

## **An oligotrophic deep subsurface community dependent on syntrophy is dominated by sulfur-driven autotrophic denitrifiers**

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### **SI Appendix**

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SI Materials and Methods

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## SI Materials and Methods

**Reverse transcription PCR-cloning.** Total RNA was extracted from a Whatman<sup>TM</sup> polycap 36 TC filter (0.2  $\mu\text{m}$  pore size), which was collected during the same campaign in 2012 July, using the RNA PowerSoil<sup>®</sup> Total RNA Isolation Kit (MO BIO Lab Inc., CA) by following the manufacturer's protocol, except that phenol/chloroform/isoamyl alcohol (25:24:1) solution was pre-warmed to 60°C. DNA was removed using DNase I as described above. A complementary DNA (cDNA) library was constructed from total RNA by following the procedure of the iScript<sup>TM</sup> cDNA Synthesis Kit (Bio-Rad Lab, CA).

PCR was performed targeting 16S rRNA of Archaea and Bacteria, and marker genes of diazotrophs, methanotrophs and methanogens. Archaeal 16S rRNA gene sequences were generated using ARC-109F (5'-ACK GCT CAG TAA CAC GT-3')(1) and ARC-915R (5-GTG CTC CCC CGC CAA TTC CT-3')(2). Bacterial 16S rRNA gene sequences were generated using BAC-S-8Fa (5'-AGR GTT YGA TYM TGG CTC AG-3')(3) and BAC-S-926R (5'-CCG TCA ATT CMT TTR AGT TT-3')(4). *NifH* gene sequences, encoding the subunit H of nitrogenase reductase, were generated using *nifH*\_PolF (5'-TGC GAY CCS AAR GCB GAC TC-3') and *nifH*\_PolR (5-ATS GCC ATC ATY TCR CCG GA-3')(5). *PmoA* gene sequences, encoding the subunit A of particulate methane monooxygenase, were generated using A189m (5'-GGN GAY TGG GAC TTY TGG-3') modified from Holmes *et al.* (6) and A682m\_a (5'-GAA YSC NGA RAA GAA CGM-3') modified from Luesken *et al.* (7). *McrA* gene sequences, encoding subunit A of the methyl coenzyme M, were generated using Mlas (5'-GGT GGT GTM GGD TTC ACM CAR TA-3')(8) and *mcrA*-rev (5'-CGT TCA TBG CGT AGT TVG GRT AGT-3')(9).

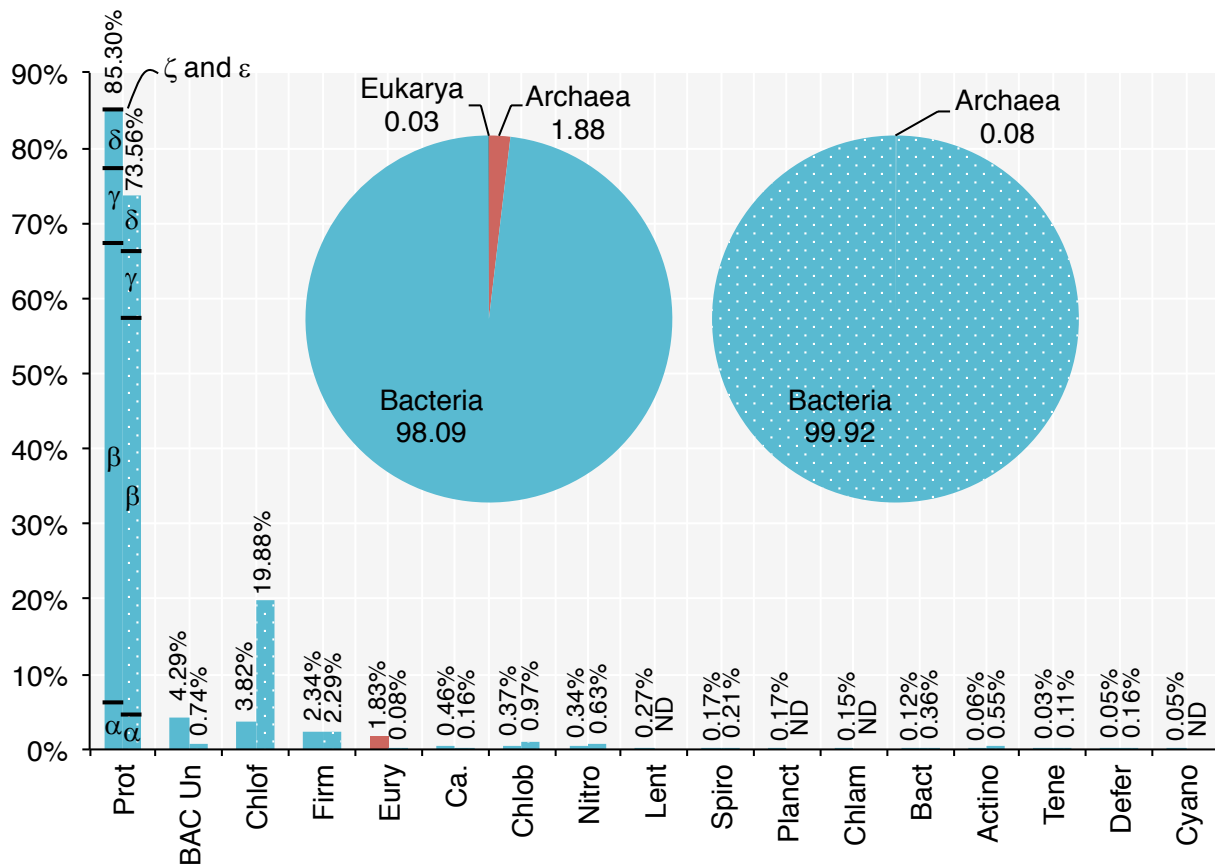
A 50  $\mu\text{L}$ -reaction contained cDNA templates plus the following reagents (final concentration): forward and reverse primer (200 nM), Takara PCR Buffer (1X), dNTPs (0.5  $\mu\text{M}$ ), Tween 20 (1/500 vol/vol), Takara *Taq* polymerase (5U/ $\mu\text{L}$ ) and nuclease-free water. All PCR amplification reactions were performed on a C1000 Touch thermal cycler using the following thermal profile: an initial denaturation at 94°C for 5 minutes; followed by 34 cycles of the next 3 steps, 1 minute at 94°C, 1 minute at an annealing temperature of 50°C, and 1 minute at an elongation temperature of 74°C; a final extension at 74°C lasted for 10 minutes. PCR amplifications of the treated RNA yielded no PCR products after 35 cycles, indicating the sample was free from DNA contamination.

Multiple reactions of each gene were pooled to reduce tube-to-tube variation and purified using the Qiagen PCR Purification Kit. The amplicons were then ligated into pGEM-T Easy vectors and finally transformed into competent *E. coli* cells using the Promega Cloning Kit (USA). The competent cells underwent a heat shock at 42° for 45 seconds, and then were incubated overnight at 37°C on LB agar plates containing ampicillin (10 mg mL<sup>-1</sup>). White colonies were picked and screened for inserts using standard M13F and M13R primers by PCR. No clones containing *pmoA* genes were obtained. The final PCR products of expected insert size were sequenced by Sanger sequencing (MacrogenUSA).

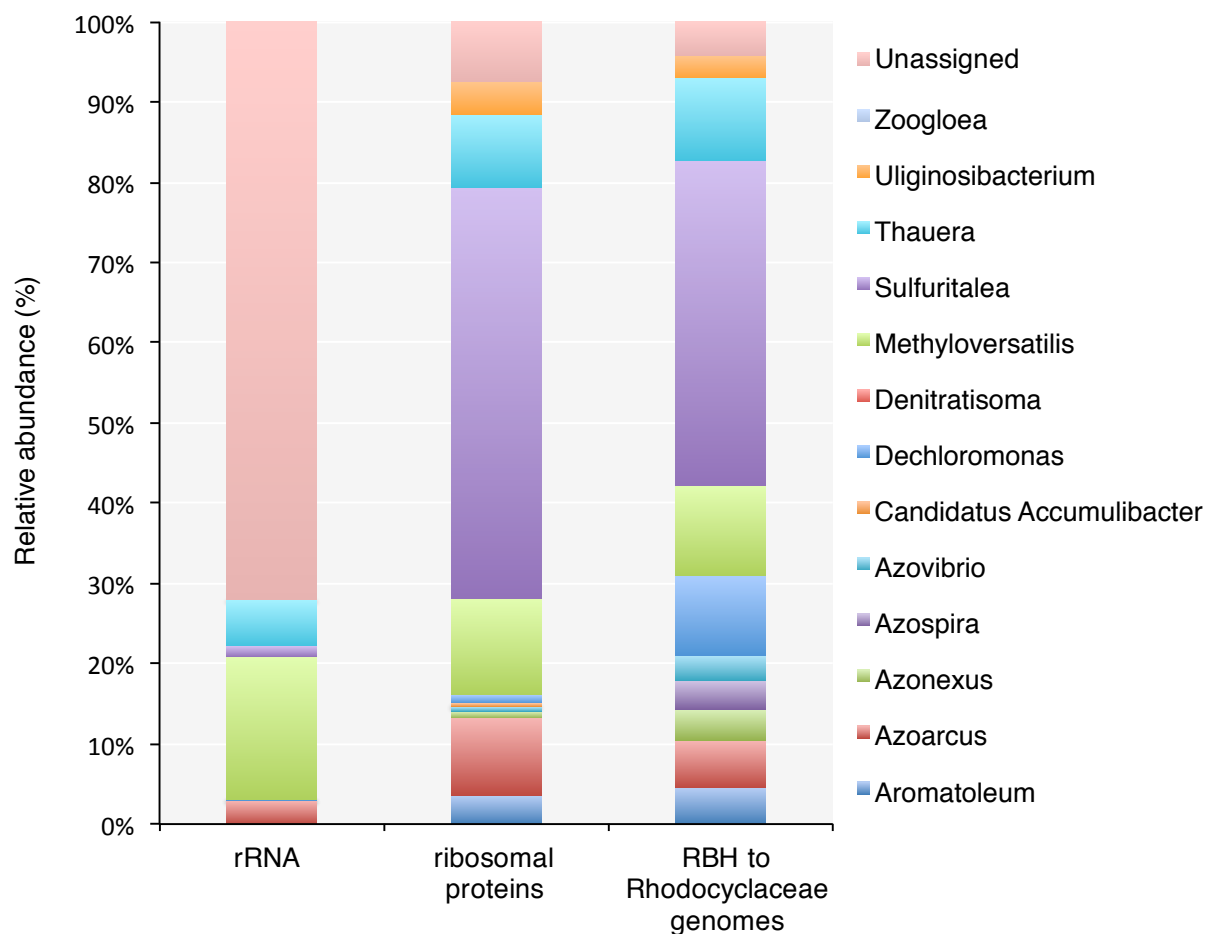
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2. Reysenbach A-L, R N (1994) Reliable amplification of hyperthermophilic archaeal 16S rRNA genes by the polymerase chain reaction. In: *Archaea - A Laboratory Manual: Thermophiles*,

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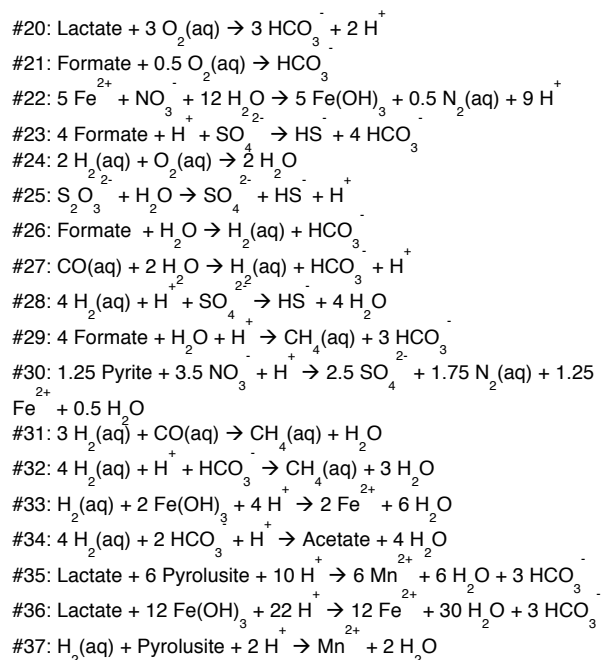
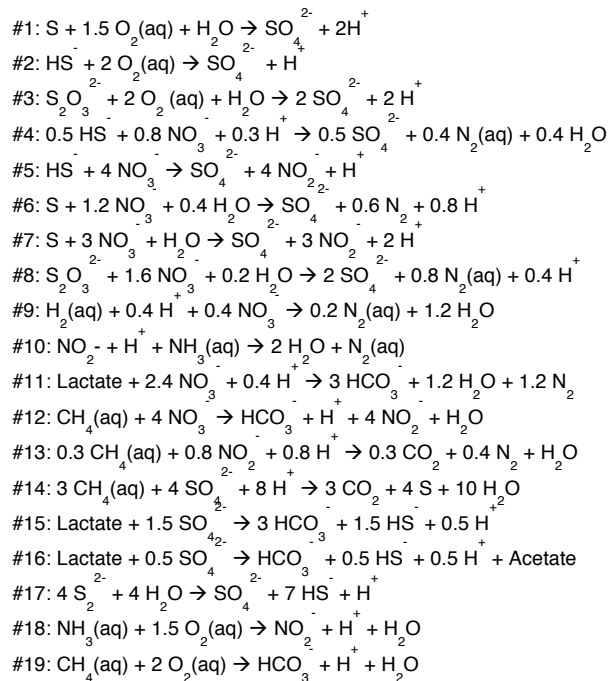
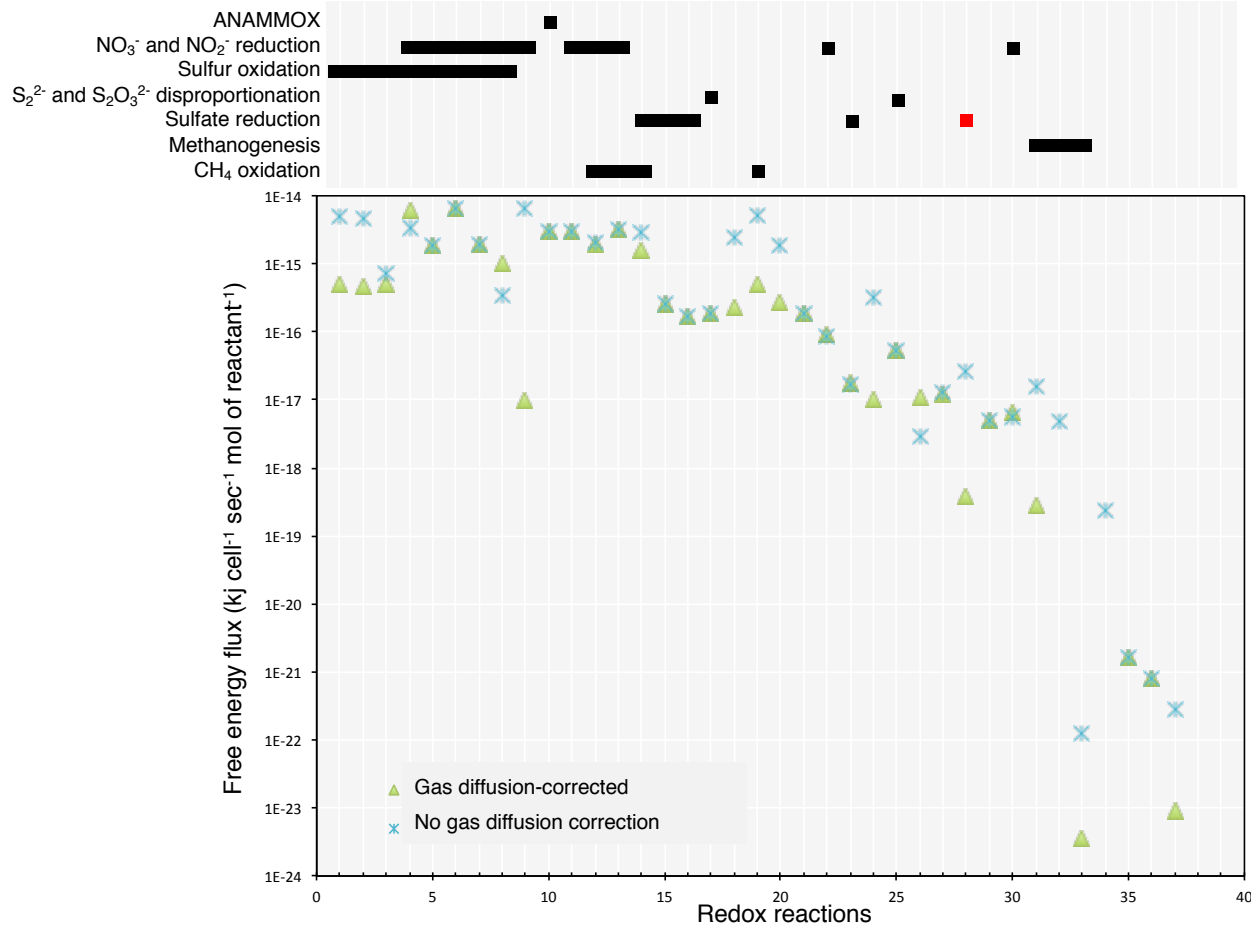
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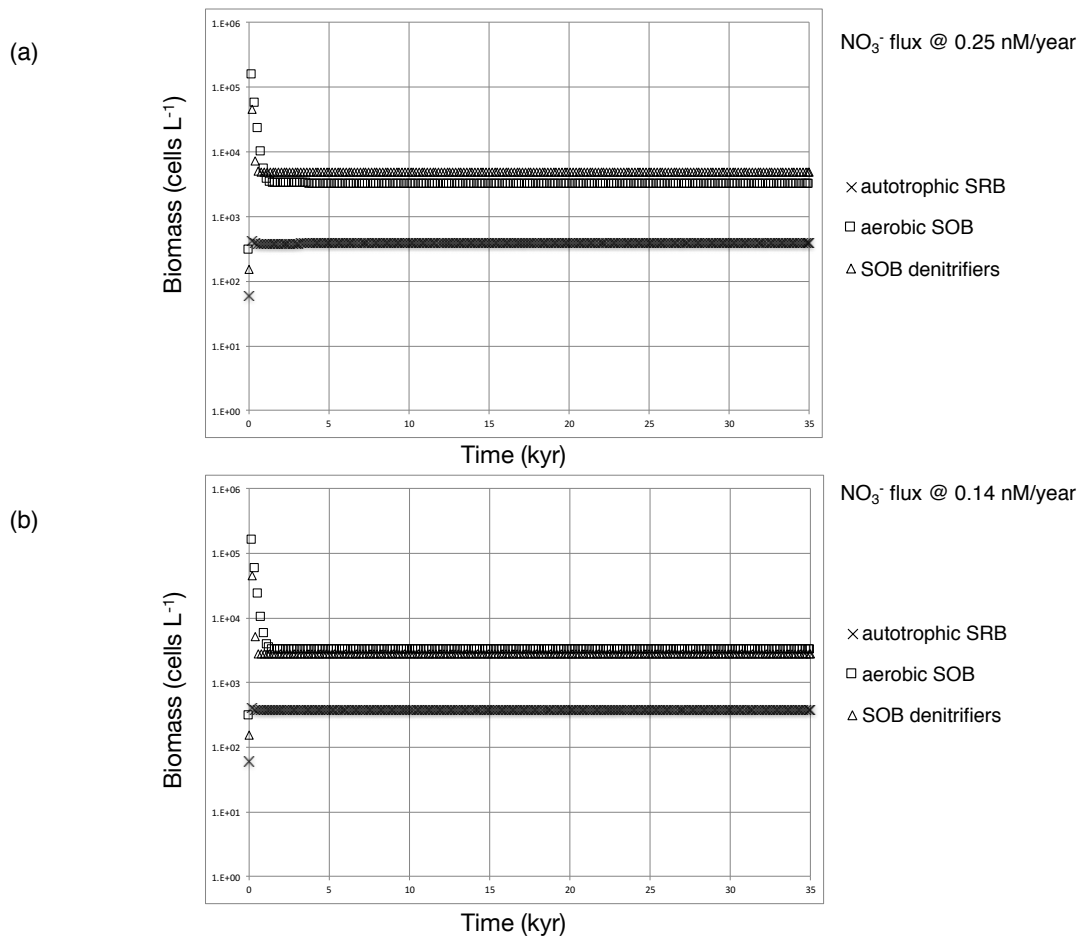
**Fig. S1. Taxonomic compositions revealed by small and large subunits of ribosomal RNA (rRNA) transcripts and ribosomal protein-encoding genes.** Dotted patterns represent ribosomal protein data in the transcriptome. Red indicates Archaea and blue indicates Bacteria. The relative abundances at that domain level are shown in pie charts. In total, 39 phyla were detected but only those showed >0.05% relative abundance are included in the bar graphs, which are arranged in decreasing abundance in the rRNA transcriptome. Abbreviations: Prot, Proteobacteria; BAC Un, unassigned bacteria; Chlof, Chloroflexi; Firm, Firmicutes; Eury, Euryarchaeota; Ca., Candidatus divisions; Chlob, Chlorobi; Nitro, Nitrospirae; Lent, Lentisphaerae; Spiro, Spirochaetae; Planct, Planctomycetes; Chlam, Chlamydiae; Bact, Bacteroidetes; Actino, Actinobacteria; Tene, Tenericutes; Defer, Deferribacteres; Cyano, Cyanobacteria; ND, not detected.



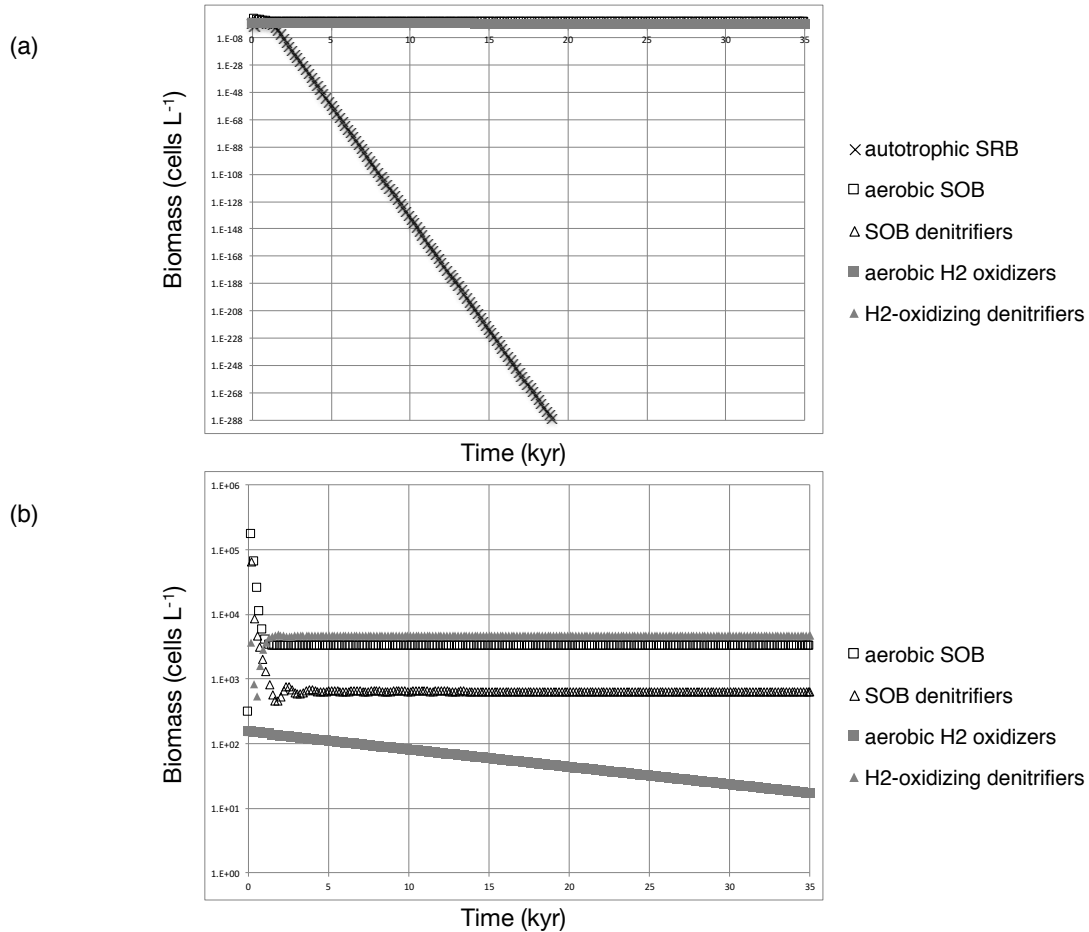
**Fig. S2. Relative abundance of genera within Rhodocyclaceae.** The  $\beta$ -proteobacterial family Rhodocyclaceae dominated the taxonomic profiles as revealed by ribosomal RNA (rRNA) and ribosomal protein encoding genes (PEGs) (25.7% and 39.4%, respectively). The relative distributions of its genera were further examined using reciprocal best-hit (RBH) BLAST approach between all PEG transcripts assembled in this study and 21 published genomes downloaded from NCBI.



**Fig. S3. Free energy fluxes estimated from the fluid chemistry for both the measured concentrations and for the diffusion-corrected gas concentrations.**



**Fig. S4. Simulated cell concentrations of sulfate reducers (SRB) and sulfate oxidizers (SOB) over 35,000 years.** Using the parameters in Table S1, the groundwater chemistry of BE326 Bh2 and the fluxes of  $\text{H}_2$ ,  $\text{SO}_4^{2-}$ ,  $\text{O}_2$  and  $\text{NO}_3^-$ , the cellular abundance (converted from mg/kg output from GWB) of the autotrophic SRB, aerobic SOB and SOB denitrifiers were simulated for different  $\text{NO}_3^-$  fluxes (high in (a) and low in (b)). SOB are about an order of magnitude more abundant than autotrophic SRB. The abundance of the SOB relative to that of the autotrophic SRB is governed by the flux of  $\text{NO}_3^-$  relative to  $\text{H}_2$  ( $0.6 \text{ nM yr}^{-1}$  for  $\text{H}_2$ ). The abundance of the SOB denitrifiers relative to that of the aerobic SOB is governed by  $\text{NO}_3^-$  fluxes, with the SOB denitrifiers being more abundant than the aerobic SOB at higher  $\text{NO}_3^-$  flux.



**Fig. S5. Simulated cell concentrations of sulfate reducers (SRB), sulfate oxidizers (SOB) and H<sub>2</sub>-oxidizers 35,000 years.** Using the parameters in Table S1, the groundwater chemistry of BE326 Bh2 and the fluxes of H<sub>2</sub>, SO<sub>4</sub><sup>2-</sup>, O<sub>2</sub> and NO<sub>3</sub><sup>-</sup>, the cellular abundance (converted from mg/kg output from GWB) of the autotrophic SRB, aerobic SOB and SOB denitrifiers, aerobic H<sub>2</sub> oxidizers and H<sub>2</sub>-oxidizing denitrifiers were simulated for the same condition as for Fig. S4a. In this simulation, the populations of autotrophic SRB (a) and the aerobic H<sub>2</sub> oxidizers (b) decline over time, with the former declines more quickly. Whereas, the abundance of H<sub>2</sub>-oxidizing denitrifiers is higher than aerobic SOB, which is more abundant than SOB denitrifiers.



Table S1. Metadata of the crustal fluids of BE326 borehole 2 collected during 2012 July.

Temperature*	38.1 °C	
pH*	8.6	
pe*	-1.4	
TDS*	3.59 g L <sup>-1</sup>	
O <sub>2</sub>	0.46 μM	4.2 μM <sup>#</sup>
N <sub>2</sub>	0.5 mM	4.1 mM <sup>#</sup>
N <sub>2</sub> O <sup>@</sup>	3.7 μM	22 μM <sup>#</sup>
H <sub>2</sub>	8.9 nM	230 nM <sup>#</sup>
CO	88.7 nM	7.8 μM <sup>#</sup>
CH <sub>4</sub>	1.3 mM	8.1 mM <sup>#</sup>
<sup>3</sup> He	4.2 pM	0.3 nM <sup>#</sup>
<sup>4</sup> He	103 μM	6.2 mM <sup>#</sup>
<sup>36</sup> Ar	3.8 nM	48.0 nM <sup>#</sup>
<sup>40</sup> Ar	12.0 μM	148.0 μM <sup>#</sup>
<sup>81</sup> Kr	0.3 nM	1.7 nM <sup>#</sup>
<sup>129</sup> Xe	16.0 pM	103.0 pM <sup>#</sup>
<sup>134</sup> Xe	6.3 pM	40.0 pM <sup>#</sup>
<sup>136</sup> Xe	5.7 pM	37.0 pM <sup>#</sup>
DOC*	28.8 μM	
DIC*	330 μM	
Formate	0.44 μM	
Acetate	<0.7 μM	
Lactate	1.0 μM	
Na <sup>+</sup> *	48.2 mM	
K <sup>+</sup> *	0.9 mM	
Mg <sup>2+</sup> *	0.03 μM	
Ca <sup>2+</sup> *	3.88 mM	
Sr <sup>2+</sup> *	73.4 μM	
Ba <sup>2+</sup> *	10.1 μM	
Si <sup>4+</sup> *	0.4 μM	
Mn <sup>2+</sup> *	5.6 μM	
Fe <sup>2+</sup> *	0.6 μM	
F <sup>-</sup> *	0.1 μM	
Cl <sup>-</sup> *	61.5 mM	
Br <sup>-</sup> *	0.1 mM	
SO <sub>4</sub> <sup>2-</sup> *	623 μM <sup>^</sup>	
HS <sup>-</sup>	14.7 μM	14.9 μM <sup>#</sup>
Total S	493 μM	
TN*	47.1 μM	
NO <sub>3</sub> <sup>-</sup> *	3 μM	
NO <sub>2</sub> <sup>-</sup> *	<2 μM	
NH <sub>4</sub> <sup>+</sup> *	46.6 μM	230 μM <sup>#</sup>
δ <sup>18</sup> O-H <sub>2</sub> O*	-8.68 ‰	
δ <sup>2</sup> H-H <sub>2</sub> O*	-47 ‰	
δ <sup>13</sup> C-CH <sub>4</sub> *	-53.8 ‰	
δ <sup>2</sup> H-CH <sub>4</sub> *	-185 ‰	
δ <sup>13</sup> C-CO <sub>2</sub> *	-42.6 ‰	
Δ <sup>14</sup> C-CO <sub>2</sub> *	-914.8±0.8 ‰	
δ <sup>13</sup> C-DOC*	-28±0.5 ‰	
Δ <sup>13</sup> C-DOC <sup>@</sup>	-493.6±1.7 ‰	
δ <sup>13</sup> C-PLFA*	-54.84 ‰	
Δ <sup>13</sup> C-PLFA*	-886.8±8.4 ‰	
δ <sup>34</sup> S-HS <sup>-</sup>	5.9 ‰	
δ <sup>34</sup> S-SO <sub>4</sub> <sup>2-</sup>	4.5 ‰	
δ <sup>15</sup> N-NO <sub>3</sub> <sup>-</sup> @	36.3±0.1 ‰	
δ <sup>18</sup> O-NO <sub>3</sub> <sup>-</sup> @	49.2±0.5 ‰	
subsurface residence time from <sup>40</sup> Ar, <sup>134</sup> Xe and <sup>136</sup> Xe	3-14 myr	
subsurface residence time for DIC	40-80 kyr	
cell concentration (direct count and PLFA conversion)*	10 <sup>3-4</sup> cells mL <sup>-1</sup>	

Notes:

\*Data assembled from Lau et al. (2014) and Simkus et al. (2016). Full citation can be found in the main article.

@Data from 2011 sample as the 2012 sample was not analyzed

#Gas concentrations corrected for diffusive loss following Lippmann et al. (2003). See Online Methods.

^ corrected the mistake in Lau et al. (2014)

Abbreviations: TDS, total dissolved solid; DOC, dissolved organic carbon; DIC, dissolved inorganic carbon; PLFA, phospholipid fatty acids

**Table S2. Summary of *de novo* metatranscriptomic assemblies of non-coding and coding RNA reads generated by Trans-ABYSS and Trinity, respectively.**

	coding RNA (1,498,563 reads)	non-coding RNA (20,078,828 reads)
Assembler	Trinity	Trans-ABYSS
Total number of transcripts	14,678	12,783
Total assembled length (nt)	5,056,527	4,922,139
Max transcript length (nt)	2,942	3,123
Min transcript length (nt)	201	200
Average transcript length (nt)	344	385
N50 transcript length (nt)	337	397
Number of transcripts longer than N50	4,574	3,560
N90 transcript length (nt)	218	223
Number of transcripts longer than N90	12,258	10,449
Mapping rate	54.00%	98.20%

**Table S3. Summary of protein-encoding genes (PEGs) identified as Rhodocyclaceae by the reciprocal best-hits BLAST approach against 21 published Rhodocyclaceae genomes.**

Species	Annotation of PEGs	Coverage
Aromatoleum aromaticum	1,4-alpha-glucan branching protein	4
Aromatoleum aromaticum	3-dehydroquininate dehydratase	4
Aromatoleum aromaticum	3-deoxy-D-manno-octulosonate 8-phosphate phosphatase	2
Aromatoleum aromaticum	30S ribosomal protein S2	29
Aromatoleum aromaticum	4-alpha-glucanotransferase	9
Aromatoleum aromaticum	ABC transporter	5
Aromatoleum aromaticum	ABC transporter permease	4
Aromatoleum aromaticum	acetolactate synthase small subunit	5
Aromatoleum aromaticum	aconitate hydratase	1
Aromatoleum aromaticum	alpha-amylase	2
Aromatoleum aromaticum	apolipoprotein N-acyltransferase	4
Aromatoleum aromaticum	ATP-dependent exonuclease	5
Aromatoleum aromaticum	ATP-dependent protease ATPase subunit HsIU	7
Aromatoleum aromaticum	bacterioferritin	9
Aromatoleum aromaticum	butyryl-CoA dehydrogenase	8
Aromatoleum aromaticum	catalase	6
Aromatoleum aromaticum	chemotaxis protein CheR	4
Aromatoleum aromaticum	chorismate synthase	15
Aromatoleum aromaticum	chromosome condensation regulator RCC1	5
Aromatoleum aromaticum	DDE endonuclease	5
Aromatoleum aromaticum	dehydrogenase	3
Aromatoleum aromaticum	diaminopimelate decarboxylase	14
Aromatoleum aromaticum	DNA polymerase subunit beta	10
Aromatoleum aromaticum	DNA topoisomerase IV subunit B	3
Aromatoleum aromaticum	exopolysaccharide export protein	2
Aromatoleum aromaticum	FAD-linked oxidase	3
Aromatoleum aromaticum	fimbrial protein	457
Aromatoleum aromaticum	gamma-glutamyl-phosphate reductase	9
Aromatoleum aromaticum	glucosylglycerol-phosphate synthase	2
Aromatoleum aromaticum	glycogen debranching enzyme	18
Aromatoleum aromaticum	glycogen-branching enzyme	3
Aromatoleum aromaticum	GreA/GreB family elongation factor	8
Aromatoleum aromaticum	heat-shock protein Hsp20	33
Aromatoleum aromaticum	hypothetical protein	244
Aromatoleum aromaticum	iron-sulfur-binding protein	5
Aromatoleum aromaticum	malate synthase G	2
Aromatoleum aromaticum	mechanosensitive ion channel protein MscS	3
Aromatoleum aromaticum	methylmalonyl-CoA mutase	5
Aromatoleum aromaticum	molybdenum protein large subunit	21
Aromatoleum aromaticum	NAD(P)H dehydrogenase (quinone)	6
Aromatoleum aromaticum	NADH:ubiquinone oxidoreductase subunit N	2
Aromatoleum aromaticum	nitric oxide synthase	4
Aromatoleum aromaticum	peptidase	8
Aromatoleum aromaticum	phenylacetate--CoA ligase	5
Aromatoleum aromaticum	phosphatidylethanolamine N-methyltransferase	4
Aromatoleum aromaticum	pyruvate dehydrogenase (acetyl-transferring) E1 component subunit alpha	2
Aromatoleum aromaticum	regulator	10
Aromatoleum aromaticum	rubredoxin	6
Aromatoleum aromaticum	sodium-independent anion transporter	3
Aromatoleum aromaticum	sugar ABC transporter substrate-binding protein	32
Aromatoleum aromaticum	transcriptional regulator	11
Aromatoleum aromaticum	transporter	0
Aromatoleum aromaticum	transposase	10
Aromatoleum aromaticum	tRNA pseudouridine synthase B	3
Aromatoleum aromaticum	tryptophan synthase subunit beta	14
Aromatoleum aromaticum	two-component sensor histidine kinase	1
Aromatoleum aromaticum	two-component system response regulator	8
Aromatoleum aromaticum	type II secretion system protein GspG	5
Aromatoleum aromaticum	ubiquinone-binding protein	6
Aromatoleum aromaticum	uroporphyrinogen decarboxylase	10
Aromatoleum aromaticum	zinc finger protein	2
Azoarcus	MULTISPECIES: NADH-quinone oxidoreductase subunit K	17
Azoarcus sp. PA01	2-nitropropane dioxygenase	11
Azoarcus sp. PA01	2-oxoacid:ferredoxin oxidoreductase subunit beta	2
Azoarcus sp. PA01	2-oxoisovalerate dehydrogenase	13
Azoarcus sp. PA01	23S rRNA (adenine(2503)-C(2))-methyltransferase	8
Azoarcus sp. PA01	50S ribosomal protein L32	17
Azoarcus sp. PA01	7-cyano-7-deazaguanine synthase	1
Azoarcus sp. PA01	aspartate aminotransferase	1
Azoarcus sp. PA01	benzoyl-CoA-dihydrodiol lyase	4

Azoarcus sp. PA01	beta-ketoacyl-ACP reductase	6
Azoarcus sp. PA01	cation transporter	10
Azoarcus sp. PA01	CDP-diacylglycerol--serine O-phosphatidyltransferase	6
Azoarcus sp. PA01	cysteine desulfurase	6
Azoarcus sp. PA01	cytochrome C	3
Azoarcus sp. PA01	dihydroorotate dehydrogenase 2	2
Azoarcus sp. PA01	dihydroxy-acid dehydratase	2
Azoarcus sp. PA01	DNA helicase	2
Azoarcus sp. PA01	DNA recombination protein RecO	3
Azoarcus sp. PA01	DNA repair protein	9
Azoarcus sp. PA01	DNA topoisomerase	2
Azoarcus sp. PA01	DNA-(apurinic or apyrimidinic site) lyase	3
Azoarcus sp. PA01	DNA-binding response regulator	4
Azoarcus sp. PA01	glucokinase	1
Azoarcus sp. PA01	glutaredoxin	3
Azoarcus sp. PA01	glycine cleavage system protein T	10
Azoarcus sp. PA01	GntR family transcriptional regulator	6
Azoarcus sp. PA01	GTPase	3
Azoarcus sp. PA01	heat-shock protein Hsp20	3
Azoarcus sp. PA01	hemin receptor	10
Azoarcus sp. PA01	hypothetical protein	94
Azoarcus sp. PA01	LysR family transcriptional regulator	5
Azoarcus sp. PA01	NADH dehydrogenase	22
Azoarcus sp. PA01	panetheine-phosphate adenyltransferase	13
Azoarcus sp. PA01	peptidase M50	1
Azoarcus sp. PA01	peptide-methionine (S)-S-oxide reductase	4
Azoarcus sp. PA01	phenylphosphate synthase subunit beta	13
Azoarcus sp. PA01	phosphate ABC transporter permease	9
Azoarcus sp. PA01	phosphatidylserine decarboxylase	10
Azoarcus sp. PA01	pilin	13
Azoarcus sp. PA01	potassium transporter	3
Azoarcus sp. PA01	protein nirG	5
Azoarcus sp. PA01	quinone oxidoreductase	1
Azoarcus sp. PA01	ribosome-binding factor A	2
Azoarcus sp. PA01	RNA helicase	2
Azoarcus sp. PA01	shikimate kinase	10
Azoarcus sp. PA01	siderophore-interacting protein	9
Azoarcus sp. PA01	sterol-binding protein	7
Azoarcus sp. PA01	thioredoxin reductase	2
Azoarcus sp. PA01	transcription elongation factor NusA	29
Azoarcus sp. PA01	UDP-N-acetylmuramate:L-alanyl-gamma-D-glutamyl-meso-diaminopimelate ligase	6
Azoarcus sp. PA01	universal stress protein	6
Azoarcus sp. PA01	Xaa-Pro aminopeptidase	2
Azoarcus sp. PA01	Zn-dependent hydrolase	5
Azoarcus toluclasticus	2-alkenal reductase	6
Azoarcus toluclasticus	3-ketoacyl-CoA thiolase	14
Azoarcus toluclasticus	30S ribosomal protein S15	3
Azoarcus toluclasticus	50S ribosomal protein L29	6
Azoarcus toluclasticus	50S rRNA methyltransferase	8
Azoarcus toluclasticus	ABC transporter ATP-binding protein	6
Azoarcus toluclasticus	ABC transporter permease	7
Azoarcus toluclasticus	adenylate kinase	12
Azoarcus toluclasticus	ADP-ribose pyrophosphatase	3
Azoarcus toluclasticus	aldehyde dehydrogenase	2
Azoarcus toluclasticus	aminotransferase	3
Azoarcus toluclasticus	antitoxin	6
Azoarcus toluclasticus	aromatic hydrocarbon degradation protein	3
Azoarcus toluclasticus	arsenical pump-driving ATPase	1
Azoarcus toluclasticus	aspartate aminotransferase	8
Azoarcus toluclasticus	ATP synthase F0F1 subunit epsilon	43
Azoarcus toluclasticus	ATP synthase subunit alpha	34
Azoarcus toluclasticus	ATP-dependent protease subunit HslV	4
Azoarcus toluclasticus	bacterioferritin	9
Azoarcus toluclasticus	BAX inhibitor protein	7
Azoarcus toluclasticus	branched-chain alpha-keto acid dehydrogenase subunit E2	13
Azoarcus toluclasticus	branched-chain amino acid ABC transporter substrate-binding protein	3
Azoarcus toluclasticus	cell division protein FtsX	4
Azoarcus toluclasticus	cytochrome C	87
Azoarcus toluclasticus	cytochrome c class I	8
Azoarcus toluclasticus	DNA polymerase beta	8
Azoarcus toluclasticus	ferredoxin oxidoreductase	4
Azoarcus toluclasticus	flagellar motor protein	2
Azoarcus toluclasticus	glycine dehydrogenase (aminomethyl-transferring)	7
Azoarcus toluclasticus	GTP-binding protein	10

Azoarcus toluclasticus	heat-shock protein Hsp20	7
Azoarcus toluclasticus	histidine triad (HIT) protein	2
Azoarcus toluclasticus	hybrid sensor histidine kinase/response regulator	3
Azoarcus toluclasticus	hypothetical protein	496
Azoarcus toluclasticus	hypothetical protein, partial	12
Azoarcus toluclasticus	lipid II flippase MurJ	1
Azoarcus toluclasticus	lysine--tRNA ligase	3
Azoarcus toluclasticus	membrane protein	4
Azoarcus toluclasticus	metal-dependent phosphohydrolase	9
Azoarcus toluclasticus	methionyl-tRNA formyltransferase	2
Azoarcus toluclasticus	molybdopterin molybdenumtransferase MoeA	7
Azoarcus toluclasticus	molybdopterin oxidoreductase	6
Azoarcus toluclasticus	mRNA interferase MqsR	8
Azoarcus toluclasticus	N-acetylglucosaminyl transferase	2
Azoarcus toluclasticus	NADH dehydrogenase subunit D	1
Azoarcus toluclasticus	nicotinate-nucleotide--dimethylbenzimidazole phosphoribosyltransferase	3
Azoarcus toluclasticus	nitroreductase family protein	4
Azoarcus toluclasticus	PAS domain-containing sensor histidine kinase	3
Azoarcus toluclasticus	patatin	3
Azoarcus toluclasticus	peptidase S11	2
Azoarcus toluclasticus	peptidoglycan-binding protein	23
Azoarcus toluclasticus	phenylacetaldehyde dehydrogenase	3
Azoarcus toluclasticus	poly(3-hydroxyalkanoate) synthetase	1
Azoarcus toluclasticus	precorrin-3B C(17)-methyltransferase	4
Azoarcus toluclasticus	preprotein translocase subunit YajC	14
Azoarcus toluclasticus	pyridine nucleotide-disulfide oxidoreductase	15
Azoarcus toluclasticus	pyruvate carboxylase	9
Azoarcus toluclasticus	ribonuclease PH	5
Azoarcus toluclasticus	RNA helicase	8
Azoarcus toluclasticus	secretin	7
Azoarcus toluclasticus	sodium:calcium antiporter	30
Azoarcus toluclasticus	succinyl-CoA synthetase subunit alpha	4
Azoarcus toluclasticus	transcription elongation factor GreB	2
Azoarcus toluclasticus	transcriptional regulator	3
Azoarcus toluclasticus	transposase	6
Azoarcus toluclasticus	tRNA threonylcarbamoyladenine biosynthesis protein TsaE	2
Azoarcus toluclasticus	two-component system response regulator	4
Azoarcus toluclasticus	UDP-glucose 6-dehydrogenase	3
Azonexus hydrophilus	2-aminoethylphosphonate--pyruvate transaminase	2
Azonexus hydrophilus	3-hydroxyacyl-CoA dehydrogenase	7
Azonexus hydrophilus	30S ribosomal protein S15	1
Azonexus hydrophilus	30S ribosomal protein S3	7
Azonexus hydrophilus	4-hydroxybenzoate octaprenyltransferase	20
Azonexus hydrophilus	5'-nucleotidase	2
Azonexus hydrophilus	50S ribosomal protein L33	9
Azonexus hydrophilus	ABC transporter ATP-binding protein	5
Azonexus hydrophilus	ABC transporter permease	5
Azonexus hydrophilus	ABC transporter substrate-binding protein	5
Azonexus hydrophilus	acetate kinase	2
Azonexus hydrophilus	acyl-CoA dehydrogenase	8
Azonexus hydrophilus	alkyl hydroperoxide reductase	36
Azonexus hydrophilus	ammonia channel protein	4
Azonexus hydrophilus	aspartate kinase	12
Azonexus hydrophilus	ATPase AAA	3
Azonexus hydrophilus	bifunctional 3-demethylubiquinone 3-O-methyltransferase/2-octaprenyl-6-hydroxy phenol methylase	15
Azonexus hydrophilus	bifunctional uridylyltransferase/uridylyl-removing protein	1
Azonexus hydrophilus	branched-chain amino acid ABC transporter substrate-binding protein	4
Azonexus hydrophilus	C4-dicarboxylate ABC transporter	27
Azonexus hydrophilus	cation transporter	10
Azonexus hydrophilus	cell division protein FtsB	2
Azonexus hydrophilus	cell division protein FtsE	3
Azonexus hydrophilus	CoA-transferase	4
Azonexus hydrophilus	cytochrome C	23
Azonexus hydrophilus	decarboxylase	8
Azonexus hydrophilus	deoxycytidine triphosphate deaminase	9
Azonexus hydrophilus	DNA polymerase III subunit gamma/tau	14
Azonexus hydrophilus	DNA-binding response regulator	11
Azonexus hydrophilus	electron transfer flavoprotein subunit beta	22
Azonexus hydrophilus	elongation factor G	7
Azonexus hydrophilus	gamma carbonic anhydrase family protein	2
Azonexus hydrophilus	GDP-fucose synthetase	3
Azonexus hydrophilus	glutamine--tRNA ligase	4
Azonexus hydrophilus	GntR family transcriptional regulator	8
Azonexus hydrophilus	GTP pyrophosphokinase	6

Azonexus hydrophilus	haloacid dehalogenase	7
Azonexus hydrophilus	histidine kinase	2
Azonexus hydrophilus	hybrid sensor histidine kinase/response regulator	6
Azonexus hydrophilus	hydrogenase assembly protein HupF	9
Azonexus hydrophilus	hypothetical protein	259
Azonexus hydrophilus	hypothetical protein, partial	37
Azonexus hydrophilus	L-aspartate oxidase	3
Azonexus hydrophilus	long-chain-fatty-acid--CoA ligase	7
Azonexus hydrophilus	mannose-1-phosphate guanyltransferase	27
Azonexus hydrophilus	mechanosensitive ion channel protein MscS, partial	4
Azonexus hydrophilus	membrane protein	49
Azonexus hydrophilus	metal-binding protein	8
Azonexus hydrophilus	methionine aminopeptidase	12
Azonexus hydrophilus	methylmalonyl-CoA mutase	3
Azonexus hydrophilus	molybdopterin synthase sulfur carrier subunit	7
Azonexus hydrophilus	NADH dehydrogenase	4
Azonexus hydrophilus	orotidine 5'-phosphate decarboxylase	2
Azonexus hydrophilus	paraslipin	7
Azonexus hydrophilus	peptide methionine sulfoxide reductase	0
Azonexus hydrophilus	peptidoglycan-binding protein	14
Azonexus hydrophilus	phosphodiesterase	2
Azonexus hydrophilus	phosphoenolpyruvate carboxykinase	8
Azonexus hydrophilus	phospholipase	18
Azonexus hydrophilus	phospholipid-binding protein	8
Azonexus hydrophilus	pilus assembly protein PilO	11
Azonexus hydrophilus	preprotein translocase subunit SecF	6
Azonexus hydrophilus	protease	5
Azonexus hydrophilus	radical SAM protein	11
Azonexus hydrophilus	recombinase RdgC	3
Azonexus hydrophilus	ribose and galactose chemoreceptor protein	2
Azonexus hydrophilus	RNA polymerase sigma factor RpoE	17
Azonexus hydrophilus	single-stranded DNA-binding protein	13
Azonexus hydrophilus	sodium:calcium antiporter	4
Azonexus hydrophilus	sulfate transporter	4
Azonexus hydrophilus	superoxide dismutase	12
Azonexus hydrophilus	thioesterase	10
Azonexus hydrophilus	thiol reductase thioredoxin	7
Azonexus hydrophilus	threonine--tRNA ligase	6
Azonexus hydrophilus	TIGR00645 family protein	2
Azonexus hydrophilus	TIGR02099 family protein	2
Azonexus hydrophilus	toxin YoeB	6
Azonexus hydrophilus	transcriptional regulator	10
Azonexus hydrophilus	transporter	9
Azonexus hydrophilus	transposase	4
Azonexus hydrophilus	tRNA (cytidine/uridine-2'-O-)-methyltransferase	1
Azonexus hydrophilus	type II restriction endonuclease	3
Azospira oryzae	1-deoxy-D-xylulose-5-phosphate synthase	6
Azospira oryzae	23S rRNA pseudouridylate synthase B	4
Azospira oryzae	3-deoxy-8-phosphooctulonate synthase	6
Azospira oryzae	ABC transporter ATP-binding protein	10
Azospira oryzae	ABC transporter substrate-binding protein	4
Azospira oryzae	acetoacetyl-CoA synthetase	13
Azospira oryzae	aspartate aminotransferase	2
Azospira oryzae	aspartyl protease	11
Azospira oryzae	ATP synthase subunit B	3
Azospira oryzae	ATP-dependent Clp protease ClpC	4
Azospira oryzae	bacterioferritin	16
Azospira oryzae	cag pathogenicity island protein Cag6	2
Azospira oryzae	cell division protein FtsX	6
Azospira oryzae	chemotaxis protein	5
Azospira oryzae	chromate resistance protein	3
Azospira oryzae	Co2+/Mg2+ efflux protein ApaG	6
Azospira oryzae	cysteine--tRNA ligase	11
Azospira oryzae	cytochrome C	9
Azospira oryzae	D-2-hydroxyacid dehydrogenase	3
Azospira oryzae	diacylglycerol kinase	5
Azospira oryzae	diguanylate cyclase	6
Azospira oryzae	dihydroilipoamide acetyltransferase	15
Azospira oryzae	dihydroilipoamide succinyltransferase	13
Azospira oryzae	entericidin	15
Azospira oryzae	general secretion pathway protein H	11
Azospira oryzae	glutamate racemase	6
Azospira oryzae	glutamate synthase subunit beta	56
Azospira oryzae	glutaredoxin-like protein	6

Azospira oryzae	glutathione ABC transporter ATP-binding protein	4
Azospira oryzae	GTP-binding protein	2
Azospira oryzae	heat-shock protein Hsp20	7
Azospira oryzae	hemagglutination activity protein	4
Azospira oryzae	heme ABC transporter permease	13
Azospira oryzae	heme lyase subunit CcmF	7
Azospira oryzae	heptosyltransferase	4
Azospira oryzae	hydroxymethylpyrimidine/phosphomethylpyrimidine kinase	6
Azospira oryzae	hypothetical protein	139
Azospira oryzae	integrase	2
Azospira oryzae	isochorismate synthase family protein	1
Azospira oryzae	isovaleryl-CoA dehydrogenase	4
Azospira oryzae	lipid A biosynthesis acyltransferase	2
Azospira oryzae	LysR family transcriptional regulator	5
Azospira oryzae	membrane protein	53
Azospira oryzae	membrane-bound metallopeptidase	4
Azospira oryzae	MFS transporter	13
Azospira oryzae	MSHA-type pilus biogenesis protein MshL	3
Azospira oryzae	multidrug ABC transporter substrate-binding protein	11
Azospira oryzae	N-acetylglutamate synthase	1
Azospira oryzae	nitrogen regulatory protein P-II 1	2
Azospira oryzae	o-succinylbenzoic acid synthetase	3
Azospira oryzae	octaprenyl diphosphate synthase	14
Azospira oryzae	outer membrane protein	4
Azospira oryzae	PAS domain S-box/diguanylate cyclase (GGDEF) domain-containing protein	5
Azospira oryzae	penicillin-binding protein 1A	3
Azospira oryzae	peptidase	12
Azospira oryzae	peptide ABC transporter permease	8
Azospira oryzae	peptidoglycan-binding protein	4
Azospira oryzae	phosphodiesterase	8
Azospira oryzae	phosphohydrolase	8
Azospira oryzae	pilus assembly protein PilP	17
Azospira oryzae	Plasmid replication region DNA-binding N-term protein, partial	2
Azospira oryzae	prepilin-type cleavage/methylation protein	10
Azospira oryzae	preprotein translocase subunit TatB	30
Azospira oryzae	protein fixB	1
Azospira oryzae	protein-L-isoaspartate O-methyltransferase	12
Azospira oryzae	protein-serine/threonine phosphatase	1
Azospira oryzae	pyridoxine 5'-phosphate synthase	2
Azospira oryzae	resolvase	2
Azospira oryzae	RNA pyrophosphohydrolase	23
Azospira oryzae	secretion system protein E	3
Azospira oryzae	serine/threonine protein kinase	5
Azospira oryzae	serine/threonine protein phosphatase	2
Azospira oryzae	signal-transduction protein containing cAMP-binding and CBS domains	3
Azospira oryzae	sodium:phosphate symporter	3
Azospira oryzae	sugar transporter	14
Azospira oryzae	tetrathionate reductase	16
Azospira oryzae	Tfp pilus assembly protein FimT	9
Azospira oryzae	thioesterase	6
Azospira oryzae	threonine-phosphate decarboxylase	3
Azospira oryzae	TonB-dependent receptor	2
Azospira oryzae	transporter	33
Azospira oryzae	transposase	5
Azospira oryzae	tRNA (guanine(37)-N(1))-methyltransferase	18
Azospira oryzae	two-component sensor histidine kinase	2
Azospira oryzae	two-component system response regulator	12
Azospira oryzae	type II secretion system protein F	16
Azospira oryzae	ubiquinone biosynthesis hydroxylase	20
Azospira oryzae	ubiquinone biosynthesis protein UbiB	10
Azospira oryzae	UDP-glucose 4-epimerase	4
Azospira oryzae	UDP-N-acetylmuramoylalanyl-D-glutamate--2, 6-diaminopimelate ligase	4
Azovibrio restrictus	2,3,4,5-tetrahydropyridine-2,6-dicarboxylate N-succinyltransferase	8
Azovibrio restrictus	50S ribosomal protein L34	1
Azovibrio restrictus	50S ribosomal protein L9	7
Azovibrio restrictus	A1-2E family transporter	12
Azovibrio restrictus	arsenic transporter	5
Azovibrio restrictus	arsenite transporter	2
Azovibrio restrictus	asparagine synthetase B	6
Azovibrio restrictus	ATP synthase subunit beta	30
Azovibrio restrictus	ATP-dependent protease	7
Azovibrio restrictus	ATPase	11
Azovibrio restrictus	ATPase P	4
Azovibrio restrictus	branched chain amino acid ABC transporter substrate-binding protein	6

Azovibrio restrictus	carbamoyl-phosphate synthase small subunit	2
Azovibrio restrictus	cell division protein FtsA	2
Azovibrio restrictus	chemotaxis protein CheC	2
Azovibrio restrictus	chemotaxis protein CheY	8
Azovibrio restrictus	chromosome partitioning protein	3
Azovibrio restrictus	cobalt-precorrin-4 C(11)-methyltransferase	2
Azovibrio restrictus	colicin V production protein	4
Azovibrio restrictus	cyanophycin synthetase	17
Azovibrio restrictus	cytochrome C biogenesis protein CcsA	12
Azovibrio restrictus	cytochrome d terminal oxidase subunit I	3
Azovibrio restrictus	cytochrome d ubiquinol oxidase subunit 2	3
Azovibrio restrictus	DNA repair protein RecN	3
Azovibrio restrictus	DNA-deoxyinosine glycosylase	3
Azovibrio restrictus	Fe(2+)-trafficking protein	5
Azovibrio restrictus	ferritin	6
Azovibrio restrictus	fimbrial protein	8
Azovibrio restrictus	Fis family transcriptional regulator	5
Azovibrio restrictus	flagellar biosynthesis protein flip	2
Azovibrio restrictus	flagellar motor protein MotD	2
Azovibrio restrictus	glycerol-3-phosphate acyltransferase	5
Azovibrio restrictus	glycine--tRNA ligase subunit alpha	9
Azovibrio restrictus	glycine--tRNA ligase subunit beta	2
Azovibrio restrictus	glycoside hydrolase	8
Azovibrio restrictus	GNAT family N-acetyltransferase	1
Azovibrio restrictus	GTP cyclohydrolase	5
Azovibrio restrictus	haloacid dehalogenase	8
Azovibrio restrictus	histidine kinase	16
Azovibrio restrictus	hypothetical protein	348
Azovibrio restrictus	integrase	4
Azovibrio restrictus	lactamase	16
Azovibrio restrictus	lysine 2,3-aminomutase	3
Azovibrio restrictus	mannose-1-phosphate guanylyltransferase	4
Azovibrio restrictus	membrane protein	9
Azovibrio restrictus	methionine--tRNA ligase	7
Azovibrio restrictus	NAD(P)-dependent oxidoreductase	4
Azovibrio restrictus	NADH dehydrogenase	10
Azovibrio restrictus	nucleoside-diphosphate kinase	9
Azovibrio restrictus	orotate phosphoribosyltransferase	15
Azovibrio restrictus	peptidase	2
Azovibrio restrictus	peptidylprolyl isomerase	8
Azovibrio restrictus	phytoene synthase	6
Azovibrio restrictus	polyphosphate kinase 2	12
Azovibrio restrictus	preprotein translocase subunit SecE	11
Azovibrio restrictus	preprotein translocase subunit TatC	3
Azovibrio restrictus	preprotein translocase subunit Tim44	7
Azovibrio restrictus	prevent-host-death protein	6
Azovibrio restrictus	protease HtpX	7
Azovibrio restrictus	SsrA-binding protein	2
Azovibrio restrictus	stationary phase survival protein SurE	8
Azovibrio restrictus	transcriptional regulator	10
Azovibrio restrictus	transcriptional regulator HU subunit alpha	5
Azovibrio restrictus	twitching motility protein PilT	3
Azovibrio restrictus	UDP-2,3-diacetylglucosamine hydrolase	19
Azovibrio restrictus	UDP-N-acetylmuramoylalanine--D-glutamate ligase	3
Azovibrio restrictus	zinc protease	6
Betaproteobacteria	MULTISPECIES: hypothetical protein	10
Dechloromonas agitata	2-octaprenyl-3-methyl-6-methoxy-1,4-benzoquinol hydroxylase	5
Dechloromonas agitata	2-succinyl-5-enolpyruvyl-6-hydroxy-3-cyclohexene-1-carboxylate synthase	3
Dechloromonas agitata	3-isopropylmalate dehydrogenase	15
Dechloromonas agitata	5,10-methylenetetrahydrofolate reductase	3
Dechloromonas agitata	6-phosphofructokinase	25
Dechloromonas agitata	ABC transporter permease	16
Dechloromonas agitata	acyl--CoA ligase	17
Dechloromonas agitata	acyltransferase	2
Dechloromonas agitata	arsenate reductase	2
Dechloromonas agitata	AsnC family transcriptional regulator	8
Dechloromonas agitata	asparagine synthetase B	6
Dechloromonas agitata	ATP synthase subunit A	33
Dechloromonas agitata	ATPase	4
Dechloromonas agitata	c-type cytochrome biogenesis protein CcmI	9
Dechloromonas agitata	carbamoyl phosphate synthase large subunit	8
Dechloromonas agitata	carbon-phosphorus lyase	21
Dechloromonas agitata	carbon-phosphorus lyase complex subunit PhnJ	9
Dechloromonas agitata	carbon-phosphorus lyase subunit PhnH	19



Dechloromonas agitata	carbonate dehydratase	6
Dechloromonas agitata	carbonic anhydrase	7
Dechloromonas agitata	CDP-diacylglycerol--glycerol-3-phosphate 3-phosphatidyltransferase	10
Dechloromonas agitata	cell division protein FtsQ	3
Dechloromonas agitata	cell shape determination protein CcmA	14
Dechloromonas agitata	chain length-determining protein	32
Dechloromonas agitata	class III cytochrome C family protein	9
Dechloromonas agitata	cobalamin biosynthesis protein CbiG	4
Dechloromonas agitata	coproporphyrinogen III oxidase	4
Dechloromonas agitata	crotonase	13
Dechloromonas agitata	CTP synthetase	5
Dechloromonas agitata	cysteine methyltransferase	5
Dechloromonas agitata	cytochrome C	73
Dechloromonas agitata	diguanylate cyclase	2
Dechloromonas agitata	dioxygenase	2
Dechloromonas agitata	DNA polymerase III subunit epsilon	2
Dechloromonas agitata	DNA starvation/stationary phase protection protein	101
Dechloromonas agitata	DNA topoisomerase III	6
Dechloromonas agitata	DNA-binding protein	11
Dechloromonas agitata	DNA-binding response regulator	15
Dechloromonas agitata	DNA-directed RNA polymerase sigma-70 factor	11
Dechloromonas agitata	dTDP-glucose 4,6-dehydratase	2
Dechloromonas agitata	ferric reductase	9
Dechloromonas agitata	ferrous iron transporter B	2
Dechloromonas agitata	flagellar basal body rod protein FlgG	12
Dechloromonas agitata	general secretion pathway protein GspH	10
Dechloromonas agitata	glutamate dehydrogenase	2
Dechloromonas agitata	glutamyl-tRNA amidotransferase	2
Dechloromonas agitata	glutaredoxin	10
Dechloromonas agitata	glycosyl transferase family I	3
Dechloromonas agitata	GTPase	9
Dechloromonas agitata	heat-shock protein HtpX	15
Dechloromonas agitata	hemolysin secretion protein D	2
Dechloromonas agitata	histidine kinase	7
Dechloromonas agitata	hybrid sensor histidine kinase/response regulator	3
Dechloromonas agitata	hydrogenase 2 maturation endopeptidase	15
Dechloromonas agitata	hypothetical protein	551
Dechloromonas agitata	integration host factor subunit beta	29
Dechloromonas agitata	lipid transporter ATP-binding/permease	1
Dechloromonas agitata	long-chain-fatty-acid--CoA ligase	5
Dechloromonas agitata	LPS export ABC transporter permease LptF	3
Dechloromonas agitata	lysine transporter LysE	6
Dechloromonas agitata	major capsid protein	1
Dechloromonas agitata	malic enzyme	8
Dechloromonas agitata	membrane protein	8
Dechloromonas agitata	methionine adenosyltransferase	2
Dechloromonas agitata	methylcrotonoyl-CoA carboxylase	4
Dechloromonas agitata	NAD(FAD)-utilizing dehydrogenase	2
Dechloromonas agitata	NADH-ubiquinone oxidoreductase subunit 6	6
Dechloromonas agitata	NADP oxidoreductase	8
Dechloromonas agitata	Nif3-like dinuclear metal center hexameric protein	11
Dechloromonas agitata	nitrate reductase	8
Dechloromonas agitata	nucleotide exchange factor GrpE	5
Dechloromonas agitata	patatin	1
Dechloromonas agitata	peptidase M1	8
Dechloromonas agitata	peptidase M50	5
Dechloromonas agitata	peptide ABC transporter permease	5
Dechloromonas agitata	phosphate ABC transporter permease	4
Dechloromonas agitata	phosphate ABC transporter substrate-binding protein	19
Dechloromonas agitata	phosphonate ABC transporter	8
Dechloromonas agitata	phosphonate ABC transporter ATP-binding protein	16
Dechloromonas agitata	phosphonate ABC transporter permease	8
Dechloromonas agitata	phosphonate ABC transporter substrate-binding protein	16
Dechloromonas agitata	phosphonate C-P lyase system protein PhnK	11
Dechloromonas agitata	phosphonate metabolism protein PhnG	9
Dechloromonas agitata	phosphonate metabolism protein PhnM	3
Dechloromonas agitata	phosphonate metabolism transcriptional regulator PhnF	49
Dechloromonas agitata	phosphoserine phosphatase	3
Dechloromonas agitata	plasmid stabilization protein	2
Dechloromonas agitata	precorrin-8X methylmutase	3
Dechloromonas agitata	protein nirF	2
Dechloromonas agitata	protein tyrosine kinase	3
Dechloromonas agitata	pyruvate-flavodoxin oxidoreductase	6
Dechloromonas agitata	ribonuclease P protein component	2

Dechloromonas agitata	ribose-phosphate pyrophosphokinase	5
Dechloromonas agitata	ribosome silencing factor RsfS	8
Dechloromonas agitata	ribosome-associated GTPase EngA	2
Dechloromonas agitata	sodium-dependent bicarbonate transport family permease	10
Dechloromonas agitata	sodium:proton exchanger	3
Dechloromonas agitata	succinate dehydrogenase	23
Dechloromonas agitata	tetrathionate reductase subunit A	15
Dechloromonas agitata	tetrathionate reductase subunit B	11
Dechloromonas agitata	thioesterase	4
Dechloromonas agitata	thymidylate kinase	3
Dechloromonas agitata	toxin	5
Dechloromonas agitata	transposase	5
Dechloromonas agitata	twitching motility protein PilT	21
Dechloromonas agitata	two-component sensor histidine kinase	12
Dechloromonas agitata	type II secretion system protein F	9
Dechloromonas agitata	UDP-N-acetylglucosamine O-acyltransferase	2
Dechloromonas agitata	UTP--glucose-1-phosphate uridylyltransferase	8
Dechloromonas agitata	YgiQ family radical SAM protein	1
Dechloromonas aromatica	2-Cys peroxiredoxin	27
Dechloromonas aromatica	2-nitropropane dioxygenase	2
Dechloromonas aromatica	2,3-bisphosphoglycerate-independent phosphoglycerate mutase	10
Dechloromonas aromatica	6-phosphogluconolactonase	3
Dechloromonas aromatica	7-cyano-7-deazaguanine synthase	1
Dechloromonas aromatica	ABC transporter	12
Dechloromonas aromatica	ABC transporter ATP-binding protein	3
Dechloromonas aromatica	ABC transporter permease	7
Dechloromonas aromatica	acetyl-CoA acetyltransferase	22
Dechloromonas aromatica	acyl-CoA dehydrogenase	18
Dechloromonas aromatica	aldolase	2
Dechloromonas aromatica	alpha/beta hydrolase	101
Dechloromonas aromatica	aromatic acid decarboxylase	13
Dechloromonas aromatica	aromatic hydrocarbon degradation protein	10
Dechloromonas aromatica	arsenic resistance protein ArsB	2
Dechloromonas aromatica	ATP-dependent Clp protease adaptor ClpS	17
Dechloromonas aromatica	biopolymer transporter ExbD	5
Dechloromonas aromatica	branched-chain amino acid ABC transporter substrate-binding protein	6
Dechloromonas aromatica	chemotaxis protein CheR	3
Dechloromonas aromatica	chemotaxis protein CheY	16
Dechloromonas aromatica	cobalt-precorrin-6A synthase	3
Dechloromonas aromatica	cobyric acid synthase CobQ	2
Dechloromonas aromatica	copper ABC transporter ATPase	4
Dechloromonas aromatica	cyclic pyranopterin phosphate synthase MoaA	4
Dechloromonas aromatica	cytochrome B561	13
Dechloromonas aromatica	deoxyuridine 5'-triphosphate nucleotidohydrolase	13
Dechloromonas aromatica	diaminohydroxyphosphoribosylaminopyrimidine deaminase	5
Dechloromonas aromatica	diguanylate cyclase	7
Dechloromonas aromatica	dihydroxynaphthoic acid synthetase	3
Dechloromonas aromatica	DNA ligase	1
Dechloromonas aromatica	DNA polymerase III subunit chi	4
Dechloromonas aromatica	DNA primase	2
Dechloromonas aromatica	DNA-binding response regulator	12
Dechloromonas aromatica	DSBA oxidoreductase	8
Dechloromonas aromatica	dTDP-4-dehydrorhamnose 3,5-epimerase	2
Dechloromonas aromatica	enoyl-CoA hydratase	1
Dechloromonas aromatica	esterase	2
Dechloromonas aromatica	exopolysaccharide biosynthesis polyprenyl glycosylphosphotransferase	14
Dechloromonas aromatica	exosortase A	11
Dechloromonas aromatica	FOF1 ATP synthase subunit C	7
Dechloromonas aromatica	ferredoxin	5
Dechloromonas aromatica	flagellar brake protein YcgR	2
Dechloromonas aromatica	formate transporter	2
Dechloromonas aromatica	glutaredoxin	3
Dechloromonas aromatica	glycosyl transferase	13
Dechloromonas aromatica	glycosyl transferase family 1	1
Dechloromonas aromatica	glycosyltransferase WbuB	5
Dechloromonas aromatica	GTP-binding protein	2
Dechloromonas aromatica	heme d1 biosynthesis radical SAM protein NirJ	3
Dechloromonas aromatica	hypothetical protein	202
Dechloromonas aromatica	integrase	14
Dechloromonas aromatica	iron ABC transporter permease	3
Dechloromonas aromatica	lysine decarboxylase	4
Dechloromonas aromatica	lytic transglycosylase	3
Dechloromonas aromatica	magnesium transporter MgtC	7
Dechloromonas aromatica	membrane protein	8

Dechloromonas aromatica	MFS transporter	15
Dechloromonas aromatica	molecular chaperone HtpG	2
Dechloromonas aromatica	NAD(P)H-dependent oxidoreductase	3
Dechloromonas aromatica	NYN domain-containing protein	9
Dechloromonas aromatica	O-succinylhomoserine sulfhydrylase	2
Dechloromonas aromatica	oxidoreductase	4
Dechloromonas aromatica	PEP-CTERM domain protein	23
Dechloromonas aromatica	peptidase M48	1
Dechloromonas aromatica	peptide ABC transporter substrate-binding protein	3
Dechloromonas aromatica	phosphoglucomutase	5
Dechloromonas aromatica	phosphoribosylglycinamide formyltransferase 2	4
Dechloromonas aromatica	polysaccharide deacetylase	7
Dechloromonas aromatica	precorrin-6Y C5,15-methyltransferase	6
Dechloromonas aromatica	propionate--CoA ligase	9
Dechloromonas aromatica	RNA methyltransferase	7
Dechloromonas aromatica	sigma-54-dependent Fis family transcriptional regulator	4
Dechloromonas aromatica	sporulation protein	11
Dechloromonas aromatica	sugar transferase	4
Dechloromonas aromatica	TetR family transcriptional regulator	6
Dechloromonas aromatica	thiamine-monophosphate kinase	1
Dechloromonas aromatica	transcription termination factor Rho	12
Dechloromonas aromatica	transcriptional regulator	11
Dechloromonas aromatica	transcriptional repressor	10
Dechloromonas aromatica	transporter	2
Dechloromonas aromatica	transposase	4
Dechloromonas aromatica	tRNA(Ile)-lysidine synthetase	8
Dechloromonas aromatica	two-component sensor histidine kinase	2
Dechloromonas aromatica	two-component system response regulator	10
Methyloversatilis	MULTISPECIES: 30S ribosomal protein S21	4
Methyloversatilis	MULTISPECIES: thiol reductase thioredoxin	5
Methyloversatilis discipulorum	2-isopropylmalate synthase	407
Methyloversatilis discipulorum	50S ribosomal protein L18	15
Methyloversatilis discipulorum	50S ribosomal protein L3	10
Methyloversatilis discipulorum	ABC transporter substrate-binding protein	2
Methyloversatilis discipulorum	acetyl-CoA carboxylase carboxyl transferase subunit alpha	12
Methyloversatilis discipulorum	branched chain amino acid aminotransferase	23
Methyloversatilis discipulorum	cell division protein ZapD	9
Methyloversatilis discipulorum	chemotaxis protein CheA	15
Methyloversatilis discipulorum	chloride channel protein	8
Methyloversatilis discipulorum	Cro/C1 family transcriptional regulator	2
Methyloversatilis discipulorum	cyclic pyranopterin phosphate synthase MoaA	1
Methyloversatilis discipulorum	cytochrome B	32
Methyloversatilis discipulorum	cytochrome-c peroxidase	6
Methyloversatilis discipulorum	DNA helicase	2
Methyloversatilis discipulorum	DNA methylase	3
Methyloversatilis discipulorum	DNA polymerase I	2
Methyloversatilis discipulorum	flagellar basal body rod protein FlgC	20
Methyloversatilis discipulorum	flagellar hook protein FlgE	16
Methyloversatilis discipulorum	flagellar motor protein MotA	17
Methyloversatilis discipulorum	four helix bundle protein	14
Methyloversatilis discipulorum	GDP-mannose 4,6-dehydratase	11
Methyloversatilis discipulorum	granule protein PhaP	12
Methyloversatilis discipulorum	hemagglutinin	16
Methyloversatilis discipulorum	histidine kinase	11
Methyloversatilis discipulorum	Holliday junction DNA helicase	2
Methyloversatilis discipulorum	hydrolase	4
Methyloversatilis discipulorum	hypothetical protein	542
Methyloversatilis discipulorum	lytic transglycosylase	3
Methyloversatilis discipulorum	membrane protein	23
Methyloversatilis discipulorum	oligopeptidase A	6
Methyloversatilis discipulorum	PEP-CTERM domain protein	115
Methyloversatilis discipulorum	peptide chain release factor 2	1
Methyloversatilis discipulorum	phenylalanine--tRNA ligase subunit alpha	7
Methyloversatilis discipulorum	phosphoheptose isomerase	3
Methyloversatilis discipulorum	preprotein translocase subunit SecF	4
Methyloversatilis discipulorum	protease TldD	6
Methyloversatilis discipulorum	pteridine reductase	6
Methyloversatilis discipulorum	pyridine nucleotide-disulfide oxidoreductase	12
Methyloversatilis discipulorum	rubrerythrin	29
Methyloversatilis discipulorum	sulfite dehydrogenase	2
Methyloversatilis discipulorum	sulfoxide reductase catalytic subunit YedY	3
Methyloversatilis discipulorum	thiol reductase thioredoxin	3
Methyloversatilis discipulorum	thiol:disulfide interchange protein	7
Methyloversatilis discipulorum	transcriptional regulator	24

Methyloversatilis discipulorum	translation initiation factor IF-3, partial	57
Methyloversatilis discipulorum	twitching motility protein PilT	2
Methyloversatilis discipulorum	two-component system response regulator	18
Methyloversatilis discipulorum	type II citrate synthase	23
Methyloversatilis discipulorum	type II secretion system protein E	17
Methyloversatilis discipulorum	udp-glucuronosyltransferase	3
Methyloversatilis thermotolerans	50S ribosomal protein L29	3
Methyloversatilis thermotolerans	50S ribosomal protein L30	7
Methyloversatilis thermotolerans	ABC transporter ATP-binding protein	2
Methyloversatilis thermotolerans	argininosuccinate synthase	5
Methyloversatilis thermotolerans	biopolymer transporter ExbD	10
Methyloversatilis thermotolerans	cation acetate symporter	15
Methyloversatilis thermotolerans	CRISPR-associated protein Csd1	3
Methyloversatilis thermotolerans	cytochrome B561	11
Methyloversatilis thermotolerans	D-alanine--D-alanine ligase	8
Methyloversatilis thermotolerans	DEAD/DEAH box helicase	4
Methyloversatilis thermotolerans	DNA starvation/stationary phase protection protein	18
Methyloversatilis thermotolerans	elongation factor 4	11
Methyloversatilis thermotolerans	ferredoxin	10
Methyloversatilis thermotolerans	formate--tetrahydrofolate ligase	2
Methyloversatilis thermotolerans	GTP cyclohydrolase I	5
Methyloversatilis thermotolerans	GTP-binding protein	12
Methyloversatilis thermotolerans	helix-turn-helix transcriptional regulator	7
Methyloversatilis thermotolerans	hydrogenase formation protein HypD	7
Methyloversatilis thermotolerans	hypothetical protein	274
Methyloversatilis thermotolerans	LPS biosynthesis protein	8
Methyloversatilis thermotolerans	ModE family transcriptional regulator	2
Methyloversatilis thermotolerans	N5-glutamine S-adenosyl-L-methionine-dependent methyltransferase	3
Methyloversatilis thermotolerans	NAD(+) kinase	6
Methyloversatilis thermotolerans	orotidine 5'-phosphate decarboxylase	1
Methyloversatilis thermotolerans	outer membrane lipid asymmetry maintenance protein MlaD	10
Methyloversatilis thermotolerans	PEP-CTERM domain protein	19
Methyloversatilis thermotolerans	pilus assembly protein	4
Methyloversatilis thermotolerans	prevent-host-death protein	6
Methyloversatilis thermotolerans	proline--tRNA ligase	7
Methyloversatilis thermotolerans	protein-tyrosine kinase	7
Methyloversatilis thermotolerans	ribonuclease E	16
Methyloversatilis thermotolerans	RND transporter	2
Methyloversatilis thermotolerans	rod shape-determining protein	22
Methyloversatilis thermotolerans	shikimate 5-dehydrogenase	21
Methyloversatilis thermotolerans	two-component sensor histidine kinase	9
Methyloversatilis thermotolerans	type I-C CRISPR-associated protein Cas5	8
Methyloversatilis thermotolerans	UDP-2,3-diacetylglucosamine hydrolase	7
Methyloversatilis thermotolerans	UDP-N-acetylmuramate--L-alanine ligase	4
Methyloversatilis thermotolerans	Vi polysaccharide biosynthesis protein VipB/TviC	2
Methyloversatilis universalis	16S rRNA pseudouridine(516) synthase	15
Methyloversatilis universalis	30S ribosomal protein S10	8
Methyloversatilis universalis	30S ribosomal protein S13	22
Methyloversatilis universalis	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol kinase	3
Methyloversatilis universalis	50S ribosomal protein L23	6
Methyloversatilis universalis	50S ribosomal protein L7/L12	13
Methyloversatilis universalis	acetyl-CoA carboxylase biotin carboxyl carrier protein subunit	7
Methyloversatilis universalis	acetylglutamate kinase	33
Methyloversatilis universalis	adenosylcobinamide kinase/adenosylcobinamide phosphate guanylyltransferase	4
Methyloversatilis universalis	ammonia channel protein	3
Methyloversatilis universalis	aspartyl-tRNA amidotransferase subunit B	5
Methyloversatilis universalis	ATP-binding protein	9
Methyloversatilis universalis	C4-dicarboxylate ABC transporter	17
Methyloversatilis universalis	carbamoyl-phosphate synthase small subunit	9
Methyloversatilis universalis	chain-length determining protein	9
Methyloversatilis universalis	chromosomal replication initiator protein DnaA	7
Methyloversatilis universalis	class V aminotransferase	13
Methyloversatilis universalis	cob(I)yrinic acid a,c-diamide adenosyltransferase	2
Methyloversatilis universalis	cobyric acid synthase CobQ	17
Methyloversatilis universalis	Crp/Fnr family transcriptional regulator	4
Methyloversatilis universalis	disulfide isomerase	25
Methyloversatilis universalis	DNA methyltransferase	3
Methyloversatilis universalis	DNA repair protein RadA	2
Methyloversatilis universalis	DNA-binding response regulator	8
Methyloversatilis universalis	DNA-directed RNA polymerase subunit omega	4
Methyloversatilis universalis	elongation factor Ts	29
Methyloversatilis universalis	enoyl-ACP reductase	6
Methyloversatilis universalis	FHA domain-containing protein	11
Methyloversatilis universalis	flagellar assembly protein FliH	3

Methyloversatilis universalis	flagellar protein FlhS	11
Methyloversatilis universalis	formylmethanofuran dehydrogenase subunit A	3
Methyloversatilis universalis	four helix bundle protein	5
Methyloversatilis universalis	fumarate hydratase	3
Methyloversatilis universalis	GPase CgtA	5
Methyloversatilis universalis	hydroxypyruvate reductase	4
Methyloversatilis universalis	hypothetical protein	131
Methyloversatilis universalis	iron-sulfur cluster scaffold-like protein	8
Methyloversatilis universalis	metallo-hydrolase	3
Methyloversatilis universalis	multidrug transporter	6
Methyloversatilis universalis	NAD(P) transhydrogenase subunit alpha	9
Methyloversatilis universalis	osmotically inducible protein C	5
Methyloversatilis universalis	peptidylprolyl isomerase	14
Methyloversatilis universalis	peroxiredoxin	5
Methyloversatilis universalis	preprotein translocase subunit SecB	4
Methyloversatilis universalis	pyridine nucleotide transhydrogenase	6
Methyloversatilis universalis	regulator	3
Methyloversatilis universalis	ribulose biphosphate carboxylase small chain	10
Methyloversatilis universalis	secretin	9
Methyloversatilis universalis	siderophore-interacting protein	2
Methyloversatilis universalis	sodium-independent anion transporter	7
Methyloversatilis universalis	sugar transferase	7
Methyloversatilis universalis	thiamine biosynthesis protein ThiF	3
Methyloversatilis universalis	transcription elongation factor GreA	4
Methyloversatilis universalis	transcriptional regulator	44
Methyloversatilis universalis	transporter	3
Methyloversatilis universalis	tRNA-2-methylthio-N(6)-dimethylallyl adenosine synthase MiaB	3
Methyloversatilis universalis	type I-C CRISPR-associated protein Cas7/Csd2	4
Methyloversatilis universalis	type II secretion system protein	4
Methyloversatilis universalis	UDP-N-acetyl glucosamine 2-epimerase	2
Methyloversatilis universalis	zinc metalloprotease	4
Proteobacteria	MULTISPECIES: arsenate reductase	10
Proteobacteria	MULTISPECIES: hypothetical protein	10
Proteobacteria	MULTISPECIES: membrane protein	5
Proteobacteria	MULTISPECIES: MerR family transcriptional regulator	2
Proteobacteria	MULTISPECIES: TetR family transcriptional regulator	5
Rhodocyclaceae	MULTISPECIES: 30S ribosomal protein S11	2
Rhodocyclaceae	MULTISPECIES: 50S ribosomal protein L13	41
Rhodocyclaceae	MULTISPECIES: cold-shock protein	25
Rhodocyclaceae	MULTISPECIES: molecular chaperone GroES	30
Rhodocyclaceae	MULTISPECIES: prevent-host-death protein	10
Rhodocyclaceae	MULTISPECIES: rubrerythrin	8
Rhodocyclaceae bacterium Paddy-	16S rRNA pseudouridine(516) synthase	5
Rhodocyclaceae bacterium Paddy-	3-hydroxy-2-methylbutyryl-CoA dehydrogenase	11
Rhodocyclaceae bacterium Paddy-	3-ketoacyl-ACP reductase, partial	18
Rhodocyclaceae bacterium Paddy-	30S ribosomal protein S16	1
Rhodocyclaceae bacterium Paddy-	30S ribosomal protein S20	2
Rhodocyclaceae bacterium Paddy-	50S ribosomal protein L16	29
Rhodocyclaceae bacterium Paddy-	50S ribosomal protein L27	16
Rhodocyclaceae bacterium Paddy-	ABC transporter	3
Rhodocyclaceae bacterium Paddy-	ABC transporter ATP-binding protein	3
Rhodocyclaceae bacterium Paddy-	ABC transporter substrate-binding protein	2
Rhodocyclaceae bacterium Paddy-	ACP S-malonyltransferase	4
Rhodocyclaceae bacterium Paddy-	ADP-L-glycero-D-mannoheptose-6-epimerase	3
Rhodocyclaceae bacterium Paddy-	alanine racemase	3
Rhodocyclaceae bacterium Paddy-	alanine-tRNA ligase	5
Rhodocyclaceae bacterium Paddy-	aldehyde dehydrogenase	2
Rhodocyclaceae bacterium Paddy-	aminotransferase	8
Rhodocyclaceae bacterium Paddy-	ArsR family transcriptional regulator	8
Rhodocyclaceae bacterium Paddy-	asparagine synthase	2
Rhodocyclaceae bacterium Paddy-	aspartate-semialdehyde dehydrogenase	5
Rhodocyclaceae bacterium Paddy-	ATP-dependent Clp protease ATP-binding subunit ClpX	19
Rhodocyclaceae bacterium Paddy-	capsular biosynthesis protein	4
Rhodocyclaceae bacterium Paddy-	cobalamin biosynthesis protein CbiX	2
Rhodocyclaceae bacterium Paddy-	cobyrinic acid a,c-diamide synthase	1
Rhodocyclaceae bacterium Paddy-	competence protein ComJ	6
Rhodocyclaceae bacterium Paddy-	Crp/Fnr family transcriptional regulator	3
Rhodocyclaceae bacterium Paddy-	cyanophycin synthetase	5
Rhodocyclaceae bacterium Paddy-	cytochrome C	33
Rhodocyclaceae bacterium Paddy-	cytochrome C552	7
Rhodocyclaceae bacterium Paddy-	division/cell wall cluster transcriptional repressor MraZ	3
Rhodocyclaceae bacterium Paddy-	electron transporter RnfB	8
Rhodocyclaceae bacterium Paddy-	exosortase B	4
Rhodocyclaceae bacterium Paddy-	Fe(3+) ABC transporter substrate-binding protein	4

Rhodocyclaceae bacterium Paddy-	glutathione peroxidase	2
Rhodocyclaceae bacterium Paddy-	glycosyl transferase	2
Rhodocyclaceae bacterium Paddy-	glycosyl transferase family 1	2
Rhodocyclaceae bacterium Paddy-	GntR family transcriptional regulator	5
Rhodocyclaceae bacterium Paddy-	heme ABC transporter permease	13
Rhodocyclaceae bacterium Paddy-	homoserine dehydrogenase	5
Rhodocyclaceae bacterium Paddy-	hypothetical protein	100
Rhodocyclaceae bacterium Paddy-	imidazole glycerol phosphate synthase subunit HisF	23
Rhodocyclaceae bacterium Paddy-	integrase	5
Rhodocyclaceae bacterium Paddy-	malate synthase A	11
Rhodocyclaceae bacterium Paddy-	metal-binding protein	3
Rhodocyclaceae bacterium Paddy-	molybdopterin-guanine dinucleotide biosynthesis protein MobB	10
Rhodocyclaceae bacterium Paddy-	N-ethylmeline chlorohydrolase	1
Rhodocyclaceae bacterium Paddy-	NADH:flavin oxidoreductase	2
Rhodocyclaceae bacterium Paddy-	oligoribonuclease	14
Rhodocyclaceae bacterium Paddy-	peptidase M48 family protein	15
Rhodocyclaceae bacterium Paddy-	peroxidase	328
Rhodocyclaceae bacterium Paddy-	phosphate acyltransferase	4
Rhodocyclaceae bacterium Paddy-	phosphate import ATP-binding protein PstB	8
Rhodocyclaceae bacterium Paddy-	phosphatidylserine decarboxylase	3
Rhodocyclaceae bacterium Paddy-	phospho-N-acetylmuramoyl-pentapeptide-transferase	12
Rhodocyclaceae bacterium Paddy-	phosphoglyceromutase	4
Rhodocyclaceae bacterium Paddy-	phosphoglycolate phosphatase	6
Rhodocyclaceae bacterium Paddy-	phosphoribosylaminoimidazole carboxylase	2
Rhodocyclaceae bacterium Paddy-	polysaccharide export protein EpsE	4
Rhodocyclaceae bacterium Paddy-	rRNA helicase	3
Rhodocyclaceae bacterium Paddy-	septum formation inhibitor Maf	2
Rhodocyclaceae bacterium Paddy-	succinyl-CoA synthetase subunit beta	6
Rhodocyclaceae bacterium Paddy-	sulfate ABC transporter substrate-binding protein	4
Rhodocyclaceae bacterium Paddy-	sulfurtransferase	11
Rhodocyclaceae bacterium Paddy-	thiol:disulfide interchange protein	10
Rhodocyclaceae bacterium Paddy-	thiosulfohydrolase SoxB	3
Rhodocyclaceae bacterium Paddy-	threonine synthase	8
Rhodocyclaceae bacterium Paddy-	transcriptional regulator	12
Rhodocyclaceae bacterium Paddy-	tRNA(5-methylaminomethyl-2-thiouridine)-methyltransferase	14
Rhodocyclaceae bacterium Paddy-	two-component system response regulator	18
Rhodocyclaceae bacterium Paddy-	two-component system response regulator protein-glutamate methyltransferase	4
Rhodocyclaceae bacterium Paddy-	undecaprenyl-phosphate glucose phosphotransferase	6
Sulfuritalea hydrogenivorans	(2Fe-2S) ferredoxin	26
Sulfuritalea hydrogenivorans	(2Fe-2S)-binding protein	18
Sulfuritalea hydrogenivorans	(Fe-S)-binding protein	3
Sulfuritalea hydrogenivorans	(Fe-S)-cluster assembly protein	8
Sulfuritalea hydrogenivorans	1-(5-phosphoribosyl)-5-((5-phosphoribosylamino)methylideneamino)imidazole-4-carboxamide isomerase	20
Sulfuritalea hydrogenivorans	1-deoxy-D-xylulose-5-phosphate reductoisomerase	6
Sulfuritalea hydrogenivorans	16S rRNA (cytosine(1402)-N(4))-methyltransferase	1
Sulfuritalea hydrogenivorans	16S rRNA (uracil(1498)-N(3))-methyltransferase	4
Sulfuritalea hydrogenivorans	16S rRNA maturation RNase YbeY	3
Sulfuritalea hydrogenivorans	2-C-methyl-D-erythritol 4-phosphate cytidylyltransferase	16
Sulfuritalea hydrogenivorans	2-hydroxy-acid oxidase	8
Sulfuritalea hydrogenivorans	2-hydroxyacid dehydrogenase	6
Sulfuritalea hydrogenivorans	2-hydroxyhepta-2,4-diene-1,7-dioate isomerase	3
Sulfuritalea hydrogenivorans	2-octaprenyl-3-methyl-6-methoxy-1,4-benzoquinol hydroxylase	8
Sulfuritalea hydrogenivorans	2-oxoglutarate dehydrogenase subunit E1	4
Sulfuritalea hydrogenivorans	23S rRNA methyltransferase	10
Sulfuritalea hydrogenivorans	3-dehydroquinate synthase	14
Sulfuritalea hydrogenivorans	3-isopropylmalate dehydratase large subunit	16
Sulfuritalea hydrogenivorans	3-mercaptopyruvate sulfurtransferase	6
Sulfuritalea hydrogenivorans	3-methyl-2-oxobutanoate hydroxymethyltransferase	5
Sulfuritalea hydrogenivorans	3-oxoadipate enol-lactonase	7
Sulfuritalea hydrogenivorans	3-phosphoshikimate 1-carboxyvinyltransferase	3
Sulfuritalea hydrogenivorans	3,4-dihydroxy-2-butanone-4-phosphate synthase	3
Sulfuritalea hydrogenivorans	3',5'-cyclic-nucleotide phosphodiesterase	4
Sulfuritalea hydrogenivorans	30S ribosomal protein S1	48
Sulfuritalea hydrogenivorans	30S ribosomal protein S14	22
Sulfuritalea hydrogenivorans	30S ribosomal protein S16	20
Sulfuritalea hydrogenivorans	30S ribosomal protein S17	7
Sulfuritalea hydrogenivorans	30S ribosomal protein S19	7
Sulfuritalea hydrogenivorans	30S ribosomal protein S20	16
Sulfuritalea hydrogenivorans	30S ribosomal protein S7	17
Sulfuritalea hydrogenivorans	30S ribosomal protein S8	22
Sulfuritalea hydrogenivorans	30S ribosomal protein S9	41
Sulfuritalea hydrogenivorans	4-hydroxy-3-methylbut-2-en-1-yl diphosphate synthase	4
Sulfuritalea hydrogenivorans	4-hydroxy-tetrahydrodipicolinate reductase	8
Sulfuritalea hydrogenivorans	4-hydroxy-tetrahydrodipicolinate synthase	8

Sulfuritalea hydrogenivorans	4'-phosphopantetheinyl transferase	3
Sulfuritalea hydrogenivorans	4Fe-4S ferredoxin	80
Sulfuritalea hydrogenivorans	5'-methylthioadenosine phosphorylase	8
Sulfuritalea hydrogenivorans	50S ribosomal protein L1	69
Sulfuritalea hydrogenivorans	50S ribosomal protein L10	24
Sulfuritalea hydrogenivorans	50S ribosomal protein L11	8
Sulfuritalea hydrogenivorans	50S ribosomal protein L14	6
Sulfuritalea hydrogenivorans	50S ribosomal protein L15	17
Sulfuritalea hydrogenivorans	50S ribosomal protein L17	13
Sulfuritalea hydrogenivorans	50S ribosomal protein L19	5
Sulfuritalea hydrogenivorans	50S ribosomal protein L21	16
Sulfuritalea hydrogenivorans	50S ribosomal protein L22	1
Sulfuritalea hydrogenivorans	50S ribosomal protein L24	6
Sulfuritalea hydrogenivorans	50S ribosomal protein L25	7
Sulfuritalea hydrogenivorans	50S ribosomal protein L28	9
Sulfuritalea hydrogenivorans	50S ribosomal protein L29	8
Sulfuritalea hydrogenivorans	50S ribosomal protein L30	4
Sulfuritalea hydrogenivorans	50S ribosomal protein L31	8
Sulfuritalea hydrogenivorans	50S ribosomal protein L35	5
Sulfuritalea hydrogenivorans	50S ribosomal protein L4	59
Sulfuritalea hydrogenivorans	50S ribosomal protein L5	5
Sulfuritalea hydrogenivorans	50S ribosomal protein L6	22
Sulfuritalea hydrogenivorans	50S rRNA methyltransferase	8
Sulfuritalea hydrogenivorans	6-phosphofructokinase	10
Sulfuritalea hydrogenivorans	7-cyano-7-deazaguanine reductase	6
Sulfuritalea hydrogenivorans	ABC transporter	70
Sulfuritalea hydrogenivorans	ABC transporter ATP-binding protein	16
Sulfuritalea hydrogenivorans	ABC transporter permease	29
Sulfuritalea hydrogenivorans	ABC-ATPase UvrA	12
Sulfuritalea hydrogenivorans	acetolactate synthase 3 catalytic subunit	11
Sulfuritalea hydrogenivorans	acetyl-CoA carboxylase subunit beta	5
Sulfuritalea hydrogenivorans	acetyl-CoA synthetase	6
Sulfuritalea hydrogenivorans	acetyl-coenzyme A synthetase	15
Sulfuritalea hydrogenivorans	acetylneuraminic acid synthetase	6
Sulfuritalea hydrogenivorans	acetylmethionine aminotransferase	15
Sulfuritalea hydrogenivorans	aconitate hydratase B	5
Sulfuritalea hydrogenivorans	acyl-CoA thioesterase	9
Sulfuritalea hydrogenivorans	adenosylmethionine--8-amino-7-oxononanoate aminotransferase BioA	4
Sulfuritalea hydrogenivorans	adenylosuccinate lyase	11
Sulfuritalea hydrogenivorans	adenylosuccinate synthase	4
Sulfuritalea hydrogenivorans	adenylyl cyclase	5
Sulfuritalea hydrogenivorans	adenylyl-sulfate reductase	393
Sulfuritalea hydrogenivorans	ADP-heptose synthase	21
Sulfuritalea hydrogenivorans	AI-2E family transporter	2
Sulfuritalea hydrogenivorans	aldehyde ferredoxin oxidoreductase	3
Sulfuritalea hydrogenivorans	alkyl hydroperoxide reductase	16
Sulfuritalea hydrogenivorans	alpha-glucan phosphorylase	3
Sulfuritalea hydrogenivorans	alpha/beta hydrolase	11
Sulfuritalea hydrogenivorans	amidophosphoribosyltransferase	7
Sulfuritalea hydrogenivorans	amino acid dehydrogenase	8
Sulfuritalea hydrogenivorans	aminoacyl-tRNA deacylase	8
Sulfuritalea hydrogenivorans	aminoglycoside phosphotransferase	7
Sulfuritalea hydrogenivorans	aminotransferase	5
Sulfuritalea hydrogenivorans	AMP-dependent synthetase	4
Sulfuritalea hydrogenivorans	anthranilate phosphoribosyltransferase	6
Sulfuritalea hydrogenivorans	anthranilate synthase component I	10
Sulfuritalea hydrogenivorans	anti-sigma-factor antagonist	16
Sulfuritalea hydrogenivorans	arabinose-5-phosphate isomerase	6
Sulfuritalea hydrogenivorans	arginine--tRNA ligase	10
Sulfuritalea hydrogenivorans	argininosuccinate lyase	7
Sulfuritalea hydrogenivorans	arginyl-tRNA-protein transferase	3
Sulfuritalea hydrogenivorans	aromatic amino acid aminotransferase	18
Sulfuritalea hydrogenivorans	arsenate reductase	14
Sulfuritalea hydrogenivorans	aspartate--tRNA ligase	9
Sulfuritalea hydrogenivorans	ATP F0F1 synthase subunit gamma	8
Sulfuritalea hydrogenivorans	ATP phosphoribosyltransferase	8
Sulfuritalea hydrogenivorans	ATP synthase F0F1 subunit C	27
Sulfuritalea hydrogenivorans	ATP--cobalamin adenosyltransferase	3
Sulfuritalea hydrogenivorans	ATP-dependent Clp protease ATP-binding subunit ClpA	14
Sulfuritalea hydrogenivorans	ATP-dependent Clp protease proteolytic subunit	6
Sulfuritalea hydrogenivorans	ATP-dependent DNA helicase RecQ	2
Sulfuritalea hydrogenivorans	ATP-dependent DNA helicase RuvB	6
Sulfuritalea hydrogenivorans	ATPase	1
Sulfuritalea hydrogenivorans	ATPase AAA	5

Sulfuritalea hydrogenivorans	BAX inhibitor protein	71
Sulfuritalea hydrogenivorans	benzoate transporter	22
Sulfuritalea hydrogenivorans	benzoyl-CoA oxygenase	3
Sulfuritalea hydrogenivorans	benzoyl-CoA-dihydrodiol lyase	7
Sulfuritalea hydrogenivorans	beta-hexosaminidase	2
Sulfuritalea hydrogenivorans	beta-ketoacyl-ACP reductase	3
Sulfuritalea hydrogenivorans	bifunctional 5,10-methylene-tetrahydrofolate dehydrogenase/5,10-methylene-tetrahydrofolate cyclohydrolase	8
Sulfuritalea hydrogenivorans	bifunctional diaminohydroxyphosphoribosylaminopyrimidine deaminase/5-amino-6-(5-phosphoribosylamino)uracil reductase	4
Sulfuritalea hydrogenivorans	bifunctional isocitrate dehydrogenase kinase/phosphatase	3
Sulfuritalea hydrogenivorans	bifunctional N-acetylglucosamine-1-phosphate uridylyltransferase/glucosamine-1-phosphate acetyltransferase	15
Sulfuritalea hydrogenivorans	bifunctional phosphoribosylaminoimidazolecarboxamide formyltransferase/inosine monophosphate cyclohydrolase	5
Sulfuritalea hydrogenivorans	bifunctional riboflavin kinase/FMN adenyllyltransferase	5
Sulfuritalea hydrogenivorans	biopolymer transporter ExbD	3
Sulfuritalea hydrogenivorans	biotin synthase	7
Sulfuritalea hydrogenivorans	biotin--[acetyl-CoA-carboxylase] ligase	3
Sulfuritalea hydrogenivorans	bis(5'-nucleosyl)-tetrphosphatase (symmetrical)	5
Sulfuritalea hydrogenivorans	BolA family transcriptional regulator	11
Sulfuritalea hydrogenivorans	branched chain amino acid ABC transporter substrate-binding protein	13
Sulfuritalea hydrogenivorans	branched-chain alpha-keto acid dehydrogenase subunit E2	381
Sulfuritalea hydrogenivorans	c-type cytochrome biogenesis protein CcmI	9
Sulfuritalea hydrogenivorans	C4-dicarboxylate ABC transporter	21
Sulfuritalea hydrogenivorans	carbonate dehydratase	1
Sulfuritalea hydrogenivorans	cation acetate symporter	2
Sulfuritalea hydrogenivorans	cation diffusion facilitator transporter	5
Sulfuritalea hydrogenivorans	cation tolerance protein CutA	5
Sulfuritalea hydrogenivorans	cation transporter	13
Sulfuritalea hydrogenivorans	ccb3-type cytochrome c oxidase subunit II	5
Sulfuritalea hydrogenivorans	CBS domain-containing protein	4
Sulfuritalea hydrogenivorans	cell division protein	3
Sulfuritalea hydrogenivorans	cell division protein FtsA	8
Sulfuritalea hydrogenivorans	cell division protein FtsH	7
Sulfuritalea hydrogenivorans	cell division protein FtsK	7
Sulfuritalea hydrogenivorans	cell division protein FtsZ	7
Sulfuritalea hydrogenivorans	cell shape determination protein CcmA	40
Sulfuritalea hydrogenivorans	channel protein TolC	6
Sulfuritalea hydrogenivorans	chemotaxis protein CheA	20
Sulfuritalea hydrogenivorans	chemotaxis protein CheY	19
Sulfuritalea hydrogenivorans	chemotaxis protein CheZ	13
Sulfuritalea hydrogenivorans	chemotaxis response regulator protein-glutamate methyltransferase	6
Sulfuritalea hydrogenivorans	chromosome partitioning protein ParB	2
Sulfuritalea hydrogenivorans	chromosome segregation protein SMC	8
Sulfuritalea hydrogenivorans	cobalamin biosynthesis protein	3
Sulfuritalea hydrogenivorans	cobyrimic acid a,c-diamide synthase	11
Sulfuritalea hydrogenivorans	competence protein ComL	6
Sulfuritalea hydrogenivorans	coproporphyrinogen III oxidase	21
Sulfuritalea hydrogenivorans	Crp/Fnr family transcriptional regulator	4
Sulfuritalea hydrogenivorans	cupin	2
Sulfuritalea hydrogenivorans	cyclic pyranopterin monophosphate synthase accessory protein	4
Sulfuritalea hydrogenivorans	cysteine desulfurase	104
Sulfuritalea hydrogenivorans	cysteine synthase	9
Sulfuritalea hydrogenivorans	cytochrome B561	26
Sulfuritalea hydrogenivorans	cytochrome C	35
Sulfuritalea hydrogenivorans	cytochrome C biogenesis protein CcmE	9
Sulfuritalea hydrogenivorans	cytochrome C oxidase subunit I	3
Sulfuritalea hydrogenivorans	cytochrome C550	13
Sulfuritalea hydrogenivorans	cytochrome Cbb3	16
Sulfuritalea hydrogenivorans	cytosol aminopeptidase	7
Sulfuritalea hydrogenivorans	D-fructose-6-phosphate amidotransferase	4
Sulfuritalea hydrogenivorans	D-glycerate dehydrogenase	5
Sulfuritalea hydrogenivorans	D-hexose-6-phosphate mutarotase	19
Sulfuritalea hydrogenivorans	damage-inducible protein CinA	2
Sulfuritalea hydrogenivorans	deacetylase	9
Sulfuritalea hydrogenivorans	DEAD/DEAH box helicase	1
Sulfuritalea hydrogenivorans	dehydrogenase	11
Sulfuritalea hydrogenivorans	delta-aminolevulinic acid dehydratase	10
Sulfuritalea hydrogenivorans	denitrification system component NirT	83
Sulfuritalea hydrogenivorans	deoxyguanosinetriphosphate triphosphohydrolase	6
Sulfuritalea hydrogenivorans	dethiobiotin synthase	4
Sulfuritalea hydrogenivorans	diaminopimelate epimerase	11
Sulfuritalea hydrogenivorans	dienelactone hydrolase	2
Sulfuritalea hydrogenivorans	diguanylate cyclase	9
Sulfuritalea hydrogenivorans	dihydroliipoamide dehydrogenase	23
Sulfuritalea hydrogenivorans	dihydroorotase	13
Sulfuritalea hydrogenivorans	dihydroxy-acid dehydratase	5



Sulfuritalea hydrogenivorans	disulfide bond formation protein	5
Sulfuritalea hydrogenivorans	DMSO reductase	3
Sulfuritalea hydrogenivorans	DNA gyrase subunit B	2
Sulfuritalea hydrogenivorans	DNA helicase	2
Sulfuritalea hydrogenivorans	DNA mismatch repair protein MutS	2
Sulfuritalea hydrogenivorans	DNA polymerase III subunit alpha	4
Sulfuritalea hydrogenivorans	DNA polymerase III subunit beta	8
Sulfuritalea hydrogenivorans	DNA polymerase III subunit epsilon	7
Sulfuritalea hydrogenivorans	DNA processing protein DprA	2
Sulfuritalea hydrogenivorans	DNA recombination/repair protein RecA	6
Sulfuritalea hydrogenivorans	DNA repair protein RecN	6
Sulfuritalea hydrogenivorans	DNA-binding protein	10
Sulfuritalea hydrogenivorans	DNA-binding response regulator	33
Sulfuritalea hydrogenivorans	DNA-directed RNA polymerase subunit beta	14
Sulfuritalea hydrogenivorans	DNA-directed RNA polymerase subunit beta'	12
Sulfuritalea hydrogenivorans	DNA-formamidopyrimidine glycosylase	6
Sulfuritalea hydrogenivorans	DnaA regulatory inactivator Hda	4
Sulfuritalea hydrogenivorans	electron transport complex subunit A	7
Sulfuritalea hydrogenivorans	electron transporter RnfA	3
Sulfuritalea hydrogenivorans	elongation factor G	7
Sulfuritalea hydrogenivorans	elongation factor P	3
Sulfuritalea hydrogenivorans	enoyl-CoA hydratase	5
Sulfuritalea hydrogenivorans	epoxyqueuosine reductase	7
Sulfuritalea hydrogenivorans	erythromycin biosynthesis sensory transduction protein eryC1	2
Sulfuritalea hydrogenivorans	EVE domain-containing protein	5
Sulfuritalea hydrogenivorans	excinuclease ABC subunit A	12
Sulfuritalea hydrogenivorans	exodeoxyribonuclease III	5
Sulfuritalea hydrogenivorans	exodeoxyribonuclease VII large subunit	6
Sulfuritalea hydrogenivorans	exopolyphosphatase	2
Sulfuritalea hydrogenivorans	Fe-S cluster assembly transcriptional regulator IscR	11
Sulfuritalea hydrogenivorans	Fe-S cluster protein	6
Sulfuritalea hydrogenivorans	Fe-S oxidoreductase	151
Sulfuritalea hydrogenivorans	Fe(3+) ABC transporter substrate-binding protein	12
Sulfuritalea hydrogenivorans	ferredoxin	21
Sulfuritalea hydrogenivorans	ferredoxin--NAD(+) reductase	3
Sulfuritalea hydrogenivorans	FeS assembly protein IscX	23
Sulfuritalea hydrogenivorans	flagellar basal body rod modification protein FlgD	25
Sulfuritalea hydrogenivorans	flagellar basal body rod protein FlgF	10
Sulfuritalea hydrogenivorans	flagellar basal body rod protein FlgG	11
Sulfuritalea hydrogenivorans	flagellar biosynthesis protein FlgB	20
Sulfuritalea hydrogenivorans	flagellar biosynthesis protein FlgI	9
Sulfuritalea hydrogenivorans	flagellar biosynthesis protein FlhB	3
Sulfuritalea hydrogenivorans	flagellar biosynthesis regulator FlhF	5
Sulfuritalea hydrogenivorans	flagellar hook protein FlgK	14
Sulfuritalea hydrogenivorans	flagellar hook-associated protein 3	6
Sulfuritalea hydrogenivorans	flagellar hook-basal body protein FlhE	38
Sulfuritalea hydrogenivorans	flagellar L-ring protein FlgH	7
Sulfuritalea hydrogenivorans	flagellar M-ring protein FlhF	8
Sulfuritalea hydrogenivorans	flagellar motor protein MotA	11
Sulfuritalea hydrogenivorans	flagellar motor protein MotB	4
Sulfuritalea hydrogenivorans	flagellar motor switch protein FlhM	4
Sulfuritalea hydrogenivorans	flagellar motor switch protein G	8
Sulfuritalea hydrogenivorans	FmdB family transcriptional regulator	10
Sulfuritalea hydrogenivorans	formate dehydrogenase	18
Sulfuritalea hydrogenivorans	fructose 1,6-bisphosphatase	43
Sulfuritalea hydrogenivorans	fructose-bisphosphate aldolase	4
Sulfuritalea hydrogenivorans	fumarate reductase	9
Sulfuritalea hydrogenivorans	glucose-1-phosphate adenylyltransferase	14
Sulfuritalea hydrogenivorans	glucose-6-phosphate isomerase	15
Sulfuritalea hydrogenivorans	glutamate 5-kinase	2
Sulfuritalea hydrogenivorans	glutamate synthase	54
Sulfuritalea hydrogenivorans	glutamate--cysteine ligase	3
Sulfuritalea hydrogenivorans	glutamate-1-semialdehyde aminotransferase	7
Sulfuritalea hydrogenivorans	glutamine synthetase	12
Sulfuritalea hydrogenivorans	glutamine--fructose-6-phosphate aminotransferase	15
Sulfuritalea hydrogenivorans	glutamine--tRNA ligase	5
Sulfuritalea hydrogenivorans	glutamine-synthetase adenylyltransferase	2
Sulfuritalea hydrogenivorans	glutamyl-tRNA amidotransferase	13
Sulfuritalea hydrogenivorans	glutamyl-tRNA reductase	9
Sulfuritalea hydrogenivorans	glycerol-3-phosphate transporter permease	1
Sulfuritalea hydrogenivorans	glycine cleavage system protein R	5
Sulfuritalea hydrogenivorans	glycogen synthase	3
Sulfuritalea hydrogenivorans	glycolate oxidase	17
Sulfuritalea hydrogenivorans	glycoside hydrolase	2

Sulfuritalea hydrogenivorans	GMP synthetase	2
Sulfuritalea hydrogenivorans	GNAT family N-acetyltransferase	8
Sulfuritalea hydrogenivorans	GTP cyclohydrolase FolE2	39
Sulfuritalea hydrogenivorans	GTP pyrophosphokinase	3
Sulfuritalea hydrogenivorans	guanosine-3',5'-bis(diphosphate) 3'-pyrophosphohydrolase	6
Sulfuritalea hydrogenivorans	guanylate cyclase	4
Sulfuritalea hydrogenivorans	guanylate kinase	6
Sulfuritalea hydrogenivorans	GxxExxY protein	2
Sulfuritalea hydrogenivorans	haloacid dehalogenase	1
Sulfuritalea hydrogenivorans	helicase	3
Sulfuritalea hydrogenivorans	heme ABC exporter ATP-binding protein CcmA	9
Sulfuritalea hydrogenivorans	hemerythrin	12
Sulfuritalea hydrogenivorans	hemolysin D	5
Sulfuritalea hydrogenivorans	heterodisulfide reductase	36
Sulfuritalea hydrogenivorans	heterodisulfide reductase subunit A	22
Sulfuritalea hydrogenivorans	histidine kinase	12
Sulfuritalea hydrogenivorans	HrcA family transcriptional regulator	7
Sulfuritalea hydrogenivorans	hydrogenase	12
Sulfuritalea hydrogenivorans	hydrogenase 2 large subunit	15
Sulfuritalea hydrogenivorans	hydrogenase 2 protein HybA	16
Sulfuritalea hydrogenivorans	hydrogenase expression/formation protein HypE	4
Sulfuritalea hydrogenivorans	hydrogenase nickel incorporation protein HypA	4
Sulfuritalea hydrogenivorans	hydroxylase	4
Sulfuritalea hydrogenivorans	hydroxymethylbilane synthase	4
Sulfuritalea hydrogenivorans	hydroxymethylglutaryl-CoA lyase	6
Sulfuritalea hydrogenivorans	hypothetical protein	2110
Sulfuritalea hydrogenivorans	hypothetical protein, partial	8
Sulfuritalea hydrogenivorans	imidazoleglycerol-phosphate dehydratase	10
Sulfuritalea hydrogenivorans	indolepyruvate ferredoxin oxidoreductase	7
Sulfuritalea hydrogenivorans	inosine-5-monophosphate dehydrogenase	27
Sulfuritalea hydrogenivorans	insertase	12
Sulfuritalea hydrogenivorans	integrase	8
Sulfuritalea hydrogenivorans	iron-sulfur cluster insertion protein ErpA	40
Sulfuritalea hydrogenivorans	isocitrate dehydrogenase	20
Sulfuritalea hydrogenivorans	isocitrate lyase	5
Sulfuritalea hydrogenivorans	isoleucine--tRNA ligase	5
Sulfuritalea hydrogenivorans	ketol-acid reductoisomerase	6
Sulfuritalea hydrogenivorans	leucine--tRNA ligase	4
Sulfuritalea hydrogenivorans	leucyl/phenylalanyl-tRNA--protein transferase	3
Sulfuritalea hydrogenivorans	lipoprotein	9
Sulfuritalea hydrogenivorans	long-chain-fatty-acid--CoA ligase	21
Sulfuritalea hydrogenivorans	magnesium and cobalt efflux protein CorC	5
Sulfuritalea hydrogenivorans	magnesium transporter	2
Sulfuritalea hydrogenivorans	malate dehydrogenase	24
Sulfuritalea hydrogenivorans	malate synthase A	13
Sulfuritalea hydrogenivorans	malic enzyme	12
Sulfuritalea hydrogenivorans	maltodextrin phosphorylase	5
Sulfuritalea hydrogenivorans	MarR family transcriptional regulator	4
Sulfuritalea hydrogenivorans	MBL fold metallo-hydrolase	11
Sulfuritalea hydrogenivorans	membrane protein	39
Sulfuritalea hydrogenivorans	metal ABC transporter permease	19
Sulfuritalea hydrogenivorans	metal-binding protein	6
Sulfuritalea hydrogenivorans	methionine synthase	6
Sulfuritalea hydrogenivorans	methylmalonyl-CoA carboxyltransferase	2
Sulfuritalea hydrogenivorans	methyltransferase	4
Sulfuritalea hydrogenivorans	microcin ABC transporter ATP-binding protein	6
Sulfuritalea hydrogenivorans	molecular chaperone DnaJ	5
Sulfuritalea hydrogenivorans	molecular chaperone DnaK	10
Sulfuritalea hydrogenivorans	molecular chaperone GroEL	147
Sulfuritalea hydrogenivorans	molecular chaperone HscA	5
Sulfuritalea hydrogenivorans	molecular chaperone SurA	4
Sulfuritalea hydrogenivorans	molybdopterin biosynthesis protein MoeB	12
Sulfuritalea hydrogenivorans	molybdopterin oxidoreductase	62
Sulfuritalea hydrogenivorans	monofunctional biosynthetic peptidoglycan transglycosylase	2
Sulfuritalea hydrogenivorans	multidrug efflux RND transporter permease subunit	3
Sulfuritalea hydrogenivorans	multidrug transporter AcrB	31
Sulfuritalea hydrogenivorans	murein transglycosylase	8
Sulfuritalea hydrogenivorans	N-acetyl-gamma-glutamyl-phosphate reductase	8
Sulfuritalea hydrogenivorans	N-acetylglutamate synthase	14
Sulfuritalea hydrogenivorans	N-acetylmuramoyl-L-alanine amidase	10
Sulfuritalea hydrogenivorans	N5-carboxyaminoimidazole ribonucleotide mutase	6
Sulfuritalea hydrogenivorans	NAD-dependent dehydratase	27
Sulfuritalea hydrogenivorans	NADH dehydrogenase	39
Sulfuritalea hydrogenivorans	NADH:ubiquinone oxidoreductase	1

Sulfititalea hydrogenivorans	NADH:ubiquinone oxidoreductase subunit A	12
Sulfititalea hydrogenivorans	NADH:ubiquinone oxidoreductase subunit H	14
Sulfititalea hydrogenivorans	NADH:ubiquinone oxidoreductase subunit J	13
Sulfititalea hydrogenivorans	NADH:ubiquinone oxidoreductase subunit L	11
Sulfititalea hydrogenivorans	NADH:ubiquinone oxidoreductase subunit M	14
Sulfititalea hydrogenivorans	NADH:ubiquinone oxidoreductase subunit N	13
Sulfititalea hydrogenivorans	NADP oxidoreductase	6
Sulfititalea hydrogenivorans	Nif3-like dinuclear metal center hexameric protein	5
Sulfititalea hydrogenivorans	nitrate reductase	109
Sulfititalea hydrogenivorans	nitrate reductase catalytic subunit	15
Sulfititalea hydrogenivorans	nitrogen assimilation regulatory protein NtrX	3
Sulfititalea hydrogenivorans	nitrogen regulatory protein P-II 1	33
Sulfititalea hydrogenivorans	non-canonical purine NTP pyrophosphatase	3
Sulfititalea hydrogenivorans	NrdR family transcriptional regulator	7
Sulfititalea hydrogenivorans	nucleoid-associated protein	17
Sulfititalea hydrogenivorans	nucleoside recognition domain-containing protein	6
Sulfititalea hydrogenivorans	nucleotide-binding protein	11
Sulfititalea hydrogenivorans	NUDIX hydrolase	16
Sulfititalea hydrogenivorans	O-acetylhomoserine aminocarboxypropyltransferase	9
Sulfititalea hydrogenivorans	outer membrane lipoprotein carrier protein LolA	27
Sulfititalea hydrogenivorans	outer membrane lipoprotein OmlA	14
Sulfititalea hydrogenivorans	oxidoreductase	3
Sulfititalea hydrogenivorans	PAS domain-containing sensor histidine kinase	4
Sulfititalea hydrogenivorans	penicillin-binding protein	1
Sulfititalea hydrogenivorans	peptidase M16	3
Sulfititalea hydrogenivorans	peptidase M17	6
Sulfititalea hydrogenivorans	peptidase M20	3
Sulfititalea hydrogenivorans	peptidase M23	22
Sulfititalea hydrogenivorans	peptidase M48	12
Sulfititalea hydrogenivorans	peptidase PMbA	5
Sulfititalea hydrogenivorans	peptidase S16	7
Sulfititalea hydrogenivorans	peptidase S41	11
Sulfititalea hydrogenivorans	peptidase S49	19
Sulfititalea hydrogenivorans	peptide chain release factor 1	11
Sulfititalea hydrogenivorans	peptide chain release factor 2	9
Sulfititalea hydrogenivorans	peptide deformylase	1
Sulfititalea hydrogenivorans	peptidylprolyl isomerase	21
Sulfititalea hydrogenivorans	peroxiredoxin	6
Sulfititalea hydrogenivorans	phage repressor	4
Sulfititalea hydrogenivorans	phage-like protein	5
Sulfititalea hydrogenivorans	phenylalanine--tRNA ligase subunit beta	4
Sulfititalea hydrogenivorans	phosphatase	5
Sulfititalea hydrogenivorans	phosphate ABC transporter permease	9
Sulfititalea hydrogenivorans	phosphate starvation protein PhoH	7
Sulfititalea hydrogenivorans	phospho-2-dehydro-3-deoxyheptonate aldolase	17
Sulfititalea hydrogenivorans	phosphocarrier protein HPr	7
Sulfititalea hydrogenivorans	phosphoenolpyruvate--protein phosphotransferase	5
Sulfititalea hydrogenivorans	phosphoglucomutase	2
Sulfititalea hydrogenivorans	phosphoglucosamine mutase	5
Sulfititalea hydrogenivorans	phosphoglycerate kinase	16
Sulfititalea hydrogenivorans	phosphoheptose isomerase	8
Sulfititalea hydrogenivorans	phosphohistidine phosphatase	18
Sulfititalea hydrogenivorans	phosphohydrolase	3
Sulfititalea hydrogenivorans	phosphopantothenate synthase	13
Sulfititalea hydrogenivorans	phosphopyruvate hydratase	11
Sulfititalea hydrogenivorans	phosphoribosyl-ATP pyrophosphatase	2
Sulfititalea hydrogenivorans	phosphoribosylamine--glycine ligase	3
Sulfititalea hydrogenivorans	phosphoribosylaminoimidazole synthetase	7
Sulfititalea hydrogenivorans	phosphoribosylaminoimidazolesuccinocarboxamide synthase	6
Sulfititalea hydrogenivorans	phosphoribosylformylglycinamide synthase	5
Sulfititalea hydrogenivorans	phosphoribulokinase	16
Sulfititalea hydrogenivorans	phosphoserine phosphatase	4
Sulfititalea hydrogenivorans	PLP-dependent threonine dehydratase	5
Sulfititalea hydrogenivorans	poly(3-hydroxyalkanoate) polymerase	8
Sulfititalea hydrogenivorans	poly(A) polymerase	8
Sulfititalea hydrogenivorans	polynucleotide phosphorylase/polyadenylase	15
Sulfititalea hydrogenivorans	polyphosphate kinase	11
Sulfititalea hydrogenivorans	potassium transporter	3
Sulfititalea hydrogenivorans	potassium transporter peripheral membrane component	4
Sulfititalea hydrogenivorans	potassium transporter Trk	2
Sulfititalea hydrogenivorans	prephenate dehydrogenase	1
Sulfititalea hydrogenivorans	preprotein translocase subunit SecA	13
Sulfititalea hydrogenivorans	preprotein translocase subunit SecD	5
Sulfititalea hydrogenivorans	preprotein translocase subunit SecE	11

Sulfuritalea hydrogenivorans	preprotein translocase subunit SecY	5
Sulfuritalea hydrogenivorans	prolipoprotein diacylglycerol transferase	5
Sulfuritalea hydrogenivorans	protease modulator HflC	11
Sulfuritalea hydrogenivorans	protease modulator HflK	6
Sulfuritalea hydrogenivorans	protein disaggregation chaperone	13
Sulfuritalea hydrogenivorans	protein phosphatase	20
Sulfuritalea hydrogenivorans	protein translocase TatA	21
Sulfuritalea hydrogenivorans	protein-(glutamine-N5) methyltransferase, ribosomal protein L3-specific	4
Sulfuritalea hydrogenivorans	protein-L-isoaspartate O-methyltransferase	11
Sulfuritalea hydrogenivorans	protoheme IX farnesyltransferase	3
Sulfuritalea hydrogenivorans	pseudouridine synthase	3
Sulfuritalea hydrogenivorans	pseudouridylylase synthase	10
Sulfuritalea hydrogenivorans	pterin-4-alpha-carbinolamine dehydratase	1
Sulfuritalea hydrogenivorans	PTS fructose transporter subunit IIA	7
Sulfuritalea hydrogenivorans	pyrophosphatase	26
Sulfuritalea hydrogenivorans	pyrroline-5-carboxylate reductase	18
Sulfuritalea hydrogenivorans	pyruvate dehydrogenase	21
Sulfuritalea hydrogenivorans	pyruvate ferredoxin oxidoreductase	13
Sulfuritalea hydrogenivorans	pyruvate formate lyase-activating protein	5
Sulfuritalea hydrogenivorans	pyruvate kinase	22
Sulfuritalea hydrogenivorans	pyruvate, phosphate dikinase	5
Sulfuritalea hydrogenivorans	quinol dehydrogenase	100
Sulfuritalea hydrogenivorans	quinolinate synthetase	6
Sulfuritalea hydrogenivorans	radical SAM protein	2
Sulfuritalea hydrogenivorans	recombination factor protein RarA	9
Sulfuritalea hydrogenivorans	recombination protein RecR	3
Sulfuritalea hydrogenivorans	reductase	9
Sulfuritalea hydrogenivorans	repressor	15
Sulfuritalea hydrogenivorans	restriction endonuclease	3
Sulfuritalea hydrogenivorans	rhodanese	67
Sulfuritalea hydrogenivorans	rhodanese-like domain-containing protein	12
Sulfuritalea hydrogenivorans	riboflavin synthase subunit alpha	16
Sulfuritalea hydrogenivorans	ribonuclease activity regulator protein RraA	14
Sulfuritalea hydrogenivorans	ribonuclease II	1
Sulfuritalea hydrogenivorans	ribonuclease III	1
Sulfuritalea hydrogenivorans	ribonucleotide reductase	10
Sulfuritalea hydrogenivorans	ribose-phosphate pyrophosphokinase	2
Sulfuritalea hydrogenivorans	ribosomal protein S12 methylthiotransferase	6
Sulfuritalea hydrogenivorans	ribosome maturation factor	11
Sulfuritalea hydrogenivorans	ribosome maturation factor RimM	8
Sulfuritalea hydrogenivorans	ribosome recycling factor	7
Sulfuritalea hydrogenivorans	ribulose-phosphate 3-epimerase	22
Sulfuritalea hydrogenivorans	RNA polymerase factor sigma-32	9
Sulfuritalea hydrogenivorans	RNA polymerase sigma factor	5
Sulfuritalea hydrogenivorans	RNA polymerase subunit sigma	23
Sulfuritalea hydrogenivorans	RNA-binding protein hfq	4
Sulfuritalea hydrogenivorans	RND transporter	3
Sulfuritalea hydrogenivorans	RnfH family protein	6
Sulfuritalea hydrogenivorans	rRNA (cytidine-2'-O-)-methyltransferase	4
Sulfuritalea hydrogenivorans	S-methyl-5-thioribose-1-phosphate isomerase	3
Sulfuritalea hydrogenivorans	S26 family signal peptidase	2
Sulfuritalea hydrogenivorans	SAM-dependent methyltransferase	3
Sulfuritalea hydrogenivorans	secretion system protein E	5
Sulfuritalea hydrogenivorans	segregation and condensation protein A	5
Sulfuritalea hydrogenivorans	serine acetyltransferase	10
Sulfuritalea hydrogenivorans	serine hydroxymethyltransferase	7
Sulfuritalea hydrogenivorans	serine--tRNA ligase	4
Sulfuritalea hydrogenivorans	serine/threonine protein kinase	11
Sulfuritalea hydrogenivorans	SH3 type 3 domain-containing protein	8
Sulfuritalea hydrogenivorans	short-chain dehydrogenase	6
Sulfuritalea hydrogenivorans	signal recognition particle protein	6
Sulfuritalea hydrogenivorans	single-stranded DNA-binding protein	13
Sulfuritalea hydrogenivorans	sodium:proton exchanger	11
Sulfuritalea hydrogenivorans	spermidine synthase	2
Sulfuritalea hydrogenivorans	subtype II CRISPR-associated endonuclease Cas1	4
Sulfuritalea hydrogenivorans	succinate dehydrogenase	40
Sulfuritalea hydrogenivorans	succinyldiaminopimelate transaminase	5
Sulfuritalea hydrogenivorans	sugar kinase	6
Sulfuritalea hydrogenivorans	sulfate adenyltransferase	62
Sulfuritalea hydrogenivorans	sulfite reductase	386
Sulfuritalea hydrogenivorans	sulfite reductase subunit gamma	62
Sulfuritalea hydrogenivorans	sulfur oxidation c-type cytochrome SoxX	5
Sulfuritalea hydrogenivorans	sulfur relay protein TusB	109
Sulfuritalea hydrogenivorans	sulfur transfer protein TusE	213

Sulfuritalea hydrogenivorans	sulfurtransferase	226
Sulfuritalea hydrogenivorans	taurine catabolism dioxygenase TauD	2
Sulfuritalea hydrogenivorans	TetR family transcriptional regulator	42
Sulfuritalea hydrogenivorans	thiamine biosynthesis protein ThiC	13
Sulfuritalea hydrogenivorans	thiamine biosynthesis protein ThiF	6
Sulfuritalea hydrogenivorans	thiamine biosynthesis protein ThiS	2
Sulfuritalea hydrogenivorans	thiazole synthase	15
Sulfuritalea hydrogenivorans	thiol:disulfide interchange protein	9
Sulfuritalea hydrogenivorans	thioredoxin	9
Sulfuritalea hydrogenivorans	thioredoxin reductase	4
Sulfuritalea hydrogenivorans	thiosulfate oxidation carrier complex protein SoxZ	5
Sulfuritalea hydrogenivorans	thiosulfate oxidation carrier protein SoxY	63
Sulfuritalea hydrogenivorans	thymidylate synthase	18
Sulfuritalea hydrogenivorans	TIGR02099 family protein	3
Sulfuritalea hydrogenivorans	transcription termination/antitermination factor NusG	20
Sulfuritalea hydrogenivorans	transcription-repair coupling factor	2
Sulfuritalea hydrogenivorans	transcriptional regulator	82
Sulfuritalea hydrogenivorans	transglycosylase	5
Sulfuritalea hydrogenivorans	transketolase	5
Sulfuritalea hydrogenivorans	translation initiation factor IF-1	5
Sulfuritalea hydrogenivorans	translocation protein TolB	16
Sulfuritalea hydrogenivorans	transposase	24
Sulfuritalea hydrogenivorans	trigger factor	14
Sulfuritalea hydrogenivorans	triose-phosphate isomerase	12
Sulfuritalea hydrogenivorans	tRNA 2-selenouridine synthase	2
Sulfuritalea hydrogenivorans	tRNA dimethylallyltransferase	5
Sulfuritalea hydrogenivorans	tRNA modification GTPase	2
Sulfuritalea hydrogenivorans	tRNA pseudouridine(38-40) synthase	7
Sulfuritalea hydrogenivorans	tRNA threonylcarbamoyladenine biosynthesis protein TsaB	3
Sulfuritalea hydrogenivorans	tRNA threonylcarbamoyladenine dehydratase	3
Sulfuritalea hydrogenivorans	tRNA-dihydrouridine synthase B	1
Sulfuritalea hydrogenivorans	tryptophan synthase subunit alpha	3
Sulfuritalea hydrogenivorans	tryptophan synthase subunit beta	7
Sulfuritalea hydrogenivorans	tryptophan--tRNA ligase	10
Sulfuritalea hydrogenivorans	tungsten ABC transporter substrate-binding protein	2
Sulfuritalea hydrogenivorans	twitching motility protein PilT	9
Sulfuritalea hydrogenivorans	two-component sensor histidine kinase	32
Sulfuritalea hydrogenivorans	type I-MYXAN CRISPR-associated protein Cas6/Cmx6	54
Sulfuritalea hydrogenivorans	type II CRISPR RNA-guided endonuclease Cas9	3
Sulfuritalea hydrogenivorans	UDP diphosphate synthase	3
Sulfuritalea hydrogenivorans	UDP pyrophosphate phosphatase	3
Sulfuritalea hydrogenivorans	UDP-3-O-(3-hydroxymyristoyl)glucosamine N-acyltransferase	4
Sulfuritalea hydrogenivorans	UDP-3-O-[3-hydroxymyristoyl] N-acetylglucosamine deacetylase	21
Sulfuritalea hydrogenivorans	UDP-N-acetylenolpyruvoylglucosamine reductase	9
Sulfuritalea hydrogenivorans	UDP-N-acetylglucosamine 1-carboxyvinyltransferase	2
Sulfuritalea hydrogenivorans	UDP-N-acetylmuramoyl-tripeptide--D-alanyl-D-alanine ligase	3
Sulfuritalea hydrogenivorans	UDP-N-acetylmuramoylalanine--D-glutamate ligase	4
Sulfuritalea hydrogenivorans	uridine monophosphate kinase	2
Sulfuritalea hydrogenivorans	uroporphyrinogen decarboxylase	6
Sulfuritalea hydrogenivorans	uroporphyrinogen III methyltransferase	12
Sulfuritalea hydrogenivorans	valine--tRNA ligase	15
Sulfuritalea hydrogenivorans	VWA domain-containing protein	1
Sulfuritalea hydrogenivorans	zinc protease	4
Thauera	MULTISPECIES: 1-acyl-sn-glycerol-3-phosphate acyltransferase	2
Thauera	MULTISPECIES: 3-oxoacyl-ACP synthase	15
Thauera	MULTISPECIES: 30S ribosomal protein S12	7
Thauera	MULTISPECIES: 30S ribosomal protein S4	13
Thauera	MULTISPECIES: 30S ribosomal protein S5	5
Thauera	MULTISPECIES: 4-hydroxy-3-methylbut-2-enyl diphosphate reductase	3
Thauera	MULTISPECIES: ABC transporter ATP-binding protein	5
Thauera	MULTISPECIES: ABC transporter permease	8
Thauera	MULTISPECIES: acyl carrier protein	31
Thauera	MULTISPECIES: amino acid ABC transporter substrate-binding protein	2
Thauera	MULTISPECIES: anti sigma-E protein, RseA	12
Thauera	MULTISPECIES: binding-protein-dependent transporter system inner membrane protein	2
Thauera	MULTISPECIES: carbamoylphosphate synthase large subunit	3
Thauera	MULTISPECIES: carbonate dehydratase	2
Thauera	MULTISPECIES: cupin	2
Thauera	MULTISPECIES: cyclohexa-1,5-dienecarbonyl-CoA hydratase	0
Thauera	MULTISPECIES: cytochrome c'	5
Thauera	MULTISPECIES: cytochrome-c oxidase	12
Thauera	MULTISPECIES: enoyl-CoA hydratase	11
Thauera	MULTISPECIES: F0F1 ATP synthase subunit delta	34
Thauera	MULTISPECIES: fimbrial assembly protein	8

Thauera	MULTISPECIES: formaldehyde-activating enzyme	1
Thauera	MULTISPECIES: hydroxypyruvate isomerase	6
Thauera	MULTISPECIES: hypothetical protein	70
Thauera	MULTISPECIES: imidazole glycerol phosphate synthase subunit HisH	23
Thauera	MULTISPECIES: integration host factor subunit alpha	15
Thauera	MULTISPECIES: iron-sulfur cluster scaffold-like protein	15
Thauera	MULTISPECIES: iron-sulfur subunit of cytochrome bc1	6
Thauera	MULTISPECIES: LysR family transcriptional regulator	4
Thauera	MULTISPECIES: magnesium transporter	1
Thauera	MULTISPECIES: MarR family transcriptional regulator	11
Thauera	MULTISPECIES: membrane protein	17
Thauera	MULTISPECIES: MerR family transcriptional regulator	4
Thauera	MULTISPECIES: metal-dependent hydrolase	17
Thauera	MULTISPECIES: metal-transporting ATPase	3
Thauera	MULTISPECIES: molecular chaperone	1
Thauera	MULTISPECIES: molecular chaperone DnaK	13
Thauera	MULTISPECIES: N-methyltransferase	6
Thauera	MULTISPECIES: NAD-dependent succinate-semialdehyde dehydrogenase	5
Thauera	MULTISPECIES: nitric oxide reductase	21
Thauera	MULTISPECIES: nitrite reductase	10
Thauera	MULTISPECIES: nitrogen regulatory protein P-II	1
Thauera	MULTISPECIES: peptide ABC transporter permease	5
Thauera	MULTISPECIES: peptidoglycan glycosyltransferase	5
Thauera	MULTISPECIES: peptidoglycan-binding protein	6
Thauera	MULTISPECIES: phosphohistidine phosphatase	2
Thauera	MULTISPECIES: pilus assembly protein PilN	11
Thauera	MULTISPECIES: prephenate dehydratase	3
Thauera	MULTISPECIES: prevent-host-death family protein	3
Thauera	MULTISPECIES: protein sphX	84
Thauera	MULTISPECIES: ribosomal-protein-alanine N-acetyltransferase RimI	11
Thauera	MULTISPECIES: transcriptional regulator	11
Thauera	MULTISPECIES: transposase	10
Thauera	MULTISPECIES: twin-arginine translocation pathway signal protein	14
Thauera	MULTISPECIES: ubiquinone/menaquinone biosynthesis methyltransferase	3
Thauera aminoaromatica	amino acid carrier protein	6
Thauera aminoaromatica	cysteine desulfurase	3
Thauera aminoaromatica	cytochrome C biogenesis protein CcsB	4
Thauera aminoaromatica	hypothetical protein	15
Thauera aminoaromatica	lipopolysaccharide biosynthesis protein RfbH	3
Thauera aminoaromatica	phosphoserine transaminase	2
Thauera aminoaromatica	porin	29
Thauera aminoaromatica	S-adenosyl-L-homocysteine hydrolase	11
Thauera aminoaromatica	transcriptional regulator	2
Thauera humireducens	2-hydroxy-3-oxopropionate reductase	23
Thauera humireducens	ABC transporter permease	4
Thauera humireducens	ABC transporter substrate-binding protein	11
Thauera humireducens	acyl-phosphate glycerol 3-phosphate acyltransferase	2
Thauera humireducens	alpha/beta hydrolase	8
Thauera humireducens	ATP phosphoribosyltransferase regulatory subunit	8
Thauera humireducens	AzIc family protein	4
Thauera humireducens	BAX inhibitor protein	16
Thauera humireducens	branched chain amino acid ABC transporter substrate-binding protein	5
Thauera humireducens	C4-dicarboxylate ABC transporter	1
Thauera humireducens	C4-dicarboxylate ABC transporter substrate-binding protein	5
Thauera humireducens	carboxymethylenebutenolidase	10
Thauera humireducens	cation:proton antiporter	5
Thauera humireducens	CoA-binding protein	4
Thauera humireducens	cytochrome C'	15
Thauera humireducens	cytochrome C551	1
Thauera humireducens	diguanylate cyclase response regulator	4
Thauera humireducens	dihydropteroate synthase	10
Thauera humireducens	DNA repair protein RadC	15
Thauera humireducens	DNA starvation/stationary phase protection protein	101
Thauera humireducens	electron transporter RnfB	15
Thauera humireducens	endonuclease	3
Thauera humireducens	Fe-S cluster assembly protein SufD	3
Thauera humireducens	FHA domain-containing protein	5
Thauera humireducens	flagellar biosynthesis protein FlhA	3
Thauera humireducens	flagellar motor protein MotA	3
Thauera humireducens	flagellin	6
Thauera humireducens	GDP-mannose dehydrogenase	7
Thauera humireducens	glycine cleavage system protein H	7
Thauera humireducens	glycosyl transferase family 1	4
Thauera humireducens	glyoxylate carboligase	46

Thauera humireducens	GNAT family acetyltransferase	4
Thauera humireducens	group II intron reverse transcriptase/maturase	6
Thauera humireducens	hemolysin D	12
Thauera humireducens	hybrid sensor histidine kinase/response regulator	5
Thauera humireducens	hypothetical protein	39
Thauera humireducens	IMP dehydrogenase	4
Thauera humireducens	integrase	2
Thauera humireducens	methylation	12
Thauera humireducens	MFS transporter	5
Thauera humireducens	N-(5'-phosphoribosyl)anthranilate isomerase	6
Thauera humireducens	NAD(P)-dependent oxidoreductase	2
Thauera humireducens	NADH-ubiquinone oxidoreductase subunit 4L	2
Thauera humireducens	NnrS family protein	1
Thauera humireducens	nodulation efficiency protein D	13
Thauera humireducens	nucleotidyltransferase	5
Thauera humireducens	peptidoglycan bridge formation protein FemAB	2
Thauera humireducens	phosphoribosylglycinamide formyltransferase	4
Thauera humireducens	phytoene dehydrogenase	4
Thauera humireducens	prenyltransferase UbiA	2
Thauera humireducens	protein involved in RimO-mediated beta-methylthiolation of ribosomal protein S12 YcaO	6
Thauera humireducens	PTS sugar transporter subunit IIA	3
Thauera humireducens	ribulose 1,5-bisphosphate carboxylase	23
Thauera humireducens	sigma-54-dependent Fis family transcriptional regulator	3
Thauera humireducens	succinyl-diaminopimelate desuccinylase	3
Thauera humireducens	thiol reductase thioredoxin	2
Thauera humireducens	transcriptional repressor	2
Thauera humireducens	transposase	18
Thauera humireducens	tyrosine--tRNA ligase	10
Thauera humireducens	UDP-N-acetyl glucosamine 2-epimerase	2
Thauera linaloentis	(2Fe-2S)-binding protein	2
Thauera linaloentis	2-isopropylmalate synthase	5
Thauera linaloentis	30S ribosomal protein S6	6
Thauera linaloentis	ABC transporter ATP-binding protein	3
Thauera linaloentis	alginate biosynthesis protein AlgZ/FimS	4
Thauera linaloentis	anaerobic ribonucleoside triphosphate reductase	3
Thauera linaloentis	carboxysome structural protein EutM	28
Thauera linaloentis	cell division protein FtsW	4
Thauera linaloentis	chemotaxis regulator CheZ	12
Thauera linaloentis	Crp/Fnr family transcriptional regulator	3
Thauera linaloentis	cytochrome c, class IC:cytochrome c, class I	9
Thauera linaloentis	cytochrome c553	8
Thauera linaloentis	diacylglycerol kinase	1
Thauera linaloentis	DNA gyrase subunit A	10
Thauera linaloentis	DNA polymerase IV	3
Thauera linaloentis	DNA-binding domain-containing protein	4
Thauera linaloentis	DNA-directed RNA polymerase subunit alpha	25
Thauera linaloentis	electron transporter RnfC	4
Thauera linaloentis	ethanolamine utilization protein EutJ	1
Thauera linaloentis	Fis family transcriptional regulator	5
Thauera linaloentis	FMN-binding protein	4
Thauera linaloentis	formyltetrahydrofolate deformylase	2
Thauera linaloentis	glutamate synthase subunit beta	12
Thauera linaloentis	glycosyl transferase family 2	3
Thauera linaloentis	hemerythrin	8
Thauera linaloentis	histidine kinase	5
Thauera linaloentis	hybrid sensor histidine kinase/response regulator	4
Thauera linaloentis	hypothetical protein	71
Thauera linaloentis	L-threonine-O-3-phosphate decarboxylase, partial	2
Thauera linaloentis	leucine--tRNA ligase	16
Thauera linaloentis	MBL fold metallo-hydrolase	2
Thauera linaloentis	NADH dehydrogenase subunit C	9
Thauera linaloentis	OsmC family protein	3
Thauera linaloentis	periplasmic copper-binding protein	23
Thauera linaloentis	phosphoribosyl-AMP cyclohydrolase	27
Thauera linaloentis	PIN domain-containing protein	1
Thauera linaloentis	polyhydroxyalkonate synthesis repressor, PhaR	18
Thauera linaloentis	protease	4
Thauera linaloentis	pyruvate carboxylase, partial	20
Thauera linaloentis	ribosome-associated inhibitor A/sigma 54 modulation protein	8
Thauera linaloentis	RNA polymerase sigma-54 factor	3
Thauera linaloentis	transcription-repair coupling factor	1
Thauera linaloentis	translation initiation factor IF-2	10
Thauera linaloentis	TRAP ABC transporter permease	5
Thauera linaloentis	type II secretion system protein GspD	5

Thauera linaloolentis	ubiquinone/menaquinone biosynthesis methyltransferase UbiE	4
Thauera linaloolentis	UDP-N-acetylglucosamine--N-acetylmuramyl-(pentapeptide) pyrophosphoryl-undecaprenol N-acetylglucosamine transferase	8
Thauera linaloolentis	Undecaprenyl phosphate-alpha-4-amino-4-deoxy-L-arabinose arabinosyl transferase	2
Thauera phenylacetica	2-isopropylmalate synthase	123
Thauera phenylacetica	23S rRNA (uracil(1939)-C(5))-methyltransferase	2
Thauera phenylacetica	4Fe-4S ferredoxin	7
Thauera phenylacetica	5,10-methylenetetrahydrofolate reductase	3
Thauera phenylacetica	ABC transporter	18
Thauera phenylacetica	ABC transporter permease	3
Thauera phenylacetica	ABC transporter substrate-binding protein	2
Thauera phenylacetica	aminotransferase DegT	2
Thauera phenylacetica	ATPase (AAA+ superfamily)-like protein	6
Thauera phenylacetica	bifunctional metallophosphatase/5'-nucleotidase	4
Thauera phenylacetica	cohyrnic acid ac-diamide synthase	11
Thauera phenylacetica	colanic acid biosynthesis glycosyltransferase WcaL	2
Thauera phenylacetica	collagen-binding protein	3
Thauera phenylacetica	Crp/Fnr family transcriptional regulator	12
Thauera phenylacetica	D-alanyl-D-alanine endopeptidase	2
Thauera phenylacetica	dihydroliipoamide dehydrogenase, partial	7
Thauera phenylacetica	DNA polymerase beta domain-containing protein	4
Thauera phenylacetica	DNA-binding response regulator	9
Thauera phenylacetica	exodeoxyribonuclease VII small subunit	8
Thauera phenylacetica	flagellar motor protein MotA	3
Thauera phenylacetica	flagellar motor switch protein FlhN	13
Thauera phenylacetica	glutamate dehydrogenase	10
Thauera phenylacetica	glutamate--tRNA ligase	4
Thauera phenylacetica	GNAT family N-acetyltransferase	1
Thauera phenylacetica	haloacid dehalogenase	14
Thauera phenylacetica	histidinol dehydrogenase	9
Thauera phenylacetica	Holliday junction DNA helicase	5
Thauera phenylacetica	hybrid sensor histidine kinase/response regulator	2
Thauera phenylacetica	hydrogenase (NiFe) small subunit HydA, partial	20
Thauera phenylacetica	hypothetical protein	55
Thauera phenylacetica	hypoxanthine-guanine phosphoribosyltransferase	6
Thauera phenylacetica	isocitrate dehydrogenase	10
Thauera phenylacetica	MBL fold hydrolase	3
Thauera phenylacetica	MBL fold metallo-hydrolase	3
Thauera phenylacetica	membrane protein	4
Thauera phenylacetica	molybdopterin oxidoreductase	14
Thauera phenylacetica	monovalent cation/H+ antiporter subunit A	11
Thauera phenylacetica	multiple resistance and pH regulation protein F	11
Thauera phenylacetica	Na+/solute symporter	5
Thauera phenylacetica	Ni/Fe hydrogenase	3
Thauera phenylacetica	nitrite reductase large subunit	1
Thauera phenylacetica	nitrous oxide reductase accessory protein NosL	11
Thauera phenylacetica	nucleic acid-binding protein	5
Thauera phenylacetica	ornithine carbamoyltransferase	2
Thauera phenylacetica	PAS domain-containing sensor histidine kinase	2
Thauera phenylacetica	peptidyl-prolyl cis-trans isomerase A	5
Thauera phenylacetica	phosphoenolpyruvate carboxykinase	6
Thauera phenylacetica	phosphoenolpyruvate carboxylase	5
Thauera phenylacetica	PIN domain-containing protein	10
Thauera phenylacetica	pyruvate ferredoxin/flavodoxin oxidoreductase subunit beta	5
Thauera phenylacetica	ribonuclease H	3
Thauera phenylacetica	SMC-Scp complex subunit ScpB	12
Thauera phenylacetica	sodium-independent anion transporter	5
Thauera phenylacetica	tol-pal system-associated acyl-CoA thioesterase	3
Thauera phenylacetica	transposase	12
Thauera phenylacetica	type II secretion system protein GspG	2
Thauera phenylacetica	type IV pilus assembly protein PilX	10
Thauera sp. MZ1T	alkaline phosphatase	5
Thauera sp. MZ1T	ATP-binding protein	2
Thauera sp. MZ1T	ATP-dependent protease	16
Thauera sp. MZ1T	cobalt transporter	56
Thauera sp. MZ1T	DNA polymerase III subunit epsilon	4
Thauera sp. MZ1T	DNA-cytosine methyltransferase	5
Thauera sp. MZ1T	hypothetical protein	38
Thauera sp. MZ1T	multidrug ABC transporter ATP-binding protein	14
Thauera sp. MZ1T	protoheme IX farnesyltransferase	2
Thauera sp. MZ1T	pyruvate, phosphate dikinase	2
Thauera sp. MZ1T	RND transporter	2
Thauera sp. MZ1T	single-stranded DNA exonuclease	1
Thauera sp. MZ1T	transporter	5
Thauera sp. MZ1T	UDP-glucose 4-epimerase	2



Thauera sp. MZ1T	uracil phosphoribosyltransferase	3
Thauera sp. MZ1T	zinc-binding dehydrogenase	1
Thauera terpenica	3-deoxy-manno-octulosonate cytidyltransferase	3
Thauera terpenica	30S ribosomal protein S9	10
Thauera terpenica	6,7-dimethyl-8-ribityllumazine synthase	7
Thauera terpenica	ABC transporter permease	1
Thauera terpenica	acetyl-CoA carboxylase	5
Thauera terpenica	addiction module antitoxin	6
Thauera terpenica	aspartate carbamoyltransferase	3
Thauera terpenica	ATP-dependent endonuclease	6
Thauera terpenica	ebb3-type cytochrome c oxidase subunit I	3
Thauera terpenica	conjugal transfer protein TraR	3
Thauera terpenica	CopG family transcriptional regulator	6
Thauera terpenica	DEAD/DEAH box helicase	2
Thauera terpenica	DNA polymerase	10
Thauera terpenica	DNA topoisomerase I	2
Thauera terpenica	exodeoxyribonuclease V subunit gamma	4
Thauera terpenica	flagellar biosynthesis protein FlhQ	2
Thauera terpenica	GNAT family N-acetyltransferase	3
Thauera terpenica	hypothetical protein	127
Thauera terpenica	LPS biosynthesis protein	2
Thauera terpenica	MBL fold hydrolase	3
Thauera terpenica	NADH dehydrogenase	4
Thauera terpenica	nitrate reductase A subunit alpha	5
Thauera terpenica	prevent-host-death protein	10
Thauera terpenica	quinone oxidoreductase	6
Thauera terpenica	sugar kinase	5
Thauera terpenica	sugar transferase	2
Thauera terpenica	transposase	4
Uliginosibacterium gangwonense	3-isopropylmalate dehydratase small subunit	9
Uliginosibacterium gangwonense	3-polyprenyl-4-hydroxybenzoate decarboxylase	3
Uliginosibacterium gangwonense	30S ribosomal protein S18	6
Uliginosibacterium gangwonense	50S ribosomal protein L2	21
Uliginosibacterium gangwonense	50S ribosomal protein L20	12
Uliginosibacterium gangwonense	6-phosphofructokinase	1
Uliginosibacterium gangwonense	6-phosphogluconate dehydrogenase	1
Uliginosibacterium gangwonense	ABC transporter substrate-binding protein	2
Uliginosibacterium gangwonense	adenylosuccinate lyase	2
Uliginosibacterium gangwonense	alkyl hydroperoxide reductase subunit C	13
Uliginosibacterium gangwonense	alkyl hydroperoxide reductase subunit F	36
Uliginosibacterium gangwonense	amino acid ABC transporter substrate-binding protein	2
Uliginosibacterium gangwonense	aspartate aminotransferase	4
Uliginosibacterium gangwonense	chromosomal replication initiator protein DnaA	2
Uliginosibacterium gangwonense	citramalate synthase	4
Uliginosibacterium gangwonense	cyclic pyranopterin phosphate synthase MoaA	5
Uliginosibacterium gangwonense	cyclopropane-fatty-acyl-phospholipid synthase	7
Uliginosibacterium gangwonense	D-alanine--D-alanine ligase	4
Uliginosibacterium gangwonense	elongation factor Tu	12
Uliginosibacterium gangwonense	FOF1 ATP synthase subunit B	27
Uliginosibacterium gangwonense	FOF1 ATP synthase subunit C	3
Uliginosibacterium gangwonense	Fe-S cluster assembly transcriptional regulator IscR	10
Uliginosibacterium gangwonense	flagellar biosynthesis sigma factor	2
Uliginosibacterium gangwonense	glucose-1-phosphate thymidyltransferase	3
Uliginosibacterium gangwonense	glyceraldehyde-3-phosphate dehydrogenase	3
Uliginosibacterium gangwonense	glycerol kinase	2
Uliginosibacterium gangwonense	GTPase Era	4
Uliginosibacterium gangwonense	histidine--tRNA ligase	10
Uliginosibacterium gangwonense	hydroxylamine reductase	10
Uliginosibacterium gangwonense	hypothetical protein	283
Uliginosibacterium gangwonense	hypothetical protein, partial	10
Uliginosibacterium gangwonense	NADH dehydrogenase	5
Uliginosibacterium gangwonense	peptidase	14
Uliginosibacterium gangwonense	peptide ABC transporter permease	1
Uliginosibacterium gangwonense	phosphate ABC transporter substrate-binding protein	25
Uliginosibacterium gangwonense	phosphate transporter permease subunit PstC	3
Uliginosibacterium gangwonense	pilus assembly protein	2
Uliginosibacterium gangwonense	protease	4
Uliginosibacterium gangwonense	RNA pseudouridine synthase	3
Uliginosibacterium gangwonense	serine/threonine protein phosphatase	11
Uliginosibacterium gangwonense	sigma-54-dependent Fis family transcriptional regulator	25
Uliginosibacterium gangwonense	sugar ABC transporter substrate-binding protein	11
Uliginosibacterium gangwonense	sulphydrogenase subunit delta	1
Uliginosibacterium gangwonense	toxin RelE	22
Uliginosibacterium gangwonense	transcription elongation factor GreA	2

Uliginosibacterium gangwonense	transcriptional regulator	4
Uliginosibacterium gangwonense	translation initiation factor IF-1	13
Uliginosibacterium gangwonense	tRNA-dihydrouridine synthase A	5
Uliginosibacterium gangwonense	tryptophan synthase subunit alpha	14
Uliginosibacterium gangwonense	two-component sensor histidine kinase	11

**Table S4. Preliminary RNA analysis by reverse transcription PCR-cloning.**

GenBank Accession number	Clone sequence title	Frequency	Relative abundance	Putative phylum	Length (nt)	GenBank accession number	% of identity
<b>Archaea 16S rRNA gene</b>							
KF901390	Uncultured archaeon BE326FW120712BH2 16S rRNA OTU1	11	23%	Unidentified archaeon	752	AB019753	92%
KF901391	Uncultured archaeon BE326FW120712BH2 16S rRNA OTU2	8	17%	Methanobacterium	756	AY695843	99%
KF901392	Uncultured archaeon BE326FW120712BH2 16S rRNA OTU3	7	15%	Methanobacterium	753	NR_028236	73%
KF901393	Uncultured archaeon BE326FW120712BH2 16S rRNA OTU4	6	13%	Uncultured archaeon	749	JF280168	96%
KF901394	Uncultured archaeon BE326FW120712BH2 16S rRNA OTU5	5	11%	Uncultured archaeon	753	DQ310380	90%
KF901395	Uncultured archaeon BE326FW120712BH2 16S rRNA OTU6	5	11%	Methanobacterium	756	AY695843	99%
KF901396	Uncultured archaeon BE326FW120712BH2 16S rRNA OTU7	2	4%	Unidentified archaeon	752	AM019753	91%
KF901397	Uncultured archaeon BE326FW120712BH2 16S rRNA OTU8	1	2%	Uncultured archaeon	752	JF280168	95%
KF901398	Uncultured archaeon BE326FW120712BH2 16S rRNA OTU9	1	2%	Unidentified archaeon	593	AB019753	93%
KF901399	Uncultured archaeon BE326FW120712BH2 16S rRNA OTU10	1	2%	Uncultured archaeon	751	DQ310393	93%
<b>Bacteria 16S rRNA gene</b>							
KF901400	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU1	33	31%	Alphaproteobacteria	787	CP002568	99%
KF901401	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU2	28	27%	Alphaproteobacteria	786	HQ588848	99%
KF901402	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU3	6	6%	Betaproteobacteria	854	GQ921470	99%
KF901403	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU4	6	6%	Betaproteobacteria	843	DQ230972	99%
KF901404	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU5	5	5%	Betaproteobacteria	816	EF667533	96%
KF901405	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU6	3	3%	Chlorobi	838	AY741700	97%
KF901406	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU7	3	3%	gamma-proteobacteria	751	NR_043670	99%
KF901407	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU8	3	3%	Alphaproteobacteria	787	GU212810	99%
KF901408	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU9	2	2%	Alphaproteobacteria	786	AM159370	95%
KF901409	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU10	2	2%	Alphaproteobacteria	674	CP002568	100%
KF901410	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU11	2	2%	Betaproteobacteria	782	AY133108	99%
KF901411	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU12	2	2%	Betaproteobacteria	657	GQ921470	99%
KF901412	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU13	1	1%	Uncultured bacterium	741	JF265770	90%
KF901413	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU14	1	1%	Alphaproteobacteria	784	AM990693	98%
KF901414	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU15	1	1%	Betaproteobacteria	624	FJ484727	100%
KF901415	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU16	1	1%	Alphaproteobacteria	761	EF663214	94%
KF901416	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU17	1	1%	Alphaproteobacteria	725	JN082255	99%
KF901417	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU18	1	1%	Alphaproteobacteria	772	AB682666	99%
KF901418	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU19	1	1%	Alphaproteobacteria	674	AM159370	94%
KF901419	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU20	1	1%	Alphaproteobacteria	764	CP002568	97%
KF901420	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU21	1	1%	Alphaproteobacteria	623	CU919551	93%
KF901421	Uncultured bacterium BE326FW120712BH2 16S rRNA OTU22	1	1%	Betaproteobacteria	650	FJ484495	94%
<b>NifH gene</b>							
KF901484	Uncultured bacterium BE326FW120712BH2 cDNA nifH OTU1	4	44%	Uncultured bacterium	322	FJ394994	92%
KF901485	Uncultured bacterium BE326FW120712BH2 cDNA nifH OTU2	2	22%	Uncultured bacterium	322	AB471165	95%
KF901486	Uncultured bacterium BE326FW120712BH2 cDNA nifH OTU3	1	11%	Uncultured bacterium	322	GU367884	94%
KF901487	Uncultured bacterium BE326FW120712BH2 cDNA nifH OTU4	1	11%	Firmicutes	319	CP000860	99%
KF901488	Uncultured bacterium BE326FW120712BH2 cDNA nifH OTU5	1	11%	Uncultured bacterium	311	FJ394994	92%
<b>McrA gene</b>							
KF901489	Uncultured archaeon BE326FW120712BH2 cDNA mcrA OTU1	4	57%	Uncultured bacterium	425	FR871734	93%
KF901490	Uncultured archaeon BE326FW120712BH2 cDNA mcrA OTU2	1	14%	Uncultured bacterium	425	FR871734	93%
KF901491	Uncultured archaeon BE326FW120712BH2 cDNA mcrA OTU3	1	14%	Uncultured bacterium	425	FR871734	93%
KF901492	Uncultured archaeon BE326FW120712BH2 cDNA mcrA OTU4	1	14%	Uncultured bacterium	425	FR871734	93%

**Table S5. Comparison of APR and SAT abundances of sulphate-reducing bacteria (SRB) and sulphur-oxidizing bacteria (SOB).** Taxonomic identity of APR and SAT was assigned based on the top three BLASTp best-hits. Coverage of protein-encoding genes (PEGs) in metatranscriptome and number of peptidespectral matches were summed accordingly.

Keys:

SOB   SRB  

APR	CD-HIT cluster	Annotation description	Taxonomic identity of the top 3 BLASTp best-hits			In PEG transcriptome		In metaproteome	
						Coverage		PSM	
						subtotal		subtotal	
	Cluster377	adenylylsulfate reductase	Desulfurivibrio	Desulfobulbus	110	189	0	46	
	Cluster580	adenylylsulfate reductase	Sulfuritalea	Thiobacillus	176	197	74	122	
	Cluster1110	adenylylsulfate reductase	Desulfurivibrio	Desulfobulbus	27		0		
	Cluster1660	adenylylsulfate reductase	Desulfurivibrio	Desulfobulbus	52		46		
	Cluster1739	adenylylsulfate reductase	Sulfuricella	Sulfuritalea	13		48		
	Cluster9450	adenylylsulfate reductase	Sulfuricella	Thiobacillus	8		0		
	Cluster11	adenylylsulfate reductase subunit alpha	Sulfuritalea	Sulfuricella	598	615	624	624	
	Cluster2224	adenylylsulfate reductase subunit alpha	Thermodesulfovibrio	Chlorobium	3		0		
	Cluster2831	adenylylsulfate reductase subunit alpha	Sulfuritalea	Sulfuricella	15		0		
	Cluster8147	adenylylsulfate reductase subunit alpha	Sulfuricella	Desulfurivibrio	6		0		
	Cluster9453	adenylylsulfate reductase subunit alpha	Sulfuritalea	Sulfuricella	2		0		
	Cluster3926	adenylylsulfate reductase subunit beta	Thermodesulfovibrio	Desulfobacca	5	16	0	0	
	Cluster11883	adenylylsulfate reductase subunit beta	Desulfovibrio	Thermopetrobacter	11		0		
	Cluster212	AprA	Sulfuritalea	Sulfuricella	299	354	123	153	
	Cluster2077	AprA	Thiobacillus		7		19		
	Cluster8661	AprA	Sulfuritalea	Sulfuricella	28		0		
	Cluster9553	AprA	Candidatus Riegeria	Thiolapillus	4		9		
	Cluster10159	AprA	Sulfuritalea	Sulfuricella	12		0		
	Cluster12986	AprA	Thiodictyon	Thiobacillus	4		2		
	Cluster200	AprA, partial	Desulfocapsa	Desulfobacterium	45	53	43	54	
	Cluster3348	AprA, partial	Desulfotomaculum	Desulfosporosinus	3		10		
	Cluster7674	AprA, partial	Desulfotomaculum		1		1		
	Cluster9950	AprA, partial	Desulfovibrio		4		0		
	Cluster12111	AprB	Thiobacillus	Thiodictyon	323	323	0	0	
	Cluster1790	APS reductase alpha subunit	Cardiolucina quadra gill endosymbiont	Codakia orbicularis gill endosymbiont	22	22	0	0	
SAT	Cluster65	sulfate adenylyltransferase	Thioalkalivibrio		106	25	86	16	
	Cluster1805	sulfate adenylyltransferase	Desulfobulbus	Desulfovibrio	17	127	0	89	
	Cluster2564	sulfate adenylyltransferase	Desulfobulbus	Desulfovibrio	5		12		
	Cluster3200	sulfate adenylyltransferase	Magnetospira	Thermopetrobacter	3		4		
	Cluster6801	sulfate adenylyltransferase	Thiobacillus denitrificans	Sulfuricella	3		0		
	Cluster10309	sulfate adenylyltransferase	Thiolapillus	Candidatus Thiomargarita	18		3		

	In PEG metatranscriptome (Total coverage)		In metaproteome (Total PSM)	
	SOB	SRB	SOB	SRB
APR	1511	258	899	100
SOB:SRB ratio	5.9		9.0	
SAT	127	25	89	16
SOB:SRB ratio	5.1		5.6	

Table S6. Summary of protein-encoding genes (PEGs) and the encoded proteins being expressed by the subsurface microorganisms.

Protein ID	Abbreviation as in Figure 1	Metabolism as in Figure 1	Coverage in metatranscriptome assembly	Number of peptide-spectral matches in metaproteome data
(2Fe-2S) ferredoxin			52	ND
(2Fe-2S)-binding protein			55	ND
(4Fe-4S)-binding protein			3	ND
(Fe-S)-binding protein			41	ND
1-(5-phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino] imidazole-4-carboxamide isomerase			25	ND
1-(5-phosphoribosyl)-5-amino-4-imidazole-carboxylate carboxylase			2	ND
1-acyl-sn-glycerol-3-phosphate acyltransferase			3	ND
1-deoxy-D-xylulose 5-phosphate reductoisomerase			6	ND
1-deoxy-D-xylulose 5-phosphate synthase			14	3
1,4-alpha-glucan-branching protein			11	ND
12-oxophytodienoate reductase			5	ND
16S rRNA maturation RNase YbeY			11	ND
16S rRNA methyltransferase			18	ND
16S rRNA processing protein RimM			7	ND
2-alkenal reductase			2	ND
2-amino-3-ketobutyrate CoA ligase			4	ND
2-aminoethylphosphonate-pyruvate aminotransferase			25	5
2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase			17	ND
2-C-methyl-D-erythritol 4-phosphate cytidylyltransferase			26	ND
2-dehydro-3-deoxyphosphooctonate aldolase			40	ND
2-dehydropantoate 2-reductase			1	ND
2-hydroxy-acid oxidase			8	ND
2-hydroxyacid dehydrogenase		C (fermentation)	14	ND
2-hydroxyhepta-2,4-diene-1,7-dioate isomerase			5	13
2-isopropylmalate synthase			657	7
2-keto-3-deoxygluconate permease			5	24
2-ketoisovalerate ferredoxin oxidoreductase subunit alpha			1	ND
2-nitropropane dioxygenase	NPD	N	30	ND
2-octaprenyl-3-methyl-6-methoxy-1,4-benzoquinol hydroxylase			14	ND
2-oxoacid ferredoxin oxidoreductase subunit beta			2	ND
2-oxoacid:acceptor oxidoreductase			19	ND
2-oxoglutarate dehydrogenase			42	ND
2-oxoglutarate ferredoxin oxidoreductase subunit alpha	KOR	C (rTCA)	3	ND
2-oxoglutarate synthase, partial	OOR	C (rTCA)	5	ND
2-oxoisovalerate dehydrogenase			38	ND
2-oxoisovalerate dehydrogenase subunit alpha			9	ND
2-oxoisovalerate dehydrogenase subunit beta			3	ND
2-polypropenylphenol hydroxylase			8	ND
2-succinyl-5-enolpyruvyl-6-hydroxy-3-cyclohexene-1-carboxylate synthase			3	ND
2-succinylbenzoate-CoA ligase			2	ND
2,3-bisphosphoglycerate-independent phosphoglycerate mutase	PGAM	C (formaldehyde assimilation via serine pathway)	3	ND
2,3,4,5-tetrahydropyridine-2,6-carboxylate N-succinyltransferase			12	11
23S rRNA (adenine(2503)-C(2))-methyltransferase RlmN			43	ND
23S rRNA methyltransferase			45	ND
3-dehydroquininate dehydratase			14	3
3-dehydroquininate synthase			57	ND
3-demethylubiquinone-9 3-methyltransferase			20	ND
3-deoxy-7-phosphoheptulonate synthase			2	ND
3-deoxy-D-manno-octulosonate 8-phosphate phosphatase			5	5
3-deoxy-manno-octulosonate cytidylyltransferase			6	ND
3-hydroxy-2-methylbutyryl-CoA dehydrogenase			19	ND
3-hydroxyacyl-CoA dehydrogenase	HBD	C (3-HP/4-HB)	28	ND
3-hydroxybutyryl-CoA dehydrogenase	HBD	C (3-HP/4-HB)	4	ND
3-hydroxypropionyl-CoA synthetase	HPCS	C (3-HP/4-HB)	5	18
3-isopropylmalate dehydratase			9	21
3-isopropylmalate dehydratase large subunit			4	ND
3-isopropylmalate dehydrogenase			40	22
3-ketoacyl-ACP reductase			83	ND
3-ketoacyl-CoA thiolase	3KAT	C (fermentation)	61	3
3-mercaptopyruvate sulfurtransferase			21	ND
3-methyl-2-oxobutanoate hydroxymethyltransferase			9	ND
3-octaprenyl-4-hydroxybenzoate carboxy-lyase	UbiX	C (hydrocarbon degradation)	13	ND
3-octaprenyl-4-hydroxybenzoate carboxy-lyase, partial	UbiX	C (hydrocarbon degradation)	8	ND
3-oxoacyl-ACP synthase			112	6
3-oxoadipate enol-lactonase			7	ND
3-phosphoglycerate dehydrogenase			5	ND
3-phosphoshikimate 1-carboxyvinyltransferase			17	ND
3-polypropenyl-4-hydroxybenzoate decarboxylase			3	2
3,4-dihydroxy-2-butanone 4-phosphate synthase			11	ND
3',5'-bisphosphate nucleotidase			16	ND
3',5'-cyclic-nucleotide phosphodiesterase			4	ND
30S ribosomal protein S1			151	9
30S ribosomal protein S10			121	8
30S ribosomal protein S10, small subunit ribosomal protein S10			41	ND
30S ribosomal protein S11			45	4
30S ribosomal protein S11, small subunit ribosomal protein S11			12	ND
30S ribosomal protein S12			51	13
30S ribosomal protein S12 methylthiotransferase			3	ND
30S ribosomal protein S13			123	4
30S ribosomal protein S13, small subunit ribosomal protein S13			11	ND
30S ribosomal protein S14			39	ND
30S ribosomal protein S14, small subunit ribosomal protein S14			8	ND
30S ribosomal protein S15			8	ND
30S ribosomal protein S16			41	4
30S ribosomal protein S17			43	ND
30S ribosomal protein S17, small subunit ribosomal protein S17			15	ND
30S ribosomal protein S18			28	13
30S ribosomal protein S19			57	3
30S ribosomal protein S19, small subunit ribosomal protein S19			13	ND
30S ribosomal protein S2			76	17
30S ribosomal protein S20			49	ND
30S ribosomal protein S21			16	ND
30S ribosomal protein S3			52	8
30S ribosomal protein S3, small subunit ribosomal protein S3			21	ND
30S ribosomal protein S30			7	ND
30S ribosomal protein S4			83	37
30S ribosomal protein S4, small subunit ribosomal protein S4			25	ND
30S ribosomal protein S5			88	ND

30S ribosomal protein S5, small subunit ribosomal protein S5			7	ND
30S ribosomal protein S6			30	4
30S ribosomal protein S7			68	32
30S ribosomal protein S8			63	ND
30S ribosomal protein S8, small subunit ribosomal protein S8			16	ND
30S ribosomal protein S9			85	ND
4-alpha-glucanotransferase			20	ND
4-aminobutyrate aminotransferase			3	ND
4-deoxy-4-formamido-L-arabinose-phospho-UDP deformylase			3	ND
4-diphosphocytidyl-2C-methyl-D-erythritol kinase			8	ND
4-hydroxy-3-methylbut-2-en-1-yl diphosphate synthase			4	6
4-hydroxy-3-methylbut-2-enyl diphosphate reductase			5	ND
4-hydroxy-tetrahydrodipicolinate reductase			21	ND
4-hydroxybenzoate polyprenyltransferase			105	ND
4-hydroxythreonine-4-phosphate dehydrogenase			14	ND
4-vinyl reductase			2	ND
4'-phosphopantetheinyl transferase			3	ND
4Fe-4S dicluster domain protein			1	ND
4Fe-4S ferredoxin			282	18
4Fe-4S ferredoxin iron-sulfur-binding domain protein			3	ND
5-aminolevulinic acid synthase			7	ND
5-methyltetrahydropteroyltrimethylglutamate-homocysteine methyltransferase			21	ND
5,10-methylenetetrahydrofolate reductase	MTHFR	C (WL)	3	ND
5'-methylthioadenosine phosphorylase			8	ND
5'-nucleotidase			10	ND
50S ribosomal protein L1			104	9
50S ribosomal protein L10			184	ND
50S ribosomal protein L11			51	ND
50S ribosomal protein L13			68	15
50S ribosomal protein L13, large subunit ribosomal protein L13			3	ND
50S ribosomal protein L14			56	9
50S ribosomal protein L14, large subunit ribosomal protein L14			13	ND
50S ribosomal protein L15			87	5
50S ribosomal protein L15, large subunit ribosomal protein L15			6	ND
50S ribosomal protein L16			58	7
50S ribosomal protein L17			79	4
50S ribosomal protein L17, large subunit ribosomal protein L17			5	ND
50S ribosomal protein L18			73	ND
50S ribosomal protein L19			70	ND
50S ribosomal protein L2			79	ND
50S ribosomal protein L2, large subunit ribosomal protein L2			5	ND
50S ribosomal protein L20			39	ND
50S ribosomal protein L21			66	ND
50S ribosomal protein L22			42	4
50S ribosomal protein L22, large subunit ribosomal protein L22			13	ND
50S ribosomal protein L23			120	ND
50S ribosomal protein L23, large subunit ribosomal protein L23			3	ND
50S ribosomal protein L24			56	ND
50S ribosomal protein L24, large subunit ribosomal protein L24			20	ND
50S ribosomal protein L25			45	3
50S ribosomal protein L27			67	ND
50S ribosomal protein L28			45	2
50S ribosomal protein L29			65	ND
50S ribosomal protein L29, large subunit ribosomal protein L29			2	ND
50S ribosomal protein L3			95	ND
50S ribosomal protein L3, large subunit ribosomal protein L3			25	ND
50S ribosomal protein L30			26	3
50S ribosomal protein L30, large subunit ribosomal protein L30			18	ND
50S ribosomal protein L31			25	ND
50S ribosomal protein L31 type B			3	ND
50S ribosomal protein L32			26	ND
50S ribosomal protein L33			29	ND
50S ribosomal protein L34			1	ND
50S ribosomal protein L35			11	ND
50S ribosomal protein L4			118	11
50S ribosomal protein L4, large subunit ribosomal protein L4			18	ND
50S ribosomal protein L5			103	49
50S ribosomal protein L5, large subunit ribosomal protein L5			6	5
50S ribosomal protein L6			89	ND
50S ribosomal protein L6, large subunit ribosomal protein L6			10	ND
50S ribosomal protein L7/L12			133	18
50S ribosomal protein L9			29	ND
50S rRNA methyltransferase			25	33
6-phosphofructokinase	PFK	C (EMP Glycolysis)	142	155
6-phosphogluconate dehydrogenase			23	ND
6-phosphogluconolactonase			3	ND
6,7-dimethyl-8-ribitylumazine synthase			10	16
60 kDa chaperonin			4	ND
60 kDa chaperonin, partial			17	180
7-cyano-7-deazaguanine reductase			6	ND
7-cyano-7-deazaguanine synthase			2	ND
70 kDa heat shock protein, partial			8	ND
ABC transport system, permease component YbhS			2	ND
ABC transporter			277	13
ABC transporter ATP-binding protein			55	ND
ABC transporter ATP-binding protein, partial			5	ND
ABC transporter permease			276	8
ABC transporter permease, partial			17	ND
ABC transporter related protein			4	ND
ABC transporter substrate-binding protein			421	151
ABC transporter substrate-binding protein family 5			2	ND
ABC-2 type transporter			2	ND
ABC-type dipeptide transport system, periplasmic component			4	ND
ABC-type multidrug transport system, ATPase component			1	ND
ABC-type phosphate/phosphonate transport system, periplasmic component			5	ND
AbrB family transcriptional regulator			6	14
acetate kinase	ACK	C	2	ND
acetoacetate metabolism regulatory protein AtoC			2	ND
acetoacetyl-CoA reductase			17	2
acetoacetyl-CoA synthetase		C (fermentation)	36	ND
acetoacetyl-CoA synthetase			13	ND
acetoacetyl-CoA synthetase			33	41
acetoacetyl-CoA synthetase			6	ND

acetyl-CoA acetyltransferase			C (fermentation)	104	5
acetyl-CoA carboxylase	ACC		C (3-HP/4-HB)	26	ND
acetyl-CoA carboxylase carboxyltransferase subunit beta	ACC		C (3-HP/4-HB)	5	ND
acetyl-CoA carboxylase subunit alpha	ACC		C (3-HP/4-HB)	39	ND
acetyl-CoA carboxylase subunit beta	ACC		C (3-HP/4-HB)	4	ND
acetyl-CoA carboxylase, partial	ACC		C (3-HP/4-HB)	7	ND
acetyl-CoA decarboxylase	ACDS		C (WL)	27	2
acetyl-CoA synthase subunit gamma	ACDS		C (WL)	6	ND
acetyl-CoA synthetase	ACStase		C (fermentation)	98	14
acetylglutamate kinase				36	ND
acetylmethionine aminotransferase				34	15
acetyltransferase				15	ND
aconitate hydratase	ACN		C (rTCA)	3	ND
acriflavin resistance protein				4	ND
acriflavine resistance protein B				3	ND
actin				1	ND
acyl carrier protein				52	16
acyl-CoA ligase				34	ND
acyl-CoA dehydrogenase	CAD		C (fermentation)	106	ND
acyl-CoA thioesterase				9	ND
acyl-phosphate glycerol 3-phosphate acyltransferase				99	ND
acyltransferase				15	5
addiction module antitoxin				24	ND
addiction module protein				5	ND
adenosine-5'-phosphosulfate reductase alpha subunit	assimilation		S	6	25
adenosine-5'-phosphosulfate reductase alpha subunit, partial	assimilation		S	4	ND
adenosine-5'-phosphosulfate reductase, partial	assimilation		S	17	ND
adenosylcobinamide kinase				4	ND
adenosylhomocysteinase				4	ND
adenosylmethionine--8-amino-7-oxononanoate aminotransferase BioA				8	ND
adenylate cyclase				7	ND
adenylate kinase				37	31
adenylate/guanylate cyclase				5	ND
adenylosuccinate lyase				26	4
adenylosuccinate synthetase				29	38
adenyllyl cyclase				5	ND
adenyllysulfate kinase				22	ND
adenyllysulfate reductase	APR		S	386	168
adenyllysulfate reductase subunit alpha	APR		S	624	624
adenyllysulfate reductase subunit beta	APR		S	16	ND
adhesin				18	ND
adk, adenylylase, adenylylase				14	ND
ADP-heptose synthase				31	ND
ADP-heptose--LPS heptosyltransferase				10	ND
ADP-L-glycero-D-manno-heptose-6-epimerase				8	ND
ADP-ribose pyrophosphatase				3	ND
ADP-ribosyl-(dinitrogen reductase) hydrolase				12	ND
agglutinin biogenesis protein MshI				5	ND
alanine dehydrogenase				9	ND
alanine racemase				3	ND
alanyl-tRNA synthetase				52	ND
alanyl-tRNA synthetase, partial				11	ND
alcohol dehydrogenase	ADH		C (fermentation/hydrocarbon degradation)	32	ND
aldehyde dehydrogenase	ALDH		C (hydrocarbon degradation)	4	ND
aldehyde ferredoxin oxidoreductase			C (formaldehyde oxidation)	45	ND
aldehyde-activating protein				1	ND
aldehyde:ferredoxin oxidoreductase				12	ND
aldolase				69	ND
aldose epimerase				30	6
alkaline phosphatase				69	6
alkyl hydroperoxide reductase				420	8
alkyl hydroperoxide reductase subunit C				318	26
alkyl hydroperoxide reductase subunit F				205	ND
alkyl hydroperoxide reductase, partial				25	ND
alkylphosphonate ABC transporter substrate-binding protein				48	31
Alpha amylase catalytic region			C (starch)	10	ND
alpha-amylase			C (starch)	49	ND
alpha-glucan phosphorylase				81	14
alpha, alpha-trehalose-phosphate synthase				2	ND
alpha/beta hydrolase				399	ND
amidase				6	ND
amidophosphoribosyltransferase				14	ND
amino acid ABC transporter				2	ND
amino acid ABC transporter ATPase				2	ND
amino acid ABC transporter substrate-binding protein				22	19
amino acid acetyltransferase				6	ND
amino acid dehydrogenase				8	ND
amino acid-binding protein				4	16
aminobenzoyl-glutamate transporter				1	ND
aminodeoxychorismate lyase				4	ND
aminoglycoside phosphotransferase				15	ND
aminopeptidase A				5	ND
aminotransferase				33	6
aminotransferase DegT				3	ND
ammonia channel protein				11	ND
ammonia monooxygenase	AMO		N	9	ND
AmoA-like protein, partial	AMO		N	16	ND
AMP-dependent synthetase				89	17
Amylopullulanase precursor				6	ND
anaerobic benzoate catabolism transcriptional regulator				2	ND
Ankyrin				15	ND
anthranilate phosphoribosyltransferase				14	ND
anthranilate synthase component I				11	ND
anthranilate synthase subunit I				1	ND
anti sigma-E protein, RseA				71	ND
anti-sigma factor antagonist				16	ND
anti-sigma-factor antagonist				38	ND
antitoxin				27	ND
antitoxin HicB				9	ND
apolipoprotein acyltransferase				4	ND
AprA	APR		S	371	158
AprA, partial	APR		S	53	53
AprB	APR		S	323	ND

APS reductase alpha subunit	APR	S	22	ND
arabinose 5-phosphate isomerase			9	ND
argininosuccinate lyase			31	3
argininosuccinate synthase			20	11
arginyl-tRNA synthetase			23	7
arginyl-tRNA-protein transferase			11	ND
aromatic acid decarboxylase			13	ND
aromatic amino acid aminotransferase			23	ND
aromatic hydrocarbon degradation protein			164	115
arsenate reductase			19	ND
arsenic ABC transporter ATPase			3	ND
arsenic resistance protein ArsB			2	ND
arsenic transporter			6	ND
arsenite S-adenosylmethyltransferase			1	ND
arsenite transporter			5	ND
arsenite transporter, partial			5	ND
arsenite-activated ATPase ArsA			16	ND
ArsR family transcriptional regulator			75	7
arylsulfate sulfotransferase			78	ND
AsnC family transcriptional regulator			26	ND
asparagine synthase			27	3
aspartate aminotransferase			12	ND
aspartate carbamoyltransferase			3	ND
aspartate carbamoyltransferase catalytic subunit			3	7
aspartate kinase			93	ND
aspartate-semialdehyde dehydrogenase			29	129
Aspartate/tyrosine/aromatic aminotransferase-like protein			1	ND
aspartokinase			4	3
aspartyl protease			28	ND
aspartyl-tRNA amidotransferase subunit B			5	ND
aspartyl-tRNA synthetase			15	ND
ATP F0F1 synthase subunit alpha			34	ND
ATP F0F1 synthase subunit beta			2	ND
ATP F0F1 synthase subunit C			13	ND
ATP F0F1 synthase subunit delta			6	ND
ATP F0F1 synthase subunit gamma			12	ND
ATP phosphoribosyltransferase			14	ND
ATP phosphoribosyltransferase catalytic subunit			14	ND
ATP phosphoribosyltransferase regulatory subunit			28	2
ATP synthase F0, A subunit			3	ND
ATP synthase F0F1 subunit A			7	ND
ATP synthase F0F1 subunit beta			51	15
ATP synthase F0F1 subunit C			60	ND
ATP synthase F0F1 subunit epsilon			43	ND
ATP synthase subunit A			50	ND
ATP synthase subunit alpha			7	ND
ATP synthase subunit B			87	ND
ATP synthase subunit C			7	ND
ATP synthase subunit gamma			2	ND
ATP synthase, F0 subunit b			4	ND
ATP--cobalamin adenosyltransferase			3	ND
ATP-binding protein			65	ND
ATP-dependent chaperone ClpB			6	ND
ATP-dependent Clp protease ATP-binding protein			31	ND
ATP-dependent Clp protease ATP-binding subunit ClpX			13	ND
ATP-dependent Clp protease proteolytic subunit			34	6
ATP-dependent dehydrobiotin synthase BioD			2	ND
ATP-dependent DNA helicase RecQ			2	ND
ATP-dependent DNA helicase RuvB			9	6
ATP-dependent metalloprotease			24	ND
ATP-dependent metalloprotease FtsH			30	ND
ATP-dependent OLD family endonuclease, partial			6	ND
ATP-dependent protease			99	ND
ATP-dependent protease ATP-binding subunit ClpX			3	ND
ATP-dependent protease ATP-binding subunit HslU			28	ND
ATP-dependent protease La			79	56
ATP-dependent protease subunit HslV			6	ND
ATP-dependent protease, partial			8	ND
ATP-dependent Zn protease			13	ND
ATP-synthase beta chain, partial			17	8
ATPase			93	5
ATPase AAA			204	44
ATPase P			7	ND
autotransporter			1	ND
AzIC family protein			4	ND
B12-dependent methionine synthase			11	ND
bacterial extracellular solute-binding proteins, family 5 Middle			15	34
bacterioferritin			38	ND
bacterioferritin-associated ferredoxin			16	ND
barnase inhibitor			6	ND
basic membrane lipoprotein			6	ND
benzoate transporter			25	ND
benzoyl-CoA oxygenase			3	ND
benzoyl-CoA dihydrodiol lyase			11	ND
beta-galactosidase			2	ND
beta-hexosaminidase			4	ND
beta-ketoacyl synthase			5	ND
bifunctional 5,10-methylene-tetrahydrofolate dehydrogenase/5,10-methylene-tetrahydrofolate cyclohydrolase	MTD	C (WL)	2	ND
bifunctional acetyl-CoA decarboxylase/synthase complex subunit alpha/beta	ACDS	C (WL)	30	5
bifunctional aconitate hydratase 2/2-methylisocitrate dehydratase	ACN	C (rTCA)	34	7
Bifunctional hemolysin/adenylyate cyclase			1	ND
bifunctional N-acetylglucosamine-1-phosphate uridylyltransferase/glucosamine-1-phosphate acetyltransferase			41	ND
bilirubin oxidase			2	ND
binding-protein-dependent transporter system inner membrane protein			10	ND
biopolymer transporter ExbB			19	ND
biopolymer transporter ExbD			27	ND
biotin synthase			24	ND
biotin--[acetyl-CoA-carboxylase] synthetase			9	ND
Blue (Type 1) copper domain protein			5	ND
BolA family transcriptional regulator			11	ND
bon domain-containing protein			2	ND
branched-chain alpha-keto acid dehydrogenase subunit E2			424	ND
branched-chain amino acid ABC transporter ATP-binding protein			14	ND



branched-chain amino acid ABC transporter permease			4	ND
branched-chain amino acid ABC transporter substrate-binding protein			110	38
branched-chain amino acid aminotransferase			38	63
C4-dicarboxylate ABC transporter			213	53
C4-dicarboxylate ABC transporter permease			11	ND
C4-dicarboxylate ABC transporter substrate-binding protein			37	6
CAAX amino protease			7	ND
cag pathogenicity island protein Cag6			6	ND
calcium-binding protein			19	ND
camphor resistance protein CreB			1	ND
capsular biosynthesis protein			13	ND
capsule biosynthesis protein CapD, partial			3	ND
carbamoyl phosphate synthase large subunit			40	ND
carbamoyl phosphate synthase small subunit			25	ND
carbamoyltransferase			4	ND
carbon monoxide dehydrogenase	CODH	C (WL)	36	ND
carbon storage regulator			1	ND
carbon-phosphorus lyase			113	17
carbon-phosphorus lyase complex subunit			19	ND
carbon-phosphorus lyase complex subunit PhnJ			121	ND
carbonate dehydratase			52	ND
carbonic anhydrase			25	ND
carboxy-terminal-processing protease			3	ND
carboxyl-terminal protease			9	ND
carboxylase			2	ND
carboxylesterase			7	ND
carboxymethylenebutenolidase			32	16
carboxypeptidase			1	ND
carboxysome shell protein			635	3059
CarD family transcriptional regulator			19	ND
catalase			9	ND
catalase-peroxidase			1775	75
catalase/hydroperoxidase HPI(I)			161	4
cation diffusion facilitator transporter			12	ND
cation tolerance protein CutA			5	ND
cation transporter			179	2
cation-transporting ATPase			3	ND
cation:proton antiporter			71	ND
cbb3-type cytochrome c oxidase subunit I			94	ND
CBS-domain-containing membrane protein			4	ND
cd1 nitrite reductase	NIR	N	2	ND
CDP-diacylglycerol--glycerol-3-phosphate 3-phosphatidyltransferase			10	ND
CDP-diacylglycerol--serine O-phosphatidyltransferase			7	ND
cell division protein			21	ND
cell division protein DedD			3	ND
cell division protein FtsA			14	ND
cell division protein FtsB			2	ND
cell division protein FtsE			5	ND
cell division protein FtsH			139	ND
cell division protein FtsK			55	ND
cell division protein FtsQ			5	ND
cell division protein FtsW			4	ND
cell division protein FtsX			23	ND
cell division protein FtsY			2	ND
cell division protein FtsZ			12	ND
cell division protein ZipA			1	ND
cell envelope biogenesis protein TonB			8	ND
cell shape determination protein CcmA			61	8
cell surface protein			4	4
cell surface protein SprA			4	ND
cell wall-binding protein, partial			5	ND
chain-length-determining protein			59	ND
chain-length-determining protein			17	ND
channel protein TolC			33	ND
Chaperone protein DnaJ			3	ND
chaperonin GroEL			87	27
chaperonin GroL			5	ND
chaperonin like family GroEL-, partial			2	8
chemotaxis protein			46	ND
chemotaxis protein CheA			154	33
chemotaxis protein CheA, partial			17	ND
chemotaxis protein CheB			2	ND
chemotaxis protein CheC			2	ND
chemotaxis protein CheR			7	ND
chemotaxis protein CheW			5	ND
chemotaxis protein CheX			2	ND
chemotaxis protein CheY			419	28
chemotaxis protein CheZ			79	3
chemotaxis protein MotB			1	ND
chemotaxis protein, partial			11	ND
chemotaxis regulator CheZ			3	ND
CheW domain protein			2	ND
chloride channel protein			8	ND
chlorite dismutase			2	ND
chorismate mutase			3	ND
chorismate synthase			47	ND
chromate resistance protein			3	ND
chromosomal replication initiator protein DnaA			19	ND
chromosome condensation regulator RCC1			5	ND
chromosome partitioning protein			3	ND
chromosome partitioning protein ParA			8	ND
chromosome partitioning protein ParB			18	ND
chromosome partitioning protein Smc			18	ND
chromosome replication initiation protein DnaA			4	ND
chromosome segregation protein SMC			41	ND
citrate transporter			3	ND
class I heat-shock protein, partial			4	5
class III cytochrome c			16	ND
class III cytochrome c family protein			13	ND
class V aminotransferase			46	6
Clp protease ATP-binding protein			109	11
Clp protease ClpC, partial			9	ND
Clp protease ClpP			6	ND

Clp protease ClpS			25	ND
Clp protease ClpX			37	ND
Clp protease ClpX, partial			31	ND
co-chaperone GrpE			6	ND
co-chaperone HscB			4	ND
CoA-binding protein			19	ND
CoA-substrate-specific enzyme activase			1	ND
CoA-transferase, partial			4	ND
cob(D)alamin adenosyltransferase/cobinamide ATP-dependent adenosyltransferase			5	ND
cobalamin			10	ND
cobalamin biosynthesis protein CbiG			4	ND
cobalamin biosynthesis protein CbiX			2	ND
cobalamin biosynthesis protein CobD			13	ND
cobalt transporter			67	ND
cobalt-precorrin-4 C(11)-methyltransferase			2	ND
cobalt-precorrin-6A synthase			3	ND
cobyric acid synthase			2	ND
cobyric acid synthase CobQ			17	ND
cobyric acid a,c-diamide synthase			55	2
cold-shock DNA-binding protein family			136	ND
cold-shock protein			192	ND
colicin V production protein			4	ND
competence protein			57	ND
competence protein ComEA			4	ND
competence protein ComJ			6	ND
competence protein ComL			20	5
competence/damage-inducible protein ClnA C-terminal domain			1	ND
conjugal transfer protein TraI			2	ND
conjugal transfer protein TraW			1	ND
conserved hypothetical protein			137	128
conserved hypothetical protein, cofD-related			3	ND
conserved protein of unknown function			153	ND
CopG family transcriptional regulator			27	ND
copper ABC transporter ATPase			21	ND
copper ABC transporter substrate-binding protein			40	ND
copper amine oxidase			11	105
coproporphyrinogen III oxidase			41	16
Cpm60, partial			7	ND
CpXC protein			3	ND
CRISPR-associated protein	CRISPR		10	ND
CRISPR-associated protein Cas3	CRISPR		9	ND
CRISPR-associated protein Csd1	CRISPR		3	ND
CRISPR-associated protein Csd2	CRISPR		4	ND
CRISPR-associated protein Csh2	CRISPR		7	ND
CRISPR-associated protein Csn1	CRISPR		13	ND
crossover junction endodeoxyribonuclease RuvC			5	ND
crotonase			30	ND
Crp/Fnr family transcriptional regulator			65	5
CTP synthase			16	ND
cupin			25	ND
cupin 2 barrel domain-containing protein, partial			2	ND
cyanophycin synthetase			83	ND
Cyc3p			2	ND
cyclase			7	ND
cyclic nucleotide-binding protein			41	5
cyclophilin			13	4
cyclophilin type peptidyl-prolyl cis-trans isomerase			5	ND
cyclopropane fatty acyl phospholipid synthase			7	ND
cyclopropane-fatty-acyl-phospholipid synthase			6	ND
cystathionine gamma-synthase			3	ND
cysteine desulfurase			288	ND
cysteine hydrolase			4	ND
cysteine methyltransferase			5	ND
cysteine peptidase			1	ND
cysteine synthase			28	14
cysteinyl-tRNA synthetase			22	ND
cytidylate kinase			12	ND
cytochrome B			92	ND
cytochrome b subunit of the bc complex			3	ND
cytochrome B561			80	ND
cytochrome B6			3	ND
cytochrome C			1640	724
cytochrome C assembly protein			4	ND
cytochrome C biogenesis protein			131	ND
cytochrome c biogenesis protein (TlpA)			2	ND
cytochrome C biogenesis protein CcmA			9	ND
cytochrome C biogenesis protein CcmE			40	ND
cytochrome C biogenesis protein CcmF			11	ND
cytochrome C biogenesis protein CcmF, partial			6	ND
cytochrome C biogenesis protein CcmH			16	ND
cytochrome C biogenesis protein CcmI			1	ND
cytochrome C biogenesis protein CcsA			225	68
cytochrome C biogenesis protein ResB			3	ND
cytochrome C biogenesis protein ResC			4	ND
cytochrome C biogenesis protein, partial			14	ND
cytochrome C biosynthesis protein			2	ND
cytochrome c class I			4	ND
cytochrome C nitrate reductase	NAR	N	5	ND
cytochrome C nitrite reductase	ccNIR	N	4	ND
cytochrome C oxidase			23	ND
cytochrome C oxidase assembly protein			18	ND
cytochrome C oxidase cbb3-type subunit III			2	ND
cytochrome C oxidase subunit I			18	ND
cytochrome c oxidase subunit II			3	ND
cytochrome C oxidase subunit III			18	ND
cytochrome C peroxidase			35	ND
cytochrome C protein NapC	NAP	N	14	ND
cytochrome c subunit of flavocytochrome c sulfide dehydrogenase	SuDH	S	17	ND
cytochrome c-type biogenesis protein CcmE			8	ND
cytochrome c-type biogenesis protein CcmF, partial			3	ND
cytochrome C, partial			9	ND
cytochrome C'			30	19
cytochrome C4 precursor			25	60

cytochrome C550			35	ND
cytochrome C552			64	19
cytochrome C553			118	47
cytochrome Cbb3			105	ND
cytochrome cd1 nitrite reductase, partial			35	35
cytochrome D ubiquinol oxidase subunit I	NIR	N	22	ND
cytochrome oxidase			21	ND
cytochrome oxidase subunit I			8	ND
cytochrome oxidase subunit II			3	ND
cytochrome oxidase, partial			1	ND
cytosol aminopeptidase			30	15
D-alanine-D-alanine ligase			25	ND
D-alanyl-D-alanine carboxypeptidase			4	ND
D-alanyl-D-alanine endopeptidase			2	ND
D-fructose-6-phosphate amidotransferase			17	ND
damage-inducible protein			6	ND
damage-inducible protein ClnA			2	ND
deacetylase			17	ND
DEAD/DEAH box helicase			17	ND
DEAD/DEAH box helicase, partial			9	ND
decarboxylase			10	ND
dehydrogenase			10	ND
delta-aminolevulinic acid dehydratase			20	4
denitrification system component NirT		N	83	ND
DeoR family transcriptional regulator			16	ND
deoxycytidine triphosphate deaminase			12	ND
deoxyguanosinetriphosphate triphosphohydrolase			6	ND
deoxyribonucleotide triphosphate pyrophosphatase			2	ND
deoxyuridine 5'-triphosphate nucleotidohydrolase			13	ND
desulfoferrodoxin			12	11
diacylglycerol kinase			59	ND
diacylglycerol transferase			5	ND
diadenosine tetraphosphatase			15	ND
diaminopimelate decarboxylase			46	6
diaminopimelate epimerase			11	ND
dienelactone hydrolase	DH	C (hydrocarbon degradation)	2	ND
diguanylate cyclase			212	ND
diguanylate cyclase, partial			5	ND
diguanylate phosphodiesterase			22	ND
dihydrodipicolinate reductase			7	ND
dihydrodipicolinate synthase			14	53
dihydrofolate reductase			1	ND
dihydroliipoamide acetyltransferase			4	ND
dihydroliipoamide acetyltransferase, partial			31	ND
dihydroliipoamide dehydrogenase			47	80
dihydroliipoamide dehydrogenase, partial			19	5
dihydroliipoamide succinyltransferase, partial			13	ND
dihydroorotase			26	4
dihydroorotate dehydrogenase			2	ND
dihydropteridine reductase			3	ND
dihydropterolate synthase			19	ND
dihydropyrimidine dehydrogenase subunit A			33	ND
dihydroxy-acid dehydratase			33	ND
dihydroxy-acid dehydratase, partial			5	ND
dihydroxynaphthoic acid synthetase			3	ND
dimethylallyl adenosine tRNA methyltransferase			3	ND
dinitrogenase iron-molybdenum cofactor biosynthesis protein		N	8	ND
dioxygenase			4	ND
dissimilatory membrane-bound nitrate reductase, partial	NRZ	N	6	ND
dissimilatory nitrite reductase, partial	NIR	N	17	30
dissimilatory sulfite reductase	DSR	S	6	3
dissimilatory sulfite reductase alpha subunit	DSR	S	26	70
dissimilatory sulfite reductase alpha subunit, partial	DSR	S	1	ND
dissimilatory sulfite reductase beta subunit	DSR	S	18	10
dissimilatory sulfite reductase beta subunit, partial	DSR	S	8	ND
disulfide bond formation protein			5	ND
disulfide isomerase	assimilation	S	25	ND
disulfide reductase	assimilation	S	10	ND
DMSO reductase		S	11	ND
DNA gyrase subunit A			44	ND
DNA gyrase subunit A, partial			5	ND
DNA gyrase subunit B			16	5
DNA helicase			13	ND
DNA invertase			2	ND
DNA methylase			19	ND
DNA methylase, partial			5	ND
DNA methyltransferase			21	ND
DNA mismatch repair protein MutS			4	ND
DNA polymerase			10	ND
DNA polymerase I			9	ND
DNA polymerase III			23	ND
DNA polymerase III subunit alpha			4	ND
DNA polymerase III subunit beta			49	55
DNA polymerase III subunit chi			6	ND
DNA polymerase III subunit delta			3	ND
DNA polymerase III subunit epsilon			7	ND
DNA polymerase III subunit gamma/tau			191	ND
DNA polymerase III subunit gamma/tau, partial			86	ND
DNA polymerase IV			3	ND
DNA polymerase V			5	ND
DNA polymerase, partial			5	ND
DNA primase			12	ND
DNA processing protein DprA			16	ND
DNA protecting protein DprA			2	ND
DNA recombination protein RmuC			2	ND
DNA repair protein			19	ND
DNA repair protein HhH-GPD			18	ND
DNA repair protein RadA			9	ND
DNA repair protein RadC			20	ND
DNA repair protein RecN			1	ND
DNA repair protein RecO			3	ND
DNA repair protein, partial			48	ND
DNA topoisomerase I			5	ND

DNA topoisomerase III			6	ND
DNA topoisomerase IV subunit B			3	ND
DNA-3-methyladenine glycosylase			9	ND
DNA-binding domain protein			6	ND
DNA-binding protein			358	43
DNA-binding protein, partial			3	ND
DNA-deoxyinosine glycosylase			3	ND
DNA-dependent helicase			2	8
DNA-directed RNA polymerase sigma-70 factor			117	ND
DNA-directed RNA polymerase subunit alpha			160	63
DNA-directed RNA polymerase subunit alpha, DNA-directed RNA polymerase subunit alpha			19	ND
DNA-directed RNA polymerase subunit beta			187	9
DNA-directed RNA polymerase subunit beta'			190	44
DNA-directed RNA polymerase subunit beta', partial			24	17
DNA-directed RNA polymerase subunit omega			15	ND
DNA-directed RNA polymerase, alpha subunit			2	ND
DnaA initiator-associating protein DiaA			3	ND
DnaK suppressor protein			1	ND
DnaK, partial			9	ND
Dps family ferritin			3	ND
DSBA oxidoreductase			48	77
DsrS	DSR	S	2	ND
dTDP-4-dehydrothiamine 3,5-epimerase			8	ND
dTDP-4-dehydrothiamine reductase			16	ND
ECF family RNA polymerase sigma factor			2	ND
EDD domain protein, DegV family			1	ND
Efflux transporter, RND family, MFP subunit, partial			10	ND
electron transfer flavoprotein alpha/beta-subunit			5	ND
electron transfer flavoprotein subunit alpha			11	ND
electron transfer flavoprotein subunit beta			29	ND
electron transfer flavoprotein subunit beta, partial			9	ND
electron transfer flavoprotein-ubiquinone oxidoreductase			3	ND
electron transporter RnfA			6	ND
electron transporter RnfB			8	ND
electron transporter RnfB, partial			15	ND
electron transporter RnfC, partial			4	ND
electron transporter RxsE			7	ND
elongation factor 4			17	ND
elongation factor G			196	75
elongation factor G, partial			33	ND
elongation factor GreAB			8	ND
elongation factor P			16	ND
elongation factor Ts			109	ND
elongation factor Tu			363	673
elongation factor Tu, partial			121	73
endonuclease			6	ND
endonuclease DDE			19	ND
enolase	ENO	C (EMP Glycolysis)	32	21
Enoyl-(Acyl carrier protein) reductase, partial			9	ND
enoyl-ACP reductase			30	ND
enoyl-CoA hydratase	ECH	C (fermentation)	40	ND
entericidin			15	ND
epimerase			3	ND
epoxyqueuosine reductase			7	ND
EpsI family protein			17	ND
erythromycin biosynthesis sensory transduction protein eryC1			2	ND
erythronolide synthase			4	ND
esterase			2	ND
ethanolamine utilization protein EutJ			88	ND
excinuclease ABC subunit A			43	ND
exodeoxyribonuclease			2	ND
exodeoxyribonuclease III			8	ND
exodeoxyribonuclease V subunit beta			9	ND
exodeoxyribonuclease VII large subunit			14	ND
exodeoxyribonuclease VII small subunit			9	ND
exonuclease			15	ND
exonuclease V subunit gamma			4	ND
exopolyphosphatase			4	ND
exopolysaccharide biosynthesis polyprenyl glycosylphosphotransferase			26	ND
exopolysaccharide biosynthesis protein			16	ND
exoribonuclease R			18	ND
exoribonuclease R, partial			13	ND
exosortase A			22	ND
exosortase B			9	ND
export ABC transporter permease protein			4	ND
extracellular solute-binding protein family I			3	ND
F0F1 ATP synthase subunit A			9	ND
F0F1 ATP synthase subunit alpha			138	41
F0F1 ATP synthase subunit beta			98	60
F0F1 ATP synthase subunit delta			106	14
F0F1 ATP synthase subunit epsilon			22	ND
F0F1 ATP synthase subunit gamma			69	18
F0F1-ATPase subunit			3	ND
F420-dependent oxidoreductase			1	ND
F420-nonreducing hydrogenase	MVH	C (CH4)	12	6
FAD-binding protein			14	5
FAD-linked oxidase			27	ND
Fe-S cluster assembly ATPase SufC			19	ND
Fe-S cluster assembly protein HesB			28	ND
Fe-S cluster assembly protein SufB			23	ND
Fe-S cluster assembly protein SufD			20	ND
Fe-S cluster assembly scaffold IscU			72	ND
Fe-S cluster assembly transcriptional regulator IscR			166	ND
Fe-S cluster protein			9	ND
Fe-S oxidoreductase			229	ND
Fe-S-cluster-containing hydrogenase subunit			32	ND
FecR domain-containing protein			8	ND
ferredoxin			173	11
ferredoxin reductase			7	ND
ferredoxin-NADP reductase			3	ND
ferric reductase			71	ND
ferritin			474	188
Ferritin Dps family protein			2	ND

Filamentation induced by cAMP protein Fic			7	ND
filamentous hemagglutinin			20	ND
fimbrial protein			62	ND
Fis family transcriptional regulator			140	ND
Fis family transcriptional regulator, partial			2	ND
flagellar basal body P-ring biosynthesis protein FlgA			1	ND
flagellar basal body rod modification protein FlgD			44	ND
flagellar basal body rod protein FlgC			39	ND
flagellar basal body rod protein FlgF			27	ND
flagellar basal body rod protein FlgG			29	ND
flagellar biosynthesis protein FlgB			34	ND
flagellar biosynthesis protein FlgM			5	ND
flagellar biosynthesis protein FlgN			19	ND
flagellar biosynthesis protein FlhA			3	ND
flagellar biosynthesis protein FlhB			3	ND
flagellar biosynthesis protein FlhC			5	ND
flagellar biosynthesis protein FlhO			8	ND
flagellar biosynthesis protein Flp			6	ND
flagellar biosynthesis protein FltQ			2	ND
flagellar biosynthesis protein FltS			24	4
flagellar biosynthesis regulator FlhF			13	ND
flagellar biosynthesis sigma factor			2	ND
flagellar brake protein			2	ND
flagellar export protein FljI			4	ND
flagellar hook protein			96	ND
flagellar hook protein FlgE			168	ND
flagellar hook protein FlgK			71	ND
flagellar hook-associated 2-like protein			3	ND
flagellar hook-associated protein			27	ND
flagellar hook-associated protein FlgL			3	ND
flagellar hook-basal body protein FlhE			41	ND
flagellar hook-length control protein			1	ND
flagellar L-ring protein FlgH			22	ND
flagellar M-ring protein FlhF			14	ND
flagellar motor protein			2	ND
flagellar motor protein MotA			71	ND
flagellar motor protein MotB			5	ND
flagellar motor protein MotB, partial			5	ND
flagellar motor protein MotD			2	ND
flagellar motor switch protein FltG			11	4
flagellar motor switch protein FltM			11	ND
flagellar motor switch protein FltN			25	ND
flagellar P-ring protein			8	ND
flagellar P-ring protein FlgI			20	ND
flagellar protein			5	ND
flagellar protein FlaF			2	ND
flagellar protein FlaG			28	ND
flagellar transcriptional regulator FlhD			44	ND
flagellin			120	3
flagellin domain-containing protein			12	ND
flagellin modification protein FlmA			2	ND
flagellin, partial			5	ND
flavocytochrome C			6	ND
flavocytochrome C sulfide dehydrogenase	SuDH	S	31	10
flavoprotein subunit of flavocytochrome c sulfide dehydrogenase	SuDH	S	2	ND
FlgN family protein			7	ND
FltI flagellar protein			20	ND
Flp pilus assembly protein, ATPase CpaE			4	ND
FndB family transcriptional regulator			13	ND
FMN adenyltransferase			9	ND
FoF1 ATP synthase subunit I			4	ND
foldase			1	ND
formamidopyrimidine-DNA glycosylase			6	ND
formate dehydrogenase	FDH	C (WL) and C (fermentation)	185	94
formate dehydrogenase subunit gamma	FDH	C (WL) and C (fermentation)	2	ND
Formate dehydrogenase-N subunit beta	FDH	C (WL) and C (fermentation)	32	ND
formate transporter		C (WL) and C (fermentation)	2	ND
formate--tetrahydrofolate ligase	FTFL	C (WL) and C (fermentation)	12	8
formylglycine-generating enzyme			3	ND
formyltetrahydrofolate deformylase			2	ND
fructose 1,6-bisphosphatase	FBP	C (Calvin-Benson-Bassham cycle) and C (EMP Glycolysis)	180	46
fructose-bisphosphate aldolase	FBA	C (Calvin-Benson-Bassham cycle) and C (EMP Glycolysis)	124	62
fumarate hydratase			14	ND
fumarate reductase	FRD	C (rTCA)	26	ND
Fur family transcriptional regulator			53	ND
FusA, partial			2	ND
GAF and PAS/PAC sensor-containing adenylate/guanylate cyclase			2	ND
GAF sensor signal transduction histidine kinase			11	ND
galactose-1-phosphate uridylyltransferase			1	ND
gamma-glutamyl kinase			7	ND
gamma-glutamyl phosphate reductase			12	ND
gas vesicle protein			71	40
gas vesicle protein GypA			7	ND
GCN5 family acetyltransferase			8	ND
GCN5 family N-acetyltransferase			12	ND
GCN5-related N-acetyltransferase			3	ND
GDP-L-fucose synthase			3	ND
GDP-mannose 4,6-dehydratase			11	ND
GDP-mannose-dependent alpha-mannosyltransferase			2	ND
general secretion pathway protein GspD			5	ND
general secretion pathway protein GspE			99	ND
general secretion pathway protein GspG			33	ND
general secretion pathway protein GspH			28	ND
general secretion pathway protein K			3	ND
general stress protein			11	13
geranylgeranyl reductase			2	ND
geranyltransferase			4	ND
GGDEF			6	ND
glmZ(sRNA)-inactivating NTPase			10	ND
globin			11	ND
glucokinase	GCK	C (EMP Glycolysis)	1	ND
glucosamine--fructose-6-phosphate aminotransferase			21	ND
glucosamine-6-phosphate deaminase			3	ND

glucose dehydrogenase			3	ND
glucose-1-phosphate adenyltransferase			82	3
glucose-1-phosphate thymidyltransferase			3	ND
glucose-6-phosphate isomerase	G6PI	C (EMP Glycolysis)	67	ND
glutamate 2,3-aminomutase			2	ND
glutamate dehydrogenase			18	54
glutamate dehydrogenase, partial			2	ND
glutamate racemase			13	ND
glutamate synthase			432	89
glutamate synthase (NADPH) small subunit, partial			4	ND
glutamate synthase large subunit			7	6
glutamate synthase subunit beta			65	ND
glutamate-cysteine ligase			10	ND
glutamate-pyruvate aminotransferase			2	ND
glutamate-1-semialdehyde aminotransferase			10	ND
glutamine amidotransferase			4	ND
glutamine synthetase			54	25
glutamine-synthetase adenyltransferase			6	ND
glutamyl-tRNA synthetase			24	ND
glutamyl-tRNA amidotransferase			42	3
glutamyl-tRNA reductase			40	ND
glutamyl-tRNA synthetase			7	ND
glutaredoxin			127	10
glutathione ABC transporter ATP-binding protein			4	ND
glutathione peroxidase			2	ND
glyceraldehyde-3-phosphate dehydrogenase	GAPDH	C (Calvin-Benson-Bassham cycle) and C (EMP Glycolysis)	203	139
glycerol kinase			2	ND
glycerol-3-phosphate ABC transporter ATP-binding protein			7	ND
glycerol-3-phosphate ABC transporter permease			4	ND
glycerol-3-phosphate ABC transporter substrate-binding protein			6	ND
glycerol-3-phosphate acyltransferase			7	ND
glycerol-3-phosphate transporter permease			1	ND
glycerophosphodiester phosphodiesterase			2	ND
glycerophosphoryl diester phosphodiesterase			2	ND
glycine cleavage system protein H			7	ND
glycine cleavage system protein R			5	ND
glycine cleavage system protein T			10	ND
glycine dehydrogenase			11	ND
glycine dehydrogenase subunit 2			1	ND
glycogen branching protein			25	ND
glycogen debranching protein			27	ND
glycogen phosphorylase			11	ND
glycogen synthase		C	29	ND
glycolate oxidase			30	ND
glycoprotease			3	ND
glycoprotein X			10	29
glycoside hydrolase		C	52	ND
glycosyl hydrolase			2	ND
glycosyl transferase			73	ND
glycosyl transferase family 1			33	ND
glycosyl transferase family 2			35	ND
glycyl-tRNA synthetase			2	ND
glycyl-tRNA synthetase subunit alpha			15	ND
glycyl-tRNA synthetase subunit beta			7	ND
glyoxylate carboligase			126	ND
GMP synthase			8	ND
GNAT family acetyltransferase			31	ND
GntR family transcriptional regulator			129	5
granule-associated-like protein			78	21
group 1 glycosyl transferase			10	ND
group II intron reverse transcriptase/maturase			15	ND
GTP binding protein			10	ND
GTP cyclohydrolase			103	ND
GTP pyrophosphokinase			20	ND
GTP-binding protein			70	ND
GTP-binding protein Era			2	ND
GTPase			35	10
GTPase CgtA			11	ND
GTPase Era			4	9
GTPase HflX			6	ND
guanosine-3',5'-bis(diphosphate) 3'-pyrophosphohydrolase			24	ND
guanylate cyclase			6	ND
guanylate kinase			10	ND
GxxExxY protein			2	ND
GYD domain superfamily			3	28
gyrase subunit A protein			1	ND
haloacid dehalogenase			36	ND
heat shock protein			4	ND
heat-shock protein			50	ND
heat-shock protein Hsp20			307	12
heat-shock protein Hsp70			14	ND
heat-shock protein Hsp90			9	18
heat-shock protein HspX			55	ND
heavy metal efflux pump, CzcA family			1	ND
heavy metal transporter			2	ND
helicase			10	ND
helicase UvrD			3	ND
helicase, C-terminal			3	ND
hemagglutination activity protein			33	ND
hemagglutinin			4	ND
hemagglutinin-like secreted protein			4	ND
hemagglutinin, partial			5	ND
heme ABC transporter ATP-binding protein			1	ND
heme ABC transporter permease			68	ND
heme biosynthesis protein HemY			1	ND
heme d1 biosynthesis radical SAM protein NirJ			3	ND
heme lyase subunit CcmF			25	ND
heme transporter CcmC			3	ND
hemerythrin			76	6
Hemerythrin HHE cation binding domain protein			11	ND
hemin receptor			38	ND
hemin transporter			2	ND
hemin-binding protein			4	ND

hemolysin				35	ND
hemolysin activation/secretion protein				13	ND
hemolysin D				7	ND
hemolysin secretion protein D				85	ND
hemolysin-type calcium-binding protein				27	ND
hemolysin-type calcium-binding region				25	ND
hemolysin-type calcium-binding repeat family protein				8	ND
hemolysin, partial				21	ND
heptaprenyl diphosphate synthase				2	ND
heptose 1-phosphate adenylyltransferase, partial				3	ND
heptosyltransferase				4	ND
heterodisulfide reductase	HDR		S	310	66
heterodisulfide reductase subunit A	HDR		S	172	29
Hfk protein				9	6
histidine kinase				1	ND
histidine kinase				336	16
histidine kinase, partial				2	ND
histidinol dehydrogenase				15	6
histidinol phosphate phosphatase				2	ND
histidinol-phosphate aminotransferase				8	ND
histidyl-tRNA synthetase				10	ND
histone deacetylase				1	ND
HNH endonuclease				3	ND
HNH endonuclease, partial				34	ND
Holliday junction DNA helicase				2	ND
Holliday junction DNA helicase RuvB				3	ND
homing endonuclease				10	ND
homocitrate synthase				2	ND
homoserine dehydrogenase				10	ND
HPr kinase				2	ND
HrcA family transcriptional regulator				15	ND
hydrazine oxidase, partial	HZO		N	3	ND
hydrazine synthase BC subunit	HZS		N	2	ND
hydrazine synthase subunit A, partial	HZS		N	3	ND
hydrogenase				156	5
hydrogenase 2 large subunit				138	12
hydrogenase 2 maturation endopeptidase				15	ND
hydrogenase 2 protein HybA				17	ND
hydrogenase 2 small subunit				106	ND
hydrogenase assembly protein HupF				17	ND
hydrogenase assembly protein HupC				1	ND
hydrogenase formation protein HupD				9	ND
hydrogenase nickel incorporation protein HypA				5	ND
hydrogenase nickel incorporation protein HypB				20	ND
hydrolase				6	ND
hydrolase, partial				6	ND
hydroperoxidase				544	16
hydroxylamine oxidase	HAO		N	3	ND
hydroxylamine oxidoreductase	HAO		N	2	ND
hydroxylamine oxidoreductase (hao)	HAO		N	2	ND
hydroxylamine reductase	HCP		N	146	43
hydroxymethylglutaryl-CoA lyase				6	ND
hydroxypyruvate isomerase				49	ND
hydroxypyruvate reductase	HPR		C (formaldehyde assimilation via serine pathway)	10	ND
HypD, partial				7	ND
hypothetical protein				23213	1550
hypothetical protein AB201_02875				37	ND
hypothetical protein Abin_001_002				17	ND
hypothetical protein ACD_10C00158G0001, partial				5	ND
hypothetical protein ACD_23C00977G0001, partial				11	ND
hypothetical protein ACD_34C00250G0004				3	ND
hypothetical protein ACD_34C00250G0005				24	ND
hypothetical protein ACD_34C00252G0001				12	ND
hypothetical protein ACD_34C00252G0002				26	ND
hypothetical protein ACD_34C00252G0003				11	ND
hypothetical protein ACD_34C00252G0006				4	ND
hypothetical protein ACD_34C00451G0001				2	ND
hypothetical protein ACD_35C00107G0002				12	ND
hypothetical protein ACD_58C00113G0001, partial				1	ND
hypothetical protein ACD_75C00728G0001				5	ND
hypothetical protein ACD_7C00143G0009				3	ND
hypothetical protein ACD_81C00068G0001				27	ND
hypothetical protein ACG97_12720				4	ND
hypothetical protein ADZ37_23465				2	ND
hypothetical protein ANME2D_01148				3	ND
hypothetical protein ANT_07950				7	ND
hypothetical protein ANT_16400				1	ND
hypothetical protein ARMA_0921				50	ND
hypothetical protein ARMA_1767				7	ND
hypothetical protein ARMA_1862				1	ND
hypothetical protein AW08_03878				16	ND
hypothetical protein AW09_004109				3	ND
hypothetical protein AZKH_p0111				4	ND
hypothetical protein BGP_3837				3	ND
hypothetical protein BSM_07040				364	ND
hypothetical protein BurJ1DRAFT_0671				10	ND
hypothetical protein BVRB_5g113470				7	ND
hypothetical protein CKO_00099				657	ND
hypothetical protein CLDAP_00920				1	ND
hypothetical protein CLDAP_09320				7	ND
hypothetical protein CLDAP_20270				48	ND
hypothetical protein Csp_H39680				38	3
hypothetical protein DAPPUDRAFT_69133				35	ND
hypothetical protein Daud_0898				5	ND
hypothetical protein DM80_6087				83	ND
hypothetical protein DSC_08620				1	ND
hypothetical protein ED21_17662				3	ND
hypothetical protein EMIHUDDRAFT_226110				5	ND
hypothetical protein ETSY1_22400				3	ND
hypothetical protein ETSY2_38865				3	ND
hypothetical protein HMPREF1487_09102				3	ND
hypothetical protein HMPREF9489_1547				94	ND
Hypothetical protein IALB_0759				20	17

Hypothetical protein IALB_1360			1	ND
Hypothetical protein IALB_3145			1	24
hypothetical protein JCM15548_14680			2	ND
hypothetical protein JV46_08600			6	ND
hypothetical protein KB13_443			159	ND
hypothetical protein kuste3403			7	ND
hypothetical protein LARV_01055			16	ND
hypothetical protein LARV_01557			1	ND
hypothetical protein LARV_01814			2	ND
hypothetical protein LARV_02768			1	ND
hypothetical protein LARV_03126			2	ND
hypothetical protein LARV_03272			4	ND
hypothetical protein LARV_03275			13	ND
hypothetical protein LTAR_00263			1	ND
hypothetical protein MC7420_7908			4	ND
hypothetical protein MCHI_001973			3	ND
hypothetical protein MidDRAFT_2089			3	ND
hypothetical protein MidDRAFT_5036			2	ND
hypothetical protein MROS_1991			12	ND
hypothetical protein N825_23335			3	ND
hypothetical protein NHU_03312			2	ND
hypothetical protein PG1C_04765			4	ND
hypothetical protein PG1C_10985			3	ND
hypothetical protein PG1C_11965			3	ND
hypothetical protein PG1C_12875			29	ND
hypothetical protein PG1C_13060			6	27
hypothetical protein Q619_VDC0001G0001			45	ND
hypothetical protein QOE_0008			17	ND
hypothetical protein RZ63_08280			561	ND
hypothetical protein SCD_n00042			8	ND
hypothetical protein SCD_n00904			8	ND
hypothetical protein SCD_n00905			4	ND
hypothetical protein SCD_n00906			5	ND
hypothetical protein SCD_n02115			5	ND
hypothetical protein SCD_n02278			3	ND
hypothetical protein SCT_0047			3	ND
hypothetical protein SCT_2339			3	ND
hypothetical protein SCT_2870			4	ND
hypothetical protein SK61_00679			978	ND
hypothetical protein SL003B_3023			5	ND
hypothetical protein SOVF_212770_partial			13	ND
hypothetical protein SUTH_00609			4	ND
hypothetical protein SUTH_00753			26	ND
hypothetical protein SUTH_01125			2	ND
hypothetical protein SUTH_01517			4	ND
hypothetical protein SUTH_01908			2	ND
hypothetical protein SUTH_01952			11	ND
hypothetical protein SUTH_01953			7	ND
hypothetical protein SUTH_01960			16	ND
hypothetical protein SUTH_02494			21	ND
hypothetical protein SUTH_02762			6	ND
hypothetical protein SUTH_03096			9	ND
hypothetical protein SUTH_03595			13	ND
hypothetical protein THICB2_410075			31	ND
hypothetical protein UBAL3_80150049			1	5
hypothetical protein UR46_C0020G0002			2	ND
hypothetical protein US11_C0004G0071			3	ND
hypothetical protein US39_C0001G0164			27	ND
hypothetical protein UT10_C0031G0005			6	21
hypothetical protein UT18_C0004G0019			3	ND
hypothetical protein UT23_C0012G0061			5	ND
hypothetical protein UT84_C0003G0011			3	ND
hypothetical protein UU74_C0052G0002			21	ND
hypothetical protein UU85_C0007G0026			1	ND
hypothetical protein UV40_C0039G0002			2	ND
hypothetical protein UY95_C0003G0009			15	ND
hypothetical protein ws034A6_0031			2	ND
hypothetical protein, partial			1386	100
hypothetical secreted protein			36	ND
hypoxanthine-guanine phosphoribosyltransferase			24	ND
IcIR family transcriptional regulator			5	ND
Ig-like domain-containing protein, partial			9	ND
imidazole glycerol phosphate synthase			89	ND
imidazoleglycerol-phosphate dehydratase			25	5
IMP dehydrogenase			4	ND
indolepyruvate ferredoxin oxidoreductase			32	ND
Inner membrane protein alx			2	ND
inner-membrane translocator			4	ND
inorganic polyphosphate/ATP-NAD kinase			1	ND
inorganic pyrophosphatase			3	ND
inosine-5-monophosphate dehydrogenase			53	4
inositol-3-phosphate synthase			2	ND
insertase			25	ND
integrase			79	ND
integrase core domain protein			4	ND
integrase, catalytic region			3	ND
integrase, partial			9	ND
integration host factor subunit alpha			15	19
integration host factor subunit beta			32	ND
ion transporter			3	ND
iron ABC transporter ATP-binding protein			17	ND
iron ABC transporter permease			23	ND
iron ABC transporter substrate-binding protein			3	ND
iron deficiency-induced protein A			192	7
iron hydrogenase			1	10
iron transporter			7	26
iron-sulfur cluster insertion protein EtpA			67	ND
isochorismatase			10	ND
isochorismatase hydrolase			3	ND
isocitrate dehydrogenase	ICDH	C (rTCA)	57	34
isocitrate lyase			98	5
isoleucyl-tRNA synthetase			15	ND
isoleucyl-tRNA synthetase, partial			5	ND



isopropylmalate isomerase			33	ND
isovaleryl-CoA dehydrogenase			4	ND
K(+)-insensitive pyrophosphate-energized proton pump			1	ND
Kef-type K+ transport systems, membrane components			3	ND
ketol-acid reductoisomerase			57	12
ketose-bisphosphate aldolase			2	ND
L-aspartate oxidase			21	ND
laccase			4	ND
Lacl family transcriptional regulator			1	ND
lactamase			48	ND
LAGLIDADG homing endonuclease			2	ND
Large exoprotein			31	ND
leucine ABC transporter substrate-binding protein			3	ND
leucine/isoleucine/valine transporter ATP-binding subunit			8	ND
leucyl-tRNA synthetase			68	4
leucyl/phenylalanyl-tRNA--protein transferase			3	ND
LexA family transcriptional regulator			3	ND
ligand-gated channel			11	ND
lipid A biosynthesis acyltransferase			2	ND
lipid transporter ATP-binding/permease			1	ND
lipocalin			3	ND
lipoprotein			44	ND
lipoprotein ABC transporter ATP-binding protein			2	ND
long-chain fatty acid ABC transporter			10	ND
long-chain fatty acid transporter			6	21
long-chain fatty acid--CoA ligase			55	ND
long-chain fatty acid--CoA ligase, partial			11	10
long-chain-fatty-acid--CoA ligase, partial			6	ND
LPS biosynthesis protein			16	ND
LPS export ABC transporter ATP-binding protein			3	ND
LPS export ABC transporter permease L.ptF			3	ND
LSU ribosomal protein L11P			1	ND
LSU ribosomal protein L17P			3	ND
LuxR family transcriptional regulator			62	5
lysine 2,3-aminomutase			1	ND
lysine decarboxylase			4	ND
lysine methyltransferase			1	ND
lysine transporter LysE			6	ND
lysine--tRNA ligase			3	ND
LysK family transcriptional regulator			84	ND
lysyl-tRNA synthetase			4	ND
lytic transglycosylase			36	ND
macrolide ABC transporter ATP-binding protein			37	ND
magnesium and cobalt efflux protein CorC			6	ND
magnesium transporter			12	ND
magnesium transporter MgtC			11	ND
magnetic particle membrane specific GTPase P16			7	ND
major capsid protein	MCP		10	14
major spike family protein, partial			2	ND
major spike protein, partial			4	ND
malate dehydrogenase	MDH	C (rTCA)	61	12
malate synthase			111	ND
malic enzyme	ME	C (fermentation)	28	4
malonyl CoA-ACP transacylase			12	ND
malonyl CoA-ACP transacylase, partial			1	ND
maltodextrin phosphorylase			3	ND
maltodextrin phosphorylase, partial			10	ND
multioligosyl trehalose synthase			2	ND
mammalian cell entry protein			5	ND
mandelate racemase			3	ND
Manganese transport system membrane protein mntC			1	ND
mannose-1-phosphate guanylyltransferase			31	ND
mannose-1-phosphate guanylyltransferase			25	ND
map, methionine aminopeptidase, methionyl aminopeptidase			11	ND
MarR family transcriptional regulator			9	ND
MBL fold metallo-hydrolase			28	ND
mechanosensitive ion channel protein MscS			99	ND
membrane protease HIK			6	ND
membrane protein			1486	172
membrane protein, partial			9	ND
membrane-bound serine protease			2	ND
menaquinol oxidoreductase			9	ND
menaquinol-cytochrome C reductase			4	ND
MerR family transcriptional regulator			25	ND
metal ABC transporter ATPase			3	ND
metal ABC transporter permease			24	ND
metal dependent phosphohydrolase			6	ND
metal-binding protein			23	ND
metallo-beta-lactamase			6	ND
metalloendopeptidase			2	ND
metallophosphatase			2	ND
metallophosphoesterase			10	ND
methane monooxygenase	MMO	C (C1)	49	ND
methane monooxygenase, partial	MMO	C (C1)	18	ND
methylenetetrahydrofolate cyclohydrolase	MTCH	C (WL)	19	4
methionine aminopeptidase			38	ND
methionine gamma-lyase			2	ND
methionine sulfoxide reductase			10	ND
methionine synthase			33	ND
methionyl-tRNA formyltransferase			2	ND
methionyl-tRNA synthetase			32	14
methyl coenzyme M reductase 1 subunit alpha	MCR	C (CH4)	23	39
methyl coenzyme M reductase subunit beta	MCR	C (CH4)	48	19
methyl coenzyme M reductase subunit gamma	MCR	C (CH4)	17	16
methyl-accepting chemotaxis protein			24	ND
methyl-accepting chemotaxis sensory transducer			5	ND
methyl-coenzyme M reductase	MCR	C (CH4)	106	73
methylamine utilization protein MauG			1	ND
methylcrotonoyl-CoA carboxylase			6	ND
methylmalonate-semialdehyde dehydrogenase			3	ND
methylmalonyl-CoA carboxyltransferase		propionate	10	ND
methylmalonyl-CoA mutase	MCM	C (3-HP/4-HB)	24	ND
methylthioribose-1-phosphate isomerase			11	ND

methyltransferase	MT	C (WL)	21	ND
methyltransferase type 11	MT	C (WL)	20	ND
MFS transporter			105	ND
Mg-chelatase subunit ChlD			2	ND
Middle cell wall protein			9	6
Minor spike protein, partial			5	ND
mitochondrial GTPase elongation factor Tu, partial			7	2
Mobile element protein			5	ND
ModE family transcriptional regulator			2	ND
molecular chaperone			26	ND
molecular chaperone DnaJ			21	ND
molecular chaperone DnaK			176	83
molecular chaperone GroEL			372	310
molecular chaperone GroES			87	42
molecular chaperone HscA			61	5
molecular chaperone Hsp20			58	ND
molecular chaperone SurA			9	ND
molybdenum biosynthesis protein MoaD			2	ND
molybdenum cofactor biosynthesis protein MoaA			37	ND
molybdenum cofactor biosynthesis protein MoaC			4	ND
molybdenum cofactor biosynthesis protein MoaD			7	ND
molybdenum cofactor biosynthesis protein MoeA			1	ND
molybdopterin biosynthesis protein			4	ND
molybdopterin biosynthesis protein MoeB			12	ND
molybdopterin dinucleotide-binding protein			3	ND
molybdopterin molybdenumtransferase			2	ND
molybdopterin oxidoreductase			119	ND
molybdopterin-guanine dinucleotide biosynthesis protein B			10	ND
molybdopterin-guanine dinucleotide biosynthesis protein MobA			3	ND
monovalent cation/H+ antiporter subunit B			10	ND
mRNA interferase MqsR			8	ND
mrp protein			4	ND
multi-sensor hybrid histidine kinase			20	ND
multidrug ABC transporter ATP-binding protein			21	ND
multidrug ABC transporter substrate-binding protein			13	ND
multidrug efflux RND transporter permease subunit			15	ND
multidrug MFS transporter			2	ND
multidrug transporter			4	ND
multidrug transporter AcrB			248	ND
multifunctional tRNA nucleotidyl transferase/2'3'-cyclic phosphodiesterase/2'nucleotidase/phosphatase			2	ND
Multiple resistance and pH homeostasis protein G			10	ND
murein transglycosylase			4	ND
N-(5'-phosphoribosyl)anthranilate isomerase			12	ND
N-6 DNA methylase			4	ND
N-acetyl-alpha-D-glucosaminyl L-malate synthase			7	ND
n-acetyl-gamma-glutamyl-phosphate reductase			52	11
N-acetylglucosamine transferase			4	ND
N-acetylglucosamine-1-phosphate uridylyltransferase			1	ND
N-acetylglucosaminylidiphospho-UDP N-acetyl-beta-D-mannosaminyltransferase			14	ND
N-acetylglutamate synthase			29	ND
N-acetylglucosaminyl-L-alanine amidase			21	ND
N-acyl-phosphatidylethanolamine-hydrolyzing phospholipase			36	ND
N-acylneuraminate-9-phosphate synthase			6	ND
N-ethylmaleimide chlorohydrolase			1	ND
N(5)-methyl-tetrahydropterin-coenzyme M methyltransferase subunit C			9	ND
N(5)-methyl-tetrahydropterin-coenzyme M methyltransferase subunit H			9	11
N5-carboxyaminoimidazole ribonucleotide mutase			9	ND
N5- glutamine S-adenosyl-L-methionine-dependent methyltransferase			4	ND
Na+/Pi-cotransporter II-like protein			3	ND
Na+/proline symporter			2	ND
Na+/solute symporter			5	ND
NAD-dependent dehydratase			30	ND
NAD-dependent DNA ligase LigA			1	ND
NAD-dependent epimerase			2	ND
NAD(FAD)-utilizing dehydrogenase			2	ND
NAD(P) transhydrogenase subunit alpha			38	ND
NAD(P)H:quinone oxidoreductase			6	ND
NADH dehydrogenase			280	36
NADH dehydrogenase subunit B			25	ND
NADH dehydrogenase subunit C			3	ND
NADH dehydrogenase subunit D			36	ND
NADH dehydrogenase subunit E			31	ND
NADH dehydrogenase subunit G			108	6
NADH dehydrogenase subunit I			7	ND
NADH dehydrogenase subunit J			4	ND
NADH dehydrogenase subunit K			2	ND
NADH dehydrogenase, partial			3	ND
NADH-plastoquinone oxidoreductase 49 kDa subunit			1	ND
NADH-quinone oxidoreductase			4	ND
NADH-quinone oxidoreductase subunit B			2	ND
NADH-quinone oxidoreductase subunit H			23	ND
NADH-quinone oxidoreductase subunit K			17	ND
NADH-quinone oxidoreductase subunit L			2	ND
NADH-quinone oxidoreductase subunit N			2	ND
NADH-ubiquinone oxidoreductase			1	ND
NADH-ubiquinone oxidoreductase subunit 4L			2	ND
NADH-ubiquinone oxidoreductase subunit 6			6	ND
NADH:flavin oxidoreductase			5	ND
NADH:ubiquinone oxidoreductase 49 kD subunit 7			3	ND
NADH:ubiquinone oxidoreductase subunit A			14	ND
NADH:ubiquinone oxidoreductase subunit G iron-sulfur-binding			6	ND
NADH:ubiquinone oxidoreductase subunit H			26	ND
NADH:ubiquinone oxidoreductase subunit J			23	ND
NADH:ubiquinone oxidoreductase subunit L			46	3
NADH:ubiquinone oxidoreductase subunit M			35	ND
NADH:ubiquinone oxidoreductase subunit N			15	ND
NADP oxidoreductase			36	ND
NADP transhydrogenase subunit alpha			5	ND
NADP-specific glutamate dehydrogenase			15	15
NADPH-dependent FMN reductase			8	ND
Ni,Fe-hydrogenase I large subunit			2	27
Ni/Fe hydrogenase			8	ND
nickel-dependent hydrogenase b-type cytochrome subunit			3	ND

nicotinate-nucleotide--dimethylbenzimidazole phosphoribosyltransferase, partial				3	ND
Nif3-like dinuclear metal center hexameric protein		N		16	ND
nifU protein		N		2	ND
NirS, partial	NIR	N		4	ND
nitrate ABC transporter ATP-binding protein		N		1	ND
nitrate reductase	NRA	N		446	1992
nitrate reductase A subunit alpha	NRA	N		23	3
nitrate reductase A subunit beta	NRA	N		3	ND
nitrate reductase A subunit gamma	NRA	N		5	ND
nitrate reductase catalytic subunit	NRA	N		34	180
nitrate reductase, partial	NRA	N		4	ND
nitric oxide reductase	NOR	N		200	3
nitric oxide reductase activation protein	NOR	N		2	ND
nitric oxide reductase subunit B	NOR	N		9	ND
nitrite reductase (ammonia-forming)	NirS	N		28	ND
nitrite reductase	NIR	N		249	97
nitrite reductase, partial	NIR	N		38	9
nitrogen fixation protein		N		4	ND
nitrogen fixation protein FixG		N		9	ND
nitrogen fixation protein FixH		N		18	ND
nitrogen fixation protein NifU		N		8	ND
nitrogen regulation protein NR(I)		N		2	ND
nitrogen regulatory protein P-II		N		1	ND
nitrogen regulatory protein P-II 1		N		35	30
nitrogen regulatory protein P-II family		N		1	ND
nitrogen utilization protein B		N		4	ND
nitrogen-fixing protein NifU		N		4	ND
nitroreductase		N		7	ND
nitrosative-stress tolerance protein NnrS				4	ND
nitrous oxide reductase accessory protein NosL	NOS	N		65	19
nitrous oxide reductase, partial	NOS	N		23	44
nitrous-oxide reductase	NOS	N		64	74
NlpBDapX family lipoprotein				7	ND
ntrs family protein				1	ND
nonstructural polyprotein				2	ND
NosZ, partial	NOS	N		54	90
NrdR family transcriptional regulator				20	ND
nucleoid-associated protein				17	ND
nucleoside diphosphate kinase				10	ND
nucleoside recognition domain-containing protein				6	ND
nucleoside-diphosphate-sugar epimerase				2	ND
nucleoside-diphosphate-sugar pyrophosphorylase				3	ND
nucleoside-triphosphate diphosphatase				3	ND
nucleotide-binding protein				15	ND
nucleotidyltransferase				27	ND
NUDIX hydrolase				31	ND
NusA antitermination factor				2	ND
O-acetylhomoserine aminocarboxypropyltransferase				21	4
O-succinylhomoserine sulfhydrylase				7	3
octaprenyl diphosphate synthase				14	ND
oligopeptidase A				65	5
oligoribonuclease				19	ND
OmpA/MotB domain protein				2	ND
organic solvent tolerance protein (OstA)				2	ND
ornithine acetyltransferase				2	ND
ornithine carbamoyltransferase				12	ND
ornithine decarboxylase				1	ND
orotate phosphoribosyltransferase				22	ND
orotidine 5'-phosphate decarboxylase				21	ND
osmotically inducible protein C				48	ND
osmotically inducible protein OsmC				3	ND
outer membrane adhesin like protein				4	ND
outer membrane adhesin-like protein				22	ND
outer membrane channel protein, partial				3	ND
outer membrane efflux protein				32	20
outer membrane lipid asymmetry maintenance protein MlaD				82	ND
outer membrane lipoprotein				10	ND
outer membrane protein				5	ND
oxidase				3	ND
oxidoreductase				43	26
PadR family transcriptional regulator				2	ND
ParB/RepB/SpoJ family partition protein				9	5
Particulate Methane Oxygenase A	MMO	C		2	ND
parvulin-like peptidyl-prolyl isomerase, partial				2	ND
PAS domain S-box				3	ND
PAS/PAC sensor signal transduction histidine kinase				1	ND
PAS/PAC sensor-containing diguanylate cyclase/phosphodiesterase				4	ND
patatin				4	ND
PE-PGRS family protein				15	ND
penicillin-binding protein				17	ND
penicillin-binding protein 2				1	ND
PEP-CTERM domain protein				607	24
PEP-CTERM domain protein, partial				10	ND
PEP-CTERM motif protein				5	ND
peptidase	PEP	N		98	11
peptidase C39	PEP	N		16	ND
peptidase M1	PEP	N		68	ND
peptidase M16	PEP	N		22	ND
peptidase M17	PEP	N		13	8
peptidase M20	PEP	N		3	ND
peptidase M22	PEP	N		11	ND
peptidase M23	PEP	N		64	ND
peptidase M28	PEP	N		4	ND
peptidase M48	PEP	N		45	ND
peptidase M50	PEP	N		5	ND
peptidase PMbA	PEP	N		5	ND
peptidase S14	PEP	N		31	3
peptidase S16	PEP	N		7	ND
peptidase S41	PEP	N		169	9
peptidase S46	PEP	N		1	ND
peptidase S49	PEP	N		33	ND
peptidase S8	PEP	N		7	ND
peptidase U32	PEP	N		9	ND

peptidase U35	PEP	N	8	ND
peptidase, partial	PEP	N	13	ND
peptide ABC transporter ATP-binding protein			3	ND
peptide ABC transporter ATPase			8	ND
peptide ABC transporter permease			13	ND
peptide ABC transporter substrate-binding protein			62	120
peptide chain release factor 1			20	ND
peptide chain release factor 2			17	ND
peptide deformylase			15	3
peptide transporter			4	ND
peptide-binding protein			4	ND
peptide/nickel ABC transporter substrate-binding protein			21	7
peptide/nickel transport system substrate-binding protein			32	13
peptidoglycan bridge formation protein FemAB			2	ND
peptidoglycan glycosyltransferase			5	ND
peptidoglycan transglycosylase			3	ND
peptidoglycan-associated lipoprotein			5	ND
peptidoglycan-binding protein			80	46
peptidoglycan-binding protein LysM			8	ND
peptidyl-prolyl cis-trans isomerase			26	9
peptidyl-tRNA hydrolase			5	ND
peptidylprolyl isomerase			35	3
periplasmic nitrate reductase	NAP	N	1	33
periplasmic or secreted lipoprotein			3	ND
permease			73	ND
peroxidase			76	ND
peroxidase, partial			122	ND
peroxiredoxin			204	ND
pH-dependent sodium/proton antiporter			21	ND
phage shock protein			26	ND
phage-like protein	phage		10	ND
Phasin			9	ND
phasin family protein			27	8
phasin protein			113	ND
phenylacetate--CoA ligase			8	ND
phenylacetate-CoA ligase			16	ND
phenylalanyl-tRNA synthetase subunit alpha			7	ND
phenylalanyl-tRNA synthetase subunit beta			40	ND
Pho4p			2	ND
PhoP family transcriptional regulator			27	ND
phosphate			61	ND
phosphate ABC transporter			3	ND
phosphate ABC transporter ATP-binding protein			79	7
phosphate ABC transporter permease			170	ND
phosphate ABC transporter substrate-binding protein			246	32
phosphate acetyltransferase			2	ND
phosphate acyltransferase			50	ND
phosphate import ATP-binding protein PstB			19	ND
phosphate starvation protein PhoH			65	ND
phosphate starvation-inducible protein PsiF			52	ND
phosphate transporter permease subunit PstC			29	ND
phosphate-binding protein			116	50
phosphate/phosphate/phosphonate ABC transporters, periplasmic binding protein			20	ND
phosphatidate cytidyltransferase			9	ND
phosphatidylethanolamine N-methyltransferase			4	ND
phosphatidylserine decarboxylase			20	ND
phospho-2-dehydro-3-deoxyheptonate aldolase			27	4
phospho-N-acetylmuramoyl-pentapeptide transferase			3	ND
phospho-N-acetylmuramoyl-pentapeptide-transferase			12	ND
phosphocarrier protein HPr			7	ND
phosphodiesterase			14	ND
phosphoenolpyruvate carboxykinase	PCK	C (Gluconeogenesis)	21	ND
phosphoenolpyruvate carboxylase	PEPC	C (formaldehyde assimilation via serine pathway)	5	ND
phosphoenolpyruvate synthase			22	ND
phosphoenolpyruvate-protein phosphotransferase			10	ND
phosphoesterase			38	ND
phosphoesterase PA-phosphatase			5	ND
phosphofructokinase	PFK	C (EMP Glycolysis)	1	2
phosphoglucomutase			22	ND
phosphoglucosamine mutase			33	ND
phosphoglycerate kinase	PGK	C (Calvin-Benson-Bassham cycle) and C (EMP Glycolysis)	138	28
phosphoglycerate mutase	PGM	C (EMP Glycolysis)	2	ND
phosphoglyceromutase			19	ND
phosphoglycolate phosphatase			8	ND
phosphoheptose isomerase			52	ND
phosphohistidine phosphatase			23	ND
phosphohydrolase			113	ND
phospholipid-binding protein			21	ND
phosphomethylpyrimidine kinase			13	ND
phosphonate ABC transporter			38	ND
phosphonate ABC transporter ATP-binding protein			136	ND
phosphonate ABC transporter permease			115	ND
phosphonate ABC transporter substrate-binding protein			138	135
phosphonate ABC transporter substrate-binding protein			2	ND
phosphonate C-P lyase			11	ND
phosphonate C-P lyase system protein PhnK			77	ND
phosphonate metabolism protein			1	ND
phosphonate metabolism protein PhnG			15	ND
phosphonate metabolism protein PhnM			149	ND
phosphonate/organophosphate ester transporter subunit			9	ND
phosphonoacetate hydrolase			14	ND
phosphopantetheine adenylyltransferase			13	2
phosphopantothenate synthase			68	ND
phosphoprotein phosphatase			3	ND
phosphoribosyl-AMP cyclohydrolase			27	ND
phosphoribosyl-ATP pyrophosphatase			11	ND
phosphoribosylamine--glycine ligase			11	ND
phosphoribosylaminoimidazole carboxylase			4	ND
phosphoribosylaminoimidazole synthetase			11	ND
phosphoribosylaminoimidazole-succinocarboxamide synthase			45	5
phosphoribosylaminoimidazolecarboxamide formyltransferase			9	ND
phosphoribosylformylglycinamide synthase			43	ND
phosphoribosylglycinamide formyltransferase			11	ND

phosphoribulokinase	PRK	C (Calvin-Benson-Bassham cycle)	62	8
phosphoserine phosphatase			7	ND
photosystem reaction center subunit H			1	ND
PhoU family transcriptional regulator			50	77
phytoene synthase			6	ND
PII uridylyl-transferase			5	ND
pilin			48	ND
pilus assembly protein			65	ND
pilus assembly protein CpaE			17	ND
pilus assembly protein CpaF			5	ND
pilus assembly protein PilM			101	ND
pilus assembly protein PilO			17	14
pilus assembly protein PilP			25	7
pilus assembly protein PilZ			26	ND
pilus assembly protein TadD			21	ND
pilus assembly protein TadG			17	ND
pirin			10	ND
plasmid maintenance system killer protein			22	ND
plasmid stabilization protein			13	ND
poly-beta-hydroxybutyrate synthase			9	ND
poly(3-hydroxyalkanoate) polymerase			15	ND
poly(3-hydroxyalkanoate) synthetase			2	ND
poly(A) polymerase			8	ND
poly(R)-hydroxyalkanoic acid synthase			27	ND
polyamine ABC transporter ATP-binding protein			2	ND
polyferredoxin			4	ND
polyhydroxyalkanoate synthesis repressor			3	ND
polyhydroxyalkanoate synthesis repressor PhaR			19	ND
polymerase			57	83
polymerase beta domain protein region protein			1	ND
polynucleotide phosphorylase			10	ND
polynucleotide phosphorylase/polyadenylase			63	7
polynucleotide phosphorylase/polyadenylase, partial			6	ND
polyphosphate kinase			36	10
polyphosphate kinase 2			11	ND
polyphosphate kinase, partial			10	ND
polynucleotide nucleotidyltransferase			12	ND
polysaccharide biosynthesis protein			10	ND
polysaccharide deacetylase			11	ND
polysulfide reductase	PSR	S	90	ND
polysulfide reductase NrfD			29	ND
porin			492	625
porphobilinogen deaminase			16	ND
portal protein			2	ND
potassium transporter			32	ND
potassium transporter peripheral membrane component			11	ND
potassium transporter Trk			4	ND
potassium transporter TrkA			5	ND
PpiC-type peptidyl-prolyl cis-trans isomerase			2	ND
precorrin-3B C17-methyltransferase, partial			4	ND
precorrin-6Y C5,15-methyltransferase			7	ND
precorrin-8X methylmutase			3	ND
predicted membrane protein			6	ND
predicted metal-sulfur cluster biosynthetic enzyme			2	ND
prenyltransferase			1	ND
prenyltransferase UbiA			3	ND
prephenate dehydratase			6	ND
prephenate dehydrogenase			1	ND
prepilin peptidase			13	ND
preprotein translocase			46	ND
preprotein translocase subunit SecA	SEC	S	76	4
preprotein translocase subunit SecB	SEC	S	4	ND
preprotein translocase subunit SecD	SEC	S	35	ND
preprotein translocase subunit SecE	SEC	S	20	ND
preprotein translocase subunit SecF	SEC	S	18	ND
preprotein translocase subunit SecG	SEC	S	15	ND
preprotein translocase subunit SecY	SEC	S	89	4
preprotein translocase subunit TatB	TAT	S	38	ND
preprotein translocase subunit TatC	TAT	S	32	ND
preprotein translocase subunit Tim44			69	ND
preprotein translocase subunit YajC			24	ND
preprotein translocase subunit, preprotein translocase subunit SecY	SEC	S	11	ND
prevent-host-death family protein	PHD		3	ND
prevent-host-death protein	PHD		22	ND
proline-rich region			147	ND
prolyl-tRNA synthetase			16	ND
propionyl-CoA synthetase			19	8
protease			47	6
protease Do			79	10
protease HtpX			10	ND
protease TldD			20	ND
protein A			3	ND
protein B			43	ND
protein CbbY			14	ND
protein containing TPR repeat			2	ND
protein containing bacterial Ig-like domain			6	ND
protein containing LysM domain			3	ND
protein containing Por secretion system C-terminal sorting domain			2	ND
protein disaggregation chaperone			57	21
protein fwdA	FWD	C (CH4)	4	ND
protein K			43	ND
protein MraZ			26	12
protein nirF	NIR	N	13	ND
protein nirG	NIR	N	5	ND
protein nirL	NIR	N	10	ND
protein of unknown function DUF21, partial			16	ND
protein phosphatase			27	ND
protein serine/threonine phosphatase			12	ND
protein sphX			139	102
protein translocase TatA	TAT	S	27	ND
protein translocase, SecG subunit	SEC	S	1	ND
protein tyrosine kinase			23	ND
protein-L-isospartate O-methyltransferase			37	ND

protein-tyrosine kinase				1	ND
protoheme IX farnesyltransferase				23	ND
PRTRC system protein E				12	ND
PSE family sulfate exporter				4	ND
pseudouridine synthase				26	ND
pseudouridine synthase, partial				3	ND
pseudouridylylase				22	ND
pteridine reductase				6	ND
pterin-4-alpha-carbinolamine dehydratase				3	ND
PTS fructose transporter subunit IIA				9	ND
PTS sugar transporter subunit IIA				18	ND
putative 23S ribosomal RNA				18	ND
putative ATP-dependent protease				16	ND
putative cytochrome c oxidase subunit I				2	ND
putative Diguanylate cyclase				2	ND
putative dissimilatory nitrite reductase, partial	NIR		N	14	27
putative F0F1-ATPase subunit				4	ND
Putative hemolysin				4	ND
putative Histidine kinase				2	ND
putative inorganic polyphosphate/ATP-NAD kinase				6	ND
putative LAGLIDADG homing endonuclease (chloroplast)				11	ND
Putative membrane protein				2	ND
putative OmpR family two-component system response regulator				1	ND
putative PAS/PAC sensor histidine kinase				5	ND
putative PAS/PAC sensor protein				3	ND
putative peptidylprolyl isomerase				3	ND
putative porin superfamily protein				5	ND
putative primosomal replication protein				2	ND
putative reductase				2	ND
putative RNA dependent RNA polymerase				1	ND
putative RNA polymerase beta subunit				2	ND
putative transmembrane protein				8	ND
putative transposase DNA-binding domain	transposase			23	ND
putative type II DNA modification enzyme				12	ND
putative zinc-finger				4	ND
pyridine nucleotide transhydrogenase				19	ND
pyridine nucleotide-disulfide oxidoreductase				131	ND
pyridoxamine 5'-phosphate oxidase				17	ND
pyridoxine 5'-phosphate synthase				4	4
pyrophosphatase				197	21
pyrroline-5-carboxylate reductase				18	ND
pyrrolo-quinoline quinone				6	ND
pyruvate carboxylase				39	ND
pyruvate carboxylase subunit A				5	ND
pyruvate dehydrogenase	PDH		C (EMP Glycolysis)	104	3
pyruvate ferredoxin oxidoreductase	PFOR		C (fermentation)	60	ND
pyruvate formate lyase-activating protein	PFL-AE		C (fermentation)	5	ND
pyruvate kinase	PK		C (EMP Glycolysis)	74	2
pyruvate phosphate dikinase	PPDK		C (Gluconeogenesis)	67	6
pyruvate phosphate dikinase PEP/pyruvate-binding protein	PPDK		C (Gluconeogenesis)	3	ND
pyruvate phosphate dikinase, partial	PPDK		C (Gluconeogenesis)	4	ND
pyruvate synthase	PK		C (EMP Glycolysis)	2	ND
pyruvate-flavodoxin oxidoreductase				29	ND
pyruvate_water dikinase			C (fermentation)	25	ND
pyruvate/2-oxoglutarate dehydrogenase complex, dehydrogenase (E1) component, eukaryotic type, beta subunit				2	ND
quinol dehydrogenase				302	ND
quinol-dependent nitric oxide reductase, partial				2	ND
quinolinate synthetase				6	ND
quinone oxidoreductase				48	13
radical activating enzyme				6	ND
radical SAM protein				54	2
radical SAM protein, partial				1	ND
RCC1 repeat-containing protein, partial				3	ND
RDD domain containing protein				4	ND
RecA, partial				12	ND
RecName: Full=Cytochrome c-552; AltName: Full=Cytochrome c nitrite reductase; AltName: Full=TvNir; Flag	ccNIR		N	8	ND
recombinase RdgC				3	ND
recombinase RecA				6	ND
recombinase RecR				7	ND
recombinase RecX				2	ND
recombinase XerD				4	ND
recombination factor protein RarA				9	2
recombination protein RecR				12	ND
RecT protein				2	ND
reductase				137	41
regulator				28	ND
RepI p				2	ND
repressor				50	ND
response regulator receiver				11	ND
restriction endonuclease				6	ND
restriction endonuclease BglII				9	ND
restriction endonuclease, partial				10	ND
reverse dissimilatory sulfite reductase alpha subunit	rDSR		S	3	ND
reverse dissimilatory sulfite reductase alpha subunit, partial	rDSR		S	10	ND
reverse-type dissimilatory siroheme sulfite reductase subunit A	rDSR		S	33	37
reverse-type dissimilatory siroheme sulfite reductase subunit B	rDSR		S	8	7
rhodanese				26	ND
Rhodanese domain protein				3	ND
rhodanese domain-containing protein				10	ND
riboflavin biosynthesis protein RibD				9	ND
riboflavin synthase subunit alpha				29	ND
ribonuclease				38	ND
ribonuclease E				38	ND
ribonuclease H				3	ND
ribonuclease II				1	ND
ribonuclease III				4	ND
ribonuclease J				27	ND
ribonuclease P				2	ND
ribonuclease P protein component				1	ND
ribonuclease PH				5	ND
ribonuclease R				3	ND
ribonuclease Y				1	ND
ribonucleoside reductase				3	ND

ribonucleoside-diphosphate reductase			2	ND
ribonucleoside-triphosphate reductase			3	ND
ribonucleotide reductase			45	ND
ribose 1,5-bisphosphate phosphokinase			5	ND
ribose-phosphate pyrophosphokinase			19	ND
ribosomal protein S1			4	ND
ribosomal protein S12 methyltransferase			8	ND
ribosomal RNA large subunit methyltransferase N, partial			9	ND
ribosomal-protein-alanine acetyltransferase			11	ND
ribosome hibernation promoting factor HPF			7	ND
ribosome maturation factor RimM			42	ND
ribosome maturation factor RimP			5	ND
ribosome maturation protein RimP			11	ND
ribosome recycling factor			18	ND
ribosome silencing factor RsfS			24	ND
ribosome-associated GTPase EngA			2	ND
ribosome-associated inhibitor A/sigma 54 modulation protein			11	ND
ribosome-binding factor A			4	ND
ribosome-recycling factor			12	ND
ribulose 1,5-bisphosphate carboxylase	RuBisCo	C (Calvin-Benson-Bassham cycle)	313	405
ribulose 1,5-bisphosphate carboxylase small subunit	RuBisCo	C (Calvin-Benson-Bassham cycle)	67	3
ribulose bisphosphate carboxylase	RuBisCo	C (Calvin-Benson-Bassham cycle)	108	133
ribulose bisphosphate carboxylase large chain	RuBisCo	C (Calvin-Benson-Bassham cycle)	18	ND
ribulose bisphosphate carboxylase small chain	RuBisCo	C (Calvin-Benson-Bassham cycle)	290	207
ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit	RuBisCo	C (Calvin-Benson-Bassham cycle)	9	8
ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit form I, partial	RuBisCo	C (Calvin-Benson-Bassham cycle)	51	25
ribulose-phosphate 3-epimerase	RPE	C (Calvin-Benson-Bassham cycle)	28	ND
RNA chaperone Hfq			27	ND
RNA helicase			42	ND
RNA helicase, partial			3	ND
RNA methyltransferase			5	ND
RNA polymerase beta subunit			24	37
RNA polymerase ECF-type sigma factor			5	ND
RNA polymerase factor sigma-32			128	ND
RNA polymerase factor sigma-54			3	ND
RNA polymerase primary sigma factor			1	ND
RNA polymerase sigma factor			19	ND
RNA polymerase sigma factor AlgU			4	ND
RNA polymerase sigma factor RpoD			91	ND
RNA polymerase sigma factor RpoE			70	ND
RNA polymerase sigma factor, sigma-70 family			12	ND
RNA polymerase sigma-H factor			11	ND
RNA polymerase sigma24 factor			8	ND
RNA polymerase subunit B, partial			6	18
RNA polymerase subunit sigma-24			40	ND
RNA polymerase subunit sigma-54			40	ND
RNA polymerase, sigma subunit, ECF family			2	ND
RNA pyrophosphohydrolase			23	ND
RNA-binding protein			13	ND
RNA-binding protein S1			2	ND
RNA-dependent RNA polymerase			2	ND
RNA-dependent RNA polymerase, partial			22	ND
RNAase			8	ND
RND family efflux transporter, MFP subunit			7	ND
RND transporter			58	ND
RND transporter, partial			3	ND
rod shape-determining protein Mbl			6	ND
rod shape-determining protein MreB			64	17
rod shape-determining protein MreC			1	ND
ROK family transcriptional regulator			2	ND
Rrf2 family transcriptional regulator			3	ND
rubredoxin			55	ND
rubrerythrin			425	ND
S-adenosyl-L-homocysteine hydrolase			21	ND
S-adenosylmethionine decarboxylase			5	ND
S-adenosylmethionine synthase			4	ND
S-adenosylmethionine synthetase			15	ND
S-adenosylmethionine-dependent methyltransferase			3	ND
S-layer protein			9	23
S23 ribosomal protein			2	ND
SAM-dependent methyltransferase			6	ND
scaffolding protein D, partial			3	ND
secretin			40	42
Secretion protein HlyD			12	ND
secretion system protein E			10	ND
SEF			6	ND
segregation and condensation protein A			5	ND
Se11 domain protein repeat-containing protein			3	ND
selenium metabolism protein YedF			6	ND
semialdehyde dehydrogenase			5	ND
sensor histidine kinase			3	ND
sensor histidine kinase/response regulator			2	ND
sensor histidine kinase/response regulator, partial			65	10
Sensor protein			1	ND
septum formation inhibitor Maf			2	ND
ser/threonine protein phosphatase			20	ND
serine acetyltransferase			23	ND
serine hydroxymethyltransferase	SHMT (glyA)	C (formaldehyde assimilation via serine pathway)	26	5
serine O-acetyltransferase			2	ND
serine peptidase			13	ND
serine protease			45	ND
serine/threonine protein kinase			21	ND
serine/threonine protein phosphatase			5	ND
serine/threonine protein phosphatase, partial			23	ND
seryl-tRNA synthetase			9	ND
shikimate dehydrogenase			21	ND
shikimate kinase			19	ND
short chain dehydrogenase			14	ND
siderophore-interacting protein			11	ND
sigma E regulatory protein, MucB/RseB			3	ND
Sigma-70-like protein			3	ND
sigma-E factor negative regulatory protein			3	ND
signal peptidase			5	ND

signal recognition particle protein			52	ND
signal transduction histidine kinase			39	ND
signal transduction protein			11	ND
single-strand binding protein			2	ND
single-stranded DNA exonuclease			1	ND
single-stranded DNA-binding protein			72	ND
SirA family protein			38	12
siroheme synthase			4	ND
sirohychlorin ferrochelutase			6	ND
SMC-Sep complex subunit SepB			15	5
SNF2 domain/helicase domain/RING finger domain-containing protein			8	ND
sodium/calcium antiporter			18	ND
sodium/proton antiporter			30	ND
sodium/proton exchanger			26	ND
sodium/solute symporter			163	2
sodium/hydrogen exchanger			6	ND
sodium/sulfate symporter			1	ND
solute-binding protein			16	ND
spermine synthase			2	ND
spore coat protein			4	ND
sporulation protein			32	ND
sporulation regulator WhiA			3	ND
SSU ribosomal protein S21P			5	ND
stationary phase survival protein SurE			8	ND
sterol-binding protein			10	2
stress response protein			16	ND
stringent starvation protein A			2	ND
Sua5/YciO/YrdC/YwlC family protein			3	ND
succinate dehydrogenase			98	ND
succinate dehydrogenase flavoprotein subunit			78	5
succinyl-CoA synthetase subunit alpha	SCS	C (rTCA)	7	ND
succinyl-CoA synthetase subunit beta	SCS	C (rTCA)	6	ND
succinyl-diaminopimelate desuccinylase			3	ND
succinyl-diaminopimelate aminotransferase			5	ND
sugar ABC transporter permease			6	ND
sugar ABC transporter substrate-binding protein			102	49
sugar kinase			14	ND
sugar transferase			11	ND
sugar transporter			18	ND
sulfate ABC transporter ATP-binding protein			43	ND
sulfate ABC transporter substrate-binding protein			4	ND
sulfate adenylyltransferase	SAT	S	157	102
sulfate permease		S	13	ND
sulfate transporter		S	71	ND
sulfide:quinone reductase	SQR	S	2	ND
sulfite dehydrogenase	SOR	S	4	ND
sulfite reductase	SOR	S	1000	1156
sulfite reductase dissimilatory-type beta subunit, partial	rDSR	S	8	22
sulfite reductase subunit alpha	SOR	S	3	ND
sulfite reductase subunit gamma	SOR	S	110	152
sulfonate ABC transporter substrate-binding protein		S	2	ND
sulfoxide reductase catalytic subunit YedY		S	7	ND
sulfur acceptor protein CsdL		S	3	ND
sulfur oxidation c-type cytochrome SoxA	SOX	S	30	ND
sulfur oxidation c-type cytochrome SoxX	SOX	S	12	ND
sulfur oxidation protein DsrM	DSR	S	8	ND
sulfur oxidoreductase	SOR	S	150	36
sulfur relay protein DsrC		S	13	4
sulfur relay protein TusB		S	28	ND
sulfur relay protein TusB/DsrH		S	150	28
sulfur transfer protein TusE		S	520	194
sulfurtransferase		S	293	18
SulP family inorganic anion transporter			4	ND
superfamily I DNA/RNA helicase			2	ND
superoxide dismutase			128	31
TadE family protein			17	ND
tail fiber assembly protein	tail		14	ND
tail length tape measure protein	tail		2	ND
tail protein	tail		2	ND
Tail sheath	tail		2	ND
tartronate semialdehyde reductase			35	4
taurine catabolism dioxygenase TauD			33	ND
teicoplanin resistance protein VanZ			7	ND
tellurite resistance protein-like permease			18	ND
Tellurite resistance TerB			2	ND
TetR family transcriptional regulator			116	ND
tetrahydromethanopterin S-methyltransferase subunit D	MTR	C (CH4)	2	ND
tetrahydromethanopterin S-methyltransferase subunit E	MTR	C (CH4)	9	ND
tetrathionate reductase	TET	S	37	ND
tetrathionate reductase subunit A	TET	S	48	ND
tetrathionate reductase subunit B	TET	S	42	ND
tetratricopeptide domain-containing protein			2	ND
Tfp pilus assembly protein, tip-associated adhesin PilY1			3	ND
thiamine biosynthesis protein ThiC			21	ND
thiamine biosynthesis protein ThiF			17	ND
thiamine biosynthesis protein ThiH			3	ND
thiamine biosynthesis protein ThiS			2	ND
thiamine monophosphate kinase			1	ND
thiamine-phosphate kinase			4	ND
thiazole synthase			15	ND
thioesterase			27	ND
thiol peroxidase			14	ND
thiol:disulfide interchange protein			104	ND
thiol:disulfide interchange protein DsbC			5	ND
thioredoxin	SOX	S	214	32
thioredoxin reductase			34	ND
thiosulfate oxidation carrier complex protein SoxZ	SOX	S	64	6
thiosulfate oxidation carrier protein SoxY	SOX	S	159	ND
thiosulfate reductase	PHS	S	74	ND
thiosulfhydrylase SoxB	SOX	S	3	ND
threonine dehydratase			8	ND
threonine synthase			17	5
threonine-phosphate decarboxylase			23	ND



threonyl-tRNA synthetase			73	ND
thymidylate kinase			3	ND
thymidylate synthase			18	ND
tol-pal system protein YbgF			12	ND
toluene ABC transporter ATP-binding protein			17	ND
TonB-dependent receptor			41	13
toxin			5	ND
toxin RelE			34	ND
toxin YoeB			6	ND
transcription antitermination protein nusG			6	ND
transcription elongation factor GreA			9	ND
transcription elongation factor GreB			2	ND
transcription elongation protein NusA			1	ND
transcription termination factor NusA			75	3
transcription termination factor Rho			52	ND
transcription termination/antitermination factor NusG			78	ND
transcription-repair coupling factor			3	ND
transcriptional initiation protein Tat			4	ND
transcriptional regulator			730	187
transcriptional regulator HU subunit alpha			5	ND
transcriptional regulator NarL		N	5	ND
Transcriptional regulator, Crp/Fnr family protein			5	ND
transcriptional regulator, partial			16	ND
transferase			10	ND
transglycosylase			13	ND
transketolase	TKT	C (Calvin-Benson-Bassham cycle)	98	11
transketolase, partial	TKT	C (Calvin-Benson-Bassham cycle)	2	ND
translation elongation factor 2			8	ND
translation elongation factor P			5	ND
translation factor Sua5			11	ND
translation initiation factor IF-1			51	ND
translation initiation factor IF-2			38	ND
translation initiation factor IF-2, partial			6	ND
translation initiation factor IF-3			125	3
translocation protein TolB			33	ND
transpeptidase			4	ND
transporter			96	ND
transposase	transposase		192	ND
transposase, partial	transposase		22	ND
trehalose 6-phosphate phosphorylase			1	ND
trigger factor			44	47
triosephosphate isomerase	TPI	C (Calvin-Benson-Bassham cycle) and C (EMP Glycolysis)	47	ND
TrmB family transcriptional regulator			3	ND
tRNA (5-methylaminomethyl-2-thiouridylylate)-methyltransferase			17	ND
tRNA (cytidine/uridine-2'-O-)-methyltransferase			1	ND
tRNA (guanine-N(1)-)-methyltransferase			5	ND
tRNA (guanine-N1)-methyltransferase			54	ND
tRNA 2-selenouridine synthase			2	ND
tRNA delta(2)-isopentenylpyrophosphate transferase			5	ND
tRNA methyltransferase			1	ND
tRNA modification GTPase TrmE			2	ND
tRNA pseudouridine synthase A			2	ND
tRNA pseudouridine synthase A, tRNA pseudouridine38-40 synthase			7	ND
tRNA pseudouridine synthase B			14	ND
tRNA-2-methylthio-N(6)-dimethylallyladenosine synthase			2	ND
tRNA-dihydrouridine synthase			4	ND
tRNA-dihydrouridine synthase A			5	ND
tRNA-dihydrouridine synthase B			10	ND
tRNA(Ile)-lysidine synthetase			14	ND
trypsin			3	ND
tryptophan synthase alpha chain			19	ND
tryptophan synthase subunit alpha			28	ND
tryptophan synthase subunit beta			34	ND
tryptophan-tRNA ligase			35	ND
tungsten ABC transporter substrate-binding protein			19	ND
twin-arginine translocation pathway signal protein			190	20
twitching motility protein PilT			147	ND
type 4 pilus biogenesis			20	ND
type I deoxyribonuclease HsdR			12	ND
type I secretion target GGXGDXXXX repeat protein			10	ND
type II and III secretion system protein			3	ND
type II citrate synthase			56	13
type II secretion system protein			6	ND
type II secretion system protein E			25	ND
type II secretion system protein F			66	ND
type III restriction-modification system, res subunit, partial			4	ND
type IV fimbrial biogenesis protein PilY1			6	ND
type IV pilus assembly protein PilX			20	ND
type IV pilus modification protein PilV			5	ND
type VI secretion system effector			4	ND
tyrosine recombinase XerC			4	ND
tyrosine recombinase XerD			5	ND
tyrosyl-tRNA synthetase			20	10
ubiquinol-cytochrome C reductase			10	ND
ubiquinone biosynthesis hydroxylase			20	ND
ubiquinone biosynthesis methyltransferase UbiE			16	ND
ubiquinone biosynthesis protein UbiB			23	ND
ubiquinone biosynthesis protein UbiH			23	ND
ubiquinone/menaquinone biosynthesis C-methyltransferase UbiE			3	ND
ubiquinone/menaquinone biosynthesis methyltransferase			3	ND
UDP diphosphate synthase			7	ND
UDP pyrophosphate phosphatase			8	ND
UDP-3-O-(3-hydroxymyristoyl) glucosamine N-acyltransferase			70	ND
UDP-3-O-(3-hydroxymyristoyl) N-acetylglucosamine deacetylase			102	ND
UDP-diphospho-muramoylpentapeptide beta-N- acetylglucosaminyltransferase			1	ND
UDP-galactose-4-epimerase			4	ND
UDP-glucose 4-epimerase			2	ND
UDP-glucose 6-dehydrogenase			5	ND
UDP-N-acetyl-D-galactosamine dehydrogenase			13	ND
UDP-N-acetylenolpyruvylglucosamine reductase			12	ND
UDP-N-acetylglucosamine 1-carboxyvinyltransferase			9	ND
UDP-N-acetylglucosamine 2-epimerase			4	ND
UDP-N-acetylglucosamine acyltransferase			4	ND

UDP-N-acetylglucosamine pyrophosphorylase			6	ND
UDP-N-acetylglucosamine--N-acetylmuramyl-(pentapeptide) pyrophosphoryl-UDP N-acetylglucosamine transferase			8	ND
UDP-N-acetylmuramate--alanine ligase			4	ND
UDP-N-acetylmuramate-L-alanyl-gamma-D-glutamyl-meso-diaminopimelate ligase			9	ND
UDP-N-acetylmuramoyl-L-alanyl-D-glutamate synthetase			23	ND
UDP-N-acetylmuramoyl-tripeptide--D-alanyl-D-alanine ligase			13	ND
UDP-N-acetylmuramoyl-tripeptide--D-alanyl-D-alanine ligase, partial			1	ND
UDP-N-acetylmuramoylalanyl-D-glutamate--2, 6-diaminopimelate ligase			4	ND
UDP-phosphate glucose phosphotransferase			14	ND
uncharacterized protein BN903_36			522	ND
uncharacterized protein OXB_0016			13	ND
universal stress protein			90	ND
universal stress protein UspA			94	ND
UNKNOWN			111	ND
unnamed protein product			6	ND
unnamed protein product, partial			395	ND
uracil phosphoribosyltransferase			6	ND
urease accessory protein UreJ	URE	N	3	ND
uridylyate kinase			33	ND
uroporphyrinogen decarboxylase			24	5
uroporphyrinogen III methyltransferase			6	ND
UTP--glucose-1-phosphate uridylyltransferase			12	ND
VacJ family lipoprotein			2	ND
valyl-tRNA synthetase			31	5
virulence factor			35	ND
virulence protein E			12	ND
VWA domain-containing protein			239	22
Xaa-Pro aminopeptidase			5	ND
XRE family transcriptional regulator			91	5
xylose ABC transporter substrate-binding protein			2	ND
xylulokinase			4	ND
YeeE/YedE			5	ND
YHS domain protein			1	ND
zinc finger protein			2	ND
zinc metalloproteinase			3	ND
zinc protease			30	ND
zinc transporter ZupT			16	ND
zinc-finger protein			3	ND
Zn-dependent hydrolase			12	ND
Zn-dependent protease			8	ND
blastp detected no putative conserved domains			9	11
None			400	457

**Table S7. Simulation parameters for sulfate reduction and sulfide oxidation reactions.**

	$4\text{H}_2 + \text{SO}_4^{2-} + \text{H}^+$ $\Rightarrow \text{HS}^- + 4\text{H}_2\text{O}$	$\text{HS}^- + 2\text{O}_2$ $\Rightarrow \text{SO}_4^{2-} + \text{H}^+$	$0.5\text{HS}^- + 0.8\text{NO}_3^- + 0.3\text{H}^+$ $\Rightarrow 0.5\text{SO}_4^{2-} + 0.4\text{N}_2 + 0.4\text{H}_2\text{O}$	$2\text{H}_2 + \text{O}_2$ $\Rightarrow 2\text{H}_2\text{O}$	$\text{H}_2 + 0.4\text{H}^+ + 0.4\text{NO}_3^-$ $\Rightarrow 0.2\text{N}_2 + 1.2\text{H}_2\text{O}$
Growth Yield (mg/mol of reactant)	2400 <sup>a</sup>	8000 <sup>b</sup>	9410 <sup>d</sup>	50 <sup>c</sup>	2800 <sup>f</sup>
$V_{\text{max}}$ (mol/mg-s)	$2 \times 10^{-10}$	$3 \times 10^{-11}$	$3 \times 10^{-11}$	$3 \times 10^{-11}$	$3 \times 10^{-11}$
$\Delta_{\text{ATP}}$ (kJ/mole of ATP)	-60	-60	-60	-232 <sup>c</sup>	-265 <sup>g</sup>
$m_{\text{ATP}}$ (mole)	1.3	3 <sup>c</sup>	2 <sup>c</sup>	2 <sup>c</sup>	0.666 <sup>g</sup>
$K_{\text{D}}$ ( $\mu\text{M}$ )	1	7	7	100	3
$K_{\text{A}}$ ( $\mu\text{M}$ )	3	10	3	50	5

Note:

<sup>a</sup> Widdel & Pfenning, 1981 (ref. 98)

<sup>b</sup> Sublette, 1987 (ref. 90)

<sup>c</sup> Kelly, 1999 (ref. 89)

<sup>d</sup> Hoor, 1976 (ref. 91)

<sup>e</sup> Drobner *et al.*, 1992 (ref. 92)

<sup>f</sup> Strohm *et al.*, 2007 (ref. 94)

<sup>g</sup> Smith *et al.*, 1994 (ref. 93)