

Supplementary Table 8: GO profiling of essential fission yeast genes conserved in eukaryotes and bacteria

| GO ID | GO term | Corrected <i>P</i> -value | Essential in eukaryotes and bacteria gene annotation | Total annotation |
|----------------------------------------------------------------------|---------------------------------------------------------|---------------------------|------------------------------------------------------|------------------|
| 1. Macromolecule metabolism and cellular biosynthesis | | | | |
| GO:0034961 | cellular biopolymer biosynthetic process | 2.47e-25 | 108 | 946 |
| GO:0034645 | cellular macromolecule biosynthetic process | 2.26e-22 | 111 | 1,047 |
| GO:0034960 | cellular biopolymer metabolic process | 1.46e-15 | 121 | 1,452 |
| GO:0044267 | cellular protein metabolic process | 4.35e-10 | 95 | 1,155 |
| GO:0044260 | cellular macromolecule metabolic process | 3.26e-09 | 139 | 2,137 |
| 2. Macromolecular complex assembly (mitochondrial associated) | | | | |
| GO:0007005 | mitochondrion organization | 8.21e-37 | 65 | 222 |
| GO:0016226 | iron-sulfur cluster assembly | 0.0081 | 6 | 15 |
| 3. Mitochondrial translation | | | | |
| GO:0032543 | mitochondrial translation | 5.26 e-45 | 56 | 117 |
| GO:0006418 | tRNA aminoacylation for protein translation | 2.02e-37 | 32 | 37 |
| GO:0006412 | translation | 7.90e-45 | 87 | 353 |
| GO:0006399 | tRNA metabolic process | 7.18e-28 | 44 | 123 |
| GO:0034660 | ncRNA metabolic process | 3.76e-15 | 46 | 258 |
| GO:0010467 | gene expression | 4.50e-18 | 109 | 1,134 |
| 4. Low molecular weight primary metabolic processes | | | | |
| GO:0019752 | carboxylic acid metabolic process | 1.17e-21 | 54 | 260 |
| GO:0006520 | amino acid metabolic process | 1.95e-20 | 45 | 186 |
| GO:0051186 | cofactor metabolic process | 2.09e-19 | 38 | 135 |
| GO:0006732 | coenzyme metabolic process | 1.03e-12 | 27 | 100 |
| GO:0009117 | nucleotide metabolic process | 4.81e-09 | 21 | 82 |
| GO:0055086 | nucleobase, nucleoside and nucleotide metabolic process | 4.32e-08 | 23 | 110 |
| GO:0009108 | coenzyme biosynthetic process | 5.74e-07 | 15 | 51 |
| GO:0009165 | nucleotide biosynthetic process | 1.25e-06 | 14 | 46 |
| GO:0006006 | glucose metabolic process | 5.16e-05 | 12 | 43 |
| GO:0015936 | coenzyme A metabolic process | 5.42e-05 | 5 | 5 |
| GO:0019318 | hexose metabolic process | 0.0002 | 13 | 56 |
| GO:0006766 | vitamin metabolic process | 0.0002 | 13 | 57 |
| GO:0006007 | glucose catabolic process | 0.0002 | 10 | 32 |
| GO:0019362 | pyridine nucleotide metabolic process | 0.0005 | 9 | 28 |

| | | | | |
|------------|------------------------------------------------------|--------|----|-----|
| GO:0009147 | pyrimidine nucleoside triphosphate metabolic process | 0.0003 | 5 | 6 |
| GO:0046365 | monosaccharide catabolic process | 0.0001 | 10 | 38 |
| GO:0006066 | cellular alcohol metabolic process | 0.0035 | 18 | 131 |
| GO:0006769 | nicotinamide metabolic process | 0.0015 | 8 | 24 |
| GO:0006213 | pyrimidine nucleoside metabolic process | 0.0010 | 5 | 7 |
| GO:0009120 | deoxyribonucleoside metabolic process | 0.0012 | 4 | 4 |
| GO:0015937 | coenzyme A biosynthetic process | 0.0012 | 4 | 4 |
| GO:0046125 | pyrimidine deoxyribonucleoside metabolic process | 0.0062 | 4 | 5 |
| GO:0046164 | alcohol catabolic process | 0.0045 | 10 | 44 |
| GO:0032787 | monocarboxylic acid metabolic process | 0.0061 | 13 | 76 |
| GO:0006098 | pentose-phosphate shunt | 0.0030 | 6 | 13 |
| GO:0006740 | NADPH regeneration | 0.0030 | 6 | 13 |
| GO:0006739 | NADP metabolic process | 0.0050 | 6 | 14 |

The number of essential genes conserved in eukaryotes and bacteria is 207, and the total gene number is 4,836.