

INGENUITY[®]

PATHWAY ANALYSIS



Analysis Name: bioconnector-rnaseq-airway - 2016-10-20 01:44 PM

Analysis Creation Date: 2016-10-20

Build version: 400896M

Content version: 28820210 (Release Date: 2016-09-24)

Analysis Settings

Reference set: Ingenuity Knowledge Base (Genes Only)

Relationship to include: Direct and Indirect

Does not Include Endogenous Chemicals

Optional Analyses: My Pathways My List

Filter Summary:

Consider all molecules and/or relationships

Top Canonical Pathways

Name	p-value	Overlap
Axonal Guidance Signaling	5.25E-08	7.8 % 35/448
eNOS Signaling	7.59E-06	10.3 % 16/155
Hepatic Fibrosis / Hepatic Stellate Cell Activation	1.62E-05	9.3 % 17/183
Nitric Oxide Signaling in the Cardiovascular System	1.68E-05	11.5 % 13/113
Gap Junction Signaling	2.10E-05	9.5 % 16/168

Top Upstream Regulators

Upstream Regulators

Upstream Regulator	p-value of overlap	Predicted Activation
dexamethasone	9.45E-29	Activated
TNF	2.17E-26	
TGFB1	9.45E-24	
beta-estradiol	1.40E-20	
U0126	3.15E-18	

Causal Networks

Name	p-value of overlap	Predicted Activation
L-cystine	4.06E-31	
Dexamethasone-GR	6.08E-31	Activated
dexamethasone	3.12E-30	Activated
TAT	7.98E-29	
Nuclear factor 1	5.14E-28	

Top Diseases and Bio Functions

Diseases and Disorders

Name	p-value	#Molecules
Cancer	9.74E-05 - 2.72E-19	552
Organismal Injury and Abnormalities	1.09E-04 - 2.72E-19	566
Gastrointestinal Disease	3.50E-05 - 5.73E-17	507
Connective Tissue Disorders	6.11E-05 - 2.48E-14	108
Inflammatory Disease	6.11E-05 - 2.48E-14	119

Molecular and Cellular Functions

Name	p-value	#Molecules
Cellular Growth and Proliferation	1.09E-04 - 1.69E-17	276
Cellular Development	1.09E-04 - 2.17E-17	254
Cellular Movement	1.09E-04 - 5.97E-15	179
Cell Death and Survival	7.72E-05 - 4.79E-12	211
Cellular Assembly and Organization	1.03E-04 - 1.98E-09	133

Physiological System Development and Function

Name	p-value	#Molecules
Tissue Development	1.10E-04 - 1.37E-14	251
Connective Tissue Development and Function	9.72E-05 - 1.26E-12	130
Cardiovascular System Development and Function	1.09E-04 - 2.29E-12	141
Tissue Morphology	9.57E-05 - 4.13E-12	186
Organismal Development	1.10E-04 - 2.25E-11	245

Top Tox Functions

Assays: Clinical Chemistry and Hematology

Name	p-value	#Molecules
Increased Levels of Bilirubin	1.96E-02 - 1.96E-02	2
Increased Levels of Albumin	1.57E-01 - 2.80E-02	3
Increased Levels of Alkaline Phosphatase	3.28E-01 - 2.80E-02	5
Decreased Levels of Albumin	4.97E-02 - 4.97E-02	2
Increased Levels of Potassium	8.06E-02 - 5.52E-02	3

Cardiotoxicity

Name	p-value	#Molecules
Cardiac Hypertrophy	2.33E-01 - 1.01E-05	29
Cardiac Arteriopathy	3.28E-01 - 1.35E-05	25
Cardiac Infarction	8.06E-02 - 1.38E-05	22
Cardiac Dysfunction	2.47E-01 - 2.38E-05	13
Cardiac Arrhythmia	2.98E-01 - 2.50E-05	21

Hepatotoxicity

Name	p-value	#Molecules
Liver Hyperplasia/Hyperproliferation	1.00E00 - 4.75E-09	246
Liver Steatosis	5.63E-01 - 4.94E-06	27
Hepatocellular Carcinoma	1.00E00 - 1.33E-04	49
Liver Cirrhosis	6.24E-03 - 7.61E-04	18
Liver Fibrosis	1.57E-01 - 4.55E-03	15

Nephrotoxicity

Name	p-value	#Molecules
Renal Inflammation	4.49E-01 - 4.10E-04	19
Renal Nephritis	4.49E-01 - 4.10E-04	19

Renal Damage	5.74E-01 - 6.62E-04	15
Renal Hydronephrosis	1.10E-03 - 1.10E-03	9
Glomerular Injury	5.49E-01 - 1.20E-03	17

Top Regulator Effect Networks

ID	Regulators	Diseases & Functions	Consistency Score
1	Creb,miR-182-5p (and other miRNAs w/seed UUGGCAA) (+5 more)	dyslipidemia,metabolism of amino acids (+1 more)	6.424
2	ACOX1,AGPAT2 (+2 more)	behavior,hepatic steatosis,oxidation of lipid	4.041
3	NQO1	accumulation of cells,generation of cells	3.5
4	STAT1,THRB	concentration of triacylglycerol,necrosis (+1 more)	2.425
5	CEBPA	interstitial fibrosis of heart	1.732

Top Networks

ID	Associated Network Functions	Score
1	Amino Acid Metabolism, Post-Translational Modification, Small Molecule Biochemistry	48
2	Molecular Transport, Cellular Assembly and Organization, Developmental Disorder	36
3	Connective Tissue Disorders, Organismal Injury and Abnormalities, Cancer	36
4	Hematological System Development and Function, Lymphoid Tissue Structure and Development, Tissue Morphology	34
5	Connective Tissue Disorders, Inflammatory Disease, Inflammatory Response	32

Top Tox Lists

Name	p-value	Overlap
Acute Renal Failure Panel (Rat)	7.94E-06	16.1 % 10/62
Cardiac Hypertrophy	8.29E-06	6.8 % 30/442
Cardiac Fibrosis	1.34E-04	8.2 % 16/196

Primary Glomerulonephritis Biomarker Panel (Human)	1.71E-04	36.4 % 4/11
Genes associated with Chronic Allograft Nephropathy (Human)	2.37E-04	23.8 % 5/21

Top Analysis-Ready Molecules

Exp Log Ratio up-regulated

Molecules	Exp. Value	Exp. Chart
ZBTB16	↑ 5.095	
ALOX15B	↑ 4.549	
SPARCL1	↑ 4.281	
KLF15	↑ 3.534	
FKBP5	↑ 3.425	
SAMHD1	↑ 3.407	
MAOA	↑ 3.039	
LOC102724788/PRODH	↑ 3.034	
GPX3	↑ 3.007	
MARCH10	↑ 2.985	

Exp Log Ratio down-regulated

Molecules	Exp. Value	Exp. Chart
LRRTM2	↓ -3.113	
VCAM1	↓ -3.058	
VASH2	↓ -2.609	
TSLP	↓ -2.500	
KCTD12	↓ -2.373	
SLC7A14	↓ -2.325	
FER1L6	↓ -2.284	
PRSS35	↓ -2.269	
NEK10	↓ -2.261	
GPR68	↓ -2.224	

