**Supplementary Table S5.** List of genes enriching pathway PWY-6386 (UDP-N-acetylmuramoyl-pentapeptide biosynthesis II).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Gene ID | Gene name | Reaction id | Reaction EC | Enzymatic activity | p-adj\* | Species |  |  |  |  |  |  |
| G-11845 | murZ | UDPNACETYLGLUCOSAMENOLPYRTRANS-RXN | 2.5.1.7 | UDP-N-acetylglucosamine 1-carboxyvinyltransferase II | 0.0395431 | 2.5.1.7|g\_\_Faecalibacterium.s\_\_Faecalibacterium\_prausnitzii | | | | |  |  |
|  |  |  |  |  | 0.0403042 | 2.5.1.7|g\_\_Eubacterium.s\_\_Eubacterium\_hallii | | | |  |  |  |
| G-11846 | murI | GLUTRACE-RXN | 5.1.1.3 | glutamate racemase | 0.0000143 | 5.1.1.3 |  |  |  |  |  |  |
|  |  |  |  |  | 0.0272091 | 5.1.1.3|unclassified |  |  |  |  |  |  |
| G-11847 | ddl | DALADALALIG-RXN | 6.3.2.4 | D-alanine:D-alanine ligase | 0.0487391 | 6.3.2.4|g\_\_Eubacterium.s\_\_Eubacterium\_hallii | | | |  |  |  |
|  |  |  |  |  | 0.0333478 | 6.3.2.4|g\_\_Faecalibacterium.s\_\_Faecalibacterium\_prausnitzii | | | | |  |  |
| G-9474 | murB | UDPNACETYLMURAMATEDEHYDROG-RXN | 1.3.1.98 | UDP-N-acetylenolpyruvoylglucosamine reductase | 0.02721 | 1.3.1.98|unclassified |  |  |  |  |  |  |
| G-11843 | murC | UDP-NACMUR-ALA-LIG-RXN | 6.3.2.8 | UDP-N-acetylmuramoyl--L-alanine ligase | 0.0000008 | 6.3.2.8 |  |  |  |  |  |  |
|  |  |  |  |  | 0.0403042 | 6.3.2.8|g\_\_Blautia.s\_\_Ruminococcus\_obeum | | | |  |  |  |
|  |  |  |  |  | 0.0456316 | 6.3.2.8|g\_\_Collinsella.s\_\_Collinsella\_aerofaciens | | | |  |  |  |
|  |  |  |  |  | 0.0205323 | 6.3.2.8|g\_\_Eubacterium.s\_\_Eubacterium\_hallii | | | |  |  |  |
|  |  |  |  |  | 0.0385965 | 6.3.2.8|g\_\_Faecalibacterium.s\_\_Faecalibacterium\_prausnitzii | | | | |  |  |
|  |  |  |  |  | 0.0395431 | 6.3.2.8|unclassified |  |  |  |  |  |  |
| G-9476 | murD | UDP-NACMURALA-GLU-LIG-RXN | 6.3.2.9 | UDP-N-acetylmuramoylalanine--D-glutamate ligase | 0.00001 | 6.3.2.9 |  |  |  |  |  |  |
|  |  |  |  |  | 0.0456316 | 6.3.2.9|g\_\_Faecalibacterium.s\_\_Faecalibacterium\_prausnitzii | | | | |  |  |
|  |  |  |  |  | 0.0094958 | 6.3.2.9|unclassified |  |  |  |  |  |  |
| G-9475 | murF | 6.3.2.10-RXN | 6.3.2.10 | UDP-N-acetylmuramoyl-tripeptide--D-alanyl-D-alanine ligase II | 0.0000237 | 6.3.2.10 |  |  |  |  |  |  |
|  |  |  |  |  | 0.0403042 | 6.3.2.10|g\_\_Faecalibacterium.s\_\_Faecalibacterium\_prausnitzii | | | | |  |  |
|  |  |  |  |  | 0.0272091 | 6.3.2.10|unclassified |  |  |  |  |  |  |
| G-11844\* | murA | UDPNACETYLGLUCOSAMENOLPYRTRANS-RXN | 2.5.1.7 | UDP-N-acetylglucosamine 1-carboxyvinyltransferase I | Did not pass filter |  |  |  |  |  |  |  |
| G-9473\* | murE | 6.3.2.10-RXN | 6.3.2.10 | UDP-N-acetylmuramoyl-tripeptide--D-alanyl-D-alanine ligase I | Did not pass filter |  |  |  |  |  |  |  |
| \*p-adj: adjusted p-value from the Wilcoxon's signed rank test for assessing the statistical significance of differentially abunadant genes between young and older age groups. | | | | | | | | | | | | |