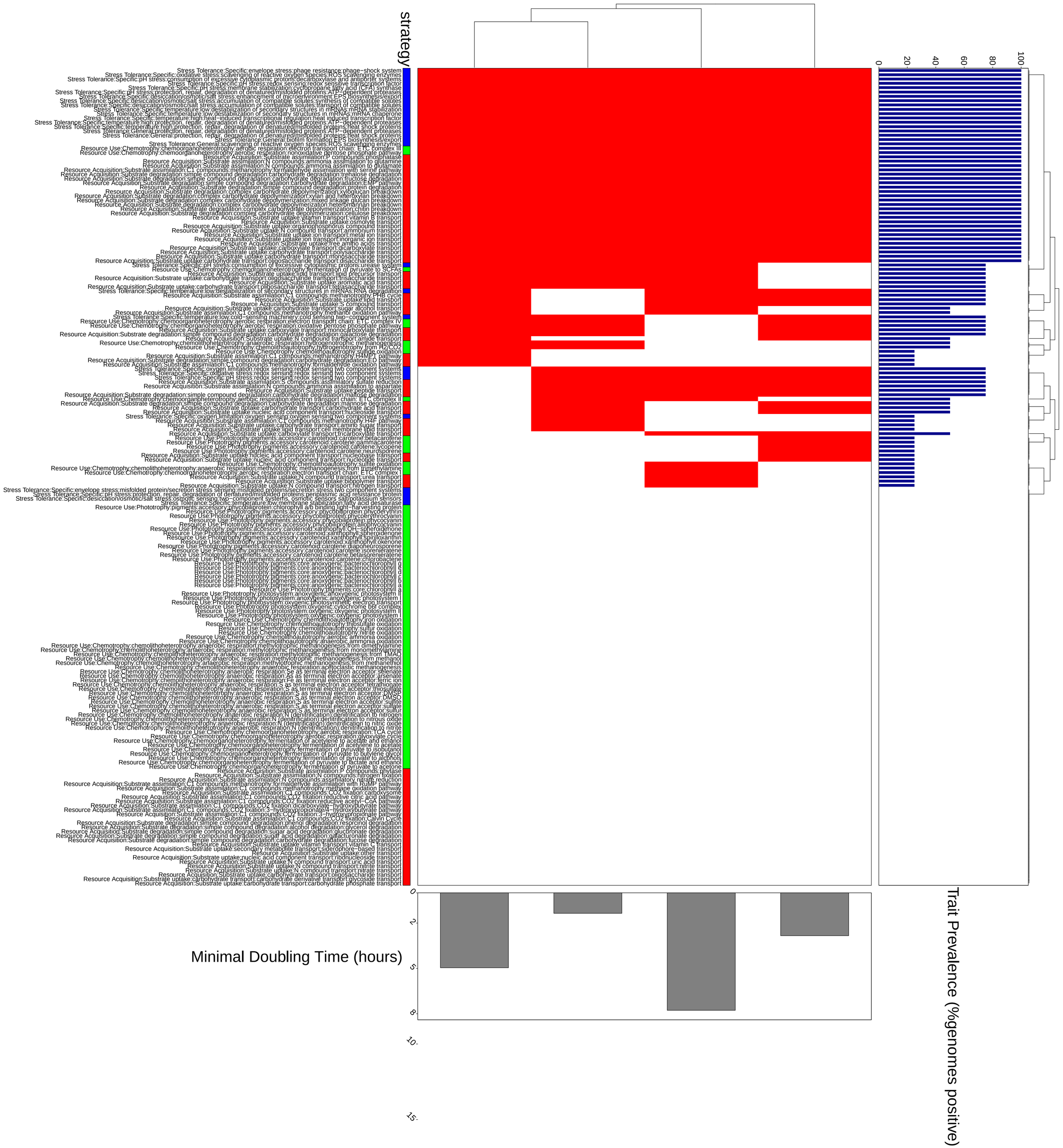
strategy
Stress Tolerance:Specific:envelope stress:phage resistance:phage--shock system
Stress Tolerance:Specific:oxidative stress:scavenging of reactive oxygen species:ROS scavenging enzymes
Stress Tolerance:Specific:pH stress:consumption of excessive cytoplasmic protons:decarboxylase and antiporter systems
Stress Tolerance:Specific:pH stress:redox sensing:redox sensitive transcription factor
Stress Tolerance:Specific:pH stress:membrane stabilization:cyclopropane fatty acid (CFA) synthase
Stress Tolerance:Specific:pH stress:protection, repair, degradation of denatured/misfolded proteins:ATP--dependent proteases
Stress Tolerance:Specific:desiccation/osmotic/salt stress:enhancement of microenvironment:EPS biosynthesis/export
Stress Tolerance:Specific:desiccation/osmotic/salt stress:accumulation of compatible solutes:synthesis of compatible solutes
Stress Tolerance:Specific:desiccation/osmotic/salt stress:accumulation of compatible solutes:transport of compatible solutes
Stress Tolerance:Specific:temperature:low:destabilization of secondary structures in mRNAs:mRNA stabilization
Stress Tolerance:Specific:temperature:low:destabilization of secondary structures in mRNAs:mRNA chaperone
Stress Tolerance:Specific:temperature:high:heat--induced transcriptional regulation:heat induced transcription factor
Stress Tolerance:Specific:temperature:high:protection, repair, degradation of denatured/misfolded proteins:ATP--dependent proteases
Stress Tolerance:Specific:temperature:high:protection, repair, degradation of denatured/misfolded proteins:ATP--dependent proteases
Stress Tolerance:General:protection, repair, degradation of denatured/misfolded proteins:ATP--dependent proteases
Stress Tolerance:General:protection, repair, degradation of denatured/misfolded proteins:heat shock proteins
Stress Tolerance:General:biofilm formation:EPS biosynthesis/export
Stress Tolerance:General:scavenging of reactive oxygen species:ROS scavenging enzymes
Resource Use:Chemotrophy:chemoorganoheterotrophy:aerobic respiration:electron transport chain:ETC complex I II
Resource Use:Chemotrophy:chemoorganoheterotrophy:aerobic respiration:nonoxidative pentose phosphate pathway
Resource Acquisition:Substrate assimilation:P compounds:phosphatase
Resource Acquisition:Substrate assimilation:N compounds:ammonia assimilation to glutamine
Resource Acquisition:Substrate assimilation:N compounds:ammonia assimilation to glutamate
Resource Acquisition:Substrate assimilation:C1 compounds:methanotrophy:formaldehyde assimilation with serine pathway
Resource Acquisition:Substrate degradation:simple compound degradation:carbohydrate degradation:trehalose degradation
Resource Acquisition:Substrate degradation:simple compound degradation:carbohydrate degradation:fructose degradation
Resource Acquisition:Substrate degradation:simple compound degradation:carbohydrate degradation:EMP pathway
Resource Acquisition:Substrate degradation:simple compound degradation:protein degradation
Resource Acquisition:Substrate degradation:complex carbohydrate depolymerization:xylan degradation
Resource Acquisition:Substrate degradation:complex carbohydrate depolymerization:xylan and heteroxylan breakdown
Resource Acquisition:Substrate degradation:complex carbohydrate depolymerization:mixed linkage glucan breakdown
Resource Acquisition:Substrate degradation:complex carbohydrate depolymerization:heteromannan breakdown
Resource Acquisition:Substrate degradation:complex carbohydrate depolymerization:chitin breakdown
Resource Acquisition:Substrate degradation:complex carbohydrate depolymerization:cellulose breakdown
Resource Acquisition:Substrate uptake:vitamin transport:vitamin B transport
Resource Acquisition:Substrate uptake:osmolyte transport
Resource Acquisition:Substrate uptake:organophosphorus compound transport
Resource Acquisition:Substrate uptake:N compound transport:ammonium transport
Resource Acquisition:Substrate uptake:ion transport:metal ion transport
Resource Acquisition:Substrate uptake:ion transport:inorganic ion transport
Resource Acquisition:Substrate uptake:free amino acids transport
Resource Acquisition:Substrate uptake:carboxylate transport:dicarboxylate transport
Resource Acquisition:Substrate uptake:carbohydrate transport:polysaccharide transport
Resource Acquisition:Substrate uptake:carbohydrate transport:monosaccharide transport
Resource Acquisition:Substrate uptake:carbohydrate transport:oligosaccharide transport:disaccharide transport
Stress Tolerance:Specific:pH stress:consumption of excessive cytoplasmic protons:urease system
Resource Use:Chemotrophy:chemoorganoheterotrophy:fermentation of pyruvate to SCFAs
Resource Acquisition:Substrate uptake:lipid transport:lipid precursor transport
Resource Acquisition:Substrate uptake:carbohydrate transport:oligosaccharide transport:trisaccharide transport
Resource Acquisition:Substrate uptake:aromatic acid transport
Resource Acquisition:Substrate uptake:carbohydrate transport:oligosaccharide transport:tetrasaccharide transport
Stress Tolerance:Specific:temperature:low:destabilization of secondary structures in mRNAs:RNA degradation
Resource Acquisition:Substrate assimilation:C1 compounds:methanotrophy:PHB cycle
Resource Acquisition:Substrate uptake:lipid transport
Resource Acquisition:Substrate uptake:S compound transport
Resource Acquisition:Substrate uptake:carbohydrate transport:sugar alcohol transport
Resource Acquisition:Substrate assimilation:C1 compounds:methanotrophy:methanol oxidation pathway
Stress Tolerance:Specific:temperature:low:cold--sensing machinery:cold sensing two--component system
Resource Use:Chemotrophy:chemoorganoheterotrophy:aerobic respiration:electron transport chain:ETC complex IV
Resource Use:Chemotrophy:chemoorganoheterotrophy:aerobic respiration:oxidative pentose phosphate pathway
Resource Acquisition:Substrate uptake:carbohydrate transport:monocarboxylate transport
Resource Acquisition:Substrate degradation:simple compound degradation:carbohydrate degradation:galactose degradation
Resource Acquisition:Substrate uptake:N compound transport:amide transport
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:hydrogenotrophic methanogenesis
Resource Use:Chemotrophy:chemolithoautotrophy:hydrogenotrophy:from H2/CO2
Resource Use:Chemotrophy:chemolithoautotrophy:sulfide oxidation
Resource Acquisition:Substrate assimilation:C1 compounds:methanotrophy:H4MPT pathway
Resource Acquisition:Substrate degradation:simple compound degradation:carbohydrate degradation:ED pathway
Resource Acquisition:Substrate assimilation:C1 compounds:methanotrophy:formaldehyde oxidation pathway
Stress Tolerance:Specific:oxygen limitation:redox sensing:redox sensing two component systems
Stress Tolerance:Specific:oxidative stress:redox sensing:redox sensing two component systems
Stress Tolerance:Specific:pH stress:redox sensing:redox sensing two component systems
Resource Acquisition:Substrate assimilation:S compounds:assimilatory sulfate reduction
Resource Acquisition:Substrate assimilation:N compounds:ammonia assimilation to aspartate
Resource Acquisition:Substrate uptake:peptide transport
Resource Acquisition:Substrate degradation:simple compound degradation:carbohydrate degradation:maltose degradation
Resource Use:Chemotrophy:chemoorganoheterotrophy:aerobic respiration:electron transport chain:ETC complex I
Resource Acquisition:Substrate degradation:simple compound degradation:carbohydrate degradation:mannose degradation
Resource Acquisition:Substrate uptake:carbohydrate transport:carbohydrate acid transport
Resource Acquisition:Substrate uptake:nucleic acid component transport:nucleoside transport
Stress Tolerance:Specific:oxygen limitation:oxygen sensing:oxygen sensing two component systems
Resource Acquisition:Substrate assimilation:C1 compounds:methanotrophy:H4F pathway
Resource Acquisition:Substrate uptake:carbohydrate transport:amino sugar transport
Resource Acquisition:Substrate uptake:lipid transport:cell membrane lipid transport
Resource Acquisition:Substrate uptake:carboxylate transport:tricarboxylate transport
Resource Use:Phototrophy:pigments:accessory:carotenoid:carotene:betacarotene
Resource Use:Phototrophy:pigments:accessory:carotenoid:carotene:gammacarotene
Resource Use:Phototrophy:pigments:accessory:carotenoid:carotene:lycopene
Resource Use:Phototrophy:pigments:accessory:carotenoid:carotene:neurosporene
Resource Acquisition:Substrate uptake:nucleic acid component transport:nucleobase transport
Resource Acquisition:Substrate uptake:nucleic acid component transport:nucleotide transport
Resource Use:Chemotrophy:chemolithoautotrophy:sulfite oxidation
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:methylotrophic methanogenesis:from trimethylamine
Resource Use:Chemotrophy:chemoorganoheterotrophy:aerobic respiration:electron transport chain:ETC complex
Resource Acquisition:Substrate uptake:N compound transport:urea transport
Resource Acquisition:Substrate uptake:polymer transport
Resource Acquisition:Substrate uptake:N compound transport:nitrogen transport
Stress Tolerance:Specific:envelope stress:misfolded protein/secretion stress sensing:misfolded proteins/secretion stress two component systems
Stress Tolerance:Specific:pH stress:protection, repair, degradation of denatured/misfolded proteins:periplasmic acid resistance protein
Stress Tolerance:Specific:desiccation/osmotic/salt stress:osmotic sensing:two--component systems, osmotic sensors:salt/potassium sensors
Stress Tolerance:Specific:temperature:low:membrane stabilization:fatty acid desaturase
Resource Use:Phototrophy:pigments:accessory:phycobiliprotein:chlorophyll a/b binding light--harvesting protein
Resource Use:Phototrophy:pigments:accessory:phycobiliprotein:phycoerythrin
Resource Use:Phototrophy:pigments:accessory:phycobiliprotein:phycoerythrocyanin
Resource Use:Phototrophy:pigments:accessory:phycobiliprotein:phycocyanin
Resource Use:Phototrophy:pigments:accessory:phycobiliprotein:allophycocyanin
Resource Use:Phototrophy:pigments:accessory:carotenoid:xanthophyll:OH--spheroidenone
Resource Use:Phototrophy:pigments:accessory:carotenoid:xanthophyll:spheroidenone
Resource Use:Phototrophy:pigments:accessory:carotenoid:xanthophyll:spirilloxanthin
Resource Use:Phototrophy:pigments:accessory:carotenoid:xanthophyll:okenone
Resource Use:Phototrophy:pigments:accessory:carotenoid:carotene:diapolycopenedioic acid xanthophyll ester
Resource Use:Phototrophy:pigments:accessory:carotenoid:carotene:isorenieratene
Resource Use:Phototrophy:pigments:accessory:carotenoid:carotene:beta-isorenieratene
Resource Use:Phototrophy:pigments:accessory:carotenoid:carotene:chlorobactene
Resource Use:Phototrophy:pigments:core:anoxygenic:bacteriochlorophyll a
Resource Use:Phototrophy:pigments:core:anoxygenic:bacteriochlorophyll e
Resource Use:Phototrophy:pigments:core:anoxygenic:bacteriochlorophyll g
Resource Use:Phototrophy:pigments:core:anoxygenic:bacteriochlorophyll c
Resource Use:Phototrophy:pigments:core:anoxygenic:bacteriochlorophyll d
Resource Use:Phototrophy:pigments:core:anoxygenic:bacteriochlorophyll f
Resource Use:Phototrophy:pigments:core:anoxygenic:bacteriochlorophyll b
Resource Use:Phototrophy:pigments:core:anoxygenic:bacteriochlorophyll a
Resource Use:Phototrophy:pigments:core:chlorophyll a
Resource Use:Phototrophy:photosystem:anoxygenic:anoxygenic photosystem II
Resource Use:Phototrophy:photosystem:anoxygenic:anoxygenic photosystem I
Resource Use:Phototrophy:photosystem:oxygenic:photosynthetic electron Transport
Resource Use:Phototrophy:photosystem:oxygenic:cytochrome b6f complex
Resource Use:Phototrophy:photosystem:oxygenic:oxygenic photosystem II
Resource Use:Phototrophy:photosystem:oxygenic:oxygenic photosystem I
Resource Use:Chemotrophy:chemolithoautotrophy:iron oxidation
Resource Use:Chemotrophy:chemolithoautotrophy:thiosulfate oxidation
Resource Use:Chemotrophy:chemolithoautotrophy:sulfur oxidation
Resource Use:Chemotrophy:chemolithoautotrophy:nitrite oxidation
Resource Use:Chemotrophy:chemolithoautotrophy:aerobic ammonia oxidation
Resource Use:Chemotrophy:chemolithoautotrophy:anaerobic ammonia oxidation
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:methylotrophic methanogenesis:from dimethylamine
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:methylotrophic methanogenesis:from monomethylamine
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:methylotrophic methanogenesis:from TMAO
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:methylotrophic methanogenesis:from methanol
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:methylotrophic methanogenesis:from methanethiol
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:acetoclastic methanogenesis
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:Se as terminal electron acceptor:selenate
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:As as terminal electron acceptor:arsenate
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:Fe as terminal electron acceptor:ferric ion
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:S as terminal electron acceptor:tetrathionate
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:S as terminal electron acceptor:thiosulfate
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:S as terminal electron acceptor:DMSO
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:S as terminal electron acceptor:sulfite
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:S as terminal electron acceptor:sulfate
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:S as terminal electron acceptor:sulfur
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:N (denitrification):denitrification to nitrogen
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:N (denitrification):denitrification to nitrous oxide
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:N (denitrification):denitrification to nitric oxide
Resource Use:Chemotrophy:chemolithoheterotrophy:anaerobic respiration:N (denitrification):denitrification to nitrite
Resource Use:Chemotrophy:chemoorganoheterotrophy:aerobic respiration:TCA cycle
Resource Use:Chemotrophy:chemoorganoheterotrophy:aerobic respiration:glyoxylate cycle
Resource Use:Chemotrophy:chemoorganoheterotrophy:fermentation:of acetylene to acetate and ethanol
Resource Use:Chemotrophy:chemoorganoheterotrophy:fermentation:of acetylene to acetate
Resource Use:Chemotrophy:chemoorganoheterotrophy:fermentation:of pyruvate to isobutanol
Resource Use:Chemotrophy:chemoorganoheterotrophy:fermentation:of pyruvate to butylene glycol
Resource Use:Chemotrophy:chemoorganoheterotrophy:fermentation:of pyruvate to alcohols
Resource Use:Chemotrophy:chemoorganoheterotrophy:fermentation:of pyruvate to lactate and ethanol
Resource Use:Chemotrophy:chemoorganoheterotrophy:fermentation:of pyruvate to acetone
Resource Acquisition:Substrate assimilation:P compounds:phytase
Resource Acquisition:Substrate assimilation:N compounds:nitrogen fixation
Resource Acquisition:Substrate assimilation:N compounds:assimilatory nitrate reduction
Resource Acquisition:Substrate assimilation:C1 compounds:methanotrophy:formaldehyde assimilation with RuMP pathway
Resource Acquisition:Substrate assimilation:C1 compounds:methanotrophy:methane oxidation pathway
Resource Acquisition:Substrate assimilation:C1 compounds:CO2 fixation:carboxysome
Resource Acquisition:Substrate assimilation:C1 compounds:CO2 fixation:reductive citric acid pathway
Resource Acquisition:Substrate assimilation:C1 compounds:CO2 fixation:reductive acetyl--CoA pathway
Resource Acquisition:Substrate assimilation:C1 compounds:CO2 fixation:dicarboxylate--hydroxybutyrate pathway
Resource Acquisition:Substrate assimilation:C1 compounds:CO2 fixation:3--hydroxypropionate/4--hydroxybutyrate pathway
Resource Acquisition:Substrate assimilation:C1 compounds:CO2 fixation:3--hydroxypropionate pathway
Resource Acquisition:Substrate assimilation:C1 compounds:CO2 fixation:Calvin cycle
Resource Acquisition:Substrate degradation:simple compound degradation:phenol degradation:resorcinol degradation
Resource Acquisition:Substrate degradation:simple compound degradation:alcohol degradation:glycerol degradation
Resource Acquisition:Substrate degradation:simple compound degradation:sugar acid degradation:glucuronate degradation
Resource Acquisition:Substrate degradation:simple compound degradation:sugar acid degradation:galacturonate degradation
Resource Acquisition:Substrate degradation:simple compound degradation:carbohydrate degradation:fucose degradation
Resource Acquisition:Substrate uptake:vitamin transport:vitamin C transport
Resource Acquisition:Substrate uptake:secondary metabolite transport:siderophore--based transport
Resource Acquisition:Substrate uptake:other transport
Resource Acquisition:Substrate uptake:nucleic acid component transport:ribonucleoside transport
Resource Acquisition:Substrate uptake:N compound transport:uric acid transport
Resource Acquisition:Substrate uptake:N compound transport:nitrite transport
Resource Acquisition:Substrate uptake:N compound transport:nitrate transport
Resource Acquisition:Substrate uptake:carbohydrate transport:oligosaccharide transport
Resource Acquisition:Substrate uptake:carbohydrate transport:carbohydrate derivative transport:glycoside transport
Resource Acquisition:Substrate uptake:carbohydrate transport:carbohydrate phosphate transport
0
20
40
60
80
100
Trait Prevalence (%genomes positive)
0
2
5
8
10
15
Minimal Doubling Time (hours)