

Table S3. KEGG Pathway classification of DEGs.

| Pathway ID | Pathway Name | Level 1 | Level 2 | Term Candidate Gene Num | Total Candidate Gene Num | Term Gene Num | Total Gene Num | Rich Ratio | P value | Q value |
|------------|--|--------------------------------------|-------------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|------------|
| ko04060 | Cytokine-cytokine receptor interaction | Environmental Information Processing | Signaling molecules and interaction | 44 | 441 | 325 | 11608 | 0.1353846 | 1.40E-13 | 3.99E-11 |
| ko00830 | Retinol metabolism | Metabolism | Metabolism of cofactors and | 16 | 441 | 86 | 11608 | 0.1860465 | 1.20E-07 | 1.71E-05 |
| ko05204 | Chemical carcinogenesis | Human Diseases | Cancers: Overview | 15 | 441 | 86 | 11608 | 0.1744186 | 7.15E-07 | 6.80E-05 |
| ko04975 | Fat digestion and absorption | Organismal Systems | Digestive system | 11 | 441 | 53 | 11608 | 0.2075472 | 3.78E-06 | 0.00026946 |
| ko00140 | Steroid hormone biosynthesis | Metabolism | Lipid metabolism | 12 | 441 | 72 | 11608 | 0.1666667 | 1.51E-05 | 0.00085929 |
| ko00590 | Arachidonic acid metabolism | Metabolism | Lipid metabolism | 14 | 441 | 101 | 11608 | 0.1386139 | 2.65E-05 | 0.00094275 |
| ko05143 | African trypanosomiasis | Human Diseases | Infectious diseases: Parasitic | 10 | 441 | 53 | 11608 | 0.1886792 | 2.54E-05 | 0.00094275 |
| ko05323 | Rheumatoid arthritis | Human Diseases | Immune diseases | 16 | 441 | 125 | 11608 | 0.128 | 1.99E-05 | 0.00094275 |
| ko00591 | Linoleic acid metabolism | Metabolism | Lipid metabolism | 9 | 441 | 44 | 11608 | 0.2045455 | 3.29E-05 | 0.00104325 |
| ko04672 | Intestinal immune network for IgA | Organismal Systems | Immune system | 11 | 441 | 68 | 11608 | 0.1617647 | 4.55E-05 | 0.00108098 |
| ko05144 | Malaria | Human Diseases | Infectious diseases: Parasitic | 12 | 441 | 80 | 11608 | 0.15 | 4.49E-05 | 0.00108098 |
| ko05340 | Primary immunodeficiency | Human Diseases | Immune diseases | 10 | 441 | 56 | 11608 | 0.1785714 | 4.19E-05 | 0.00108098 |
| ko04062 | Chemokine signaling pathway | Organismal Systems | Immune system | 22 | 441 | 254 | 11608 | 0.0866142 | 0.0002721 | 0.00553888 |
| ko04726 | Serotonergic synapse | Organismal Systems | Nervous system | 15 | 441 | 139 | 11608 | 0.1079137 | 0.0002544 | 0.00553888 |
| ko05321 | Inflammatory bowel disease (IBD) | Human Diseases | Immune diseases | 11 | 441 | 87 | 11608 | 0.1264368 | 0.0004351 | 0.0082664 |
| ko04064 | NF-kappa B signaling pathway | Environmental Information Processing | Signal transduction | 14 | 441 | 139 | 11608 | 0.1007194 | 0.000814 | 0.01449997 |

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|------------|--|--------------------------------------|-------------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|------------|
| ko05140 | Leishmaniasis | Human Diseases | Infectious diseases: Parasitic | 11 | 441 | 95 | 11608 | 0.1157895 | 0.0009245 | 0.01549892 |
| ko03320 | PPAR signaling pathway | Organismal Systems | Endocrine system | 11 | 441 | 96 | 11608 | 0.1145833 | 0.0010093 | 0.01598096 |
| ko04610 | Complement and coagulation cascades | Organismal Systems | Immune system | 13 | 441 | 131 | 11608 | 0.0992366 | 0.0014181 | 0.02127093 |
| ko04979 | Cholesterol metabolism | Organismal Systems | Digestive system | 9 | 441 | 75 | 11608 | 0.12 | 0.0020643 | 0.02941559 |
| ko04640 | Hematopoietic cell lineage | Organismal Systems | Immune system | 12 | 441 | 122 | 11608 | 0.0983607 | 0.0023031 | 0.03125647 |
| ko04657 | IL-17 signaling pathway | Organismal Systems | Immune system | 18 | 441 | 227 | 11608 | 0.0792952 | 0.0025806 | 0.03343113 |
| ko04614 | Renin-angiotensin system | Organismal Systems | Endocrine system | 5 | 441 | 28 | 11608 | 0.1785714 | 0.0036877 | 0.04569538 |
| ko04668 | TNF signaling pathway | Environmental Information Processing | Signal transduction | 12 | 441 | 137 | 11608 | 0.0875912 | 0.005931 | 0.07043038 |
| ko04512 | ECM-receptor interaction | Environmental Information Processing | Signaling molecules and interaction | 22 | 441 | 326 | 11608 | 0.0674847 | 0.0065855 | 0.07507504 |
| ko04151 | PI3K-Akt signaling pathway | Environmental Information Processing | Signal transduction | 37 | 441 | 641 | 11608 | 0.0577223 | 0.0071953 | 0.07887176 |
| ko04625 | C-type lectin receptor signaling pathway | Organismal Systems | Immune system | 12 | 441 | 142 | 11608 | 0.084507 | 0.0078405 | 0.08276088 |
| ko04350 | TGF-beta signaling pathway | Environmental Information Processing | Signal transduction | 9 | 441 | 97 | 11608 | 0.0927835 | 0.011329 | 0.115313 |
| ko04371 | Apelin signaling pathway | Environmental Information Processing | Signal transduction | 14 | 441 | 188 | 11608 | 0.0744681 | 0.0125114 | 0.1229568 |
| ko05322 | Systemic lupus erythematosus | Human Diseases | Immune diseases | 12 | 441 | 152 | 11608 | 0.0789474 | 0.0130799 | 0.1242593 |
| ko04659 | Th17 cell differentiation | Organismal Systems | Immune system | 11 | 441 | 136 | 11608 | 0.0808824 | 0.0144895 | 0.1332096 |
| ko04977 | Vitamin digestion and absorption | Organismal Systems | Digestive system | 5 | 441 | 39 | 11608 | 0.1282051 | 0.0153677 | 0.1368681 |
| ko04928 | Parathyroid hormone synthesis, secretion and | Organismal Systems | Endocrine system | 13 | 441 | 178 | 11608 | 0.0730337 | 0.0182473 | 0.1575906 |

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|------------|---|--------------------------------------|---------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|-----------|
| ko04010 | MAPK signaling pathway | Environmental Information Processing | Signal transduction | 22 | 441 | 361 | 11608 | 0.0609418 | 0.0197802 | 0.1610671 |
| ko04974 | Protein digestion and absorption | Organismal Systems | Digestive system | 37 | 441 | 686 | 11608 | 0.0539359 | 0.0194964 | 0.1610671 |
| ko04923 | Regulation of lipolysis in adipocytes | Organismal Systems | Endocrine system | 7 | 441 | 74 | 11608 | 0.0945946 | 0.0219818 | 0.1740224 |
| ko05146 | Amoebiasis | Human Diseases | Infectious diseases: Parasitic | 30 | 441 | 547 | 11608 | 0.0548446 | 0.0275226 | 0.2119983 |
| ko04068 | FoxO signaling pathway | Environmental Information Processing | Signal transduction | 11 | 441 | 153 | 11608 | 0.0718954 | 0.0315034 | 0.2244617 |
| ko04510 | Focal adhesion | Cellular Processes | Cellular community - eukaryotes | 27 | 441 | 487 | 11608 | 0.0554415 | 0.0314629 | 0.2244617 |
| ko05202 | Transcriptional misregulation in cancer | Human Diseases | Cancers: Overview | 17 | 441 | 273 | 11608 | 0.0622711 | 0.0314661 | 0.2244617 |
| ko04360 | Axon guidance | Organismal Systems | Development | 16 | 441 | 255 | 11608 | 0.0627451 | 0.034089 | 0.2278475 |
| ko04913 | Ovarian steroidogenesis | Organismal Systems | Endocrine system | 6 | 441 | 64 | 11608 | 0.09375 | 0.0341029 | 0.2278475 |
| ko05142 | Chagas disease (American | Human Diseases | Infectious diseases: Parasitic | 10 | 441 | 136 | 11608 | 0.0735294 | 0.034377 | 0.2278475 |
| ko05320 | Autoimmune thyroid disease | Human Diseases | Immune diseases | 8 | 441 | 100 | 11608 | 0.08 | 0.0362755 | 0.2349662 |
| ko00430 | Taurine and hypotaurine metabolism | Metabolism | Metabolism of other amino acids | 3 | 441 | 20 | 11608 | 0.15 | 0.0384089 | 0.2411847 |
| ko05132 | Salmonella infection | Human Diseases | Infectious diseases: Bacterial | 12 | 441 | 178 | 11608 | 0.0674157 | 0.0389281 | 0.2411847 |
| ko05200 | Pathways in cancer | Human Diseases | Cancers: Overview | 37 | 441 | 726 | 11608 | 0.0509642 | 0.0411471 | 0.2495089 |
| ko04620 | Toll-like receptor signaling pathway | Organismal Systems | Immune system | 10 | 441 | 144 | 11608 | 0.0694444 | 0.0477332 | 0.2720791 |
| ko04742 | Taste transduction | Organismal Systems | Sensory system | 7 | 441 | 87 | 11608 | 0.0804598 | 0.0472071 | 0.2720791 |
| ko05414 | Dilated cardiomyopathy (DCM) | Human Diseases | Cardiovascular diseases | 10 | 441 | 144 | 11608 | 0.0694444 | 0.0477332 | 0.2720791 |

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|------------|--|--------------------------------------|---------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|-----------|
| ko05133 | Pertussis | Human Diseases | Infectious diseases: Bacterial | 8 | 441 | 107 | 11608 | 0.0747664 | 0.0507421 | 0.2781055 |
| ko05410 | Hypertrophic cardiomyopathy (HCM) | Human Diseases | Cardiovascular diseases | 9 | 441 | 126 | 11608 | 0.0714286 | 0.0505662 | 0.2781055 |
| ko04380 | Osteoclast differentiation | Organismal Systems | Development | 11 | 441 | 167 | 11608 | 0.0658683 | 0.0536099 | 0.2829413 |
| ko05210 | Colorectal cancer | Human Diseases | Cancers: Specific types | 8 | 441 | 108 | 11608 | 0.0740741 | 0.0530735 | 0.2829413 |
| ko04978 | Mineral absorption | Organismal Systems | Digestive system | 5 | 441 | 55 | 11608 | 0.0909091 | 0.057007 | 0.2954001 |
| ko04660 | T cell receptor signaling pathway | Organismal Systems | Immune system | 9 | 441 | 130 | 11608 | 0.0692308 | 0.0593968 | 0.302287 |
| ko00500 | Starch and sucrose metabolism | Metabolism | Carbohydrate metabolism | 4 | 441 | 40 | 11608 | 0.1 | 0.0641109 | 0.3174274 |
| ko04216 | Ferroptosis | Cellular Processes | Cell growth and death | 5 | 441 | 57 | 11608 | 0.0877193 | 0.0645993 | 0.3174274 |
| ko05020 | Prion diseases | Human Diseases | Neurodegenerative diseases | 5 | 441 | 58 | 11608 | 0.0862069 | 0.0685978 | 0.3285178 |
| ko05145 | Toxoplasmosis | Human Diseases | Infectious diseases: Parasitic | 9 | 441 | 134 | 11608 | 0.0671642 | 0.0691617 | 0.3285178 |
| ko04390 | Hippo signaling pathway | Environmental Information Processing | Signal transduction | 12 | 441 | 197 | 11608 | 0.0609137 | 0.0726522 | 0.3394406 |
| ko04662 | B cell receptor signaling pathway | Organismal Systems | Immune system | 7 | 441 | 97 | 11608 | 0.0721649 | 0.0757419 | 0.3426418 |
| ko05418 | Fluid shear stress and atherosclerosis | Human Diseases | Cardiovascular diseases | 12 | 441 | 198 | 11608 | 0.0606061 | 0.074827 | 0.3426418 |
| ko04926 | Relaxin signaling pathway | Organismal Systems | Endocrine system | 21 | 441 | 396 | 11608 | 0.0530303 | 0.0771949 | 0.3437585 |
| ko02010 | ABC transporters | Environmental Information Processing | Membrane transport | 6 | 441 | 81 | 11608 | 0.0740741 | 0.0872257 | 0.3824513 |
| ko05134 | Legionellosis | Human Diseases | Infectious diseases: Bacterial | 7 | 441 | 103 | 11608 | 0.0679612 | 0.0968366 | 0.4181579 |
| ko00480 | Glutathione metabolism | Metabolism | Metabolism of other amino acids | 5 | 441 | 65 | 11608 | 0.0769231 | 0.1002799 | 0.4265638 |

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|------------|--|--------------------------------------|-------------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|-----------|
| ko04950 | Maturity onset diabetes of the young | Human Diseases | Endocrine and metabolic diseases | 3 | 441 | 30 | 11608 | 0.1 | 0.1039461 | 0.4350046 |
| ko05330 | Allograft rejection | Human Diseases | Immune diseases | 5 | 441 | 66 | 11608 | 0.0757576 | 0.1053169 | 0.4350046 |
| ko04514 | Cell adhesion molecules (CAMs) | Environmental Information Processing | Signaling molecules and interaction | 11 | 441 | 191 | 11608 | 0.0575916 | 0.1117053 | 0.4504148 |
| ko05167 | Kaposi's sarcoma-associated herpesvirus | Human Diseases | Infectious diseases: Viral | 14 | 441 | 257 | 11608 | 0.0544747 | 0.1122086 | 0.4504148 |
| ko00760 | Nicotinate and nicotinamide metabolism | Metabolism | Metabolism of cofactors and | 4 | 441 | 49 | 11608 | 0.0816327 | 0.1146499 | 0.4538225 |
| ko05211 | Renal cell carcinoma | Human Diseases | Cancers: Specific types | 6 | 441 | 88 | 11608 | 0.0681818 | 0.1176097 | 0.4591612 |
| ko04973 | Carbohydrate digestion and absorption | Organismal Systems | Digestive system | 4 | 441 | 51 | 11608 | 0.0784314 | 0.1277158 | 0.48532 |
| ko05310 | Asthma | Human Diseases | Immune diseases | 4 | 441 | 51 | 11608 | 0.0784314 | 0.1277158 | 0.48532 |
| ko04713 | Circadian entrainment | Organismal Systems | Environmental adaptation | 8 | 441 | 133 | 11608 | 0.0601504 | 0.1336731 | 0.4884209 |
| ko04933 | AGE-RAGE signaling pathway in diabetic | Human Diseases | Endocrine and metabolic diseases | 18 | 441 | 355 | 11608 | 0.0507042 | 0.130502 | 0.4884209 |
| ko05222 | Small cell lung cancer | Human Diseases | Cancers: Specific types | 10 | 441 | 176 | 11608 | 0.0568182 | 0.1333889 | 0.4884209 |
| ko04976 | Bile secretion | Organismal Systems | Digestive system | 7 | 441 | 115 | 11608 | 0.0608696 | 0.1476146 | 0.5325337 |
| ko05206 | MicroRNAs in cancer | Human Diseases | Cancers: Overview | 11 | 441 | 203 | 11608 | 0.0541872 | 0.150623 | 0.5365944 |
| ko05120 | Epithelial cell signaling in Helicobacter pylori | Human Diseases | Infectious diseases: Bacterial | 5 | 441 | 75 | 11608 | 0.0666667 | 0.1558782 | 0.5484603 |
| ko04921 | Oxytocin signaling pathway | Organismal Systems | Endocrine system | 11 | 441 | 206 | 11608 | 0.0533981 | 0.1613281 | 0.5607135 |
| ko04630 | Jak-STAT signaling pathway | Environmental Information Processing | Signal transduction | 11 | 441 | 208 | 11608 | 0.0528846 | 0.1686711 | 0.5791718 |
| ko00561 | Glycerolipid metabolism | Metabolism | Lipid metabolism | 5 | 441 | 79 | 11608 | 0.0632911 | 0.1810499 | 0.6070497 |

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|------------|--|--------------------------------------|---------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|-----------|
| ko05220 | Chronic myeloid leukemia | Human Diseases | Cancers: Specific types | 6 | 441 | 100 | 11608 | 0.06 | 0.1800306 | 0.6070497 |
| ko05152 | Tuberculosis | Human Diseases | Infectious diseases: Bacterial | 14 | 441 | 282 | 11608 | 0.0496454 | 0.1864576 | 0.6179118 |
| ko00220 | Arginine biosynthesis | Metabolism | Amino acid metabolism | 2 | 441 | 21 | 11608 | 0.0952381 | 0.1888648 | 0.618695 |
| ko00790 | Folate biosynthesis | Metabolism | Metabolism of cofactors and | 3 | 441 | 40 | 11608 | 0.075 | 0.1934572 | 0.6265375 |
| ko05205 | Proteoglycans in cancer | Human Diseases | Cancers: Overview | 13 | 441 | 262 | 11608 | 0.0496183 | 0.1980511 | 0.6271618 |
| ko00770 | Pantothenate and CoA biosynthesis | Metabolism | Metabolism of cofactors and | 2 | 441 | 22 | 11608 | 0.0909091 | 0.2028424 | 0.630885 |
| ko04024 | cAMP signaling pathway | Environmental Information Processing | Signal transduction | 14 | 441 | 287 | 11608 | 0.0487805 | 0.2036541 | 0.630885 |
| ko05030 | Cocaine addiction | Human Diseases | Substance dependence | 4 | 441 | 62 | 11608 | 0.0645161 | 0.2090004 | 0.6404851 |
| ko03020 | RNA polymerase | Genetic Information Processing | Transcription | 6 | 441 | 107 | 11608 | 0.0560748 | 0.2214677 | 0.6584302 |
| ko04270 | Vascular smooth muscle contraction | Organismal Systems | Circulatory system | 9 | 441 | 175 | 11608 | 0.0514286 | 0.221787 | 0.6584302 |
| ko04621 | NOD-like receptor signaling pathway | Organismal Systems | Immune system | 12 | 441 | 244 | 11608 | 0.0491803 | 0.2184957 | 0.6584302 |
| ko05166 | HTLV-I infection | Human Diseases | Infectious diseases: Viral | 15 | 441 | 318 | 11608 | 0.0471698 | 0.2293862 | 0.6739698 |
| ko04215 | Apoptosis - multiple species | Cellular Processes | Cell growth and death | 3 | 441 | 44 | 11608 | 0.0681818 | 0.2333894 | 0.6787345 |
| ko00260 | Glycine, serine and threonine metabolism | Metabolism | Amino acid metabolism | 3 | 441 | 45 | 11608 | 0.0666667 | 0.2436001 | 0.6942603 |
| ko00860 | Porphyrin and chlorophyll metabolism | Metabolism | Metabolism of cofactors and | 3 | 441 | 45 | 11608 | 0.0666667 | 0.2436001 | 0.6942603 |
| ko01523 | Antifolate resistance | Human Diseases | Drug resistance: Antineoplastic | 4 | 441 | 67 | 11608 | 0.0597015 | 0.2499103 | 0.7051924 |
| ko00360 | Phenylalanine metabolism | Metabolism | Amino acid metabolism | 2 | 441 | 26 | 11608 | 0.0769231 | 0.2595852 | 0.7253116 |

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|------------|--|--------------------------------------|--------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|-----------|
| ko04920 | Adipocytokine signaling pathway | Organismal Systems | Endocrine system | 5 | 441 | 91 | 11608 | 0.0549451 | 0.2640417 | 0.7306008 |
| ko04310 | Wnt signaling pathway | Environmental Information Processing | Signal transduction | 9 | 441 | 185 | 11608 | 0.0486486 | 0.2710244 | 0.7427111 |
| ko05219 | Bladder cancer | Human Diseases | Cancers: Specific types | 3 | 441 | 48 | 11608 | 0.0625 | 0.2746135 | 0.7453795 |
| ko05169 | Epstein-Barr virus infection | Human Diseases | Infectious diseases: Viral | 14 | 441 | 307 | 11608 | 0.0456026 | 0.278862 | 0.7497705 |
| ko00400 | Phenylalanine, tyrosine and tryptophan | Metabolism | Amino acid metabolism | 1 | 441 | 9 | 11608 | 0.1111111 | 0.2943996 | 0.7841485 |
| ko04964 | Proximal tubule bicarbonate reclamation | Organismal Systems | Excretory system | 2 | 441 | 29 | 11608 | 0.0689655 | 0.3023241 | 0.7899574 |
| ko05033 | Nicotine addiction | Human Diseases | Substance dependence | 3 | 441 | 51 | 11608 | 0.0588235 | 0.3059973 | 0.7899574 |
| ko05100 | Bacterial invasion of epithelial cells | Human Diseases | Infectious diseases: Bacterial | 8 | 441 | 168 | 11608 | 0.047619 | 0.3076676 | 0.7899574 |
| ko05217 | Basal cell carcinoma | Human Diseases | Cancers: Specific types | 4 | 441 | 73 | 11608 | 0.0547945 | 0.3009346 | 0.7899574 |
| ko05224 | Breast cancer | Human Diseases | Cancers: Specific types | 9 | 441 | 193 | 11608 | 0.0466321 | 0.3125335 | 0.7952861 |
| ko05150 | Staphylococcus aureus infection | Human Diseases | Infectious diseases: Bacterial | 4 | 441 | 75 | 11608 | 0.0533333 | 0.318228 | 0.8026104 |
| ko00740 | Riboflavin metabolism | Metabolism | Metabolism of cofactors and | 1 | 441 | 10 | 11608 | 0.1 | 0.3212269 | 0.8030673 |
| ko00040 | Pentose and glucuronate interconversions | Metabolism | Carbohydrate metabolism | 2 | 441 | 31 | 11608 | 0.0645161 | 0.3305966 | 0.8037422 |
| ko04623 | Cytosolic DNA-sensing pathway | Organismal Systems | Immune system | 5 | 441 | 100 | 11608 | 0.05 | 0.330987 | 0.8037422 |
| ko05162 | Measles | Human Diseases | Infectious diseases: Viral | 9 | 441 | 197 | 11608 | 0.0456853 | 0.3337997 | 0.8037422 |
| ko05213 | Endometrial cancer | Human Diseases | Cancers: Specific types | 4 | 441 | 77 | 11608 | 0.0519481 | 0.3355976 | 0.8037422 |
| ko05412 | Arrhythmogenic right ventricular | Human Diseases | Cardiovascular diseases | 5 | 441 | 100 | 11608 | 0.05 | 0.330987 | 0.8037422 |

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|------------|--|--------------------------------------|------------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|-----------|
| ko00650 | Butanoate metabolism | Metabolism | Carbohydrate metabolism | 2 | 441 | 33 | 11608 | 0.0606061 | 0.3585404 | 0.8463374 |
| ko04725 | Cholinergic synapse | Organismal Systems | Nervous system | 6 | 441 | 128 | 11608 | 0.046875 | 0.3593222 | 0.8463374 |
| ko00230 | Purine metabolism | Metabolism | Nucleotide metabolism | 12 | 441 | 279 | 11608 | 0.0430108 | 0.3714439 | 0.8677173 |
| ko04924 | Renin secretion | Organismal Systems | Endocrine system | 5 | 441 | 106 | 11608 | 0.0471698 | 0.3765154 | 0.8724137 |
| ko00601 | Glycosphingolipid biosynthesis - lacto and | Metabolism | Glycan biosynthesis and metabolism | 2 | 441 | 37 | 11608 | 0.0540541 | 0.4130276 | 0.9300616 |
| ko04650 | Natural killer cell mediated cytotoxicity | Organismal Systems | Immune system | 7 | 441 | 161 | 11608 | 0.0434783 | 0.4128457 | 0.9300616 |
| ko05032 | Morphine addiction | Human Diseases | Substance dependence | 5 | 441 | 111 | 11608 | 0.045045 | 0.4144485 | 0.9300616 |
| ko05416 | Viral myocarditis | Human Diseases | Cardiovascular diseases | 5 | 441 | 111 | 11608 | 0.045045 | 0.4144485 | 0.9300616 |
| ko04972 | Pancreatic secretion | Organismal Systems | Digestive system | 6 | 441 | 137 | 11608 | 0.0437956 | 0.4207749 | 0.9345437 |
| ko05161 | Hepatitis B | Human Diseases | Infectious diseases: Viral | 8 | 441 | 188 | 11608 | 0.0425532 | 0.423004 | 0.9345437 |
| ko00072 | Synthesis and degradation of ketone | Metabolism | Lipid metabolism | 1 | 441 | 15 | 11608 | 0.0666667 | 0.4408459 | 0.93762 |
| ko04066 | HIF-1 signaling pathway | Environmental Information Processing | Signal transduction | 5 | 441 | 114 | 11608 | 0.0438596 | 0.437052 | 0.93762 |
| ko04122 | Sulfur relay system | Genetic Information Processing | Folding, sorting and degradation | 1 | 441 | 15 | 11608 | 0.0666667 | 0.4408459 | 0.93762 |
| ko05212 | Pancreatic cancer | Human Diseases | Cancers: Specific types | 4 | 441 | 88 | 11608 | 0.0454545 | 0.4308994 | 0.93762 |
| ko05226 | Gastric cancer | Human Diseases | Cancers: Specific types | 15 | 441 | 370 | 11608 | 0.0405405 | 0.4356996 | 0.93762 |
| ko04724 | Glutamatergic synapse | Organismal Systems | Nervous system | 6 | 441 | 141 | 11608 | 0.0425532 | 0.4479116 | 0.9455912 |
| ko00061 | Fatty acid biosynthesis | Metabolism | Lipid metabolism | 1 | 441 | 16 | 11608 | 0.0625 | 0.4621163 | 0.9468596 |

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|------------|---|--------------------------------------|-----------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|-----------|
| ko00250 | Alanine, aspartate and glutamate metabolism | Metabolism | Amino acid metabolism | 2 | 441 | 41 | 11608 | 0.0487805 | 0.465124 | 0.9468596 |
| ko04020 | Calcium signaling pathway | Environmental Information Processing | Signal transduction | 11 | 441 | 272 | 11608 | 0.0404412 | 0.4598547 | 0.9468596 |
| ko04115 | p53 signaling pathway | Cellular Processes | Cell growth and death | 5 | 441 | 117 | 11608 | 0.042735 | 0.4594565 | 0.9468596 |
| ko05163 | Human cytomegalovirus infection | Human Diseases | Infectious diseases: Viral | 13 | 441 | 325 | 11608 | 0.04 | 0.4649296 | 0.9468596 |
| ko00052 | Galactose metabolism | Metabolism | Carbohydrate metabolism | 2 | 441 | 42 | 11608 | 0.047619 | 0.4777193 | 0.9588028 |
| ko04392 | Hippo signaling pathway - multiple species | Environmental Information Processing | Signal transduction | 2 | 441 | 42 | 11608 | 0.047619 | 0.4777193 | 0.9588028 |
| ko00730 | Thiamine metabolism | Metabolism | Metabolism of cofactors and | 1 | 441 | 18 | 11608 | 0.0555556 | 0.5022654 | 0.994742 |
| ko05031 | Amphetamine addiction | Human Diseases | Substance dependence | 4 | 441 | 97 | 11608 | 0.0412371 | 0.5060968 | 0.994742 |
| ko05165 | Human papillomavirus infection | Human Diseases | Infectious diseases: Viral | 25 | 441 | 650 | 11608 | 0.0384615 | 0.5047784 | 0.994742 |
| ko00010 | Glycolysis / Gluconeogenesis | Metabolism | Carbohydrate metabolism | 3 | 441 | 102 | 11608 | 0.0294118 | 0.7499366 | 1 |
| ko00020 | Citrate cycle (TCA cycle) | Metabolism | Carbohydrate metabolism | 1 | 441 | 51 | 11608 | 0.0196078 | 0.8618835 | 1 |
| ko00051 | Fructose and mannose metabolism | Metabolism | Carbohydrate metabolism | 1 | 441 | 36 | 11608 | 0.0277778 | 0.7525341 | 1 |
| ko00053 | Ascorbate and aldarate metabolism | Metabolism | Carbohydrate metabolism | 1 | 441 | 26 | 11608 | 0.0384615 | 0.6350981 | 1 |
| ko00071 | Fatty acid degradation | Metabolism | Lipid metabolism | 2 | 441 | 57 | 11608 | 0.0350877 | 0.6432413 | 1 |
| ko00100 | Steroid biosynthesis | Metabolism | Lipid metabolism | 1 | 441 | 29 | 11608 | 0.0344828 | 0.6752168 | 1 |
| ko00120 | Primary bile acid biosynthesis | Metabolism | Lipid metabolism | 1 | 441 | 20 | 11608 | 0.05 | 0.539424 | 1 |
| ko00240 | Pyrimidine metabolism | Metabolism | Nucleotide metabolism | 7 | 441 | 189 | 11608 | 0.037037 | 0.581503 | 1 |

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| ko00270 | Cysteine and methionine metabolism | Metabolism | Amino acid metabolism | 2 | 441 | 57 | 11608 | 0.0350877 | 0.6432413 | 1 |
| ko00280 | Valine, leucine and isoleucine degradation | Metabolism | Amino acid metabolism | 2 | 441 | 70 | 11608 | 0.0285714 | 0.7507536 | 1 |
| ko00310 | Lysine degradation | Metabolism | Amino acid metabolism | 2 | 441 | 132 | 11608 | 0.0151515 | 0.9633254 | 1 |
| ko00330 | Arginine and proline metabolism | Metabolism | Amino acid metabolism | 2 | 441 | 70 | 11608 | 0.0285714 | 0.7507536 | 1 |
| ko00350 | Tyrosine metabolism | Metabolism | Amino acid metabolism | 2 | 441 | 53 | 11608 | 0.0377358 | 0.6035308 | 1 |
| ko00380 | Tryptophan metabolism | Metabolism | Amino acid metabolism | 2 | 441 | 59 | 11608 | 0.0338983 | 0.6618902 | 1 |
| ko00410 | beta-Alanine metabolism | Metabolism | Metabolism of other amino acids | 1 | 441 | 37 | 11608 | 0.027027 | 0.7619648 | 1 |
| ko00511 | Other glycan degradation | Metabolism | Glycan biosynthesis and metabolism | 1 | 441 | 26 | 11608 | 0.0384615 | 0.6350981 | 1 |
| ko00512 | Mucin type O-glycan biosynthesis | Metabolism | Glycan biosynthesis and metabolism | 1 | 441 | 35 | 11608 | 0.0285714 | 0.7427306 | 1 |
| ko00531 | Glycosaminoglycan degradation | Metabolism | Glycan biosynthesis and metabolism | 1 | 441 | 24 | 11608 | 0.0416667 | 0.6056422 | 1 |
| ko00532 | Glycosaminoglycan biosynthesis - chondroitin | Metabolism | Glycan biosynthesis and metabolism | 1 | 441 | 23 | 11608 | 0.0434783 | 0.5900363 | 1 |
| ko00564 | Glycerophospholipid metabolism | Metabolism | Lipid metabolism | 4 | 441 | 135 | 11608 | 0.0296296 | 0.7597137 | 1 |
| ko00565 | Ether lipid metabolism | Metabolism | Lipid metabolism | 2 | 441 | 65 | 11608 | 0.0307692 | 0.7131525 | 1 |
| ko00592 | alpha-Linolenic acid metabolism | Metabolism | Lipid metabolism | 1 | 441 | 32 | 11608 | 0.03125 | 0.7109337 | 1 |
| ko00600 | Sphingolipid metabolism | Metabolism | Lipid metabolism | 2 | 441 | 64 | 11608 | 0.03125 | 0.7050855 | 1 |
| ko00603 | Glycosphingolipid biosynthesis - globo and | Metabolism | Glycan biosynthesis and metabolism | 1 | 441 | 19 | 11608 | 0.0526316 | 0.5212042 | 1 |
| ko00604 | Glycosphingolipid biosynthesis - ganglio | Metabolism | Glycan biosynthesis and metabolism | 1 | 441 | 22 | 11608 | 0.0454545 | 0.5738143 | 1 |

| Pathway ID | Pathway Name | Level 1 | Level 2 | Term Candidate Gene Num | Total Candidate Gene Num | Term Gene Num | Total Gene Num | Rich Ratio | P value | Q value |
|------------|---|--------------------------------|----------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|---------|
| ko00620 | Pyruvate metabolism | Metabolism | Carbohydrate metabolism | 3 | 441 | 88 | 11608 | 0.0340909 | 0.655311 | 1 |
| ko00640 | Propanoate metabolism | Metabolism | Carbohydrate metabolism | 1 | 441 | 66 | 11608 | 0.0151515 | 0.9229735 | 1 |
| ko00980 | Metabolism of xenobiotics by | Metabolism | Xenobiotics biodegradation and | 2 | 441 | 66 | 11608 | 0.030303 | 0.7210339 | 1 |
| ko00982 | Drug metabolism - cytochrome P450 | Metabolism | Xenobiotics biodegradation and | 2 | 441 | 63 | 11608 | 0.031746 | 0.6968307 | 1 |
| ko00983 | Drug metabolism - other enzymes | Metabolism | Xenobiotics biodegradation and | 2 | 441 | 78 | 11608 | 0.025641 | 0.8020848 | 1 |
| ko01212 | Fatty acid metabolism | Metabolism | Global and overview maps | 2 | 441 | 60 | 11608 | 0.0333333 | 0.6709174 | 1 |
| ko01230 | Biosynthesis of amino acids | Metabolism | Global and overview maps | 1 | 441 | 90 | 11608 | 0.0111111 | 0.9697885 | 1 |
| ko01521 | EGFR tyrosine kinase inhibitor resistance | Human Diseases | Drug resistance: Antineoplastic | 2 | 441 | 99 | 11608 | 0.020202 | 0.8948947 | 1 |
| ko01522 | Endocrine resistance | Human Diseases | Drug resistance: Antineoplastic | 5 | 441 | 144 | 11608 | 0.0347222 | 0.6438103 | 1 |
| ko01524 | Platinum drug resistance | Human Diseases | Drug resistance: Antineoplastic | 3 | 441 | 91 | 11608 | 0.032967 | 0.6775436 | 1 |
| ko03008 | Ribosome biogenesis in eukaryotes | Genetic Information Processing | Translation | 1 | 441 | 106 | 11608 | 0.009434 | 0.9838299 | 1 |
| ko03010 | Ribosome | Genetic Information Processing | Translation | 2 | 441 | 191 | 11608 | 0.0104712 | 0.9950078 | 1 |
| ko03013 | RNA transport | Genetic Information Processing | Translation | 6 | 441 | 279 | 11608 | 0.0215054 | 0.9572116 | 1 |
| ko03015 | mRNA surveillance pathway | Genetic Information Processing | Translation | 7 | 441 | 189 | 11608 | 0.037037 | 0.581503 | 1 |
| ko03018 | RNA degradation | Genetic Information Processing | Folding, sorting and degradation | 2 | 441 | 101 | 11608 | 0.019802 | 0.9012147 | 1 |
| ko03022 | Basal transcription factors | Genetic Information Processing | Transcription | 2 | 441 | 147 | 11608 | 0.0136054 | 0.9776611 | 1 |
| ko03040 | Spliceosome | Genetic Information Processing | Transcription | 1 | 441 | 188 | 11608 | 0.0053191 | 0.9993522 | 1 |

| Pathway ID | Pathway Name | Level 1 | Level 2 | Term Candidate Gene Num | Total Candidate Gene Num | Term Gene Num | Total Gene Num | Rich Ratio | P value | Q value |
|------------|---|--------------------------------------|-------------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|---------|
| ko03410 | Base excision repair | Genetic Information Processing | Replication and repair | 1 | 441 | 48 | 11608 | 0.0208333 | 0.8447876 | 1 |
| ko03440 | Homologous recombination | Genetic Information Processing | Replication and repair | 1 | 441 | 48 | 11608 | 0.0208333 | 0.8447876 | 1 |
| ko04012 | ErbB signaling pathway | Environmental Information Processing | Signal transduction | 3 | 441 | 100 | 11608 | 0.03 | 0.7378222 | 1 |
| ko04013 | MAPK signaling pathway - fly | Environmental Information Processing | Signal transduction | 5 | 441 | 129 | 11608 | 0.0387597 | 0.5459442 | 1 |
| ko04014 | Ras signaling pathway | Environmental Information Processing | Signal transduction | 11 | 441 | 330 | 11608 | 0.0333333 | 0.7146007 | 1 |
| ko04015 | Rap1 signaling pathway | Environmental Information Processing | Signal transduction | 10 | 441 | 315 | 11608 | 0.031746 | 0.7633742 | 1 |
| ko04022 | cGMP-PKG signaling pathway | Environmental Information Processing | Signal transduction | 6 | 441 | 229 | 11608 | 0.0262009 | 0.8722601 | 1 |
| ko04071 | Sphingolipid signaling pathway | Environmental Information Processing | Signal transduction | 2 | 441 | 149 | 11608 | 0.0134228 | 0.9791039 | 1 |
| ko04072 | Phospholipase D signaling pathway | Environmental Information Processing | Signal transduction | 6 | 441 | 194 | 11608 | 0.0309278 | 0.7515674 | 1 |
| ko04080 | Neuroactive ligand-receptor interaction | Environmental Information Processing | Signaling molecules and interaction | 10 | 441 | 326 | 11608 | 0.0306748 | 0.7985889 | 1 |
| ko04110 | Cell cycle | Cellular Processes | Cell growth and death | 4 | 441 | 153 | 11608 | 0.0261438 | 0.838374 | 1 |
| ko04114 | Oocyte meiosis | Cellular Processes | Cell growth and death | 1 | 441 | 162 | 11608 | 0.0061728 | 0.9981988 | 1 |
| ko04130 | SNARE interactions in vesicular transport | Genetic Information Processing | Folding, sorting and degradation | 1 | 441 | 38 | 11608 | 0.0263158 | 0.7710369 | 1 |
| ko04136 | Autophagy - other | Cellular Processes | Transport and catabolism | 1 | 441 | 40 | 11608 | 0.025 | 0.7881592 | 1 |
| ko04137 | Mitophagy - animal | Cellular Processes | Transport and catabolism | 3 | 441 | 76 | 11608 | 0.0394737 | 0.5557538 | 1 |
| ko04140 | Autophagy - animal | Cellular Processes | Transport and catabolism | 5 | 441 | 164 | 11608 | 0.0304878 | 0.7518975 | 1 |
| ko04141 | Protein processing in endoplasmic reticulum | Genetic Information Processing | Folding, sorting and degradation | 7 | 441 | 213 | 11608 | 0.0328638 | 0.7048863 | 1 |

| Pathway ID | Pathway Name | Level 1 | Level 2 | Term Candidate Gene Num | Total Candidate Gene Num | Term Gene Num | Total Gene Num | Rich Ratio | P value | Q value |
|------------|---|--------------------------------------|--------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|---------|
| ko04144 | Endocytosis | Cellular Processes | Transport and catabolism | 12 | 441 | 451 | 11608 | 0.0266075 | 0.9279206 | 1 |
| ko04145 | Phagosome | Cellular Processes | Transport and catabolism | 5 | 441 | 204 | 11608 | 0.0245098 | 0.8919017 | 1 |
| ko04146 | Peroxisome | Cellular Processes | Transport and catabolism | 2 | 441 | 110 | 11608 | 0.0181818 | 0.9255055 | 1 |
| ko04150 | mTOR signaling pathway | Environmental Information Processing | Signal transduction | 2 | 441 | 187 | 11608 | 0.0106952 | 0.9942662 | 1 |
| ko04152 | AMPK signaling pathway | Environmental Information Processing | Signal transduction | 5 | 441 | 153 | 11608 | 0.0326797 | 0.6957749 | 1 |
| ko04210 | Apoptosis | Cellular Processes | Cell growth and death | 7 | 441 | 189 | 11608 | 0.037037 | 0.581503 | 1 |
| ko04211 | Longevity regulating pathway | Organismal Systems | Aging | 2 | 441 | 114 | 11608 | 0.0175439 | 0.9343888 | 1 |
| ko04212 | Longevity regulating pathway - worm | Organismal Systems | Aging | 3 | 441 | 118 | 11608 | 0.0254237 | 0.8313381 | 1 |
| ko04213 | Longevity regulating pathway - multiple | Organismal Systems | Aging | 2 | 441 | 79 | 11608 | 0.0253165 | 0.8077961 | 1 |
| ko04214 | Apoptosis - fly | Cellular Processes | Cell growth and death | 2 | 441 | 72 | 11608 | 0.0277778 | 0.7645666 | 1 |
| ko04217 | Necroptosis | Cellular Processes | Cell growth and death | 8 | 441 | 223 | 11608 | 0.0358744 | 0.6163334 | 1 |
| ko04218 | Cellular senescence | Cellular Processes | Cell growth and death | 6 | 441 | 212 | 11608 | 0.0283019 | 0.821456 | 1 |
| ko04260 | Cardiac muscle contraction | Organismal Systems | Circulatory system | 2 | 441 | 86 | 11608 | 0.0232558 | 0.84382 | 1 |
| ko04261 | Adrenergic signaling in cardiomyocytes | Organismal Systems | Circulatory system | 4 | 441 | 192 | 11608 | 0.0208333 | 0.9374537 | 1 |
| ko04320 | Dorso-ventral axis formation | Organismal Systems | Development | 2 | 441 | 96 | 11608 | 0.0208333 | 0.8847078 | 1 |
| ko04330 | Notch signaling pathway | Environmental Information Processing | Signal transduction | 3 | 441 | 78 | 11608 | 0.0384615 | 0.5734942 | 1 |
| ko04370 | VEGF signaling pathway | Environmental Information Processing | Signal transduction | 3 | 441 | 72 | 11608 | 0.0416667 | 0.5189916 | 1 |

| Pathway ID | Pathway Name | Level 1 | Level 2 | Term Candidate Gene Num | Total Candidate Gene Num | Term Gene Num | Total Gene Num | Rich Ratio | P value | Q value |
|------------|--|--------------------------------------|---------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|---------|
| ko04391 | Hippo signaling pathway - fly | Environmental Information Processing | Signal transduction | 2 | 441 | 120 | 11608 | 0.0166667 | 0.9458561 | 1 |
| ko04520 | Adherens junction | Cellular Processes | Cellular community - eukaryotes | 5 | 441 | 162 | 11608 | 0.0308642 | 0.7423009 | 1 |
| ko04530 | Tight junction | Cellular Processes | Cellular community - eukaryotes | 8 | 441 | 318 | 11608 | 0.0251572 | 0.9209677 | 1 |
| ko04540 | Gap junction | Cellular Processes | Cellular community - eukaryotes | 1 | 441 | 107 | 11608 | 0.0093458 | 0.9844499 | 1 |
| ko04550 | Signaling pathways regulating pluripotency | Cellular Processes | Cellular community - eukaryotes | 3 | 441 | 160 | 11608 | 0.01875 | 0.9458788 | 1 |
| ko04611 | Platelet activation | Organismal Systems | Immune system | 12 | 441 | 361 | 11608 | 0.033241 | 0.7237169 | 1 |
| ko04612 | Antigen processing and presentation | Organismal Systems | Immune system | 2 | 441 | 105 | 11608 | 0.0190476 | 0.9128059 | 1 |
| ko04622 | RIG-I-like receptor signaling pathway | Organismal Systems | Immune system | 4 | 441 | 105 | 11608 | 0.0380952 | 0.5690113 | 1 |
| ko04624 | Toll and Imd signaling pathway | Organismal Systems | Immune system | 1 | 441 | 66 | 11608 | 0.0151515 | 0.9229735 | 1 |
| ko04658 | Th1 and Th2 cell differentiation | Organismal Systems | Immune system | 3 | 441 | 123 | 11608 | 0.0243902 | 0.851624 | 1 |
| ko04664 | Fc epsilon RI signaling pathway | Organismal Systems | Immune system | 3 | 441 | 84 | 11608 | 0.0357143 | 0.6239937 | 1 |
| ko04666 | Fc gamma R-mediated phagocytosis | Organismal Systems | Immune system | 5 | 441 | 177 | 11608 | 0.0282486 | 0.8078514 | 1 |
| ko04670 | Leukocyte transendothelial | Organismal Systems | Immune system | 6 | 441 | 171 | 11608 | 0.0350877 | 0.6362747 | 1 |
| ko04714 | Thermogenesis | Organismal Systems | Environmental adaptation | 7 | 441 | 290 | 11608 | 0.0241379 | 0.9285023 | 1 |
| ko04720 | Long-term potentiation | Organismal Systems | Nervous system | 1 | 441 | 93 | 11608 | 0.0107527 | 0.9731278 | 1 |
| ko04721 | Synaptic vesicle cycle | Organismal Systems | Nervous system | 1 | 441 | 73 | 11608 | 0.0136986 | 0.9413624 | 1 |
| ko04722 | Neurotrophin signaling pathway | Organismal Systems | Nervous system | 6 | 441 | 174 | 11608 | 0.0344828 | 0.6529438 | 1 |

| Pathway ID | Pathway Name | Level 1 | Level 2 | Term Candidate Gene Num | Total Candidate Gene Num | Term Gene Num | Total Gene Num | Rich Ratio | P value | Q value |
|------------|---|--------------------|------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|---------|
| ko04723 | Retrograde endocannabinoid | Organismal Systems | Nervous system | 6 | 441 | 161 | 11608 | 0.0372671 | 0.5774764 | 1 |
| ko04727 | GABAergic synapse | Organismal Systems | Nervous system | 4 | 441 | 106 | 11608 | 0.0377358 | 0.5765601 | 1 |
| ko04728 | Dopaminergic synapse | Organismal Systems | Nervous system | 4 | 441 | 175 | 11608 | 0.0228571 | 0.9041106 | 1 |
| ko04740 | Olfactory transduction | Organismal Systems | Sensory system | 9 | 441 | 1769 | 11608 | 0.0050876 | 1 | 1 |
| ko04744 | Phototransduction | Organismal Systems | Sensory system | 2 | 441 | 54 | 11608 | 0.037037 | 0.6137623 | 1 |
| ko04745 | Phototransduction - fly | Organismal Systems | Sensory system | 1 | 441 | 62 | 11608 | 0.016129 | 0.9099878 | 1 |
| ko04750 | Inflammatory mediator regulation of TRP | Organismal Systems | Sensory system | 5 | 441 | 146 | 11608 | 0.0342466 | 0.6558196 | 1 |
| ko04810 | Regulation of actin cytoskeleton | Cellular Processes | Cell motility | 8 | 441 | 356 | 11608 | 0.0224719 | 0.9638838 | 1 |
| ko04910 | Insulin signaling pathway | Organismal Systems | Endocrine system | 4 | 441 | 197 | 11608 | 0.0203046 | 0.9450331 | 1 |
| ko04911 | Insulin secretion | Organismal Systems | Endocrine system | 4 | 441 | 130 | 11608 | 0.0307692 | 0.7332351 | 1 |
| ko04912 | GnRH signaling pathway | Organismal Systems | Endocrine system | 4 | 441 | 133 | 11608 | 0.0300752 | 0.749375 | 1 |
| ko04914 | Progesterone-mediated oocyte maturation | Organismal Systems | Endocrine system | 1 | 441 | 115 | 11608 | 0.0086957 | 0.9886277 | 1 |
| ko04915 | Estrogen signaling pathway | Organismal Systems | Endocrine system | 6 | 441 | 194 | 11608 | 0.0309278 | 0.7515674 | 1 |
| ko04916 | Melanogenesis | Organismal Systems | Endocrine system | 3 | 441 | 136 | 11608 | 0.0220588 | 0.8947118 | 1 |
| ko04917 | Prolactin signaling pathway | Organismal Systems | Endocrine system | 1 | 441 | 90 | 11608 | 0.0111111 | 0.9697885 | 1 |
| ko04918 | Thyroid hormone synthesis | Organismal Systems | Endocrine system | 3 | 441 | 91 | 11608 | 0.032967 | 0.6775436 | 1 |
| ko04919 | Thyroid hormone signaling pathway | Organismal Systems | Endocrine system | 2 | 441 | 161 | 11608 | 0.0124224 | 0.9860423 | 1 |

| Pathway ID | Pathway Name | Level 1 | Level 2 | Term Candidate Gene Num | Total Candidate Gene Num | Term Gene Num | Total Gene Num | Rich Ratio | P value | Q value |
|------------|--|--------------------|----------------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|---------|
| ko04922 | Glucagon signaling pathway | Organismal Systems | Endocrine system | 4 | 441 | 133 | 11608 | 0.0300752 | 0.749375 | 1 |
| ko04925 | Aldosterone synthesis and secretion | Organismal Systems | Endocrine system | 4 | 441 | 131 | 11608 | 0.0305344 | 0.7386998 | 1 |
| ko04927 | Cortisol synthesis and secretion | Organismal Systems | Endocrine system | 1 | 441 | 77 | 11608 | 0.012987 | 0.9498294 | 1 |
| ko04931 | Insulin resistance | Human Diseases | Endocrine and metabolic diseases | 4 | 441 | 130 | 11608 | 0.0307692 | 0.7332351 | 1 |
| ko04932 | Non-alcoholic fatty liver disease (NAFLD) | Human Diseases | Endocrine and metabolic diseases | 5 | 441 | 180 | 11608 | 0.0277778 | 0.8192348 | 1 |
| ko04934 | Cushing's syndrome | Human Diseases | Endocrine and metabolic diseases | 5 | 441 | 203 | 11608 | 0.0246305 | 0.8894666 | 1 |
| ko04940 | Type I diabetes mellitus | Human Diseases | Endocrine and metabolic diseases | 2 | 441 | 76 | 11608 | 0.0263158 | 0.7902093 | 1 |
| ko04960 | Aldosterone-regulated sodium reabsorption | Organismal Systems | Excretory system | 1 | 441 | 40 | 11608 | 0.025 | 0.7881592 | 1 |
| ko04961 | Endocrine and other factor-regulated calcium | Organismal Systems | Excretory system | 2 | 441 | 59 | 11608 | 0.0338983 | 0.6618902 | 1 |
| ko04970 | Salivary secretion | Organismal Systems | Digestive system | 7 | 441 | 200 | 11608 | 0.035 | 0.6411464 | 1 |
| ko04971 | Gastric acid secretion | Organismal Systems | Digestive system | 2 | 441 | 119 | 11608 | 0.0168067 | 0.9440872 | 1 |
| ko05010 | Alzheimer's disease | Human Diseases | Neurodegenerative diseases | 4 | 441 | 235 | 11608 | 0.0170213 | 0.9803075 | 1 |
| ko05014 | Amyotrophic lateral sclerosis (ALS) | Human Diseases | Neurodegenerative diseases | 2 | 441 | 93 | 11608 | 0.0215054 | 0.8736147 | 1 |
| ko05016 | Huntington's disease | Human Diseases | Neurodegenerative diseases | 11 | 441 | 379 | 11608 | 0.0290237 | 0.8584874 | 1 |
| ko05034 | Alcoholism | Human Diseases | Substance dependence | 7 | 441 | 228 | 11608 | 0.0307018 | 0.7685664 | 1 |
| ko05130 | Pathogenic Escherichia coli infection | Human Diseases | Infectious diseases: Bacterial | 1 | 441 | 112 | 11608 | 0.0089286 | 0.9872116 | 1 |
| ko05131 | Shigellosis | Human Diseases | Infectious diseases: Bacterial | 4 | 441 | 154 | 11608 | 0.025974 | 0.8420316 | 1 |

| Pathway ID | Pathway Name | Level 1 | Level 2 | Term Candidate Gene Num | Total Candidate Gene Num | Term Gene Num | Total Gene Num | Rich Ratio | P value | Q value |
|------------|------------------------------|----------------|----------------------------|-------------------------|--------------------------|---------------|----------------|------------|-----------|---------|
| ko05160 | Hepatitis C | Human Diseases | Infectious diseases: Viral | 4 | 441 | 170 | 11608 | 0.0235294 | 0.8916787 | 1 |
| ko05164 | Influenza A | Human Diseases | Infectious diseases: Viral | 9 | 441 | 247 | 11608 | 0.0364372 | 0.5989564 | 1 |
| ko05168 | Herpes simplex infection | Human Diseases | Infectious diseases: Viral | 15 | 441 | 414 | 11608 | 0.0362319 | 0.6130231 | 1 |
| ko05203 | Viral carcinogenesis | Human Diseases | Cancers: Overview | 5 | 441 | 244 | 11608 | 0.0204918 | 0.9579265 | 1 |
| ko05214 | Glioma | Human Diseases | Cancers: Specific types | 2 | 441 | 113 | 11608 | 0.0176991 | 0.9322668 | 1 |
| ko05215 | Prostate cancer | Human Diseases | Cancers: Specific types | 3 | 441 | 117 | 11608 | 0.025641 | 0.8270067 | 1 |
| ko05216 | Thyroid cancer | Human Diseases | Cancers: Specific types | 2 | 441 | 48 | 11608 | 0.0416667 | 0.5493258 | 1 |
| ko05218 | Melanoma | Human Diseases | Cancers: Specific types | 3 | 441 | 84 | 11608 | 0.0357143 | 0.6239937 | 1 |
| ko05221 | Acute myeloid leukemia | Human Diseases | Cancers: Specific types | 2 | 441 | 76 | 11608 | 0.0263158 | 0.7902093 | 1 |
| ko05223 | Non-small cell lung cancer | Human Diseases | Cancers: Specific types | 2 | 441 | 77 | 11608 | 0.025974 | 0.7962235 | 1 |
| ko05225 | Hepatocellular carcinoma | Human Diseases | Cancers: Specific types | 8 | 441 | 223 | 11608 | 0.0358744 | 0.6163334 | 1 |
| ko05231 | Choline metabolism in cancer | Human Diseases | Cancers: Overview | 4 | 441 | 178 | 11608 | 0.0224719 | 0.91095 | 1 |
| ko05332 | Graft-versus-host disease | Human Diseases | Immune diseases | 2 | 441 | 60 | 11608 | 0.0333333 | 0.6709174 | 1 |