

Table S4. The scores of pathways from GSE25066

| Rank | Number | Symbol        | Name                                                       | Score      |
|------|--------|---------------|------------------------------------------------------------|------------|
| 1    | 246    | path:hsa05033 | Nicotine addiction                                         | 0.43065571 |
| 2    | 146    | path:hsa05217 | Basal cell carcinoma                                       | 0.40253392 |
| 3    | 254    | path:hsa04740 | Olfactory transduction                                     | 0.39895226 |
| 4    | 253    | path:hsa04742 | Taste transduction                                         | 0.39306936 |
| 5    | 280    | path:hsa04340 | Hedgehog signaling pathway                                 | 0.37603454 |
| 6    | 51     | path:hsa04727 | GABAergic synapse                                          | 0.36203141 |
| 7    | 121    | path:hsa04713 | Circadian entrainment                                      | 0.35668682 |
| 8    | 231    | path:hsa00053 | Ascorbate and aldarate metabolism                          | 0.3536296  |
| 9    | 47     | path:hsa04723 | Retrograde endocannabinoid signaling                       | 0.34331412 |
| 10   | 198    | path:hsa04978 | Mineral absorption                                         | 0.34246095 |
| 11   | 174    | path:hsa04961 | Endocrine and other factor-regulated calcium reabsorption  | 0.34161353 |
| 12   | 63     | path:hsa00140 | Steroid hormone biosynthesis                               | 0.337664   |
| 13   | 185    | path:hsa04966 | Collecting duct acid secretion                             | 0.33617877 |
| 14   | 249    | path:hsa04330 | Notch signaling pathway                                    | 0.33396368 |
| 15   | 71     | path:hsa04614 | Renin-angiotensin system                                   | 0.33299363 |
| 16   | 89     | path:hsa04976 | Bile secretion                                             | 0.33155797 |
| 17   | 50     | path:hsa04724 | Glutamatergic synapse                                      | 0.33110464 |
| 18   | 258    | path:hsa04744 | Phototransduction                                          | 0.32519225 |
| 19   | 6      | path:hsa04320 | Dorso-ventral axis formation                               | 0.32464422 |
| 20   | 42     | path:hsa00561 | Glycerolipid metabolism                                    | 0.32354572 |
| 21   | 248    | path:hsa00785 | Lipoic acid metabolism                                     | 0.32290404 |
| 22   | 80     | path:hsa04310 | Wnt signaling pathway                                      | 0.31932572 |
| 23   | 229    | path:hsa04080 | Neuroactive ligand-receptor interaction                    | 0.31754698 |
| 24   | 269    | path:hsa04911 | Insulin secretion                                          | 0.31488782 |
| 25   | 52     | path:hsa04726 | Serotonergic synapse                                       | 0.31320715 |
| 26   | 105    | path:hsa03410 | Base excision repair                                       | 0.31226416 |
| 27   | 265    | path:hsa05030 | Cocaine addiction                                          | 0.3122355  |
| 28   | 92     | path:hsa04122 | Sulfur relay system                                        | 0.31074156 |
| 29   | 278    | path:hsa00534 | Glycosaminoglycan biosynthesis - heparan sulfate / heparin | 0.30619229 |
| 30   | 94     | path:hsa04120 | Ubiquitin mediated proteolysis                             | 0.30532663 |
| 31   | 264    | path:hsa05034 | Alcoholism                                                 | 0.30463035 |
| 32   | 107    | path:hsa05014 | Amyotrophic lateral sclerosis (ALS)                        | 0.30452639 |
| 33   | 267    | path:hsa04913 | Ovarian steroidogenesis                                    | 0.30420741 |
| 34   | 25     | path:hsa04920 | Adipocytokine signaling pathway                            | 0.3040426  |
| 35   | 268    | path:hsa04910 | Insulin signaling pathway                                  | 0.30375578 |
| 36   | 101    | path:hsa04141 | Protein processing in endoplasmic reticulum                | 0.30307229 |
| 37   | 236    | path:hsa00524 | Butirosin and neomycin biosynthesis                        | 0.30280645 |
| 38   | 259    | path:hsa05032 | Morphine addiction                                         | 0.30210387 |
| 39   | 75     | path:hsa04918 | Thyroid hormone synthesis                                  | 0.30165504 |
| 40   | 201    | path:hsa00430 | Taurine and hypotaurine metabolism                         | 0.30145689 |
| 41   | 238    | path:hsa04022 | cGMP-PKG signaling pathway                                 | 0.301051   |
| 42   | 210    | path:hsa05031 | Amphetamine addiction                                      | 0.30099086 |
| 43   | 143    | path:hsa04710 | Circadian rhythm                                           | 0.30058083 |
| 44   | 203    | path:hsa04260 | Cardiac muscle contraction                                 | 0.300499   |
| 45   | 154    | path:hsa03020 | RNA polymerase                                             | 0.29467213 |
| 46   | 138    | path:hsa00340 | Histidine metabolism                                       | 0.29236256 |
| 47   | 257    | path:hsa05210 | Colorectal cancer                                          | 0.29209495 |
| 48   | 43     | path:hsa00565 | Ether lipid metabolism                                     | 0.29161539 |
| 49   | 45     | path:hsa04721 | Synaptic vesicle cycle                                     | 0.29109733 |
| 50   | 193    | path:hsa04010 | MAPK signaling pathway                                     | 0.29049091 |
| 51   | 261    | path:hsa04919 | Thyroid hormone signaling pathway                          | 0.28866245 |
| 52   | 270    | path:hsa04916 | Melanogenesis                                              | 0.28756478 |
| 53   | 58     | path:hsa04930 | Type II diabetes mellitus                                  | 0.28750236 |

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|-----|-----|---------------|--------------------------------------------------------|------------|
| 54  | 233 | path:hsa00280 | Valine, leucine and isoleucine degradation             | 0.2862489  |
| 55  | 48  | path:hsa04722 | Neurotrophin signaling pathway                         | 0.28616311 |
| 56  | 46  | path:hsa04720 | Long-term potentiation                                 | 0.28597289 |
| 57  | 207 | path:hsa00230 | Purine metabolism                                      | 0.28429666 |
| 58  | 99  | path:hsa00500 | Starch and sucrose metabolism                          | 0.28334615 |
| 59  | 189 | path:hsa04014 | Ras signaling pathway                                  | 0.28241058 |
| 60  | 182 | path:hsa00591 | Linoleic acid metabolism                               | 0.28218137 |
| 61  | 120 | path:hsa04068 | FoxO signaling pathway                                 | 0.28035766 |
| 62  | 15  | path:hsa05220 | Chronic myeloid leukemia                               | 0.28015658 |
| 63  | 192 | path:hsa04972 | Pancreatic secretion                                   | 0.28011309 |
| 64  | 108 | path:hsa04962 | Vasopressin-regulated water reabsorption               | 0.28002649 |
| 65  | 262 | path:hsa00630 | Glyoxylate and dicarboxylate metabolism                | 0.27910643 |
| 66  | 133 | path:hsa04950 | Maturity onset diabetes of the young                   | 0.27825619 |
| 67  | 252 | path:hsa05216 | Thyroid cancer                                         | 0.27824323 |
| 68  | 190 | path:hsa04970 | Salivary secretion                                     | 0.27615317 |
| 69  | 135 | path:hsa00512 | Mucin type O-Glycan biosynthesis                       | 0.27547363 |
| 70  | 66  | path:hsa00410 | beta-Alanine metabolism                                | 0.27456882 |
| 71  | 90  | path:hsa00310 | Lysine degradation                                     | 0.27387607 |
| 72  | 102 | path:hsa04140 | Regulation of autophagy                                | 0.27360107 |
| 73  | 23  | path:hsa00830 | Retinol metabolism                                     | 0.27341681 |
| 74  | 1   | path:hsa00790 | Folate biosynthesis                                    | 0.27266114 |
| 75  | 202 | path:hsa00120 | Primary bile acid biosynthesis                         | 0.27072666 |
| 76  | 53  | path:hsa04728 | Dopaminergic synapse                                   | 0.27060741 |
| 77  | 147 | path:hsa00970 | Aminoacyl-tRNA biosynthesis                            | 0.27055147 |
| 78  | 266 | path:hsa00040 | Pentose and glucuronate interconversions               | 0.2703391  |
| 79  | 24  | path:hsa04921 | Oxytocin signaling pathway                             | 0.26929735 |
| 80  | 20  | path:hsa04150 | mTOR signaling pathway                                 | 0.26889848 |
| 81  | 232 | path:hsa00052 | Galactose metabolism                                   | 0.26884625 |
| 82  | 255 | path:hsa05212 | Pancreatic cancer                                      | 0.26733796 |
| 83  | 150 | path:hsa04261 | Adrenergic signaling in cardiomyocytes                 | 0.26708527 |
| 84  | 155 | path:hsa04390 | Hippo signaling pathway                                | 0.26700256 |
| 85  | 112 | path:hsa05016 | Huntington,s disease                                   | 0.26433114 |
| 86  | 36  | path:hsa00010 | Glycolysis / Gluconeogenesis                           | 0.26358759 |
| 87  | 88  | path:hsa04912 | GnRH signaling pathway                                 | 0.26305826 |
| 88  | 19  | path:hsa00620 | Pyruvate metabolism                                    | 0.2624041  |
| 89  | 256 | path:hsa05213 | Endometrial cancer                                     | 0.26215054 |
| 90  | 177 | path:hsa00860 | Porphyrin and chlorophyll metabolism                   | 0.26175803 |
| 91  | 100 | path:hsa04146 | Peroxisome                                             | 0.26149969 |
| 92  | 217 | path:hsa05200 | Pathways in cancer                                     | 0.26113309 |
| 93  | 59  | path:hsa04932 | Non-alcoholic fatty liver disease (NAFLD)              | 0.25980516 |
| 94  | 106 | path:hsa04973 | Carbohydrate digestion and absorption                  | 0.2590041  |
| 95  | 151 | path:hsa05215 | Prostate cancer                                        | 0.25818912 |
| 96  | 128 | path:hsa04130 | SNARE interactions in vesicular transport              | 0.25810777 |
| 97  | 153 | path:hsa03022 | Basal transcription factors                            | 0.25797397 |
| 98  | 175 | path:hsa00190 | Oxidative phosphorylation                              | 0.25793194 |
| 99  | 97  | path:hsa04012 | ErbB signaling pathway                                 | 0.25778009 |
| 100 | 275 | path:hsa00531 | Glycosaminoglycan degradation                          | 0.25700374 |
| 101 | 49  | path:hsa04725 | Cholinergic synapse                                    | 0.25679006 |
| 102 | 104 | path:hsa05010 | Alzheimer,s disease                                    | 0.25586522 |
| 103 | 37  | path:hsa00051 | Fructose and mannose metabolism                        | 0.25563628 |
| 104 | 55  | path:hsa05218 | Melanoma                                               | 0.2553623  |
| 105 | 114 | path:hsa04971 | Gastric acid secretion                                 | 0.25526575 |
| 106 | 73  | path:hsa05412 | Arrhythmogenic right ventricular cardiomyopathy (ARVC) | 0.25429262 |
| 107 | 115 | path:hsa04668 | TNF signaling pathway                                  | 0.25368064 |
| 108 | 277 | path:hsa00533 | Glycosaminoglycan biosynthesis - keratan sulfate       | 0.25326238 |
| 109 | 239 | path:hsa00520 | Amino sugar and nucleotide sugar metabolism            | 0.25197333 |

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| 110 | 103 | path:hsa04142 | Lysosome                                                   | 0.25170888 |
| 111 | 173 | path:hsa00982 | Drug metabolism - cytochrome P450                          | 0.25116403 |
| 112 | 136 | path:hsa04360 | Axon guidance                                              | 0.25113678 |
| 113 | 260 | path:hsa03050 | Proteasome                                                 | 0.25085394 |
| 114 | 35  | path:hsa00240 | Pyrimidine metabolism                                      | 0.25076955 |
| 115 | 30  | path:hsa04350 | TGF-beta signaling pathway                                 | 0.25021957 |
| 116 | 125 | path:hsa03013 | RNA transport                                              | 0.2501358  |
| 117 | 208 | path:hsa03320 | PPAR signaling pathway                                     | 0.24971136 |
| 118 | 22  | path:hsa00511 | Other glycan degradation                                   | 0.24905125 |
| 119 | 165 | path:hsa04964 | Proximal tubule bicarbonate reclamation                    | 0.24880669 |
| 120 | 168 | path:hsa04915 | Estrogen signaling pathway                                 | 0.24717818 |
| 121 | 227 | path:hsa00910 | Nitrogen metabolism                                        | 0.24680035 |
| 122 | 149 | path:hsa05214 | Glioma                                                     | 0.24613474 |
| 123 | 40  | path:hsa00563 | Glycosylphosphatidylinositol(GPI)-anchor biosynthesis      | 0.24609017 |
| 124 | 12  | path:hsa05223 | Non-small cell lung cancer                                 | 0.24484153 |
| 125 | 169 | path:hsa04270 | Vascular smooth muscle contraction                         | 0.24480738 |
| 126 | 140 | path:hsa00100 | Steroid biosynthesis                                       | 0.24337171 |
| 127 | 161 | path:hsa00072 | Synthesis and degradation of ketone bodies                 | 0.24282517 |
| 128 | 38  | path:hsa05211 | Renal cell carcinoma                                       | 0.2425746  |
| 129 | 148 | path:hsa05410 | Hypertrophic cardiomyopathy (HCM)                          | 0.24256141 |
| 130 | 216 | path:hsa05206 | MicroRNAs in cancer                                        | 0.24216451 |
| 131 | 220 | path:hsa05160 | Hepatitis C                                                | 0.24130456 |
| 132 | 7   | path:hsa00380 | Tryptophan metabolism                                      | 0.24071829 |
| 133 | 137 | path:hsa00510 | N-Glycan biosynthesis                                      | 0.24061145 |
| 134 | 139 | path:hsa04152 | AMPK signaling pathway                                     | 0.24036383 |
| 135 | 240 | path:hsa04210 | Apoptosis                                                  | 0.23960804 |
| 136 | 224 | path:hsa00600 | Sphingolipid metabolism                                    | 0.23927281 |
| 137 | 141 | path:hsa00514 | Other types of O-glycan biosynthesis                       | 0.23873378 |
| 138 | 134 | path:hsa00270 | Cysteine and methionine metabolism                         | 0.23825966 |
| 139 | 158 | path:hsa00071 | Fatty acid degradation                                     | 0.23653308 |
| 140 | 222 | path:hsa05012 | Parkinson,s disease                                        | 0.23563759 |
| 141 | 93  | path:hsa00640 | Propanoate metabolism                                      | 0.23500998 |
| 142 | 67  | path:hsa05414 | Dilated cardiomyopathy                                     | 0.23493643 |
| 143 | 11  | path:hsa00604 | Glycosphingolipid biosynthesis - ganglio series            | 0.23450791 |
| 144 | 130 | path:hsa04623 | Cytosolic DNA-sensing pathway                              | 0.23378337 |
| 145 | 111 | path:hsa04540 | Gap junction                                               | 0.23377764 |
| 146 | 212 | path:hsa03440 | Homologous recombination                                   | 0.23197988 |
| 147 | 10  | path:hsa04750 | Inflammatory mediator regulation of TRP channels           | 0.23142563 |
| 148 | 164 | path:hsa04622 | RIG-I-like receptor signaling pathway                      | 0.23141904 |
| 149 | 144 | path:hsa00450 | Selenocompound metabolism                                  | 0.23135617 |
| 150 | 68  | path:hsa04066 | HIF-1 signaling pathway                                    | 0.22858626 |
| 151 | 3   | path:hsa00020 | Citrate cycle (TCA cycle)                                  | 0.22764413 |
| 152 | 9   | path:hsa03460 | Fanconi anemia pathway                                     | 0.22598664 |
| 153 | 245 | path:hsa03040 | Spliceosome                                                | 0.22578057 |
| 154 | 21  | path:hsa04151 | PI3K-Akt signaling pathway                                 | 0.22538818 |
| 155 | 219 | path:hsa05202 | Transcriptional misregulation in cancer                    | 0.22475653 |
| 156 | 218 | path:hsa05203 | Viral carcinogenesis                                       | 0.224702   |
| 157 | 163 | path:hsa04621 | NOD-like receptor signaling pathway                        | 0.22416213 |
| 158 | 142 | path:hsa03420 | Nucleotide excision repair                                 | 0.22375545 |
| 159 | 78  | path:hsa04730 | Long-term depression                                       | 0.22365317 |
| 160 | 124 | path:hsa03015 | mRNA surveillance pathway                                  | 0.22346458 |
| 161 | 132 | path:hsa05120 | Epithelial cell signaling in Helicobacter pylori infection | 0.223081   |
| 162 | 160 | path:hsa04020 | Calcium signaling pathway                                  | 0.2230018  |
| 163 | 214 | path:hsa05204 | Chemical carcinogenesis                                    | 0.22292808 |
| 164 | 44  | path:hsa00564 | Glycerophospholipid metabolism                             | 0.22235655 |
| 165 | 188 | path:hsa04015 | Rap1 signaling pathway                                     | 0.22121232 |

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|-----|-----|---------------|------------------------------------------------------------|------------|
| 166 | 31  | path:hsa00330 | Arginine and proline metabolism                            | 0.22105706 |
| 167 | 187 | path:hsa04975 | Fat digestion and absorption                               | 0.21958521 |
| 168 | 119 | path:hsa03018 | RNA degradation                                            | 0.21526966 |
| 169 | 221 | path:hsa05161 | Hepatitis B                                                | 0.21524865 |
| 170 | 13  | path:hsa05222 | Small cell lung cancer                                     | 0.21514203 |
| 171 | 215 | path:hsa04917 | Prolactin signaling pathway                                | 0.21501488 |
| 172 | 171 | path:hsa00980 | Metabolism of xenobiotics by cytochrome P450               | 0.21455704 |
| 173 | 74  | path:hsa04144 | Endocytosis                                                | 0.21404272 |
| 174 | 82  | path:hsa05221 | Acute myeloid leukemia                                     | 0.21402805 |
| 175 | 178 | path:hsa04960 | Aldosterone-regulated sodium reabsorption                  | 0.21263368 |
| 176 | 223 | path:hsa00603 | Glycosphingolipid biosynthesis - globo series              | 0.21250508 |
| 177 | 194 | path:hsa00062 | Fatty acid elongation                                      | 0.21194349 |
| 178 | 184 | path:hsa00900 | Terpenoid backbone biosynthesis                            | 0.21125651 |
| 179 | 225 | path:hsa00601 | Glycosphingolipid biosynthesis - lacto and neolacto series | 0.21078662 |
| 180 | 156 | path:hsa05110 | Vibrio cholerae infection                                  | 0.20903207 |
| 181 | 79  | path:hsa04530 | Tight junction                                             | 0.20550351 |
| 182 | 172 | path:hsa00983 | Drug metabolism - other enzymes                            | 0.20440956 |
| 183 | 167 | path:hsa04370 | VEGF signaling pathway                                     | 0.20404324 |
| 184 | 251 | path:hsa05169 | Epstein-Barr virus infection                               | 0.20323758 |
| 185 | 237 | path:hsa00350 | Tyrosine metabolism                                        | 0.19987236 |
| 186 | 181 | path:hsa00590 | Arachidonic acid metabolism                                | 0.19781674 |
| 187 | 54  | path:hsa04520 | Adherens junction                                          | 0.19690753 |
| 188 | 213 | path:hsa05205 | Proteoglycans in cancer                                    | 0.19666104 |
| 189 | 110 | path:hsa01040 | Biosynthesis of unsaturated fatty acids                    | 0.19610619 |
| 190 | 162 | path:hsa04620 | Toll-like receptor signaling pathway                       | 0.19552807 |
| 191 | 61  | path:hsa00650 | Butanoate metabolism                                       | 0.19542822 |
| 192 | 204 | path:hsa04070 | Phosphatidylinositol signaling system                      | 0.19395942 |
| 193 | 170 | path:hsa00260 | Glycine, serine and threonine metabolism                   | 0.19320771 |
| 194 | 118 | path:hsa05166 | HTLV-I infection                                           | 0.19314874 |
| 195 | 244 | path:hsa04060 | Cytokine-cytokine receptor interaction                     | 0.192685   |
| 196 | 127 | path:hsa04810 | Regulation of actin cytoskeleton                           | 0.19265902 |
| 197 | 18  | path:hsa03060 | Protein export                                             | 0.19203336 |
| 198 | 123 | path:hsa00770 | Pantothenate and CoA biosynthesis                          | 0.19092875 |
| 199 | 200 | path:hsa05145 | Toxoplasmosis                                              | 0.1906931  |
| 200 | 157 | path:hsa05142 | Chagas disease (American trypanosomiasis)                  | 0.18974601 |
| 201 | 60  | path:hsa05219 | Bladder cancer                                             | 0.18964668 |
| 202 | 17  | path:hsa04510 | Focal adhesion                                             | 0.18883421 |
| 203 | 243 | path:hsa00030 | Pentose phosphate pathway                                  | 0.18636583 |
| 204 | 2   | path:hsa04610 | Complement and coagulation cascades                        | 0.18613305 |
| 205 | 86  | path:hsa03008 | Ribosome biogenesis in eukaryotes                          | 0.18376063 |
| 206 | 176 | path:hsa00750 | Vitamin B6 metabolism                                      | 0.18366907 |
| 207 | 166 | path:hsa03430 | Mismatch repair                                            | 0.18283119 |
| 208 | 70  | path:hsa04630 | Jak-STAT signaling pathway                                 | 0.18280503 |
| 209 | 85  | path:hsa00480 | Glutathione metabolism                                     | 0.18264308 |
| 210 | 131 | path:hsa04115 | p53 signaling pathway                                      | 0.18247053 |
| 211 | 91  | path:hsa04977 | Vitamin digestion and absorption                           | 0.18240582 |
| 212 | 241 | path:hsa04064 | NF-kappa B signaling pathway                               | 0.18031603 |
| 213 | 87  | path:hsa00760 | Nicotinate and nicotinamide metabolism                     | 0.1788466  |
| 214 | 209 | path:hsa05131 | Shigellosis                                                | 0.17873745 |
| 215 | 34  | path:hsa05132 | Salmonella infection                                       | 0.17858831 |
| 216 | 230 | path:hsa04380 | Osteoclast differentiation                                 | 0.17851441 |
| 217 | 41  | path:hsa00562 | Inositol phosphate metabolism                              | 0.17516931 |
| 218 | 183 | path:hsa05152 | Tuberculosis                                               | 0.17185469 |
| 219 | 274 | path:hsa05168 | Herpes simplex infection                                   | 0.17178692 |
| 220 | 32  | path:hsa00130 | Ubiquinone and other terpenoid-quinone biosynthesis        | 0.16978725 |
| 221 | 8   | path:hsa05020 | Prion diseases                                             | 0.16752624 |

|     |     |               |                                                                         |            |
|-----|-----|---------------|-------------------------------------------------------------------------|------------|
| 222 | 276 | path:hsa00532 | Glycosaminoglycan biosynthesis - chondroitin sulfate / dermatan sulfate | 0.1668719  |
| 223 | 226 | path:hsa05162 | Measles                                                                 | 0.16428324 |
| 224 | 72  | path:hsa00360 | Phenylalanine metabolism                                                | 0.16308837 |
| 225 | 152 | path:hsa00740 | Riboflavin metabolism                                                   | 0.16195028 |
| 226 | 242 | path:hsa04062 | Chemokine signaling pathway                                             | 0.16177148 |
| 227 | 64  | path:hsa04110 | Cell cycle                                                              | 0.1607954  |
| 228 | 180 | path:hsa00592 | alpha-Linolenic acid metabolism                                         | 0.15939683 |
| 229 | 234 | path:hsa05164 | Influenza A                                                             | 0.15867545 |
| 230 | 205 | path:hsa00232 | Caffeine metabolism                                                     | 0.15847641 |
| 231 | 27  | path:hsa04662 | B cell receptor signaling pathway                                       | 0.15645272 |
| 232 | 33  | path:hsa05133 | Pertussis                                                               | 0.1551987  |
| 233 | 179 | path:hsa03030 | DNA replication                                                         | 0.1548013  |
| 234 | 206 | path:hsa05100 | Bacterial invasion of epithelial cells                                  | 0.14962944 |
| 235 | 279 | path:hsa04914 | Progesterone-mediated oocyte maturation                                 | 0.14797757 |
| 236 | 39  | path:hsa05134 | Legionellosis                                                           | 0.14797697 |
| 237 | 145 | path:hsa02010 | ABC transporters                                                        | 0.14199179 |
| 238 | 247 | path:hsa00780 | Biotin metabolism                                                       | 0.14096309 |
| 239 | 26  | path:hsa04660 | T cell receptor signaling pathway                                       | 0.13978458 |
| 240 | 65  | path:hsa04114 | Oocyte meiosis                                                          | 0.13970636 |
| 241 | 250 | path:hsa03450 | Non-homologous end-joining                                              | 0.13873144 |
| 242 | 109 | path:hsa00460 | Cyanoamino acid metabolism                                              | 0.13824715 |
| 243 | 113 | path:hsa05143 | African trypanosomiasis                                                 | 0.1370672  |
| 244 | 122 | path:hsa05146 | Amoebiasis                                                              | 0.13398293 |
| 245 | 28  | path:hsa04664 | Fc epsilon RI signaling pathway                                         | 0.13166859 |
| 246 | 117 | path:hsa04611 | Platelet activation                                                     | 0.12960384 |
| 247 | 273 | path:hsa04670 | Leukocyte transendothelial migration                                    | 0.12908715 |
| 248 | 228 | path:hsa05323 | Rheumatoid arthritis                                                    | 0.12810859 |
| 249 | 186 | path:hsa04974 | Protein digestion and absorption                                        | 0.12491936 |
| 250 | 29  | path:hsa04666 | Fc gamma R-mediated phagocytosis                                        | 0.12469275 |
| 251 | 81  | path:hsa05322 | Systemic lupus erythematosus                                            | 0.12400582 |
| 252 | 196 | path:hsa05140 | Leishmaniasis                                                           | 0.12388785 |
| 253 | 76  | path:hsa00471 | D-Glutamine and D-glutamate metabolism                                  | 0.12237875 |
| 254 | 16  | path:hsa04512 | ECM-receptor interaction                                                | 0.12210762 |
| 255 | 191 | path:hsa00290 | Valine, leucine and isoleucine biosynthesis                             | 0.12144465 |
| 256 | 129 | path:hsa00670 | One carbon pool by folate                                               | 0.12126919 |
| 257 | 263 | path:hsa00920 | Sulfur metabolism                                                       | 0.11944576 |
| 258 | 84  | path:hsa05321 | Inflammatory bowel disease (IBD)                                        | 0.11388533 |
| 259 | 98  | path:hsa04145 | Phagosome                                                               | 0.1131427  |
| 260 | 211 | path:hsa05130 | Pathogenic Escherichia coli infection                                   | 0.10588805 |
| 261 | 199 | path:hsa05144 | Malaria                                                                 | 0.10394065 |
| 262 | 195 | path:hsa04650 | Natural killer cell mediated cytotoxicity                               | 0.1025008  |
| 263 | 235 | path:hsa04640 | Hematopoietic cell lineage                                              | 0.10160391 |
| 264 | 271 | path:hsa04672 | Intestinal immune network for IgA production                            | 0.10060175 |
| 265 | 159 | path:hsa05150 | Staphylococcus aureus infection                                         | 0.08712216 |
| 266 | 272 | path:hsa00730 | Thiamine metabolism                                                     | 0.08193033 |
| 267 | 14  | path:hsa04514 | Cell adhesion molecules (CAMs)                                          | 0.0805607  |
| 268 | 116 | path:hsa05310 | Asthma                                                                  | 0.07940406 |
| 269 | 69  | path:hsa05416 | Viral myocarditis                                                       | 0.07402959 |
| 270 | 4   | path:hsa04612 | Antigen processing and presentation                                     | 0.07208948 |
| 271 | 96  | path:hsa04940 | Type I diabetes mellitus                                                | 0.06952087 |
| 272 | 5   | path:hsa05340 | Primary immunodeficiency                                                | 0.06841601 |
| 273 | 83  | path:hsa05320 | Autoimmune thyroid disease                                              | 0.06470609 |
| 274 | 197 | path:hsa00061 | Fatty acid biosynthesis                                                 | 0.06104635 |
| 275 | 56  | path:hsa05330 | Allograft rejection                                                     | 0.0576579  |
| 276 | 57  | path:hsa05332 | Graft-versus-host disease                                               | 0.05119566 |

|     |     |                                                                   |            |
|-----|-----|-------------------------------------------------------------------|------------|
| 277 | 95  | path:hsa00400 Phenylalanine, tyrosine and tryptophan biosynthesis | 0.04524044 |
| 278 | 126 | path:hsa03010 Ribosome                                            | 0.04481333 |
| 279 | 62  | path:hsa00300 Lysine biosynthesis                                 | NA         |
| 280 | 77  | path:hsa00472 D-Arginine and D-ornithine metabolism               | NA         |