### Male Kidney Top 10 GO Biological Process Gene Sets Ranked by Potency of Perturbation (Sorted by BMD Median)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Category Name** | Input Genes/Platform Genes in Gene Set | % Gene Set Coverage | Active Genes | BMD1std Median of Gene Set Transcripts (mg/kg) | Median BMDL1Std-BMDU1Std (mg/kg) | Genes with Changed Direction Up | Genes with Changed Direction Down |
| **GO:0007420**  brain development | 4/79 | 5% | top2a; nefh; hmgcs2; cxcr4 | 6.167 | 1.732-23.263 | 0 | 4 |
| **GO:0022412**  cellular process involved in reproduction in multicellular organism | 3/60 | 5% | top2a; kif20a; cxcr4 | 12.334 | 3.464-46.527 | 0 | 3 |
| **GO:1903046**  meiotic cell cycle process | 3/29 | 10% | top2a; nuf2; kif20a | 12.334 | 4.279-46.527 | 0 | 3 |
| **GO:0051301**  cell division | 4/79 | 5% | top2a; nuf2; mcm5; kif20a | 12.417 | 6.977-42.166 | 0 | 4 |
| **GO:0000281**  mitotic cytokinesis | 3/16 | 19% | kif23; kif20a; ect2 | 31.232 | 15.546-67.195 | 0 | 3 |
| **GO:0046685**  response to arsenic-containing substance | 3/20 | 15% | zfand2a; nefh; cyp1a1 | 49.045 | 39.236-64.853 | 2 | 1 |
| **GO:0098754**  detoxification | 3/58 | 5% | nqo1; mt1; akr7a3 | 62.795 | 48.749-87.647 | 2 | 1 |
| **GO:0001822**  kidney development | 4/53 | 8% | zfp354a; rgn; hmgcs2; cyp4a8 | 102.787 | 65.463-185.933 | 1 | 3 |
| **GO:1901570**  fatty acid derivative biosynthetic process | 3/23 | 13% | hmgcs2; cyp4a8; cyp2c11 | 106.351 | 59.870-208.329 | 1 | 2 |
| **GO:0031099**  regeneration | 7/120 | 6% | socs3; rgn; nrep; nefh; dmbt1; cebpb; alas2 | 114.178 | 79.082-204.229 | 2 | 5 |

Official gene symbols from the Rat Genome Database are shown in the “Active Genes” column. Definitions of Gene Ontology terms were provided by the Gene Ontology Resource (http://geneontology.org/).

**GO process description version:** https://cebs.niehs.nih.gov/cebs/study/002-00600-0002-000-0 V04132020

**GO:0007420 brain development:** The process whose specific outcome is the progression of the brain over time, from its formation to the mature structure. Brain development begins with patterning events in the neural tube and ends with the mature structure that is the center of thought and emotion. The brain is responsible for the coordination and control of bodily activities and the interpretation of information from the senses (sight, hearing, smell, etc.).

**GO:0022412 cellular process involved in reproduction in multicellular organism:** A process, occurring at the cellular level, that is involved in the reproductive function of a multicellular organism.

**GO:1903046 meiotic cell cycle process:** A process that is part of the meiotic cell cycle.

**GO:0051301 cell division:** The process resulting in division and partitioning of components of a cell to form more cells; may or may not be accompanied by the physical separation of a cell into distinct, individually membrane-bounded daughter cells.

**GO:0000281 mitotic cytokinesis:** A cell cycle process that results in the division of the cytoplasm of a cell after mitosis, resulting in the separation of the original cell into two daughter cells.

**GO:0046685 response to arsenic-containing substance:** Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of an arsenic stimulus from compounds containing arsenic, including arsenates, arsenites, and arsenides.

**GO:0098754 detoxification:** Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration of the toxic substance.

**GO:0001822 kidney development:** The process whose specific outcome is the progression of the kidney over time, from its formation to the mature structure. The kidney is an organ that filters the blood and/or excretes the end products of body metabolism in the form of urine.

**GO:1901570 fatty acid derivative biosynthetic process:** The chemical reactions and pathways resulting in the formation of fatty acid derivative.

**GO:0031099 regeneration:** The regrowth of a lost or destroyed body part, such as an organ or tissue. This process may occur via renewal, repair, and/or growth alone (i.e. increase in size or mass).

### Female Kidney Top 10 GO Biological Process Gene Sets Ranked by Potency of Perturbation (Sorted by BMD Median)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Category Name** | Input Genes/Platform Genes in Gene Set | % Gene Set Coverage | Active Genes | BMD1std Median of Gene Set Transcripts (mg/kg) | Median BMDL1Std-BMDU1Std (mg/kg) | Genes with Changed Direction Up | Genes with Changed Direction Down |
| **GO:0048145**  regulation of fibroblast proliferation | 4/41 | 10% | thy1; mmp9; gstp1; ccna2 | 14.574 | 7.161-41.985 | 1 | 3 |
| **GO:0048147**  negative regulation of fibroblast proliferation | 3/11 | 27% | thy1; mmp9; gstp1 | 14.763 | 9.430-25.720 | 1 | 2 |
| **GO:0001523**  retinoid metabolic process | 4/19 | 21% | ppard; cyp26b1; cyp1a1; ces1d | 15.537 | 9.574-28.025 | 2 | 2 |
| **GO:0006694**  steroid biosynthetic process | 4/49 | 8% | dhcr7; cyp26b1; cyp1a1; ces1d | 15.537 | 9.574-28.025 | 2 | 2 |
| **GO:0031100**  animal organ regeneration | 4/80 | 5% | vwf; mki67; gstp1; ccna2 | 17.220 | 5.859-67.215 | 1 | 3 |
| **GO:0008610**  lipid biosynthetic process | 7/122 | 6% | ppard; gstp1; dhcr7; cyp26b1; cyp1a1; ces1d; alox15 | 18.187 | 10.018-36.727 | 3 | 4 |
| **GO:0016101**  diterpenoid metabolic process | 5/26 | 19% | ppard; pgr; cyp26b1; cyp1a1; ces1d | 18.187 | 10.018-36.727 | 2 | 3 |
| **GO:0034754**  cellular hormone metabolic process | 3/41 | 7% | ugt2b7; cyp26b1; cyp1a1 | 18.187 | 10.018-36.727 | 3 | 0 |
| **GO:1902653**  secondary alcohol biosynthetic process | 3/22 | 14% | dhcr7; cyp26b1; ces1d | 18.187 | 10.018-36.727 | 1 | 2 |
| **GO:0071241**  cellular response to inorganic substance | 6/113 | 5% | nqo1; mmp9; ect2; cyp1a1; ccna2; alox15 | 20.033 | 8.435-72.186 | 2 | 4 |

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**GO:0048145 regulation of fibroblast proliferation:** Any process that modulates the frequency, rate or extent of multiplication or reproduction of fibroblast cells.

**GO:0048147 negative regulation of fibroblast proliferation:** Any process that stops, prevents, or reduces the frequency, rate or extent of multiplication or reproduction of fibroblast cells.

**GO:0001523 retinoid metabolic process:** The chemical reactions and pathways involving retinoids, any member of a class of isoprenoids that contain or are derived from four prenyl groups linked head-to-tail. Retinoids include retinol and retinal and structurally similar natural derivatives or synthetic compounds, but need not have vitamin A activity.

**GO:0006694 steroid biosynthetic process:** The chemical reactions and pathways resulting in the formation of steroids, compounds with a 1,2,cyclopentanoperhydrophenanthrene nucleus; includes de novo formation and steroid interconversion by modification.

**GO:0031100 animal organ regeneration:** The regrowth of a lost or destroyed animal organ.

**GO:0008610 lipid biosynthetic process:** The chemical reactions and pathways resulting in the formation of lipids, compounds soluble in an organic solvent but not, or sparingly, in an aqueous solvent.

**GO:0016101 diterpenoid metabolic process:** The chemical reactions and pathways involving diterpenoid compounds, terpenoids with four isoprene units.

**GO:0034754 cellular hormone metabolic process:** The chemical reactions and pathways involving any hormone, naturally occurring substances secreted by specialized cells that affects the metabolism or behavior of other cells possessing functional receptors for the hormone, as carried out by individual cells.

**GO:1902653 secondary alcohol biosynthetic process:** The chemical reactions and pathways resulting in the formation of secondary alcohol.

**GO:0071241 cellular response to inorganic substance:** Any process that results in a change in state or activity of a cell (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of an inorganic substance stimulus.