-apoptotic action of membrane-bound ESR1	<a href="#">1</a>	38	1.259	$\geq 0.05$
120	Immune response_Role of integrins in NK cells cytotoxicity	<a href="#">1</a>	38	1.259	$\geq 0.05$
121	Immune response_Human NKG2D signaling	<a href="#">1</a>	38	1.259	$\geq 0.05$
122	Immune response_IL-7 signaling in T lymphocytes	<a href="#">1</a>	38	1.259	$\geq 0.05$
123	Cell adhesion_PLAU signaling	<a href="#">1</a>	39	1.248	$\geq 0.05$
124	Development_ERBB-family signaling	<a href="#">1</a>	39	1.248	$\geq 0.05$
125	Translation_Non-genomic (rapid) action of Androgen Receptor	<a href="#">1</a>	40	1.237	$\geq 0.05$
126	Development_Neurotrophin family signaling	<a href="#">1</a>	40	1.237	$\geq 0.05$
127	Immune response_TCR and CD28 co-stimulation in activation of NF-kB	<a href="#">1</a>	40	1.237	$\geq 0.05$
128	Apoptosis and survival_Ceramides signaling pathway	<a href="#">1</a>	40	1.237	$\geq 0.05$
129	Immune response_PIP3 signaling in B lymphocytes	<a href="#">1</a>	42	1.217	$\geq 0.05$
130	Signal transduction_JNK pathway	<a href="#">1</a>	42	1.217	$\geq 0.05$
131	Apoptosis and survival_Lymphotoxin-beta receptor signaling	<a href="#">1</a>	42	1.217	$\geq 0.05$
132	Development_Growth hormone signaling via PI3K/AKT and MAPK cascades	<a href="#">1</a>	42	1.217	$\geq 0.05$
133	Immune response_Murine NKG2D signaling	<a href="#">1</a>	42	1.217	$\geq 0.05$
134	Regulation of metabolism_Role of Adiponectin in regulation of metabolism	<a href="#">1</a>	43	1.207	$\geq 0.05$
135	Development_EPO-induced PI3K/AKT pathway and Ca(2+) influx	<a href="#">1</a>	43	1.207	$\geq 0.05$
136	Development_S1P3 receptor signaling pathway	<a href="#">1</a>	43	1.207	$\geq 0.05$

137	Methionine-cysteine-glutamate metabolism	<a href="#">1</a>	43	1.207	$\geq 0.05$
138	Development_Angiotensin signaling via PYK2	<a href="#">1</a>	43	1.207	$\geq 0.05$
139	Immune response_IL-5 signalling	<a href="#">1</a>	44	1.197	$\geq 0.05$
140	Cell adhesion_Ephrin signaling	<a href="#">1</a>	45	1.188	$\geq 0.05$
141	Development_Thrombopoietin-regulated cell processes	<a href="#">1</a>	45	1.188	$\geq 0.05$
142	Immune response_ICOS pathway in T-helper cell	<a href="#">1</a>	46	1.179	$\geq 0.05$
143	Development_TGF-beta-dependent induction of EMT via RhoA, PI3K and ILK.	<a href="#">1</a>	46	1.179	$\geq 0.05$
144	Immune response_Inhibitory action of Lipoxins on pro-inflammatory TNF-alpha signaling	<a href="#">1</a>	46	1.179	$\geq 0.05$
145	Immune response_Fc gamma R-mediated phagocytosis in macrophages	<a href="#">1</a>	46	1.179	$\geq 0.05$
146	Development_Angiotensin activation of Akt	<a href="#">1</a>	46	1.179	$\geq 0.05$
147	Development_WNT5A signaling	<a href="#">1</a>	47	1.169	$\geq 0.05$
148	Development_PDGF signaling via MAPK cascades	<a href="#">1</a>	47	1.169	$\geq 0.05$
149	Muscle contraction_Relaxin signaling pathway	<a href="#">1</a>	48	1.161	$\geq 0.05$
150	Immune response_Histamine H1 receptor signaling in immune response	<a href="#">1</a>	48	1.161	$\geq 0.05$
151	Cell adhesion_Integrin-mediated cell adhesion and migration	<a href="#">1</a>	48	1.161	$\geq 0.05$
152	Development_Melanocyte development and pigmentation	<a href="#">1</a>	49	1.152	$\geq 0.05$
153	Signal transduction_IP3 signaling	<a href="#">1</a>	49	1.152	$\geq 0.05$
154	Development_G-CSF signaling	<a href="#">1</a>	49	1.152	$\geq 0.05$
155	Immune response_IL-2 activation and signaling pathway	<a href="#">1</a>	49	1.152	$\geq 0.05$
156	Nicotine signaling in cholinergic neurons	<a href="#">1</a>	50	1.144	$\geq 0.05$
157	Immune response_IL-13 signaling via PI3K-ERK	<a href="#">1</a>	50	1.144	$\geq 0.05$
158	Some pathways of EMT in cancer cells	<a href="#">1</a>	51	1.135	$\geq 0.05$

159	Immune response_NFAT in immune response	<a href="#">1</a>	51	1.135	$\geq 0.05$
160	Sulfur metabolism	<a href="#">1</a>	52	1.127	$\geq 0.05$
161	Development_FGF-family signaling	<a href="#">1</a>	52	1.127	$\geq 0.05$
162	Development_WNT signaling pathway. Part 2	<a href="#">1</a>	53	1.119	$\geq 0.05$
163	Development_Endothelin-1/EDNRA signaling	<a href="#">1</a>	53	1.119	$\geq 0.05$
164	Immune response_CD28 signaling	<a href="#">1</a>	54	1.111	$\geq 0.05$
165	Immune response_Role of DAP12 receptors in NK cells	<a href="#">1</a>	54	1.111	$\geq 0.05$
166	Immune response _IFN gamma signaling pathway	<a href="#">1</a>	54	1.111	$\geq 0.05$
167	Immune response_BCR pathway	<a href="#">1</a>	54	1.111	$\geq 0.05$
168	Chemotaxis_CCL2-induced chemotaxis	<a href="#">1</a>	55	1.104	$\geq 0.05$
169	Immune response_Fc epsilon RI pathway	<a href="#">1</a>	55	1.104	$\geq 0.05$
170	PGE2 pathways in cancer	<a href="#">1</a>	55	1.104	$\geq 0.05$
171	(L)-Alanine, (L)-cysteine, and (L)-methionine metabolism	<a href="#">1</a>	56	1.096	$\geq 0.05$
172	(L)-Alanine, (L)-cysteine, and (L)-methionine metabolism / Human version	<a href="#">1</a>	58	1.081	$\geq 0.05$
173	Immune response_TREM1 signaling pathway	<a href="#">1</a>	59	1.074	$\geq 0.05$
174	Immune response_Immunological synapse formation	<a href="#">1</a>	59	1.074	$\geq 0.05$
175	Immune response_IL-17 signaling pathways	<a href="#">1</a>	60	1.067	$\geq 0.05$
176	Development_Alpha-2 adrenergic receptor activation of ERK	<a href="#">1</a>	62	1.054	$\geq 0.05$
177	Development_EGFR signaling pathway	<a href="#">1</a>	63	1.047	$\geq 0.05$
178	Transport_Macropinocytosis regulation by growth factors	<a href="#">1</a>	63	1.047	$\geq 0.05$
179	Immune response_IL-15 signaling	<a href="#">1</a>	64	1.04	$\geq 0.05$
180	Immune response_CD40 signaling	<a href="#">1</a>	65	1.034	$\geq 0.05$
181	Immune response_CD16 signaling in NK cells	<a href="#">1</a>	69	1.009	$\geq 0.05$

182	Regulation of lipid metabolism_Stimulation of Arachidonic acid production by ACM receptors	<a href="#">1</a>	72	0.992	$\geq 0.05$
183	Chemotaxis_Leukocyte chemotaxis	<a href="#">1</a>	75	0.975	$\geq 0.05$
184	Blood coagulation_GPIb-IX-V-dependent platelet activation	<a href="#">1</a>	76	0.969	$\geq 0.05$

<sup>a</sup> ratio between miRNA target genes and total genes in the pathway.

**eTable 7:** GeneGo Pathways Enriched in miR-135a Target Genes.

#	Maps	Ratio <sup>a</sup>	-log(p)	FDR
1	G-protein signaling_RhoA regulation pathway	<u>6</u>	34	6.118 <0.05
2	Apoptosis and survival_Anti-apoptotic action of Gastrin	<u>6</u>	43	5.492 <0.05
3	Cytoskeleton remodeling_TGF, WNT and cytoskeletal remodeling	<u>8</u>	111	4.952 <0.05
4	Muscle contraction_GPCRs in the regulation of smooth muscle tone	<u>7</u>	83	4.837 <0.05
5	Development_Gastrin in cell growth and proliferation	<u>6</u>	62	4.552 <0.05
6	Cytoskeleton remodeling_Cytoskeleton remodeling	<u>7</u>	102	4.253 <0.05
7	Cytoskeleton remodeling_Fibronectin-binding integrins in cell motility	<u>4</u>	31	3.67 <0.05
8	Development_Growth hormone signaling via STATs and PLC/IP3	<u>4</u>	35	3.461 <0.05
9	G-protein signaling_Regulation of RAC1 activity	<u>4</u>	36	3.413 <0.05
10	Cell adhesion_Chemokines and adhesion	<u>6</u>	100	3.392 <0.05
11	Transcription_Transcription factor Tubby signaling pathways	<u>3</u>	17	3.263 <0.05
12	Development_WNT signaling pathway. Part 1. Degradation of beta-catenin in the absence WNT signaling	<u>3</u>	19	3.115 <0.05
13	Neurophysiological process_ACM regulation of nerve impulse	<u>4</u>	46	3.003 <0.05
14	Cytoskeleton remodeling_ESR1 action on cytoskeleton remodeling and cell migration	<u>3</u>	22	2.923 <0.05
15	Development_Endothelin-1/EDNRA signaling	<u>4</u>	53	2.771 <0.05
16	Development_WNT signaling pathway. Part 2	<u>4</u>	53	2.771 <0.05
17	Development_Slit-Robo signaling	<u>3</u>	30	2.527 ≥0.05

18	Development_EGFR signaling pathway	<u>4</u>	63	2.495	$\geq 0.05$
19	Muscle contraction_Regulation of eNOS activity in endothelial cells	<u>4</u>	65	2.446	$\geq 0.05$
20	Putative pathways for stimulation of fat cell differentiation by Bisphenol A	<u>3</u>	32	2.446	$\geq 0.05$
21	Development_PDGF signaling via STATs and NF-kB	<u>3</u>	32	2.446	$\geq 0.05$
22	Cell adhesion_Alpha-4 integrins in cell migration and adhesion	<u>3</u>	34	2.37	$\geq 0.05$
23	Development_Role of CDK5 in neuronal development	<u>3</u>	34	2.37	$\geq 0.05$
24	Immune response_Gastrin in inflammatory response	<u>4</u>	69	2.352	$\geq 0.05$
25	Development_Angiopoietin - Tie2 signaling	<u>3</u>	35	2.334	$\geq 0.05$
26	Cytoskeleton remodeling_ACM3 and ACM4 in keratinocyte migration	<u>3</u>	38	2.233	$\geq 0.05$
27	Development_Gastrin in differentiation of the gastric mucosa	<u>3</u>	38	2.233	$\geq 0.05$
28	Immune response_Th1 and Th2 cell differentiation	<u>3</u>	40	2.171	$\geq 0.05$
29	N-Glycan biosynthesis p2	<u>3</u>	41	2.141	$\geq 0.05$
30	Development_Growth hormone signaling via PI3K/AKT and MAPK cascades	<u>3</u>	42	2.111	$\geq 0.05$
31	Development_S1P3 receptor signaling pathway	<u>3</u>	43	2.083	$\geq 0.05$
32	Immune response_IL-4 signaling pathway	<u>3</u>	44	2.055	$\geq 0.05$
33	Cell adhesion_Ephrin signaling	<u>3</u>	45	2.028	$\geq 0.05$
34	Neurophysiological process_Receptor-mediated axon growth repulsion	<u>3</u>	45	2.028	$\geq 0.05$
35	Cell adhesion_Histamine H1 receptor signaling in the interruption of cell barrier integrity	<u>3</u>	45	2.028	$\geq 0.05$
36	Development_Thrombopoietin-regulated cell processes	<u>3</u>	45	2.028	$\geq 0.05$

37	Development_Endothelin-1/EDNRA transactivation of EGFR	<u>3</u>	46	2.002	$\geq 0.05$
38	Signal transduction_PTEN pathway	<u>3</u>	46	2.002	$\geq 0.05$
39	Neurophysiological process_Circadian rhythm	<u>3</u>	47	1.976	$\geq 0.05$
40	Development_Leptin signaling via PI3K-dependent pathway	<u>3</u>	47	1.976	$\geq 0.05$
41	Development_PIP3 signaling in cardiac myocytes	<u>3</u>	47	1.976	$\geq 0.05$
42	Cell adhesion_Integrin-mediated cell adhesion and migration	<u>3</u>	48	1.952	$\geq 0.05$
43	Cytoskeleton remodeling_Integrin outside-in signaling	<u>3</u>	49	1.927	$\geq 0.05$
44	Development_GM-CSF signaling	<u>3</u>	50	1.903	$\geq 0.05$
45	Development_A2B receptor: action via G-protein alpha s	<u>3</u>	50	1.903	$\geq 0.05$
46	Some pathways of EMT in cancer cells	<u>3</u>	51	1.88	$\geq 0.05$
47	Cell cycle_Influence of Ras and Rho proteins on G1/S Transition	<u>3</u>	53	1.835	$\geq 0.05$
48	Chemotaxis_CCL2-induced chemotaxis	<u>3</u>	55	1.792	$\geq 0.05$
49	Muscle contraction_ACMy regulation of smooth muscle contraction	<u>3</u>	56	1.771	$\geq 0.05$
50	Airway smooth muscle contraction in asthma	<u>3</u>	56	1.771	$\geq 0.05$
51	Cardiac Hypertrophy_Ca(2+)-dependent NF-AT signaling in Cardiac Hypertrophy	<u>3</u>	57	1.75	$\geq 0.05$
52	Cytoskeleton remodeling_FAK signaling	<u>3</u>	57	1.75	$\geq 0.05$
53	Development_Thyroliberin signaling	<u>3</u>	60	1.691	$\geq 0.05$
54	Immune response_IL-15 signaling via JAK-STAT cascade	<u>2</u>	23	1.684	$\geq 0.05$
55	Role of Nicotine-induced Leptin resistance in hypothalamus in development of obesity	<u>2</u>	25	1.616	$\geq 0.05$
56	G-protein signaling_K-RAS regulation pathway	<u>2</u>	25	1.616	$\geq 0.05$
57	Immune response_IL-23 signaling pathway	<u>2</u>	25	1.616	$\geq 0.05$

58	Development_Leptin signaling via JAK/STAT and MAPK cascades	<u>2</u>	25	1.616	$\geq 0.05$
59	Development_Role of IL-8 in angiogenesis	<u>3</u>	65	1.6	$\geq 0.05$
60	Development_S1P2 and S1P3 receptors in cell proliferation and differentiation	<u>2</u>	26	1.584	$\geq 0.05$
61	Neurophysiological process_GABA-B receptor-mediated regulation of glutamate signaling in Purkinje cells	<u>2</u>	27	1.553	$\geq 0.05$
62	Apoptosis and survival_nAChR in apoptosis inhibition and cell cycle progression	<u>2</u>	29	1.495	$\geq 0.05$
63	Reproduction_GnRH signaling	<u>3</u>	72	1.486	$\geq 0.05$
64	Muscle contraction_S1P2 receptor-mediated smooth muscle contraction	<u>2</u>	30	1.468	$\geq 0.05$
65	Development_Osteopontin signaling in osteoclasts	<u>2</u>	30	1.468	$\geq 0.05$
66	Cytoskeleton remodeling_RalA regulation pathway	<u>2</u>	30	1.468	$\geq 0.05$
67	Immune response_IL-4 - antiapoptotic action	<u>2</u>	30	1.468	$\geq 0.05$
68	Influence of low doses of Arsenite on glucose uptake in adipocytes	<u>2</u>	31	1.442	$\geq 0.05$
69	Transport_ACM3 signaling in lacrimal glands	<u>3</u>	75	1.441	$\geq 0.05$
70	Development_Angiotensin signaling via STATs	<u>2</u>	32	1.416	$\geq 0.05$
71	Development_Activation of astroglial cells proliferation by ACM3	<u>2</u>	33	1.392	$\geq 0.05$
72	Neurophysiological process_GABA-B receptor signaling in presynaptic nerve terminals	<u>2</u>	34	1.368	$\geq 0.05$
73	Development_CNTF receptor signaling	<u>2</u>	34	1.368	$\geq 0.05$
74	Chemotaxis_CXCR4 signaling pathway	<u>2</u>	34	1.368	$\geq 0.05$
75	G-protein signaling_G-Protein alpha-q signaling cascades	<u>2</u>	34	1.368	$\geq 0.05$
76	Immune response_Th17 cell differentiation	<u>2</u>	35	1.345	$\geq 0.05$

77	Cell adhesion_Plasmin signaling	<u>2</u>	35	1.345	$\geq 0.05$
78	Inhibitory action of Lipoxin A4 on PDGF, EGF and LTD4 signaling	<u>2</u>	35	1.345	$\geq 0.05$
79	Oxidative stress_Angiotensin II-induced production of ROS	<u>2</u>	35	1.345	$\geq 0.05$
80	Neurophysiological process_Thyroliberin in cell hyperpolarization and excitability	<u>2</u>	35	1.345	$\geq 0.05$
81	G-protein signaling_S1P2 receptor signaling	<u>2</u>	35	1.345	$\geq 0.05$
82	Neurophysiological process_EphB receptors in dendritic spine morphogenesis and synaptogenesis	<u>2</u>	35	1.345	$\geq 0.05$
83	G-protein signaling_Rac2 regulation pathway	<u>2</u>	36	1.323	$\geq 0.05$
84	Development_Lipoxin inhibitory action on PDGF, EGF and LTD4 signaling	<u>2</u>	36	1.323	$\geq 0.05$
85	Development_VEGF signaling via VEGFR2 - generic cascades	<u>3</u>	84	1.318	$\geq 0.05$
86	G-protein signaling_G-Protein alpha-12 signaling pathway	<u>2</u>	37	1.302	$\geq 0.05$
87	Cell adhesion_Role of tetraspanins in the integrin-mediated cell adhesion	<u>2</u>	37	1.302	$\geq 0.05$
88	Development_Delta-type opioid receptor mediated cardioprotection	<u>2</u>	37	1.302	$\geq 0.05$
89	Immune response_Human NKG2D signaling	<u>2</u>	38	1.281	$\geq 0.05$
90	Immune response_IL-7 signaling in T lymphocytes	<u>2</u>	38	1.281	$\geq 0.05$
91	Translation _Regulation of EIF2 activity	<u>2</u>	39	1.261	$\geq 0.05$
92	Development_PACAP signaling in neural cells	<u>2</u>	39	1.261	$\geq 0.05$
93	Cell adhesion_PLAU signaling	<u>2</u>	39	1.261	$\geq 0.05$
94	Cytoskeleton remodeling_Role of PKA in cytoskeleton reorganisation	<u>2</u>	40	1.241	$\geq 0.05$
95	Immune response_HMGB1 release from the cell	<u>2</u>	41	1.222	$\geq 0.05$

96	Immune response_Murine NKG2D signaling	<u>2</u>	42	1.204	$\geq 0.05$
97	Apoptosis and survival_BAD phosphorylation	<u>2</u>	42	1.204	$\geq 0.05$
98	Transport_ACM3 in salivary glands	<u>2</u>	42	1.204	$\geq 0.05$
99	Immune response_IL-7 signaling in B lymphocytes	<u>2</u>	43	1.186	$\geq 0.05$
100	Development_EPO-induced PI3K/AKT pathway and Ca(2+) influx	<u>2</u>	43	1.186	$\geq 0.05$
101	Development_Angiotensin signaling via PYK2	<u>2</u>	43	1.186	$\geq 0.05$
102	Neurophysiological process_Melatonin signaling	<u>2</u>	43	1.186	$\geq 0.05$
103	Immune response_HTR2A-induced activation of cPLA2	<u>2</u>	43	1.186	$\geq 0.05$
104	cAMP/ Ca(2+)-dependent Insulin secretion	<u>2</u>	43	1.186	$\geq 0.05$
105	Development_VEGF signaling and activation	<u>2</u>	43	1.186	$\geq 0.05$
106	Immune response_IL-13 signaling via JAK-STAT	<u>2</u>	44	1.168	$\geq 0.05$
107	Immune response_IL-5 signalling	<u>2</u>	44	1.168	$\geq 0.05$
108	G-protein signaling_Regulation of cAMP levels by ACM	<u>2</u>	45	1.151	$\geq 0.05$
109	Immune response_NF-AT signaling and leukocyte interactions	<u>2</u>	46	1.134	$\geq 0.05$
110	Immune response_Inhibitory action of Lipoxins on pro-inflammatory TNF-alpha signaling	<u>2</u>	46	1.134	$\geq 0.05$
111	Development_Angiotensin activation of Akt	<u>2</u>	46	1.134	$\geq 0.05$
112	Development_WNT5A signaling	<u>2</u>	47	1.118	$\geq 0.05$
113	Development_HGF signaling pathway	<u>2</u>	47	1.118	$\geq 0.05$
114	Development_Melanocyte development and pigmentation	<u>2</u>	49	1.087	$\geq 0.05$
115	Development_A3 receptor signaling	<u>2</u>	49	1.087	$\geq 0.05$
116	Signal transduction_IP3 signaling	<u>2</u>	49	1.087	$\geq 0.05$
117	Development_G-CSF signaling	<u>2</u>	49	1.087	$\geq 0.05$

118	Cell adhesion_Role of CDK5 in cell adhesion	<u>1</u>	9	1.075	$\geq 0.05$
119	wtCFTR and delta508-CFTR traffic / Generic schema (norm and CF)	<u>2</u>	50	1.072	$\geq 0.05$
120	G-protein signaling_Proinsulin C-peptide signaling	<u>2</u>	52	1.043	$\geq 0.05$
121	Cell adhesion_ECM remodeling	<u>2</u>	52	1.043	$\geq 0.05$
122	Immune response_Antiviral actions of Interferons	<u>2</u>	52	1.043	$\geq 0.05$
123	Immune response_HMGB1/RAGE signaling pathway	<u>2</u>	53	1.029	$\geq 0.05$
124	Immune response _IFN gamma signaling pathway	<u>2</u>	54	1.015	$\geq 0.05$
125	PGE2 pathways in cancer	<u>2</u>	55	1.002	$\geq 0.05$
126	G-protein signaling_Rap1B regulation pathway	<u>1</u>	11	0.992	$\geq 0.05$
127	Cell adhesion_Integrin inside-out signaling	<u>2</u>	56	0.988	$\geq 0.05$
128	Regulation of lipid metabolism_Insulin regulation of glycogen metabolism	<u>2</u>	56	0.988	$\geq 0.05$
129	Immune response_CCR5 signaling in macrophages and T lymphocytes	<u>2</u>	58	0.963	$\geq 0.05$
130	Regulation of CFTR activity (norm and CF)	<u>2</u>	58	0.963	$\geq 0.05$
131	Development_Prolactin receptor signaling	<u>2</u>	58	0.963	$\geq 0.05$
132	Transport_RAB1A regulation pathway	<u>1</u>	12	0.956	$\geq 0.05$
133	Immune response_IL-17 signaling pathways	<u>2</u>	60	0.939	$\geq 0.05$
134	Regulation of lipid metabolism_G-alpha(q) regulation of lipid metabolism	<u>2</u>	61	0.927	$\geq 0.05$
135	Development_c-Kit ligand signaling pathway during hemopoiesis	<u>2</u>	61	0.927	$\geq 0.05$
136	Cytoskeleton remodeling_RalB regulation pathway	<u>1</u>	13	0.923	$\geq 0.05$
137	Unsaturated fatty acid biosynthesis	<u>2</u>	62	0.915	$\geq 0.05$
138	Muscle contraction_Oxytocin signaling in uterus and	<u>2</u>	62	0.915	$\geq 0.05$

	mammary gland				
139	Transport_RAB3 regulation pathway	<u>1</u>	14	0.893	$\geq 0.05$
140	Immune response_IL-15 signaling	<u>2</u>	64	0.892	$\geq 0.05$
141	Development_Regulation of epithelial-to-mesenchymal transition (EMT)	<u>2</u>	64	0.892	$\geq 0.05$
142	Immune response_CD40 signaling	<u>2</u>	65	0.882	$\geq 0.05$
143	Cardiac Hypertrophy_NF-AT signaling in Cardiac Hypertrophy	<u>2</u>	65	0.882	$\geq 0.05$
144	G-protein signaling_RhoB regulation pathway	<u>1</u>	16	0.839	$\geq 0.05$
145	Blood coagulation_GPCRs in platelet aggregation	<u>2</u>	71	0.82	$\geq 0.05$
146	Regulation of lipid metabolism_Stimulation of Arachidonic acid production by ACM receptors	<u>2</u>	72	0.811	$\geq 0.05$
147	Immune response_Oncostatin M signaling via JAK-Stat in mouse cells	<u>1</u>	18	0.792	$\geq 0.05$
148	Transport_RAN regulation pathway	<u>1</u>	18	0.792	$\geq 0.05$
149	Cytoskeleton remodeling_Alpha-1A adrenergic receptor-dependent inhibition of PI3K	<u>1</u>	19	0.771	$\geq 0.05$
150	Development_Alpha-1 adrenergic receptors signaling via cAMP	<u>1</u>	19	0.771	$\geq 0.05$
151	wtCFTR and delta508 traffic / Clathrin coated vesicles formation (norm and CF)	<u>1</u>	19	0.771	$\geq 0.05$
152	Immune response _CCR3 signaling in eosinophils	<u>2</u>	77	0.765	$\geq 0.05$
153	Translation_IL-2 regulation of translation	<u>1</u>	20	0.751	$\geq 0.05$
154	UMP biosynthesis	<u>1</u>	20	0.751	$\geq 0.05$
155	Immune response_Oncostatin M signaling via JAK-Stat in human cells	<u>1</u>	20	0.751	$\geq 0.05$
156	Development_FGF2-dependent induction of EMT	<u>1</u>	20	0.751	$\geq 0.05$

157	Taurine and hypotaurine metabolism	<a href="#">1</a>	22	0.713	$\geq 0.05$
158	Cell cycle_Sister chromatid cohesion	<a href="#">1</a>	22	0.713	$\geq 0.05$
159	Transcription_Role of heterochromatin protein 1 (HP1) family in transcriptional silencing	<a href="#">1</a>	22	0.713	$\geq 0.05$
160	Development_Thrombopoetin signaling via JAK-STAT pathway	<a href="#">1</a>	22	0.713	$\geq 0.05$
161	LRRK2 and immune function in Parkinson's disease	<a href="#">1</a>	22	0.713	$\geq 0.05$
162	Immune response_IL-12 signaling pathway	<a href="#">1</a>	23	0.696	$\geq 0.05$
163	Delta508-CFTR traffic / Sorting endosome formation in CF	<a href="#">1</a>	23	0.696	$\geq 0.05$
164	Cytoskeleton remodeling_Regulation of actin cytoskeleton by Rho GTPases	<a href="#">1</a>	23	0.696	$\geq 0.05$
165	Apoptosis and survival_NO signaling in apoptosis	<a href="#">1</a>	23	0.696	$\geq 0.05$
166	Apoptosis and survival_Beta-2 adrenergic receptor anti-apoptotic action	<a href="#">1</a>	23	0.696	$\geq 0.05$
167	Development_EGFR signaling via PIP3	<a href="#">1</a>	23	0.696	$\geq 0.05$
168	G-protein signaling_Cross-talk between Ras-family GTPases	<a href="#">1</a>	23	0.696	$\geq 0.05$
169	Immune response_IFN alpha/beta signaling pathway	<a href="#">1</a>	24	0.679	$\geq 0.05$
170	Cell adhesion_Endothelial cell contacts by non-junctional mechanisms	<a href="#">1</a>	24	0.679	$\geq 0.05$
171	Proteolysis_Role of Parkin in the Ubiquitin-Proteasomal Pathway	<a href="#">1</a>	24	0.679	$\geq 0.05$
172	Immune response_IL-27 signaling pathway	<a href="#">1</a>	24	0.679	$\geq 0.05$
173	Cytoskeleton remodeling_Role of PDGFs in cell migration	<a href="#">1</a>	24	0.679	$\geq 0.05$
174	Development_Dopamine D2 receptor transactivation of EGFR	<a href="#">1</a>	24	0.679	$\geq 0.05$
175	Development_GDNF signaling	<a href="#">1</a>	24	0.679	$\geq 0.05$
176	Regulation of lipid metabolism_Insulin regulation of fatty	<a href="#">2</a>	89	0.669	$\geq 0.05$

	acid metabolism				
177	Cytoskeleton remodeling_Neurofilaments	1	25	0.664	≥0.05
178	Cell adhesion_Cadherin-mediated cell adhesion	1	26	0.649	≥0.05
179	Apoptosis and survival_NGF signaling pathway	1	26	0.649	≥0.05
180	Immune response_IL-10 signaling pathway	1	26	0.649	≥0.05
181	Neurophysiological process_GABA-A receptor life cycle	1	27	0.634	≥0.05
182	Muscle contraction_nNOS Signaling in Skeletal Muscle	1	28	0.621	≥0.05
183	Possible influence of low doses of Arsenite on glucose uptake in muscle	1	28	0.621	≥0.05
184	Development_Delta-type opioid receptor signaling via G-protein alpha-14	1	28	0.621	≥0.05
185	Development_Thrombospondin-1 signaling	1	28	0.621	≥0.05
186	Apoptosis and survival_NGF activation of NF-kB	1	29	0.607	≥0.05
187	Proteolysis_Putative SUMO-1 pathway	1	29	0.607	≥0.05
188	Development_G-CSF-induced myeloid differentiation	1	30	0.595	≥0.05
189	DNA damage_Brca1 as a transcription regulator	1	30	0.595	≥0.05
190	Transcription_Ligand-dependent activation of the ESR1/SP pathway	1	30	0.595	≥0.05
191	Transport_Aldosterone-mediated regulation of ENaC sodium transport	1	30	0.595	≥0.05
192	Neurophysiological process _Visual perception	1	30	0.595	≥0.05
193	Immune response_IL-3 activation and signaling pathway	1	31	0.582	≥0.05
194	Cytoskeleton remodeling_Reverse signaling by ephrin B	1	31	0.582	≥0.05
195	Development_Transactivation of PDGFR in non-neuronal cells by Dopamine D2 receptor	1	31	0.582	≥0.05
196	Development_Transcription regulation of granulocyte	1	32	0.571	≥0.05

	development			
197	Apoptosis and survival_Granzyme B signaling	<u>1</u>	32	0.571 ≥0.05
198	Cell cycle_Role of Nek in cell cycle regulation	<u>1</u>	32	0.571 ≥0.05
199	DNA damage_ATM/ATR regulation of G1/S checkpoint	<u>1</u>	32	0.571 ≥0.05
200	Protein folding and maturation_B Bradykinin / Kallidin maturation	<u>1</u>	32	0.571 ≥0.05
201	Autophagy_Autophagy	<u>1</u>	32	0.571 ≥0.05
202	ATP metabolism	<u>2</u>	106	0.56 ≥0.05
203	Development_Angiotensin activation of ERK	<u>1</u>	33	0.559 ≥0.05
204	G-protein signaling_Regulation of CDC42 activity	<u>1</u>	33	0.559 ≥0.05
205	Development_BMP signaling	<u>1</u>	33	0.559 ≥0.05
206	Development_EGFR signaling via small GTPases	<u>1</u>	33	0.559 ≥0.05
207	Cytoskeleton remodeling_Thyroliberin in cytoskeleton remodeling	<u>1</u>	33	0.559 ≥0.05
208	G-protein signaling_N-RAS regulation pathway	<u>1</u>	33	0.559 ≥0.05
209	Normal and pathological TGF-beta-mediated regulation of cell proliferation	<u>1</u>	33	0.559 ≥0.05
210	CTP/UTP metabolism	<u>2</u>	108	0.549 ≥0.05
211	Immune response_Inflammasome in inflammatory response	<u>1</u>	34	0.548 ≥0.05
212	Signal transduction_Erk Interactions: Inhibition of Erk	<u>1</u>	34	0.548 ≥0.05
213	Apoptosis and survival_Role of CDK5 in neuronal death and survival	<u>1</u>	34	0.548 ≥0.05
214	Immune response_IL-22 signaling pathway	<u>1</u>	34	0.548 ≥0.05
215	Mucin expression in CF via IL-6, IL-17 signaling pathways	<u>1</u>	34	0.548 ≥0.05
216	wtCFTR and deltaF508 traffic / Membrane expression (norm and CF)	<u>1</u>	34	0.548 ≥0.05

217	Development_EPO-induced Jak-STAT pathway	<a href="#">1</a>	35	0.538	$\geq 0.05$
218	Keratan sulfate metabolism p.1	<a href="#">1</a>	35	0.538	$\geq 0.05$
219	Immune response_Regulation of T cell function by CTLA-4	<a href="#">1</a>	36	0.527	$\geq 0.05$
220	Development_SSTR2 in regulation of cell proliferation	<a href="#">1</a>	36	0.527	$\geq 0.05$
221	Immune response_HMGB1/TLR signaling pathway	<a href="#">1</a>	36	0.527	$\geq 0.05$
222	Development_Hedgehog and PTH signaling pathways in bone and cartilage development	<a href="#">1</a>	36	0.527	$\geq 0.05$
223	Immune response_IL-9 signaling pathway	<a href="#">1</a>	36	0.527	$\geq 0.05$
224	Cell adhesion_Tight junctions	<a href="#">1</a>	36	0.527	$\geq 0.05$
225	Immune response_IL-12-induced IFN-gamma production	<a href="#">1</a>	36	0.527	$\geq 0.05$
226	Development_MAG-dependent inhibition of neurite outgrowth	<a href="#">1</a>	37	0.517	$\geq 0.05$
227	Regulation of metabolism_Bile acids regulation of glucose and lipid metabolism via FXR	<a href="#">1</a>	37	0.517	$\geq 0.05$
228	Development_Beta-adrenergic receptors transactivation of EGFR	<a href="#">1</a>	37	0.517	$\geq 0.05$
229	Apoptosis and survival_Anti-apoptotic action of membrane-bound ESR1	<a href="#">1</a>	38	0.508	$\geq 0.05$
230	Cell adhesion_Cell-matrix glycoconjugates	<a href="#">1</a>	38	0.508	$\geq 0.05$
231	Keratan sulfate metabolism p.2	<a href="#">1</a>	39	0.499	$\geq 0.05$
232	Cytokine production by Th17 cells in CF	<a href="#">1</a>	39	0.499	$\geq 0.05$
233	HIV-1 signaling via CCR5 in macrophages and T lymphocytes	<a href="#">1</a>	39	0.499	$\geq 0.05$
234	Development_ERBB-family signaling	<a href="#">1</a>	39	0.499	$\geq 0.05$
235	Transcription_Receptor-mediated HIF regulation	<a href="#">1</a>	39	0.499	$\geq 0.05$
236	G-protein signaling_Regulation of p38 and JNK signaling mediated by G-proteins	<a href="#">1</a>	39	0.499	$\geq 0.05$

237	Translation_Non-genomic (rapid) action of Androgen Receptor	<u>1</u>	40	0.49	$\geq 0.05$
238	Development_Oxytocin receptor signaling	<u>1</u>	40	0.49	$\geq 0.05$
239	Neurophysiological process_ACM1 and ACM2 in neuronal membrane polarization	<u>1</u>	40	0.49	$\geq 0.05$
240	Immune response_TCR and CD28 co-stimulation in activation of NF-kB	<u>1</u>	40	0.49	$\geq 0.05$
241	G-protein signaling_Rap1A regulation pathway	<u>1</u>	40	0.49	$\geq 0.05$
242	Apoptosis and survival_Ceramides signaling pathway	<u>1</u>	40	0.49	$\geq 0.05$
243	Development_Neurotrophin family signaling	<u>1</u>	40	0.49	$\geq 0.05$
244	Neurophysiological process_Netrin-1 in regulation of axon guidance	<u>1</u>	41	0.481	$\geq 0.05$
245	Development_VEGF-family signaling	<u>1</u>	41	0.481	$\geq 0.05$
246	Immune response_Neurotensin-induced activation of IL-8 in colonocytes	<u>1</u>	42	0.472	$\geq 0.05$
247	Translation_Insulin regulation of translation	<u>1</u>	42	0.472	$\geq 0.05$
248	Leucine, isoleucine and valine metabolism	<u>1</u>	42	0.472	$\geq 0.05$
249	Immune response_PIP3 signaling in B lymphocytes	<u>1</u>	42	0.472	$\geq 0.05$
250	Serotonin modulation of dopamine release in nicotine addiction	<u>1</u>	42	0.472	$\geq 0.05$
251	ATP/ITP metabolism	<u>2</u>	124	0.469	$\geq 0.05$
252	Signal transduction_AKT signaling	<u>1</u>	43	0.464	$\geq 0.05$
253	Nicotine signaling in dopaminergic neurons, Pt. 2 - axon terminal	<u>1</u>	43	0.464	$\geq 0.05$
254	Development_A2A receptor signaling	<u>1</u>	43	0.464	$\geq 0.05$
255	Chemotaxis_C5a-induced chemotaxis	<u>1</u>	43	0.464	$\geq 0.05$
256	CFTR-dependent regulation of ion channels in Airway	<u>1</u>	44	0.456	$\geq 0.05$

	Epithelium (norm and CF)			
257	Development_Flt3 signaling	1	44	0.456 ≥0.05
258	Development_Activation of Erk by ACM1, ACM3 and ACM5	1	44	0.456 ≥0.05
259	Neurophysiological process_Glutamate regulation of Dopamine D1A receptor signaling	1	45	0.448 ≥0.05
260	Development_Adiponectin signaling	1	45	0.448 ≥0.05
261	Role of alpha-6/beta-4 integrins in carcinoma progression	1	45	0.448 ≥0.05
262	Development_EPO-induced MAPK pathway	1	45	0.448 ≥0.05
263	Transcription_Androgen Receptor nuclear signaling	1	45	0.448 ≥0.05
264	Development_Ligand-independent activation of ESR1 and ESR2	1	45	0.448 ≥0.05
265	Development_Membrane-bound ESR1: interaction with growth factors signaling	1	45	0.448 ≥0.05
266	Signal transduction_Calcium signaling	1	45	0.448 ≥0.05
267	Development_Activation of ERK by Alpha-1 adrenergic receptors	1	45	0.448 ≥0.05
268	Development_Hedgehog signaling	1	46	0.441 ≥0.05
269	Development_G-Proteins mediated regulation MAPK-ERK signaling	1	46	0.441 ≥0.05
270	Nicotine signaling in chromaffin cells	1	46	0.441 ≥0.05
271	Mechanisms of CFTR activation by S-nitrosoglutathione (normal and CF)	1	46	0.441 ≥0.05
272	Development_GDNF family signaling	1	46	0.441 ≥0.05
273	Chemotaxis_Lipoxin inhibitory action on fMLP-induced neutrophil chemotaxis	1	46	0.441 ≥0.05
274	Immune response_ICOS pathway in T-helper cell	1	46	0.441 ≥0.05

275	Development_TGF-beta-dependent induction of EMT via RhoA, PI3K and ILK.	<a href="#">1</a>	46	0.441	$\geq 0.05$
276	Immune response_Fc gamma R-mediated phagocytosis in macrophages	<a href="#">1</a>	46	0.441	$\geq 0.05$
277	Transcription_CREB pathway	<a href="#">1</a>	47	0.433	$\geq 0.05$
278	Transport_Alpha-2 adrenergic receptor regulation of ion channels	<a href="#">1</a>	47	0.433	$\geq 0.05$
279	Phospholipid metabolism p.2	<a href="#">1</a>	47	0.433	$\geq 0.05$
280	Regulation of lipid metabolism_Insulin signaling:generic cascades	<a href="#">1</a>	47	0.433	$\geq 0.05$
281	Development_TGF-beta-dependent induction of EMT via MAPK	<a href="#">1</a>	47	0.433	$\geq 0.05$
282	Development_PDGF signaling via MAPK cascades	<a href="#">1</a>	47	0.433	$\geq 0.05$
283	Nicotine signaling in dopaminergic neurons, Pt. 1 - cell body	<a href="#">1</a>	48	0.426	$\geq 0.05$
284	Immune response_Histamine H1 receptor signaling in immune response	<a href="#">1</a>	48	0.426	$\geq 0.05$
285	Immune response_IL-2 activation and signaling pathway	<a href="#">1</a>	49	0.419	$\geq 0.05$
286	Development_PEDF signaling	<a href="#">1</a>	49	0.419	$\geq 0.05$
287	Neurophysiological process_Long-term depression in cerebellum	<a href="#">1</a>	49	0.419	$\geq 0.05$
288	Cytokine production by Th17 cells in CF (Mouse model)	<a href="#">1</a>	49	0.419	$\geq 0.05$
289	Apoptosis and survival_HTR1A signaling	<a href="#">1</a>	50	0.412	$\geq 0.05$
290	Neurophysiological process_Corticoliberin signaling via CRHR1	<a href="#">1</a>	50	0.412	$\geq 0.05$
291	Immune response_Bacterial infections in normal airways	<a href="#">1</a>	50	0.412	$\geq 0.05$
292	Immune response_Histamine signaling in dendritic cells	<a href="#">1</a>	50	0.412	$\geq 0.05$
293	Development_EDNRB signaling	<a href="#">1</a>	50	0.412	$\geq 0.05$

294	Nicotine signaling in cholinergic neurons	<a href="#">1</a>	50	0.412	$\geq 0.05$
295	Immune response_IL-13 signaling via PI3K-ERK	<a href="#">1</a>	50	0.412	$\geq 0.05$
296	Immune response_NFAT in immune response	<a href="#">1</a>	51	0.405	$\geq 0.05$
297	Development_Beta-adrenergic receptors signaling via cAMP	<a href="#">1</a>	52	0.399	$\geq 0.05$
298	ENaC regulation in airways (normal and CF)	<a href="#">1</a>	52	0.399	$\geq 0.05$
299	Development_IGF-1 receptor signaling	<a href="#">1</a>	52	0.399	$\geq 0.05$
300	Signal transduction_Activation of PKC via G-Protein coupled receptor	<a href="#">1</a>	52	0.399	$\geq 0.05$
301	Immune response_PGE2 common pathways	<a href="#">1</a>	52	0.399	$\geq 0.05$
302	Development_FGF-family signaling	<a href="#">1</a>	52	0.399	$\geq 0.05$
303	Translation_Regulation of EIF4F activity	<a href="#">1</a>	53	0.393	$\geq 0.05$
304	Translation_Translation regulation by Alpha-1 adrenergic receptors	<a href="#">1</a>	53	0.393	$\geq 0.05$
305	Immune response_CD28 signaling	<a href="#">1</a>	54	0.386	$\geq 0.05$
306	Immune response_Role of DAP12 receptors in NK cells	<a href="#">1</a>	54	0.386	$\geq 0.05$
307	Immune response_HSP60 and HSP70/ TLR signaling pathway	<a href="#">1</a>	54	0.386	$\geq 0.05$
308	Membrane-bound ESR1: interaction with G-proteins signaling	<a href="#">1</a>	54	0.386	$\geq 0.05$
309	Development_Role of HDAC and calcium/calmodulin-dependent kinase (CaMK) in control of skeletal myogenesis	<a href="#">1</a>	54	0.386	$\geq 0.05$
310	GTP metabolism	<a href="#">1</a>	54	0.386	$\geq 0.05$
311	Development_FGFR signaling pathway	<a href="#">1</a>	54	0.386	$\geq 0.05$
312	Immune response_CCL2 signaling	<a href="#">1</a>	54	0.386	$\geq 0.05$
313	Immune response_BCR pathway	<a href="#">1</a>	54	0.386	$\geq 0.05$
314	Immune response_Fc epsilon RI pathway	<a href="#">1</a>	55	0.38	$\geq 0.05$

315	Development_Keratinocyte differentiation	<a href="#">1</a>	56	0.374	$\geq 0.05$
316	Immune response_TREM1 signaling pathway	<a href="#">1</a>	59	0.358	$\geq 0.05$
317	Immune response_Immunological synapse formation	<a href="#">1</a>	59	0.358	$\geq 0.05$
318	Chondroitin sulfate and dermatan sulfate metabolism	<a href="#">1</a>	60	0.352	$\geq 0.05$
319	O-glycan biosynthesis	<a href="#">1</a>	62	0.342	$\geq 0.05$
320	Development_Alpha-2 adrenergic receptor activation of ERK	<a href="#">1</a>	62	0.342	$\geq 0.05$
321	O-glycan biosynthesis / Human version	<a href="#">1</a>	62	0.342	$\geq 0.05$
322	Transcription_PPAR Pathway	<a href="#">1</a>	63	0.337	$\geq 0.05$
323	Transport_Macropinocytosis regulation by growth factors	<a href="#">1</a>	63	0.337	$\geq 0.05$
324	n-6 Polyunsaturated fatty acid biosynthesis	<a href="#">1</a>	64	0.332	$\geq 0.05$
325	n-3 Polyunsaturated fatty acid biosynthesis	<a href="#">1</a>	64	0.332	$\geq 0.05$
326	Plasmalogen biosynthesis	<a href="#">1</a>	64	0.332	$\geq 0.05$
327	Immune response_CD16 signaling in NK cells	<a href="#">1</a>	69	0.308	$\geq 0.05$
328	Neolacto-series GSL Metabolism p.1	<a href="#">1</a>	70	0.304	$\geq 0.05$
329	Neolacto-series GSL Metabolism p.1 / Human version	<a href="#">1</a>	70	0.304	$\geq 0.05$
330	Transport_Clathrin-coated vesicle cycle	<a href="#">1</a>	71	0.3	$\geq 0.05$
331	Regulation of lipid metabolism_Alpha-1 adrenergic receptors signaling via arachidonic acid	<a href="#">1</a>	73	0.291	$\geq 0.05$
332	Blood coagulation_GPIb-IX-V-dependent platelet activation	<a href="#">1</a>	76	0.28	$\geq 0.05$
333	Neurophysiological process_NMDA-dependent postsynaptic long-term potentiation in CA1 hippocampal neurons	<a href="#">1</a>	80	0.265	$\geq 0.05$
334	Transport_Intracellular cholesterol transport in norm	<a href="#">1</a>	90	0.232	$\geq 0.05$

<sup>a</sup>ratio between miRNA target genes and total genes in the pathway.

**eTable 8:** GeneGo Pathways Enriched in miR-146a Target Genes.

#	Maps		Ratio <sup>a</sup>	-log(p)	FDR
1	Immune response_HSP60 and HSP70/ TLR signaling pathway	<u>7</u>	54	8.134	<0.05
2	Immune response_Bacterial infections in normal airways	<u>6</u>	50	6.814	<0.05
3	Immune response_TLR signaling pathways	<u>6</u>	54	6.61	<0.05
4	Bacterial infections in CF airways	<u>6</u>	58	6.421	<0.05
5	Immune response_CD40 signaling	<u>6</u>	65	6.123	<0.05
6	Mucin expression in CF via TLRs, EGFR signaling pathways	<u>5</u>	50	5.34	<0.05
7	Immune response_Role of HMGB1 in dendritic cell maturation and migration	<u>4</u>	27	5.047	<0.05
8	DNA damage_ATM/ATR regulation of G1/S checkpoint	<u>4</u>	32	4.743	<0.05
9	Immune response_HMGB1/TLR signaling pathway	<u>4</u>	36	4.535	<0.05
10	Cell cycle_Regulation of G1/S transition (part 1)	<u>4</u>	38	4.44	<0.05
11	Apoptosis and survival_Anti-apoptotic TNFs/NF-kB/Bcl-2 pathway	<u>4</u>	41	4.308	<0.05
12	Development_PEDF signaling	<u>4</u>	49	4	<0.05
13	Cytokine production by Th17 cells in CF (Mouse model)	<u>4</u>	49	4	<0.05
14	Apoptosis and survival_Role of PKR in stress-induced apoptosis	<u>4</u>	53	3.866	<0.05
15	Immune response_Role of PKR in stress-induced antiviral cell response	<u>4</u>	57	3.742	<0.05
16	DNA damage_ATM / ATR regulation of G2 / M checkpoint	<u>3</u>	26	3.545	<0.05
17	Immune response_Innate immune response to RNA viral infection	<u>3</u>	28	3.448	<0.05

18	Immune response_Gastrin in inflammatory response	<u>4</u>	69	3.421	<0.05
19	Apoptosis and survival_NGF activation of NF-kB	<u>3</u>	29	3.402	<0.05
20	Immune response_Signaling pathway mediated by IL-6 and IL-1	<u>3</u>	30	3.358	<0.05
21	Mucin expression in CF via IL-6, IL-17 signaling pathways	<u>3</u>	34	3.196	<0.05
22	G-protein signaling_G-Protein alpha-q signaling cascades	<u>3</u>	34	3.196	<0.05
23	Development_NOTCH1-mediated pathway for NF-KB activity modulation	<u>3</u>	34	3.196	<0.05
24	Immune response_IL-12-induced IFN-gamma production	<u>3</u>	36	3.122	<0.05
25	Apoptosis and survival_APRIL and BAFF signaling	<u>3</u>	39	3.019	<0.05
26	Transcription_P53 signaling pathway	<u>3</u>	39	3.019	<0.05
27	Cytokine production by Th17 cells in CF	<u>3</u>	39	3.019	<0.05
28	Development_ERBB-family signaling	<u>3</u>	39	3.019	<0.05
29	Transcription_NF-kB signaling pathway	<u>3</u>	39	3.019	<0.05
30	Immune response_MIF in innate immunity response	<u>3</u>	40	2.987	<0.05
31	Immune response_Th1 and Th2 cell differentiation	<u>3</u>	40	2.987	<0.05
32	Development_VEGF signaling and activation	<u>3</u>	43	2.895	<0.05
33	Immune response_IL-1 signaling pathway	<u>3</u>	44	2.866	<0.05
34	Immune response_NF-AT signaling and leukocyte interactions	<u>3</u>	46	2.81	<0.05
35	Immune response_C5a signaling	<u>3</u>	50	2.705	<0.05
36	Development_TGF-beta receptor signaling	<u>3</u>	50	2.705	<0.05
37	Cell adhesion_ECM remodeling	<u>3</u>	52	2.656	<0.05
38	Immune response_HMGB1/RAGE signaling pathway	<u>3</u>	53	2.632	<0.05
39	Apoptosis and survival_NO synthesis and signaling	<u>3</u>	55	2.586	<0.05

40	Muscle contraction_ACM regulation of smooth muscle contraction	<a href="#">3</a>	56	2.563	<0.05
41	IL-1 beta-dependent CFTR expression	<a href="#">2</a>	16	2.547	<0.05
42	Immune response_IL-17 signaling pathways	<a href="#">3</a>	60	2.478	<0.05
43	Muscle contraction_Oxytocin signaling in uterus and mammary gland	<a href="#">3</a>	62	2.437	<0.05
44	Development_EGFR signaling pathway	<a href="#">3</a>	63	2.418	<0.05
45	Development_Role of IL-8 in angiogenesis	<a href="#">3</a>	65	2.379	<0.05
46	Immune response_TLR3 and TLR4 induce TICAM1-specific signaling pathway	<a href="#">2</a>	20	2.353	<0.05
47	DNA damage_Inhibition of telomerase activity and cellular senescence	<a href="#">2</a>	20	2.353	<0.05
48	Cytoskeleton remodeling_Role of Activin A in cytoskeleton remodeling	<a href="#">2</a>	20	2.353	<0.05
49	Immune response_MIF-mediated glucocorticoid regulation	<a href="#">2</a>	22	2.271	<0.05
50	Proteolysis_Role of Parkin in the Ubiquitin-Proteasomal Pathway	<a href="#">2</a>	24	2.196	<0.05
51	Development_Mu-type opioid receptor regulation of proliferation	<a href="#">2</a>	28	2.065	<0.05
52	Cell cycle_Transition and termination of DNA replication	<a href="#">2</a>	28	2.065	<0.05
53	Development_SSTR1 in regulation of cell proliferation and migration	<a href="#">2</a>	29	2.036	≥0.05
54	Proteolysis_Putative SUMO-1 pathway	<a href="#">2</a>	29	2.036	≥0.05
55	DNA damage_Brca1 as a transcription regulator	<a href="#">2</a>	30	2.007	≥0.05
56	DNA damage_Role of Brca1 and Brca2 in DNA repair	<a href="#">2</a>	30	2.007	≥0.05
57	Apoptosis and survival_Role of IAP-proteins in apoptosis	<a href="#">2</a>	31	1.98	≥0.05
58	Development_Inhibition of angiogenesis by PEDF	<a href="#">2</a>	31	1.98	≥0.05

59	Cell cycle_Role of APC in cell cycle regulation	<a href="#">2</a>	32	1.953	$\geq 0.05$
60	Signal transduction_ERK1/2 signaling pathway	<a href="#">2</a>	32	1.953	$\geq 0.05$
61	Development_EGFR signaling via small GTPases	<a href="#">2</a>	33	1.927	$\geq 0.05$
62	Apoptosis and survival_Caspase cascade	<a href="#">2</a>	33	1.927	$\geq 0.05$
63	G-protein signaling_N-RAS regulation pathway	<a href="#">2</a>	33	1.927	$\geq 0.05$
64	Cell cycle_ESR1 regulation of G1/S transition	<a href="#">2</a>	33	1.927	$\geq 0.05$
65	Signal transduction_Activin A signaling regulation	<a href="#">2</a>	33	1.927	$\geq 0.05$
66	Apoptosis and survival_Cytoplasmic/mitochondrial transport of proapoptotic proteins Bid, Bmf and Bim	<a href="#">2</a>	34	1.902	$\geq 0.05$
67	Immune response_CXCR4 signaling via second messenger	<a href="#">2</a>	34	1.902	$\geq 0.05$
68	Development_Angiopoietin - Tie2 signaling	<a href="#">2</a>	35	1.878	$\geq 0.05$
69	Immune response_Th17 cell differentiation	<a href="#">2</a>	35	1.878	$\geq 0.05$
70	Immune response_Lipoxins and Resolvin E1 inhibitory action on neutrophil functions	<a href="#">2</a>	35	1.878	$\geq 0.05$
71	Cell adhesion_Chemokines and adhesion	<a href="#">3</a>	100	1.864	$\geq 0.05$
72	Immune response_Regulation of T cell function by CTLA-4	<a href="#">2</a>	36	1.854	$\geq 0.05$
73	Cytoskeleton remodeling_Cytoskeleton remodeling	<a href="#">3</a>	102	1.841	$\geq 0.05$
74	Apoptosis and survival_Anti-apoptotic action of nuclear ESR1 and ESR2	<a href="#">2</a>	37	1.832	$\geq 0.05$
75	Immune response_Role of integrins in NK cells cytotoxicity	<a href="#">2</a>	38	1.81	$\geq 0.05$
76	Transcription_Role of AP-1 in regulation of cellular metabolism	<a href="#">2</a>	38	1.81	$\geq 0.05$
77	Development_Gastrin in differentiation of the gastric mucosa	<a href="#">2</a>	38	1.81	$\geq 0.05$

78	G-protein signaling_Regulation of p38 and JNK signaling mediated by G-proteins	<a href="#">2</a>	39	1.788	$\geq 0.05$
79	Inhibitory action of Lipoxins and Resolvin E1 on neutrophil functions	<a href="#">2</a>	40	1.767	$\geq 0.05$
80	Translation_Non-genomic (rapid) action of Androgen Receptor	<a href="#">2</a>	40	1.767	$\geq 0.05$
81	Immune response_TCR and CD28 co-stimulation in activation of NF-kB	<a href="#">2</a>	40	1.767	$\geq 0.05$
82	Development_Role of Activin A in cell differentiation and proliferation	<a href="#">2</a>	40	1.767	$\geq 0.05$
83	Apoptosis and survival_Ceramides signaling pathway	<a href="#">2</a>	40	1.767	$\geq 0.05$
84	Immune response_HMGB1 release from the cell	<a href="#">2</a>	41	1.747	$\geq 0.05$
85	Immune response_Neurotensin-induced activation of IL-8 in colonocytes	<a href="#">2</a>	42	1.727	$\geq 0.05$
86	Apoptosis and survival_Apoptotic TNF-family pathways	<a href="#">2</a>	42	1.727	$\geq 0.05$
87	Apoptosis and survival_Lymphotoxin-beta receptor signaling	<a href="#">2</a>	42	1.727	$\geq 0.05$
88	Transport_ACM3 in salivary glands	<a href="#">2</a>	42	1.727	$\geq 0.05$
89	Development_ACM2 and ACM4 activation of ERK	<a href="#">2</a>	43	1.708	$\geq 0.05$
90	Signal transduction_AKT signaling	<a href="#">2</a>	43	1.708	$\geq 0.05$
91	Apoptosis and survival_TNFR1 signaling pathway	<a href="#">2</a>	43	1.708	$\geq 0.05$
92	Apoptosis and survival_FAS signaling cascades	<a href="#">2</a>	44	1.689	$\geq 0.05$
93	Development_Activation of Erk by ACM1, ACM3 and ACM5	<a href="#">2</a>	44	1.689	$\geq 0.05$
94	Neurophysiological process_Receptor-mediated axon growth repulsion	<a href="#">2</a>	45	1.671	$\geq 0.05$
95	Development_EPO-induced MAPK pathway	<a href="#">2</a>	45	1.671	$\geq 0.05$
96	Transcription_Androgen Receptor nuclear signaling	<a href="#">2</a>	45	1.671	$\geq 0.05$

97	Development_Thrombopoietin-regulated cell processes	<a href="#">2</a>	45	1.671	$\geq 0.05$
98	Neurophysiological process_ACM regulation of nerve impulse	<a href="#">2</a>	46	1.653	$\geq 0.05$
99	Development_GDNF family signaling	<a href="#">2</a>	46	1.653	$\geq 0.05$
100	Immune response_ICOS pathway in T-helper cell	<a href="#">2</a>	46	1.653	$\geq 0.05$
101	Signal transduction_PTEN pathway	<a href="#">2</a>	46	1.653	$\geq 0.05$
102	Immune response_IL-2 activation and signaling pathway	<a href="#">2</a>	49	1.601	$\geq 0.05$
103	Development_A3 receptor signaling	<a href="#">2</a>	49	1.601	$\geq 0.05$
104	Development_A2B receptor: action via G-protein alpha s	<a href="#">2</a>	50	1.585	$\geq 0.05$
105	Immune response_NFAT in immune response	<a href="#">2</a>	51	1.569	$\geq 0.05$
106	Signal transduction_Activation of PKC via G-Protein coupled receptor	<a href="#">2</a>	52	1.553	$\geq 0.05$
107	G-protein signaling_Proinsulin C-peptide signaling	<a href="#">2</a>	52	1.553	$\geq 0.05$
108	Translation _Regulation of EIF4F activity	<a href="#">2</a>	53	1.538	$\geq 0.05$
109	Cell cycle_Influence of Ras and Rho proteins on G1/S Transition	<a href="#">2</a>	53	1.538	$\geq 0.05$
110	Immune response_CD28 signaling	<a href="#">2</a>	54	1.523	$\geq 0.05$
111	Immune response _IFN gamma signaling pathway	<a href="#">2</a>	54	1.523	$\geq 0.05$
112	Immune response_CCL2 signaling	<a href="#">2</a>	54	1.523	$\geq 0.05$
113	Cell adhesion_Integrin inside-out signaling	<a href="#">2</a>	56	1.494	$\geq 0.05$
114	Immune response_TREM1 signaling pathway	<a href="#">2</a>	59	1.452	$\geq 0.05$
115	Immune response_Immunological synapse formation	<a href="#">2</a>	59	1.452	$\geq 0.05$
116	Development_Thyroliberin signaling	<a href="#">2</a>	60	1.439	$\geq 0.05$
117	Development_Gastrin in cell growth and proliferation	<a href="#">2</a>	62	1.413	$\geq 0.05$
118	Immune response_IL-15 signaling	<a href="#">2</a>	64	1.388	$\geq 0.05$

119	DNA damage_DNA-damage-induced responses	<u>1</u>	9	1.353	$\geq 0.05$
120	Chemotaxis_Leukocyte chemotaxis	<u>2</u>	75	1.264	$\geq 0.05$
121	DNA damage_Role of NFBD1 in DNA damage response	<u>1</u>	13	1.197	$\geq 0.05$
122	Development_VEGF signaling via VEGFR2 - generic cascades	<u>2</u>	84	1.177	$\geq 0.05$
123	Cell cycle_Nucleocytoplasmic transport of CDK/Cyclins	<u>1</u>	14	1.166	$\geq 0.05$
124	Apoptosis and survival_DNA-damage-induced apoptosis	<u>1</u>	15	1.137	$\geq 0.05$
125	LRRK2 in neuronal apoptosis in Parkinson's disease	<u>1</u>	17	1.085	$\geq 0.05$
126	Transcription_Transcription factor Tubby signaling pathways	<u>1</u>	17	1.085	$\geq 0.05$
127	DNA damage_NHEJ mechanisms of DSBs repair	<u>1</u>	19	1.039	$\geq 0.05$
128	Cell cycle_Cell cycle (generic schema)	<u>1</u>	21	0.997	$\geq 0.05$
129	Cell cycle_Chromosome condensation in prometaphase	<u>1</u>	21	0.997	$\geq 0.05$
130	Development_Thrombopoietin signaling via JAK-STAT pathway	<u>1</u>	22	0.978	$\geq 0.05$
131	LRRK2 and immune function in Parkinson's disease	<u>1</u>	22	0.978	$\geq 0.05$
132	Cytoskeleton remodeling_TGF, WNT and cytoskeletal remodeling	<u>2</u>	111	0.97	$\geq 0.05$
133	Cytoskeleton remodeling_Regulation of actin cytoskeleton by Rho GTPases	<u>1</u>	23	0.96	$\geq 0.05$
134	Proteolysis_Putative ubiquitin pathway	<u>1</u>	23	0.96	$\geq 0.05$
135	Apoptosis and survival_NO signaling in apoptosis	<u>1</u>	23	0.96	$\geq 0.05$
136	Development_Delta- and kappa-type opioid receptors signaling via beta-arrestin	<u>1</u>	23	0.96	$\geq 0.05$
137	Development_EGFR signaling via PIP3	<u>1</u>	23	0.96	$\geq 0.05$
138	Immune response_MIF-JAB1 signaling	<u>1</u>	24	0.943	$\geq 0.05$

139	Apoptosis and survival_NO signaling in survival	<a href="#">1</a>	24	0.943	$\geq 0.05$
140	Immune response_IL-27 signaling pathway	<a href="#">1</a>	24	0.943	$\geq 0.05$
141	Development_Glucocorticoid receptor signaling	<a href="#">1</a>	24	0.943	$\geq 0.05$
142	Development_Dopamine D2 receptor transactivation of EGFR	<a href="#">1</a>	24	0.943	$\geq 0.05$
143	Development_GDNF signaling	<a href="#">1</a>	24	0.943	$\geq 0.05$
144	G-protein signaling_K-RAS regulation pathway	<a href="#">1</a>	25	0.926	$\geq 0.05$
145	Transport_RAB5A regulation pathway	<a href="#">1</a>	25	0.926	$\geq 0.05$
146	Apoptosis and survival_Apoptotic Activin A signaling	<a href="#">1</a>	25	0.926	$\geq 0.05$
147	Transcription_Transcription regulation of aminoacid metabolism	<a href="#">1</a>	25	0.926	$\geq 0.05$
148	Neurophysiological process_Dopamine D2 receptor transactivation of PDGFR in CNS	<a href="#">1</a>	26	0.91	$\geq 0.05$
149	G-protein signaling_Ras family GTPases in kinase cascades (scheme)	<a href="#">1</a>	26	0.91	$\geq 0.05$
150	Cell cycle_Regulation of G1/S transition (part 2)	<a href="#">1</a>	26	0.91	$\geq 0.05$
151	Development_Cross-talk between VEGF and Angiopoietin 1 signaling pathways	<a href="#">1</a>	26	0.91	$\geq 0.05$
152	Apoptosis and survival_Anti-apoptotic TNFs/NF-kB/IAP pathway	<a href="#">1</a>	27	0.894	$\geq 0.05$
153	Possible pathway of TGF-beta 1-dependent inhibition of CFTR expression	<a href="#">1</a>	27	0.894	$\geq 0.05$
154	Muscle contraction_nNOS Signaling in Skeletal Muscle	<a href="#">1</a>	28	0.88	$\geq 0.05$
155	Development_Delta-type opioid receptor signaling via G-protein alpha-14	<a href="#">1</a>	28	0.88	$\geq 0.05$
156	Neurophysiological process_Role of CDK5 in presynaptic signaling	<a href="#">1</a>	28	0.88	$\geq 0.05$
157	Cell cycle_Role of SCF complex in cell cycle regulation	<a href="#">1</a>	29	0.866	$\geq 0.05$

158	Neurophysiological process_nNOS signaling in neuronal synapses	<a href="#">1</a>	29	0.866	$\geq 0.05$
159	Immune response_CD137 signaling in immune cell	<a href="#">1</a>	29	0.866	$\geq 0.05$
160	Apoptosis and survival_p53-dependent apoptosis	<a href="#">1</a>	29	0.866	$\geq 0.05$
161	Muscle contraction_S1P2 receptor-mediated smooth muscle contraction	<a href="#">1</a>	30	0.852	$\geq 0.05$
162	Development_Slit-Robo signaling	<a href="#">1</a>	30	0.852	$\geq 0.05$
163	Role of prenatal nicotine exposure in apoptosis and proliferation of pancreatic beta cells	<a href="#">1</a>	30	0.852	$\geq 0.05$
164	Transcription_Ligand-dependent activation of the ESR1/SP pathway	<a href="#">1</a>	30	0.852	$\geq 0.05$
165	Immune response_IL-4 - antiapoptotic action	<a href="#">1</a>	30	0.852	$\geq 0.05$
166	Cell adhesion_Gap junctions	<a href="#">1</a>	30	0.852	$\geq 0.05$
167	Cytoskeleton remodeling_Fibronectin-binding integrins in cell motility	<a href="#">1</a>	31	0.839	$\geq 0.05$
168	Immune response_IL-6 signaling pathway	<a href="#">1</a>	31	0.839	$\geq 0.05$
169	Influence of low doses of Arsenite on glucose uptake in adipocytes	<a href="#">1</a>	31	0.839	$\geq 0.05$
170	Cytoskeleton remodeling_Reverse signaling by ephrin B	<a href="#">1</a>	31	0.839	$\geq 0.05$
171	Development_Transactivation of PDGFR in non-neuronal cells by Dopamine D2 receptor	<a href="#">1</a>	31	0.839	$\geq 0.05$
172	Development_Transcription regulation of granulocyte development	<a href="#">1</a>	32	0.826	$\geq 0.05$
173	Development_PDGF signaling via STATs and NF-kB	<a href="#">1</a>	32	0.826	$\geq 0.05$
174	Autophagy_Autophagy	<a href="#">1</a>	32	0.826	$\geq 0.05$
175	Development_Angiotensin activation of ERK	<a href="#">1</a>	33	0.814	$\geq 0.05$
176	Development_BMP signaling	<a href="#">1</a>	33	0.814	$\geq 0.05$

177	Apoptosis and survival_Regulation of Apoptosis by Mitochondrial Proteins	<a href="#">1</a>	33	0.814	$\geq 0.05$
178	Cytoskeleton remodeling_Thyroliberin in cytoskeleton remodeling	<a href="#">1</a>	33	0.814	$\geq 0.05$
179	Muscle contraction_Role of kappa-type opioid receptor in heart	<a href="#">1</a>	33	0.814	$\geq 0.05$
180	Cell adhesion_IL-8-dependent cell migration and adhesion	<a href="#">1</a>	33	0.814	$\geq 0.05$
181	Cell cycle_Spindle assembly and chromosome separation	<a href="#">1</a>	33	0.814	$\geq 0.05$
182	Normal and pathological TGF-beta-mediated regulation of cell proliferation	<a href="#">1</a>	33	0.814	$\geq 0.05$
183	Immune response_Inflammasome in inflammatory response	<a href="#">1</a>	34	0.802	$\geq 0.05$
184	Signal transduction_Erk Interactions: Inhibition of Erk	<a href="#">1</a>	34	0.802	$\geq 0.05$
185	G-protein signaling_RhoA regulation pathway	<a href="#">1</a>	34	0.802	$\geq 0.05$
186	Chemotaxis_CXCR4 signaling pathway	<a href="#">1</a>	34	0.802	$\geq 0.05$
187	wtCFTR and deltaF508 traffic / Membrane expression (norm and CF)	<a href="#">1</a>	34	0.802	$\geq 0.05$
188	Inhibitory action of Lipoxin A4 on PDGF, EGF and LTD4 signaling	<a href="#">1</a>	35	0.79	$\geq 0.05$
189	Oxidative stress_Angiotensin II-induced production of ROS	<a href="#">1</a>	35	0.79	$\geq 0.05$
190	Development_TGF-beta-dependent induction of EMT via SMADs	<a href="#">1</a>	35	0.79	$\geq 0.05$
191	G-protein signaling_S1P2 receptor signaling	<a href="#">1</a>	35	0.79	$\geq 0.05$
192	Development_SSTR2 in regulation of cell proliferation	<a href="#">1</a>	36	0.779	$\geq 0.05$
193	Development_Hedgehog and PTH signaling pathways in bone and cartilage development	<a href="#">1</a>	36	0.779	$\geq 0.05$

194	Immune response_IL-9 signaling pathway	<a href="#">1</a>	36	0.779	$\geq 0.05$
195	Development_Lipoxin inhibitory action on PDGF, EGF and LTD4 signaling	<a href="#">1</a>	36	0.779	$\geq 0.05$
196	G-protein signaling_G-Protein alpha-12 signaling pathway	<a href="#">1</a>	37	0.768	$\geq 0.05$
197	G-protein signaling_H-RAS regulation pathway	<a href="#">1</a>	37	0.768	$\geq 0.05$
198	Cell adhesion_Role of tetraspanins in the integrin-mediated cell adhesion	<a href="#">1</a>	37	0.768	$\geq 0.05$
199	Development_MAG-dependent inhibition of neurite outgrowth	<a href="#">1</a>	37	0.768	$\geq 0.05$
200	Development_Beta-adrenergic receptors transactivation of EGFR	<a href="#">1</a>	37	0.768	$\geq 0.05$
201	Development_Delta-type opioid receptor mediated cardioprotection	<a href="#">1</a>	37	0.768	$\geq 0.05$
202	Apoptosis and survival_Anti-apoptotic action of membrane-bound ESR1	<a href="#">1</a>	38	0.758	$\geq 0.05$
203	Cytoskeleton remodeling_ACM3 and ACM4 in keratinocyte migration	<a href="#">1</a>	38	0.758	$\geq 0.05$
204	Transcription_Sin3 and NuRD in transcription regulation	<a href="#">1</a>	38	0.758	$\geq 0.05$
205	Signal transduction_cAMP signaling	<a href="#">1</a>	38	0.758	$\geq 0.05$
206	Translation _Regulation of EIF2 activity	<a href="#">1</a>	39	0.747	$\geq 0.05$
207	Cell adhesion_PLAU signaling	<a href="#">1</a>	39	0.747	$\geq 0.05$
208	Immune response_Alternative complement pathway	<a href="#">1</a>	39	0.747	$\geq 0.05$
209	Development_Oxytocin receptor signaling	<a href="#">1</a>	40	0.738	$\geq 0.05$
210	Development_Neurotrophin family signaling	<a href="#">1</a>	40	0.738	$\geq 0.05$
211	Cytoskeleton remodeling_Role of PKA in cytoskeleton reorganisation	<a href="#">1</a>	40	0.738	$\geq 0.05$
212	Apoptosis and survival_BAD phosphorylation	<a href="#">1</a>	42	0.718	$\geq 0.05$

213	Signal transduction_JNK pathway	<a href="#">1</a>	42	0.718	$\geq 0.05$
214	Serotonin modulation of dopamine release in nicotine addiction	<a href="#">1</a>	42	0.718	$\geq 0.05$
215	Development_Angiotensin signaling via PYK2	<a href="#">1</a>	43	0.709	$\geq 0.05$
216	Protein folding and maturation_Angiotensin system maturation \ Human version	<a href="#">1</a>	43	0.709	$\geq 0.05$
217	Apoptosis and survival_Anti-apoptotic action of Gastrin	<a href="#">1</a>	43	0.709	$\geq 0.05$
218	Development_S1P3 receptor signaling pathway	<a href="#">1</a>	43	0.709	$\geq 0.05$
219	Development_A2A receptor signaling	<a href="#">1</a>	43	0.709	$\geq 0.05$
220	Development_Notch Signaling Pathway	<a href="#">1</a>	43	0.709	$\geq 0.05$
221	cAMP/ Ca(2+)-dependent Insulin secretion	<a href="#">1</a>	43	0.709	$\geq 0.05$
222	Apoptosis and survival_Inhibition of ROS-induced apoptosis by 17beta-estradiol	<a href="#">1</a>	44	0.7	$\geq 0.05$
223	Immune response_IL-4 signaling pathway	<a href="#">1</a>	44	0.7	$\geq 0.05$
224	Immune response_PGE2 in immune and neuroendocrine system interactions	<a href="#">1</a>	44	0.7	$\geq 0.05$
225	Regulation of lipid metabolism_Regulation of lipid metabolism by niacin and isoprenaline	<a href="#">1</a>	45	0.691	$\geq 0.05$
226	Role of alpha-6/beta-4 integrins in carcinoma progression	<a href="#">1</a>	45	0.691	$\geq 0.05$
227	Cell adhesion_Histamine H1 receptor signaling in the interruption of cell barrier integrity	<a href="#">1</a>	45	0.691	$\geq 0.05$
228	Development_Ligand-independent activation of ESR1 and ESR2	<a href="#">1</a>	45	0.691	$\geq 0.05$
229	Immune response_PGE2 signaling in immune response	<a href="#">1</a>	45	0.691	$\geq 0.05$
230	Development_Activation of ERK by Alpha-1 adrenergic receptors	<a href="#">1</a>	45	0.691	$\geq 0.05$
231	Development_Hedgehog signaling	<a href="#">1</a>	46	0.683	$\geq 0.05$

232	Development_G-Proteins mediated regulation MAPK-ERK signaling	<a href="#">1</a>	46	0.683	$\geq 0.05$
233	Mechanisms of CFTR activation by S-nitrosoglutathione (normal and CF)	<a href="#">1</a>	46	0.683	$\geq 0.05$
234	Chemotaxis_Lipoxin inhibitory action on fMLP-induced neutrophil chemotaxis	<a href="#">1</a>	46	0.683	$\geq 0.05$
235	Development_TGF-beta-dependent induction of EMT via RhoA, PI3K and ILK.	<a href="#">1</a>	46	0.683	$\geq 0.05$
236	Immune response_Inhibitory action of Lipoxins on pro-inflammatory TNF-alpha signaling	<a href="#">1</a>	46	0.683	$\geq 0.05$
237	Development_Endothelin-1/EDNRA transactivation of EGFR	<a href="#">1</a>	46	0.683	$\geq 0.05$
238	Development_Angiotensin activation of Akt	<a href="#">1</a>	46	0.683	$\geq 0.05$
239	Immune response_MIF - the neuroendocrine-macrophage connector	<a href="#">1</a>	46	0.683	$\geq 0.05$
240	Immune response_Fc gamma R-mediated phagocytosis in macrophages	<a href="#">1</a>	46	0.683	$\geq 0.05$
241	NO-dependent CFTR activation (normal and CF)	<a href="#">1</a>	47	0.675	$\geq 0.05$
242	Neurophysiological process_Circadian rhythm	<a href="#">1</a>	47	0.675	$\geq 0.05$
243	Transport_Alpha-2 adrenergic receptor regulation of ion channels	<a href="#">1</a>	47	0.675	$\geq 0.05$
244	Development_HGF signaling pathway	<a href="#">1</a>	47	0.675	$\geq 0.05$
245	Development_PDGF signaling via MAPK cascades	<a href="#">1</a>	47	0.675	$\geq 0.05$
246	Immune response_Histamine H1 receptor signaling in immune response	<a href="#">1</a>	48	0.667	$\geq 0.05$
247	Protein folding and maturation_Angiotensin system maturation \ Rodent version	<a href="#">1</a>	48	0.667	$\geq 0.05$
248	Muscle contraction_Relaxin signaling pathway	<a href="#">1</a>	48	0.667	$\geq 0.05$

249	Cell adhesion_Integrin-mediated cell adhesion and migration	<a href="#">1</a>	48	0.667	$\geq 0.05$
250	Signal transduction_IP3 signaling	<a href="#">1</a>	49	0.659	$\geq 0.05$
251	Inhibitory action of Lipoxins on Superoxide production in neutrophils	<a href="#">1</a>	49	0.659	$\geq 0.05$
252	Development_G-CSF signaling	<a href="#">1</a>	49	0.659	$\geq 0.05$
253	Apoptosis and survival_HTR1A signaling	<a href="#">1</a>	50	0.651	$\geq 0.05$
254	Immune response_Histamine signaling in dendritic cells	<a href="#">1</a>	50	0.651	$\geq 0.05$
255	Development_GM-CSF signaling	<a href="#">1</a>	50	0.651	$\geq 0.05$
256	Immune response_Function of MEF2 in T lymphocytes	<a href="#">1</a>	50	0.651	$\geq 0.05$
257	wtCFTR and delta508-CFTR traffic / Generic schema (norm and CF)	<a href="#">1</a>	50	0.651	$\geq 0.05$
258	Development_EDNRB signaling	<a href="#">1</a>	50	0.651	$\geq 0.05$
259	Nicotine signaling in cholinergic neurons	<a href="#">1</a>	50	0.651	$\geq 0.05$
260	Immune response_Inhibitory action of lipoxins on superoxide production induced by IL-8 and Leukotriene B4 in neutrophils	<a href="#">1</a>	50	0.651	$\geq 0.05$
261	Immune response_IL-13 signaling via PI3K-ERK	<a href="#">1</a>	50	0.651	$\geq 0.05$
262	Chemotaxis_Inhibitory action of lipoxins on IL-8- and Leukotriene B4-induced neutrophil migration	<a href="#">1</a>	51	0.643	$\geq 0.05$
263	Signal transduction_PKA signaling	<a href="#">1</a>	51	0.643	$\geq 0.05$
264	Some pathways of EMT in cancer cells	<a href="#">1</a>	51	0.643	$\geq 0.05$
265	Development_IGF-1 receptor signaling	<a href="#">1</a>	52	0.636	$\geq 0.05$
266	Immune response_T cell receptor signaling pathway	<a href="#">1</a>	52	0.636	$\geq 0.05$
267	Immune response_PGE2 common pathways	<a href="#">1</a>	52	0.636	$\geq 0.05$
268	Development_FGF-family signaling	<a href="#">1</a>	52	0.636	$\geq 0.05$

269	Development_A1 receptor signaling	<a href="#">1</a>	53	0.629	$\geq 0.05$
270	Development_Endothelin-1/EDNRA signaling	<a href="#">1</a>	53	0.629	$\geq 0.05$
271	Translation_Translation regulation by Alpha-1 adrenergic receptors	<a href="#">1</a>	53	0.629	$\geq 0.05$
272	Membrane-bound ESR1: interaction with G-proteins signaling	<a href="#">1</a>	54	0.622	$\geq 0.05$
273	Development_Role of HDAC and calcium/calmodulin-dependent kinase (CaMK) in control of skeletal myogenesis	<a href="#">1</a>	54	0.622	$\geq 0.05$
274	Immune response_BCR pathway	<a href="#">1</a>	54	0.622	$\geq 0.05$
275	Chemotaxis_CCL2-induced chemotaxis	<a href="#">1</a>	55	0.615	$\geq 0.05$
276	PGE2 pathways in cancer	<a href="#">1</a>	55	0.615	$\geq 0.05$
277	Immune response_Fc epsilon RI pathway	<a href="#">1</a>	55	0.615	$\geq 0.05$
278	Airway smooth muscle contraction in asthma	<a href="#">1</a>	56	0.608	$\geq 0.05$
279	Development_Keratinocyte differentiation	<a href="#">1</a>	56	0.608	$\geq 0.05$
280	Inhibitory action of Lipoxins on neutrophil migration	<a href="#">1</a>	57	0.601	$\geq 0.05$
281	Regulation of CFTR activity (norm and CF)	<a href="#">1</a>	58	0.595	$\geq 0.05$
282	Regulation of lipid metabolism_G-alpha(q) regulation of lipid metabolism	<a href="#">1</a>	61	0.576	$\geq 0.05$
283	Phospholipid metabolism p.1	<a href="#">1</a>	61	0.576	$\geq 0.05$
284	Development_c-Kit ligand signaling pathway during hemopoiesis	<a href="#">1</a>	61	0.576	$\geq 0.05$
285	Development_Alpha-2 adrenergic receptor activation of ERK	<a href="#">1</a>	62	0.57	$\geq 0.05$
286	Transport_Macropinocytosis regulation by growth factors	<a href="#">1</a>	63	0.564	$\geq 0.05$
287	Development_Regulation of epithelial-to-mesenchymal transition (EMT)	<a href="#">1</a>	64	0.558	$\geq 0.05$

288	Cardiac Hypertrophy_NF-AT signaling in Cardiac Hypertrophy	<a href="#">1</a>	65	0.552	$\geq 0.05$
289	Blood coagulation_GPCRs in platelet aggregation	<a href="#">1</a>	71	0.52	$\geq 0.05$
290	Reproduction_GnRH signaling	<a href="#">1</a>	72	0.515	$\geq 0.05$
291	Regulation of lipid metabolism_Stimulation of Arachidonic acid production by ACM receptors	<a href="#">1</a>	72	0.515	$\geq 0.05$
292	Transport_ACM3 signaling in lacrimal glands	<a href="#">1</a>	75	0.5	$\geq 0.05$
293	(L)-Arginine metabolism	<a href="#">1</a>	75	0.5	$\geq 0.05$
294	Immune response _CCR3 signaling in eosinophils	<a href="#">1</a>	77	0.491	$\geq 0.05$
295	Muscle contraction_GPCRs in the regulation of smooth muscle tone	<a href="#">1</a>	83	0.464	$\geq 0.05$
296	Arginine metabolism/ Rodent version	<a href="#">1</a>	97	0.411	$\geq 0.05$

<sup>a</sup>ratio between miRNA target genes and total genes in the pathway.

**eTable 9:** GeneGo Pathways Enriched in miR-155 Target Genes.

#	Maps	Ratio <sup>a</sup>	-log(p)	FDR	
1	Cytoskeleton remodeling_TGF, WNT and cytoskeletal remodeling	<u>9</u>	111	5.574	<0.05
2	Muscle contraction_GPCRs in the regulation of smooth muscle tone	<u>8</u>	83	5.572	<0.05
3	Development_VEGF signaling and activation	<u>6</u>	43	5.236	<0.05
4	Immune response_CCL2 signaling	<u>6</u>	54	4.651	<0.05
5	Development_TGF-beta-dependent induction of EMT via SMADs	<u>5</u>	35	4.489	<0.05
6	Immune response_IL-17 signaling pathways	<u>6</u>	60	4.386	<0.05
7	DNA damage_Mismatch repair	<u>4</u>	20	4.275	<0.05
8	Immune response_MIF-mediated glucocorticoid regulation	<u>4</u>	22	4.103	<0.05
9	Development_TGF-beta-dependent induction of EMT via RhoA, PI3K and ILK.	<u>5</u>	46	3.904	<0.05
10	Muscle contraction_Relaxin signaling pathway	<u>5</u>	48	3.815	<0.05
11	Development_S1P2 and S1P3 receptors in cell proliferation and differentiation	<u>4</u>	26	3.807	<0.05
12	Development_A2B receptor: action via G-protein alpha s	<u>5</u>	50	3.73	<0.05
13	Signal transduction_PKA signaling	<u>5</u>	51	3.689	<0.05
14	Development_WNT signaling pathway. Part 2	<u>5</u>	53	3.609	<0.05
15	Immune response_HMGB1/RAGE signaling pathway	<u>5</u>	53	3.609	<0.05
16	Immune response_Signaling pathway mediated by IL-6 and IL-1	<u>4</u>	30	3.558	<0.05
17	Airway smooth muscle contraction in asthma	<u>5</u>	56	3.496	<0.05
18	Development_PDGF signaling via STATs and NF-kB	<u>4</u>	32	3.447	<0.05

19	Development_Thyroliberin signaling	<u>5</u>	60	3.355	<0.05
20	Development_HGF-dependent inhibition of TGF-beta-induced EMT	<u>4</u>	34	3.344	<0.05
21	Development_Hedgehog and PTH signaling pathways in bone and cartilage development	<u>4</u>	36	3.247	<0.05
22	Cell adhesion_Tight junctions	<u>4</u>	36	3.247	<0.05
23	Development_Regulation of epithelial-to-mesenchymal transition (EMT)	<u>5</u>	64	3.225	<0.05
24	Development_PACAP signaling in neural cells	<u>4</u>	39	3.113	<0.05
25	Development_Role of Activin A in cell differentiation and proliferation	<u>4</u>	40	3.07	<0.05
26	Cytoskeleton remodeling_Role of PKA in cytoskeleton reorganisation	<u>4</u>	40	3.07	<0.05
27	Blood coagulation_GPCRs in platelet aggregation	<u>5</u>	71	3.018	<0.05
28	Immune response_Neurotensin-induced activation of IL-8 in colonocytes	<u>4</u>	42	2.99	<0.05
29	Development_Alpha-1 adrenergic receptors signaling via cAMP	<u>3</u>	19	2.988	<0.05
30	wtCFTR and delta508 traffic / Clathrin coated vesicles formation (norm and CF)	<u>3</u>	19	2.988	<0.05
31	Development_WNT signaling pathway. Part 1. Degradation of beta-catenin in the absence WNT signaling	<u>3</u>	19	2.988	<0.05
32	Development_A2A receptor signaling	<u>4</u>	43	2.951	<0.05
33	Cytoskeleton remodeling_Role of Activin A in cytoskeleton remodeling	<u>3</u>	20	2.921	<0.05
34	Development_Hedgehog signaling	<u>4</u>	46	2.84	<0.05
35	Development_G-Proteins mediated regulation MAPK-ERK signaling	<u>4</u>	46	2.84	<0.05

36	Nicotine signaling in chromaffin cells	<u>4</u>	46	2.84	<0.05
37	Development_Endothelin-1/EDNRA transactivation of EGFR	<u>4</u>	46	2.84	<0.05
38	Immune response_MIF - the neuroendocrine-macrophage connector	<u>4</u>	46	2.84	<0.05
39	Development_PIP3 signaling in cardiac myocytes	<u>4</u>	47	2.805	<0.05
40	Development_ERK5 in cell proliferation and neuronal survival	<u>3</u>	23	2.74	<0.05
41	Cytoskeleton remodeling_Regulation of actin cytoskeleton by Rho GTPases	<u>3</u>	23	2.74	<0.05
42	Mucin expression in CF via TLRs, EGFR signaling pathways	<u>4</u>	50	2.705	<0.05
43	Immune response_C5a signaling	<u>4</u>	50	2.705	<0.05
44	Development_TGF-beta receptor signaling	<u>4</u>	50	2.705	<0.05
45	Development_IGF-1 receptor signaling	<u>4</u>	52	2.641	<0.05
46	Development_Leptin signaling via JAK/STAT and MAPK cascades	<u>3</u>	25	2.633	<0.05
47	Apoptosis and survival_Apoptotic Activin A signaling	<u>3</u>	25	2.633	<0.05
48	Cell adhesion_Cadherin-mediated cell adhesion	<u>3</u>	26	2.583	<0.05
49	G-protein signaling_Ras family GTPases in kinase cascades (scheme)	<u>3</u>	26	2.583	<0.05
50	Cell cycle_Regulation of G1/S transition (part 2)	<u>3</u>	26	2.583	<0.05
51	Development_Cross-talk between VEGF and Angiopoietin 1 signaling pathways	<u>3</u>	26	2.583	<0.05
52	PGE2 pathways in cancer	<u>4</u>	55	2.552	<0.05
53	Apoptosis and survival_Anti-apoptotic TNFs/NF-kB/IAP pathway	<u>3</u>	27	2.535	<0.05
54	Muscle contraction_ACMy regulation of smooth muscle	<u>4</u>	56	2.523	<0.05

	contraction				
55	Immune response_Innate immune response to RNA viral infection	<u>3</u>	28	2.489	<0.05
56	Development_Prolactin receptor signaling	<u>4</u>	58	2.468	<0.05
57	Hypoxia-induced EMT in cancer and fibrosis	<u>2</u>	9	2.407	<0.05
58	Muscle contraction_S1P2 receptor-mediated smooth muscle contraction	<u>3</u>	30	2.403	<0.05
59	Transcription_Ligand-dependent activation of the ESR1/SP pathway	<u>3</u>	30	2.403	<0.05
60	DNA damage_Role of Brca1 and Brca2 in DNA repair	<u>3</u>	30	2.403	<0.05
61	Immune response_IL-6 signaling pathway	<u>3</u>	31	2.362	<0.05
62	Immune response_IL-3 activation and signaling pathway	<u>3</u>	31	2.362	<0.05
63	Immune response_ETV3 affect on CSF1-promoted macrophage differentiation	<u>3</u>	31	2.362	<0.05
64	Putative pathways for stimulation of fat cell differentiation by Bisphenol A	<u>3</u>	32	2.323	<0.05
65	Development_Transcription regulation of granulocyte development	<u>3</u>	32	2.323	<0.05
66	Immune response_IL-15 signaling	<u>4</u>	64	2.313	<0.05
67	Muscle contraction_Regulation of eNOS activity in endothelial cells	<u>4</u>	65	2.289	<0.05
68	Development_BMP signaling	<u>3</u>	33	2.285	<0.05
69	Development_EGFR signaling via small GTPases	<u>3</u>	33	2.285	<0.05
70	Signal transduction_Activin A signaling regulation	<u>3</u>	33	2.285	<0.05
71	Mucin expression in CF via IL-6, IL-17 signaling pathways	<u>3</u>	34	2.248	<0.05
72	Development_NOTCH1-mediated pathway for NF-KB activity modulation	<u>3</u>	34	2.248	<0.05

73	wtCFTR and deltaF508 traffic / Membrane expression (norm and CF)	<u>3</u>	34	2.248	<0.05
74	Immune response_Lipoxins and Resolvin E1 inhibitory action on neutrophil functions	<u>3</u>	35	2.212	<0.05
75	Oxidative stress_Angiotensin II-induced production of ROS	<u>3</u>	35	2.212	<0.05
76	Immune response_Regulation of T cell function by CTLA-4	<u>3</u>	36	2.178	<0.05
77	Transport_Clathrin-coated vesicle cycle	<u>4</u>	71	2.154	<0.05
78	Development_Role of nicotinamide in G-CSF-induced granulopoiesis	<u>2</u>	12	2.153	<0.05
79	Transport_Macropinocytosis	<u>2</u>	12	2.153	<0.05
80	Reproduction_GnRH signaling	<u>4</u>	72	2.132	<0.05
81	Signal transduction_cAMP signaling	<u>3</u>	38	2.112	<0.05
82	Transcription_P53 signaling pathway	<u>3</u>	39	2.081	<0.05
83	Development_ERBB-family signaling	<u>3</u>	39	2.081	<0.05
84	Chemotaxis_Leukocyte chemotaxis	<u>4</u>	75	2.071	<0.05
85	Inhibitory action of Lipoxins and Resolvin E1 on neutrophil functions	<u>3</u>	40	2.05	<0.05
86	Translation_Non-genomic (rapid) action of Androgen Receptor	<u>3</u>	40	2.05	<0.05
87	Immune response_MIF in innate immunity response	<u>3</u>	40	2.05	<0.05
88	Development_GH-RH signaling	<u>3</u>	41	2.02	<0.05
89	Apoptosis and survival_Anti-apoptotic TNFs/NF-kB/Bcl-2 pathway	<u>3</u>	41	2.02	<0.05
90	Apoptosis and survival_BAD phosphorylation	<u>3</u>	42	1.992	<0.05
91	Immune response_PIP3 signaling in B lymphocytes	<u>3</u>	42	1.992	<0.05

92	Transport_ACM3 in salivary glands	<a href="#">3</a>	42	1.992	<0.05
93	Development_Growth hormone signaling via PI3K/AKT and MAPK cascades	<a href="#">3</a>	42	1.992	<0.05
94	Signal transduction_AKT signaling	<a href="#">3</a>	43	1.964	<0.05
95	Beta-2 adrenergic-dependent CFTR expression	<a href="#">2</a>	15	1.961	<0.05
96	Immune response_IL-4 signaling pathway	<a href="#">3</a>	44	1.936	$\geq 0.05$
97	Immune response_IL-1 signaling pathway	<a href="#">3</a>	44	1.936	$\geq 0.05$
98	Regulation of lipid metabolism_Regulation of lipid metabolism by niacin and isoprenaline	<a href="#">3</a>	45	1.91	$\geq 0.05$
99	Cell adhesion_Histamine H1 receptor signaling in the interruption of cell barrier integrity	<a href="#">3</a>	45	1.91	$\geq 0.05$
100	Development_EPO-induced MAPK pathway	<a href="#">3</a>	45	1.91	$\geq 0.05$
101	Immune response_PGE2 signaling in immune response	<a href="#">3</a>	45	1.91	$\geq 0.05$
102	IL-1 beta-dependent CFTR expression	<a href="#">2</a>	16	1.906	$\geq 0.05$
103	Neurophysiological process_ACM regulation of nerve impulse	<a href="#">3</a>	46	1.884	$\geq 0.05$
104	Signal transduction_PTEN pathway	<a href="#">3</a>	46	1.884	$\geq 0.05$
105	Transcription_CREB pathway	<a href="#">3</a>	47	1.859	$\geq 0.05$
106	Transport_Alpha-2 adrenergic receptor regulation of ion channels	<a href="#">3</a>	47	1.859	$\geq 0.05$
107	Development_TGF-beta-dependent induction of EMT via MAPK	<a href="#">3</a>	47	1.859	$\geq 0.05$
108	G-protein signaling_Rap2A regulation pathway	<a href="#">2</a>	17	1.854	$\geq 0.05$
109	Immune response_Histamine H1 receptor signaling in immune response	<a href="#">3</a>	48	1.834	$\geq 0.05$
110	Cell adhesion_Integrin-mediated cell adhesion and migration	<a href="#">3</a>	48	1.834	$\geq 0.05$

111	Development_Melanocyte development and pigmentation	<u>3</u>	49	1.81	$\geq 0.05$
112	Development_PEDF signaling	<u>3</u>	49	1.81	$\geq 0.05$
113	Development_A3 receptor signaling	<u>3</u>	49	1.81	$\geq 0.05$
114	Neurophysiological process_Corticoliberin signaling via CRHR1	<u>3</u>	50	1.786	$\geq 0.05$
115	Immune response_Bacterial infections in normal airways	<u>3</u>	50	1.786	$\geq 0.05$
116	Immune response_Histamine signaling in dendritic cells	<u>3</u>	50	1.786	$\geq 0.05$
117	Development_EDNRB signaling	<u>3</u>	50	1.786	$\geq 0.05$
118	Chemotaxis_Inhibitory action of lipoxins on IL-8- and Leukotriene B4-induced neutrophil migration	<u>3</u>	51	1.763	$\geq 0.05$
119	Some pathways of EMT in cancer cells	<u>3</u>	51	1.763	$\geq 0.05$
120	Development_Beta-adrenergic receptors signaling via cAMP	<u>3</u>	52	1.741	$\geq 0.05$
121	Signal transduction_Activation of PKC via G-Protein coupled receptor	<u>3</u>	52	1.741	$\geq 0.05$
122	Development_Endothelin-1/EDNRA signaling	<u>3</u>	53	1.719	$\geq 0.05$
123	Cell cycle_Influence of Ras and Rho proteins on G1/S Transition	<u>3</u>	53	1.719	$\geq 0.05$
124	Immune response_HSP60 and HSP70/ TLR signaling pathway	<u>3</u>	54	1.697	$\geq 0.05$
125	Membrane-bound ESR1: interaction with G-proteins signaling	<u>3</u>	54	1.697	$\geq 0.05$
126	Immune response_TLR signaling pathways	<u>3</u>	54	1.697	$\geq 0.05$
127	Immune response _IFN gamma signaling pathway	<u>3</u>	54	1.697	$\geq 0.05$
128	Transcription_ChREBP regulation pathway	<u>2</u>	21	1.678	$\geq 0.05$
129	Atherosclerosis_Role of ZNF202 in regulation of expression of genes involved in Atherosclerosis	<u>2</u>	21	1.678	$\geq 0.05$

130	Apoptosis and survival_NO synthesis and signaling	<u>3</u>	55	1.676	$\geq 0.05$
131	Development_Keratinocyte differentiation	<u>3</u>	56	1.655	$\geq 0.05$
132	Muscle contraction_Regulation of eNOS activity in cardiomyocytes	<u>3</u>	56	1.655	$\geq 0.05$
133	Cell adhesion_Chemokines and adhesion	<u>4</u>	100	1.65	$\geq 0.05$
134	Cytoskeleton remodeling_ESR1 action on cytoskeleton remodeling and cell migration	<u>2</u>	22	1.639	$\geq 0.05$
135	Development_S1P4 receptor signaling pathway	<u>2</u>	22	1.639	$\geq 0.05$
136	Transcription_CREM signaling in testis	<u>2</u>	22	1.639	$\geq 0.05$
137	Cardiac Hypertrophy_Ca(2+)-dependent NF-AT signaling in Cardiac Hypertrophy	<u>3</u>	57	1.635	$\geq 0.05$
138	Inhibitory action of Lipoxins on neutrophil migration	<u>3</u>	57	1.635	$\geq 0.05$
139	Immune response_Role of PKR in stress-induced antiviral cell response	<u>3</u>	57	1.635	$\geq 0.05$
140	Cytoskeleton remodeling_Cytoskeleton remodeling	<u>4</u>	102	1.622	$\geq 0.05$
141	Bacterial infections in CF airways	<u>3</u>	58	1.616	$\geq 0.05$
142	Apoptosis and survival_Beta-2 adrenergic receptor anti-apoptotic action	<u>2</u>	23	1.603	$\geq 0.05$
143	Development_Delta- and kappa-type opioid receptors signaling via beta-arrestin	<u>2</u>	23	1.603	$\geq 0.05$
144	Immune response_IL-27 signaling pathway	<u>2</u>	24	1.568	$\geq 0.05$
145	Development_Glucocorticoid receptor signaling	<u>2</u>	24	1.568	$\geq 0.05$
146	Cytoskeleton remodeling_Role of PDGFs in cell migration	<u>2</u>	24	1.568	$\geq 0.05$
147	Development_c-Kit ligand signaling pathway during hemopoiesis	<u>3</u>	61	1.559	$\geq 0.05$
148	Development_Gastrin in cell growth and proliferation	<u>3</u>	62	1.54	$\geq 0.05$
149	Cell cycle_Initiation of mitosis	<u>2</u>	25	1.535	$\geq 0.05$

150	Transcription_Transcription regulation of aminoacid metabolism	<u>2</u>	25	1.535	$\geq 0.05$
151	Development_EGFR signaling pathway	<u>3</u>	63	1.523	$\geq 0.05$
152	dGTP metabolism	<u>3</u>	64	1.505	$\geq 0.05$
153	Cell adhesion_Endothelial cell contacts by junctional mechanisms	<u>2</u>	26	1.503	$\geq 0.05$
154	Immune response_CD40 signaling	<u>3</u>	65	1.488	$\geq 0.05$
155	Development_Role of IL-8 in angiogenesis	<u>3</u>	65	1.488	$\geq 0.05$
156	Cardiac Hypertrophy_NF-AT signaling in Cardiac Hypertrophy	<u>3</u>	65	1.488	$\geq 0.05$
157	Regulation of degradation of deltaF508 CFTR in CF	<u>2</u>	27	1.472	$\geq 0.05$
158	Neurophysiological process_GABA-A receptor life cycle	<u>2</u>	27	1.472	$\geq 0.05$
159	TTP metabolism	<u>3</u>	66	1.471	$\geq 0.05$
160	Development_Regulation of CDK5 in CNS	<u>2</u>	28	1.443	$\geq 0.05$
161	Immune response_Gastrin in inflammatory response	<u>3</u>	69	1.422	$\geq 0.05$
162	Apoptosis and survival_NGF activation of NF-kB	<u>2</u>	29	1.415	$\geq 0.05$
163	Immune response_CD137 signaling in immune cell	<u>2</u>	29	1.415	$\geq 0.05$
164	Proteolysis_Putative SUMO-1 pathway	<u>2</u>	29	1.415	$\geq 0.05$
165	Development_Slit-Robo signaling	<u>2</u>	30	1.388	$\geq 0.05$
166	DNA damage_Brca1 as a transcription regulator	<u>2</u>	30	1.388	$\geq 0.05$
167	Immune response_IL-4 - antiapoptotic action	<u>2</u>	30	1.388	$\geq 0.05$
168	Cell adhesion_Gap junctions	<u>2</u>	30	1.388	$\geq 0.05$
169	Regulation of lipid metabolism_Stimulation of Arachidonic acid production by ACM receptors	<u>3</u>	72	1.376	$\geq 0.05$
170	Development_Angiotensin signaling via STATs	<u>2</u>	32	1.337	$\geq 0.05$
171	dCTP/dUTP metabolism	<u>3</u>	75	1.332	$\geq 0.05$

172	Development_Angiotensin activation of ERK	<u>2</u>	33	1.313	$\geq 0.05$
173	Cytoskeleton remodeling_Thyroliberin in cytoskeleton remodeling	<u>2</u>	33	1.313	$\geq 0.05$
174	Nicotine signaling in glutamatergic neurons	<u>2</u>	33	1.313	$\geq 0.05$
175	Cell adhesion_IL-8-dependent cell migration and adhesion	<u>2</u>	33	1.313	$\geq 0.05$
176	Development_Activation of astroglial cells proliferation by ACM3	<u>2</u>	33	1.313	$\geq 0.05$
177	Cell cycle_ESR1 regulation of G1/S transition	<u>2</u>	33	1.313	$\geq 0.05$
178	Normal and pathological TGF-beta-mediated regulation of cell proliferation	<u>2</u>	33	1.313	$\geq 0.05$
179	Signal transduction_Erk Interactions: Inhibition of Erk	<u>2</u>	34	1.29	$\geq 0.05$
180	G-protein signaling_RhoA regulation pathway	<u>2</u>	34	1.29	$\geq 0.05$
181	Development_CNTF receptor signaling	<u>2</u>	34	1.29	$\geq 0.05$
182	Immune response_Role of the Membrane attack complex in cell survival	<u>2</u>	34	1.29	$\geq 0.05$
183	G-protein signaling_G-Protein alpha-q signaling cascades	<u>2</u>	34	1.29	$\geq 0.05$
184	Development_Role of CDK5 in neuronal development	<u>2</u>	34	1.29	$\geq 0.05$
185	Inhibitory action of Lipoxin A4 on PDGF, EGF and LTD4 signaling	<u>2</u>	35	1.267	$\geq 0.05$
186	Immune response_Oncostatin M signaling via MAPK in mouse cells	<u>2</u>	35	1.267	$\geq 0.05$
187	Development_Growth hormone signaling via STATs and PLC/IP3	<u>2</u>	35	1.267	$\geq 0.05$
188	Neurophysiological process_Thyroliberin in cell hyperpolarization and excitability	<u>2</u>	35	1.267	$\geq 0.05$
189	G-protein signaling_S1P2 receptor signaling	<u>2</u>	35	1.267	$\geq 0.05$
190	G-protein signaling_RAC1 in cellular process	<u>2</u>	35	1.267	$\geq 0.05$

191	Neurophysiological process_NMDA-dependent postsynaptic long-term potentiation in CA1 hippocampal neurons	<u>3</u>	80	1.263	$\geq 0.05$
192	Immune response_HMGB1/TLR signaling pathway	<u>2</u>	36	1.245	$\geq 0.05$
193	G-protein signaling_G-Protein alpha-s signaling cascades	<u>2</u>	36	1.245	$\geq 0.05$
194	Immune response_IL-12-induced IFN-gamma production	<u>2</u>	36	1.245	$\geq 0.05$
195	Development_Lipoxin inhibitory action on PDGF, EGF and LTD4 signaling	<u>2</u>	36	1.245	$\geq 0.05$
196	G-protein signaling_G-Protein alpha-12 signaling pathway	<u>2</u>	37	1.224	$\geq 0.05$
197	Immune response_Oncostatin M signaling via MAPK in human cells	<u>2</u>	37	1.224	$\geq 0.05$
198	Cell adhesion_Role of tetraspanins in the integrin-mediated cell adhesion	<u>2</u>	37	1.224	$\geq 0.05$
199	Development_Beta-adrenergic receptors transactivation of EGFR	<u>2</u>	37	1.224	$\geq 0.05$
200	Development_VEGF signaling via VEGFR2 - generic cascades	<u>3</u>	84	1.212	$\geq 0.05$
201	Immune response_Role of integrins in NK cells cytotoxicity	<u>2</u>	38	1.204	$\geq 0.05$
202	Cell cycle_Regulation of G1/S transition (part 1)	<u>2</u>	38	1.204	$\geq 0.05$
203	Cytoskeleton remodeling_ACM3 and ACM4 in keratinocyte migration	<u>2</u>	38	1.204	$\geq 0.05$
204	Regulation of lipid metabolism_Regulation of lipid metabolism via LXR, NF-Y and SREBP	<u>2</u>	38	1.204	$\geq 0.05$
205	Immune response_IL-7 signaling in T lymphocytes	<u>2</u>	38	1.204	$\geq 0.05$
206	Development_Gastrin in differentiation of the gastric mucosa	<u>2</u>	38	1.204	$\geq 0.05$
207	Apoptosis and survival_APRIL and BAFF signaling	<u>2</u>	39	1.184	$\geq 0.05$

208	Cytokine production by Th17 cells in CF	<a href="#">2</a>	39	1.184	$\geq 0.05$
209	Transcription_Receptor-mediated HIF regulation	<a href="#">2</a>	39	1.184	$\geq 0.05$
210	Transcription_NF-kB signaling pathway	<a href="#">2</a>	39	1.184	$\geq 0.05$
211	G-protein signaling_Regulation of p38 and JNK signaling mediated by G-proteins	<a href="#">2</a>	39	1.184	$\geq 0.05$
212	Reproduction_Progesterone-mediated oocyte maturation	<a href="#">2</a>	40	1.164	$\geq 0.05$
213	Apoptosis and survival_Lymphotoxin-beta receptor signaling	<a href="#">2</a>	42	1.127	$\geq 0.05$
214	Development_Angiotensin signaling via PYK2	<a href="#">2</a>	43	1.11	$\geq 0.05$
215	Immune response_HTR2A-induced activation of cPLA2	<a href="#">2</a>	43	1.11	$\geq 0.05$
216	Nicotine signaling in dopaminergic neurons, Pt. 2 - axon terminal	<a href="#">2</a>	43	1.11	$\geq 0.05$
217	Development_S1P3 receptor signaling pathway	<a href="#">2</a>	43	1.11	$\geq 0.05$
218	Development_Notch Signaling Pathway	<a href="#">2</a>	43	1.11	$\geq 0.05$
219	Neurophysiological process_PGE2-induced pain processing	<a href="#">2</a>	43	1.11	$\geq 0.05$
220	Development_Flt3 signaling	<a href="#">2</a>	44	1.092	$\geq 0.05$
221	Development_Activation of Erk by ACM1, ACM3 and ACM5	<a href="#">2</a>	44	1.092	$\geq 0.05$
222	Immune response_IL-5 signalling	<a href="#">2</a>	44	1.092	$\geq 0.05$
223	dATP/dITP metabolism	<a href="#">3</a>	95	1.085	$\geq 0.05$
224	Cell adhesion_Ephrin signaling	<a href="#">2</a>	45	1.076	$\geq 0.05$
225	Neurophysiological process_Glutamate regulation of Dopamine D1A receptor signaling	<a href="#">2</a>	45	1.076	$\geq 0.05$
226	Development_Ligand-independent activation of ESR1 and ESR2	<a href="#">2</a>	45	1.076	$\geq 0.05$
227	Development_Thrombopoietin-regulated cell processes	<a href="#">2</a>	45	1.076	$\geq 0.05$

228	Mechanisms of CFTR activation by S-nitrosoglutathione (normal and CF)	<u>2</u>	46	1.059	$\geq 0.05$
229	Development_GDNF family signaling	<u>2</u>	46	1.059	$\geq 0.05$
230	Chemotaxis_Lipoxin inhibitory action on fMLP-induced neutrophil chemotaxis	<u>2</u>	46	1.059	$\geq 0.05$
231	Immune response_Inhibitory action of Lipoxins on pro-inflammatory TNF-alpha signaling	<u>2</u>	46	1.059	$\geq 0.05$
232	Neurophysiological process_Circadian rhythm	<u>2</u>	47	1.043	$\geq 0.05$
233	Regulation of lipid metabolism_Insulin signaling:generic cascades	<u>2</u>	47	1.043	$\geq 0.05$
234	Development_Beta-adrenergic receptors regulation of ERK	<u>2</u>	47	1.043	$\geq 0.05$
235	Development_WNT5A signaling	<u>2</u>	47	1.043	$\geq 0.05$
236	Development_HGF signaling pathway	<u>2</u>	47	1.043	$\geq 0.05$
237	Development_PDGF signaling via MAPK cascades	<u>2</u>	47	1.043	$\geq 0.05$
238	Cell adhesion_Role of CDK5 in cell adhesion	<u>1</u>	9	1.033	$\geq 0.05$
239	Immune response_IL-2 activation and signaling pathway	<u>2</u>	49	1.013	$\geq 0.05$
240	Cytokine production by Th17 cells in CF (Mouse model)	<u>2</u>	49	1.013	$\geq 0.05$
241	Development_G-CSF signaling	<u>2</u>	49	1.013	$\geq 0.05$
242	Apoptosis and survival_HTR1A signaling	<u>2</u>	50	0.998	$\geq 0.05$
243	Development_GM-CSF signaling	<u>2</u>	50	0.998	$\geq 0.05$
244	Arachidonic acid production	<u>2</u>	50	0.998	$\geq 0.05$
245	ENaC regulation in airways (normal and CF)	<u>2</u>	52	0.969	$\geq 0.05$
246	Immune response_T cell receptor signaling pathway	<u>2</u>	52	0.969	$\geq 0.05$
247	Immune response_PGE2 common pathways	<u>2</u>	52	0.969	$\geq 0.05$
248	Development_A1 receptor signaling	<u>2</u>	53	0.955	$\geq 0.05$
249	Apoptosis and survival_Role of PKR in stress-induced	<u>2</u>	53	0.955	$\geq 0.05$

	apoptosis				
250	Translation_Translation regulation by Alpha-1 adrenergic receptors	<u>2</u>	53	0.955	$\geq 0.05$
251	Immune response_BCR pathway	<u>2</u>	54	0.942	$\geq 0.05$
252	Blood coagulation_GPVI-dependent platelet activation	<u>2</u>	55	0.929	$\geq 0.05$
253	Cell adhesion_Integrin inside-out signaling	<u>2</u>	56	0.916	$\geq 0.05$
254	Regulation of CFTR activity (norm and CF)	<u>2</u>	58	0.891	$\geq 0.05$
255	Immune response_TREM1 signaling pathway	<u>2</u>	59	0.879	$\geq 0.05$
256	Regulation of lipid metabolism_G-alpha(q) regulation of lipid metabolism	<u>2</u>	61	0.856	$\geq 0.05$
257	Transcription_Role of VDR in regulation of genes involved in osteoporosis	<u>2</u>	61	0.856	$\geq 0.05$
258	Development_Ligand-dependent activation of the ESR1/AP-1 pathway	<u>1</u>	14	0.852	$\geq 0.05$
259	CFTR folding and maturation (norm and CF)	<u>1</u>	14	0.852	$\geq 0.05$
260	Unsaturated fatty acid biosynthesis	<u>2</u>	62	0.844	$\geq 0.05$
261	Muscle contraction_Oxytocin signaling in uterus and mammary gland	<u>2</u>	62	0.844	$\geq 0.05$
262	Transcription_PPAR Pathway	<u>2</u>	63	0.833	$\geq 0.05$
263	Transport_Macropinocytosis regulation by growth factors	<u>2</u>	63	0.833	$\geq 0.05$
264	n-6 Polyunsaturated fatty acid biosynthesis	<u>2</u>	64	0.822	$\geq 0.05$
265	n-3 Polyunsaturated fatty acid biosynthesis	<u>2</u>	64	0.822	$\geq 0.05$
266	Transcription_Transcription factor Tubby signaling pathways	<u>1</u>	17	0.775	$\geq 0.05$
267	Immune response_CD16 signaling in NK cells	<u>2</u>	69	0.771	$\geq 0.05$
268	Regulation of degradation of wt-CFTR	<u>1</u>	18	0.752	$\geq 0.05$

269	Cytoskeleton remodeling_Alpha-1A adrenergic receptor-dependent inhibition of PI3K	<u>1</u>	19	0.731	$\geq 0.05$
270	Regulation of lipid metabolism_Regulation of acetyl-CoA carboxylase 2 activity in muscle	<u>1</u>	19	0.731	$\geq 0.05$
271	Regulation of lipid metabolism_Regulation of fatty acid synthase activity in hepatocytes	<u>1</u>	19	0.731	$\geq 0.05$
272	Immune response_TLR3 and TLR4 induce TICAM1-specific signaling pathway	<u>1</u>	20	0.711	$\geq 0.05$
273	Translation_IL-2 regulation of translation	<u>1</u>	20	0.711	$\geq 0.05$
274	DNA damage_Inhibition of telomerase activity and cellular senescence	<u>1</u>	20	0.711	$\geq 0.05$
275	Development_FGF2-dependent induction of EMT	<u>1</u>	20	0.711	$\geq 0.05$
276	Blood coagulation_GPIb-IX-V-dependent platelet activation	<u>2</u>	76	0.706	$\geq 0.05$
277	Immune response _CCR3 signaling in eosinophils	<u>2</u>	77	0.698	$\geq 0.05$
278	Cell cycle_Chromosome condensation in prometaphase	<u>1</u>	21	0.692	$\geq 0.05$
279	Cell cycle_Role of 14-3-3 proteins in cell cycle regulation	<u>1</u>	22	0.674	$\geq 0.05$
280	Cell cycle_Sister chromatid cohesion	<u>1</u>	22	0.674	$\geq 0.05$
281	Transcription_Role of heterochromatin protein 1 (HP1) family in transcriptional silencing	<u>1</u>	22	0.674	$\geq 0.05$
282	Development_Thrombopoietin signaling via JAK-STAT pathway	<u>1</u>	22	0.674	$\geq 0.05$
283	LRRK2 and immune function in Parkinson's disease	<u>1</u>	22	0.674	$\geq 0.05$
284	Immune response_IL-12 signaling pathway	<u>1</u>	23	0.657	$\geq 0.05$
285	Cholesterol and Sphingolipids transport / Recycling to plasma membrane in lung (normal and CF)	<u>1</u>	23	0.657	$\geq 0.05$
286	Dichloroethylene metabolism	<u>1</u>	23	0.657	$\geq 0.05$
287	Development_EGFR signaling via PIP3	<u>1</u>	23	0.657	$\geq 0.05$

288	G-protein signaling_Cross-talk between Ras-family GTPases	<u>1</u>	23	0.657	$\geq 0.05$
289	Immune response_IFN alpha/beta signaling pathway	<u>1</u>	24	0.641	$\geq 0.05$
290	Cell adhesion_Endothelial cell contacts by non-junctional mechanisms	<u>1</u>	24	0.641	$\geq 0.05$
291	Proteolysis_Role of Parkin in the Ubiquitin-Proteasomal Pathway	<u>1</u>	24	0.641	$\geq 0.05$
292	Development_Mu-type opioid receptor signaling via Beta-arrestin	<u>1</u>	24	0.641	$\geq 0.05$
293	Translation_Opioid receptors in regulation of translation	<u>1</u>	24	0.641	$\geq 0.05$
294	Development_GDNF signaling	<u>1</u>	24	0.641	$\geq 0.05$
295	G-protein signaling_M-RAS regulation pathway	<u>1</u>	24	0.641	$\geq 0.05$
296	G-protein signaling_TC21 regulation pathway	<u>1</u>	25	0.625	$\geq 0.05$
297	G-protein signaling_K-RAS regulation pathway	<u>1</u>	25	0.625	$\geq 0.05$
298	G-protein signaling_R-RAS regulation pathway	<u>1</u>	25	0.625	$\geq 0.05$
299	Development_Angiotensin signaling via beta-Arrestin	<u>1</u>	25	0.625	$\geq 0.05$
300	Neurophysiological process_Dopamine D2 receptor transactivation of PDGFR in CNS	<u>1</u>	26	0.61	$\geq 0.05$
301	DNA damage_ATM / ATR regulation of G2 / M checkpoint	<u>1</u>	26	0.61	$\geq 0.05$
302	Development_Signaling of Beta-adrenergic receptors via Beta-arrestins	<u>1</u>	26	0.61	$\geq 0.05$
303	Regulation of lipid metabolism_Insulin regulation of fatty acid metabolism	<u>2</u>	89	0.606	$\geq 0.05$
304	Transport_Intracellular cholesterol transport in norm	<u>2</u>	90	0.599	$\geq 0.05$
305	G-protein signaling_G-Protein alpha-i signaling cascades	<u>1</u>	27	0.596	$\geq 0.05$
306	Immune response_Role of HMGB1 in dendritic cell maturation and migration	<u>1</u>	27	0.596	$\geq 0.05$

307	Transcription_Role of Akt in hypoxia induced HIF1 activation	<a href="#">1</a>	27	0.596	$\geq 0.05$
308	Development_Mu-type opioid receptor regulation of proliferation	<a href="#">1</a>	28	0.583	$\geq 0.05$
309	Muscle contraction_nNOS Signaling in Skeletal Muscle	<a href="#">1</a>	28	0.583	$\geq 0.05$
310	Possible influence of low doses of Arsenite on glucose uptake in muscle	<a href="#">1</a>	28	0.583	$\geq 0.05$
311	Triacylglycerol metabolism p.2	<a href="#">1</a>	28	0.583	$\geq 0.05$
312	Immune response_Delta-type opioid receptor signaling in T-cells	<a href="#">1</a>	29	0.57	$\geq 0.05$
313	Cell cycle_Role of SCF complex in cell cycle regulation	<a href="#">1</a>	29	0.57	$\geq 0.05$
314	Apoptosis and survival_nAChR in apoptosis inhibition and cell cycle progression	<a href="#">1</a>	29	0.57	$\geq 0.05$
315	Development_SSTR1 in regulation of cell proliferation and migration	<a href="#">1</a>	29	0.57	$\geq 0.05$
316	Role of Diethylhexyl Phthalate and Tributyltin in fat cell differentiation	<a href="#">1</a>	29	0.57	$\geq 0.05$
317	Neurophysiological process_Mu-type opioid receptor-mediated analgesia	<a href="#">1</a>	30	0.557	$\geq 0.05$
318	Apoptosis and survival_Granzyme A signaling	<a href="#">1</a>	30	0.557	$\geq 0.05$
319	Development_G-CSF-induced myeloid differentiation	<a href="#">1</a>	30	0.557	$\geq 0.05$
320	Regulation of lipid metabolism_RXR-dependent regulation of lipid metabolism via PPAR, RAR and VDR	<a href="#">1</a>	30	0.557	$\geq 0.05$
321	Transport_Aldosterone-mediated regulation of ENaC sodium transport	<a href="#">1</a>	30	0.557	$\geq 0.05$
322	Development_Osteopontin signaling in osteoclasts	<a href="#">1</a>	30	0.557	$\geq 0.05$
323	Cytoskeleton remodeling_RalA regulation pathway	<a href="#">1</a>	30	0.557	$\geq 0.05$
324	Cytoskeleton remodeling_Fibronectin-binding integrins in	<a href="#">1</a>	31	0.545	$\geq 0.05$

	cell motility				
325	Influence of low doses of Arsenite on glucose uptake in adipocytes	<a href="#">1</a>	31	0.545	$\geq 0.05$
326	Cytoskeleton remodeling_Reverse signaling by ephrin B	<a href="#">1</a>	31	0.545	$\geq 0.05$
327	Cell cycle_Role of Nek in cell cycle regulation	<a href="#">1</a>	32	0.534	$\geq 0.05$
328	Signal transduction_ERK1/2 signaling pathway	<a href="#">1</a>	32	0.534	$\geq 0.05$
329	DNA damage_ATM/ATR regulation of G1/S checkpoint	<a href="#">1</a>	32	0.534	$\geq 0.05$
330	Autophagy_Autophagy	<a href="#">1</a>	32	0.534	$\geq 0.05$
331	Regulation of CFTR gating (normal and CF)	<a href="#">1</a>	33	0.522	$\geq 0.05$
332	Muscle contraction_Role of kappa-type opioid receptor in heart	<a href="#">1</a>	33	0.522	$\geq 0.05$
333	Cell cycle_Spindle assembly and chromosome separation	<a href="#">1</a>	33	0.522	$\geq 0.05$
334	CCR4-dependent immune cell chemotaxis in asthma and atopic dermatitis	<a href="#">1</a>	34	0.512	$\geq 0.05$
335	Immune response_Inflammasome in inflammatory response	<a href="#">1</a>	34	0.512	$\geq 0.05$
336	G-protein signaling_G-Protein beta/gamma signaling cascades	<a href="#">1</a>	34	0.512	$\geq 0.05$
337	Development_S1P1 receptor signaling via beta-arrestin	<a href="#">1</a>	34	0.512	$\geq 0.05$
338	Immune response_IL-22 signaling pathway	<a href="#">1</a>	34	0.512	$\geq 0.05$
339	Chemotaxis_CCR4-induced chemotaxis of immune cells	<a href="#">1</a>	34	0.512	$\geq 0.05$
340	Mechanism of action of CCR4 antagonists in asthma and atopic dermatitis (Variant 1)	<a href="#">1</a>	34	0.512	$\geq 0.05$
341	Immune response_CXCR4 signaling via second messenger	<a href="#">1</a>	34	0.512	$\geq 0.05$
342	Chemotaxis_CXCR4 signaling pathway	<a href="#">1</a>	34	0.512	$\geq 0.05$
343	Development_EPO-induced Jak-STAT pathway	<a href="#">1</a>	35	0.501	$\geq 0.05$

344	Development_Angiopoietin - Tie2 signaling	<a href="#">1</a>	35	0.501	$\geq 0.05$
345	Immune response_Th17 cell differentiation	<a href="#">1</a>	35	0.501	$\geq 0.05$
346	Development_Regulation of telomere length and cellular immortalization	<a href="#">1</a>	35	0.501	$\geq 0.05$
347	Cytoskeleton remodeling_Keratin filaments	<a href="#">1</a>	36	0.491	$\geq 0.05$
348	Immune response_IL-9 signaling pathway	<a href="#">1</a>	36	0.491	$\geq 0.05$
349	G-protein signaling_Rac2 regulation pathway	<a href="#">1</a>	36	0.491	$\geq 0.05$
350	Development_MAG-dependent inhibition of neurite outgrowth	<a href="#">1</a>	37	0.481	$\geq 0.05$
351	Development_Mu-type opioid receptor signaling	<a href="#">1</a>	38	0.472	$\geq 0.05$
352	Transcription_Role of AP-1 in regulation of cellular metabolism	<a href="#">1</a>	38	0.472	$\geq 0.05$
353	Cell adhesion_Cell-matrix glycoconjugates	<a href="#">1</a>	38	0.472	$\geq 0.05$
354	Transcription_Sin3 and NuRD in transcription regulation	<a href="#">1</a>	38	0.472	$\geq 0.05$
355	Immune response_Human NKG2D signaling	<a href="#">1</a>	38	0.472	$\geq 0.05$
356	Linoleic acid / Rodent version	<a href="#">1</a>	38	0.472	$\geq 0.05$
357	Translation _Regulation of EIF2 activity	<a href="#">1</a>	39	0.463	$\geq 0.05$
358	Neurophysiological process_Delta-type opioid receptor in the nervous system	<a href="#">1</a>	40	0.454	$\geq 0.05$
359	Neurophysiological process_ACM1 and ACM2 in neuronal membrane polarization	<a href="#">1</a>	40	0.454	$\geq 0.05$
360	Immune response_TCR and CD28 co-stimulation in activation of NF-kB	<a href="#">1</a>	40	0.454	$\geq 0.05$
361	G-protein signaling_Rap1A regulation pathway	<a href="#">1</a>	40	0.454	$\geq 0.05$
362	Immune response_Th1 and Th2 cell differentiation	<a href="#">1</a>	40	0.454	$\geq 0.05$
363	Neurophysiological process_Netrin-1 in regulation of axon guidance	<a href="#">1</a>	41	0.446	$\geq 0.05$

364	Translation_(L)-selenoaminoacids incorporation in proteins during translation	<a href="#">1</a>	41	0.446	$\geq 0.05$
365	Immune response_HMGB1 release from the cell	<a href="#">1</a>	41	0.446	$\geq 0.05$
366	Development_VEGF-family signaling	<a href="#">1</a>	41	0.446	$\geq 0.05$
367	Apoptosis and survival_Apoptotic TNF-family pathways	<a href="#">1</a>	42	0.437	$\geq 0.05$
368	Translation_Insulin regulation of translation	<a href="#">1</a>	42	0.437	$\geq 0.05$
369	Immune response_Murine NKG2D signaling	<a href="#">1</a>	42	0.437	$\geq 0.05$
370	Neurophysiological process_HTR1A receptor signaling in neuronal cells	<a href="#">1</a>	42	0.437	$\geq 0.05$
371	Leucine, isoleucine and valine metabolism	<a href="#">1</a>	42	0.437	$\geq 0.05$
372	Signal transduction_JNK pathway	<a href="#">1</a>	42	0.437	$\geq 0.05$
373	Serotonin modulation of dopamine release in nicotine addiction	<a href="#">1</a>	42	0.437	$\geq 0.05$
374	NAD metabolism	<a href="#">2</a>	119	0.435	$\geq 0.05$
375	Development_ACM2 and ACM4 activation of ERK	<a href="#">1</a>	43	0.429	$\geq 0.05$
376	Regulation of metabolism_Role of Adiponectin in regulation of metabolism	<a href="#">1</a>	43	0.429	$\geq 0.05$
377	Development_EPO-induced PI3K/AKT pathway and Ca(2+) influx	<a href="#">1</a>	43	0.429	$\geq 0.05$
378	Neurophysiological process_Melatonin signaling	<a href="#">1</a>	43	0.429	$\geq 0.05$
379	Protein folding and maturation_Angiotensin system maturation \ Human version	<a href="#">1</a>	43	0.429	$\geq 0.05$
380	Apoptosis and survival_Anti-apoptotic action of Gastrin	<a href="#">1</a>	43	0.429	$\geq 0.05$
381	Apoptosis and survival_TNFR1 signaling pathway	<a href="#">1</a>	43	0.429	$\geq 0.05$
382	cAMP/ Ca(2+)-dependent Insulin secretion	<a href="#">1</a>	43	0.429	$\geq 0.05$
383	Immune response_IL-13 signaling via JAK-STAT	<a href="#">1</a>	44	0.421	$\geq 0.05$

384	Immune response_PGE2 in immune and neuroendocrine system interactions	<a href="#">1</a>	44	0.421	$\geq 0.05$
385	Development_S1P1 signaling pathway	<a href="#">1</a>	44	0.421	$\geq 0.05$
386	Neurophysiological process_Receptor-mediated axon growth repulsion	<a href="#">1</a>	45	0.414	$\geq 0.05$
387	Transcription_Androgen Receptor nuclear signaling	<a href="#">1</a>	45	0.414	$\geq 0.05$
388	Development_Membrane-bound ESR1: interaction with growth factors signaling	<a href="#">1</a>	45	0.414	$\geq 0.05$
389	Signal transduction_Calcium signaling	<a href="#">1</a>	45	0.414	$\geq 0.05$
390	Development_Activation of ERK by Alpha-1 adrenergic receptors	<a href="#">1</a>	45	0.414	$\geq 0.05$
391	G-protein signaling_Regulation of cAMP levels by ACM	<a href="#">1</a>	45	0.414	$\geq 0.05$
392	Immune response_ICOS pathway in T-helper cell	<a href="#">1</a>	46	0.406	$\geq 0.05$
393	Immune response_NF-AT signaling and leukocyte interactions	<a href="#">1</a>	46	0.406	$\geq 0.05$
394	Development_Angiotensin activation of Akt	<a href="#">1</a>	46	0.406	$\geq 0.05$
395	Immune response_Fc gamma R-mediated phagocytosis in macrophages	<a href="#">1</a>	46	0.406	$\geq 0.05$
396	Neurophysiological process_Dopamine D2 receptor signaling in CNS	<a href="#">1</a>	47	0.399	$\geq 0.05$
397	Development_Leptin signaling via PI3K-dependent pathway	<a href="#">1</a>	47	0.399	$\geq 0.05$
398	Regulation of metabolism_Triiodothyronine and Thyroxine signaling	<a href="#">1</a>	48	0.392	$\geq 0.05$
399	Protein folding and maturation_Angiotensin system maturation \ Rodent version	<a href="#">1</a>	48	0.392	$\geq 0.05$
400	Neurophysiological process_Long-term depression in cerebellum	<a href="#">1</a>	49	0.385	$\geq 0.05$

401	Cytoskeleton remodeling_Integrin outside-in signaling	<a href="#">1</a>	49	0.385	$\geq 0.05$
402	Immune response_Function of MEF2 in T lymphocytes	<a href="#">1</a>	50	0.379	$\geq 0.05$
403	wtCFTR and delta508-CFTR traffic / Generic schema (norm and CF)	<a href="#">1</a>	50	0.379	$\geq 0.05$
404	Immune response_NFAT in immune response	<a href="#">1</a>	51	0.372	$\geq 0.05$
405	G-protein signaling_Proinsulin C-peptide signaling	<a href="#">1</a>	52	0.366	$\geq 0.05$
406	Development_FGF-family signaling	<a href="#">1</a>	52	0.366	$\geq 0.05$
407	Translation _Regulation of EIF4F activity	<a href="#">1</a>	53	0.36	$\geq 0.05$
408	Immune response_CD28 signaling	<a href="#">1</a>	54	0.354	$\geq 0.05$
409	Development_Role of HDAC and calcium/calmodulin-dependent kinase (CaMK) in control of skeletal myogenesis	<a href="#">1</a>	54	0.354	$\geq 0.05$
410	Ganglioside Metabolism p1	<a href="#">1</a>	54	0.354	$\geq 0.05$
411	GTP metabolism	<a href="#">1</a>	54	0.354	$\geq 0.05$
412	Chemotaxis_CCL2-induced chemotaxis	<a href="#">1</a>	55	0.348	$\geq 0.05$
413	Immune response_Fc epsilon RI pathway	<a href="#">1</a>	55	0.348	$\geq 0.05$
414	Regulation of lipid metabolism_Insulin regulation of glycogen metabolism	<a href="#">1</a>	56	0.342	$\geq 0.05$
415	Cytoskeleton remodeling_FAK signaling	<a href="#">1</a>	57	0.336	$\geq 0.05$
416	Immune response_CCR5 signaling in macrophages and T lymphocytes	<a href="#">1</a>	58	0.331	$\geq 0.05$
417	Immune response_Immunological synapse formation	<a href="#">1</a>	59	0.326	$\geq 0.05$
418	O-glycan biosynthesis	<a href="#">1</a>	62	0.31	$\geq 0.05$
419	O-glycan biosynthesis / Human version	<a href="#">1</a>	62	0.31	$\geq 0.05$
420	Regulation of lipid metabolism_Alpha-1 adrenergic receptors signaling via arachidonic acid	<a href="#">1</a>	73	0.262	$\geq 0.05$

421	Aspartate and asparagine metabolism	<u>1</u>	73	0.262	$\geq 0.05$
422	Cholesterol Biosynthesis	<u>1</u>	88	0.211	$\geq 0.05$
423	GTP-XTP metabolism	<u>1</u>	90	0.205	$\geq 0.05$
424	Aminoacyl-tRNA biosynthesis in cytoplasm	<u>1</u>	97	0.186	$\geq 0.05$
425	Aminoacyl-tRNA biosynthesis in cytoplasm/ Rodent version	<u>1</u>	98	0.184	$\geq 0.05$
426	ATP metabolism	<u>1</u>	106	0.165	$\geq 0.05$
427	ATP/ITP metabolism	<u>1</u>	124	0.13	$\geq 0.05$

<sup>a</sup>ratio between miRNA target genes and total genes in the pathway.

**eTable 10:** GeneGo Pathways Enriched in miR-21 Target Genes.

#	Maps	Ratio <sup>a</sup>	-log(p)	FDR	
1	Development_Regulation of epithelial-to-mesenchymal transition (EMT)	<u>7</u>	64	6.352	<0.05
2	Development_G-CSF-induced myeloid differentiation	<u>4</u>	30	4.155	<0.05
3	Transcription_Ligand-dependent activation of the ESR1/SP pathway	<u>4</u>	30	4.155	<0.05
4	Development_EGFR signaling via small GTPases	<u>4</u>	33	3.989	<0.05
5	Cell cycle_ESR1 regulation of G1/S transition	<u>4</u>	33	3.989	<0.05
6	Development_EGFR signaling pathway	<u>5</u>	63	3.978	<0.05
7	Cytoskeleton remodeling_Cytoskeleton remodeling	<u>6</u> 2	10 2	3.951	<0.05
8	Apoptosis and survival_Cytoplasmic/mitochondrial transport of proapoptotic proteins Bid, Bmf and Bim	<u>4</u>	34	3.937	<0.05
9	Development_EPO-induced Jak-STAT pathway	<u>4</u>	35	3.887	<0.05
10	Cell adhesion_Plasmin signaling	<u>4</u>	35	3.887	<0.05
11	Apoptosis and survival_FAS signaling cascades	<u>4</u>	44	3.495	<0.05
12	Immune response_IL-5 signalling	<u>4</u>	44	3.495	<0.05
13	DNA damage_Mismatch repair	<u>3</u>	20	3.37	<0.05
14	Cell cycle_Cell cycle (generic schema)	<u>3</u>	21	3.305	<0.05
15	Development_TGF-beta receptor signaling	<u>4</u>	50	3.28	<0.05
16	Development_EGFR signaling via PIP3	<u>3</u>	23	3.185	<0.05
17	Apoptosis and survival_Endoplasmic reticulum stress response pathway	<u>4</u>	53	3.183	<0.05
18	Translation _Regulation of EIF4F activity	<u>4</u>	53	3.183	<0.05
19	Immune response_HMGB1/RAGE signaling pathway	<u>4</u>	53	3.183	<0.05

20	Immune response_HSP60 and HSP70/ TLR signaling pathway	<u>4</u>	54	3.152	<0.05
21	Immune response_IL-27 signaling pathway	<u>3</u>	24	3.13	<0.05
22	Cell adhesion_Chemokines and adhesion	<u>5</u>	10 0	3.041	<0.05
23	Immune response_Role of HMGB1 in dendritic cell maturation and migration	<u>3</u>	27	2.977	<0.05
24	Apoptosis and survival_p53-dependent apoptosis	<u>3</u>	29	2.885	<0.05
25	Immune response_CD40 signaling	<u>4</u>	65	2.849	<0.05
26	DNA damage_Brca1 as a transcription regulator	<u>3</u>	30	2.842	<0.05
27	Development_Transcription regulation of granulocyte development	<u>3</u>	32	2.759	<0.05
28	Development_BMP signaling	<u>3</u>	33	2.72	<0.05
29	Signal transduction_Activin A signaling regulation	<u>3</u>	33	2.72	<0.05
30	Development_HGF-dependent inhibition of TGF-beta-induced EMT	<u>3</u>	34	2.682	<0.05
31	Apoptosis and survival_Role of CDK5 in neuronal death and survival	<u>3</u>	34	2.682	<0.05
32	Immune response_IL-22 signaling pathway	<u>3</u>	34	2.682	<0.05
33	Development_Angiopoietin - Tie2 signaling	<u>3</u>	35	2.646	<0.05
34	Immune response_Th17 cell differentiation	<u>3</u>	35	2.646	<0.05
35	G-protein signaling_H-RAS regulation pathway	<u>3</u>	37	2.576	<0.05
36	Development_ERBB-family signaling	<u>3</u>	39	2.51	<0.05
37	Translation_Non-genomic (rapid) action of Androgen Receptor	<u>3</u>	40	2.479	<0.05
38	Signal transduction_AKT signaling	<u>3</u>	43	2.389	<0.05
39	Development_Notch Signaling Pathway	<u>3</u>	43	2.389	<0.05

40	Transcription_Androgen Receptor nuclear signaling	<u>3</u>	45	2.333	<0.05
41	Development_Ligand-independent activation of ESR1 and ESR2	<u>3</u>	45	2.333	<0.05
42	Development_G-CSF signaling	<u>3</u>	49	2.229	<0.05
43	Development_GM-CSF signaling	<u>3</u>	50	2.204	<0.05
44	Some pathways of EMT in cancer cells	<u>3</u>	51	2.18	<0.05
45	Cell adhesion_ECM remodeling	<u>3</u>	52	2.157	<0.05
46	Apoptosis and survival_Role of PKR in stress-induced apoptosis	<u>3</u>	53	2.134	<0.05
47	Cell cycle_Influence of Ras and Rho proteins on G1/S Transition	<u>3</u>	53	2.134	<0.05
48	Immune response _IFN gamma signaling pathway	<u>3</u>	54	2.111	<0.05
49	Development_NOTCH-induced EMT	<u>2</u>	19	2.054	≥0.05
50	Bacterial infections in CF airways	<u>3</u>	58	2.026	≥0.05
51	Development_Prolactin receptor signaling	<u>3</u>	58	2.026	≥0.05
52	Cytoskeleton remodeling_TGF, WNT and cytoskeletal remodeling	<u>4</u>	11 1	2.014	≥0.05
53	Development_FGF2-dependent induction of EMT	<u>2</u>	20	2.011	≥0.05
54	Immune response_IL-17 signaling pathways	<u>3</u>	60	1.985	≥0.05
55	Cell cycle_Chromosome condensation in prometaphase	<u>2</u>	21	1.969	≥0.05
56	Transcription_Role of VDR in regulation of genes involved in osteoporosis	<u>3</u>	61	1.966	≥0.05
57	Development_Gastrin in cell growth and proliferation	<u>3</u>	62	1.947	≥0.05
58	Transcription_Role of heterochromatin protein 1 (HP1) family in transcriptional silencing	<u>2</u>	22	1.93	≥0.05
59	Immune response_IL-15 signaling via JAK-STAT cascade	<u>2</u>	23	1.892	≥0.05

60	G-protein signaling_Cross-talk between Ras-family GTPases	<u>2</u>	23	1.892	$\geq 0.05$
61	G-protein signaling_M-RAS regulation pathway	<u>2</u>	24	1.857	$\geq 0.05$
62	G-protein signaling_TC21 regulation pathway	<u>2</u>	25	1.823	$\geq 0.05$
63	G-protein signaling_K-RAS regulation pathway	<u>2</u>	25	1.823	$\geq 0.05$
64	Transport_RAB5A regulation pathway	<u>2</u>	25	1.823	$\geq 0.05$
65	G-protein signaling_R-RAS regulation pathway	<u>2</u>	25	1.823	$\geq 0.05$
66	Immune response_Gastrin in inflammatory response	<u>3</u>	69	1.821	$\geq 0.05$
67	Immune response_IL-10 signaling pathway	<u>2</u>	26	1.79	$\geq 0.05$
68	Possible pathway of TGF-beta 1-dependent inhibition of CFTR expression	<u>2</u>	27	1.759	$\geq 0.05$
69	Cell cycle_Role of SCF complex in cell cycle regulation	<u>2</u>	29	1.7	$\geq 0.05$
70	Role of prenatal nicotine exposure in apoptosis and proliferation of pancreatic beta cells	<u>2</u>	30	1.672	$\geq 0.05$
71	DNA damage_Role of Brca1 and Brca2 in DNA repair	<u>2</u>	30	1.672	$\geq 0.05$
72	Apoptosis and survival_Role of IAP-proteins in apoptosis	<u>2</u>	31	1.645	$\geq 0.05$
73	Development_Inhibition of angiogenesis by PEDF	<u>2</u>	31	1.645	$\geq 0.05$
74	DNA damage_ATM/ATR regulation of G1/S checkpoint	<u>2</u>	32	1.619	$\geq 0.05$
75	Development_PDGF signaling via STATs and NF-kB	<u>2</u>	32	1.619	$\geq 0.05$
76	G-protein signaling_Regulation of CDC42 activity	<u>2</u>	33	1.594	$\geq 0.05$
77	Apoptosis and survival_Regulation of Apoptosis by Mitochondrial Proteins	<u>2</u>	33	1.594	$\geq 0.05$
78	Apoptosis and survival_Caspase cascade	<u>2</u>	33	1.594	$\geq 0.05$
79	G-protein signaling_N-RAS regulation pathway	<u>2</u>	33	1.594	$\geq 0.05$
80	Normal and pathological TGF-beta-mediated regulation of cell proliferation	<u>2</u>	33	1.594	$\geq 0.05$

81	Chemotaxis_CXCR4 signaling pathway	<a href="#">2</a>	34	1.57	$\geq 0.05$
82	Development_NOTCH1-mediated pathway for NF-KB activity modulation	<a href="#">2</a>	34	1.57	$\geq 0.05$
83	Development_TGF-beta-dependent induction of EMT via SMADs	<a href="#">2</a>	35	1.546	$\geq 0.05$
84	Development_Regulation of telomere length and cellular immortalization	<a href="#">2</a>	35	1.546	$\geq 0.05$
85	G-protein signaling_Regulation of RAC1 activity	<a href="#">2</a>	36	1.523	$\geq 0.05$
86	Apoptosis and survival_Anti-apoptotic action of nuclear ESR1 and ESR2	<a href="#">2</a>	37	1.501	$\geq 0.05$
87	Development_MAG-dependent inhibition of neurite outgrowth	<a href="#">2</a>	37	1.501	$\geq 0.05$
88	Development_Delta-type opioid receptor mediated cardioprotection	<a href="#">2</a>	37	1.501	$\geq 0.05$
89	Immune response_Role of integrins in NK cells cytotoxicity	<a href="#">2</a>	38	1.48	$\geq 0.05$
90	Cell cycle_Regulation of G1/S transition (part 1)	<a href="#">2</a>	38	1.48	$\geq 0.05$
91	Transcription_Sin3 and NuRD in transcription regulation	<a href="#">2</a>	38	1.48	$\geq 0.05$
92	Immune response_IL-7 signaling in T lymphocytes	<a href="#">2</a>	38	1.48	$\geq 0.05$
93	Transcription_P53 signaling pathway	<a href="#">2</a>	39	1.459	$\geq 0.05$
94	Cytokine production by Th17 cells in CF	<a href="#">2</a>	39	1.459	$\geq 0.05$
95	HIV-1 signaling via CCR5 in macrophages and T lymphocytes	<a href="#">2</a>	39	1.459	$\geq 0.05$
96	Translation _Regulation of EIF2 activity	<a href="#">2</a>	39	1.459	$\geq 0.05$
97	Development_PACAP signaling in neural cells	<a href="#">2</a>	39	1.459	$\geq 0.05$
98	Cell adhesion_PLAU signaling	<a href="#">2</a>	39	1.459	$\geq 0.05$
99	G-protein signaling_Rap1A regulation pathway	<a href="#">2</a>	40	1.439	$\geq 0.05$

100	Apoptosis and survival_Ceramides signaling pathway	<a href="#">2</a>	40	1.439	$\geq 0.05$
101	Apoptosis and survival_Apoptotic TNF-family pathways	<a href="#">2</a>	42	1.4	$\geq 0.05$
102	Apoptosis and survival_BAD phosphorylation	<a href="#">2</a>	42	1.4	$\geq 0.05$
103	Signal transduction_JNK pathway	<a href="#">2</a>	42	1.4	$\geq 0.05$
104	Apoptosis and survival_TNFR1 signaling pathway	<a href="#">2</a>	43	1.382	$\geq 0.05$
105	Development_VEGF signaling and activation	<a href="#">2</a>	43	1.382	$\geq 0.05$
106	Development_Activation of Erk by ACM1, ACM3 and ACM5	<a href="#">2</a>	44	1.364	$\geq 0.05$
107	Development_S1P1 signaling pathway	<a href="#">2</a>	44	1.364	$\geq 0.05$
108	Cell adhesion_Ephrin signaling	<a href="#">2</a>	45	1.346	$\geq 0.05$
109	Neurophysiological process_Receptor-mediated axon growth repulsion	<a href="#">2</a>	45	1.346	$\geq 0.05$
110	Role of alpha-6/beta-4 integrins in carcinoma progression	<a href="#">2</a>	45	1.346	$\geq 0.05$
111	Development_Membrane-bound ESR1: interaction with growth factors signaling	<a href="#">2</a>	45	1.346	$\geq 0.05$
112	Development_GDNF family signaling	<a href="#">2</a>	46	1.329	$\geq 0.05$
113	Development_TGF-beta-dependent induction of EMT via RhoA, PI3K and ILK.	<a href="#">2</a>	46	1.329	$\geq 0.05$
114	Immune response_Inhibitory action of Lipoxins on pro-inflammatory TNF-alpha signaling	<a href="#">2</a>	46	1.329	$\geq 0.05$
115	Signal transduction_PTEN pathway	<a href="#">2</a>	46	1.329	$\geq 0.05$
116	Development_PIP3 signaling in cardiac myocytes	<a href="#">2</a>	47	1.312	$\geq 0.05$
117	Development_TGF-beta-dependent induction of EMT via MAPK	<a href="#">2</a>	47	1.312	$\geq 0.05$
118	Development_PEDF signaling	<a href="#">2</a>	49	1.279	$\geq 0.05$
119	Development_A3 receptor signaling	<a href="#">2</a>	49	1.279	$\geq 0.05$

120	Cytokine production by Th17 cells in CF (Mouse model)	<u>2</u>	49	1.279	$\geq 0.05$
121	Apoptosis and survival_HTR1A signaling	<u>2</u>	50	1.264	$\geq 0.05$
122	Immune response_Bacterial infections in normal airways	<u>2</u>	50	1.264	$\geq 0.05$
123	Immune response_Function of MEF2 in T lymphocytes	<u>2</u>	50	1.264	$\geq 0.05$
124	Immune response_C5a signaling	<u>2</u>	50	1.264	$\geq 0.05$
125	Development_IGF-1 receptor signaling	<u>2</u>	52	1.233	$\geq 0.05$
126	Development_WNT signaling pathway. Part 2	<u>2</u>	53	1.219	$\geq 0.05$
127	Development_Role of HDAC and calcium/calmodulin-dependent kinase (CaMK) in control of skeletal myogenesis	<u>2</u>	54	1.204	$\geq 0.05$
128	Immune response_CCL2 signaling	<u>2</u>	54	1.204	$\geq 0.05$
129	PGE2 pathways in cancer	<u>2</u>	55	1.19	$\geq 0.05$
130	Cell adhesion_Role of CDK5 in cell adhesion	<u>1</u>	9	1.181	$\geq 0.05$
131	Cardiac Hypertrophy_Ca(2+)-dependent NF-AT signaling in Cardiac Hypertrophy	<u>2</u>	57	1.163	$\geq 0.05$
132	Immune response_Role of PKR in stress-induced antiviral cell response	<u>2</u>	57	1.163	$\geq 0.05$
133	Immune response_CCR5 signaling in macrophages and T lymphocytes	<u>2</u>	58	1.15	$\geq 0.05$
134	Immune response_Immunological synapse formation	<u>2</u>	59	1.137	$\geq 0.05$
135	Transport_Rab-9 regulation pathway	<u>1</u>	10	1.137	$\geq 0.05$
136	Transport_Macropinocytosis regulation by growth factors	<u>2</u>	63	1.088	$\geq 0.05$
137	Immune response_IL-15 signaling	<u>2</u>	64	1.076	$\geq 0.05$
138	Development_Role of IL-8 in angiogenesis	<u>2</u>	65	1.065	$\geq 0.05$
139	Transport_Clathrin-coated vesicle cycle	<u>2</u>	71	1	$\geq 0.05$
140	Apoptosis and survival_DNA-damage-induced apoptosis	<u>1</u>	15	0.969	$\geq 0.05$

141	Chemotaxis_Leukocyte chemotaxis	<u>2</u>	75	0.96	$\geq 0.05$
142	G-protein signaling_RhoB regulation pathway	<u>1</u>	16	0.942	$\geq 0.05$
143	IL-1 beta-dependent CFTR expression	<u>1</u>	16	0.942	$\geq 0.05$
144	DNA damage_Role of SUMO in p53 regulation	<u>1</u>	17	0.918	$\geq 0.05$
145	LRRK2 in neuronal apoptosis in Parkinson's disease	<u>1</u>	17	0.918	$\geq 0.05$
146	Regulation of degradation of wt-CFTR	<u>1</u>	18	0.894	$\geq 0.05$
147	Immune response_Oncostatin M signaling via JAK-Stat in mouse cells	<u>1</u>	18	0.894	$\geq 0.05$
148	Development_VEGF signaling via VEGFR2 - generic cascades	<u>2</u>	84	0.879	$\geq 0.05$
149	Development_TGF-beta-induction of EMT via ROS	<u>1</u>	19	0.872	$\geq 0.05$
150	Phosphatidylinositol metabolism	<u>2</u>	87	0.854	$\geq 0.05$
151	DNA damage_Inhibition of telomerase activity and cellular senescence	<u>1</u>	20	0.852	$\geq 0.05$
152	Immune response_Oncostatin M signaling via JAK-Stat in human cells	<u>1</u>	20	0.852	$\geq 0.05$
153	Cell cycle_Role of 14-3-3 proteins in cell cycle regulation	<u>1</u>	22	0.813	$\geq 0.05$
154	Cell cycle_Sister chromatid cohesion	<u>1</u>	22	0.813	$\geq 0.05$
155	Immune response_MIF-mediated glucocorticoid regulation	<u>1</u>	22	0.813	$\geq 0.05$
156	Development_Thrombopoietin signaling via JAK-STAT pathway	<u>1</u>	22	0.813	$\geq 0.05$
157	Immune response_IL-12 signaling pathway	<u>1</u>	23	0.796	$\geq 0.05$
158	Cholesterol and Sphingolipids transport / Recycling to plasma membrane in lung (normal and CF)	<u>1</u>	23	0.796	$\geq 0.05$
159	Dichloroethylene metabolism	<u>1</u>	23	0.796	$\geq 0.05$
160	Development_ERK5 in cell proliferation and neuronal	<u>1</u>	23	0.796	$\geq 0.05$

	survival				
161	Development_Mu-type opioid receptor signaling via Beta-arrestin	<a href="#">1</a>	24	0.779	$\geq 0.05$
162	Cytoskeleton remodeling_Role of PDGFs in cell migration	<a href="#">1</a>	24	0.779	$\geq 0.05$
163	Development_Dopamine D2 receptor transactivation of EGFR	<a href="#">1</a>	24	0.779	$\geq 0.05$
164	Role of Nicotine-induced Leptin resistance in hypothalamus in development of obesity	<a href="#">1</a>	25	0.763	$\geq 0.05$
165	Cell cycle_Initiation of mitosis	<a href="#">1</a>	25	0.763	$\geq 0.05$
166	Immune response_IL-23 signaling pathway	<a href="#">1</a>	25	0.763	$\geq 0.05$
167	Development_Leptin signaling via JAK/STAT and MAPK cascades	<a href="#">1</a>	25	0.763	$\geq 0.05$
168	Apoptosis and survival_Apoptotic Activin A signaling	<a href="#">1</a>	25	0.763	$\geq 0.05$
169	Transcription_Transcription regulation of aminoacid metabolism	<a href="#">1</a>	25	0.763	$\geq 0.05$
170	Cell cycle_Regulation of G1/S transition (part 2)	<a href="#">1</a>	26	0.747	$\geq 0.05$
171	Development_Cross-talk between VEGF and Angiopoietin 1 signaling pathways	<a href="#">1</a>	26	0.747	$\geq 0.05$
172	Regulation of degradation of deltaF508 CFTR in CF	<a href="#">1</a>	27	0.732	$\geq 0.05$
173	G-protein signaling_G-Protein alpha-i signaling cascades	<a href="#">1</a>	27	0.732	$\geq 0.05$
174	Translation _Regulation of translation initiation	<a href="#">1</a>	27	0.732	$\geq 0.05$
175	Development_Mu-type opioid receptor regulation of proliferation	<a href="#">1</a>	28	0.718	$\geq 0.05$
176	Possible influence of low doses of Arsenite on glucose uptake in muscle	<a href="#">1</a>	28	0.718	$\geq 0.05$
177	Development_Delta-type opioid receptor signaling via G-protein alpha-14	<a href="#">1</a>	28	0.718	$\geq 0.05$

178	Apoptosis and survival_NGF activation of NF-kB	<a href="#">1</a>	29	0.704	$\geq 0.05$
179	Immune response_CD137 signaling in immune cell	<a href="#">1</a>	29	0.704	$\geq 0.05$
180	Proteolysis_Putative SUMO-1 pathway	<a href="#">1</a>	29	0.704	$\geq 0.05$
181	Immune response_IL-4 - antiapoptotic action	<a href="#">1</a>	30	0.691	$\geq 0.05$
182	Cytoskeleton remodeling_Fibronectin-binding integrins in cell motility	<a href="#">1</a>	31	0.679	$\geq 0.05$
183	Immune response_IL-6 signaling pathway	<a href="#">1</a>	31	0.679	$\geq 0.05$
184	Immune response_ETV3 affect on CSF1-promoted macrophage differentiation	<a href="#">1</a>	31	0.679	$\geq 0.05$
185	Apoptosis and survival_Granzyme B signaling	<a href="#">1</a>	32	0.666	$\geq 0.05$
186	Cell cycle_Role of APC in cell cycle regulation	<a href="#">1</a>	32	0.666	$\geq 0.05$
187	Development_Angiotensin signaling via STATs	<a href="#">1</a>	32	0.666	$\geq 0.05$
188	Cell cycle_Start of DNA replication in early S phase	<a href="#">1</a>	32	0.666	$\geq 0.05$
189	Autophagy_Autophagy	<a href="#">1</a>	32	0.666	$\geq 0.05$
190	Development_Angiotensin activation of ERK	<a href="#">1</a>	33	0.655	$\geq 0.05$
191	Cytoskeleton remodeling_Thyroliberin in cytoskeleton remodeling	<a href="#">1</a>	33	0.655	$\geq 0.05$
192	Nicotine signaling in glutamatergic neurons	<a href="#">1</a>	33	0.655	$\geq 0.05$
193	Transcription_Ligand-Dependent Transcription of Retinoid-Target genes	<a href="#">1</a>	33	0.655	$\geq 0.05$
194	Cell adhesion_IL-8-dependent cell migration and adhesion	<a href="#">1</a>	33	0.655	$\geq 0.05$
195	CCR4-dependent immune cell chemotaxis in asthma and atopic dermatitis	<a href="#">1</a>	34	0.643	$\geq 0.05$
196	Immune response_Inflammasome in inflammatory response	<a href="#">1</a>	34	0.643	$\geq 0.05$
197	Oxidative stress_Role of ASK1 under oxidative stress	<a href="#">1</a>	34	0.643	$\geq 0.05$

198	Development_CNTF receptor signaling	<a href="#">1</a>	34	0.643	$\geq 0.05$
199	Chemotaxis_CCR4-induced chemotaxis of immune cells	<a href="#">1</a>	34	0.643	$\geq 0.05$
200	Mucin expression in CF via IL-6, IL-17 signaling pathways	<a href="#">1</a>	34	0.643	$\geq 0.05$
201	Mechanism of action of CCR4 antagonists in asthma and atopic dermatitis (Variant 1)	<a href="#">1</a>	34	0.643	$\geq 0.05$
202	wtCFTR and deltaF508 traffic / Membrane expression (norm and CF)	<a href="#">1</a>	34	0.643	$\geq 0.05$
203	Inhibitory action of Lipoxin A4 on PDGF, EGF and LTD4 signaling	<a href="#">1</a>	35	0.632	$\geq 0.05$
204	Development_Growth hormone signaling via STATs and PLC/IP3	<a href="#">1</a>	35	0.632	$\geq 0.05$
205	G-protein signaling_S1P2 receptor signaling	<a href="#">1</a>	35	0.632	$\geq 0.05$
206	Immune response_HMGB1/TLR signaling pathway	<a href="#">1</a>	36	0.621	$\geq 0.05$
207	Immune response_IL-9 signaling pathway	<a href="#">1</a>	36	0.621	$\geq 0.05$
208	Immune response_IL-12-induced IFN-gamma production	<a href="#">1</a>	36	0.621	$\geq 0.05$
209	G-protein signaling_Rac2 regulation pathway	<a href="#">1</a>	36	0.621	$\geq 0.05$
210	Development_Lipoxin inhibitory action on PDGF, EGF and LTD4 signaling	<a href="#">1</a>	36	0.621	$\geq 0.05$
211	Cell adhesion_Role of tetraspanins in the integrin-mediated cell adhesion	<a href="#">1</a>	37	0.611	$\geq 0.05$
212	Development_Beta-adrenergic receptors transactivation of EGFR	<a href="#">1</a>	37	0.611	$\geq 0.05$
213	Transcription_Role of AP-1 in regulation of cellular metabolism	<a href="#">1</a>	38	0.601	$\geq 0.05$
214	Apoptosis and survival_Anti-apoptotic action of membrane-bound ESR1	<a href="#">1</a>	38	0.601	$\geq 0.05$
215	Apoptosis and survival_APRL and BAFF signaling	<a href="#">1</a>	39	0.591	$\geq 0.05$

216	Transcription_Receptor-mediated HIF regulation	<a href="#">1</a>	39	0.591	$\geq 0.05$
217	G-protein signaling_Regulation of p38 and JNK signaling mediated by G-proteins	<a href="#">1</a>	39	0.591	$\geq 0.05$
218	Blood coagulation_Blood coagulation	<a href="#">1</a>	39	0.591	$\geq 0.05$
219	Development_Oxytocin receptor signaling	<a href="#">1</a>	40	0.582	$\geq 0.05$
220	Development_Role of Activin A in cell differentiation and proliferation	<a href="#">1</a>	40	0.582	$\geq 0.05$
221	Immune response_MIF in innate immunity response	<a href="#">1</a>	40	0.582	$\geq 0.05$
222	Development_Neurotrophin family signaling	<a href="#">1</a>	40	0.582	$\geq 0.05$
223	Immune response_Th1 and Th2 cell differentiation	<a href="#">1</a>	40	0.582	$\geq 0.05$
224	Apoptosis and survival_Anti-apoptotic TNFs/NF-kB/Bcl-2 pathway	<a href="#">1</a>	41	0.573	$\geq 0.05$
225	Immune response_HMGB1 release from the cell	<a href="#">1</a>	41	0.573	$\geq 0.05$
226	Translation_Insulin regulation of translation	<a href="#">1</a>	42	0.564	$\geq 0.05$
227	Apoptosis and survival_Lymphotoxin-beta receptor signaling	<a href="#">1</a>	42	0.564	$\geq 0.05$
228	Immune response_PIP3 signaling in B lymphocytes	<a href="#">1</a>	42	0.564	$\geq 0.05$
229	Serotonin modulation of dopamine release in nicotine addiction	<a href="#">1</a>	42	0.564	$\geq 0.05$
230	Development_ACM2 and ACM4 activation of ERK	<a href="#">1</a>	43	0.555	$\geq 0.05$
231	Immune response_IL-7 signaling in B lymphocytes	<a href="#">1</a>	43	0.555	$\geq 0.05$
232	Apoptosis and survival_Anti-apoptotic action of Gastrin	<a href="#">1</a>	43	0.555	$\geq 0.05$
233	Nicotine signaling in dopaminergic neurons, Pt. 2 - axon terminal	<a href="#">1</a>	43	0.555	$\geq 0.05$
234	Development_S1P3 receptor signaling pathway	<a href="#">1</a>	43	0.555	$\geq 0.05$
235	Immune response_IL-13 signaling via JAK-STAT	<a href="#">1</a>	44	0.547	$\geq 0.05$

236	Apoptosis and survival_Inhibition of ROS-induced apoptosis by 17beta-estradiol	<a href="#">1</a>	44	0.547	$\geq 0.05$
237	Immune response_PGE2 in immune and neuroendocrine system interactions	<a href="#">1</a>	44	0.547	$\geq 0.05$
238	Immune response_IL-1 signaling pathway	<a href="#">1</a>	44	0.547	$\geq 0.05$
239	Development_Adiponectin signaling	<a href="#">1</a>	45	0.539	$\geq 0.05$
240	Cell adhesion_Histamine H1 receptor signaling in the interruption of cell barrier integrity	<a href="#">1</a>	45	0.539	$\geq 0.05$
241	Signal transduction_Calcium signaling	<a href="#">1</a>	45	0.539	$\geq 0.05$
242	Development_Thrombopoietin-regulated cell processes	<a href="#">1</a>	45	0.539	$\geq 0.05$
243	Chemotaxis_Lipoxin inhibitory action on fMLP-induced neutrophil chemotaxis	<a href="#">1</a>	46	0.53	$\geq 0.05$
244	Immune response_NF-AT signaling and leukocyte interactions	<a href="#">1</a>	46	0.53	$\geq 0.05$
245	Development_Endothelin-1/EDNRA transactivation of EGFR	<a href="#">1</a>	46	0.53	$\geq 0.05$
246	Development_Angiotensin activation of Akt	<a href="#">1</a>	46	0.53	$\geq 0.05$
247	Glycolysis and gluconeogenesis p. 1	<a href="#">1</a>	46	0.53	$\geq 0.05$
248	Immune response_Fc gamma R-mediated phagocytosis in macrophages	<a href="#">1</a>	46	0.53	$\geq 0.05$
249	Development_Beta-adrenergic receptors regulation of ERK	<a href="#">1</a>	47	0.523	$\geq 0.05$
250	Development_HGF signaling pathway	<a href="#">1</a>	47	0.523	$\geq 0.05$
251	Immune response_Histamine H1 receptor signaling in immune response	<a href="#">1</a>	48	0.515	$\geq 0.05$
252	Cell adhesion_Integrin-mediated cell adhesion and migration	<a href="#">1</a>	48	0.515	$\geq 0.05$
253	Pyruvate metabolism	<a href="#">1</a>	49	0.508	$\geq 0.05$

254	Immune response_IL-2 activation and signaling pathway	<a href="#">1</a>	49	0.508	$\geq 0.05$
255	Signal transduction_IP3 signaling	<a href="#">1</a>	49	0.508	$\geq 0.05$
256	Cytoskeleton remodeling_Integrin outside-in signaling	<a href="#">1</a>	49	0.508	$\geq 0.05$
257	Immune response_Histamine signaling in dendritic cells	<a href="#">1</a>	50	0.5	$\geq 0.05$
258	Mucin expression in CF via TLRs, EGFR signaling pathways	<a href="#">1</a>	50	0.5	$\geq 0.05$
259	wtCFTR and delta508-CFTR traffic / Generic schema (norm and CF)	<a href="#">1</a>	50	0.5	$\geq 0.05$
260	Immune response_IL-13 signaling via PI3K-ERK	<a href="#">1</a>	50	0.5	$\geq 0.05$
261	Chemotaxis_Inhibitory action of lipoxins on IL-8- and Leukotriene B4-induced neutrophil migration	<a href="#">1</a>	51	0.493	$\geq 0.05$
262	Signal transduction_Activation of PKC via G-Protein coupled receptor	<a href="#">1</a>	52	0.486	$\geq 0.05$
263	Immune response_T cell receptor signaling pathway	<a href="#">1</a>	52	0.486	$\geq 0.05$
264	G-protein signaling_Proinsulin C-peptide signaling	<a href="#">1</a>	52	0.486	$\geq 0.05$
265	Development_FGF-family signaling	<a href="#">1</a>	52	0.486	$\geq 0.05$
266	Immune response_Antiviral actions of Interferons	<a href="#">1</a>	52	0.486	$\geq 0.05$
267	Translation_Translation regulation by Alpha-1 adrenergic receptors	<a href="#">1</a>	53	0.48	$\geq 0.05$
268	Membrane-bound ESR1: interaction with G-proteins signaling	<a href="#">1</a>	54	0.473	$\geq 0.05$
269	Development_FGFR signaling pathway	<a href="#">1</a>	54	0.473	$\geq 0.05$
270	Immune response_TLR signaling pathways	<a href="#">1</a>	54	0.473	$\geq 0.05$
271	Immune response_BCR pathway	<a href="#">1</a>	54	0.473	$\geq 0.05$
272	Apoptosis and survival_NO synthesis and signaling	<a href="#">1</a>	55	0.466	$\geq 0.05$
273	Development_Keratinocyte differentiation	<a href="#">1</a>	56	0.46	$\geq 0.05$

274	Inhibitory action of Lipoxins on neutrophil migration	<a href="#">1</a>	57	0.454	$\geq 0.05$
275	Cytoskeleton remodeling_FAK signaling	<a href="#">1</a>	57	0.454	$\geq 0.05$
276	Neolacto-series GSL Metabolism p.2	<a href="#">1</a>	59	0.442	$\geq 0.05$
277	Immune response_TREM1 signaling pathway	<a href="#">1</a>	59	0.442	$\geq 0.05$
278	Neolacto-series GSL Metabolism p.2 / Human version	<a href="#">1</a>	59	0.442	$\geq 0.05$
279	Development_c-Kit ligand signaling pathway during hemopoiesis	<a href="#">1</a>	61	0.431	$\geq 0.05$
280	Muscle contraction_Oxytocin signaling in uterus and mammary gland	<a href="#">1</a>	62	0.425	$\geq 0.05$
281	Development_Alpha-2 adrenergic receptor activation of ERK	<a href="#">1</a>	62	0.425	$\geq 0.05$
282	Cardiac Hypertrophy_NF-AT signaling in Cardiac Hypertrophy	<a href="#">1</a>	65	0.409	$\geq 0.05$
283	Glycolysis and gluconeogenesis (short map)	<a href="#">1</a>	66	0.404	$\geq 0.05$
284	Pyruvate metabolism/ Rodent version	<a href="#">1</a>	66	0.404	$\geq 0.05$
285	Neolacto-series GSL Metabolism p.3	<a href="#">1</a>	68	0.394	$\geq 0.05$
286	Immune response_CD16 signaling in NK cells	<a href="#">1</a>	69	0.389	$\geq 0.05$
287	Neolacto-series GSL Metabolism p.1	<a href="#">1</a>	70	0.384	$\geq 0.05$
288	Neolacto-series GSL Metabolism p.1 / Human version	<a href="#">1</a>	70	0.384	$\geq 0.05$
289	Fructose metabolism	<a href="#">1</a>	73	0.371	$\geq 0.05$
290	Immune response _CCR3 signaling in eosinophils	<a href="#">1</a>	77	0.353	$\geq 0.05$
291	Fructose metabolism/ Rodent version	<a href="#">1</a>	83	0.329	$\geq 0.05$
292	Lysine metabolism	<a href="#">1</a>	84	0.326	$\geq 0.05$
293	Lysine metabolism/ Rodent version	<a href="#">1</a>	86	0.318	$\geq 0.05$
294	Regulation of lipid metabolism_Insulin regulation of fatty acid metabolism	<a href="#">1</a>	89	0.308	$\geq 0.05$

295	Transport_Intracellular cholesterol transport in norm	<u>1</u>	90	0.305	$\geq 0.05$
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<sup>a</sup> ratio between miRNA target genes and total genes in the pathway.

**eTable 11:** GeneGo Pathways Enriched in miR-222 Target Genes.

#	Maps	Ratio <sup>a</sup>	-log(p)	FDR	
1	Immune response_CCL2 signaling	<u>7</u>	54	6.483	<0.05
2	Signal transduction_AKT signaling	<u>6</u>	43	5.813	<0.05
3	Development_VEGF signaling and activation	<u>6</u>	43	5.813	<0.05
4	Development_c-Kit ligand signaling pathway during hemopoiesis	<u>6</u>	61	4.907	<0.05
5	Immune response_MIF-mediated glucocorticoid regulation	<u>4</u>	22	4.489	<0.05
6	Immune response_IL-2 activation and signaling pathway	<u>5</u>	49	4.24	<0.05
7	Development_GM-CSF signaling	<u>5</u>	50	4.197	<0.05
8	Apoptosis and survival_p53-dependent apoptosis	<u>4</u>	29	3.997	<0.05
9	Apoptosis and survival_Regulation of Apoptosis by Mitochondrial Proteins	<u>4</u>	33	3.772	<0.05
10	Apoptosis and survival_Role of CDK5 in neuronal death and survival	<u>4</u>	34	3.721	<0.05
11	Immune response_IL-22 signaling pathway	<u>4</u>	34	3.721	<0.05
12	Cell adhesion_Chemokines and adhesion	<u>6</u>	100	3.689	<0.05
13	Immune response_CD40 signaling	<u>5</u>	65	3.65	<0.05
14	Development_Role of IL-8 in angiogenesis	<u>5</u>	65	3.65	<0.05
15	Muscle contraction_Regulation of eNOS activity in endothelial cells	<u>5</u>	65	3.65	<0.05
16	Immune response_IL-7 signaling in T lymphocytes	<u>4</u>	38	3.53	<0.05
17	Cytoskeleton remodeling_TGF, WNT and cytoskeletal remodeling	<u>6</u>	111	3.443	<0.05
18	Translation_Non-genomic (rapid) action of Androgen Receptor	<u>4</u>	40	3.443	<0.05

19	Immune response_Oncostatin M signaling via JAK-Stat in mouse cells	<u>3</u>	18	3.346	<0.05
20	Immune response_IL-5 signalling	<u>4</u>	44	3.282	<0.05
21	Development_Membrane-bound ESR1: interaction with growth factors signaling	<u>4</u>	45	3.245	<0.05
22	Signal transduction_PTEN pathway	<u>4</u>	46	3.208	<0.05
23	Immune response_Oncostatin M signaling via JAK-Stat in human cells	<u>3</u>	20	3.207	<0.05
24	Development_PIP3 signaling in cardiac myocytes	<u>4</u>	47	3.172	<0.05
25	Development_WNT5A signaling	<u>4</u>	47	3.172	<0.05
26	Immune response_Histamine H1 receptor signaling in immune response	<u>4</u>	48	3.137	<0.05
27	Cytoskeleton remodeling_ESR1 action on cytoskeleton remodeling and cell migration	<u>3</u>	22	3.081	<0.05
28	Development_Thrombopoietin signaling via JAK-STAT pathway	<u>3</u>	22	3.081	<0.05
29	Immune response_IL-12 signaling pathway	<u>3</u>	23	3.023	<0.05
30	Development_Delta- and kappa-type opioid receptors signaling via beta-arrestin	<u>3</u>	23	3.023	<0.05
31	G-protein signaling_Proinsulin C-peptide signaling	<u>4</u>	52	3.005	<0.05
32	Development_Role of HDAC and calcium/calmodulin-dependent kinase (CaMK) in control of skeletal myogenesis	<u>4</u>	54	2.943	<0.05
33	Immune response_IL-23 signaling pathway	<u>3</u>	25	2.915	<0.05
34	Development_Cross-talk between VEGF and Angiopoietin 1 signaling pathways	<u>3</u>	26	2.865	<0.05
35	Immune response_IL-10 signaling pathway	<u>3</u>	26	2.865	<0.05
36	Development_Prolactin receptor signaling	<u>4</u>	58	2.827	<0.05
37	Immune response_Immunological synapse formation	<u>4</u>	59	2.799	<0.05

38	Immune response_IL-17 signaling pathways	<u>4</u>	60	2.772	<0.05
39	Transcription_Role of VDR in regulation of genes involved in osteoporosis	<u>4</u>	61	2.745	<0.05
40	Development_Alpha-2 adrenergic receptor activation of ERK	<u>4</u>	62	2.719	<0.05
41	DNA damage_Brca1 as a transcription regulator	<u>3</u>	30	2.682	<0.05
42	Immune response_IL-3 activation and signaling pathway	<u>3</u>	31	2.64	<0.05
43	Immune response_ETV3 affect on CSF1-promoted macrophage differentiation	<u>3</u>	31	2.64	<0.05
44	Cytoskeleton remodeling_Reverse signaling by ephrin B	<u>3</u>	31	2.64	<0.05
45	Development_Inhibition of angiogenesis by PEDF	<u>3</u>	31	2.64	<0.05
46	Development_Angiotensin signaling via STATs	<u>3</u>	32	2.6	<0.05
47	Development_PDGF signaling via STATs and NF-kB	<u>3</u>	32	2.6	<0.05
48	Cell cycle_ESR1 regulation of G1/S transition	<u>3</u>	33	2.561	<0.05
49	Normal and pathological TGF-beta-mediated regulation of cell proliferation	<u>3</u>	33	2.561	<0.05
50	Cannabinoid receptor signaling in nicotine addiction	<u>3</u>	34	2.524	<0.05
51	Development_S1P1 receptor signaling via beta-arrestin	<u>3</u>	34	2.524	<0.05
52	Development_CNTF receptor signaling	<u>3</u>	34	2.524	<0.05
53	Apoptosis and survival_Cytoplasmic/mitochondrial transport of proapoptotic proteins Bid, Bmf and Bim	<u>3</u>	34	2.524	<0.05
54	Development_EPO-induced Jak-STAT pathway	<u>3</u>	35	2.488	<0.05
55	Development_Growth hormone signaling via STATs and PLC/IP3	<u>3</u>	35	2.488	<0.05
56	Development_SSTR2 in regulation of cell proliferation	<u>3</u>	36	2.452	<0.05
57	Immune response_IL-9 signaling pathway	<u>3</u>	36	2.452	<0.05
58	Chemotaxis_Leukocyte chemotaxis	<u>4</u>	75	2.417	<0.05

59	Immune response_Human NKG2D signaling	<u>3</u>	38	2.385	<0.05
60	Transcription_P53 signaling pathway	<u>3</u>	39	2.353	<0.05
61	Development_ERBB-family signaling	<u>3</u>	39	2.353	<0.05
62	Development_Neurotrophin family signaling	<u>3</u>	40	2.322	<0.05
63	Development_VEGF-family signaling	<u>3</u>	41	2.292	<0.05
64	Immune response_Murine NKG2D signaling	<u>3</u>	42	2.262	<0.05
65	Immune response_PIP3 signaling in B lymphocytes	<u>3</u>	42	2.262	<0.05
66	Immune response_IL-7 signaling in B lymphocytes	<u>3</u>	43	2.233	<0.05
67	Development_Ligand-dependent activation of the ESR1/AP-1 pathway	<u>2</u>	14	2.209	<0.05
68	Apoptosis and survival_FAS signaling cascades	<u>3</u>	44	2.205	<0.05
69	Development_S1P1 signaling pathway	<u>3</u>	44	2.205	<0.05
70	Role of alpha-6/beta-4 integrins in carcinoma progression	<u>3</u>	45	2.178	<0.05
71	Development_Ligand-independent activation of ESR1 and ESR2	<u>3</u>	45	2.178	<0.05
72	Development_Thrombopoietin-regulated cell processes	<u>3</u>	45	2.178	<0.05
73	Neurophysiological process_ACM regulation of nerve impulse	<u>3</u>	46	2.151	<0.05
74	Immune response_Inhibitory action of Lipoxins on pro-inflammatory TNF-alpha signaling	<u>3</u>	46	2.151	<0.05
75	Development_Endothelin-1/EDNRA transactivation of EGFR	<u>3</u>	46	2.151	<0.05
76	Development_TGF-beta-dependent induction of EMT via MAPK	<u>3</u>	47	2.125	<0.05
77	Development_Melanocyte development and pigmentation	<u>3</u>	49	2.075	<0.05
78	Development_PEDF signaling	<u>3</u>	49	2.075	<0.05
79	Development_IGF-1 receptor signaling	<u>3</u>	52	2.004	<0.05

80	Immune response_T cell receptor signaling pathway	<u>3</u>	52	2.004	<0.05
81	Apoptosis and survival_Endoplasmic reticulum stress response pathway	<u>3</u>	53	1.982	<0.05
82	Immune response_HMGB1/RAGE signaling pathway	<u>3</u>	53	1.982	<0.05
83	Membrane-bound ESR1: interaction with G-proteins signaling	<u>3</u>	54	1.959	≥0.05
84	Development_Alpha-1 adrenergic receptors signaling via cAMP	<u>2</u>	19	1.947	≥0.05
85	Development_WNT signaling pathway. Part 1. Degradation of beta-catenin in the absence WNT signaling	<u>2</u>	19	1.947	≥0.05
86	Cell adhesion_Integrin inside-out signaling	<u>3</u>	56	1.916	≥0.05
87	Development_FGF2-dependent induction of EMT	<u>2</u>	20	1.904	≥0.05
88	Cytoskeleton remodeling_FAK signaling	<u>3</u>	57	1.896	≥0.05
89	Regulation of CFTR activity (norm and CF)	<u>3</u>	58	1.875	≥0.05
90	Cell cycle_Role of 14-3-3 proteins in cell cycle regulation	<u>2</u>	22	1.824	≥0.05
91	Transcription_Role of heterochromatin protein 1 (HP1) family in transcriptional silencing	<u>2</u>	22	1.824	≥0.05
92	Amitraz-induced inhibition of Insulin secretion	<u>2</u>	22	1.824	≥0.05
93	Development_Gastrin in cell growth and proliferation	<u>3</u>	62	1.797	≥0.05
94	Immune response_IL-15 signaling via JAK-STAT cascade	<u>2</u>	23	1.787	≥0.05
95	Apoptosis and survival_Beta-2 adrenergic receptor anti-apoptotic action	<u>2</u>	23	1.787	≥0.05
96	Development_EGFR signaling via PIP3	<u>2</u>	23	1.787	≥0.05
97	Immune response_IL-15 signaling	<u>3</u>	64	1.76	≥0.05
98	Immune response_IL-27 signaling pathway	<u>2</u>	24	1.752	≥0.05
99	Development_Dopamine D2 receptor transactivation of EGFR	<u>2</u>	24	1.752	≥0.05

100	Cardiac Hypertrophy_NF-AT signaling in Cardiac Hypertrophy	<u>3</u>	65	1.743	$\geq 0.05$
101	Development_Leptin signaling via JAK/STAT and MAPK cascades	<u>2</u>	25	1.718	$\geq 0.05$
102	Apoptosis and survival_Apoptotic Activin A signaling	<u>2</u>	25	1.718	$\geq 0.05$
103	Neurophysiological process_Dopamine D2 receptor transactivation of PDGFR in CNS	<u>2</u>	26	1.685	$\geq 0.05$
104	Immune response_CD16 signaling in NK cells	<u>3</u>	69	1.674	$\geq 0.05$
105	Transcription_Role of Akt in hypoxia induced HIF1 activation	<u>2</u>	27	1.654	$\geq 0.05$
106	Neurophysiological process_GABA-A receptor life cycle	<u>2</u>	27	1.654	$\geq 0.05$
107	Development_Mu-type opioid receptor regulation of proliferation	<u>2</u>	28	1.624	$\geq 0.05$
108	Development_Thrombospondin-1 signaling	<u>2</u>	28	1.624	$\geq 0.05$
109	Immune response_Delta-type opioid receptor signaling in T-cells	<u>2</u>	29	1.596	$\geq 0.05$
110	Development_G-CSF-induced myeloid differentiation	<u>2</u>	30	1.568	$\geq 0.05$
111	Transcription_Ligand-dependent activation of the ESR1/SP pathway	<u>2</u>	30	1.568	$\geq 0.05$
112	Blood coagulation_GPIb-IX-V-dependent platelet activation	<u>3</u>	76	1.565	$\geq 0.05$
113	Immune response_IL-6 signaling pathway	<u>2</u>	31	1.542	$\geq 0.05$
114	Development_Transactivation of PDGFR in non-neuronal cells by Dopamine D2 receptor	<u>2</u>	31	1.542	$\geq 0.05$
115	Putative pathways for stimulation of fat cell differentiation by Bisphenol A	<u>2</u>	32	1.516	$\geq 0.05$
116	Development_Transcription regulation of granulocyte development	<u>2</u>	32	1.516	$\geq 0.05$
117	Development_Angiotensin activation of ERK	<u>2</u>	33	1.491	$\geq 0.05$

118	Development_EGFR signaling via small GTPases	<u>2</u>	33	1.491	$\geq 0.05$
119	Cell adhesion_IL-8-dependent cell migration and adhesion	<u>2</u>	33	1.491	$\geq 0.05$
120	Mechanism of Maraviroc action in HIV Infections	<u>1</u>	4	1.47	$\geq 0.05$
121	CCR4-dependent immune cell chemotaxis in asthma and atopic dermatitis	<u>2</u>	34	1.467	$\geq 0.05$
122	Cell adhesion_Alpha-4 integrins in cell migration and adhesion	<u>2</u>	34	1.467	$\geq 0.05$
123	Chemotaxis_CCR4-induced chemotaxis of immune cells	<u>2</u>	34	1.467	$\geq 0.05$
124	Mechanism of action of CCR4 antagonists in asthma and atopic dermatitis (Variant 1)	<u>2</u>	34	1.467	$\geq 0.05$
125	Immune response_CXCR4 signaling via second messenger	<u>2</u>	34	1.467	$\geq 0.05$
126	Chemotaxis_CXCR4 signaling pathway	<u>2</u>	34	1.467	$\geq 0.05$
127	Development_Role of CDK5 in neuronal development	<u>2</u>	34	1.467	$\geq 0.05$
128	Development_Angiopoietin - Tie2 signaling	<u>2</u>	35	1.444	$\geq 0.05$
129	Cell adhesion_Plasmin signaling	<u>2</u>	35	1.444	$\geq 0.05$
130	Inhibitory action of Lipoxin A4 on PDGF, EGF and LTD4 signaling	<u>2</u>	35	1.444	$\geq 0.05$
131	Immune response_Oncostatin M signaling via MAPK in mouse cells	<u>2</u>	35	1.444	$\geq 0.05$
132	Immune response_Lipoxins and Resolvin E1 inhibitory action on neutrophil functions	<u>2</u>	35	1.444	$\geq 0.05$
133	G-protein signaling_S1P2 receptor signaling	<u>2</u>	35	1.444	$\geq 0.05$
134	Neurophysiological process_EphB receptors in dendritic spine morphogenesis and synaptogenesis	<u>2</u>	35	1.444	$\geq 0.05$
135	Immune response_Regulation of T cell function by CTLA-4	<u>2</u>	36	1.422	$\geq 0.05$
136	Development_Hedgehog and PTH signaling pathways in bone and cartilage development	<u>2</u>	36	1.422	$\geq 0.05$

137	Development_Lipoxin inhibitory action on PDGF, EGF and LTD4 signaling	<a href="#">2</a>	36	1.422	$\geq 0.05$
138	Immune response_Oncostatin M signaling via MAPK in human cells	<a href="#">2</a>	37	1.4	$\geq 0.05$
139	Apoptosis and survival_Anti-apoptotic action of nuclear ESR1 and ESR2	<a href="#">2</a>	37	1.4	$\geq 0.05$
140	Development_Beta-adrenergic receptors transactivation of EGFR	<a href="#">2</a>	37	1.4	$\geq 0.05$
141	Development_Delta-type opioid receptor mediated cardioprotection	<a href="#">2</a>	37	1.4	$\geq 0.05$
142	Immune response_Role of integrins in NK cells cytotoxicity	<a href="#">2</a>	38	1.379	$\geq 0.05$
143	Development_Mu-type opioid receptor signaling	<a href="#">2</a>	38	1.379	$\geq 0.05$
144	Cell cycle_Regulation of G1/S transition (part 1)	<a href="#">2</a>	38	1.379	$\geq 0.05$
145	Apoptosis and survival_Anti-apoptotic action of membrane-bound ESR1	<a href="#">2</a>	38	1.379	$\geq 0.05$
146	Cell adhesion_Cell-matrix glycoconjugates	<a href="#">2</a>	38	1.379	$\geq 0.05$
147	Transcription_Receptor-mediated HIF regulation	<a href="#">2</a>	39	1.358	$\geq 0.05$
148	Development_PACAP signaling in neural cells	<a href="#">2</a>	39	1.358	$\geq 0.05$
149	Inhibitory action of Lipoxins and Resolvin E1 on neutrophil functions	<a href="#">2</a>	40	1.338	$\geq 0.05$
150	Neurophysiological process_ACM1 and ACM2 in neuronal membrane polarization	<a href="#">2</a>	40	1.338	$\geq 0.05$
151	Immune response_TCR and CD28 co-stimulation in activation of NF-kB	<a href="#">2</a>	40	1.338	$\geq 0.05$
152	Apoptosis and survival_Ceramides signaling pathway	<a href="#">2</a>	40	1.338	$\geq 0.05$
153	Reproduction_Progesterone-mediated oocyte maturation	<a href="#">2</a>	40	1.338	$\geq 0.05$
154	Immune response_HMGB1 release from the cell	<a href="#">2</a>	41	1.319	$\geq 0.05$
155	Immune response_Neurotensin-induced activation of IL-8 in	<a href="#">2</a>	42	1.3	$\geq 0.05$

	colonocytes				
156	Apoptosis and survival_Lymphotoxin-beta receptor signaling	<u>2</u>	42	1.3	$\geq 0.05$
157	Apoptosis and survival_BAD phosphorylation	<u>2</u>	42	1.3	$\geq 0.05$
158	Transport_ACM3 in salivary glands	<u>2</u>	42	1.3	$\geq 0.05$
159	Signal transduction_JNK pathway	<u>2</u>	42	1.3	$\geq 0.05$
160	Development_Growth hormone signaling via PI3K/AKT and MAPK cascades	<u>2</u>	42	1.3	$\geq 0.05$
161	Serotonin modulation of dopamine release in nicotine addiction	<u>2</u>	42	1.3	$\geq 0.05$
162	Development_ACM2 and ACM4 activation of ERK	<u>2</u>	43	1.282	$\geq 0.05$
163	Development_EPO-induced PI3K/AKT pathway and Ca(2+) influx	<u>2</u>	43	1.282	$\geq 0.05$
164	Development_Angiotensin signaling via PYK2	<u>2</u>	43	1.282	$\geq 0.05$
165	Nicotine signaling in dopaminergic neurons, Pt. 2 - axon terminal	<u>2</u>	43	1.282	$\geq 0.05$
166	Development_S1P3 receptor signaling pathway	<u>2</u>	43	1.282	$\geq 0.05$
167	Apoptosis and survival_Inhibition of ROS-induced apoptosis by 17beta-estradiol	<u>2</u>	44	1.264	$\geq 0.05$
168	Development_Flt3 signaling	<u>2</u>	44	1.264	$\geq 0.05$
169	Development_Activation of Erk by ACM1, ACM3 and ACM5	<u>2</u>	44	1.264	$\geq 0.05$
170	Cell adhesion_Ephrin signaling	<u>2</u>	45	1.247	$\geq 0.05$
171	Neurophysiological process_Glutamate regulation of Dopamine D1A receptor signaling	<u>2</u>	45	1.247	$\geq 0.05$
172	Development_EPO-induced MAPK pathway	<u>2</u>	45	1.247	$\geq 0.05$
173	Development_Activation of ERK by Alpha-1 adrenergic receptors	<u>2</u>	45	1.247	$\geq 0.05$

174	G-protein signaling_Regulation of cAMP levels by ACM	<u>2</u>	45	1.247	$\geq 0.05$
175	Cytoskeleton remodeling_Cytoskeleton remodeling	<u>3</u>	102	1.245	$\geq 0.05$
176	Development_G-Proteins mediated regulation MAPK-ERK signaling	<u>2</u>	46	1.23	$\geq 0.05$
177	Chemotaxis_Lipoxin inhibitory action on fMLP-induced neutrophil chemotaxis	<u>2</u>	46	1.23	$\geq 0.05$
178	Neurophysiological process_Dopamine D2 receptor signaling in CNS	<u>2</u>	47	1.213	$\geq 0.05$
179	Transport_Alpha-2 adrenergic receptor regulation of ion channels	<u>2</u>	47	1.213	$\geq 0.05$
180	Development_HGF signaling pathway	<u>2</u>	47	1.213	$\geq 0.05$
181	Nicotine signaling in dopaminergic neurons, Pt. 1 - cell body	<u>2</u>	48	1.197	$\geq 0.05$
182	Muscle contraction_Relaxin signaling pathway	<u>2</u>	48	1.197	$\geq 0.05$
183	Signal transduction_IP3 signaling	<u>2</u>	49	1.181	$\geq 0.05$
184	Development_G-CSF signaling	<u>2</u>	49	1.181	$\geq 0.05$
185	Apoptosis and survival_HTR1A signaling	<u>2</u>	50	1.166	$\geq 0.05$
186	Immune response_Function of MEF2 in T lymphocytes	<u>2</u>	50	1.166	$\geq 0.05$
187	Development_EDNRB signaling	<u>2</u>	50	1.166	$\geq 0.05$
188	Immune response_C5a signaling	<u>2</u>	50	1.166	$\geq 0.05$
189	Chemotaxis_Inhibitory action of lipoxins on IL-8- and Leukotriene B4-induced neutrophil migration	<u>2</u>	51	1.151	$\geq 0.05$
190	Signal transduction_PKA signaling	<u>2</u>	51	1.151	$\geq 0.05$
191	Immune response_NFAT in immune response	<u>2</u>	51	1.151	$\geq 0.05$
192	Some pathways of EMT in cancer cells	<u>2</u>	51	1.151	$\geq 0.05$
193	Signal transduction_Activation of PKC via G-Protein coupled receptor	<u>2</u>	52	1.136	$\geq 0.05$

194	Hypoxia-induced EMT in cancer and fibrosis	<u>1</u>	9	1.127	$\geq 0.05$
195	DNA damage_DNA-damage-induced responses	<u>1</u>	9	1.127	$\geq 0.05$
196	Development_Endothelin-1/EDNRA signaling	<u>2</u>	53	1.122	$\geq 0.05$
197	Apoptosis and survival_Role of PKR in stress-induced apoptosis	<u>2</u>	53	1.122	$\geq 0.05$
198	Cell cycle_Influence of Ras and Rho proteins on G1/S Transition	<u>2</u>	53	1.122	$\geq 0.05$
199	Development_WNT signaling pathway. Part 2	<u>2</u>	53	1.122	$\geq 0.05$
200	Immune response_CD28 signaling	<u>2</u>	54	1.108	$\geq 0.05$
201	Immune response _IFN gamma signaling pathway	<u>2</u>	54	1.108	$\geq 0.05$
202	Immune response_BCR pathway	<u>2</u>	54	1.108	$\geq 0.05$
203	Chemotaxis_CCL2-induced chemotaxis	<u>2</u>	55	1.094	$\geq 0.05$
204	Blood coagulation_GPVI-dependent platelet activation	<u>2</u>	55	1.094	$\geq 0.05$
205	PGE2 pathways in cancer	<u>2</u>	55	1.094	$\geq 0.05$
206	Apoptosis and survival_NO synthesis and signaling	<u>2</u>	55	1.094	$\geq 0.05$
207	Muscle contraction_ACM regulation of smooth muscle contraction	<u>2</u>	56	1.081	$\geq 0.05$
208	Airway smooth muscle contraction in asthma	<u>2</u>	56	1.081	$\geq 0.05$
209	Cardiac Hypertrophy_Ca(2+)-dependent NF-AT signaling in Cardiac Hypertrophy	<u>2</u>	57	1.067	$\geq 0.05$
210	Inhibitory action of Lipoxins on neutrophil migration	<u>2</u>	57	1.067	$\geq 0.05$
211	Immune response_CCR5 signaling in macrophages and T lymphocytes	<u>2</u>	58	1.054	$\geq 0.05$
212	Immune response_TREM1 signaling pathway	<u>2</u>	59	1.042	$\geq 0.05$
213	Development_Thyroliberin signaling	<u>2</u>	60	1.029	$\geq 0.05$
214	Transport_RAB1A regulation pathway	<u>1</u>	12	1.008	$\geq 0.05$

215	Immune response_Antigen presentation by MHC class II	<u>1</u>	12	1.008	$\geq 0.05$
216	Development_EGFR signaling pathway	<u>2</u>	63	0.994	$\geq 0.05$
217	DNA damage_Role of NFBD1 in DNA damage response	<u>1</u>	13	0.975	$\geq 0.05$
218	Immune response_Gastrin in inflammatory response	<u>2</u>	69	0.928	$\geq 0.05$
219	Apoptosis and survival_DNA-damage-induced apoptosis	<u>1</u>	15	0.916	$\geq 0.05$
220	Blood coagulation_GPCRs in platelet aggregation	<u>2</u>	71	0.908	$\geq 0.05$
221	Regulation of lipid metabolism_Stimulation of Arachidonic acid production by ACM receptors	<u>2</u>	72	0.898	$\geq 0.05$
222	DNA damage_Role of SUMO in p53 regulation	<u>1</u>	17	0.866	$\geq 0.05$
223	LRRK2 in neuronal apoptosis in Parkinson's disease	<u>1</u>	17	0.866	$\geq 0.05$
224	G-protein signaling_Rap2A regulation pathway	<u>1</u>	17	0.866	$\geq 0.05$
225	Regulation of degradation of wt-CFTR	<u>1</u>	18	0.843	$\geq 0.05$
226	Transcription_Assembly of RNA Polymerase II preinitiation complex on TATA-less promoters	<u>1</u>	18	0.843	$\geq 0.05$
227	Neurophysiological process_NMDA-dependent postsynaptic long-term potentiation in CA1 hippocampal neurons	<u>2</u>	80	0.824	$\geq 0.05$
228	Cytoskeleton remodeling_Alpha-1A adrenergic receptor-dependent inhibition of PI3K	<u>1</u>	19	0.821	$\geq 0.05$
229	Protein folding_Membrane trafficking and signal transduction of G-alpha (i) heterotrimeric G-protein	<u>1</u>	19	0.821	$\geq 0.05$
230	Translation_IL-2 regulation of translation	<u>1</u>	20	0.8	$\geq 0.05$
231	DNA damage_Inhibition of telomerase activity and cellular senescence	<u>1</u>	20	0.8	$\geq 0.05$
232	Muscle contraction_GPCRs in the regulation of smooth muscle tone	<u>2</u>	83	0.799	$\geq 0.05$
233	Development_VEGF signaling via VEGFR2 - generic cascades	<u>2</u>	84	0.79	$\geq 0.05$

234	Nicotine signaling (general scheme)	<a href="#">1</a>	21	0.781	$\geq 0.05$
235	Transcription_ChREBP regulation pathway	<a href="#">1</a>	21	0.781	$\geq 0.05$
236	Development_S1P4 receptor signaling pathway	<a href="#">1</a>	22	0.762	$\geq 0.05$
237	Development_ERK5 in cell proliferation and neuronal survival	<a href="#">1</a>	23	0.745	$\geq 0.05$
238	Immune response_MIF-JAB1 signaling	<a href="#">1</a>	24	0.728	$\geq 0.05$
239	Apoptosis and survival_NO signaling in survival	<a href="#">1</a>	24	0.728	$\geq 0.05$
240	Immune response_IFN alpha/beta signaling pathway	<a href="#">1</a>	24	0.728	$\geq 0.05$
241	Proteolysis_Role of Parkin in the Ubiquitin-Proteasomal Pathway	<a href="#">1</a>	24	0.728	$\geq 0.05$
242	Development_Glucocorticoid receptor signaling	<a href="#">1</a>	24	0.728	$\geq 0.05$
243	Development_Mu-type opioid receptor signaling via Beta-arrestin	<a href="#">1</a>	24	0.728	$\geq 0.05$
244	Cytoskeleton remodeling_Role of PDGFs in cell migration	<a href="#">1</a>	24	0.728	$\geq 0.05$
245	Translation_Opioid receptors in regulation of translation	<a href="#">1</a>	24	0.728	$\geq 0.05$
246	Role of Nicotine-induced Leptin resistance in hypothalamus in development of obesity	<a href="#">1</a>	25	0.712	$\geq 0.05$
247	G-protein signaling_Ras family GTPases in kinase cascades (scheme)	<a href="#">1</a>	26	0.697	$\geq 0.05$
248	Cell cycle_Regulation of G1/S transition (part 2)	<a href="#">1</a>	26	0.697	$\geq 0.05$
249	Neurophysiological process_GABA-B receptor signaling at postsynaptic sides of synapses	<a href="#">1</a>	26	0.697	$\geq 0.05$
250	Apoptosis and survival_NGF signaling pathway	<a href="#">1</a>	26	0.697	$\geq 0.05$
251	Muscle contraction_Delta-type opioid receptor in smooth muscle contraction	<a href="#">1</a>	26	0.697	$\geq 0.05$
252	DNA damage_ATM / ATR regulation of G2 / M checkpoint	<a href="#">1</a>	26	0.697	$\geq 0.05$
253	Development_S1P2 and S1P3 receptors in cell proliferation	<a href="#">1</a>	26	0.697	$\geq 0.05$

	and differentiation			
254	Regulation of degradation of deltaF508 CFTR in CF	1	27	0.683 ≥0.05
255	G-protein signaling_G-Protein alpha-i signaling cascades	1	27	0.683 ≥0.05
256	Neurophysiological process_GABA-B receptor-mediated regulation of glutamate signaling in Purkinje cells	1	27	0.683 ≥0.05
257	Immune response_Role of HMGB1 in dendritic cell maturation and migration	1	27	0.683 ≥0.05
258	Possible influence of low doses of Arsenite on glucose uptake in muscle	1	28	0.669 ≥0.05
259	Immune response_Innate immune response to RNA viral infection	1	28	0.669 ≥0.05
260	Cell cycle_Role of SCF complex in cell cycle regulation	1	29	0.655 ≥0.05
261	Apoptosis and survival_nAChR in apoptosis inhibition and cell cycle progression	1	29	0.655 ≥0.05
262	Apoptosis and survival_NGF activation of NF-kB	1	29	0.655 ≥0.05
263	Development_SSTR1 in regulation of cell proliferation and migration	1	29	0.655 ≥0.05
264	Immune response_CD137 signaling in immune cell	1	29	0.655 ≥0.05
265	Proteolysis_Putative SUMO-1 pathway	1	29	0.655 ≥0.05
266	Neurophysiological process_Kappa-type opioid receptor in transmission of nerve impulses	1	30	0.642 ≥0.05
267	Neurophysiological process_Mu-type opioid receptor-mediated analgesia	1	30	0.642 ≥0.05
268	Apoptosis and survival_Granzyme A signaling	1	30	0.642 ≥0.05
269	Role of prenatal nicotine exposure in apoptosis and proliferation of pancreatic beta cells	1	30	0.642 ≥0.05
270	Immune response_Signaling pathway mediated by IL-6 and IL-1	1	30	0.642 ≥0.05

271	Transport_Aldosterone-mediated regulation of ENaC sodium transport	<a href="#">1</a>	30	0.642	$\geq 0.05$
272	DNA damage_Role of Brca1 and Brca2 in DNA repair	<a href="#">1</a>	30	0.642	$\geq 0.05$
273	Development_Osteopontin signaling in osteoclasts	<a href="#">1</a>	30	0.642	$\geq 0.05$
274	Immune response_IL-4 - antiapoptotic action	<a href="#">1</a>	30	0.642	$\geq 0.05$
275	Cytoskeleton remodeling_Fibronectin-binding integrins in cell motility	<a href="#">1</a>	31	0.63	$\geq 0.05$
276	Influence of low doses of Arsenite on glucose uptake in adipocytes	<a href="#">1</a>	31	0.63	$\geq 0.05$
277	Regulation of lipid metabolism_FXR-dependent negative-feedback regulation of bile acids concentration	<a href="#">1</a>	31	0.63	$\geq 0.05$
278	Apoptosis and survival_Role of IAP-proteins in apoptosis	<a href="#">1</a>	31	0.63	$\geq 0.05$
279	Apoptosis and survival_Granzyme B signaling	<a href="#">1</a>	32	0.618	$\geq 0.05$
280	Cell cycle_Role of Nek in cell cycle regulation	<a href="#">1</a>	32	0.618	$\geq 0.05$
281	Signal transduction_ERK1/2 signaling pathway	<a href="#">1</a>	32	0.618	$\geq 0.05$
282	DNA damage_ATM/ATR regulation of G1/S checkpoint	<a href="#">1</a>	32	0.618	$\geq 0.05$
283	Apoptosis and survival_Caspase cascade	<a href="#">1</a>	33	0.606	$\geq 0.05$
284	Nicotine signaling in glutamatergic neurons	<a href="#">1</a>	33	0.606	$\geq 0.05$
285	G-protein signaling_N-RAS regulation pathway	<a href="#">1</a>	33	0.606	$\geq 0.05$
286	LRRK2 in neurons in Parkinson's disease	<a href="#">1</a>	33	0.606	$\geq 0.05$
287	Muscle contraction_Role of kappa-type opioid receptor in heart	<a href="#">1</a>	33	0.606	$\geq 0.05$
288	Development_Activation of astroglial cells proliferation by ACM3	<a href="#">1</a>	33	0.606	$\geq 0.05$
289	Oxidative stress_Role of ASK1 under oxidative stress	<a href="#">1</a>	34	0.595	$\geq 0.05$
290	Development_HGF-dependent inhibition of TGF-beta-induced EMT	<a href="#">1</a>	34	0.595	$\geq 0.05$

291	Neurophysiological process_GABA-B receptor signaling in presynaptic nerve terminals	<a href="#">1</a>	34	0.595	$\geq 0.05$
292	Mucin expression in CF via IL-6, IL-17 signaling pathways	<a href="#">1</a>	34	0.595	$\geq 0.05$
293	Immune response_Role of the Membrane attack complex in cell survival	<a href="#">1</a>	34	0.595	$\geq 0.05$
294	Immune response_Th17 cell differentiation	<a href="#">1</a>	35	0.584	$\geq 0.05$
295	Development_TGF-beta-dependent induction of EMT via SMADs	<a href="#">1</a>	35	0.584	$\geq 0.05$
296	Cytoskeleton remodeling_Keratin filaments	<a href="#">1</a>	36	0.573	$\geq 0.05$
297	Development_Activation of ERK by Kappa-type opioid receptor	<a href="#">1</a>	36	0.573	$\geq 0.05$
298	Influence of low doses of Arsenite on Glucose stimulated Insulin secretion in pancreatic cells	<a href="#">1</a>	36	0.573	$\geq 0.05$
299	G-protein signaling_Rac2 regulation pathway	<a href="#">1</a>	36	0.573	$\geq 0.05$
300	G-protein signaling_G-Protein alpha-12 signaling pathway	<a href="#">1</a>	37	0.563	$\geq 0.05$
301	Development_MAG-dependent inhibition of neurite outgrowth	<a href="#">1</a>	37	0.563	$\geq 0.05$
302	Transcription_Role of AP-1 in regulation of cellular metabolism	<a href="#">1</a>	38	0.553	$\geq 0.05$
303	Cytoskeleton remodeling_ACM3 and ACM4 in keratinocyte migration	<a href="#">1</a>	38	0.553	$\geq 0.05$
304	Transcription_Sin3 and NuRD in transcription regulation	<a href="#">1</a>	38	0.553	$\geq 0.05$
305	Signal transduction_cAMP signaling	<a href="#">1</a>	38	0.553	$\geq 0.05$
306	Nicotine signaling in GABAergic neurons	<a href="#">1</a>	39	0.544	$\geq 0.05$
307	Cytokine production by Th17 cells in CF	<a href="#">1</a>	39	0.544	$\geq 0.05$
308	HIV-1 signaling via CCR5 in macrophages and T lymphocytes	<a href="#">1</a>	39	0.544	$\geq 0.05$
309	Translation _Regulation of EIF2 activity	<a href="#">1</a>	39	0.544	$\geq 0.05$

310	Cell adhesion_PLAU signaling	<a href="#">1</a>	39	0.544	$\geq 0.05$
311	G-protein signaling_Regulation of p38 and JNK signaling mediated by G-proteins	<a href="#">1</a>	39	0.544	$\geq 0.05$
312	Neurophysiological process_Delta-type opioid receptor in the nervous system	<a href="#">1</a>	40	0.535	$\geq 0.05$
313	Development_Role of Activin A in cell differentiation and proliferation	<a href="#">1</a>	40	0.535	$\geq 0.05$
314	G-protein signaling_Rap1A regulation pathway	<a href="#">1</a>	40	0.535	$\geq 0.05$
315	Immune response_MIF in innate immunity response	<a href="#">1</a>	40	0.535	$\geq 0.05$
316	Immune response_Th1 and Th2 cell differentiation	<a href="#">1</a>	40	0.535	$\geq 0.05$
317	Cytoskeleton remodeling_Role of PKA in cytoskeleton reorganisation	<a href="#">1</a>	40	0.535	$\geq 0.05$
318	Development_GH-RH signaling	<a href="#">1</a>	41	0.526	$\geq 0.05$
319	Apoptosis and survival_Apoptotic TNF-family pathways	<a href="#">1</a>	42	0.517	$\geq 0.05$
320	Translation_Insulin regulation of translation	<a href="#">1</a>	42	0.517	$\geq 0.05$
321	Neurophysiological process_HTR1A receptor signaling in neuronal cells	<a href="#">1</a>	42	0.517	$\geq 0.05$
322	Regulation of metabolism_Role of Adiponectin in regulation of metabolism	<a href="#">1</a>	43	0.508	$\geq 0.05$
323	Neurophysiological process_Melatonin signaling	<a href="#">1</a>	43	0.508	$\geq 0.05$
324	Apoptosis and survival_Anti-apoptotic action of Gastrin	<a href="#">1</a>	43	0.508	$\geq 0.05$
325	Immune response_HTR2A-induced activation of cPLA2	<a href="#">1</a>	43	0.508	$\geq 0.05$
326	Apoptosis and survival_TNFR1 signaling pathway	<a href="#">1</a>	43	0.508	$\geq 0.05$
327	Development_A2A receptor signaling	<a href="#">1</a>	43	0.508	$\geq 0.05$
328	Chemotaxis_C5a-induced chemotaxis	<a href="#">1</a>	43	0.508	$\geq 0.05$
329	Development_Notch Signaling Pathway	<a href="#">1</a>	43	0.508	$\geq 0.05$

330	Immune response_IL-13 signaling via JAK-STAT	<u>1</u>	44	0.5	$\geq 0.05$
331	Immune response_IL-4 signaling pathway	<u>1</u>	44	0.5	$\geq 0.05$
332	Immune response_PGE2 in immune and neuroendocrine system interactions	<u>1</u>	44	0.5	$\geq 0.05$
333	Ganglioside Metabolism p2	<u>1</u>	44	0.5	$\geq 0.05$
334	Regulation of lipid metabolism_Regulation of lipid metabolism by niacin and isoprenaline	<u>1</u>	45	0.492	$\geq 0.05$
335	Development_Adiponectin signaling	<u>1</u>	45	0.492	$\geq 0.05$
336	Signal transduction_Calcium signaling	<u>1</u>	45	0.492	$\geq 0.05$
337	Development_Hedgehog signaling	<u>1</u>	46	0.484	$\geq 0.05$
338	Development_GDNF family signaling	<u>1</u>	46	0.484	$\geq 0.05$
339	Immune response_ICOS pathway in T-helper cell	<u>1</u>	46	0.484	$\geq 0.05$
340	Immune response_NF-AT signaling and leukocyte interactions	<u>1</u>	46	0.484	$\geq 0.05$
341	Development_TGF-beta-dependent induction of EMT via RhoA, PI3K and ILK.	<u>1</u>	46	0.484	$\geq 0.05$
342	Development_Angiotensin activation of Akt	<u>1</u>	46	0.484	$\geq 0.05$
343	Immune response_Fc gamma R-mediated phagocytosis in macrophages	<u>1</u>	46	0.484	$\geq 0.05$
344	Transcription_CREB pathway	<u>1</u>	47	0.477	$\geq 0.05$
345	Development_Leptin signaling via PI3K-dependent pathway	<u>1</u>	47	0.477	$\geq 0.05$
346	Regulation of lipid metabolism_Insulin signaling:generic cascades	<u>1</u>	47	0.477	$\geq 0.05$
347	Development_Beta-adrenergic receptors regulation of ERK	<u>1</u>	47	0.477	$\geq 0.05$
348	Development_PDGF signaling via MAPK cascades	<u>1</u>	47	0.477	$\geq 0.05$
349	Regulation of metabolism_Triiodothyronine and Thyroxine signaling	<u>1</u>	48	0.469	$\geq 0.05$

350	Globo-(isoglobo) series GSL Metabolism	<a href="#">1</a>	48	0.469	$\geq 0.05$
351	Development_A3 receptor signaling	<a href="#">1</a>	49	0.462	$\geq 0.05$
352	Inhibitory action of Lipoxins on Superoxide production in neutrophils	<a href="#">1</a>	49	0.462	$\geq 0.05$
353	Neurophysiological process_Corticoliberin signaling via CRHR1	<a href="#">1</a>	50	0.455	$\geq 0.05$
354	Immune response_Histamine signaling in dendritic cells	<a href="#">1</a>	50	0.455	$\geq 0.05$
355	Nicotine signaling in cholinergic neurons	<a href="#">1</a>	50	0.455	$\geq 0.05$
356	Neurophysiological process_GABAergic neurotransmission	<a href="#">1</a>	50	0.455	$\geq 0.05$
357	Development_A2B receptor: action via G-protein alpha s	<a href="#">1</a>	50	0.455	$\geq 0.05$
358	Immune response_Inhibitory action of lipoxins on superoxide production induced by IL-8 and Leukotriene B4 in neutrophils	<a href="#">1</a>	50	0.455	$\geq 0.05$
359	Immune response_IL-13 signaling via PI3K-ERK	<a href="#">1</a>	50	0.455	$\geq 0.05$
360	Development_Beta-adrenergic receptors signaling via cAMP	<a href="#">1</a>	52	0.442	$\geq 0.05$
361	Immune response_PGE2 common pathways	<a href="#">1</a>	52	0.442	$\geq 0.05$
362	Cell adhesion_ECM remodeling	<a href="#">1</a>	52	0.442	$\geq 0.05$
363	Development_FGF-family signaling	<a href="#">1</a>	52	0.442	$\geq 0.05$
364	Development_A1 receptor signaling	<a href="#">1</a>	53	0.435	$\geq 0.05$
365	Translation _Regulation of EIF4F activity	<a href="#">1</a>	53	0.435	$\geq 0.05$
366	Translation_Translation regulation by Alpha-1 adrenergic receptors	<a href="#">1</a>	53	0.435	$\geq 0.05$
367	Immune response_Role of DAP12 receptors in NK cells	<a href="#">1</a>	54	0.429	$\geq 0.05$
368	Immune response_HSP60 and HSP70/ TLR signaling pathway	<a href="#">1</a>	54	0.429	$\geq 0.05$
369	Ganglioside Metabolism p1	<a href="#">1</a>	54	0.429	$\geq 0.05$

370	Development_FGFR signaling pathway	<a href="#">1</a>	54	0.429	$\geq 0.05$
371	Immune response_TLR signaling pathways	<a href="#">1</a>	54	0.429	$\geq 0.05$
372	Cholesterol metabolism	<a href="#">1</a>	54	0.429	$\geq 0.05$
373	Immune response_Fc epsilon RI pathway	<a href="#">1</a>	55	0.422	$\geq 0.05$
374	Development_Keratinocyte differentiation	<a href="#">1</a>	56	0.416	$\geq 0.05$
375	Muscle contraction_Regulation of eNOS activity in cardiomyocytes	<a href="#">1</a>	56	0.416	$\geq 0.05$
376	Regulation of lipid metabolism_Insulin regulation of glycogen metabolism	<a href="#">1</a>	56	0.416	$\geq 0.05$
377	CoA biosynthesis	<a href="#">1</a>	57	0.41	$\geq 0.05$
378	Chondroitin sulfate and dermatan sulfate metabolism	<a href="#">1</a>	60	0.393	$\geq 0.05$
379	Muscle contraction_Oxytocin signaling in uterus and mammary gland	<a href="#">1</a>	62	0.382	$\geq 0.05$
380	Heparan sulfate/heparin metabolism	<a href="#">1</a>	62	0.382	$\geq 0.05$
381	Transcription_PPAR Pathway	<a href="#">1</a>	63	0.377	$\geq 0.05$
382	Transport_Macropinocytosis regulation by growth factors	<a href="#">1</a>	63	0.377	$\geq 0.05$
383	Reproduction_GnRH signaling	<a href="#">1</a>	72	0.334	$\geq 0.05$
384	Immune response _CCR3 signaling in eosinophils	<a href="#">1</a>	77	0.313	$\geq 0.05$
385	Phosphatidylinositol metabolism	<a href="#">1</a>	87	0.277	$\geq 0.05$
386	Regulation of lipid metabolism_Insulin regulation of fatty acid metabolism	<a href="#">1</a>	89	0.27	$\geq 0.05$
387	Bile Acid Biosynthesis	<a href="#">1</a>	94	0.254	$\geq 0.05$

<sup>a</sup>ratio between miRNA target genes and total genes in the pathway.

**eTable 12:** GeneGo Pathways Enriched in miR-9 Target Genes.

#	Maps	Ratio <sup>a</sup>	-log(p)	FDR
1	Development_Glucocorticoid receptor signaling	4	24	4.379 <0.05
2	Development_PDGF signaling via STATs and NF-kB	4	32	3.871 <0.05
3	Normal and pathological TGF-beta-mediated regulation of cell proliferation	4	33	3.818 <0.05
4	Transport_Macropinocytosis regulation by growth factors	5	63	3.769 <0.05
5	Development_TGF-beta-dependent induction of EMT via SMADs	4	35	3.716 <0.05
6	Development_TGF-beta-induction of EMT via ROS	3	19	3.309 <0.05
7	Development_TGF-beta-dependent induction of EMT via MAPK	4	47	3.217 <0.05
8	Development_PEDF signaling	4	49	3.147 <0.05
9	Some pathways of EMT in cancer cells	4	51	3.081 <0.05
10	Cell adhesion_Chemokines and adhesion	5	100	2.843 <0.05
11	Development_Regulation of epithelial-to-mesenchymal transition (EMT)	4	64	2.711 <0.05
12	Development_Transactivation of PDGFR in non-neuronal cells by Dopamine D2 receptor	3	31	2.674 <0.05
13	Signal transduction_ERK1/2 signaling pathway	3	32	2.634 <0.05
14	Cell adhesion_Role of CDK5 in cell adhesion	2	9	2.623 <0.05
15	Hypoxia-induced EMT in cancer and fibrosis	2	9	2.623 <0.05
16	Cell adhesion_Tight junctions	3	36	2.486 ≥0.05
17	G-protein signaling_H-RAS regulation pathway	3	37	2.451 ≥0.05
18	Cell adhesion_Cell-matrix glycoconjugates	3	38	2.418 ≥0.05

19	Development_Neurotrophin family signaling	<u>3</u>	40	2.355	$\geq 0.05$
20	Immune response_IL-4 signaling pathway	<u>3</u>	44	2.238	$\geq 0.05$
21	Development_Thrombopoietin-regulated cell processes	<u>3</u>	45	2.211	$\geq 0.05$
22	Development_GDNF family signaling	<u>3</u>	46	2.184	$\geq 0.05$
23	Development_PDGF signaling via MAPK cascades	<u>3</u>	47	2.158	$\geq 0.05$
24	Signal transduction_IP3 signaling	<u>3</u>	49	2.108	$\geq 0.05$
25	Apoptosis and survival_HTR1A signaling	<u>3</u>	50	2.083	$\geq 0.05$
26	Immune response_Function of MEF2 in T lymphocytes	<u>3</u>	50	2.083	$\geq 0.05$
27	Development_TGF-beta receptor signaling	<u>3</u>	50	2.083	$\geq 0.05$
28	Development_A2B receptor: action via G-protein alpha s	<u>3</u>	50	2.083	$\geq 0.05$
29	Development_IGF-1 receptor signaling	<u>3</u>	52	2.036	$\geq 0.05$
30	Development_Role of HDAC and calcium/calmodulin-dependent kinase (CaMK) in control of skeletal myogenesis	<u>3</u>	54	1.991	$\geq 0.05$
31	Immune response_CCL2 signaling	<u>3</u>	54	1.991	$\geq 0.05$
32	Immune response_BCR pathway	<u>3</u>	54	1.991	$\geq 0.05$
33	Cytoskeleton remodeling_Cytoskeleton remodeling	<u>4</u>	102	1.989	$\geq 0.05$
34	DNA damage_NHEJ mechanisms of DSBs repair	<u>2</u>	19	1.97	$\geq 0.05$
35	Development_Alpha-1 adrenergic receptors signaling via cAMP	<u>2</u>	19	1.97	$\geq 0.05$
36	Cardiac Hypertrophy_Ca(2+)-dependent NF-AT signaling in Cardiac Hypertrophy	<u>3</u>	57	1.927	$\geq 0.05$
37	Immune response_MIF-mediated glucocorticoid regulation	<u>2</u>	22	1.846	$\geq 0.05$
38	Development_ERK5 in cell proliferation and neuronal survival	<u>2</u>	23	1.809	$\geq 0.05$

39	Cell adhesion_Endothelial cell contacts by non-junctional mechanisms	<u>2</u>	24	1.774	$\geq 0.05$
40	Cytoskeleton remodeling_Role of PDGFs in cell migration	<u>2</u>	24	1.774	$\geq 0.05$
41	Role of Nicotine-induced Leptin resistance in hypothalamus in development of obesity	<u>2</u>	25	1.74	$\geq 0.05$
42	G-protein signaling_K-RAS regulation pathway	<u>2</u>	25	1.74	$\geq 0.05$
43	Neurophysiological process_Dopamine D2 receptor transactivation of PDGFR in CNS	<u>2</u>	26	1.707	$\geq 0.05$
44	Cell adhesion_Cadherin-mediated cell adhesion	<u>2</u>	26	1.707	$\geq 0.05$
45	Cell adhesion_Endothelial cell contacts by junctional mechanisms	<u>2</u>	26	1.707	$\geq 0.05$
46	Immune response_Gastrin in inflammatory response	<u>3</u>	69	1.705	$\geq 0.05$
47	G-protein signaling_G-Protein alpha-i signaling cascades	<u>2</u>	27	1.676	$\geq 0.05$
48	Possible pathway of TGF-beta 1-dependent inhibition of CFTR expression	<u>2</u>	27	1.676	$\geq 0.05$
49	Apoptosis and survival_NGF activation of NF-kB	<u>2</u>	29	1.618	$\geq 0.05$
50	Proteolysis_Putative SUMO-1 pathway	<u>2</u>	29	1.618	$\geq 0.05$
51	Immune response_Signaling pathway mediated by IL-6 and IL-1	<u>2</u>	30	1.59	$\geq 0.05$
52	Immune response_IL-4 - antiapoptotic action	<u>2</u>	30	1.59	$\geq 0.05$
53	Immune response_IL-6 signaling pathway	<u>2</u>	31	1.563	$\geq 0.05$
54	Immune response_IL-3 activation and signaling pathway	<u>2</u>	31	1.563	$\geq 0.05$
55	Putative pathways for stimulation of fat cell differentiation by Bisphenol A	<u>2</u>	32	1.538	$\geq 0.05$
56	Protein folding and maturation_B Bradykinin / Kallidin maturation	<u>2</u>	32	1.538	$\geq 0.05$
57	G-protein signaling_N-RAS regulation pathway	<u>2</u>	33	1.513	$\geq 0.05$

58	Development_HGF-dependent inhibition of TGF-beta-induced EMT	<a href="#">2</a>	34	1.489	$\geq 0.05$
59	G-protein signaling_G-Protein alpha-q signaling cascades	<a href="#">2</a>	34	1.489	$\geq 0.05$
60	Development_Angiopoietin - Tie2 signaling	<a href="#">2</a>	35	1.465	$\geq 0.05$
61	Immune response_Th17 cell differentiation	<a href="#">2</a>	35	1.465	$\geq 0.05$
62	Cell adhesion_Plasmin signaling	<a href="#">2</a>	35	1.465	$\geq 0.05$
63	Immune response_Oncostatin M signaling via MAPK in mouse cells	<a href="#">2</a>	35	1.465	$\geq 0.05$
64	Immune response_Regulation of T cell function by CTLA-4	<a href="#">2</a>	36	1.443	$\geq 0.05$
65	Immune response_IL-9 signaling pathway	<a href="#">2</a>	36	1.443	$\geq 0.05$
66	Immune response_Oncostatin M signaling via MAPK in human cells	<a href="#">2</a>	37	1.421	$\geq 0.05$
67	Possible role of neonatal nicotine exposure in development of postnatal obesity	<a href="#">1</a>	5	1.387	$\geq 0.05$
68	Apoptosis and survival_APRL and BAFF signaling	<a href="#">2</a>	39	1.379	$\geq 0.05$
69	Transcription_P53 signaling pathway	<a href="#">2</a>	39	1.379	$\geq 0.05$
70	Development_ERBB-family signaling	<a href="#">2</a>	39	1.379	$\geq 0.05$
71	Transcription_Receptor-mediated HIF regulation	<a href="#">2</a>	39	1.379	$\geq 0.05$
72	G-protein signaling_Regulation of p38 and JNK signaling mediated by G-proteins	<a href="#">2</a>	39	1.379	$\geq 0.05$
73	Translation_Non-genomic (rapid) action of Androgen Receptor	<a href="#">2</a>	40	1.36	$\geq 0.05$
74	Immune response_Neurotensin-induced activation of IL-8 in colonocytes	<a href="#">2</a>	42	1.321	$\geq 0.05$
75	Apoptosis and survival_BAD phosphorylation	<a href="#">2</a>	42	1.321	$\geq 0.05$
76	Immune response_IL-7 signaling in B lymphocytes	<a href="#">2</a>	43	1.303	$\geq 0.05$

77	Protein folding and maturation_Angiotensin system maturation \ Human version	<a href="#">2</a>	43	1.303	$\geq 0.05$
78	Apoptosis and survival_TNFR1 signaling pathway	<a href="#">2</a>	43	1.303	$\geq 0.05$
79	Development_A2A receptor signaling	<a href="#">2</a>	43	1.303	$\geq 0.05$
80	Development_Activation of Erk by ACM1, ACM3 and ACM5	<a href="#">2</a>	44	1.285	$\geq 0.05$
81	Role of alpha-6/beta-4 integrins in carcinoma progression	<a href="#">2</a>	45	1.267	$\geq 0.05$
82	Cell adhesion_Histamine H1 receptor signaling in the interruption of cell barrier integrity	<a href="#">2</a>	45	1.267	$\geq 0.05$
83	Transcription_Androgen Receptor nuclear signaling	<a href="#">2</a>	45	1.267	$\geq 0.05$
84	Development_Membrane-bound ESR1: interaction with growth factors signaling	<a href="#">2</a>	45	1.267	$\geq 0.05$
85	Development_G-Proteins mediated regulation MAPK-ERK signaling	<a href="#">2</a>	46	1.25	$\geq 0.05$
86	Development_TGF-beta-dependent induction of EMT via RhoA, PI3K and ILK.	<a href="#">2</a>	46	1.25	$\geq 0.05$
87	Development_Beta-adrenergic receptors regulation of ERK	<a href="#">2</a>	47	1.234	$\geq 0.05$
88	Development_HGF signaling pathway	<a href="#">2</a>	47	1.234	$\geq 0.05$
89	Protein folding and maturation_Angiotensin system maturation \ Rodent version	<a href="#">2</a>	48	1.218	$\geq 0.05$
90	Muscle contraction_Relaxin signaling pathway	<a href="#">2</a>	48	1.218	$\geq 0.05$
91	Immune response_IL-2 activation and signaling pathway	<a href="#">2</a>	49	1.202	$\geq 0.05$
92	Development_A3 receptor signaling	<a href="#">2</a>	49	1.202	$\geq 0.05$
93	Cytokine production by Th17 cells in CF (Mouse model)	<a href="#">2</a>	49	1.202	$\geq 0.05$
94	Mucin expression in CF via TLRs, EGFR signaling pathways	<a href="#">2</a>	50	1.186	$\geq 0.05$

95	Development_GM-CSF signaling	<a href="#">2</a>	50	1.186	$\geq 0.05$
96	Development_EDNRB signaling	<a href="#">2</a>	50	1.186	$\geq 0.05$
97	Immune response_C5a signaling	<a href="#">2</a>	50	1.186	$\geq 0.05$
98	Cytoskeleton remodeling_TGF, WNT and cytoskeletal remodeling	<a href="#">3</a>	111	1.185	$\geq 0.05$
99	Signal transduction_Activation of PKC via G-Protein coupled receptor	<a href="#">2</a>	52	1.157	$\geq 0.05$
100	G-protein signaling_Proinsulin C-peptide signaling	<a href="#">2</a>	52	1.157	$\geq 0.05$
101	Cell adhesion_ECM remodeling	<a href="#">2</a>	52	1.157	$\geq 0.05$
102	Development_A1 receptor signaling	<a href="#">2</a>	53	1.142	$\geq 0.05$
103	Translation _Regulation of EIF4F activity	<a href="#">2</a>	53	1.142	$\geq 0.05$
104	Development_WNT signaling pathway. Part 2	<a href="#">2</a>	53	1.142	$\geq 0.05$
105	Immune response_HMGB1/RAGE signaling pathway	<a href="#">2</a>	53	1.142	$\geq 0.05$
106	Immune response_Role of DAP12 receptors in NK cells	<a href="#">2</a>	54	1.128	$\geq 0.05$
107	Immune response_HSP60 and HSP70/ TLR signaling pathway	<a href="#">2</a>	54	1.128	$\geq 0.05$
108	Immune response_TLR signaling pathways	<a href="#">2</a>	54	1.128	$\geq 0.05$
109	Apoptosis and survival_NO synthesis and signaling	<a href="#">2</a>	55	1.114	$\geq 0.05$
110	Regulation of lipid metabolism_Insulin regulation of glycogen metabolism	<a href="#">2</a>	56	1.101	$\geq 0.05$
111	Regulation of CFTR activity (norm and CF)	<a href="#">2</a>	58	1.074	$\geq 0.05$
112	Development_Thyroliberin signaling	<a href="#">2</a>	60	1.049	$\geq 0.05$
113	Development_Gastrin in cell growth and proliferation	<a href="#">2</a>	62	1.025	$\geq 0.05$
114	Development_MicroRNA-dependent inhibition of EMT	<a href="#">1</a>	12	1.019	$\geq 0.05$
115	Development_Role of nicotinamide in G-CSF-induced granulopoiesis	<a href="#">1</a>	12	1.019	$\geq 0.05$

116	Transport_Macropinocytosis	<a href="#">1</a>	12	1.019	$\geq 0.05$
117	Development_EGFR signaling pathway	<a href="#">2</a>	63	1.013	$\geq 0.05$
118	Transcription_PPAR Pathway	<a href="#">2</a>	63	1.013	$\geq 0.05$
119	Immune response_IL-15 signaling	<a href="#">2</a>	64	1.002	$\geq 0.05$
120	Muscle contraction_Regulation of eNOS activity in endothelial cells	<a href="#">2</a>	65	0.991	$\geq 0.05$
121	Cardiac Hypertrophy_NF-AT signaling in Cardiac Hypertrophy	<a href="#">2</a>	65	0.991	$\geq 0.05$
122	DNA damage_Role of NFBD1 in DNA damage response	<a href="#">1</a>	13	0.986	$\geq 0.05$
123	DNA damage_Role of SUMO in p53 regulation	<a href="#">1</a>	17	0.876	$\geq 0.05$
124	Transport_RAN regulation pathway	<a href="#">1</a>	18	0.853	$\geq 0.05$
125	Neurophysiological process_NMDA-dependent postsynaptic long-term potentiation in CA1 hippocampal neurons	<a href="#">2</a>	80	0.843	$\geq 0.05$
126	wtCFTR and delta508 traffic / Clathrin coated vesicles formation (norm and CF)	<a href="#">1</a>	19	0.832	$\geq 0.05$
127	Development_NOTCH-induced EMT	<a href="#">1</a>	19	0.832	$\geq 0.05$
128	Immune response_TLR3 and TLR4 induce TICAM1-specific signaling pathway	<a href="#">1</a>	20	0.811	$\geq 0.05$
129	Translation_IL-2 regulation of translation	<a href="#">1</a>	20	0.811	$\geq 0.05$
130	Development_VEGF signaling via VEGFR2 - generic cascades	<a href="#">2</a>	84	0.809	$\geq 0.05$
131	Transcription_Role of heterochromatin protein 1 (HP1) family in transcriptional silencing	<a href="#">1</a>	22	0.773	$\geq 0.05$
132	LRRK2 and immune function in Parkinson's disease	<a href="#">1</a>	22	0.773	$\geq 0.05$
133	Dichloroethylene metabolism	<a href="#">1</a>	23	0.756	$\geq 0.05$
134	Apoptosis and survival_Beta-2 adrenergic receptor anti-apoptotic action	<a href="#">1</a>	23	0.756	$\geq 0.05$

135	G-protein signaling_Cross-talk between Ras-family GTPases	<a href="#">1</a>	23	0.756	$\geq 0.05$
136	Immune response_MIF-JAB1 signaling	<a href="#">1</a>	24	0.739	$\geq 0.05$
137	Immune response_IL-27 signaling pathway	<a href="#">1</a>	24	0.739	$\geq 0.05$
138	Development_Dopamine D2 receptor transactivation of EGFR	<a href="#">1</a>	24	0.739	$\geq 0.05$
139	Development_GDNF signaling	<a href="#">1</a>	24	0.739	$\geq 0.05$
140	G-protein signaling_M-RAS regulation pathway	<a href="#">1</a>	24	0.739	$\geq 0.05$
141	G-protein signaling_TC21 regulation pathway	<a href="#">1</a>	25	0.723	$\geq 0.05$
142	Development_Leptin signaling via JAK/STAT and MAPK cascades	<a href="#">1</a>	25	0.723	$\geq 0.05$
143	G-protein signaling_Ras family GTPases in kinase cascades (scheme)	<a href="#">1</a>	26	0.708	$\geq 0.05$
144	Apoptosis and survival_NGF signaling pathway	<a href="#">1</a>	26	0.708	$\geq 0.05$
145	Development_Cross-talk between VEGF and Angiopoietin 1 signaling pathways	<a href="#">1</a>	26	0.708	$\geq 0.05$
146	Development_Signaling of Beta-adrenergic receptors via Beta-arrestins	<a href="#">1</a>	26	0.708	$\geq 0.05$
147	Immune response_Role of HMGB1 in dendritic cell maturation and migration	<a href="#">1</a>	27	0.693	$\geq 0.05$
148	Apoptosis and survival_Anti-apoptotic TNFs/NF-kB/IAP pathway	<a href="#">1</a>	27	0.693	$\geq 0.05$
149	Development_Mu-type opioid receptor regulation of proliferation	<a href="#">1</a>	28	0.679	$\geq 0.05$
150	Possible influence of low doses of Arsenite on glucose uptake in muscle	<a href="#">1</a>	28	0.679	$\geq 0.05$
151	Development_Delta-type opioid receptor signaling via G-protein alpha-14	<a href="#">1</a>	28	0.679	$\geq 0.05$

152	Development_Regulation of CDK5 in CNS	<a href="#">1</a>	28	0.679	$\geq 0.05$
153	Immune response_Innate immune response to RNA viral infection	<a href="#">1</a>	28	0.679	$\geq 0.05$
154	PDGF activation of prostacyclin synthesis	<a href="#">1</a>	29	0.665	$\geq 0.05$
155	Apoptosis and survival_nAChR in apoptosis inhibition and cell cycle progression	<a href="#">1</a>	29	0.665	$\geq 0.05$
156	Development_SSTR1 in regulation of cell proliferation and migration	<a href="#">1</a>	29	0.665	$\geq 0.05$
157	Immune response_CD137 signaling in immune cell	<a href="#">1</a>	29	0.665	$\geq 0.05$
158	Apoptosis and survival_p53-dependent apoptosis	<a href="#">1</a>	29	0.665	$\geq 0.05$
159	Role of Diethylhexyl Phthalate and Tributyltin in fat cell differentiation	<a href="#">1</a>	29	0.665	$\geq 0.05$
160	Apoptosis and survival_Granzyme A signaling	<a href="#">1</a>	30	0.652	$\geq 0.05$
161	Cholesterol and Sphingolipids transport / Influx to the early endosome in lung (normal and CF)	<a href="#">1</a>	30	0.652	$\geq 0.05$
162	DNA damage_Brca1 as a transcription regulator	<a href="#">1</a>	30	0.652	$\geq 0.05$
163	DNA damage_Role of Brca1 and Brca2 in DNA repair	<a href="#">1</a>	30	0.652	$\geq 0.05$
164	Development_Osteopontin signaling in osteoclasts	<a href="#">1</a>	30	0.652	$\geq 0.05$
165	Immune response_ETV3 affect on CSF1-promoted macrophage differentiation	<a href="#">1</a>	31	0.64	$\geq 0.05$
166	Apoptosis and survival_Granzyme B signaling	<a href="#">1</a>	32	0.628	$\geq 0.05$
167	DNA damage_ATM/ATR regulation of G1/S checkpoint	<a href="#">1</a>	32	0.628	$\geq 0.05$
168	Autophagy_Autophagy	<a href="#">1</a>	32	0.628	$\geq 0.05$
169	Development_Angiotensin activation of ERK	<a href="#">1</a>	33	0.616	$\geq 0.05$
170	Development_EGFR signaling via small GTPases	<a href="#">1</a>	33	0.616	$\geq 0.05$
171	Apoptosis and survival_Caspase cascade	<a href="#">1</a>	33	0.616	$\geq 0.05$

172	Signal transduction_Activin A signaling regulation	<a href="#">1</a>	33	0.616	$\geq 0.05$
173	Immune response_Inflammasome in inflammatory response	<a href="#">1</a>	34	0.605	$\geq 0.05$
174	Apoptosis and survival_Role of CDK5 in neuronal death and survival	<a href="#">1</a>	34	0.605	$\geq 0.05$
175	G-protein signaling_G-Protein beta/gamma signaling cascades	<a href="#">1</a>	34	0.605	$\geq 0.05$
176	Development_S1P1 receptor signaling via beta-arrestin	<a href="#">1</a>	34	0.605	$\geq 0.05$
177	Development_CNTF receptor signaling	<a href="#">1</a>	34	0.605	$\geq 0.05$
178	Mucin expression in CF via IL-6, IL-17 signaling pathways	<a href="#">1</a>	34	0.605	$\geq 0.05$
179	Immune response_CXCR4 signaling via second messenger	<a href="#">1</a>	34	0.605	$\geq 0.05$
180	Chemotaxis_CXCR4 signaling pathway	<a href="#">1</a>	34	0.605	$\geq 0.05$
181	Development_NOTCH1-mediated pathway for NF-KB activity modulation	<a href="#">1</a>	34	0.605	$\geq 0.05$
182	Development_EPO-induced Jak-STAT pathway	<a href="#">1</a>	35	0.594	$\geq 0.05$
183	Inhibitory action of Lipoxin A4 on PDGF, EGF and LTD4 signaling	<a href="#">1</a>	35	0.594	$\geq 0.05$
184	Immune response_Lipoxins and Resolvin E1 inhibitory action on neutrophil functions	<a href="#">1</a>	35	0.594	$\geq 0.05$
185	Oxidative stress_Angiotensin II-induced production of ROS	<a href="#">1</a>	35	0.594	$\geq 0.05$
186	G-protein signaling_RAC1 in cellular process	<a href="#">1</a>	35	0.594	$\geq 0.05$
187	Development_SSTR2 in regulation of cell proliferation	<a href="#">1</a>	36	0.584	$\geq 0.05$
188	Development_Hedgehog and PTH signaling pathways in bone and cartilage development	<a href="#">1</a>	36	0.584	$\geq 0.05$
189	Development_Activation of ERK by Kappa-type opioid	<a href="#">1</a>	36	0.584	$\geq 0.05$

	receptor				
190	G-protein signaling_G-Protein alpha-s signaling cascades	<a href="#">1</a>	36	0.584	$\geq 0.05$
191	Immune response_IL-12-induced IFN-gamma production	<a href="#">1</a>	36	0.584	$\geq 0.05$
192	Development_Lipoxin inhibitory action on PDGF, EGF and LTD4 signaling	<a href="#">1</a>	36	0.584	$\geq 0.05$
193	Apoptosis and survival_Anti-apoptotic action of nuclear ESR1 and ESR2	<a href="#">1</a>	37	0.573	$\geq 0.05$
194	Development_MAG-dependent inhibition of neurite outgrowth	<a href="#">1</a>	37	0.573	$\geq 0.05$
195	Regulation of metabolism_Bile acids regulation of glucose and lipid metabolism via FXR	<a href="#">1</a>	37	0.573	$\geq 0.05$
196	Development_Beta-adrenergic receptors transactivation of EGFR	<a href="#">1</a>	37	0.573	$\geq 0.05$
197	Immune response_Role of integrins in NK cells cytotoxicity	<a href="#">1</a>	38	0.564	$\geq 0.05$
198	Transcription_Role of AP-1 in regulation of cellular metabolism	<a href="#">1</a>	38	0.564	$\geq 0.05$
199	Cell cycle_Regulation of G1/S transition (part 1)	<a href="#">1</a>	38	0.564	$\geq 0.05$
200	Transcription_Sin3 and NuRD in transcription regulation	<a href="#">1</a>	38	0.564	$\geq 0.05$
201	Immune response_IL-7 signaling in T lymphocytes	<a href="#">1</a>	38	0.564	$\geq 0.05$
202	Cytokine production by Th17 cells in CF	<a href="#">1</a>	39	0.554	$\geq 0.05$
203	Translation _Regulation of EIF2 activity	<a href="#">1</a>	39	0.554	$\geq 0.05$
204	Transcription_NF-kB signaling pathway	<a href="#">1</a>	39	0.554	$\geq 0.05$
205	Development_PACAP signaling in neural cells	<a href="#">1</a>	39	0.554	$\geq 0.05$
206	Cell adhesion_PLAU signaling	<a href="#">1</a>	39	0.554	$\geq 0.05$
207	Inhibitory action of Lipoxins and Resolvin E1 on	<a href="#">1</a>	40	0.545	$\geq 0.05$

	neutrophil functions				
208	Development_Oxytocin receptor signaling	<a href="#">1</a>	40	0.545	$\geq 0.05$
209	Neurophysiological process_ACM1 and ACM2 in neuronal membrane polarization	<a href="#">1</a>	40	0.545	$\geq 0.05$
210	Immune response_TCR and CD28 co-stimulation in activation of NF-kB	<a href="#">1</a>	40	0.545	$\geq 0.05$
211	G-protein signaling_Rap1A regulation pathway	<a href="#">1</a>	40	0.545	$\geq 0.05$
212	Reproduction_Progesterone-mediated oocyte maturation	<a href="#">1</a>	40	0.545	$\geq 0.05$
213	IMP biosynthesis	<a href="#">1</a>	40	0.545	$\geq 0.05$
214	Immune response_Th1 and Th2 cell differentiation	<a href="#">1</a>	40	0.545	$\geq 0.05$
215	Apoptosis and survival_Anti-apoptotic TNFs/NF-kB/Bcl-2 pathway	<a href="#">1</a>	41	0.536	$\geq 0.05$
216	Immune response_HMGB1 release from the cell	<a href="#">1</a>	41	0.536	$\geq 0.05$
217	Development_VEGF-family signaling	<a href="#">1</a>	41	0.536	$\geq 0.05$
218	Translation_Insulin regulation of translation	<a href="#">1</a>	42	0.527	$\geq 0.05$
219	Apoptosis and survival_Lymphotoxin-beta receptor signaling	<a href="#">1</a>	42	0.527	$\geq 0.05$
220	Signal transduction_JNK pathway	<a href="#">1</a>	42	0.527	$\geq 0.05$
221	Development_Growth hormone signaling via PI3K/AKT and MAPK cascades	<a href="#">1</a>	42	0.527	$\geq 0.05$
222	Development_ACM2 and ACM4 activation of ERK	<a href="#">1</a>	43	0.518	$\geq 0.05$
223	Regulation of metabolism_Role of Adiponectin in regulation of metabolism	<a href="#">1</a>	43	0.518	$\geq 0.05$
224	Development_EPO-induced PI3K/AKT pathway and Ca(2+) influx	<a href="#">1</a>	43	0.518	$\geq 0.05$
225	Pentose phosphate pathway/ Rodent version	<a href="#">1</a>	43	0.518	$\geq 0.05$
226	Signal transduction_AKT signaling	<a href="#">1</a>	43	0.518	$\geq 0.05$

227	Development_Angiotensin signaling via PYK2	<a href="#">1</a>	43	0.518	$\geq 0.05$
228	Immune response_HTR2A-induced activation of cPLA2	<a href="#">1</a>	43	0.518	$\geq 0.05$
229	Development_S1P3 receptor signaling pathway	<a href="#">1</a>	43	0.518	$\geq 0.05$
230	Chemotaxis_C5a-induced chemotaxis	<a href="#">1</a>	43	0.518	$\geq 0.05$
231	Development_VEGF signaling and activation	<a href="#">1</a>	43	0.518	$\geq 0.05$
232	Apoptosis and survival_Inhibition of ROS-induced apoptosis by 17beta-estradiol	<a href="#">1</a>	44	0.51	$\geq 0.05$
233	CFTR-dependent regulation of ion channels in Airway Epithelium (norm and CF)	<a href="#">1</a>	44	0.51	$\geq 0.05$
234	Immune response_PGE2 in immune and neuroendocrine system interactions	<a href="#">1</a>	44	0.51	$\geq 0.05$
235	Development_Flt3 signaling	<a href="#">1</a>	44	0.51	$\geq 0.05$
236	Apoptosis and survival_FAS signaling cascades	<a href="#">1</a>	44	0.51	$\geq 0.05$
237	Pentose phosphate pathway	<a href="#">1</a>	44	0.51	$\geq 0.05$
238	Immune response_IL-5 signalling	<a href="#">1</a>	44	0.51	$\geq 0.05$
239	Neurophysiological process_Receptor-mediated axon growth repulsion	<a href="#">1</a>	45	0.502	$\geq 0.05$
240	Development_EPO-induced MAPK pathway	<a href="#">1</a>	45	0.502	$\geq 0.05$
241	Development_Ligand-independent activation of ESR1 and ESR2	<a href="#">1</a>	45	0.502	$\geq 0.05$
242	Signal transduction_Calcium signaling	<a href="#">1</a>	45	0.502	$\geq 0.05$
243	Development_Activation of ERK by Alpha-1 adrenergic receptors	<a href="#">1</a>	45	0.502	$\geq 0.05$
244	Immune response_ICOS pathway in T-helper cell	<a href="#">1</a>	46	0.494	$\geq 0.05$
245	Immune response_NF-AT signaling and leukocyte interactions	<a href="#">1</a>	46	0.494	$\geq 0.05$
246	Immune response_Inhibitory action of Lipoxins on pro-	<a href="#">1</a>	46	0.494	$\geq 0.05$

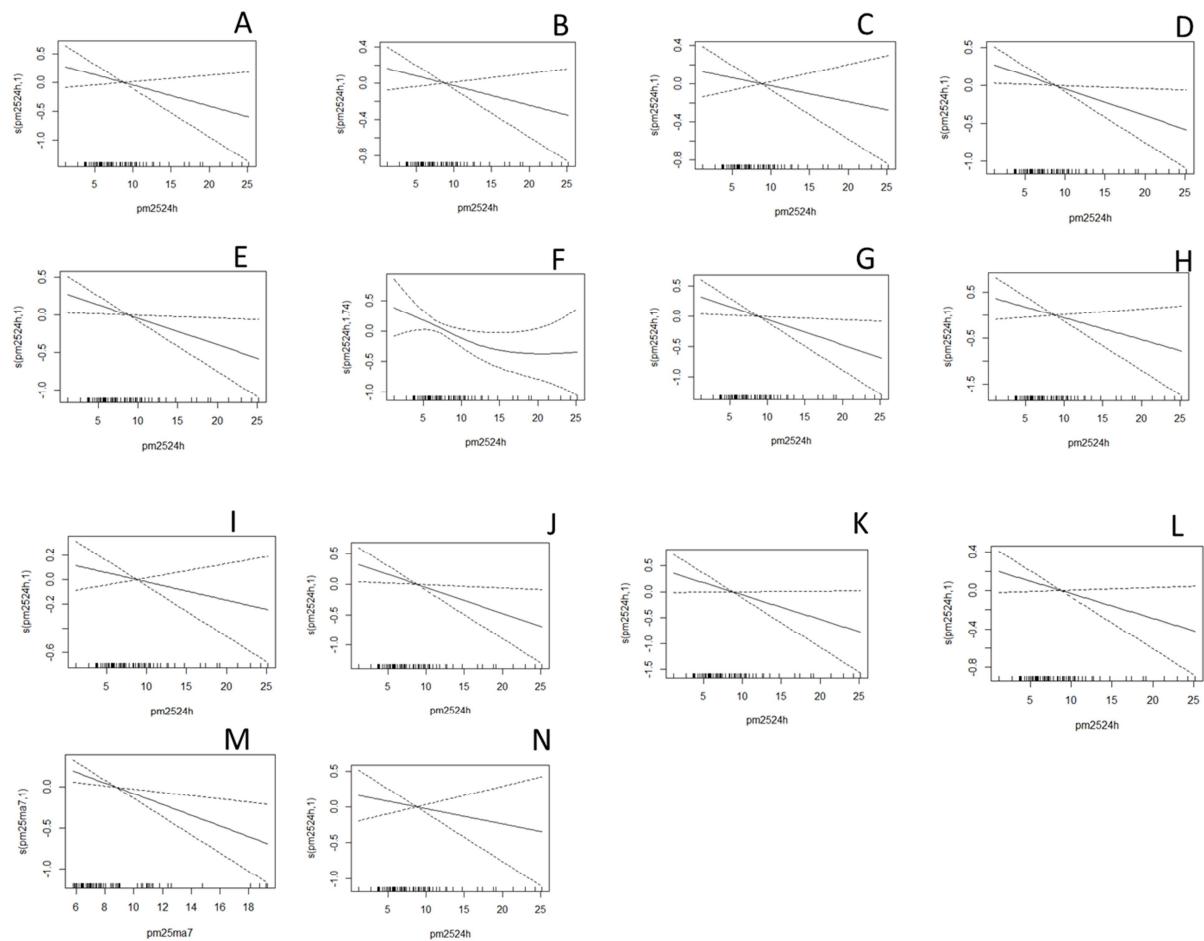
	inflammatory TNF-alpha signaling				
247	Development_Endothelin-1/EDNRA transactivation of EGFR	1	46	0.494	≥0.05
248	Signal transduction_PTEN pathway	1	46	0.494	≥0.05
249	Transcription_CREB pathway	1	47	0.486	≥0.05
250	Development_Leptin signaling via PI3K-dependent pathway	1	47	0.486	≥0.05
251	Development_PIP3 signaling in cardiac myocytes	1	47	0.486	≥0.05
252	Regulation of lipid metabolism_Insulin signaling:generic cascades	1	47	0.486	≥0.05
253	Immune response_Histamine H1 receptor signaling in immune response	1	48	0.479	≥0.05
254	Development_Melanocyte development and pigmentation	1	49	0.472	≥0.05
255	Development_G-CSF signaling	1	49	0.472	≥0.05
256	Neurophysiological process_Corticoliberin signaling via CRHR1	1	50	0.465	≥0.05
257	Immune response_Bacterial infections in normal airways	1	50	0.465	≥0.05
258	Nicotine signaling in cholinergic neurons	1	50	0.465	≥0.05
259	Immune response_IL-13 signaling via PI3K-ERK	1	50	0.465	≥0.05
260	Immune response_NFAT in immune response	1	51	0.458	≥0.05
261	Immune response_T cell receptor signaling pathway	1	52	0.451	≥0.05
262	Development_FGF-family signaling	1	52	0.451	≥0.05
263	Apoptosis and survival_Endoplasmic reticulum stress response pathway	1	53	0.444	≥0.05
264	Development_Endothelin-1/EDNRA signaling	1	53	0.444	≥0.05
265	Apoptosis and survival_Role of PKR in stress-induced	1	53	0.444	≥0.05

	apoptosis				
266	Translation_Translation regulation by Alpha-1 adrenergic receptors	<a href="#">1</a>	53	0.444	$\geq 0.05$
267	Folic acid metabolism	<a href="#">1</a>	53	0.444	$\geq 0.05$
268	Immune response_CD28 signaling	<a href="#">1</a>	54	0.438	$\geq 0.05$
269	Membrane-bound ESR1: interaction with G-proteins signaling	<a href="#">1</a>	54	0.438	$\geq 0.05$
270	GTP metabolism	<a href="#">1</a>	54	0.438	$\geq 0.05$
271	Development_FGFR signaling pathway	<a href="#">1</a>	54	0.438	$\geq 0.05$
272	Chemotaxis_CCL2-induced chemotaxis	<a href="#">1</a>	55	0.432	$\geq 0.05$
273	Blood coagulation_GPVI-dependent platelet activation	<a href="#">1</a>	55	0.432	$\geq 0.05$
274	Immune response_Fc epsilon RI pathway	<a href="#">1</a>	55	0.432	$\geq 0.05$
275	Cytoskeleton remodeling_FAK signaling	<a href="#">1</a>	57	0.419	$\geq 0.05$
276	Immune response_Role of PKR in stress-induced antiviral cell response	<a href="#">1</a>	57	0.419	$\geq 0.05$
277	Bacterial infections in CF airways	<a href="#">1</a>	58	0.413	$\geq 0.05$
278	Development_Prolactin receptor signaling	<a href="#">1</a>	58	0.413	$\geq 0.05$
279	Chondroitin sulfate and dermatan sulfate metabolism	<a href="#">1</a>	60	0.402	$\geq 0.05$
280	Immune response_IL-17 signaling pathways	<a href="#">1</a>	60	0.402	$\geq 0.05$
281	Transcription_Role of VDR in regulation of genes involved in osteoporosis	<a href="#">1</a>	61	0.397	$\geq 0.05$
282	Development_c-Kit ligand signaling pathway during hemopoiesis	<a href="#">1</a>	61	0.397	$\geq 0.05$
283	O-glycan biosynthesis	<a href="#">1</a>	62	0.391	$\geq 0.05$
284	Development_Alpha-2 adrenergic receptor activation of ERK	<a href="#">1</a>	62	0.391	$\geq 0.05$

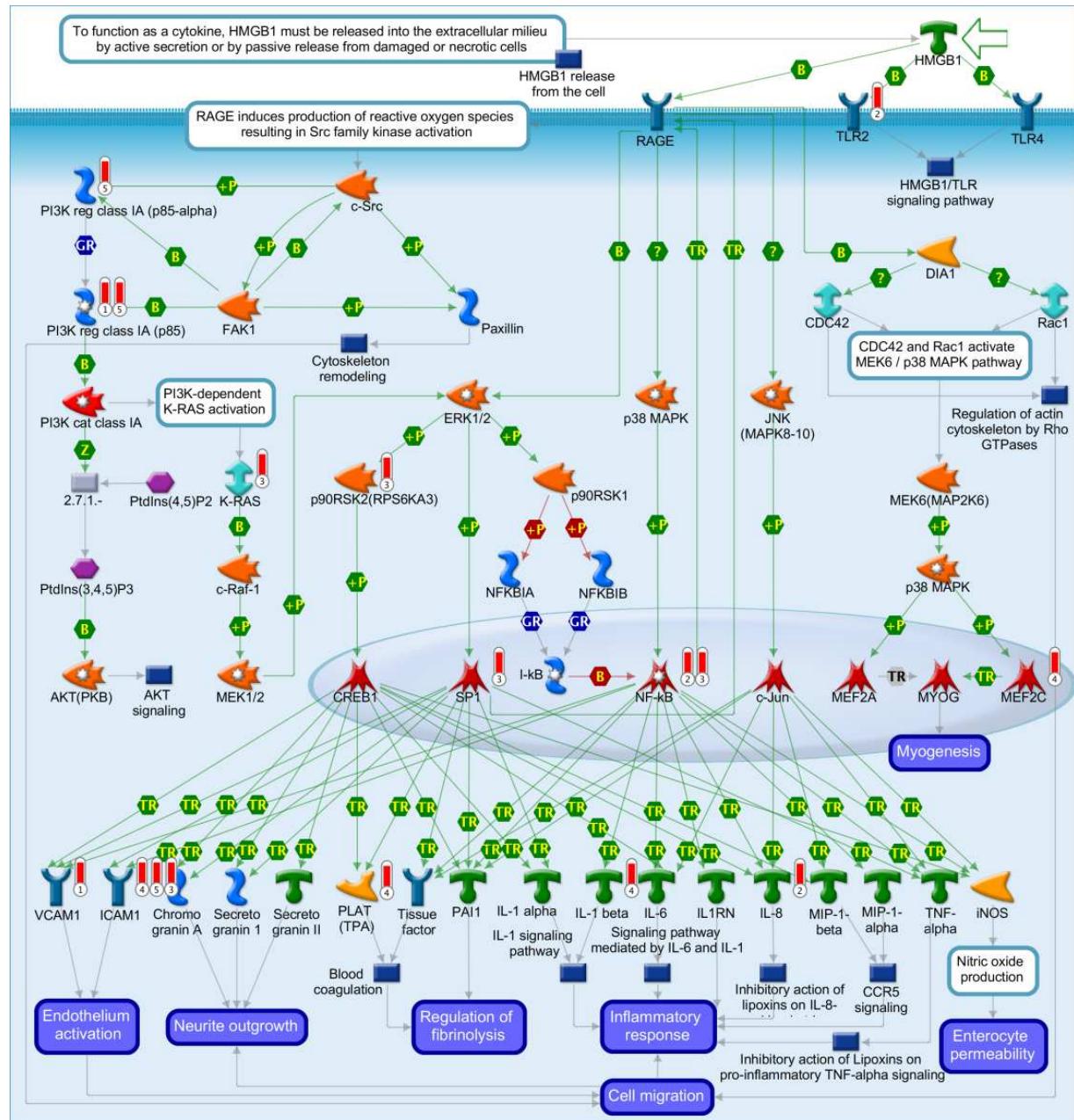
285	O-glycan biosynthesis / Human version	<a href="#">1</a>	62	0.391	$\geq 0.05$
286	Immune response_CD40 signaling	<a href="#">1</a>	65	0.376	$\geq 0.05$
287	Development_Role of IL-8 in angiogenesis	<a href="#">1</a>	65	0.376	$\geq 0.05$
288	Immune response_CD16 signaling in NK cells	<a href="#">1</a>	69	0.356	$\geq 0.05$
289	N-Glycan biosynthesis p1	<a href="#">1</a>	70	0.352	$\geq 0.05$
290	Transport_Clathrin-coated vesicle cycle	<a href="#">1</a>	71	0.347	$\geq 0.05$
291	Regulation of lipid metabolism_Stimulation of Arachidonic acid production by ACM receptors	<a href="#">1</a>	72	0.343	$\geq 0.05$
292	Regulation of lipid metabolism_Alpha-1 adrenergic receptors signaling via arachidonic acid	<a href="#">1</a>	73	0.338	$\geq 0.05$
293	Chemotaxis_Leukocyte chemotaxis	<a href="#">1</a>	75	0.33	$\geq 0.05$
294	Transport_ACM3 signaling in lacrimal glands	<a href="#">1</a>	75	0.33	$\geq 0.05$
295	Regulation of lipid metabolism_Insulin regulation of fatty acid metabolism	<a href="#">1</a>	89	0.278	$\geq 0.05$
296	Transport_Intracellular cholesterol transport in norm	<a href="#">1</a>	90	0.274	$\geq 0.05$
297	Sphingolipid metabolism	<a href="#">1</a>	91	0.271	$\geq 0.05$
298	Sphingolipid metabolism / Human version	<a href="#">1</a>	92	0.268	$\geq 0.05$
299	Histidine-glutamate-glutamine metabolism	<a href="#">1</a>	95	0.259	$\geq 0.05$
300	ATP metabolism	<a href="#">1</a>	106	0.228	$\geq 0.05$
301	CTP/UTP metabolism	<a href="#">1</a>	108	0.223	$\geq 0.05$
302	NAD metabolism	<a href="#">1</a>	119	0.198	$\geq 0.05$
303	Histidine-glutamate-glutamine and proline metabolism/Rodent version	<a href="#">1</a>	120	0.196	$\geq 0.05$
304	ATP/ITP metabolism	<a href="#">1</a>	124	0.188	$\geq 0.05$

<sup>a</sup>ratio between miRNA target genes and total genes in the pathway.

**eFigure 1.** Results of the nonlinearity test on the association of 24-hours PM<sub>2.5</sub> and miRNAs using penalized splines in generalized linear models, for miR-1 (A), miR-125a5p (B), miR-125b (C), miR-126 (D), miR-128 (E), miR-135a (F), miR-146a (G), miR-147 (H), miR-155 (I), miR-21 (J), miR218 (K), miR-222 (L), miR-9 (M) and miR-96 (N).



**eFigure 2.** HMGB1/RAGE signaling pathway. The targets of miR-126 (1), miR-146a (2), miR-155 (3), miR-21 (4) and miR-222 (5) are identified by thermometer-like red symbols (for a complete legend of symbol see eFigure 2).



Abbreviations: AKT(PKB), Protein kinase B group; CDC42, Cell division control protein 42 homolog; CREB1, Cyclic AMP-responsive element-binding protein 1; DIA1, Protein diaphanous homolog 1; ERK1/2, extracellular-signal-regulated kinases ½; FAK1, Focal adhesion kinase 1; HMGB1, High mobility group protein B1; I-κB, Nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor group; ICAM1, Intercellular adhesion molecule 1; IL, Interleukin;

IL1RN, Interleukin-1 receptor antagonist protein; JNK(MAPK8-10), c-Jun N-terminal kinases Protein group; K-RAS, V-Ki-ras2 Kirsten rat sarcoma viral oncogene homolog; MEF, Myocyte-specific enhancer factor; MEK, Dual specificity mitogen-activated protein kinase kinase ; MIP-1-alpha, C-C motif chemokine 3; MIP-1-beta, C-C motif chemokine 4; MYOG, Myogenin; NF-kB, nuclear factor kappa-light-chain-enhancer of activated B group; NFKBI, NF-kappa-B inhibitor; PAI1, Plasminogen activator inhibitor 1; PI3K cat class IA, catalytic subunit of phosphatidylinositol 3-kinase subgroups IA; PI3K reg class IA, Phosphoinositide-3-kinase, regulatory subunit 1 (alpha); PLAT (TPA), Tissue-type plasminogen activator; RAGE, Advanced glycosylation end product-specific receptor; Rac1, Ras-related C3 botulinum toxin substrate 1; SP1, Transcription factor Sp1; TLR, Toll-like receptor; TNF-alpha, Tumor necrosis factor alpha; VCAM1, Vascular cell adhesion molecule 1; c-Jun, Transcription factor AP-1; c-Raf-1, RAF proto-oncogene serine/threonine-protein kinase; c-Src, Proto-oncogene tyrosine-protein kinase Src; iNOS, Nitric oxide synthase, inducible; p38 MAPK, p38 mitogen-activated protein kinase Protein group; p90RSK1, Ribosomal protein S6 kinase alpha-1; p90RSK2(RPS6KA3), Ribosomal protein S6 kinase alpha-3.

**eFigure 3.** Complete MetaCore legend for efigure 2.

