

# INGENUITY<sup>®</sup>

## PATHWAY ANALYSIS



Analysis Name: Training\_2Color\_GeneList\_FDR-25pctw - 2014-09-22 01:20 PM

Analysis Creation Date: 2014-09-22

Build version: 321501M

Content version: 18841524 (Release Date: 2014-06-24)

### Analysis settings

[View](#)

Reference set: Ingenuity Knowledge Base (Genes Only)

Relationship to include: Direct and Indirect

Does not Include Endogenous Chemicals

Optional Analyses:

Filter Summary:

Consider only relationships where  
confidence = Experimentally Observed

Cutoff:

## Top Canonical Pathways

| Name   | p-value  | Ratio          |
|--|----------|----------------|
| Role of Pattern Recognition Receptors in Recognition of Bacteria and Viruses | 4.28E-07 | 23/127 (0.181) |
| Role of Cytokines in Mediating Communication between Immune Cells            | 8.51E-06 | 13/56 (0.232)  |
| Altered T Cell and B Cell Signaling in Rheumatoid Arthritis                  | 8.8E-05  | 15/88 (0.17)   |
| Dendritic Cell Maturation  | 3.68E-04 | 22/179 (0.123) |
| Hematopoiesis from Pluripotent Stem Cells                                    | 4.09E-04 | 10/51 (0.196)  |

## Top Upstream Regulators

| Upstream Regulator   | p-value of overlap | Predicted Activation State |
|--|--------------------|----------------------------|
| IFNG   | 1.70E-17           | Activated                  |
| TLR3   | 1.84E-16           | Activated                  |
| Salmonella enterica serotype abortus equi lipopolysaccharide | 1.21E-15           | Activated                  |
| lipopolysaccharide   | 1.38E-15           | Activated                  |
| IRF7   | 1.60E-15           | Activated                  |

## Top Diseases and Bio Functions

### Diseases and Disorders

| Name                     | p-value             | # Molecules |
|--------------------------|---------------------|-------------|
| Cancer                   | 7.00E-19 - 1.26E-03 | 885         |
| Gastrointestinal Disease | 3.47E-13 - 1.26E-03 | 506         |
| Inflammatory Response    | 1.44E-07 - 1.34E-03 | 162         |
| Hematological Disease    | 2.57E-06 - 8.83E-04 | 93          |
| Immunological Disease    | 2.57E-06 - 6.37E-04 | 156         |

### Molecular and Cellular Functions

| Name                                   | p-value             | # Molecules |
|--|---------------------|-------------|
| Cellular Growth and Proliferation      | 5.85E-09 - 1.25E-03 | 364         |
| Cellular Development                   | 6.01E-08 - 1.26E-03 | 336         |
| Cell-To-Cell Signaling and Interaction | 1.44E-07 - 1.34E-03 | 155         |
| Cellular Movement                      | 2.81E-07 - 1.33E-03 | 206         |
| Cell Morphology                        | 2.86E-07 - 1.26E-03 | 238         |

### Physiological System Development and Function

| Name  | p-value             | # Molecules |
|---|---------------------|-------------|
| Organismal Development                        | 2.86E-09 - 1.23E-03 | 291         |
| Organismal Survival                           | 7.16E-09 - 1.21E-03 | 261         |
| Hematopoiesis                                 | 6.01E-08 - 1.26E-03 | 100         |
| Hematological System Development and Function | 1.44E-07 - 1.34E-03 | 190         |
| Immune Cell Trafficking                       | 1.44E-07 - 1.34E-03 | 128         |

## Top Tox Functions

### Assays: Clinical Chemistry and Hematology

| Name                           | p-value             | # Molecules |
|--------------------------------|---------------------|-------------|
| Increased Levels of LDH        | 1.10E-02 - 4.65E-02 | 6           |
| Increased Levels of Creatinine | 3.88E-02 - 5.13E-02 | 8           |
| Increased Levels of Albumin    | 3.94E-02 - 1.07E-01 | 3           |
| Increased Levels of Bilirubin  | 3.94E-02 - 1.07E-01 | 3           |
| Increased Levels of Potassium  | 8.48E-02 - 2.20E-01 | 4           |

### Cardiotoxicity

| Name                     | p-value             | # Molecules |
|--------------------------|---------------------|-------------|
| Cardiac Arrythmia        | 1.21E-03 - 5.99E-01 | 23          |
| Congenital Heart Anomaly | 2.65E-03 - 3.05E-01 | 18          |
| Tachycardia              | 4.85E-03 - 4.25E-01 | 11          |
| Cardiac Infarction       | 1.12E-02 - 1.98E-01 | 19          |
| Cardiac Hypertrophy      | 1.68E-02 - 1.00E00  | 32          |

### Hepatotoxicity

| Name                         | p-value             | # Molecules |
|------------------------------|---------------------|-------------|
| Liver Necrosis/Cell Death    | 5.16E-04 - 1.00E00  | 29          |
| Liver Cirrhosis              | 8.69E-04 - 5.27E-03 | 19          |
| Liver Fibrosis               | 9.44E-04 - 3.65E-01 | 20          |
| Liver Damage                 | 1.86E-03 - 5.51E-01 | 28          |
| Liver Inflammation/Hepatitis | 5.01E-03 - 5.51E-01 | 28          |

### Nephrotoxicity

| Name                | p-value             | # Molecules |
|---------------------|---------------------|-------------|
| Kidney Failure      | 1.88E-03 - 1.00E00  | 24          |
| Renal Damage        | 3.45E-03 - 4.09E-01 | 22          |
| Renal Hypoplasia    | 3.69E-03 - 2.03E-01 | 7           |
| Renal Tubule Injury | 7.62E-03 - 4.09E-01 | 13          |
| Renal Degeneration  | 8.81E-03 - 5.53E-02 | 2           |

### Top Regulator Effect Networks

| ID | Regulators  | Diseases & Functions  | Consistency Score |
|----|---|---|-------------------|
| 1  | CD14, CD80, DOCK8, IFIH1, Ighg2b, LITAF, MAP2K3 (+12 more)    | accumulation of cells, activation of cells (+14 more)       | 54.966            |
| 2  | CD14, DOCK8, IFNK, Ighg2b, IL-17f dimer (+13 more)            | accumulation of cells, activation of cells (+14 more)       | 50.371            |
| 3  | CD80, FYN, Ighg2b, NFATC1                                     | accumulation of cells, activation of lymphocytes (+13 more) | 49.646            |
| 4  | ACKR2, BTNL2, DDX58, DOCK8, FYN, ICOS, IFIH1, Ifna (+18 more) | activation of lymphocytes (+12 more)                        | 45.571            |
| 5  | CTGF, DOCK8, Ifn gamma, IFNA4, Ifnar, IFNK, IFNL1 (+9 more)   | activation of cells, cell movement of lymphocytes (+8 more) | 44.114            |

### Top Networks

| ID | Associated Network Functions   | Score |
|----|--|-------|
| 1  | Cellular Growth and Proliferation, Hematological System Development and Function, Cancer                   | 37    |
| 2  | Cell-To-Cell Signaling and Interaction, Cell Signaling, Molecular Transport                                | 35    |
| 3  | Infectious Disease, Tissue Morphology, Cellular Development  | 35    |
| 4  | Cell Cycle, Cellular Assembly and Organization, Cell Death and Survival                                    | 33    |
| 5  | Connective Tissue Disorders, Skeletal and Muscular System Development and Function, Developmental Disorder | 31    |

### Top Tox Lists

| Name  | p-value  | Ratio          |
|---|----------|----------------|
| Liver Necrosis/Cell Death                                   | 5.82E-04 | 29/273 (0.106) |
| Persistent Renal Ischemia-Reperfusion Injury (Mouse)        | 1.02E-03 | 7/30 (0.233)   |
| Hepatic Cholestasis   | 1.95E-03 | 19/165 (0.115) |
| Genes associated with Chronic Allograft Nephropathy (Human) | 4.94E-03 | 5/21 (0.238)   |
| Liver Proliferation   | 5.27E-03 | 22/220 (0.1)   |

## Top Molecules

### Fold Change up-regulated

| Molecules | Exp. Value | Exp. Chart |
|-----------|------------|------------|
| CCL20     | ↑2.935     |            |
| ISG15     | ↑2.715     |            |
| IL6       | ↑2.682     |            |
| CD274     | ↑2.666     |            |
| CD38      | ↑2.483     |            |
| IL1A      | ↑2.451     |            |
| IL21      | ↑2.389     |            |
| CCL8      | ↑2.382     |            |
| IL12B     | ↑2.348     |            |
| IDO1      | ↑2.302     |            |

### Fold Change down-regulated

| Molecules | Exp. Value | Exp. Chart |
|-----------|------------|------------|
| FUCA1     | ↓3.540     |            |
| BMP1      | ↓2.376     |            |
| DYDC1     | ↓2.263     |            |
| NKX2-2    | ↓2.185     |            |

|          |         |
|----------|---------|
| GPR82    | ↓-2.148 |
| MSTN     | ↓-2.147 |
| LIN28A   | ↓-2.117 |
| ALG10B   | ↓-2.104 |
| FAM149B1 | ↓-2.080 |
| FLJ37035 | ↓-2.059 |