

Table 2. Predicted proteome of *M. smithii* strain PS and conservation among other strains and in the fecal microbiome of two healthy adults.

		KEY: - Present - Absent - Divergent				
		<i>M. smithii</i> strain genotyping ¹				Human Gut Microbiome ²
Gene	Annotation	PS	F1	ALI	B181	
MSM0001	exoribonuclease VII, large subunit, XseA					
MSM0002	integrase-recombinase protein					
MSM0003	conserved hypothetical membrane protein (putative heme utilization/adhesion related)					
MSM0004	predicted lysine decarboxylase					
MSM0005	conserved hypothetical protein					
MSM0006	conserved hypothetical protein					
MSM0007	SAM-dependent methyltransferase					
MSM0008	putative transposase					
MSM0009	conserved hypothetical protein					
MSM0010	N-acetyltransferase, GNAT family					
MSM0011	hypothetical protein					
MSM0012	conserved hypothetical protein					
MSM0013	hypothetical protein					
MSM0014	putative heat shock related protein					
MSM0015	hypothetical protein					
MSM0016	hypothetical protein					
MSM0017	hypothetical protein					
MSM0018	hypothetical protein					
MSM0019	hypothetical protein					
MSM0020	predicted O-linked GlnNAc transferase					
MSM0021	short chain dehydrogenase (7-alpha-hydroxysteroid dehydrogenase)					
MSM0022	hypothetical protein					
MSM0023	uncharacterized protein predicted to be involved in DNA repair					
MSM0024	hypothetical protein					
MSM0025	long-chain-fatty-acid-CoA ligase					
MSM0026	predicted transcriptional regulator					
MSM0027	glutamate synthase, domain 2 with rubredoxin					
MSM0028	SAM-dependent methyltransferase					
MSM0029	putative calcium-binding protein					
MSM0030	conserved hypothetical membrane protein					
MSM0031	adhesin-like protein					
MSM0032	hypothetical protein					
MSM0033	ketopantoate reductase, ApbA					
MSM0034	conserved hypothetical protein					
MSM0035	hypothetical protein					
MSM0036	hypothetical protein					
MSM0037	hypothetical protein					
MSM0038	hypothetical protein					
MSM0039	hypothetical protein					
MSM0040	conserved hypothetical protein					
MSM0041	hypothetical protein					
MSM0042	hypothetical protein					
MSM0043	peptide methionine sulfoxide reductase, PMSR					
MSM0044	PLP dependent aminotransferase (aspartate)					
MSM0045	nucleotide-binding protein (putative ATPase involved in chromosome partitioning)					
MSM0046	NADH oxidase					
MSM0047	Chloramphenicol O-acetyltransferase					
MSM0048	conserved hypothetical protein					
MSM0049	F420-dependent NADP oxidoreductase, fno					
MSM0050	predicted metal-binding protein					
MSM0051	adhesin-like protein					
MSM0052	adhesin-like protein					
MSM0053	tRNA nucleotidyltransferase (CCA-adding enzyme)					
MSM0054	2'-5' RNA ligase, LigT					
MSM0055	predicted alternative 3-dehydroquinate synthase					
MSM0056	archaeal fructose-1,6-bisphosphate aldolase					
MSM0057	adhesin-like protein					
MSM0058	DNA helicase II					
MSM0059	SAM-dependent methyltransferase					
MSM0060	predicted archaeal kinase (GHMP kinase family)					
MSM0061	predicted ATPase (AAA+ superfamily)					
MSM0062	flavodoxin					
MSM0063	amidohydrolase (PHP family)					
MSM0064	conserved hypothetical protein					
MSM0065	riboflavin-specific deaminase					
MSM0066	N-acetylglucosamine-1-phosphate transferase, GT4 family					
MSM0067	conserved hypothetical protein					

MSM0068	hypothetical protein				
MSM0069	conserved hypothetical protein				
MSM0070	conserved hypothetical protein				
MSM0071	methionyl-tRNA synthetase, MetG				
MSM0072	putative exonuclease SBCC				
MSM0073	DNA primase, large subunit (eukaryotic-type)				
MSM0074	hypothetical protein				
MSM0075	DNA primase, small subunit				
MSM0076	conserved hypothetical protein				
MSM0077	thymidylate kinase				
MSM0078	dolichol kinase (cytidyltransferase family)				
MSM0079	CofH protein (7,8-didemethyl-8-hydroxy-5-deazariboflavin (FO)/F420 biosynthesis)				
MSM0080	sulfoxyruvate decarboxylase, comD				
MSM0081	sulfoxyruvate decarboxylase, ComE				
MSM0082	heterodisulfide reductase, subunit A, HdrA				
MSM0083	heterodisulfide reductase, subunit B, HdrB				
MSM0084	heterodisulfide reductase, subunit C, HdrC				
MSM0085	putative ferredoxin				
MSM0086	(2R)-phospho-3-sulfolactate synthase, ComA				
MSM0087	putative transposase				
MSM0088	conserved hypothetical protein				
MSM0089	pyrroline-5-carboxylate reductase (NADP oxidoreductase, coenzyme F420-dependent), ProC				
MSM0090	conserved hypothetical protein (UPF0058)				
MSM0091	2,3-diphosphoglycerate synthase (putative GTPase)				
MSM0092	putative adhesin-like protein				
MSM0093	conserved hypothetical membrane-spanning protein (phage infection)				
MSM0094	predicted transcription regulator (TetR family)				
MSM0095	predicted phosphotransacetylase				
MSM0096	undecaprenyl pyrophosphate synthase, UppS				
MSM0097	Mq-dependent DNase, TatD				
MSM0098	hypothetical protein				
MSM0099	conserved hypothetical membrane protein				
MSM0100	conserved hypothetical protein				
MSM0101	precorrin-3 methylase, CbiF				
MSM0102	cobalamin-independent methionine synthase, MetE				
MSM0103	conserved hypothetical protein				
MSM0104	conserved hypothetical protein				
MSM0105	conserved hypothetical protein				
MSM0106	conserved hypothetical protein				
MSM0107	hydrogenase expression/formation protein, HypB				
MSM0108	hydrogenase nickel incorporation protein, HypA				
MSM0109	conserved hypothetical membrane-spanning protein				
MSM0110	predicted transposase				
MSM0111	hypothetical protein				
MSM0112	ATP-dependent RNA helicase, eIF-4A family				
MSM0113	DNA helicase				
MSM0114	hypothetical protein				
MSM0115	conserved hypothetical protein				
MSM0116	MobA-related protein				
MSM0117	conserved hypothetical membrane protein				
MSM0118	cell wall biosynthesis protein, MurD-like peptide ligase family				
MSM0119	predicted nuclease				
MSM0120	purine NTPase involved in DNA repair, Rad50				
MSM0121	DNA repair exonuclease (SbcD/Mre11-family), Rad32				
MSM0122	predicted ATPase				
MSM0123	uncharacterized protein conserved in archaea				
MSM0124	predicted phosphate-binding protein (PcrB family)				
MSM0125	ribosomal protein L40e				
MSM0126	conserved hypothetical protein				
MSM0127	hypothetical protein				
MSM0128	conserved hypothetical protein				
MSM0129	nicotinamide mononucleotide adenylyltransferase, NadR				
MSM0130	molybdenum cofactor biosynthesis protein, MoaE				
MSM0131	molybdenum-binding protein, MopI				
MSM0132	conserved hypothetical protein				
MSM0133	predicted thioesterase, FcbC				
MSM0134	M42 glutamyl aminopeptidase/endo-glucanase				
MSM0135	coenzyme F420-reducing hydrogenase, beta subunit				
MSM0136	putative ferredoxin				
MSM0137	putative archaeal flagellar protein D/E				
MSM0138	predicted exonuclease				
MSM0139	hypothetical protein				
MSM0140	conserved hypothetical protein				
MSM0141	dephospho-CoA kinase, CoaE				

MSM0142	predicted ATPase (PP-loop superfamily)				
MSM0143	conserved hypothetical membrane protein				
MSM0144	hypothetical protein (putative ADP-ribosylation domain)				
MSM0145	conserved hypothetical protein				
MSM0146	type IV leader peptidase				
MSM0147	CTP synthase (UTP-ammonia lyase), PyrG				
MSM0148	predicted oxidoreductase, aldo/keto reductase family				
MSM0149	predicted acetyltransferase				
MSM0150	hypothetical protein				
MSM0151	hypothetical protein				
MSM0152	Na ⁺ -driven multidrug efflux pump (MATE family), NorM				
MSM0153	predicted phosphoglycerate mutase				
MSM0154	homoserine dehydrogenase, ThrA				
MSM0155	predicted allosteric regulator of homoserine dehydrogenase				
MSM0156	Asp-tRNA(Asn)/Glu-tRNA(Gln) amidotransferase, C subunit				
MSM0157	predicted type I restriction-modification enzyme, subunit S				
MSM0158	type I restriction-modification system methylase, subunit S				
MSM0159	adhesin-like protein				
MSM0160	asparagine synthetase, AsnB				
MSM0161	hypothetical protein				
MSM0162	hypothetical protein				
MSM0163	conserved hypothetical protein predicted to be involved in DNA repair				
MSM0164	conserved hypothetical protein predicted to be involved in DNA repair				
MSM0165	predicted exonuclease				
MSM0166	predicted helicase				
MSM0167	conserved hypothetical protein predicted to be involved in DNA repair (RAMP superfamily)				
MSM0168	conserved hypothetical protein predicted to be involved in DNA repair				
MSM0169	predicted CRISPR-associated protein				
MSM0170	conserved hypothetical protein predicted to be involved in DNA repair (RAMP superfamily)				
MSM0171	conserved hypothetical membrane protein (invasin/intimin cell-adhesion domain)				
MSM0172	hypothetical protein				
MSM0173	adhesin-like protein				
MSM0174	O-acetylhomoserine sulfhydrylase (PLP-dependent), MET17				
MSM0175	homoserine O-acetyltransferase, MetX				
MSM0176	ribonuclease III (dsRNA-specific), Rnc				
MSM0177	hypothetical protein				
MSM0178	conserved hypothetical protein				
MSM0179	hypothetical protein				
MSM0180	hypothetical protein				
MSM0181	ribosomal protein L37e				
MSM0182	snRNP Sm-like protein				
MSM0183	RNA-binding protein, PUA domain family				
MSM0184	creatinine amidohydrolase				
MSM0185	conserved hypothetical membrane protein				
MSM0186	conserved hypothetical protein				
MSM0187	rubredoxin				
MSM0188	rubredoxin				
MSM0189	acetyl/acyl transferase related protein				
MSM0190	predicted ATPase				
MSM0191	conserved hypothetical protein				
MSM0192	argininosuccinate lyase, ArgH				
MSM0193	ribosomal protein S27ae				
MSM0194	ribosomal protein S24ae				
MSM0195	uncharacterized protein conserved in archaea				
MSM0196	archaeal DNA-dependent RNA polymerase, subunit E, RpoE				
MSM0197	archaeal DNA-dependent RNA polymerase, subunit E, RpoE				
MSM0198	inorganic pyrophosphatase				
MSM0199	conserved hypothetical protein (Pit N-term./Vapc superfamily)				
MSM0200	translation initiation factor aIF-2, gamma subunit				
MSM0201	ribosomal protein S6e				
MSM0202	translation initiation factor aIF-2, InfB				
MSM0203	nucleoside diphosphate kinase, Ndk				
MSM0204	ribosomal protein L24e				
MSM0205	ribosomal protein S28e				
MSM0206	ribosomal protein L7ae				
MSM0207	predicted DNA-binding protein				
MSM0208	predicted DNA-binding protein				
MSM0209	ferredoxin				
MSM0210	hypothetical protein				
MSM0211	hypothetical protein				
MSM0212	conserved hypothetical protein				
MSM0213	archaeal histone, HMTA				
MSM0214	threonine synthase (pyridoxal-phosphate dependent), ThrC				

MSM0215	conserved hypothetical integral membrane protein				
MSM0216	tryptophanyl-tRNA synthetase, TrpS				
MSM0217	tRNA intron endonuclease, EndA				
MSM0218	iron dependent transcriptional regulator (Fe2+-binding)				
MSM0219	putative cysteine protease (transglutaminase-like superfamily)				
MSM0220	chaperonin (TCP-1/cpn60 family), alpha subunit				
MSM0221	adhesin-like protein				
MSM0222	flavoprotein (Metallo-beta-lactamase superfamily), FpaA				
MSM0223	conserved hypothetical protein				
MSM0224	conserved hypothetical protein				
MSM0225	conserved hypothetical protein				
MSM0226	hypothetical protein				
MSM0227	hydroxymethylglutaryl-CoA (HMG-CoA) reductase, HmgA				
MSM0228	succinyl-CoA synthetase, alpha subunit, SucD				
MSM0229	conserved hypothetical protein				
MSM0230	putative transposase		ND		
MSM0231	3-dehydroquinate dehydratase				
MSM0232	signal peptidase I				
MSM0233	nitrogen regulatory protein P-II, GlnK				
MSM0234	ammonium transporter				
MSM0235	hypothetical protein				
MSM0236	phosphohydrolase (HD superfamily)				
MSM0237	3-polyprenyl-4-hydroxybenzoate decarboxylase, UbiX				
MSM0238	precorrin-6B methylase, CbiT				
MSM0239	conserved hypothetical protein				
MSM0240	molybdopterin-guanine dinucleotide biosynthesis protein A, MobA				
MSM0241	ribonuclease PH-related protein				
MSM0242	ribonuclease PH, Rph				
MSM0243	RNA-binding protein Rrp4				
MSM0244	predicted exosome subunit				
MSM0245	proteasome, alpha subunit, PsmA				
MSM0246	ribonuclease P, subunit Rpp14				
MSM0247	ribonuclease P, subunit p30				
MSM0248	hypothetical protein				
MSM0249	conserved hypothetical protein				
MSM0250	conserved hypothetical membrane protein (putative zinc-finger domain, Znf265)				
MSM0251	hypothetical protein				
MSM0252	Na+-driven multidrug efflux pump, NorM				
MSM0253	conserved hypothetical protein				
MSM0254	hypothetical protein				
MSM0255	putative transcription regulator (winged helix DNA-binding domain)				
MSM0256	putative transposase				
MSM0257	conserved hypothetical membrane protein				
MSM0258	hypothetical protein (putative zinc-finger domain, Znf265)				
MSM0259	hypothetical protein (putative zinc beta-ribbon superfamily)				
MSM0260	archaea-specific RecJ-like exonuclease				
MSM0261	conserved hypothetical protein				
MSM0262	desulfoferrodoxin (dfx)				
MSM0263	nitrogen fixation protein, NifU				
MSM0264	cysteine desulfurase, NifS				
MSM0265	O-acetylhomoserine sulfhydrylase				
MSM0266	adhesin-like protein				
MSM0267	NAD(P)H-dependent FMN reductase (multimeric flavodoxin)				
MSM0268	cysteinyl-tRNA synthetase, CysS				
MSM0269	predicted transcriptional regulator (lambda repressor-like)				
MSM0270	serine acetyltransferase, CysE				
MSM0271	cysteine synthase, CysK				
MSM0272	endonuclease III				
MSM0273	EPSP synthase (3-phosphoshikimate 1-carboxyvinyltransferase)				
MSM0274	SAM-dependent methyltransferase (cyclopropane fatty acid synthase-related)				
MSM0275	valyl-tRNA synthetase, ValS				
MSM0276	conserved hypothetical protein				
MSM0277	phenylalanyl-tRNA synthetase, beta subunit, PheT				
MSM0278	hypothetical protein				
MSM0279	conserved hypothetical protein (UPF0047 family)				
MSM0280	predicted archaeal ATPase (AAA+ superfamily)				
MSM0281	putative adhesin-like protein				
MSM0282	adhesin-like protein				
MSM0283	hypothetical protein				
MSM0284	ribose 5-phosphate isomerase, RpiA				
MSM0285	conserved hypothetical protein (UPF0179 family)				
MSM0286	glycerol 1-phosphate dehydrogenase (Dehydroquinate synthase-like family)				
MSM0287	prolyl-tRNA synthetase, ProS				

MSM0288	conserved hypothetical protein (DUF121 daomain)				
MSM0289	phosphomethylpyrimidine kinase (HMPP-kinase), ThiD				
MSM0290	nitrate/sulfonate/bicarbonate ABC transporter, ATPase component, TauB				
MSM0291	nitrate/sulfonate/bicarbonate ABC transporter, permease component, TauC				
MSM0292	predicted metal-dependent membrane protease				
MSM0293	cation transport ATPase, HAD family				
MSM0294	conserved hypothetical protein				
MSM0295	formate dehydrogenase accessory protein, FdhD				
MSM0296	putative carboxymuconolactone decarboxylase				
MSM0297	predicted exosome subunit				
MSM0298	ribosomal protein L15e				
MSM0299	conserved hypothetical protein				
MSM0300	peptide/nickel ABC transporter, solute-binding component				
MSM0301	peptide/nickel ABC transporter, permease component, DppB				
MSM0302	peptide/nickel ABC transporter, permease component, DppC				
MSM0303	peptide/nickel ABC transporter, ATP-binding component, DppD				
MSM0304	peptide/nickel ABC transporter, ATP-binding component, DppF				
MSM0305	conserved hypothetical membrane protein (IMP dehydrogenase related)				
MSM0306	polyferredoxin, iron-sulfur binding				
MSM0307	sugar kinase (ribokinase/pfkB superfamily)				
MSM0308	formylmethanofuran:tetrahydromethanopterin formyltransferase, FtrC				
MSM0309	conserved hypothetical membrane protein				
MSM0310	polyferredoxin, iron-sulfur binding				
MSM0311	polyferredoxin, iron-sulfur binding				
MSM0312	[NiFe]-hydrogenase-3-type complex, large subunit/NADH:quinone oxidoreductase (complex I), subunit 49K/NdhH/NuoD				
MSM0313	[NiFe]-hydrogenase-3-type complex, small subunit/NADH:quinone oxidoreductase (complex I), subunit PSST/NdhK/NuoB				
MSM0314	conserved hypothetical protein				
MSM0315	predicted [NiFe]-hydrogenase-3-type complex Eha, membrane protein EhaL				
MSM0316	hypothetical protein				
MSM0317	NADH dehydrogenase (ubiquinone), subunit 1				
MSM0318	conserved hypothetical membrane protein				
MSM0319	NADH dehydrogenase I, subunit N related				
MSM0320	predicted [NiFe]-hydrogenase-3-type complex Eha, membrane protein EhaG				
MSM0321	conserved hypothetical membrane protein				
MSM0322	predicted [NiFe]-hydrogenase-3-type complex Eha, membrane protein EhaE				
MSM0323	conserved hypothetical membrane protein				
MSM0324	conserved hypothetical membrane protein				
MSM0325	conserved hypothetical membrane protein				
MSM0326	conserved hypothetical membrane protein				
MSM0327	UDP-glucose 4-epimerase (NAD dependent)				
MSM0328	conserved hypothetical protein				
MSM0329	DNA binding protein (regulator), xenobiotic response element family				
MSM0330	acetyl-CoA synthetase, AMP-forming-related, Acs				
MSM0331	2-oxoisovalerate ferredoxin oxidoreductase, delta subunit				
MSM0332	2-oxoisovalerate ferredoxin oxidoreductase, alpha subunit				
MSM0333	2-oxoisovalerate ferredoxin oxidoreductase, beta subunit				
MSM0334	L-asparaginase, GatD,				
MSM0335	archaeal glutamyl-tRNA(Gln) amidotransferase, subunit E, GatE				
MSM0336	hypothetical protein				
MSM0337	putative adhesin-like protein				
MSM0338	hypothetical protein				
MSM0339	hypothetical protein				
MSM0340	thioredoxin reductase (NADPH), TrxB				
MSM0341	hypothetical protein				
MSM0342	putative transposase			ND	
MSM0343	GMP synthase (glutamine-hydrolysing), subunit A, GuaA				
MSM0344	hypothetical protein				
MSM0345	GMP synthase (glutamine-hydrolysing), PP-ATPase domain/subunit, GuaA				
MSM0346	conserved hypothetical protein				
MSM0347	putative pyridoxal phosphate-dependent enzyme				
MSM0348	conserved hypothetical protein				
MSM0349	hypothetical protein				
MSM0350	2-isopropylmalate synthase, LeuA				
MSM0351	conserved hypothetical protein				
MSM0352	predicted DNA modification methylase				
MSM0353	conserved hypothetical protein				

MSM0354	ATP-dependent 26S proteasome regulatory subunit, RPT1				
MSM0355	predicted transcription factor (eukaryotic MBF1 related)				
MSM0356	conserved hypothetical protein				
MSM0357	conserved hypothetical membrane protein (possible Zinc-binding)				
MSM0358	conserved hypothetical membrane protein				
MSM0359	cell wall biosynthesis protein, MurD-like peptide ligase family				
MSM0360	cell wall biosynthesis protein, phospho-N-acetylmuramoyl-pentapeptide transferase family				
MSM0361	carbamoyl-phosphate synthase, large subunit, CarB				
MSM0362	coenzyme F420-reducing hydrogenase (Ni,Fe-hydrogenase maturation protease), delta subunit				
MSM0363	predicted RNA methylase				
MSM0364	transcriptional regulator (nickel-responsive), NikR				
MSM0365	conserved hypothetical protein				
MSM0366	hypothetical protein				
MSM0367	conserved hypothetical protein				
MSM0368	glutamate synthase (NADPH), subunit 2				
MSM0369	glutamate synthase, subunit 3				
MSM0370	glutamate synthase, subunit 1				
MSM0371	predicted glutamine amidotransferase involved in pyridoxine biosynthesis, Pdx2				
MSM0372	phycobiliprotein (PBS) lyase (HEAT repeat)				
MSM0373	isocitrate/isopropylmalate dehydrogenase, LeuB				
MSM0374	long-chain fatty-acid-CoA ligase (AMP-forming), CaiC				
MSM0375	acetylglutamate kinase, ArgB				
MSM0376	alcohol dehydrogenase (zinc-binding), GroES-like				
MSM0377	4-diphosphocytidyl-2-methyl-D-erythritol synthase, IspD				
MSM0378	SAM-dependent methyltransferase				
MSM0379	glutamate N-acetyltransferase, ArgJ				
MSM0380	hypothetical protein				
MSM0381	conserved hypothetical protein				
MSM0382	conserved hypothetical protein (PIN domain-like)				
MSM0383	predicted phosphohydrolase, calcineurin-like superfamily				
MSM0384	transcription factor, NACalpha-BTF3 related				
MSM0385	anaerobic magnesium-protoporphyrin IX monomethyl ester cyclase, Elongator protein 3/MiaB/NifB family				
MSM0386	sodium/proline symporter (proline permease), PutP				
MSM0387	coenzyme F390 synthetase, PaaK				
MSM0388	amino acid regulator				
MSM0389	hypothetical protein				
MSM0390	hypothetical protein				
MSM0391	indolepyruvate ferredoxin oxidoreductase, beta subunit				
MSM0392	indolepyruvate ferredoxin oxidoreductase, alpha subunit				
MSM0393	fumarate reductase, iron-sulfur protein				
MSM0394	rRNA methylase, SpoU family				
MSM0395	ferredoxin, iron-sulfur binding				
MSM0396	putative transposase				
MSM0397	xanthine/uracil permease, UraA				
MSM0398	uracil phosphoribosyltransferase, Upp				
MSM0399	hypothetical protein				
MSM0400	hypothetical protein				
MSM0401	predicted surface protease				
MSM0402	dCTP deaminase, dUTPase family				
MSM0403	glycyl-tRNA synthetase				
MSM0404	predicted transcriptional regulator				
MSM0405	predicted metal-dependent DNase, TatD-related family				
MSM0406	conserved hypothetical protein				
MSM0407	P-loop containing nucleoside triphosphate hydrolase (NAD(P)-binding)				
MSM0408	2-phosphoglycerate kinase/small-molecule binding protein				
MSM0409	C4-type Zinc-finger protein				
MSM0410	conserved hypothetical protein, histone-fold superfamily				
MSM0411	adhesin-like protein				
MSM0412	putative adhesin-like protein				
MSM0413	transcriptional regulator, MarR family				
MSM0414	Na ⁺ -driven multidrug efflux pump, NorM				
MSM0415	uridylyl transferase, PyrH				
MSM0416	Mg-dependent DNase, TatD-related				
MSM0417	predicted transmembrane protein with a zinc ribbon				
MSM0418	conserved hypothetical protein				
MSM0419	conserved hypothetical protein				
MSM0420	predicted permease				
MSM0421	hypothetical protein				
MSM0422	conserved hypothetical membrane protein				
MSM0423	glycosyltransferase (modular protein with two domains distantly related to glycosyltransferases), GT2/GT1 families [CAZy]				

MSM0424	transcription initiation factor TFIIIB (zinc-binding)				
MSM0425	predicted RNA-binding protein involved in rRNA processing				
MSM0426	demethylmenaquinone methyltransferase				
MSM0427	DNA primase (bacterial type), DnaG				
MSM0428	integrase-recombinase protein, phage integrase family				
MSM0429	biotin biosynthesis protein, BioY				
MSM0430	conserved hypothetical protein, predicted metal-binding				
MSM0431	predicted ATP-dependent carboxylase, biotin carboxylase-related				
MSM0432	conserved hypothetical protein				
MSM0433	archaeal/vacuolar-type H ⁺ -transporting ATP synthase, subunit D				
MSM0434	archaeal/vacuolar-type H ⁺ -transporting ATP synthase, subunit B				
MSM0435	archaeal/vacuolar-type H ⁺ -transporting ATP synthase, subunit A				
MSM0436	archaeal/vacuolar-type H ⁺ -transporting ATP synthase, subunit F				
MSM0437	archaeal/vacuolar-type H ⁺ -transporting ATP synthase, subunit C				
MSM0438	archaeal/vacuolar-type H ⁺ -transporting ATP synthase, subunit E				
MSM0439	archaeal/vacuolar-type H ⁺ -transporting ATP synthase, subunit K				
MSM0440	archaeal/vacuolar-type H ⁺ -transporting ATP synthase, subunit I				
MSM0441	archaeal/vacuolar-type H ⁺ -transporting ATP synthase, subunit H				
MSM0442	hypothetical protein				
MSM0443	hypothetical protein				
MSM0444	hypothetical protein				
MSM0445	NADH dehydrogenase/NAD(P)H nitroreductase				
MSM0446	citrate synthase, GltA				
MSM0447	fumarate hydratase, alpha subunit				
MSM0448	conserved hypothetical protein				
MSM0449	2-methylcitrate dehydratase, MmgE/PrpD family				
MSM0450	conserved hypothetical membrane protein				
MSM0451	conserved hypothetical membrane protein				
MSM0452	predicted DNA-binding protein				
MSM0453	predicted transcriptional regulator				
MSM0454	hypothetical protein				
MSM0455	conserved hypothetical protein				
MSM0456	conserved hypothetical protein				
MSM0457	D-3-phosphoglycerate dehydrogenase, SerA				
MSM0458	transposase, homeodomain-like superfamily		ND		
MSM0459	hypothetical protein				
MSM0460	predicted transposase				
MSM0461	adhesin-like protein				
MSM0462	predicted metal-dependent protease, PAD1/JAB1 superfamily				
MSM0463	predicted tRNA(His) guanylyltransferase				
MSM0464	homoserine/aspartate dehydrogenase (NAD binding), glyceraldehyde-3-phosphate dehydrogenase-like superfamily				
MSM0465	conserved hypothetical protein				
MSM0466	predicted tRNA-binding protein				
MSM0467	NADP-dependent glyceraldehyde-3-phosphate dehydrogenase				
MSM0468	conserved hypothetical membrane protein				
MSM0469	conserved hypothetical membrane protein				
MSM0470	conserved hypothetical membrane protein				
MSM0471	type II secretion system protein F, GspF				
MSM0472	Xaa-Pro aminopeptidase				
MSM0473	hypothetical protein				
MSM0474	hypothetical protein				
MSM0475	hypothetical protein				
MSM0476	hypothetical protein				
MSM0477	hypothetical protein				
MSM0478	hypothetical protein				
MSM0479	Zn-dependent protease, peptidase M50 family				
MSM0480	YcaO-like protein				
MSM0481	TfuA-like protein				
MSM0482	ATP-utilizing enzymes, PP-loop superfamily				
MSM0483	conserved hypothetical protein				
MSM0484	inosine-5'-monophosphate dehydrogenase related protein				
MSM0485	universal stress protein, UspA				
MSM0486	N-ethylammelane chlorohydrolase, metallo-dependent amidohydrolase family				
MSM0487	hypothetical protein				
MSM0488	carbamoylphosphate synthase, large subunit, CarB				
MSM0489	carbamoylphosphate synthase, small subunit, CarA				
MSM0490	SAM-dependent methyltransferase, UbiE/CobQ family				
MSM0491	nicotinate-nucleotide pyrophosphorylase (carboxylating), NadC				
MSM0492	ribonuclease Z (zinc-dependent), beta-lactamase superfamily, ElaC				
MSM0493	mechanosensitive ion channel protein, Sm-like ribonucleoprotein superfamily, MscS				
MSM0494	quinolinate synthetase, subunit A, NadA				
MSM0495	conserved hypothetical protein				
MSM0496	homoserine O-acetyltransferase				

MSM0497	predicted nuclease, RecB family				
MSM0498	hypothetical protein				
MSM0499	conserved hypothetical protein				
MSM0500	N-carbamoyl-D-amino acid amidohydrolase				
MSM0501	phycocyanin alpha phycocyanobilin lyase, CpcE				
MSM0502	ATP-dependent helicase, Lhr-like				
MSM0503	flavodoxin, FldA				
MSM0504	conserved hypothetical protein				
MSM0505	hypothetical protein				
MSM0506	ATP-utilizing enzyme, ATP-grasp superfamily				
MSM0507	predicted phosphoesterase, YfcE				
MSM0508	cell division protein J (23S rRNA methylase), FtsJ				
MSM0509	conserved hypothetical protein				
MSM0510	predicted ATPase involved in DNA replication control, MCM2/3/5 family				
MSM0511	translation initiation factor 2, beta subunit (aIF-2beta)				
MSM0512	NMD3-related protein (nonsense mediated mRNA decay)				
MSM0513	tyrosyl-tRNA synthetase, TyrS				
MSM0514	conserved hypothetical protein				
MSM0515	methanol:cobalamin methyltransferase, MtaB				
MSM0516	corrinoid protein (methionine synthase-related), MtaC				
MSM0517	methyltransferase activation protein, MapA				
MSM0518	methylcobalamin:coenzyme M methyltransferase, MtaA				
MSM0519	conserved hypothetical protein				
MSM0520	thymidylate kinase, Tmk				
MSM0521	conserved hypothetical membrane protein				
MSM0522	collagenase, peptidase family U32				
MSM0523	collagenase, peptidase family U32				
MSM0524	DNA mismatch repair ATPase, MutS				
MSM0525	predicted unusual protein kinase, ubiquinone biosynthesis protein-related, AarF				
MSM0526	conserved hypothetical protein				
MSM0527	IS element ISM1 (ICSNY family)				
MSM0528	IS element ISM1 (ICSNY family)				
MSM0529	hypothetical protein				
MSM0530	predicted O-linked GlcNAc transferase				
MSM0531	adenine/cytosine DNA methyltransferase				
MSM0532	IS element ISM1 (ICSNY family)				
MSM0533	IS element ISM1 (ICSNY family)				
MSM0534	IS element ISM1 (ICSNY family)				
MSM0535	hypothetical protein				
MSM0536	hypothetical protein				
MSM0537	TPR-repeat protein				
MSM0538	pyruvate formate-lyase activating enzyme, PflA				
MSM0539	putative DNA-directed DNA polymerase				
MSM0540	predicted transcriptional regulator				
MSM0541	hypothetical protein				
MSM0542	coenzyme F420-dependent N5,N10-methylene tetrahydromethanopterin reductase, Mer				
MSM0543	DNA repair photolyase, SplB				
MSM0544	predicted Fe-S oxidoreductase				
MSM0545	conserved hypothetical protein				
MSM0546	conserved hypothetical protein				
MSM0547	predicted nucleotidyltransferase, cytidyltransferase-related				
MSM0548	6-phosphogluconate dehydrogenase, beta-hydroxyacid dehydrogenase related, MmsB				
MSM0549	cytochrome C-type biogenesis protein, DsbD				
MSM0550	protein disulfide-isomerase, thioredoxin-related				
MSM0551	conserved hypothetical protein				
MSM0552	sulfur transfer protein involved in thiamine biosynthesis				
MSM0553	ATPase, PP-loop superfamily				
MSM0554	protein containing von Willebrand factor type A (vWA) domain, CoxE				
MSM0555	MoxR-like ATPase				
MSM0556	dihydropteroate synthase				
MSM0557	pyruvate:ferredoxin oxidoreductase, gamma subunit, PorG				
MSM0558	pyruvate:ferredoxin oxidoreductase, delta subunit, PorD				
MSM0559	pyruvate:ferredoxin oxidoreductase, alpha subunit, PorA				
MSM0560	pyruvate:ferredoxin oxidoreductase, beta subunit, PorB				
MSM0561	formate dehydrogenase, iron-sulfur subunit				
MSM0562	formate dehydrogenase, iron-sulfur subunit				
MSM0563	fumarate hydratase, alpha subunit				
MSM0564	phosphate uptake regulator, PhoU				
MSM0565	phosphate ABC transporter, ATPase component, PstB				
MSM0566	phosphate ABC transporter, permease component, PstA				
MSM0567	phosphate ABC transporter, permease component, PstC				
MSM0568	phosphate ABC transporter, phosphate-binding component, PstS				

MSM0569	phosphate transport system regulator related protein, PhoU				
MSM0570	conserved hypothetical protein				
MSM0571	conserved hypothetical protein				
MSM0572	H2-forming N5,N10-methylenetetrahydromethanopterin dehydrogenase (coenzyme F420-dependent), Mth				
MSM0573	biotin synthetase, BioB				
MSM0574	conserved hypothetical protein				
MSM0575	conserved hypothetical protein				
MSM0576	NIF3-related protein (NGG1p interacting factor 3)				
MSM0577	predicted dinucleotide-utilizing enzyme, ThiF/HesA family				
MSM0578	conserved hypothetical protein				
MSM0579	polyferredoxin, iron-sulfur binding				
MSM0580	putative adhesin-like protein				
MSM0581	conserved hypothetical membrane protein				
MSM0582	peptide methionine sulfoxide reductase, PMSR				
MSM0583	cobalt ABC transporter, permease component, CbiM				
MSM0584	cobalt ABC transporter, permease component				
MSM0585	cobalt ABC transporter, permease component, CbiQ				
MSM0586	cobalt ABC transporter, ATPase component, CbiO				
MSM0587	conserved hypothetical protein				
MSM0588	ferrous iron transport protein A, FeoA				
MSM0589	ferrous iron transport protein B, FeoB				
MSM0590	hypothetical protein				
MSM0591	hypothetical protein				
MSM0592	conserved hypothetical protein				
MSM0593	multidrug ABC transporter, ATPase component, CcmA				
MSM0594	multidrug ABC transporter, permease component				
MSM0595	multidrug ABC transporter, permease component				
MSM0596	bacterial type II secretion system protein, GspF				
MSM0597	bacterial type II/IV secretion system protein kinase, GspE				
MSM0598	SAM-dependent methyltransferase				
MSM0599	conserved hypothetical membrane protein				
MSM0600	transcriptional regulator, MarR family				
MSM0601	putative transposase			ND	
MSM0602	translation elongation factor EF-1, beta subunit				
MSM0603	predicted Zn-ribbon RNA-binding protein involved in translation				
MSM0604	predicted archaeal aspartate/glutamate/uridylate kinase				
MSM0605	peptidyl-tRNA hydrolase, PTH2 family				
MSM0606	hypothetical protein				
MSM0607	predicted ATPase, RNase L inhibitor family				
MSM0608	putative metal-binding protein				
MSM0609	ferredoxin, iron-sulfur binding				
MSM0610	aspartate aminotransferase				
MSM0611	DNA repair protein, RadB				
MSM0612	putative translation factor, Sua5/YciO/YrdC/YwC family				
MSM0613	phosphatidylglycerophosphate synthase, PgsA				
MSM0614	conserved hypothetical protein				
MSM0615	archaeal fructose 1,6-bisphosphatase				
MSM0616	adhesin-like protein				
MSM0617	thiamine biosynthesis ATP pyrophosphatase, ThiI				
MSM0618	pH regulator (monovalent cation:H+ antiporter)				
MSM0619	alanyl-tRNA synthetase, AlaS				
MSM0620	ribosomal protein L12p				
MSM0621	ribosomal protein L10p				
MSM0622	ribosomal protein L1p				
MSM0623	ribosomal protein L11				
MSM0624	transcription antiterminator, NusG				
MSM0625	protein translocation complex sec61, gamma subunit				
MSM0626	cell division protein, FtsZ				
MSM0627	tetrahydromethanopterin S-methyltransferase, subunit H, MtrH				
MSM0628	conserved hypothetical protein				
MSM0629	putative transposase			ND	
MSM0630	conserved hypothetical protein				
MSM0631	transcription initiation factor IIE, alpha subunit				
MSM0632	predicted hydrolase, HD superfamily				
MSM0633	archaeosine tRNA-ribosyltransferase				
MSM0634	predicted metal-sulfur cluster biosynthetic enzyme				
MSM0635	predicted regulator of amino acid metabolism				
MSM0636	hydrogenase expression/formation protein, HypC				
MSM0637	dihydrolipoamide dehydrogenase				
MSM0638	pfam match to MurG; not predicted to be a carbohydrate active enzyme by CAZy				
MSM0639	putative cell wall biosynthesis protein				
MSM0640	cell division protein (RNA-binding), PelA				
MSM0641	prephenate dehydrogenase (NADP+)				
MSM0642	cell division control protein Cdc48, AAA+ ATPase family				

MSM0643	conserved hypothetical protein				
MSM0644	thiamine biosynthesis protein, ThiC				
MSM0645	ATP-dependent DNA ligase, Cdc9				
MSM0646	conserved hypothetical protein				
MSM0647	predicted RNA-binding protein, contains TRAM domain				
MSM0648	phosphomannomutase, ManB				
MSM0649	conserved hypothetical protein				
MSM0650	transcriptional regulator, TetR/AcrR family				
MSM0651	best blast hit to MTH_1585; not predicted to be a carbohydrate active enzyme by CAZy				
MSM0652	pyruvate formate-lyase activating enzyme, PflA				
MSM0653	histidinol-phosphate aminotransferase, HisC				
MSM0654	carbonic anhydrase, Cab				
MSM0655	glucose-1-phosphate thymidyltransferase				
MSM0656	phosphomannomutase, ManB				
MSM0657	phosphoglycerate mutase, AP superfamily				
MSM0658	hypothetical protein				
MSM0659	conserved hypothetical membrane protein				
MSM0660	LemA protein				
MSM0661	small subunit ribosomal protein S3Ae				
MSM0662	putative flagellar protein, Flil				
MSM0663	dinitrogenase iron-molybdenum cofactor biosynthesis protein, NifX_NifB family				
MSM0664	multimeric flavodoxin, NADPH-dependent FMN reductase family				
MSM0665	5'-methylthioadenosine phosphorylase				
MSM0666	conserved hypothetical protein				
MSM0667	conserved hypothetical protein				
MSM0668	conserved hypothetical protein				
MSM0669	hypothetical protein				
MSM0670	conserved hypothetical protein				
MSM0671	cell division control protein Cdc6-related, AAA+ ATPase superfamily				
MSM0672	thiamine pyrophosphokinase				
MSM0673	conserved hypothetical membrane protein				
MSM0674	hypothetical protein				
MSM0675	hypothetical protein				
MSM0676	conserved hypothetical membrane protein				
MSM0677	archaeal aspartate aminotransferase				
MSM0678	conserved hypothetical membrane protein				
MSM0679	conserved hypothetical membrane protein				
MSM0680	predicted ATPase, AAA+ superfamily				
MSM0681	conserved hypothetical protein				
MSM0682	hypothetical protein				
MSM0683	conserved hypothetical protein				
MSM0684	conserved hypothetical protein				
MSM0685	hypothetical protein				
MSM0686	acetolactate synthase (TPP-requiring), large subunit, IlvB				
MSM0687	deoxycytidine-triphosphate deaminase, Dcd				
MSM0688	4-oxalocrotonate tautomerase				
MSM0689	hypothetical protein				
MSM0690	helicase				
MSM0691	mutator mutT protein (NUDIX domain)				
MSM0692	conserved hypothetical protein				
MSM0693	ATPase involved in DNA repair, SbcC				
MSM0694	hypothetical protein				
MSM0695	DNA repair helicase				
MSM0696	Fe-S oxidoreductase				
MSM0697	hypothetical protein				
MSM0698	hypothetical protein				
MSM0699	Na ⁺ -dependent transporter, SNF family				
MSM0700	putative poly-gamma-glutamate synthesis protein, PgsA				
MSM0701	signal recognition particle GTPase SRP54				
MSM0702	predicted prefoldin, alpha subunit				
MSM0703	ribosomal protein LX				
MSM0704	translation initiation factor 6 (aIF-6)				
MSM0705	ribosomal protein L31a				
MSM0706	ribosomal protein L39a				
MSM0707	predicted subunit of tRNA methyltransferase				
MSM0708	dsDNA-binding protein				
MSM0709	ribosomal protein S16a				
MSM0710	RNA-binding protein, CRS1/YhbY family				
MSM0711	ribonuclease P, subunit RPR2				
MSM0712	conserved hypothetical protein (DUF1696 domain)				
MSM0713	predicted nucleotide kinase				
MSM0714	predicted GTPase				
MSM0715	predicted GTPase				
MSM0716	oligosaccharyl transferase, STT3 subunit				

MSM0717	DNA topoisomerase I, TopA				
MSM0718	conserved hypothetical protein				
MSM0719	phosphoserine phosphatase, HAD family, SerB				
MSM0720	transcription initiation factor TFIID TATA binding protein				
MSM0721	adenylate cyclase, class 2				
MSM0722	2-isopropylmalate synthase, LeuA				
MSM0723	3-isopropylmalate dehydratase, LeuC				
MSM0724	4-hydroxybenzoate synthetase (chorismate lyase)				
MSM0725	DNA repair flap structure-specific 5'-3' endonuclease				
MSM0726	conserved hypothetical protein				
MSM0727	S-adenosylhomocysteine hydrolase (adenosylhomocysteinase), AhcY				
MSM0728	predicted oxidoreductase, aldo/keto reductase family				
MSM0729	molybdopterin biosynthesis protein, MoeB				
MSM0730	putative transposase				
MSM0731	putative DNA helicase II, UvrD				
MSM0732	tRNA pseudouridine synthase B, TruB				
MSM0733	ribosomal protein L14e				
MSM0734	cytidylate kinase, Cmk				
MSM0735	ribosomal protein L34e				
MSM0736	conserved hypothetical membrane protein				
MSM0737	archaeal adenylate kinase, AdkA				
MSM0738	preprotein translocase, SecY subunit, SecY				
MSM0739	ribosomal protein L15p				
MSM0740	ribosomal protein L30p				
MSM0741	ribosomal protein S5p, RpsE				
MSM0742	ribosomal protein L18p, RplR				
MSM0743	ribosomal protein L19e				
MSM0744	ribosomal protein L32e				
MSM0745	ribosomal protein L6p, RplF				
MSM0746	ribosomal protein S8p				
MSM0747	ribosomal protein S14p				
MSM0748	ribosomal protein L5p				
MSM0749	ribosomal protein S4e				
MSM0750	ribosomal protein L24p				
MSM0751	ribosomal protein L14p				
MSM0752	ribosomal protein S17p				
MSM0753	ribonuclease P, subunit P29				
MSM0754	translation initiation factor SUI1				
MSM0755	ribosomal protein L29p				
MSM0756	ribosomal protein S3p				
MSM0757	ribosomal protein L22p				
MSM0758	ribosomal protein S19p				
MSM0759	ribosomal protein L2p				
MSM0760	ribosomal protein L23p				
MSM0761	ribosomal protein L1e				
MSM0762	ribosomal protein L3p				
MSM0763	conserved hypothetical protein				
MSM0764	ribosomal L11 RNA methyltransferase (SAM-dependent)				
MSM0765	pyruvate carboxylase (acetyl-CoA/biotin carboxylase), subunit A, PycA				
MSM0766	biotin-[acetyl-CoA-carboxylase] ligase/biotin operon regulator bifunctional protein, BirA				
MSM0767	selenocysteine synthase, SelA				
MSM0768	conserved hypothetical protein				
MSM0769	fumarate hydratase, class I				
MSM0770	cobalt ABC transporter, ATPase component, CbiO				
MSM0771	cobalt ABC transporter, permease component, CbiQ				
MSM0772	predicted permease, major facilitator superfamily				
MSM0773	multidrug ABC transporter, ATPase component				
MSM0774	multidrug ABC transporter, ATPase component				
MSM0775	transcriptional regulator, AraC family				
MSM0776	conserved hypothetical membrane protein				
MSM0777	conserved hypothetical protein				
MSM0778	predicted RNA-binding protein, eukaryotic snRNP-like				
MSM0779	predicted Zn-dependent hydrolase, metallo-beta-lactamase superfamily				
MSM0780	conserved hypothetical protein				
MSM0781	conserved hypothetical protein				
MSM0782	hypothetical protein				
MSM0783	tungsten formylmethanofuran dehydrogenase, subunit F, FwdF				
MSM0784	ferredoxin				
MSM0785	predicted phosphopantetheine adenylyltransferase (PPAT)				
MSM0786	transglutaminase-like protein, putative cysteine protease				
MSM0787	Fe-S oxidoreductase				
MSM0788	aspartate aminotransferase				

MSM0789	cation efflux system protein (zinc/cadmium/cobalt)				
MSM0790	CBS-domain-containing protein				
MSM0791	2-phosphoglycerate kinase				
MSM0792	predicted calcineurin-like phosphoesterase				
MSM0793	conserved hypothetical protein				
MSM0794	conserved hypothetical protein				
MSM0795	heterodisulfide reductase, subunit B, HdrB				
MSM0796	heterodisulfide reductase, subunit C, HdrC				
MSM0797	archaeosine tRNA-ribosyltransferase				
MSM0798	hypothetical protein				
MSM0799	conserved hypothetical protein				
MSM0800	hypothetical protein				
MSM0801	diphthine synthase, DphB				
MSM0802	methyltransferase				
MSM0803	predicted metal-dependent membrane protease, CAAX amino terminal protease family				
MSM0804	translation initiation factor aIF-2B, alpha subunit				
MSM0805	polar amino acid ABC transporter, ATPase component				
MSM0806	polar amino acid ABC transporter, permease component				
MSM0807	polar amino acid ABC transporter, substrate-binding component				
MSM0808	nitrogenase iron-molybdenum cofactor biosynthesis protein, NifB				
MSM0809	conserved hypothetical protein				
MSM0810	activator of (R)-2-hydroxyglutaryl-CoA dehydratase				
MSM0811	conserved hypothetical protein				
MSM0812	conserved hypothetical protein				
MSM0813	predicted peptidyl-prolyl cis-trans isomerase				
MSM0814	phosphoribosylformylglycinamide synthase-related protein (selenophosphate synthetase)				
MSM0815	conserved hypothetical protein				
MSM0816	predicted nucleic acid-binding protein, PIN domain-like family				
MSM0817	predicted transcriptional regulator				
MSM0818	predicted transcriptional regulator				
MSM0819	putative transcription regulator, ArsR family				
MSM0820	molybdenum cofactor biosynthesis protein, MoaB				
MSM0821	orotate phosphoribosyltransferase, PyrE				
MSM0822	photosynthetic reaction centre cytoplasmic domain-containing protein				
MSM0823	phosphoenolpyruvate synthase/pyruvate phosphate dikinase, PpsA				
MSM0824	putative N-acetyltransferase, GNAT family				
MSM0825	adenosylcobinamide amidohydrolase, CbiZ				
MSM0826	chaperonin, Cpn60/TCP-1/thermosome family, GroL				
MSM0827	predicted metal-dependent hydrolase, cyclase family				
MSM0828	best blast hit to Msp_0220; not predicted to be a carbohydrate active enzyme by CAZy				
MSM0829	aspartate-semialdehyde dehydrogenase, Asd				
MSM0830	dihydrodipicolinate reductase, DapB				
MSM0831	dihydrodipicolinate synthase, DapA				
MSM0832	aspartokinase, alpha subunit				
MSM0833	ribosomal protein S17a				
MSM0834	chorismate mutase				
MSM0835	archaeal shikimate kinase				
MSM0836	related to alpha-glycosyltransferases, GT4 family				
MSM0837	cobalamin biosynthesis protein D, CbiD				
MSM0838	putative thioredoxin/glutaredoxin				
MSM0839	ATP-dependent helicase				
MSM0840	conserved hypothetical protein				
MSM0841	photosynthetic reaction centre cytoplasmic domain containing protein				
MSM0842	histone acetyltransferase, radical SAM superfamily				
MSM0843	2-deoxyribose-5-phosphate aldolase (DERA), DeoC				
MSM0844	archaeal histone, HmtA				
MSM0845	2-methylthioadenine synthetase, MiaB				
MSM0846	uncharacterized archaeal Zn-finger protein				
MSM0847	archaeal 3-isopropylmalate dehydratase, small subunit, LeuD				
MSM0848	ribofuranosylaminobenzene 5'-phosphate synthase, RfaS				
MSM0849	molybdenum cofactor biosynthesis-related protein, MoaA				
MSM0850	predicted CDP-diglyceride synthetase				
MSM0851	predicted transcriptional regulator				
MSM0852	predicted ATP-utilizing enzyme				
MSM0853	UDP-N-acetylglucosamine 2-epimerase, WecB				
MSM0854	hypothetical protein				
MSM0855	archaeal tRNA pseudouridine synthase A, TruA				
MSM0856	antimicrobial peptide ABC transporter, permease component				
MSM0857	antimicrobial peptide ABC transporter, ATPase component				
MSM0858	phosphoribosylformimino-5-aminoimidazole carboxamide ribotide (ProFAR) isomerase, HisA				

MSM0859	glycerol-3-phosphate cytidyltransferase				
MSM0860	aspartate-semialdehyde dehydrogenase, ArgC				
MSM0861	flavodoxin				
MSM0862	aspartate carbamoyltransferase regulatory chain, Pylr				
MSM0863	pyridoxamine-phosphate oxidase (FMN-binding)				
MSM0864	predicted transcriptional regulator				
MSM0865	putative glucose-methanol-choline oxidoreductase (FAD-dependent)				
MSM0866	Zn metalloprotease, TldD				
MSM0867	AMMECR1-related protein				
MSM0868	hypothetical protein				
MSM0869	GTPase, GTP1/OBG family				
MSM0870	molecular chaperone (small heat shock protein), HSP20/alpha crystallin family				
MSM0871	putative transposase			ND	
MSM0872	glucosamine:fructose-6-phosphate aminotransferase (isomerizing), AgaS				
MSM0873	conserved hypothetical protein				
MSM0874	adenine deaminase, AdeC				
MSM0875	lysine-oxoglutarate reductase/Saccharopine dehydrogenase (LOR/SDH) bifunctional enzyme				
MSM0876	arginase/agmatinase/formimionoglutamate hydrolase, SpeB				
MSM0877	translation initiation factor 5A (aIF-5A)				
MSM0878	pyruvoyl-dependent arginine decarboxylase, PdaD				
MSM0879	Poly(P)/ATP NAD kinase, inositol monophosphatase family, PpnK				
MSM0880	UDP-N-acetylmuramyl tripeptide synthetase (Mur ligase)				
MSM0881	porphobilinogen deaminase				
MSM0882	3-chlorobenzoate-3,4-dioxygenase dyhydrogenase				
MSM0883	orotate phosphoribosyltransferase				
MSM0884	adhesin-like protein				
MSM0885	adhesin-like protein				
MSM0886	hypothetical protein				
MSM0887	universal stress protein, adenine nucleotide alpha hydrolase-like family				
MSM0888	glutamate dehydrogenase (NADP+), GdhA				
MSM0889	hypothetical protein				
MSM0890	hypothetical protein				
MSM0891	peptide chain release factor eRF, subunit 1				
MSM0892	putative zinc-binding protein				
MSM0893	acetyltransferase				
MSM0894	conserved hypothetical protein				
MSM0895	cation transport ATPase, HAD family				
MSM0896	precorrin-6X reductase, CbiJ				
MSM0897	ribosomal protein S10p				
MSM0898	translation elongation factor 1-alpha (EF-Tu)				
MSM0899	translation elongation factor EF-2, FusA				
MSM0900	ribosomal protein S7p				
MSM0901	ribosomal protein S12p				
MSM0902	methyl-coenzyme M reductase, alpha subunit, McrA				
MSM0903	methyl-coenzyme M reductase, gamma subunit, McrG				
MSM0904	methyl-coenzyme M reductase, D subunit, McrD				
MSM0905	methyl-coenzyme M reductase, beta subunit, McrB				
MSM0906	transcription termination factor, NusA				
MSM0907	ribosomal protein L17Ae				
MSM0908	DNA-dependent RNA polymerase, subunit A, RpoA				
MSM0909	DNA-dependent RNA polymerase, subunit A', RpoA				
MSM0910	DNA-dependent RNA polymerase, subunit B', RpoB				
MSM0911	DNA-dependent RNA polymerase, subunit B, RpoB				
MSM0912	DNA-dependent RNA polymerase, subunit H, RpoH				
MSM0913	hypothetical protein				
MSM0914	predicted O-linked GlcNAc transferase				
MSM0915	hypothetical protein				
MSM0916	hydroxyethylthiazole kinase, ThiM				
MSM0917	thiamine monophosphate synthase, ThiE				
MSM0918	3-phosphoglycerate kinase, Pqk				
MSM0919	triosephosphate isomerase, TpiA				
MSM0920	conserved hypothetical protein				
MSM0921	predicted surface protein				
MSM0922	Fe-S oxidoreductase				
MSM0923	multimeric flavodoxin				
MSM0924	succinyl-CoA synthetase, beta subunit, SucC				
MSM0925	2-oxoglutarate ferredoxin oxidoreductase, gamma subunit, KorC				
MSM0926	2-oxoglutarate ferredoxin oxidoreductase, beta subunit, KorB				
MSM0927	2-oxoglutarate ferredoxin oxidoreductase, alpha subunit, KorA				
MSM0928	2-oxoglutarate ferredoxin oxidoreductase, delta subunit, KorD				
MSM0929	fumarate hydratase, FumA				
MSM0930	peptidyl-prolyl cis-trans isomerase, FKBP-type				

MSM0931	conserved hypothetical protein				
MSM0932	conserved hypothetical protein				
MSM0933	cobalamin-5-phosphate synthase, CobS				
MSM0934	predicted phosphatidylglycerophosphatase A-related protein				
MSM0935	conserved hypothetical protein				
MSM0936	transcription regulator-related ATPase, ExsB				
MSM0937	HD superfamily hydrolase				
MSM0938	hypothetical protein				
MSM0939	pyruvate carboxylase, subunit B, PycB				
MSM0940	myo-inositol-1-phosphate synthase				
MSM0941	prenyltransferase, UbiA				
MSM0942	conserved hypothetical membrane protein				
MSM0943	conserved hypothetical protein				
MSM0944	CMP-N-acetylneuraminic acid synthetase, NeuA				
MSM0945	hydrogenase expression/formation protein, HypD				
MSM0946	archaeal sucrose-phosphate phosphatase (SPP-like), HAD family				
MSM0947	predicted zinc metalloprotease, modulator of DNA gyrase				
MSM0948	hypothetical protein				
MSM0949	transcriptional activator				
MSM0950	molybdopterin biosynthesis protein, MoeA				
MSM0951	translation initiation factor aIF-1A				
MSM0952	serine/threonine protein kinase, RIO1 family				
MSM0953	conserved hypothetical membrane protein				
MSM0954	predicted RNA-binding protein				
MSM0955	type II DNA topoisomerase VI, subunit B				
MSM0956	type II DNA topoisomerase VI, subunit A				
MSM0957	adhesin-like protein				
MSM0958	predicted 1,4-beta-cellobiosidase				
MSM0959	conserved hypothetical protein				
MSM0960	cation transport ATPase, HAD family				
MSM0961	heavy-metal cation transporting ATPase				
MSM0962	glyceraldehyde 3-phosphate dehydrogenase, GapA				
MSM0963	endonuclease IV, xylose isomerase-like TIM barrel family, Nfo				
MSM0964	calcineurin-like phosphoesterase				
MSM0965	3-hydroxyacyl-CoA dehydrogenase, FadB				
MSM0966	predicted 26S protease regulatory subunit (ATP-dependent), AAA+ family ATPase				
MSM0967	glutamyl-tRNA reductase, HemaA				
MSM0968	bifunctional precorrin-2 oxidase/chelatase (siroheme synthase), CysG				
MSM0969	predicted metal-binding transcription factor				
MSM0970	conserved hypothetical protein				
MSM0971	methyl-coenzyme M reductase, component A2				
MSM0972	tRNA-dihydrouridine synthase				
MSM0973	GTP cyclohydrolase III, GGDN family				
MSM0974	LPPG:FO 2-phospho-L-lactate transferase, CofD				
MSM0975	F420-0:gamma-glutamyl ligase, CofE				
MSM0976	archaeal IMP cyclohydrolase, PurO				
MSM0977	putative biopolymer transport protein, ExbD/TolR family				
MSM0978	biopolymer transport protein, MotA/TolQ/ExbB proton channel family				
MSM0979	ribonuclease HII, RnhB				
MSM0980	rod shape-determining protein, MreB/Mrl family				
MSM0981	conserved hypothetical protein				
MSM0982	phosphatidylserine synthase, PssA				
MSM0983	conserved hypothetical protein				
MSM0984	sortase (surface protein transpeptidase), SrtA				
MSM0985	conserved hypothetical protein				
MSM0986	conjugated bile acid hydrolase (CBAH)				
MSM0987	tyrosine decarboxylase, MfnA				
MSM0988	phosphoenolpyruvate synthase, PpsA				
MSM0989	ribosomal protein L10e				
MSM0990	nitrate/sulfonate/bicarbonate ABC transporter, ATPase component				
MSM0991	nitrate/sulfonate/bicarbonate ABC transporter, substrate-binding component				
MSM0992	conserved hypothetical protein				
MSM0993	putative ATPase, glucocorticoid receptor-like (DNA-binding domain) family				
MSM0994	predicted nucleotidyltransferase				
MSM0995	adhesin-like protein				
MSM0996	adhesin-like protein				
MSM0997	dihydroorotase, PyrC				
MSM0998	polyferredoxin, MvhB				
MSM0999	methyl viologen-reducing hydrogenase, alpha subunit, MvhA				
MSM1000	methyl viologen-reducing hydrogenase, gamma subunit, MvhG				
MSM1001	methyl viologen-reducing hydrogenase, delta subunit, MvhD				

MSM1002	ABC transporter involved in Fe-S cluster assembly, permease component				
MSM1003	ABC transporter involved in Fe-S cluster assembly, ATPase component				
MSM1004	photosynthetic reaction centre cytoplasmic domain containing protein				
MSM1005	GTP:adenosylcobinamide-phosphate guanylyltransferase				
MSM1006	conserved hypothetical protein				
MSM1007	N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit H, MtrH				
MSM1008	N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit G, MtrG				
MSM1009	N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit F, MtrF				
MSM1010	N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit A, MtrA				
MSM1011	N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit B, MtrB				
MSM1012	N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit C, MtrC				
MSM1013	N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit D, MtrD				
MSM1014	N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit E, MtrE				
MSM1015	methyl-coenzyme M reductase, alpha subunit, McrA				
MSM1016	methyl-coenzyme M reductase, gamma subunit, McrG				
MSM1017	methyl-coenzyme M reductase, C subunit, McrC				
MSM1018	methyl-coenzyme M reductase, D subunit, McrD				
MSM1019	methyl-coenzyme M reductase, beta subunit, McrB				
MSM1020	Fe-S oxidoreductase, Radical SAM family				
MSM1021	uncharacterized protein related to methyl coenzyme M reductase subunit C (McrC)				
MSM1022	conserved hypothetical protein				
MSM1023	2-phosphosulpholactate phosphatase, ComB, (coenzyme M biosynthesis)				
MSM1024	pheromone shutdown protein, TraB family				
MSM1025	conserved hypothetical protein				
MSM1026	hemolysin-related protein, transporter-associated family, TlyC				
MSM1027	Ca ²⁺ /Na ⁺ antiporter (K ⁺ -dependent)				
MSM1028	predicted ATPase, PP-loop family				
MSM1029	conserved hypothetical protein				
MSM1030	predicted pyridoxal phosphate-dependent enzyme				
MSM1031	N ² ,N ² -dimethylguanosine tRNA methyltransferase, Trm1				
MSM1032	transcriptional regulator, Lrp family				
MSM1033	conserved hypothetical protein				
MSM1034	conserved hypothetical protein				
MSM1035	FO synthase subunit 1 (SAM-dependent), CofG (F420 biosynthesis)				
MSM1036	predicted methyltransferase				
MSM1037	proteasome, beta subunit				
MSM1038	predicted metal-dependent RNase				
MSM1039	phosphoribosylformylglycinamide cyclo-ligase (AIRS), PurM				
MSM1040	malate/L-lactate dehydrogenase				
MSM1041	DNA-dependent DNA polymerase I, PolB1				
MSM1042	predicted permease				
MSM1043	dihydroorotate dehydrogenase electron transfer subunit, PyrK				
MSM1044	dihydroorotate dehydrogenase, PyrD				
MSM1045	possible glycosyltransferase				
MSM1046	pre-mRNA splicing ribonucleoprotein PRP31				
MSM1047	fibrillar-like pre-rRNA processing protein, FlpA				
MSM1048	phosphopantothenoylcysteine synthetase/decarboxylase				
MSM1049	phosphopantothenoylcysteine synthetase/decarboxylase				
MSM1050	conserved hypothetical protein				
MSM1051	putative endoglucanase				
MSM1052	prephenate dehydratase, PheA				
MSM1053	IMP dehydrogenase related protein				
MSM1054	IMP dehydrogenase related protein				
MSM1055	coenzyme PQQ synthesis protein, SAM family				
MSM1056	6-pyruvoyl-tetrahydropterin synthase				
MSM1057	conserved hypothetical protein				
MSM1058	conserved hypothetical protein				
MSM1059	predicted RecB family exonuclease				
MSM1060	energy-converting hydrogenase B, subunit Q, EhbQ				
MSM1061	energy-converting hydrogenase B, subunit P, EhbP				
MSM1062	energy-converting hydrogenase B, subunit O, EhbO				
MSM1063	energy-converting hydrogenase B, subunit N, EhbN				
MSM1064	energy-converting hydrogenase B, subunit M, EhbM				

MSM1065	energy-converting hydrogenase B, subunit L, EhbL				
MSM1066	energy-converting hydrogenase B, subunit K, EhbK				
MSM1067	energy-converting hydrogenase B, subunit J, EhbJ				
MSM1068	energy-converting hydrogenase B, subunit I, EhbI				
MSM1069	energy-converting hydrogenase B, subunit H, EhbH				
MSM1070	energy-converting hydrogenase B, subunit G, EhbG				
MSM1071	energy-converting hydrogenase B, subunit F, EhbF				
MSM1072	energy-converting hydrogenase B, subunit E, EhbE				
MSM1073	energy-converting hydrogenase B, subunit D, EhbD				
MSM1074	energy-converting hydrogenase B, subunit C, EhbC				
MSM1075	energy-converting hydrogenase B, subunit B, EhbB				
MSM1076	energy-converting hydrogenase B, subunit A, EhbA				
MSM1077	putative permease (transport)				
MSM1078	predicted bile acid/sodium symporter				
MSM1079	predicted membrane-bound metal-dependent hydrolase, NCS2 family				
MSM1080	predicted deacylase				
MSM1081	transcriptional regulator (enhancer-binding protein), DNA2/NAM7 helicase family				
MSM1082	hypothetical protein				
MSM1083	conserved hypothetical membrane protein				
MSM1084	argininosuccinate synthase, ArgG				
MSM1085	aquaporin, MIP superfamily, AqpM				
MSM1086	conserved hypothetical protein				
MSM1087	NAD-dependent protein deacetylase, SIR2 family				
MSM1088	hypothetical protein				
MSM1089	hypothetical protein				
MSM1090	sugar fermentation stimulation protein, SfsA				
MSM1091	sugar kinase, YjeF-related protein family				
MSM1092	formylmethanofuran:tetrahydromethanopterin formyltransferase, Ftr				
MSM1093	putative transposase			ND	
MSM1094	conserved hypothetical integral membrane protein				
MSM1095	Trk-type potassium transport system, membrane component, TrkH				
MSM1096	Trk-type potassium transport system, NAD-binding component, TrkA				
MSM1097	Zn-dependent hydrolase				
MSM1098	archaeal holliday junction resolvase				
MSM1099	biotin synthase related protein				
MSM1100	conserved hypothetical protein				
MSM1101	Asp-tRNA(Asn)/Glu-tRNA(Gln) amidotransferase, B subunit, GatB				
MSM1102	IMP dehydrogenase related protein				
MSM1103	phosphoribosyl-ATP pyrophosphohydrolase, HisE				
MSM1104	acetyltransferase, GNAT family				
MSM1105	NCAIR mutase related protein, PurE				
MSM1106	hydrogenase maturation factor, HypF				
MSM1107	predicted transcriptional regulator				
MSM1108	molecular chaperone GrpE				
MSM1109	molecular chaperone DnaK				
MSM1110	molecular chaperone DnaJ				
MSM1111	adhesin-like protein				
MSM1112	adhesin-like protein				
MSM1113	adhesin-like protein				
MSM1114	adhesin-like protein				
MSM1115	putative transposase			ND	
MSM1116	adhesin-like protein				
MSM1117	cobalamin biosynthesis protein N, CobN				
MSM1118	conserved hypothetical protein				
MSM1119	conserved hypothetical protein				
MSM1120	methionine aminopeptidase, Map				
MSM1121	coenzyme F420-reducing hydrogenase, beta subunit, FrhB				
MSM1122	coenzyme F420-reducing hydrogenase, gamma subunit, FrhG				
MSM1123	coenzyme F420-reducing hydrogenase, delta subunit, FrhD				
MSM1124	coenzyme F420-reducing hydrogenase, alpha subunit, FrhA				
MSM1125	predicted endoglucanase (CobN-related)				
MSM1126	predicted transcriptional regulator, ArsR family				
MSM1127	cation transport ATPase, HAD family				
MSM1128	hypothetical protein				
MSM1129	conserved hypothetical protein				
MSM1130	conserved hypothetical protein				
MSM1131	conserved hypothetical protein				
MSM1132	ribosome biogenesis protein Nop10				
MSM1133	translation initiation factor aIF-2, alpha subunit				
MSM1134	ribosomal protein S27e				
MSM1135	ribosomal protein L44e				
MSM1136	conserved hypothetical protein				
MSM1137	DNA polymerase sliding clamp subunit, PCNA family, Pcn				
MSM1138	predicted glutamine amidotransferase, CobB/CobQ-like family				

MSM1139	cell wall biosynthesis protein, MurD-like peptide ligase family				
MSM1140	hypothetical protein				
MSM1141	tryptophan synthase, alpha subunit, TrpA				
MSM1142	tryptophan synthase, beta subunit, TrpB				
MSM1143	indole-3-glycerol phosphate synthase, TrpC				
MSM1144	anthranilate phosphoribosyltransferase, TrpD				
MSM1145	anthranilate/para-aminobenzoate synthase component II, TrpG				
MSM1146	anthranilate/para-aminobenzoate synthase component I, TrpE				
MSM1147	hypothetical protein				
MSM1148	predicted metal-dependent membrane protease				
MSM1149	conserved hypothetical membrane protein				
MSM1150	predicted transcriptional regulator				
MSM1151	adenylosuccinate lyase, PurB				
MSM1152	conserved hypothetical membrane protein				
MSM1153	cation transport ATPase, HAD family				
MSM1154	metal-dependent amidohydrolase				
MSM1155	conserved hypothetical protein				
MSM1156	tRNA pseudouridine synthase D, TruD				
MSM1157	hypothetical protein				
MSM1158	hydrogenase expression/formation protein, HypE				
MSM1159	glutamine amidotransferase, HisH				
MSM1160	nitrogenase molybdenum-iron protein, NifD				
MSM1161	hypothetical protein				
MSM1162	conserved hypothetical protein				
MSM1163	hypothetical protein				
MSM1164	predicted GTPase, HSR1-related family				
MSM1165	predicted phosphohydrolase (metal-dependent)				
MSM1166	conserved hypothetical membrane protein				
MSM1167	cobalt precorrin-6Y C5,15-methyltransferase, CbiE				
MSM1168	putative adhesin-like protein				
MSM1169	hypothetical protein				
MSM1170	arsenite-transporting ATPase				
MSM1171	ammonia-dependent NAD ⁺ synthetase, NadE				
MSM1172	leucyl-tRNA synthetase, LeuS				
MSM1173	tRNA(1-methyladenosine) methyltransferase				
MSM1174	heat shock protein HtpX (Zn-dependent)				
MSM1175	conserved hypothetical membrane protein				
MSM1176	replication factor C, small subunit, RfcS				
MSM1177	replication factor C, large subunit, RfcL				
MSM1178	putative ATPase implicated in cell cycle control				
MSM1179	shikimate 5-dehydrogenase, AroE				
MSM1180	predicted metal-dependent membrane protease				
MSM1181	histidyl-tRNA synthetase, HisS				
MSM1182	phosphoribosyl-AMP cyclohydrolase, HisI				
MSM1183	ATPase, PilT family				
MSM1184	sugar phosphate isomerase/epimerase, AP endonuclease family 2				
MSM1185	methylated-DNA-[protein]-cysteine S-methyltransferase				
MSM1186	potassium transport system, membrane component, KefB				
MSM1187	ERCC4-like helicase				
MSM1188	adhesin-like protein				
MSM1189	putative transposase				
MSM1190	cell wall biosynthesis protein, UDP-N-acetylmuramate-alanine ligase family		ND		
MSM1191	cell wall biosynthesis protein, MurD-like peptide ligase family				
MSM1192	conserved hypothetical protein				
MSM1193	single-stranded DNA-specific exonuclease, DHH family				
MSM1194	ribosomal protein S15p				
MSM1195	xanthosine triphosphate pyrophosphatase, Ham1 family				
MSM1196	predicted archaeal ATPase, AAA+ superfamily				
MSM1197	predicted ATPase, AAA+ superfamily				
MSM1198	O-sialoglycoprotein endopeptidase				
MSM1199	conserved hypothetical protein				
MSM1200	phosphoribosyltransferase, CobT				
MSM1201	undecaprenyl-diphosphatase, UppP				
MSM1202	branched-chain-amino-acid aminotransferase, IlvE				
MSM1203	Zn-dependent protease, peptidase M48 family				
MSM1204	coenzyme F420-dependent methylenetetrahydromethanopterin dehydrogenase, Mtd				
MSM1205	conserved hypothetical membrane protein				
MSM1206	imidazoleglycerol-phosphate dehydrogenase, HisB				
MSM1207	molybdate transport system regulatory protein				
MSM1208	teichoic acid transporter				
MSM1209	multimeric flavodoxin				
MSM1210	efflux pump antibiotic resistance protein, MFS permease family				
MSM1211	putative phosphoserine phosphatase				
MSM1212	conserved hypothetical protein				

MSM1213	3-hexulose 6-phosphate synthase/formaldehyde activating enzyme				
MSM1214	threonyl-tRNA synthetase, ThrS				
MSM1215	cobyrinic acid a,c-diamide synthase, CbiA				
MSM1216	conserved hypothetical membrane protein				
MSM1217	type II restriction endonuclease				
MSM1218	predicted acid phosphatase (survival protein), SurE				
MSM1219	hypothetical protein				
MSM1220	small nucleolar ribonucleoprotein, Sm-like family				
MSM1221	actin-like ATPase				
MSM1222	ketol-acid reductoisomerase, IlvC				
MSM1223	carbonic anhydrase				
MSM1224	acetolactate synthase, small subunit (regulatory), IlvH				
MSM1225	acetolactate synthase, large subunit (TPP-requiring), IlvB				
MSM1226	ornithine carbamoyltransferase, ArgF				
MSM1227	phosphoribosylamine-glycine ligase, PurD				
MSM1228	Na ⁺ -driven multidrug efflux pump				
MSM1229	Na ⁺ -driven multidrug efflux pump				
MSM1230	transcriptional regulator, MarR family				
MSM1231	arginyl-tRNA synthetase, ArgS				
MSM1232	signal peptidase I				
MSM1233	glutamate-1-semialdehyde 2,1-aminomutase, HemL				
MSM1234	cobalt-precorrin-8X methylmutase, CbiC				
MSM1235	predicted flavoprotein				
MSM1236	aspartyl-tRNA synthetase, AspS				
MSM1237	dihydroxy-acid dehydratase, IlvD				
MSM1238	histidinol dehydrogenase, HisD				
MSM1239	predicted DNA-binding protein				
MSM1240	predicted AAA ATPase				
MSM1241	chromosome partitioning ATPase				
MSM1242	tryptophan synthase, beta subunit, TrpB				
MSM1243	putative actin-like ATPase				
MSM1244	predicted metal-dependent phosphoesterases, PHP family				
MSM1245	archaeal DNA-binding protein, AlbA				
MSM1246	isopropylmalate synthase, LeuA				
MSM1247	serine/threonine protein kinase related protein (PQQ-binding)				
MSM1248	multidrug ABC transporter, permease component				
MSM1249	multidrug ABC transporter, ATPase component				
MSM1250	predicted transcriptional regulator, PadR-like family				
MSM1251	predicted sugar phosphate isomerase/epimerase, AP endonuclease family 2				
MSM1252	cation transporting P-type ATPase, HAD family				
MSM1253	glutamyl-tRNA (Gln) amidotransferase subunit A, GatA				
MSM1254	cobyrinic acid synthase				
MSM1255	hypothetical protein				
MSM1256	3,4-dihydroxy-2-butanone 4-phosphate synthase, RibB				
MSM1257	predicted transcriptional regulator of riboflavin/FAD biosynthetic operon				
MSM1258	fumarate reductase/succinate dehydrogenase flavoprotein, Sdh				
MSM1259	predicted metal-dependent hydrolase, TRZ/ATZ family				
MSM1260	archaeal histone				
MSM1261	ATP phosphoribosyltransferase, HisG				
MSM1262	flavodoxin (protoporphyrinogen oxidase)				
MSM1263	aspartate carbamoyltransferase, PyrB				
MSM1264	cell division control protein 6, Cdc6				
MSM1265	conserved hypothetical protein				
MSM1266	cobalamin biosynthesis protein D, CobD				
MSM1267	cobalamin biosynthesis protein G, CbiG				
MSM1268	conserved hypothetical protein				
MSM1269	putative Met repressor-like protein				
MSM1270	fucose-1-phosphate aldolase, class II aldolase/adducin family				
MSM1271	archaeal DNA polymerase II, small subunit				
MSM1272	conserved hypothetical protein				
MSM1273	cobalt precorrin-3B C17-methyltransferase, CbiH				
MSM1274	predicted potassium ion transport protein				
MSM1275	mgtE-like divalent cation transporter				
MSM1276	conserved hypothetical protein				
MSM1277	conserved hypothetical membrane protein				
MSM1278	predicted archaeal ATPase, AAA+ superfamily				
MSM1279	predicted nucleic-acid-binding protein containing a Zn-ribbon				
MSM1280	sirohdrochlorin cobaltochelataase, CbiX				
MSM1281	sirohdrochlorin cobaltochelataase-related protein				
MSM1282	putative adhesin-like protein				
MSM1283	thiamine monphosphate kinase, ThiL				
MSM1284	pyruvate formate-lyase activating enzyme, PflA				
MSM1285	conserved hypothetical protein				
MSM1286	3-octaprenyl-4-hydroxybenzoate carboxy-lyase, UbiD				

MSM1287	phosphoribosylaminoimidazole carboxylase (NCAIR mutase), PurE				
MSM1288	conserved hypothetical membrane protein				
MSM1289	GtrA-like surface polysaccharide biosynthesis protein, GtrA				
MSM1290	glycosyltransferase (related to beta-glycosidases), GT2 family [CAZy]				
MSM1291	conserved hypothetical membrane protein				
MSM1292	transcriptional accessory protein, S1 RNA binding family, Tex				
MSM1293	nitroreductase, NADH oxidase/flavin reductase family				
MSM1294	glycosyltransferase, GT2 family				
MSM1295	predicted DNA-binding protein				
MSM1296	riboflavin synthase, beta subunit, RibH				
MSM1297	glycosyltransferase, GT2 family				
MSM1298	3-isopropylmalate dehydrogenase, LeuB				
MSM1299	3-isopropylmalate dehydratase, small subunit, LeuD				
MSM1300	3-isopropylmalate dehydratase, large subunit, LeuC				
MSM1301	predicted Fe-S oxidoreductase				
MSM1302	conserved hypothetical protein				
MSM1303	UDP-N-acetyl-D-mannosaminuronate dehydrogenase				
MSM1304	dTDP-4-dehydrorhamnose reductase, RfbD				
MSM1305	adhesin-like protein				
MSM1306	adhesin-like protein				
MSM1307	dTDP-glucose pyrophosphorylase, RfbA				
MSM1308	dTDP-4-dehydrorhamnose 3,5-epimerase				
MSM1309	dTDP-D-glucose 4,6-dehydratase, RfbB				
MSM1310	glycosyltransferase, GT2 family				
MSM1311	glycosyltransferase, GT2 family				
MSM1312	glycosyltransferase, GT2 family				
MSM1313	distantly related to glycosyltransferases, GT4 family				
MSM1314	hypothetical protein				
MSM1315	predicted transcriptional regulator				
MSM1316	glycosyltransferase, GT2 family				
MSM1317	distantly related to glycosyltransferases, GT4 family				
MSM1318	conserved hypothetical protein				
MSM1319	conserved hypothetical protein				
MSM1320	possible glycosyltransferase				
MSM1321	predicted glycosyltransferase, GT2 family				
MSM1322	distantly related to alpha-glycosyltransferases, GT4 family				
MSM1323	glycosyltransferase, GT2 family				
MSM1324	glycosyltransferase, GT2 family				
MSM1325	predicted polysaccharide/polyol phosphate ABC transporter, permease component				
MSM1326	polysaccharide/polyol phosphate ABC transporter, ATPase component				
MSM1327	predicted CDP-glycerol:poly(glycerophosphate) glycerophosphotransferase				
MSM1328	glycosyltransferase, GT2 family				
MSM1329	predicted glycosyltransferase, GT2 family				
MSM1330	predicted glycosyltransferase, GT2 family				
MSM1331	bacterial suqar transferase, WcaJ				
MSM1332	ssDNA-binding protein				
MSM1333	DNA repair protein RadA, RadA				
MSM1334	predicted permease				
MSM1335	hypothetical protein				
MSM1336	heterodisulfide reductase, subunit A, HdrA				
MSM1337	glycine hydroxymethyltransferase, GlyA				
MSM1338	archaeal flavoprotein				
MSM1339	conserved hypothetical protein				
MSM1340	archaeal S-adenosylmethionine synthetase, MetK				
MSM1341	isoleucyl-tRNA synthetase, IleS				
MSM1342	phosphoribosylformylglycinamide (FGAM) synthase, PurL				
MSM1343	molybdenum cofactor biosynthesis protein, MoeA				
MSM1344	predicted membrane-associated Zn-dependent protease				
MSM1345	hypothetical protein				
MSM1346	conserved hypothetical protein				
MSM1347	hypothetical protein				
MSM1348	rubrythrin				
MSM1349	F420H2-oxidase/flavoprotein, FprA				
MSM1350	predicted transcriptional regulator, ArsR family				
MSM1351	precocorin-2 C20-methyltransferase, CbiL				
MSM1352	predicted ATP-dependent DNA helicase				
MSM1353	putative topoisomerase IV, subunit A				
MSM1354	DNA-directed RNA polymerase subunit M, RpoM				
MSM1355	ADP-ribose pyrophosphatase, NUDIX hydrolase family				
MSM1356	DNA-directed RNA polymerase, subunit L, RpoL				
MSM1357	predicted RNA-binding protein				
MSM1358	diphthamide synthase, subunit DPH2				

MSM1359	adenine phosphoribosyltransferase, Apt				
MSM1360	signal recognition particle GTPase SRP54				
MSM1361	predicted pseudouridylate synthase				
MSM1362	molybdenum cofactor biosynthesis protein C, MoaC				
MSM1363	preprotein translocase, SecG subunit, SecG				
MSM1364	imidazoleglycerol-phosphate synthase, HisF				
MSM1365	3-methyladenine DNA glycosylase/8-oxoguanine DNA glycosylase				
MSM1366	lactoylglutathione lyase, LglU				
MSM1367	peptidyl-prolyl cis-trans isomerase, PpiB				
MSM1368	N-acetylornithine aminotransferase, ArgD				
MSM1369	MutT-related protein, NUDIX family				
MSM1370	conserved hypothetical membrane protein				
MSM1371	diaminopimelate decarboxylase, LysA				
MSM1372	diaminopimelate epimerase, DapF				
MSM1373	methyltransferase, HemK				
MSM1374	dimethyladenosine transferase, KsgA				
MSM1375	predicted RNA-binding protein				
MSM1376	DNA-directed RNA polymerase subunit F				
MSM1377	ribosomal protein L21e				
MSM1378	putative monooxygenase, ABM family				
MSM1379	predicted NADP-dependent alcohol dehydrogenase				
MSM1380	NADP-dependent alcohol dehydrogenase				
MSM1381	putative NADP-dependent alcohol dehydrogenase				
MSM1382	conserved hypothetical membrane protein				
MSM1383	anaerobic ribonucleoside-triphosphate reductase, NrdD				
MSM1384	archaeal DNA polymerase II, large subunit, PolC				
MSM1385	predicted acyltransferase				
MSM1386	cytosine deaminase				
MSM1387	lysyl-tRNA synthetase (class I), LysS				
MSM1388	thiamine biosynthesis protein, ThiC				
MSM1389	sugar kinase, ribokinase/pfkB superfamily				
MSM1390	transcriptional regulator, LysR family				
MSM1391	predicted sugar phosphate isomerase involved in capsule formation, GutQ				
MSM1392	formate dehydrogenase accessory protein FdhD, FdhD				
MSM1393	iron(III) ABC transporter, substrate-binding component				
MSM1394	iron(III) ABC transporter, permease component				
MSM1395	iron(III) ABC transporter, ATPase component				
MSM1396	tungsten formylmethanofuran dehydrogenase, subunit E, FwdE				
MSM1397	adhesin-like protein				
MSM1398	adhesin-like protein				
MSM1399	adhesin-like protein				
MSM1400	putative antimicrobial peptide ABC transporter, permease component				
MSM1401	biopolymer transport protein				
MSM1402	conserved hypothetical protein				
MSM1403	formate/nitrite transporter, FdhC				
MSM1404	formate dehydrogenase, alpha subunit, FdhA				
MSM1405	formate dehydrogenase, beta subunit, FdhB				
MSM1406	molybdopterin cofactor biosynthesis protein A, MoaA				
MSM1407	molybdopterin-guanine dinucleotide biosynthesis protein B, MobB				
MSM1408	tungsten formylmethanofuran dehydrogenase, subunit E, FwdE				
MSM1409	tungsten formylmethanofuran dehydrogenase, subunit F, FwdF				
MSM1410	tungsten formylmethanofuran dehydrogenase, subunit G, FwdG				
MSM1411	tungsten formylmethanofuran dehydrogenase, subunit D, FwdD				
MSM1412	tungsten formylmethanofuran dehydrogenase, subunit B, FwdB				
MSM1413	tungsten formylmethanofuran dehydrogenase, subunit A, FwdA				
MSM1414	tungsten formylmethanofuran dehydrogenase, subunit C, FwdC				
MSM1415	conserved hypothetical protein				
MSM1416	conserved hypothetical protein				
MSM1417	conserved hypothetical protein				
MSM1418	glutamine synthetase, GlnA				
MSM1419	putative transposase				
MSM1420	helicase, UvrD/REP family				
MSM1421	conserved hypothetical membrane protein				
MSM1422	LemA protein				
MSM1423	exopolyphosphatase, GppA				
MSM1424	polyphosphate kinase, ppk				
MSM1425	ribosomal protein S13p				
MSM1426	ribosomal protein S4p				
MSM1427	ribosomal protein S11p				
MSM1428	DNA-directed RNA polymerase, subunit D, RpoD				
MSM1429	ribosomal protein L18e				
MSM1430	ribosomal protein L13p				
MSM1431	ribosomal protein S9p				
MSM1432	DNA-directed RNA polymerase, subunit N, RpoN				
MSM1433	DNA-directed RNA polymerase, subunit K, RpoK				
MSM1434	conserved hypothetical protein				

MSM1435	enolase				
MSM1436	ferredoxin				
MSM1437	ribosomal protein S2p				
MSM1438	predicted dioxygenase				
MSM1439	mevalonate kinase				
MSM1440	predicted archaeal kinase				
MSM1441	isopentenyl-diphosphate delta-isomerase				
MSM1442	predicted RNA hydrolase, metallo-beta-lactamase superfamily				
MSM1443	bifunctional short chain isoprenyl diphosphate synthase, IdsA				
MSM1444	conserved hypothetical membrane protein				
MSM1445	predicted transcriptional regulator				
MSM1446	predicted hydroxylamine reductase, Hcp				
MSM1447	conserved hypothetical protein				
MSM1448	SAM-dependent methyltransferase				
MSM1449	putative O-linked GlcNAc transferase				
MSM1450	predicted oxidoreductase, aldo/keto reductase family				
MSM1451	best blast hit to TPR repeat protein (Mba); not predicted to be a carbohydrate active enzyme by CAZy				
MSM1452	glutamyl-tRNA synthetase, GltX				
MSM1453	hypothetical protein				
MSM1454	predicted ATPase, AAA+ family				
MSM1455	aspartate/tyrosine/aromatic aminotransferase				
MSM1456	conserved hypothetical protein				
MSM1457	hypothetical protein				
MSM1458	hypothetical protein				
MSM1459	multidrug efflux permease, AraJ				
MSM1460	energy-converting hydrogenase B, subunit K, EhbK				
MSM1461	methyl viologen-reducing hydrogenase, delta subunit, MvhD				
MSM1462	formate dehydrogenase, beta subunit, FdhB				
MSM1463	formate dehydrogenase, alpha subunit, FdhA				
MSM1464	FlpE-related protein				
MSM1465	multidrug efflux permease, AraJ				
MSM1466	hypothetical protein				
MSM1467	hypothetical protein				
MSM1468	adenylosuccinate synthetase, PurA				
MSM1469	nitrate/sulfonate/bicarbonate ABC transporter, substrate-binding component, TauA				
MSM1470	hypothetical protein				
MSM1471	acyl-CoA synthetase				
MSM1472	conserved hypothetical protein				
MSM1473	metal-dependent hydrolase, beta-lactamase superfamily				
MSM1474	chorismate synthase, AroC				
MSM1475	predicted endonuclease III-related protein				
MSM1476	porphobilinogen synthase, HemB				
MSM1477	ATP:dephospho-CoA triphosphoribosyl transferase				
MSM1478	phenylalanyl-tRNA synthetase, PheS				
MSM1479	exodeoxyribonuclease, XthA				
MSM1480	predicted hydrolase, HAD superfamily				
MSM1481	DNA-directed DNA polymerase, family B, PolB				
MSM1482	hypothetical protein				
MSM1483	multidrug ABC transporter, ATPase component				
MSM1484	multidrug ABC transporter, permease component				
MSM1485	putative adhesin-like protein				
MSM1486	ribosomal protein S8e				
MSM1487	conserved hypothetical protein				
MSM1488	cobalt ABC transporter, permease component, CbiM				
MSM1489	protein related to formylmethanofuran dehydrogenase subunit E, metal-binding				
MSM1490	conserved hypothetical protein				
MSM1491	protein related to formylmethanofuran dehydrogenase subunit E, metal-binding				
MSM1492	hydrogenase maturation factor, HypE				
MSM1493	conserved hypothetical membrane protein, RDD family				
MSM1494	hypothetical protein				
MSM1495	nuclease, Staphylococcus nuclease-like family				
MSM1496	conserved hypothetical protein				
MSM1497	predicted coenzyme PQQ synthesis protein				
MSM1498	helicase				
MSM1499	predicted transcriptional regulator				
MSM1500	ssDNA exonuclease, RecJ				
MSM1501	signal recognition particle, subunit SRP19				
MSM1502	UDP-galactopyranose mutase				
MSM1503	glycosyltransferase, GT2 family				
MSM1504	uroporphyrinogen III synthase, HemD				
MSM1505	hypothetical protein				
MSM1506	hypothetical protein				

MSM1507	glycosyltransferase, GT2 family				
MSM1508	hypothetical protein				
MSM1509	hypothetical protein				
MSM1510	putative SAM-dependent methyltransferase				
MSM1511	hypothetical protein				
MSM1512	lipopolysaccharide cholinephosphotransferase, LicD family				
MSM1513	aspartate aminotransferase				
MSM1514	glycerol-3-phosphate cytidyltransferase, TagD				
MSM1515	lipopolysaccharide cholinephosphotransferase, LicD family				
MSM1516	histidinol-phosphate aminotransferase, HisC				
MSM1517	ornithine cyclodeaminase				
MSM1518	IS element ISM1 (ICSNY family)				
MSM1519	IS element ISM1 (ICSNY family)				
MSM1520	IS element ISM1 (ICSNY family)				
MSM1521	hypothetical protein				
MSM1522	hypothetical protein				
MSM1523	transposase				
MSM1524	conserved hypothetical protein				
MSM1525	conserved hypothetical protein				
MSM1526	conserved hypothetical membrane protein				
MSM1527	predicted ATPase, AAA+ superfamily				
MSM1528	predicted transcriptional regulator, HTH XRE-like family				
MSM1529	putative Zn peptidase				
MSM1530	putative nucleic acid-binding protein				
MSM1531	Na ⁺ -dependent transporter, SNF family				
MSM1532	Na ⁺ -dependent transporter, SNF family				
MSM1533	adhesin-like protein				
MSM1534	adhesin-like protein				
MSM1535	predicted dTDP-D-glucose 4,6-dehydratase				
MSM1536	pleiotropic regulatory protein DegT (PLP-dependent)				
MSM1537	predicted acylneuraminate cytidyltransferase, NeuS				
MSM1538	CMP-sialic acid synthetase, NeuA				
MSM1539	sialic acid synthase, NeuB				
MSM1540	glycerol-3-phosphate dehydrogenase (NAD)				
MSM1541	hypothetical protein				
MSM1542	4-diphosphocytidyl-2-methyl-D-erythritol synthase, IspD				
MSM1543	hypothetical protein				
MSM1544	lipopolysaccharide cholinephosphotransferase				
MSM1545	glycosyltransferase, GT2 family				
MSM1546	hypothetical protein				
MSM1547	phosphoribosylaminoimidazole-succinocarboxamide (SAICAR) synthase, PurC				
MSM1548	phosphoribosylformylglycinamidine (FGAM) synthase, PurS				
MSM1549	phosphoribosylformylglycinamidine (FGAM) synthase, PurQ				
MSM1550	uroporphyrin-III C-methyltransferase, CobA				
MSM1551	glucosamine-fructose-6-phosphate aminotransferase, GlmS				
MSM1552	hypothetical protein				
MSM1553	hypothetical protein				
MSM1554	putative adhesin-like protein				
MSM1555	SAM-dependent methyltransferase				
MSM1556	conserved hypothetical membrane protein				
MSM1557	queuine/archaeosine tRNA-ribosyltransferase				
MSM1558	SAM-dependent methyltransferase, UbiE family				
MSM1559	polysaccharide biosynthesis protein, MviN-like family				
MSM1560	polysaccharide biosynthesis protein, MviN-like family				
MSM1561	3-hydroxy-3-methylglutaryl-CoA (HMG-CoA) synthase				
MSM1562	acetyl-CoA acyltransferase, SCP-type thiolase family				
MSM1563	hypothetical protein				
MSM1564	predicted SAM-dependent methyltransferase				
MSM1565	cobyric acid synthase, CobQ				
MSM1566	putative transposase				
MSM1567	adhesin-like protein				
MSM1568	putative transcription regulator				
MSM1569	ATP-dependent protease La, LonB				
MSM1570	cell wall biosynthesis protein, MurD-like peptide ligase family				
MSM1571	hypothetical protein				
MSM1572	ADP-ribosylglycohydrolase				
MSM1573	N-acetyltransferase, GNAT family				
MSM1574	nitroreductase, NfnB				
MSM1575	hypothetical protein				
MSM1576	hypothetical protein				
MSM1577	ribose-phosphate pyrophosphokinase, PrsA				
MSM1578	hypothetical protein				
MSM1579	excinuclease ABC, subunit B, UvrB				
MSM1580	hypothetical protein				
MSM1581	excinuclease ABC, subunit A, UvrA				
MSM1582	conserved hypothetical membrane protein				

MSM1583	archaea-specific helicase					
MSM1584	predicted excinuclease ABC, C subunit, UvrC					
MSM1585	adhesin-like protein					
MSM1586	adhesin-like protein					
MSM1587	adhesin-like protein					
MSM1588	transposase					
MSM1589	transposase, RNaseH-like family			ND		
MSM1590	adhesin-like protein					
MSM1591	conserved hypothetical protein					
MSM1592	polysaccharide/polyol phosphate ABC transporter, ATPase component					
MSM1593	polysaccharide/polyol phosphate ABC transporter, permease component					
MSM1594	glycosyltransferase/CDP-glycerol:poly(glycerophosphate) glycerophosphotransferase, GT2 family					
MSM1595	SAM-dependent methyltransferase, FkbM family					
MSM1596	putative transposase			ND		
MSM1597	hypothetical protein					
MSM1598	SAM-dependent methyltransferase					
MSM1599	SAM-dependent methyltransferase					
MSM1600	putative acetyltransferase, trimeric LpxA-like family					
MSM1601	conserved hypothetical protein					
MSM1602	glycosyltransferase/CDP-glycerol:poly(glycerophosphate) glycerophosphotransferase, GT2 family					
MSM1603	conserved hypothetical protein					
MSM1604	UDP-glucose pyrophosphorylase, GalU					
MSM1605	hypothetical protein					
MSM1606	arylsulfatase regulator, AsIB					
MSM1607	conserved hypothetical protein					
MSM1608	predicted oxidoreductase, aldo/keto reductase family					
MSM1609	molybdate ABC transporter, substrate-binding component, ModA					
MSM1610	molybdate ABC transporter, permease component, ModC					
MSM1611	molybdate ABC transporter, ATPase component, ModB					
MSM1612	predicted UDP-glucose 6-dehydrogenase					
MSM1613	predicted UDP-glucose/GDP-mannose dehydrogenase					
MSM1614	predicted transcriptional regulator					
MSM1615	deoxyhypusine synthase, Dys					
MSM1616	conserved hypothetical membrane protein					
MSM1617	orotidine-5'-phosphate decarboxylase, PyrF					
MSM1618	cobalamin biosynthesis protein M, CbiM					
MSM1619	cobalt ABC transporter, substrate-binding component, CbiN					
MSM1620	cobalt ABC transporter, permease component, CbiQ					
MSM1621	cobalt ABC transporter, ATPase component, CbiO					
MSM1622	archaeal riboflavin synthase, RibC					
MSM1623	glycosyltransferase/dolichyl-phosphate mannose synthase, GT2 family					
MSM1624	conserved hypothetical protein					
MSM1625	thiol:fumarate reductase, subunit B, TfrB					
MSM1626	predicted fumarate reductase					
MSM1627	glycosyltransferase, GT2 family					
MSM1628	conserved hypothetical protein, aldolase family					
MSM1629	IMP dehydrogenase/GMP reductase, GuaB					
MSM1630	ribosomal protein L37Ae					
MSM1631	predicted DNA-directed RNA polymerase II, subunit RPC10					
MSM1632	predicted brix-domain ribosomal biogenesis protein					
MSM1633	conserved hypothetical protein					
MSM1634	prefoldin, beta subunit					
MSM1635	conserved hypothetical protein					
MSM1636	ProFAR isomerase-related protein					
MSM1637	conserved hypothetical membrane protein					
MSM1638	conserved hypothetical membrane protein					
MSM1639	heavy metal cation (Co/Zn/Cd) efflux system protein, CzcD family					
MSM1640	DNA integrase/recombinase, phage integrase family					
MSM1641	hypothetical protein					
MSM1642	conserved hypothetical protein					
MSM1643	hypothetical protein					
MSM1644	hypothetical protein					
MSM1645	virulence protein					
MSM1646	putative ATPase (AAA+ superfamily)					
MSM1647	hypothetical protein					
MSM1648	hypothetical protein					
MSM1649	hypothetical protein					
MSM1650	hypothetical protein					
MSM1651	hypothetical protein					
MSM1652	hypothetical protein					
MSM1653	hypothetical protein					

MSM1654	putative Gp40-related protein, ERF family single-strand annealing protein				
MSM1655	hypothetical protein				
MSM1656	hypothetical protein				
MSM1657	conserved hypothetical protein				
MSM1658	hypothetical protein				
MSM1659	hypothetical protein				
MSM1660	hypothetical protein				
MSM1661	hypothetical protein				
MSM1662	hypothetical protein				
MSM1663	hypothetical protein				
MSM1664	hypothetical protein				
MSM1665	hypothetical protein				
MSM1666	hypothetical protein				
MSM1667	hypothetical protein				
MSM1668	hypothetical protein				
MSM1669	hypothetical protein				
MSM1670	hypothetical protein				
MSM1671	large terminase subunit				
MSM1672	bacteriophage capsid portal protein				
MSM1673	conserved hypothetical protein				
MSM1674	hypothetical protein				
MSM1675	putative structural protein				
MSM1676	hypothetical protein				
MSM1677	putative major capsid protein gp5				
MSM1678	hypothetical protein				
MSM1679	hypothetical protein				
MSM1680	hypothetical protein				
MSM1681	hypothetical protein				
MSM1682	hypothetical protein				
MSM1683	hypothetical protein				
MSM1684	phage-related minor tail protein				
MSM1685	hypothetical protein				
MSM1686	hypothetical protein				
MSM1687	conserved hypothetical protein				
MSM1688	hypothetical protein				
MSM1689	putative collagen-like protein B				
MSM1690	hypothetical protein				
MSM1691	putative pseudomurein endoisopeptidase, PeiW				
MSM1692	hypothetical protein				
MSM1693	predicted ribokinase, PfkB family				
MSM1694	predicted helicase				
MSM1695	excinuclease ABC, subunit C, UvrC				
MSM1696	conserved hypothetical protein				
MSM1697	hypothetical protein				
MSM1698	methyl coenzyme M reductase system, component A2-like				
MSM1699	predicted universal stress protein, UspA				
MSM1700	predicted ferredoxin				
MSM1701	predicted FAD-dependent dehydrogenase, geranylgeranyl reductase family				
MSM1702	UDP-glucose 4-epimerase				
MSM1703	conserved hypothetical protein				
MSM1704	glutamine phosphoribosylpyrophosphate amidotransferase, PurF				
MSM1705	predicted collagenase, peptidase family U32				
MSM1706	CDP-diacylglycerol-glycerol-3-phosphate 3-phosphatidyltransferase				
MSM1707	nitrogenase NifH subunit, NifH				
MSM1708	hypothetical protein				
MSM1709	adhesin-like protein				
MSM1710	seryl-tRNA synthetase, SerS				
MSM1711	conserved hypothetical protein				
MSM1712	predicted ferritin				
MSM1713	predicted regulatory protein, amino acid-binding ACT domain family				
MSM1714	coenzyme F390 synthetase				
MSM1715	magnesium chelatase subunit				
MSM1716	adhesin-like protein				
MSM1717	predicted transporter				
MSM1718	predicted biopolymer transport protein				
MSM1719	conserved hypothetical protein				
MSM1720	DNA-directed RNA polymerase, subunit M, RpoM				
MSM1721	voltage gated chloride channel protein/cation transporter, TrkA family				
MSM1722	nitroreductase				
MSM1723	N5,N10-methenyl-tetrahydromethanopterin cyclohydrolase, Mch				
MSM1724	conserved hypothetical membrane protein				
MSM1725	conserved hypothetical membrane protein				
MSM1726	conserved hypothetical membrane protein				
MSM1727	multimeric flavodoxin				

MSM1728	hypothetical protein				
MSM1729	conserved hypothetical protein				
MSM1730	conserved hypothetical membrane protein				
MSM1731	short chain dehydrogenase/reductase				
MSM1732	conserved hypothetical protein				
MSM1733	rubryerythrin				
MSM1734	predicted thymidylate synthase, ThyA				
MSM1735	adhesin-like protein				
MSM1736	permease, xanthine/uracil/vitamin C permease family				
MSM1737	putative transcription regulator				
MSM1738	putative adhesin-like protein				
MSM1739	conserved hypothetical membrane protein				
MSM1740	O-linked GlcNAc transferase				
MSM1741	conserved hypothetical protein				
MSM1742	predicted integrase, phage integrase-like family				
MSM1743	predicted type II restriction enzyme, methylase subunit				
MSM1744	predicted type II restriction enzyme, methylase subunit				
MSM1745	predicted type II restriction enzyme, methylase subunit				
MSM1746	predicted type II restriction enzyme, methylase subunit				
MSM1747	predicted type II restriction enzyme, methylase subunit				
MSM1748	predicted type II restriction enzyme, methylase subunit				
MSM1749	conserved hypothetical protein				
MSM1750	conserved hypothetical protein				
MSM1751	conserved hypothetical protein				
MSM1752	predicted restriction endonuclease				
MSM1753	conserved hypothetical protein				
MSM1754	predicted ATP-dependent protease La, Lon				
MSM1755	purine/pyrimidine phosphoribosyl transferase				
MSM1756	Smf protein				
MSM1757	hypothetical protein				
MSM1758	hypothetical protein				
MSM1759	hypothetical protein				
MSM1760	hypothetical protein				
MSM1761	predicted ATPase involved in DNA repair				
MSM1762	hypothetical protein				
MSM1763	predicted DNA-directed RNA polymerase, subunit M, RpoM				
MSM1764	conserved hypothetical protein				
MSM1765	conserved hypothetical protein				
MSM1766	O-linked GlcNAc transferase				
MSM1767	hypothetical protein				
MSM1768	hypothetical protein				
MSM1769	conserved hypothetical membrane protein				
MSM1770	conserved hypothetical membrane protein				
MSM1771	DNA helicase, UvrD/REP helicase family				
MSM1772	conserved hypothetical protein				
MSM1773	conserved hypothetical protein				
MSM1774	hypothetical protein				
MSM1775	putative topoisomerase IV, subunit A				
MSM1776	TPR repeat protein				
MSM1777	putative transcription regulator				
MSM1778	conserved hypothetical protein				
MSM1779	conserved hypothetical protein				
MSM1780	conserved hypothetical membrane protein				
MSM1781	conserved hypothetical protein				
MSM1782	hypothetical protein				
MSM1783	hypothetical protein				
MSM1784	hypothetical protein				
MSM1785	conserved hypothetical protein				
MSM1786	O-linked GlcNAc transferase				
MSM1787	O-linked GlcNAc transferase				
MSM1788	O-linked GlcNAc transferase				
MSM1789	predicted ATPase, AAA+ superfamily				
MSM1790	predicted ATPase, AAA+ superfamily				
MSM1791	conserved hypothetical protein				
MSM1792	nicotinate phosphoribosyltransferase				
MSM1793	conserved hypothetical protein				
MSM1794	predicted tubulin-like protein				
MSM1795	predicted ATPase, AAA+ superfamily				

¹GeneChip-based genotyping of *M. smithii* strains done in duplicate; 'present' or 'absent' calls were determined using a perfect match/mismatch (PM/MM) model in dChip (see *Methods*). Note that the term 'absent' is based on different criteria than those used for the human microbiome dataset (see footnote 2).

²Metagenomic datasets from the microbiomes of two healthy lean adults (Gill et al., 2006) were tested for identity to *M. smithii* PS ORFs ; ORFs with reads that matched with >95% identity are called 'present', 80-95% identity are called 'divergent', and <80% identity are called 'absent'.

³Probeset for *M. smithii* gene not represented on GeneChip.