**Table S2**. List of all the KEGG pathways with the number of annotated ECs.

|  |  |  |
| --- | --- | --- |
| **KEGG pathways**  | N unigenes | N enzynes |
| Biosynthesis of antibiotics | 722 | 364 |
| Purine metabolism | 565 | 110 |
| Starch and sucrose metabolism | 316 | 99 |
| Pyrimidine metabolism | 211 | 76 |
| Thiamine metabolism | 159 | 20 |
| Pentose and glucuronate interconversions | 114 | 23 |
| Glycolysis / Gluconeogenesis | 201 | 66 |
| Phenylalanine metabolism | 150 | 41 |
| Pentose phosphate pathway | 173 | 51 |
| Phenylpropanoid biosynthesis | 127 | 24 |
| Methane metabolism | 171 | 52 |
| Cysteine and methionine metabolism | 158 | 93 |
| Pyruvate metabolism | 127 | 54 |
| Oxidative phosphorylation | 133 | 22 |
| Amino sugar and nucleotide sugar metabolism | 132 | 72 |
| Glyoxylate and dicarboxylate metabolism | 122 | 43 |
| Carbon fixation in photosynthetic organisms | 143 | 56 |
| Glutathione metabolism | 99 | 46 |
| Arginine and proline metabolism | 109 | 65 |
| Aminoacyl-tRNA biosynthesis | 102 | 69 |
| Carbon fixation pathways in prokaryotes | 104 | 46 |
| Glycerophospholipid metabolism | 112 | 55 |
| Alanine, aspartate and glutamate metabolism | 95 | 46 |
| Frutose and mannose metabolism | 120 | 53 |
| Galactose metabolism | 106 | 36 |
| Glycerolipid metabolism | 81 | 35 |
| Phenylalanine, tyrosine and tryptophan biosynthesis | 76 | 51 |
| Citrate cycle (TCA cycle) | 82 | 39 |
| Porphyrin and chlorophyll metabolism | 96 | 61 |
| Riboflavin metabolism | 67 | 27 |
| Glycine, serine and threonine metabolism | 83 | 55 |
| Sulfur metabolism | 67 | 37 |
| Terpenoid backbone biosynthesis | 52 | 45 |
| Tyrosine metabolism | 58 | 42 |
| Aminobenzoate degradation | 52 | 10 |
| Phosphatidylinositol signaling system | 53 | 30 |
| On carbon pool by folate | 48 | 36 |
| Lysine degradation | 35 | 12 |
| Fatty acid biosynthesis | 33 | 18 |
| Nitrogen metabolism | 50 | 26 |
| Valine, leucine and isoleucine degradation | 37 | 25 |
| N-Glycan biosynthesis | 32 | 17 |
| Pantothenate and CoA biosynthesis | 34 | 27 |
| Various types of N-glycan biosynthesis | 31 | 17 |
| Other glycan degradation | 47 | 21 |
| Inositol phosphate metabolism | 39 | 33 |
| T cell receptor signaling pathway | 45 | 6 |
| Alpha-Linolenic acid metabolism | 40 | 18 |
| Streptomycin biosynthesis | 39 | 20 |
| Tryptophan metabolism | 43 | 15 |
| Isoquinoline alkaloid biosynthesis | 37 | 24 |
| Selenocompound metabolism | 48 | 27 |
| Propanoate metabolism | 30 | 19 |
| Histidine metabolism | 39 | 26 |
| Nicotinate and nicotinamide metabolism | 45 | 23 |
| Butanoate metabolism | 32 | 21 |
| Linoleic acid metabolism | 26 | 8 |
| Drug metabolism - other enzymes | 40 | 28 |
| Drug metabolism - cytochrome P450 | 28 | 12 |
| Valine, leucine and isoleucine biosynthesis | 26 | 19 |
| Cyanoamino acid metabolism | 29 | 14 |
| Lysine biosynthesis | 32 | 18 |
| Tropane, piperidine and pyridine alkaloid biosynthesis | 29 | 20 |
| Aflatoxin biosynthesis | 12 | 4 |
| Tetracycline biosynthesis | 12 | 4 |
| Biosynthesis of unsaturated fatty acids | 26 | 12 |
| Polyketide sugar and unit biosynthesis | 18 | 8 |
| Novobiocin biosynthesis | 20 | 16 |
| Ascorbate and aldarate metabolism | 32 | 19 |
| mTOR signaling pathway | 28 | 4 |
| Arachidonic acid metabolism | 14 | 8 |
| Metabolism of xenobiotics by cythocrome P450 | 20 | 8 |
| Ubiquinone and other terpenoid-quinone biosynthesis | 22 | 13 |
| Biotin metabolism | 15 | 12 |
| beta-Alanine metabolism | 29 | 20 |
| Sphingolipid metabolism | 37 | 16 |
| Ether lipid metabolism | 21 | 12 |
| Monobactam biosynthesis | 21 | 12 |
| Styrene degradation | 10 | 9 |
| Folate biosynthesis | 17 | 19 |
| Taurine and hypotaurine metabolism | 10 | 8 |
| Butirosin and neomycin biosynthesis | 11 | 5 |
| Glycosphingolipid biosynthesis - ganglio series | 25 | 7 |
| Glycosphingolipid biosynthesis - globo series | 11 | 9 |
| C5-Branched dibasic acid metabolism | 13 | 7 |
| Fatty acid degradation | 13 | 9 |
| Vitamin B6 metabolism | 13 | 10 |
| Steroid biosynthesis | 14 | 14 |
| Fatty acid elongation | 11 | 9 |
| Flavonoid biosynthesis | 14 | 9 |
| Lipopolysaccharide byosynthesis | 6 | 6 |
| Glycosaminoglycan biosynthesis - heparan sulfate / heparin | 14 | 8 |
| Glycosaminoglycan biosynthesis - chondroitin sulfate / derma… | 14 | 8 |
| Glycosaminoglycan degradation | 25 | 7 |
| Steroid degradation | 5 | 4 |
| Toluene degradation | 9 | 5 |
| Geraniol degradation | 9 | 5 |
| Primary bile acid biosynthesis | 8 | 4 |
| Other types of O-glycan biosynthesis | 10 | 4 |
| Carotenoid biosynthesis | 14 | 10 |
| Diterpenoid biosynthesis | 7 | 7 |
| Indole alkaloid biosynthesis | 5 | 5 |
| Synthesis and degradation of ketone bodies | 9 | 6 |
| Peptidoglycan biosynthesis | 3 | 2 |
| Biosynthesis of ansamycins | 11 | 4 |
| Coprolactam degradation | 10 | 6 |
| Caffeine metabolism | 2 | 2 |
| Lipoic acid metabolism | 5 | 3 |
| Photosynthesis | 7 | 5 |
| Sesquiterpenoid and triterpenoid biosynthesis | 3 | 3 |
| Zeatin biosynthesis | 6 | 5 |
| Glucosinolate biosynthesis | 3 | 3 |
| Betalain biosynthesis | 1 | 1 |
| D-Glutamine and D-glutamate metabolism | 2 | 2 |
| Penicillin and cephalosporin biosynthesis | 2 | 2 |
| Glycosphingolipid biosynthesis - lacto and neolacto series | 4 | 4 |
| Cutin, suberine and wax biosynthesis | 4 | 4 |
| beta-Lactam resistance | 2 | 2 |
| Biosynthesis of siderophore group nonribosomal peptides | 2 | 2 |
| Atrazine degradation | 4 | 4 |
| Steroid hormone biosynthesis | 4 | 3 |
| Biosynthesis of vancomycin group antibiotics | 5 | 2 |
| Retinol metabolism | 0 | 0 |
| Anthocyanin biosynthesis | 1 | 1 |
| Chlorocyclohexane and chlorobenzene degradation | 3 | 3 |
| Phosphonate and phosphinate metabolism | 2 | 2 |
| D-Alanine metabolism | 1 | 1 |
| Chloroalkane and chloroalkene degradation | 2 | 2 |
| Carbapenem biosynthesis | 3 | 4 |
| Fluorobenzoate degradation | 1 | 1 |
| Benzoate degradation | 1 | 1 |
| Flavone and flavonol biosynthesis | 1 | 1 |