

Table S1 Function annotations of all *Ca. L. asiaticus* proteins

NCBI_gi	SEED_id	NCBI_annotaion	SEED_annotation	Curated_functon_prediction	Comments
254780122	537021.9.peg.1	hypothetical protein	hypothetical protein	unknown	
254780123	537021.9.peg.2	hypothetical protein	hypothetical protein	unknown	
254780124	537021.9.peg.3	hypothetical protein	Phage protein	endo/exonuclease	
254780125	537021.9.peg.4	prophage antirepressor	Phage antirepressor protein	prophage antirepressor	
254780126	537021.9.peg.5	hypothetical protein	unknown	phage protein, may related to DNA binding	
254780127	537021.9.peg.6	putative DNA polymerase from bacteriophage origin	DNA polymerase I (EC 2.7.7.7)	prophage DNA polymerase I (EC 2.7.7.7)	
254780128	537021.9.peg.7	VRR-NUC domain-containing protein	hypothetical protein	restriction endonuclease	
254780129	537021.9.peg.8	hypothetical protein	DNA helicase, phage-associated	prohage DNA/RNA helicase	1/2 of a protein
254780130	537021.9.peg.9	hypothetical protein	DNA helicase, phage-associated	prohage DNA/RNA helicase	1/2 of a protein
254780131	537021.9.peg.10	DNA ligase, NAD-dependent	DNA ligase, NAD-dependent	NAD-dependant DNA ligase	
254780132	537021.9.peg.11	guanylate kinase	Guanylate kinase (EC 2.7.4.8)	guanylate kinase (EC 2.7.4.8)	
254780133	N/A	hypothetical protein	N/A	unknown	
254780134	537021.9.peg.12	phage-related integrase/recombinase	integrase	phage integrase	
254780135	537021.9.peg.13	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780136	537021.9.peg.14	ribonucleotide-diphosphate reductase subunit beta	Ribonucleotide reductase of class Ia (aerobic), beta subunit (EC 1.17.4.1)	ribonucleotide-diphosphate reductase subunit beta (EC 1.17.4.1)	this is just part of the protein,
254780137	537021.9.peg.16	malic enzyme	NADP-dependent malic enzyme (EC 1.1.1.40)	malic enzyme (EC 1.1.1.40)	
254780138	537021.9.peg.17	ABC transporter	ABC-type transport system involved in resistance to organic solvents, permease component USSDB6A	ABC-type import for membrane lipid (from outer membrane to inner membrane), transmembrane component	transmembrane protein
254780139	537021.9.peg.18	putative ATP-binding component of ABC transporter	probable ABC transporter, ATP-binding protein	ABC-type import for membrane lipid (from outer membrane to inner membrane), ATPase component	
254780140	537021.9.peg.19	putative ABC transporter, substrate-binding protein	putative solute-binding component of ABC transporter	ABC-type import for membrane lipid (from outer membrane to inner membrane), auxiliary component	transmembrane protein
254780141	537021.9.peg.20	putative ABC transporter protein	hypothetical protein	ABC-type import for membrane lipid (from outer membrane to inner membrane), auxiliary component	has signal peptide
254780142	537021.9.peg.22	DNA-directed RNA polymerase subunit beta'	DNA-directed RNA polymerase beta' subunit (EC 2.7.7.6)	DNA-directed RNA polymerase subunit beta' (EC 2.7.7.6)	
254780143	537021.9.peg.23	DNA-directed RNA polymerase subunit beta	DNA-directed RNA polymerase beta subunit (EC 2.7.7.6)	DNA-directed RNA polymerase subunit beta (EC 2.7.7.6)	
254780144	537021.9.peg.24	50S ribosomal protein L12P	LSU ribosomal protein L7/L12 (P1/P2)	50S ribosomal protein L12P	
254780145	537021.9.peg.25	50S ribosomal protein L10	LSU ribosomal protein L10p (P0)	50S ribosomal protein L10	
254780146	537021.9.peg.27	50S ribosomal protein L1	LSU ribosomal protein L1p (L10Ae)	50S ribosomal protein L1	
254780147	537021.9.peg.28	50S ribosomal protein L11	LSU ribosomal protein L11p (L12e)	50S ribosomal protein L11	
254780148	537021.9.peg.29	transcription antitermination protein NusG	Transcription antitermination protein NusG	transcription antitermination protein NusG	
254780149	537021.9.peg.30	hypothetical protein	preprotein translocase	Preprotein translocase subunit SecE	transmembrane protein
254780150	537021.9.peg.31	translation elongation factor Tu	Translation elongation factor Tu	translation elongation factor Tu	
254780151	537021.9.peg.32	tRNA-specific 2-thiouridylase MnmA	tRNA (5-methylaminomethyl-2-thiouridylate)-methyltransferase (EC 2.1.1.61)	tRNA methyl transferase (EC 2.1.1.61)	wrong start protein should start from the second M
N/A	537021.9.peg.33	N/A	D-3-phosphoglycerate dehydrogenase	D-3-phosphoglycerate dehydrogenase	1/4 of a protein
N/A	537021.9.peg.34	N/A	D-3-phosphoglycerate dehydrogenase (EC 1.1.1.95)	D-3-phosphoglycerate dehydrogenase	1/4 of a protein
254780152	537021.9.peg.35	D-3-phosphoglycerate dehydrogenase	D-3-phosphoglycerate dehydrogenase (EC 1.1.1.95)	D-3-phosphoglycerate dehydrogenase	1/4 of a protein
N/A	537021.9.peg.36	N/A	hypothetical protein	D-3-phosphoglycerate dehydrogenase	1/4 of a protein
254780153	537021.9.peg.37	phosphoserine aminotransferase	Phosphoserine aminotransferase (EC 2.6.1.52)	phosphoserine aminotransferase (EC 2.6.1.52)	
254780154	537021.9.peg.38	hypothetical protein	hypothetical protein	unknown	
254780156	537021.9.peg.39	putative inositol-1-monophosphatase	Inositol-1-monophosphatase (EC 3.1.3.25)	inositol-1-monophosphatase (EC 3.1.3.25)	
254780157	537021.9.peg.40	phosphoribosylaminoimidazole carboxylase catalytic subunit protein	Phosphoribosylaminoimidazole carboxylase catalytic subunit (EC 4.1.1.21)	phosphoribosylaminoimidazole carboxylase (EC 4.1.1.21)	
254780158	537021.9.peg.41	phosphoribosylaminoimidazole carboxylase ATPase subunit	Phosphoribosylaminoimidazole carboxylase ATPase subunit (EC 4.1.1.21)	phosphoribosylaminoimidazole carboxylase ATPase (EC 4.1.1.21)	

N/A	537021.9.peg.42	N/A	hypothetical protein	missing in NCBI database, but should have it, it is ribosome protein	missing in NCBI database, but should have it
254780159	537021.9.peg.43	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780160	537021.9.peg.44	hypothetical protein	hypothetical protein	unknown	no reliable prediction
254780161	537021.9.peg.45	phytoene synthase protein	Phytoene synthase (EC 2.5.1.32)	phytoene synthase protein (EC 2.5.1.32)	
254780162	537021.9.peg.46	hypothetical protein	hypothetical protein	unknown	wrong gene prediction?
254780163	537021.9.peg.47	ATP-dependent Clp protease ATP-binding subunit	ATP-dependent Clp protease ATP-binding subunit ClpA	ATP-dependent Clp protease ATP-binding subunit	
254780164	537021.9.peg.48	ATP-dependent Clp protease adaptor protein ClpS	ATP-dependent Clp protease adaptor protein ClpS	ATP-dependent Clp protease adaptor protein ClpS	wrong start point? But start from??
254780165	537021.9.peg.49	hypothetical protein	hypothetical protein	unknown	correct protein, unknown function
254780166	537021.9.peg.50	hydrolase protein	probable hydrolase protein	hydrolase	
254780167	537021.9.peg.51	hypothetical protein	hypothetical protein	zinc-finger	need to check out function
254780168	537021.9.peg.52	monoxygenase FAD-binding protein	Salicylate hydroxylase (EC 1.14.13.1)	salicylate hydroxylase (EC 1.14.13.1)	
254780169	537021.9.peg.53	hypothetical protein	hypothetical protein	unknown	wrong gene prediction, only 54 aa
254780170	537021.9.peg.55	cationic amino acid ABC transporter, periplasmic binding protein	Glutamate Aspartate periplasmic binding protein precursor GltI (TC 3.A.1.3.4)	ABC-type importer for general L-amino acids, substrate binding component	has signal peptide
254780171	537021.9.peg.56	ABC transporter membrane spanning protein (amino acid)	Glutamate Aspartate transport system permease protein GltJ (TC 3.A.1.3.4)	ABC-type importer for general L-amino acids, transmembrane component	transmembrane protein
254780172	537021.9.peg.57	general L-amino acid transport system permease protein	Glutamate Aspartate transport system permease protein GltK (TC 3.A.1.3.4)	ABC-type importer for general L-amino acids, transmembrane component	transmembrane protein
254780173	537021.9.peg.58	ABC transporter related protein	Amino acid ABC transporter, ATP-binding protein	ABC-type importer for general L-amino acids, ATPase component	
254780174	537021.9.peg.59	putative oxidoreductase protein	PUTATIVE OXIDOREDUCTASE PROTEIN	oxidoreductase protein in electron transport chain complex I	start point wrong prediction
254780175	537021.9.peg.61	hypothetical protein	hypothetical protein	unknown	wrong gene prediction, only 38 aa, and find nothing in NR
254780176	537021.9.peg.62	hypothetical protein	hypothetical protein	unknown	No consensus prediction
254780177	537021.9.peg.63	lipoyltransferase	Octanoate-[acyl-carrier-protein]-protein-N-octanoyltransferase	lipoyltransferase (EC:2.3.1.181)	
254780178	537021.9.peg.64	queuine tRNA-ribosyltransferase	tRNA-guanine transglycosylase (EC 2.4.2.29)	queuine tRNA-ribosyltransferase (EC 2.4.2.29)	
254780179	537021.9.peg.65	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780180	537021.9.peg.66	S-adenosylmethionine:tRNA ribosyltransferase-isomerase	S-adenosylmethionine:tRNA ribosyltransferase-isomerase (EC 5.-.-.-)	S-adenosylmethionine:tRNA ribosyltransferase-isomerase (EC 5.-.-.-)	
254780181	537021.9.peg.67	phosphopantetheine adenylyltransferase	Phosphopantetheine adenylyltransferase (EC 2.7.7.3)	phosphopantetheine adenylyltransferase (EC 2.7.7.3)	
254780182	537021.9.peg.68	DNA gyrase subunit A	DNA gyrase subunit A (EC 5.99.1.3)	DNA gyrase subunit A (EC 5.99.1.3)	
254780183	537021.9.peg.69	single-strand binding protein (ssb)	Single-stranded DNA-binding protein	single-strand binding protein (ssb)	
254780184	537021.9.peg.70	excinuclease ABC subunit A	Excinuclease ABC subunit A	excinuclease ABC subunit A, uvrA	
254780185	537021.9.peg.71	glutamine synthetase protein	Glutamine synthetase type I (EC 6.3.1.2)	glutamine synthetase (EC 6.3.1.2)	
254780186	537021.9.peg.72	glutaminase	Glutaminase (EC 3.5.1.2)	glutaminase (EC 3.5.1.2)	
254780187	537021.9.peg.73	30S ribosomal protein S4	SSU ribosomal protein S4p (S9e)	30S ribosomal protein S4	
N/A	537021.9.peg.74	N/A	Ribonucleotide reductase of class Ia (aerobic), beta subunit (EC 1.17.4.1)	ribonucleotide-diphosphate reductase subunit beta	1/2 of a protein
N/A	537021.9.peg.75	N/A	Ribonucleotide reductase of class Ia (aerobic), beta subunit (EC 1.17.4.1)	ribonucleotide-diphosphate reductase subunit beta	1/2 of a protein
254780189	537021.9.peg.76	hypothetical protein	hypothetical protein	unknown	
254780190	537021.9.peg.77	fumarate hydratase	Fumarate hydratase class II (EC 4.2.1.2)	fumarate hydratase (EC 4.2.1.2)	
254780191	537021.9.peg.78	alanyl-tRNA synthetase	Alanyl-tRNA synthetase (EC 6.1.1.7)	alanyl-tRNA synthetase (EC 6.1.1.7)	
255764460	537021.9.peg.79	recombinase A	RecA protein	recombinase A	
254780193	537021.9.peg.81	lipid A ABC exporter family, fused ATPase and inner membrane subunits	hypothetical protein	ABC-type exporter for multiple drug and lipid, transmembrane and ATPase component	transmembrane protein
254780194	537021.9.peg.83	50S ribosomal protein L31	LSU ribosomal protein L31p	50S ribosomal protein L31	

254780195	537021.9.p.84	CTP synthetase	CTP synthase (EC 6.3.4.2)	CTP synthetase (EC 6.3.4.2)	
254780196	537021.9.p.85	hypothetical protein	hypothetical protein	protein translocase (for protein to pass the inner membrane)	transmembrane protein
254780197	537021.9.p.86	triosephosphate isomerase protein	Triosephosphate isomerase (EC 5.3.1.1)	triosephosphate isomerase protein (EC 5.3.1.1)	
254780198	N/A	hypothetical protein	N/A	unknown	transmembrane protein
254780199	537021.9.p.87	outer membrane lipoprotein	hypothetical protein	outermembrane lipoprotein	has signal peptide
254780200	537021.9.p.88	ferrochelatase	Ferrochelatase, protoheme ferro-lyase (EC 4.99.1.1)	ferrochelatase (EC 4.99.1.1)	
254780201	537021.9.p.89	hypothetical protein	hypothetical protein	Lipopolysaccharide biosynthesis protein	
254780202	537021.9.p.90	hypothetical protein	Queuosine Biosynthesis QueE Radical SAM	organic radical activating enzymes	
N/A	537021.9.p.91	N/A	Putative deoxyribonuclease YcfH	hydrolase, just piece of protein 254780214	just piece of protein 254780214
254780203	537021.9.p.92	hypothetical protein	hypothetical protein	unknown	
254780204	537021.9.p.93	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780205	537021.9.p.94	prenyltransferase	4-hydroxybenzoate polyprenyltransferase (EC 2.5.1.-)	4-hydroxybenzoate polyprenyltransferase (EC 2.5.1.-)	transmembrane protein
254780206	537021.9.p.95	phosphoribosylamine--glycine ligase	Phosphoribosylamine--glycine ligase (EC 6.3.4.13)	phosphoribosylamine--glycine ligase (EC 6.3.4.13)	
254780207	537021.9.p.96	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780209	537021.9.p.99	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780210	537021.9.p.100	hypothetical protein	hypothetical protein	unknown	
254780212	537021.9.p.101	bacterioferritin comigratory protein	Thiol peroxidase, Bcp-type (EC 1.11.1.15)	bacterioferritin comigratory protein/peroxiredoxin (EC 1.11.1.15)	bacterioferritin comigratory protein = peroxiredoxin
254780213	537021.9.p.102	hypothetical protein	hypothetical protein	unknown	
254780214	537021.9.p.103	metal-dependent hydrolase protein	Metal-dependent hydrolases of the beta-lactamase superfamily I; PhnP protein	metal-dependent hydrolase protein	
254780215	537021.9.p.104	hypothetical protein	Putative deoxyribonuclease YcfH	Dnase	
255764461	537021.9.p.105	methionyl-tRNA synthetase	Methionyl-tRNA synthetase (EC 6.1.1.10)	methionyl-tRNA synthetase (EC 6.1.1.10)	
254780217	537021.9.p.106	DNA polymerase III subunit delta'	DNA polymerase III delta prime subunit (EC 2.7.7.7)	DNA polymerase III subunit delta' (EC 2.7.7.7)	
254780218	537021.9.p.107	thymidylate kinase	Thymidylate kinase (EC 2.7.4.9)	thymidylate kinase (EC 2.7.4.9)	
254780219	537021.9.p.108	hypothetical protein	hypothetical protein	unknown	
254780220	N/A	hypothetical protein	N/A	unknown	has signal peptide
254780221	537021.9.p.110	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780222	537021.9.p.111	DNA topoisomerase IV subunit B	Topoisomerase IV subunit B (EC 5.99.1.-)	DNA topoisomerase IV subunit B (EC 5.99.1.-)	
254780223	537021.9.p.112	ABC transporter permease	hypothetical protein	permease	transmembrane protein
254780224	537021.9.p.113	hypothetical protein	hypothetical protein	unknown	
254780225	537021.9.p.114	peptidyl-tRNA hydrolase	Peptidyl-tRNA hydrolase (EC 3.1.1.29)	peptidyl-tRNA hydrolase (EC 3.1.1.29)	
254780226	537021.9.p.115	translation-associated GTPase	GTP-binding and nucleic acid-binding protein YchF	translation-associated GTPase	
254780227	537021.9.p.117	pyrophosphate--fructose-6-phosphate 1-phosphotransferase	Pyrophosphate--fructose 6-phosphate 1-phosphotransferase, alpha subunit (EC 2.7.1.90)	pyrophosphate--fructose-6-phosphate 1-phosphotransferase subunit alpha (EC 2.7.1.90)	
254780228	537021.9.p.118	hypothetical protein	Integral membrane protein	unknown	transmembrane protein
254780229	537021.9.p.119	hypothetical protein	hypothetical protein	DNA helicase	
254780230	537021.9.p.120	hypothetical protein	hypothetical conserved membrane protein	unknown	transmembrane protein
254780231	537021.9.p.121	hypothetical protein	hypothetical protein	unknown	
254780232	537021.9.p.122	inorganic pyrophosphatase	Inorganic pyrophosphatase (EC 3.6.1.1)	inorganic pyrophosphatase (EC 3.6.1.1)	
254780233	537021.9.p.123	GTP-binding protein	GTP-binding protein TypA/BipA	GTPase, TypA involved in stress response	
254780234	537021.9.p.124	argininosuccinate synthase	Argininosuccinate synthase (EC 6.3.4.5)	argininosuccinate synthase (EC 6.3.4.5)	
254780235	537021.9.p.125	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780236	537021.9.p.126	50S ribosomal protein L17	LSU ribosomal protein L17p	50S ribosomal protein L17	
254780237	537021.9.p.127	DNA-directed RNA polymerase subunit alpha	DNA-directed RNA polymerase alpha subunit (EC 2.7.7.6)	DNA-directed RNA polymerase subunit alpha (EC 2.7.7.6)	
254780238	537021.9.p.129	30S ribosomal protein S11	SSU ribosomal protein S11p (S14e)	30S ribosomal protein S11	
254780239	537021.9.p.130	30S ribosomal protein S13	SSU ribosomal protein S13p (S18e)	30S ribosomal protein S13	
254780240	537021.9.p.131	adenylate kinase	Adenylate kinase (EC 2.7.4.3)	adenylate kinase (EC 2.7.4.3)	
254780241	537021.9.p.132	preprotein translocase subunit SecY	Preprotein translocase secY subunit (TC 3.A.5.1.1)	preprotein translocase subunit SecY	transmembrane protein
254780242	537021.9.p.133	50S ribosomal protein L15	LSU ribosomal protein L15p (L27Ae)	50S ribosomal protein L15	

254780243	537021.9.peg.134	50S ribosomal protein L30	LSU ribosomal protein L30p (L7e)	50S ribosomal protein L30	
254780244	537021.9.peg.135	30S ribosomal protein S5	SSU ribosomal protein S5p (S2e)	30S ribosomal protein S5	
254780245	537021.9.peg.136	50S ribosomal protein L18	LSU ribosomal protein L18p (L5e)	50S ribosomal protein L18	
254780246	537021.9.peg.137	50S ribosomal protein L6	LSU ribosomal protein L6p (L9e)	50S ribosomal protein L6	
254780247	537021.9.peg.138	30S ribosomal protein S8	SSU ribosomal protein S8p (S15Ae)	30S ribosomal protein S8	
254780248	537021.9.peg.139	30S ribosomal protein S14	SSU ribosomal protein S14p (S29e) Zinc-independent	30S ribosomal protein S14	
254780249	537021.9.peg.140	50S ribosomal protein L5	LSU ribosomal protein L5p (L11e)	50S ribosomal protein L5	
254780250	537021.9.peg.141	50S ribosomal protein L24	LSU ribosomal protein L24p (L26e)	50S ribosomal protein L24	
254780251	537021.9.peg.142	50S ribosomal protein L14	LSU ribosomal protein L14p (L23e)	50S ribosomal protein L14	
254780252	537021.9.peg.143	30S ribosomal protein S17	SSU ribosomal protein S17p (S11e)	30S ribosomal protein S17	
254780253	537021.9.peg.144	ribosomal protein L29	LSU ribosomal protein L29p (L35e)	ribosomal protein L29	
254780254	537021.9.peg.145	50S ribosomal protein L16	LSU ribosomal protein L16p (L10e)	50S ribosomal protein L16	
254780255	537021.9.peg.146	30S ribosomal protein S3	SSU ribosomal protein S3p (S3e)	30S ribosomal protein S3	
254780256	537021.9.peg.147	50S ribosomal protein L22	LSU ribosomal protein L22p (L17e)	50S ribosomal protein L22	
254780257	537021.9.peg.148	SSU ribosomal protein S19P	SSU ribosomal protein S19p (S15e)	SSU ribosomal protein S19P	
254780258	537021.9.peg.149	50S ribosomal protein L2	LSU ribosomal protein L2p (L8e)	50S ribosomal protein L2	
254780259	537021.9.peg.150	50S ribosomal protein L23	LSU ribosomal protein L23p (L23Ae)	50S ribosomal protein L23	
254780260	537021.9.peg.151	50S ribosomal protein L4	LSU ribosomal protein L4p (L1e)	50S ribosomal protein L4	
254780261	537021.9.peg.152	50S ribosomal protein L3	LSU ribosomal protein L3p (L3e)	50S ribosomal protein L3	
254780262	537021.9.peg.153	30S ribosomal protein S10	SSU ribosomal protein S10p (S20e)	30S ribosomal protein S10	
254780263	537021.9.peg.154	translation elongation factor Tu	Translation elongation factor Tu	translation elongation factor Tu	
254780264	537021.9.peg.155	elongation factor G	Translation elongation factor G	elongation factor G	
254780265	537021.9.peg.156	30S ribosomal protein S7	SSU ribosomal protein S7p (S5e)	30S ribosomal protein S7	
254780266	537021.9.peg.157	30S ribosomal protein S12	SSU ribosomal protein S12p (S23e)	30S ribosomal protein S12	
254780267	537021.9.peg.158	acetyl-CoA carboxylase biotin carboxyl carrier protein subunit	Biotin carboxyl carrier protein of acetyl-CoA carboxylase	acetyl-CoA carboxylase biotin carboxyl carrier	
254780268	537021.9.peg.159	acetyl-CoA carboxylase biotin carboxylase subunit	Biotin carboxylase of acetyl-CoA carboxylase (EC 6.3.4.14)	acetyl-CoA carboxylase biotin carboxylase (EC 6.3.4.14)	
254780269	537021.9.peg.160	leucyl/phenylalanyl-tRNA--protein transferase	Leucyl/phenylalanyl-tRNA--protein transferase (EC 2.3.2.6)	leucyl/phenylalanyl-tRNA--protein transferase (EC 2.3.2.6)	
254780270	537021.9.peg.161	ATP-dependent protease La	ATP-dependent protease La (EC 3.4.21.53) Type I	ATP-dependent protease La (EC 3.4.21.53)	
254780271	537021.9.peg.162	ATP-dependent protease ATP-binding subunit ClpX	ATP-dependent Clp protease ATP-binding subunit ClpX	ATP-dependent protease ATP-binding subunit ClpX	
254780272	537021.9.peg.163	ATP-dependent Clp protease proteolytic subunit	ATP-dependent Clp protease proteolytic subunit (EC 3.4.21.92)	ATP-dependent Clp protease proteolytic subunit (EC 3.4.21.92)	
254780273	537021.9.peg.164	putative ABC transporter ATP-binding protein	ABC transporter, ATP-binding protein	ABC-type ATPase, function as regulator for virulence gene, chvD	
254780274	537021.9.peg.165	lysophospholipase protein	hypothetical protein	lysophospholipase protein	
254780275	537021.9.peg.167	SsrA-binding protein	tmRNA-binding protein SmpB	SsrA-binding protein	
254780276	537021.9.peg.168	dihydrodipicolinate synthase	Dihydrodipicolinate synthase (EC 4.2.1.52)	dihydrodipicolinate synthase (EC 4.2.1.52)	
254780277	537021.9.peg.169	DNA polymerase I	DNA polymerase I (EC 2.7.7.7)	DNA polymerase I	
254780278	537021.9.peg.170	phosphoglyceromutase	Phosphoglycerate mutase (EC 5.4.2.1)	phosphoglyceromutase (EC 5.4.2.1)	
254780279	537021.9.peg.171	dihydrodipicolinate reductase	Dihydrodipicolinate reductase (EC 1.3.1.26)	dihydrodipicolinate reductase (EC 1.3.1.26)	
254780280	537021.9.peg.172	glucokinase	Glucokinase (EC 2.7.1.2)	glucokinase (EC 2.7.1.2)	
254780281	537021.9.peg.173	cytochrome-c oxidase assembly factor protein	Cytochrome oxidase biogenesis protein Sco1/SenC/PrrC, putative copper metallochaperone	cytochrome-c oxidase assembly factor protein	has signal peptide
254780282	537021.9.peg.174	putative transcription regulator protein	Transcriptional regulator, LysR family	putative transcription regulator protein	
254780283	537021.9.peg.175	thioredoxin reductase (NADPH) protein	Thioredoxin reductase (EC 1.8.1.9)	thioredoxin reductase (NADPH) protein (EC 1.8.1.9)	
254780284	537021.9.peg.176	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780285	537021.9.peg.177	arginyl-tRNA synthetase	Arginyl-tRNA synthetase (EC 6.1.1.19)	arginyl-tRNA synthetase (EC 6.1.1.19)	
254780286	537021.9.peg.178	deoxyguanosinetriphosphate triphosphohydrolase-like protein	Deoxyguanosinetriphosphate triphosphohydrolase (EC 3.1.5.1)	dGTP triphosphohydrolase (EC 3.1.5.1)	
254780287	537021.9.peg.179	iron-sulfur cluster assembly accessory protein	probable iron binding protein from the HesB_IscA_SufA family	iron-sulfur cluster assembly accessory protein	
254780288	537021.9.peg.180	exodeoxyribonuclease III protein	Exodeoxyribonuclease III (EC 3.1.11.2)	exodeoxyribonuclease III protein (EC 3.1.11.2)	

254780289	537021.9.peg.181	RNA polymerase sigma factor RpoD	RNA polymerase sigma factor RpoD	RNA polymerase sigma factor RpoD	
254780290	537021.9.peg.182	quinone oxidoreductase	Quinone oxidoreductase (EC 1.6.5.5)	quinone oxidoreductase	
254780291	537021.9.peg.183	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780292	537021.9.peg.184	50S ribosomal protein L13	LSU ribosomal protein L13p (L13Ae)	50S ribosomal protein L13	start point might be wrong
254780293	537021.9.peg.185	30S ribosomal protein S9	SSU ribosomal protein S9p (S16e)	30S ribosomal protein S9	
254780294	537021.9.peg.187	N-acetyl-gamma-glutamyl-phosphate reductase	N-acetyl-gamma-glutamyl-phosphate reductase (EC 1.2.1.38)	N-acetyl-gamma-glutamyl-phosphate reductase (EC 1.2.1.38)	
254780295	537021.9.peg.188	tRNA pseudouridine synthase A	tRNA pseudouridine synthase A (EC 4.2.1.70)	tRNA pseudouridine synthase A (EC 4.2.1.70)	
255764462	537021.9.peg.189	methionyl-tRNA formyltransferase	Methionyl-tRNA formyltransferase (EC 2.1.2.9)	methionyl-tRNA formyltransferase (EC 2.1.2.9)	
254780297	537021.9.peg.190	peptide deformylase	Peptide deformylase (EC 3.5.1.88)	peptide deformylase (EC 3.5.1.88)	
254780298	537021.9.peg.192	putative transmembrane protein	hypothetical multidrug efflux transporter protein	unknown	transmembrane protein
254780299	537021.9.peg.193	acyl-CoA dehydrogenase protein	Acyl-CoA dehydrogenase (EC 1.3.99.3)	acyl-CoA dehydrogenase protein (EC 1.3.99.3)	
254780300	537021.9.peg.194	aspartate carbamoyltransferase catalytic subunit	Aspartate carbamoyltransferase (EC 2.1.3.2)	aspartate carbamoyltransferase catalytic subunit (EC 2.1.3.2)	
254780301	537021.9.peg.195	dihydroorotase	Dihydroorotase (EC 3.5.2.3)	dihydroorotase (EC 3.5.2.3)	
254780302	537021.9.peg.196	putative glycerol-3-phosphate acyltransferase PlsY	Acyl-phosphate:glycerol-3-phosphate O-acyltransferase PlsY	glycerol-3-phosphate acyltransferase	transmembrane protein
254780303	537021.9.peg.197	DNA protecting protein DprA	putative smf protein	DNA protecting protein DprA	1/3 of the protein
254780304	N/A	DNA protecting protein DprA	N/A	DNA protecting protein DprA	1/3 of the protein
254780305	537021.9.peg.198	hypothetical protein	hypothetical protein	DNA protecting protein DprA	1/3 of the protein
254780306	537021.9.peg.199	DNA topoisomerase I	DNA topoisomerase I (EC 5.99.1.2)	DNA topoisomerase I (EC 5.99.1.2)	
254780307	537021.9.peg.200	aspartate-semialdehyde dehydrogenase	Aspartate-semialdehyde dehydrogenase (EC 1.2.1.11)	aspartate-semialdehyde dehydrogenase (EC 1.2.1.11)	
254780308	537021.9.peg.201	putative membrane-bound lytic murein transglycosylase signal peptide protein	Membrane-bound lytic murein transglycosylase B precursor (EC 3.2.1.-)	lytic murein transglycosylase protein	has signal peptide
254780309	537021.9.peg.202	comF family protein	Competence protein comF	Competence protein comF	1/2 of the protein
254780310	537021.9.peg.203	hypothetical protein	hypothetical protein	Competence protein comF	1/2 of the protein
254780311	537021.9.peg.205	hypothetical protein	Expressed protein	peroxiredoxin	
254780312	537021.9.peg.206	response regulator receiver protein	Response regulator	two component system regulator protein	
254780313	537021.9.peg.207	ribosomal RNA methyltransferase RrmJ/FtsJ	Cell division protein FtsJ / Ribosomal RNA large subunit methyltransferase E (EC 2.1.1.-)	ribosomal RNA methyltransferase RrmJ/FtsJ (EC 2.1.1.-)	
254780314	537021.9.peg.208	outer membrane protein	porin outer membrane protein	outer membrane protein	has signal peptide
254780315	537021.9.peg.209	hypothetical protein	hypothetical protein	unknown	
254780316	537021.9.peg.210	phenylalanyl-tRNA synthetase subunit beta	Phenylalanyl-tRNA synthetase beta chain (EC 6.1.1.20)	phenylalanyl-tRNA synthetase subunit beta (EC 6.1.1.20)	
254780317	537021.9.peg.211	phenylalanyl-tRNA synthetase, alpha subunit	Phenylalanyl-tRNA synthetase alpha chain (EC 6.1.1.20)	phenylalanyl-tRNA synthetase, alpha subunit (EC 6.1.1.20)	
254780318	537021.9.peg.212	ribosomal protein L20	LSU ribosomal protein L20p	ribosomal protein L20	
254780319	537021.9.peg.213	50S ribosomal protein L35	LSU ribosomal protein L35p	50S ribosomal protein L35	
254780320	537021.9.peg.214	translation initiation factor IF-3	Translation initiation factor 3	translation initiation factor IF-3	
254780321	537021.9.peg.215	GTP-binding protein LepA	Translation elongation factor LepA	GTP-binding protein LepA	
254780322	537021.9.peg.216	SAM-dependent methyltransferase protein	probable SAM-dependent methyltransferase protein	SAM-dependent methyltransferase protein	
254780323	537021.9.peg.217	ATP/ADP translocase	Nucleotide related transporter , NTT family	ATP/ADP translocase	transmembrane protein
254780324	537021.9.peg.219	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780325	537021.9.peg.220	mutator MutT protein	5-methyl-dCTP pyrophosphohydrolase (EC 3.6.1.-)	mutator MutT protein (EC 3.6.1.-)	
254780326	537021.9.peg.221	bifunctional ornithine acetyltransferase/N-acetylglutamate synthase protein	Glutamate N-acetyltransferase (EC 2.3.1.35) / N-acetylglutamate synthase (EC 2.3.1.1)	bifunctional ornithine acetyltransferase/N-acetylglutamate synthase	
254780327	537021.9.peg.222	preprotein translocase subunit SecA	Protein export cytoplasm protein SecA ATPase RNA helicase (TC 3.A.5.1.1)	preprotein translocase subunit SecA	
254780328	537021.9.peg.223	UDP-glucose 4-epimerase	UDP-glucose 4-epimerase (EC 5.1.3.2)	UDP-glucose 4-epimerase (EC 5.1.3.2)	
254780329	537021.9.peg.225	30S ribosomal protein S6	SSU ribosomal protein S6p	30S ribosomal protein S6	
254780330	537021.9.peg.226	30S ribosomal protein S18	SSU ribosomal protein S18p	30S ribosomal protein S18	
254780331	537021.9.peg.228	50S ribosomal protein L9	LSU ribosomal protein L9p	50S ribosomal protein L9	
254780332	537021.9.peg.229	replicative DNA helicase	Replicative DNA helicase (EC 3.6.1.-)	replicative DNA helicase (EC 3.6.1.-)	
254780333	537021.9.peg.230	alanine racemase	Alanine racemase (EC 5.1.1.1)	alanine racemase (EC 5.1.1.1)	

254780334	537021.9.peg.231	DNA repair protein RadA	DNA repair protein RadA	DNA repair protein RadA	
N/A	537021.9.peg.232	N/A	hypothetical protein	unknown	
254780335	N/A	colicin V production protein	N/A	colicin V production protein	transmembrane protein
254780336	537021.9.peg.234	amidophosphoribosyltransferase	Amidophosphoribosyltransferase (EC 2.4.2.14)	amidophosphoribosyltransferase (EC 2.4.2.14)	
254780337	537021.9.peg.235	oxidoreductase protein	putative short-chain dehydrogenase/reductase	oxidoreductase protein	
254780338	537021.9.peg.236	hypothetical protein	hypothetical protein	unknown	transmembrane protein
N/A	537021.9.peg.237	N/A	hypothetical protein	unknown	transmembrane protein
254780339	537021.9.peg.238	hypothetical protein	hypothetical protein	unknown	
254780340	537021.9.peg.239	proline/glycine betaine ABC transporter, ATP-binding protein	L-proline glycine betaine ABC transport system permease protein ProV (TC 3.A.1.12.1)	ABC-type importer for Choline (vitamin Bp), ATPase component	
254780341	537021.9.peg.240	proline/glycine betaine ABC transporter, permease protein	L-proline glycine betaine ABC transport system permease protein ProW (TC 3.A.1.12.1)	ABC-type importer for Choline (vitamin Bp), transmembrane component	transmembrane protein
254780342	537021.9.peg.241	substrate-binding region of ABC-type glycine betaine transport system	putative glycine betaine-binding ABC transporter protein	ABC-type importer for Choline (vitamin Bp), substrate binding component	has signal peptide
254780343	537021.9.peg.242	probable cation efflux protein	Cobalt-zinc-cadmium resistance protein	cation efflux protein	transmembrane protein
254780344	537021.9.peg.243	7-cyano-7-deazaguanine reductase	NADPH dependent preQ0 reductase	7-cyano-7-deazaguanine reductase	
254780345	537021.9.peg.244	transcription antitermination protein NusB	Transcription termination protein NusB	transcription antitermination protein NusB	
254780346	537021.9.peg.245	riboflavin synthase subunit beta	6,7-dimethyl-8-ribityllumazine synthase (EC 2.5.1.9)	riboflavin synthase subunit beta (EC 2.5.1.9)	
254780347	537021.9.peg.246	riboflavin synthase subunit alpha	Riboflavin synthase alpha chain (EC 2.5.1.9)	riboflavin synthase subunit alpha (EC 2.5.1.9)	
254780348	537021.9.peg.247	5-amino-6-(5-phosphoribosylamino)uracil reductase/diaminohydroxyphosphoribosylaminopyrimidine	Diaminohydroxyphosphoribosylaminopyrimidine deaminase (EC 3.5.4.26) / 5-amino-6-(5-phosphoribosylamino)uracil reductase (EC 1.1.1.193)	5-amino-6-(5-phosphoribosylamino)uracil reductase/diaminohydroxyphosphoribosylaminopyrimidine (EC 3.5.4.26) (EC 1.1.1.193)	
254780349	537021.9.peg.249	serine hydroxymethyltransferase	Serine hydroxymethyltransferase (EC 2.1.2.1)	serine hydroxymethyltransferase (EC 2.1.2.1)	
254780350	537021.9.peg.250	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780351	537021.9.peg.251	MarR family transcriptional regulator	Transcriptional regulator, MarR family	MarR family transcriptional regulator	
255764463	537021.9.peg.253	delta-aminolevulinic acid dehydratase	Porphobilinogen synthase (EC 4.2.1.24)	delta-aminolevulinic acid dehydratase	
254780353	537021.9.peg.255	DNA topoisomerase IV subunit A	Topoisomerase IV subunit A (EC 5.99.1.-)	DNA topoisomerase IV subunit A (EC 5.99.1.-)	
254780354	537021.9.peg.256	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780355	537021.9.peg.257	type II citrate synthase	Citrate synthase (si) (EC 2.3.3.1)	type II citrate synthase (EC 2.3.3.1)	
254780356	537021.9.peg.258	hypothetical protein	hypothetical protein	DNA uptake, ComEC/Rec2-related protein	transmembrane protein
254780357	537021.9.peg.259	hypothetical protein	DNA internalization-related competence protein ComEC/Rec2	DNA uptake, ComEC/Rec2-related protein	transmembrane protein
255764464	537021.9.peg.260	Cytidine/deoxycytidylate deaminase, zinc-binding region	tRNA-specific adenosine-34 deaminase (EC 3.5.4.-)	adenosine deaminase (EC 3.5.4.-)	
254780359	537021.9.peg.261	GTP cyclohydrolase II protein (riboflavin biosynthesis)	3,4-dihydroxy-2-butanone 4-phosphate synthase / GTP cyclohydrolase II (EC 3.5.4.25)	GTP cyclohydrolase II protein (EC 3.5.4.25)	
254780360	537021.9.peg.262	protoheme IX farnesyltransferase	Heme O synthase, protoheme IX farnesyltransferase (EC 2.5.1.-) COX10-CtaB	protoheme IX farnesyltransferase (EC 2.5.1.-)	transmembrane protein
254780361	537021.9.peg.263	ribosomal protein L32	LSU ribosomal protein L32p	ribosomal protein L32	
255764465	537021.9.peg.264	Na ⁺ /H ⁺ antiporter NhaA	Na ⁺ /H ⁺ antiporter NhaA type	Na ⁺ /H ⁺ antiporter NhaA	transmembrane protein
254780363	537021.9.peg.265	ferredoxin-NADP ⁺ reductase protein	Flavodoxin reductases (ferredoxin-NADPH reductases) family 1	ferredoxin-NADP ⁺ reductase protein	
254780364	537021.9.peg.266	ferredoxin-NADP ⁺ reductase protein	Ferredoxin--NADP(+) reductase (EC 1.18.1.2)	ferredoxin-NADP ⁺ reductase protein	
254780365	537021.9.peg.267	UTP-glucose-1-phosphate uridylyltransferase protein	UTP--glucose-1-phosphate uridylyltransferase (EC 2.7.7.9)	UTP-glucose-1-phosphate uridylyltransferase (EC 2.7.7.9)	
255764466	537021.9.peg.268	hypothetical protein	Periplasmic thiol:disulfide oxidoreductase DsbB, required for DsbA reoxidation	Disulfide bond formation protein DsbB	transmembrane protein
254780367	537021.9.peg.269	ribonuclease protein	Ribonuclease BN (EC 3.1.-.-)	ribonuclease protein (EC 3.1.-.-)	transmembrane protein
254780368	537021.9.peg.270	electron transfer flavoprotein beta subunit	Electron transfer flavoprotein, beta subunit	electron transfer flavoprotein beta subunit	
254780369	537021.9.peg.271	Electron transfer flavoprotein alpha subunit	Electron transfer flavoprotein, alpha subunit	Electron transfer flavoprotein alpha subunit	
254780370	537021.9.peg.272	argininosuccinate lyase	Argininosuccinate lyase (EC 4.3.2.1)	argininosuccinate lyase (EC 4.3.2.1)	
254780371	537021.9.peg.273	diaminopimelate decarboxylase protein	Diaminopimelate decarboxylase (EC 4.1.1.20)	diaminopimelate decarboxylase protein (EC 4.1.1.20)	
254780372	537021.9.peg.274	flagellar biosynthesis protein FliP	Flagellar biosynthesis protein FliP	flagellar biosynthesis protein FliP	transmembrane protein
254780373	537021.9.peg.275	flagellar basal body-associated protein FliL	Flagellar biosynthesis protein fliL	flagellar basal body-associated protein FliL	transmembrane protein
254780374	537021.9.peg.276	flagellar basal body L-ring protein	Flagellar L-ring protein FliH	flagellar basal body L-ring protein	has signal peptide

254780375	537021.9.peg.277	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780376	537021.9.peg.278	flagellar basal body P-ring protein	Flagellar P-ring protein FlgI	flagellar basal body P-ring protein	has signal peptide
254780377	537021.9.peg.279	flagellar basal body P-ring biosynthesis protein FlgA	Flagellar basal-body P-ring formation protein flgA	flagellar basal body P-ring biosynthesis protein	has signal peptide
254780378	537021.9.peg.280	flagellar basal body rod protein FlgG	Flagellar basal-body rod protein FlgG	flagellar basal body rod protein FlgG	extracellular, flagellar component, exported by flagellar assembly machinery
254780379	537021.9.peg.281	flagellar hook-basal body protein FliE	Flagellar hook-basal body complex protein FliE	flagellar hook-basal body protein FliE	periplasmic, flagellar component, transported by flagellar
254780380	537021.9.peg.282	flagellar basal body rod protein FlgC	Flagellar basal-body rod protein FlgC	flagellar basal body rod protein FlgC	periplasmic, flagellar component, transported by flagellar
254780381	537021.9.peg.283	flagellar basal body rod protein FlgB	Flagellar basal-body rod protein FlgB	flagellar basal body rod protein FlgB	periplasmic, flagellar component, transported by flagellar
254780382	537021.9.peg.284	ATP dependent RNA helicase protein	ATP-dependent RNA helicase Atu1833	ATP dependent RNA helicase protein	
254780383	537021.9.peg.285	endonuclease III	Endonuclease III (EC 4.2.99.18)	endonuclease III (EC 4.2.99.18)	
254780384	537021.9.peg.286	serralysin	hypothetical protein	zinc-dependant protease	
255764467	537021.9.peg.287	Type I secretion system ATPase, PrtD	hypothetical protein	Type I secretion system ATPase and permease, PrtD, ABC-exporter	transmembrane protein
254780386	537021.9.peg.288	Type I secretion membrane fusion protein, HlyD	Alkaline protease secretion protein AprE	Type I secretion membrane fusion protein, HlyD, ABC-type-exporter	transmembrane protein
254780387	537021.9.peg.289	C4-dicarboxylate transporter DctA	C4-dicarboxylate transport protein	Na ⁺ /H ⁺ -dicarboxylate symporter	transmembrane protein
254780388	537021.9.peg.290	hypothetical protein	hypothetical protein	von Willebrand factor type A fused with TadE/F involved in pilus assembly	transmembrane protein, but might be processed by cpaA and become periplasmic
254780389	537021.9.peg.291	hypothetical protein	hypothetical protein	unknown	
254780390	537021.9.peg.292	nucleoside diphosphate kinase	Nucleoside diphosphate kinase (EC 2.7.4.6)	nucleoside diphosphate kinase (EC 2.7.4.6)	
254780391	537021.9.peg.293	DNA polymerase III subunit chi	DNA polymerase III chi subunit (EC 2.7.7.7)	DNA polymerase III subunit chi (EC 2.7.7.7)	
254780392	537021.9.peg.294	leucyl aminopeptidase	Cytosol aminopeptidase PepA (EC 3.4.11.1)	leucyl aminopeptidase (EC 3.4.11.1)	
255764468	537021.9.peg.295	permease protein	hypothetical protein	ABC-type exporter for lipopolysaccharide, transmembrane component	transmembrane protein
255764469	537021.9.peg.296	putative permease protein	putative permease protein	ABC-type exporter for lipopolysaccharide, transmembrane component	transmembrane protein
254780395	537021.9.peg.297	organic solvent tolerance protein	Outer membrane protein Imp, required for envelope biogenesis / Organic solvent tolerance protein precursor	ABC-type exporter for lipopolysaccharide, auxiliary component	has signal peptide
254780396	537021.9.peg.299	peptidyl-prolyl cis-trans isomerase protein	Survival protein SurA precursor (Peptidyl-prolyl cis-trans isomerase SurA) (EC 5.2.1.8)	peptidyl-prolyl cis-trans isomerase protein (EC 5.2.1.8)	has signal peptide
254780397	537021.9.peg.300	4-hydroxythreonine-4-phosphate dehydrogenase	4-hydroxythreonine-4-phosphate dehydrogenase (EC 1.1.1.262)	4-hydroxythreonine-4-phosphate dehydrogenase (EC 1.1.1.262)	
254780398	537021.9.peg.301	dimethyladenosine transferase	Dimethyladenosine transferase (EC 2.1.1.-)	dimethyladenosine transferase (EC 2.1.1.-)	
254780399	537021.9.peg.302	DNA mismatch repair protein	DNA mismatch repair protein MutL	DNA mismatch repair protein	
254780400	537021.9.peg.303	hypothetical protein	hypothetical protein	unknown	
254780401	537021.9.peg.304	tetraacyldisaccharide 4'-kinase	Tetraacyldisaccharide 4'-kinase (EC 2.7.1.130)	tetraacyldisaccharide 4'-kinase (EC 2.7.1.130)	transmembrane protein
254780402	537021.9.peg.305	3-deoxy-D-manno-octulosonic-acid transferase	3-deoxy-D-manno-octulosonic-acid transferase (EC 2.-.-.-)	3-deoxy-D-manno-octulosonic-acid transferase (EC 2.-.-.-)	transmembrane protein
254780403	537021.9.peg.306	hypothetical protein	Uncharacterized protein, Bsl7517 homolog	unknown	
254780404	537021.9.peg.307	inositol monophosphatase family protein	FIG043197: Inositol monophosphatase family protein	inositol monophosphatase family protein	
254780405	537021.9.peg.308	hypothetical protein	hypothetical protein	N6-adenine-specific methylase (EC 2.1.1.-)	
254780406	537021.9.peg.309	putative ribosomal large subunit pseudouridine synthase B	Ribosomal large subunit pseudouridine synthase B (EC 4.2.1.70) LSU Psi2605	ribosomal large subunit pseudouridine synthase B (EC 4.2.1.70)	
254780407	537021.9.peg.310	hypothetical protein	hypothetical protein	unknown	
254780408	537021.9.peg.311	hypothetical protein	hypothetical protein	unknown	

254780409	537021.9.peg.312	ribose-phosphate pyrophosphokinase	Ribose-phosphate pyrophosphokinase (EC 2.7.6.1)	ribose-phosphate pyrophosphokinase (EC 2.7.6.1)	
254780410	537021.9.peg.313	hypothetical protein	COG1565: Uncharacterized conserved protein	unknown	
254780411	537021.9.peg.314	prolipoprotein diacylglyceryl transferase	Prolipoprotein diacylglyceryl transferase (EC 2.4.99.-)	prolipoprotein diacylglyceryl transferase (EC 2.4.99.-)	transmembrane protein
254780412	537021.9.peg.315	hypothetical protein	hypothetical protein	unknown	
254780413	537021.9.peg.316	PAS/PAC sensor signal transduction histidine kinase	Sensory box histidine kinase	Signal transduction histidine kinase	
254780414	537021.9.peg.317	GMP synthase	GMP synthase [glutamine-hydrolyzing] (EC 6.3.5.2)	GMP synthase (EC 6.3.5.2)	
255764470	537021.9.peg.318	integral membrane protein TerC	CBS domain protein	integral membrane protein TerC + TlyC, Hemolysins and related proteins containing CBS domains	transmembrane protein
254780416	537021.9.peg.319	putative ferredoxin protein	4Fe-4S ferredoxin, iron-sulfur binding	putative ferredoxin protein	
254780417	537021.9.peg.320	transcriptional regulator CarD family protein	CarD-like transcriptional regulator	transcriptional regulator CarD family protein	
254780418	537021.9.peg.321	50S ribosomal protein L25/general stress protein Ctc	LSU ribosomal protein L25p	50S ribosomal protein L25/general stress protei	
254780419	537021.9.peg.322	aspartyl-tRNA synthetase	Aspartyl-tRNA synthetase (EC 6.1.1.12), Aspartyl-tRNA(Asn) synthetase (EC 6.1.1.23) unambiguous	aspartyl-tRNA synthetase (EC 6.1.1.12)	
254780420	537021.9.peg.323	carbamoyl phosphate synthase small subunit	Carbamoyl-phosphate synthase small chain (EC 6.3.5.5)	carbamoyl phosphate synthase small subunit (EC 6.3.5.5)	
254780421	537021.9.peg.324	hypothetical protein	hypothetical protein	unknown	transmembrane protein
255764471	537021.9.peg.325	GTP-binding protein EngA	GTP-binding protein EngA	GTP-binding protein EngA	
254780423	537021.9.peg.326	S-adenosylmethionine synthetase	S-adenosylmethionine synthetase (EC 2.5.1.6)	S-adenosylmethionine synthetase (EC 2.5.1.6)	
254780424	537021.9.peg.327	transcriptional regulator protein	Predicted transcriptional regulator	transcriptional regulator protein	
254780425	537021.9.peg.328	apolipoprotein N-acyltransferase	Apolipoprotein N-acyltransferase (EC 2.3.1.-) / Copper homeostasis protein CutE	apolipoprotein N-acyltransferase (EC 2.3.1.-)	transmembrane protein
254780426	537021.9.peg.329	hemolysin protein	Magnesium and cobalt efflux protein CorC	hemolysin protein, transporter associated protein	
254780427	537021.9.peg.331	hypothetical protein	FIG000233: metal-dependent hydrolase	metal binding protein	
255764472	537021.9.peg.332	2-methylthioadenine synthetase (miaB-like) protein	tRNA-i(6)A37 methylthiotransferase	2-methylthioadenine synthetase	
254780429	537021.9.peg.333	hypothetical protein	Inactive homolog of metal-dependent proteases, putative molecular chaperone	metal-dependant protease	
254780430	537021.9.peg.334	nitrogen fixation protein	NifU protein	Nfu/NifU protein, may involve in formation of Fe-S cluster	
254780431	537021.9.peg.335	hypothetical protein	hypothetical protein	cell cycle regulator	
254780432	537021.9.peg.336	acetylornithine transaminase protein	Acetylornithine aminotransferase (EC 2.6.1.11)	acetylornithine transaminase protein (EC 2.6.1.11)	
255764473	537021.9.peg.337	ornithine carbamoyltransferase	Ornithine carbamoyltransferase (EC 2.1.3.3)	ornithine carbamoyltransferase (EC 2.1.3.3)	
254780434	537021.9.peg.338	dihydroorotate dehydrogenase 2	Dihydroorotate dehydrogenase (EC 1.3.3.1)	dihydroorotate dehydrogenase (EC 1.3.3.1)	
254780435	537021.9.peg.339	peptidase S11, D-alanyl-D-alanine carboxypeptidase 1	D-alanyl-D-alanine carboxypeptidase (EC 3.4.16.4)	D-alanyl-D-alanine carboxypeptidase (EC 3.4.16.4)	has signal peptide
254780436	537021.9.peg.340	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780437	537021.9.peg.341	30S ribosomal protein S21	SSU ribosomal protein S21p	30S ribosomal protein S21	should be mapped to ribosome pathway in KEGG... maybe the start point is wrong... if not wrong, rosetta may help predict the fix helix
254780438	537021.9.peg.342	pyridoxine 5'-phosphate synthase	Pyridoxine 5'-phosphate synthase (EC 2.6.99.2)	pyridoxine 5'-phosphate synthase (EC 2.6.99.2)	
254780439	537021.9.peg.343	carbamoyl phosphate synthase large subunit	Carbamoyl-phosphate synthase large chain (EC 6.3.5.5)	carbamoyl phosphate synthase large subunit (EC 6.3.5.5)	
254780440	537021.9.peg.344	transcription elongation factor GreA	Transcription elongation factor GreA	transcription elongation factor GreA	
255764474	537021.9.peg.345	glycosyl transferase group 1	Glycosyltransferase	glycosyl transferase	
254780442	537021.9.peg.346	pyruvate kinase	Pyruvate kinase (EC 2.7.1.40)	pyruvate kinase (EC 2.7.1.40)	
254780443	537021.9.peg.347	hypothetical protein	conserved hypothetical protein	unknown	has signal peptide
254780444	537021.9.peg.350	bacteriophage repressor protein C1	Phage repressor	transcriptional regulator, phage repressor	
254780445	537021.9.peg.351	isoleucyl-tRNA synthetase	Isoleucyl-tRNA synthetase (EC 6.1.1.5)	isoleucyl-tRNA synthetase (EC 6.1.1.5)	
254780446	537021.9.peg.352	hypothetical protein	hypothetical protein	unknown	
254780448	537021.9.peg.353	hypothetical protein	hypothetical protein	unknown	transmembrane protein

254780449	537021.9.peg.354	hypothetical protein	hypothetical protein	unknown	
254780450	537021.9.peg.355	two-component sensor histidine kinase/response regulator hybrid protein	Sensory box histidine kinase/response regulator	two-component sensor histidine kinase/respons	transmembrane protein
254780451	537021.9.peg.356	aconitate hydratase	Aconitate hydratase (EC 4.2.1.3)	aconitate hydratase (EC 4.2.1.3)	
254780452	537021.9.peg.357	hypothetical protein	FIG005935: membrane protein	unknown	transmembrane protein
254780453	537021.9.peg.358	orotidine 5'-phosphate decarboxylase	Orotidine 5'-phosphate decarboxylase (EC 4.1.1.23)	orotidine 5'-phosphate decarboxylase (EC 4.1.1.23)	
254780454	537021.9.peg.359	DNA polymerase III subunit beta	DNA polymerase III beta subunit (EC 2.7.7.7)	DNA polymerase III subunit beta (EC 2.7.7.7)	
254780455	537021.9.peg.361	nicotinate phosphoribosyltransferase	Nicotinate phosphoribosyltransferase (EC 2.4.2.11)	nicotinate phosphoribosyltransferase (EC 2.4.2.11)	
254780456	537021.9.peg.362	30S ribosomal protein S1	SSU ribosomal protein S1p	30S ribosomal protein S1	
254780457	537021.9.peg.364	cytidylate kinase	Cytidylate kinase (EC 2.7.4.14)	cytidylate kinase (EC 2.7.4.14)	
254780458	537021.9.peg.365	3-phosphoshikimate 1-carboxyvinyltransferase	5-Enolpyruvylshikimate-3-phosphate synthase (EC 2.5.1.19)	3-phosphoshikimate 1-carboxyvinyltransferase (EC 2.5.1.19)	
254780459	537021.9.peg.366	hypothetical protein	hypothetical protein	unknown	
254780460	537021.9.peg.367	3-hydroxydecanoyl-(acyl carrier protein) dehydratase	3-hydroxydecanoyl-[acyl-carrier-protein] dehydratase (EC 4.2.1.60)	3-hydroxydecanoyl-(acyl carrier protein) synthase (EC 2.3.1.41)	
254780461	537021.9.peg.368	3-oxoacyl-(acyl carrier protein) synthase I	3-oxoacyl-[acyl-carrier-protein] synthase, KASI (EC 2.3.1.41)	3-oxoacyl-(acyl carrier protein) synthase I (EC 2.3.1.41)	
254780462	537021.9.peg.369	enoyl-(acyl carrier protein) reductase	Enoyl-[acyl-carrier-protein] reductase [NADH] (EC 1.3.1.9)	enoyl-(acyl carrier protein) reductase (EC 1.3.1.9)	
254780463	537021.9.peg.370	putative peptidoglycan binding protein	putative hemagglutinin protein	unknown	transmembrane protein
254780464	537021.9.peg.371	M16 family peptidase	Mitochondrial processing peptidase-like protein (EC 3.4.24.64)	Zn-dependent peptidases (EC 3.4.24.64)	
254780465	537021.9.peg.372	threonine synthase	Threonine synthase (EC 4.2.3.1)	threonine synthase (EC 4.2.3.1)	
254780466	537021.9.peg.373	putative modification methylase	DNA modification methyltransferase (EC 2.1.1.-)	DNA modification methylase (EC 2.1.1.-)	
254780467	537021.9.peg.375	exodeoxyribonuclease VII small subunit	Exodeoxyribonuclease VII small subunit (EC 3.1.11.6)	exodeoxyribonuclease VII small subunit (EC 3.1.11.6)	
254780468	537021.9.peg.376	sensory box/GGDEF family protein	Sensory box/GGDEF domain/EAL domain protein	signal transduction protein	transmembrane protein
254780469	537021.9.peg.377	zinc-binding protein	hypothetical protein	zinc-finger	
254780470	537021.9.peg.378	translation initiation factor IF-1	Translation initiation factor 1	translation initiation factor IF-1	
254780471	537021.9.peg.379	cytochrome o ubiquinol oxidase subunit IV	Cytochrome O ubiquinol oxidase subunit IV (EC 1.10.3.-)	cytochrome o ubiquinol oxidase subunit IV (EC 1.10.3.-)	transmembrane protein
254780472	537021.9.peg.380	cytochrome o ubiquinol oxidase subunit III	Cytochrome O ubiquinol oxidase subunit III (EC 1.10.3.-)	cytochrome o ubiquinol oxidase subunit III (EC 1.10.3.-)	transmembrane protein
254780473	537021.9.peg.381	cytochrome O ubiquinol oxidase subunit I	Cytochrome O ubiquinol oxidase subunit I (EC 1.10.3.-)	cytochrome O ubiquinol oxidase subunit I (EC 1.10.3.-)	transmembrane protein
254780474	537021.9.peg.382	ubiquinol oxidase, subunit II	Cytochrome O ubiquinol oxidase subunit II (EC 1.10.3.-)	ubiquinol oxidase, subunit II (EC 1.10.3.-)	transmembrane protein
254780475	537021.9.peg.383	50S ribosomal protein L33	LSU ribosomal protein L33p	50S ribosomal protein L33	
254780476	537021.9.peg.384	two component response regulator	PUTATIVE 2-COMPONENT RECEIVER DOMAIN PROTEIN	two component response regulator	
254780477	537021.9.peg.385	DSBA oxidoreductase	Periplasmic thiol:disulfide interchange protein Dsba	DSBA oxidoreductase	has signal peptide
254780478	537021.9.peg.386	hypothetical protein	Argininosuccinate synthase	unknown	
254780479	537021.9.peg.387	A/G-specific adenine glycosylase	A/G-specific adenine glycosylase (EC 3.2.2.-)	A/G-specific adenine glycosylase (EC 3.2.2.-)	
254780480	537021.9.peg.388	2'-deoxycytidine 5'-triphosphate deaminase	Deoxycytidine triphosphate deaminase (EC 3.5.4.13)	2'-deoxycytidine 5'-triphosphate deaminase (EC 3.5.4.13)	
254780481	537021.9.peg.389	50S ribosomal protein L34	hypothetical protein	50S ribosomal protein L34	
254780482	537021.9.peg.390	ribonuclease P	Ribonuclease P protein component (EC 3.1.26.5)	ribonuclease P (EC 3.1.26.5)	
254780483	537021.9.peg.391	putative inner membrane protein translocase component YidC	Inner membrane protein translocase component YidC, long form	inner membrane protein translocase component YidC	transmembrane protein
254780484	537021.9.peg.392	GTPase EngB	GTP-binding protein EngB	GTPase EngB	
N/A	537021.9.peg.393	N/A	Acetylglutamate kinase (EC 2.7.2.8)	Acetylglutamate kinase	1/2 of the protein
N/A	537021.9.peg.394	N/A	Acetylglutamate kinase (EC 2.7.2.8)	Acetylglutamate kinase	1/2 of the protein
254780485	537021.9.peg.395	biotin synthase	Biotin synthase (EC 2.8.1.6)	biotin synthase (EC 2.8.1.6)	
254780486	537021.9.peg.396	8-amino-7-oxononanoate synthase	8-amino-7-oxononanoate synthase (EC 2.3.1.47)	8-amino-7-oxononanoate synthase (EC 2.3.1.47)	
254780487	537021.9.peg.397	dithiobiotin synthetase	Dethiobiotin synthetase (EC 6.3.3.3)	dithiobiotin synthetase (EC 6.3.3.3)	
254780488	537021.9.peg.398	adenosylmethionine--8-amino-7-oxononanoate	Adenosylmethionine-8-amino-7-oxononanoate	Adenosylmethionine-8-amino-7-oxononanoate	

		transaminase	aminotransferase (EC 2.6.1.62)	aminotransferase (EC 2.6.1.62)	
254780489	537021.9.peg.399	3-oxoacyl-(acyl carrier protein) synthase II	Biotin synthesis protein bioZ	3-oxoacyl-(acyl carrier protein) synthase II	
254780490	537021.9.peg.400	site-specific tyrosine recombinase XerC	probable integrase/recombinase protein	site-specific tyrosine recombinase XerC	
254780491	537021.9.peg.401	Mrp protein	Mrp protein	unknown	
254780492	N/A	hypothetical protein	N/A	unknown	
254780829	537021.9.peg.402	ATP-dependent protease ATP-binding subunit	ATP-dependent hsl protease ATP-binding subunit HslU	ATP-dependent protease ATP-binding subunit	
254780828	537021.9.peg.403	ATP-dependent protease peptidase subunit	ATP-dependent protease HslV (EC 3.4.25.-)	ATP-dependent protease peptidase subunit (EC 3.4.25.-)	
254780827	537021.9.peg.404	pantothenate kinase	Pantothenate kinase (EC 2.7.1.33)	pantothenate kinase (EC 2.7.1.33)	
254780826	537021.9.peg.405	phosphoenolpyruvate carboxykinase	Phosphoenolpyruvate carboxykinase [ATP] (EC 4.1.1.49)	phosphoenolpyruvate carboxykinase (EC 4.1.1.49)	
255764476	537021.9.peg.406	two-component sensor histidine kinase protein	FIG056333: sensor	two-component sensor histidine kinase protein	transmembrane protein
254780824	537021.9.peg.407	hypothetical protein	ATPase YjeE, predicted to have essential role in cell wall biosynthesis / COG3178: Predicted phosphotransferase related to Ser/Thr protein kinases	ATPase or kinase	
254780823	537021.9.peg.408	double-strand break repair protein AddB	FIG041266: ATP-dependent nuclease subunit B	double-strand break repair protein AddB	
N/A	537021.9.peg.409	N/A	FIG061771: ATP-dependent nuclease subunit A	double-strand break repair helicase AddA	1/2 of the protein
N/A	537021.9.peg.410	N/A	FIG061771: ATP-dependent nuclease subunit A	double-strand break repair helicase AddA	1/2 of the protein
254780822	537021.9.peg.411	thioredoxin	Thioredoxin	thioredoxin	
254780821	537021.9.peg.412	FolC bifunctional protein	Dihydrofolate synthase (EC 6.3.2.12) / Folylpolyglutamate synthase (EC 6.3.2.17)	FolC bifunctional protein	
254780820	537021.9.peg.413	acetyl-CoA carboxylase subunit beta	Acetyl-coenzyme A carboxyl transferase beta chain (EC 6.4.1.2)	acetyl-CoA carboxylase subunit beta (EC 6.4.1.2)	
255764477	537021.9.peg.415	dephospho-CoA kinase	Dephospho-CoA kinase (EC 2.7.1.24)	dephospho-CoA kinase (EC 2.7.1.24)	
254780818	537021.9.peg.416	DNA polymerase III subunit epsilon	DNA polymerase III epsilon subunit (EC 2.7.7.7)	DNA polymerase III subunit epsilon (EC 2.7.7.7)	
254780817	537021.9.peg.417	preprotein translocase subunit SecB	Protein export cytoplasm chaperone protein (SecB, maintains protein to be exported in unfolded state)	preprotein translocase subunit SecB	
254780815	537021.9.peg.418	hypothetical protein	hypothetical protein	membrane associated transporter protein	transmembrane protein
254780814	537021.9.peg.419	DNA gyrase subunit B	DNA gyrase subunit B (EC 5.99.1.3)	DNA gyrase subunit B (EC 5.99.1.3)	
254780813	537021.9.peg.420	Maf-like protein	Maf/YceF/YhdE family protein	Maf-like protein, cell cycle control	
254780812	537021.9.peg.421	uroporphyrinogen decarboxylase	Uroporphyrinogen III decarboxylase (EC 4.1.1.37)	uroporphyrinogen decarboxylase (EC 4.1.1.37)	
254780811	537021.9.peg.422	hypothetical protein	Hypothetical membrane protein, possible involvement in cytochrome functioning/assembly	unknown	transmembrane protein
254780810	537021.9.peg.424	transcription termination factor Rho	Transcription termination factor Rho	transcription termination factor Rho	
254780809	537021.9.peg.425	tRNA modification GTPase TrmE	GTPase and tRNA-U34 5-formylation enzyme TrmE	tRNA modification GTPase TrmE	
254780808	537021.9.peg.426	tRNA uridine 5-carboxymethylaminomethyl modification enzyme GidA	tRNA uridine 5-carboxymethylaminomethyl modification enzyme GidA	tRNA uridine 5-carboxymethylaminomethyl modification enzyme GidA	
254780807	537021.9.peg.427	glucose-inhibited division protein B	probable glucose inhibited division protein B	glucose-inhibited division protein B	
254780806	537021.9.peg.428	chromosome partitioning protein A	Chromosome (plasmid) partitioning protein ParA / Sporulation initiation inhibitor protein Soj	chromosome partitioning protein A	
254780805	537021.9.peg.429	chromosome partitioning protein B	Chromosome (plasmid) partitioning protein ParB / Stage 0 sporulation protein J	chromosome partitioning protein B	
254780804	537021.9.peg.430	DNA polymerase III subunit delta	DNA polymerase III delta subunit (EC 2.7.7.7)	DNA polymerase III subunit delta (EC 2.7.7.7)	
254780803	537021.9.peg.431	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780802	537021.9.peg.432	leucyl-tRNA synthetase	Leucyl-tRNA synthetase (EC 6.1.1.4)	leucyl-tRNA synthetase (EC 6.1.1.4)	
254780801	537021.9.peg.433	hypothetical protein	Hypothetical protein YggS, proline synthase co-transcribed bacterial homolog PROSC	enzyme of TIM barrel fold	
254780800	537021.9.peg.434	hypothetical protein	hypothetical protein	unknown	
254780799	537021.9.peg.435	DNA translocase FtsK	Cell division protein FtsK	DNA translocase FtsK	transmembrane protein
254780798	537021.9.peg.436	possible lola type protein	outer membrane lipoprotein carrier protein LolA	ABC transporter for lipoprotein, auxiliary component	has signal peptide
254780797	537021.9.peg.437	hypothetical protein	hypothetical protein	Exonuclease III	
254780796	537021.9.peg.438	ribonuclease H	Ribonuclease HI (EC 3.1.26.4)	ribonuclease H (EC 3.1.26.4)	
254780795	537021.9.peg.439	homoserine kinase	Homoserine kinase (EC 2.7.1.39)	homoserine kinase (EC 2.7.1.39)	
254780794	537021.9.peg.440	tryptophanyl-tRNA synthetase	Tryptophanyl-tRNA synthetase (EC 6.1.1.2)	tryptophanyl-tRNA synthetase (EC 6.1.1.2)	
254780793	537021.9.peg.441	integral membrane protein MviN	hypothetical protein	integral membrane protein MviN	transmembrane protein

255764478	537021.9.peg.442	aminopeptidase protein	Aminopeptidase S (Leu, Val, Phe, Tyr preference) (EC 3.4.11.24)	aminopeptidase protein (EC 3.4.11.24)	
254780791	537021.9.peg.443	exodeoxyribonuclease VII large subunit	Exodeoxyribonuclease VII large subunit (EC 3.1.11.6)	exodeoxyribonuclease VII large subunit	
254780790	N/A	hypothetical protein	N/A	unknown	transmembrane protein
254780789	537021.9.peg.444	hypothetical protein	COG0779: clustered with transcription termination protein NusA	unknown	
254780788	537021.9.peg.445	transcription elongation factor NusA	Transcription termination protein NusA	transcription elongation/termination factor NusA	
254780787	537021.9.peg.446	translation initiation factor IF-2	Translation initiation factor 2	translation initiation factor IF-2	
254780786	537021.9.peg.447	ribosome-binding factor A	Ribosome-binding factor A	ribosome-binding factor A	
254780785	537021.9.peg.448	30S ribosomal protein S15	SSU ribosomal protein S15p (S13e)	30S ribosomal protein S15	
254780784	537021.9.peg.449	polynucleotide phosphorylase/polyadenylase	Polyribonucleotide nucleotidyltransferase (EC 2.7.7.8)	polynucleotide phosphorylase/polyadenylase (EC 2.7.7.8)	
254780783	537021.9.peg.450	transcription regulator protein	TRANSCRIPTION REGULATOR PROTEIN	ROS/MUCR transcription regulator	
255764479	537021.9.peg.452	hypothetical protein	hypothetical protein	unknown	
254780782	537021.9.peg.451	succinyl-diaminopimelate desuccinylase	N-succinyl-L,L-diaminopimelate desuccinylase (EC 3.5.1.18)	succinyl-diaminopimelate desuccinylase (EC 3.5.1.18)	
254780781	537021.9.peg.453	2,3,4,5-tetrahydropyridine-2,6-carboxylate N-succinyltransferase	2,3,4,5-tetrahydropyridine-2,6-dicarboxylate N-succinyltransferase (EC 2.3.1.117)	2,3,4,5-tetrahydropyridine-2,6-carboxylate N-succinyltransferase (EC 2.3.1.117)	
254780780	537021.9.peg.454	histidine triad (HIT) protein	histidine triad (HIT) protein	HIT family hydrolyase involve in cell cycle	
254780779	537021.9.peg.456	30S ribosomal protein S2	SSU ribosomal protein S2p (SAe)	30S ribosomal protein S2	
254780778	537021.9.peg.457	elongation factor Ts	Translation elongation factor Ts	elongation factor Ts	
254780777	537021.9.peg.458	uridylate kinase	Uridylate kinase (EC 2.7.4.-)	uridylate kinase (EC 2.7.4.-)	
254780776	537021.9.peg.459	ribosome recycling factor	Ribosome recycling factor	ribosome recycling factor	
254780775	537021.9.peg.460	undecaprenyl diphosphate synthase	Undecaprenyl pyrophosphate synthetase (EC 2.5.1.31)	undecaprenyl diphosphate synthase (EC 2.5.1.31)	
254780774	537021.9.peg.461	phosphatidate cytidyltransferase protein	Phosphatidate cytidyltransferase (EC 2.7.7.41)	phosphatidate cytidyltransferase protein (EC 2.7.7.41)	transmembrane protein
254780773	537021.9.peg.462	zinc metallopeptidase	Membrane-associated zinc metalloprotease	membrane-associated Zn-dependent protease	transmembrane protein
254780772	537021.9.peg.463	surface antigen (D15)	Outer membrane protein assembly factor YaeT precursor	YaeT in YaeT/YfiO complex for assembling proteins into outer membrane	has signal peptide
254780771	537021.9.peg.464	UDP-3-O-[3-hydroxymyristoyl] glucosamine N-acyltransferase	UDP-3-O-[3-hydroxymyristoyl] glucosamine N-acyltransferase (EC 2.3.1.-)	UDP-3-O-[3-hydroxymyristoyl] glucosamine N-acyltransferase (EC 2.3.1.-)	
254780770	537021.9.peg.465	(3R)-hydroxymyristoyl-ACP dehydratase	(3R)-hydroxymyristoyl-[acyl carrier protein] dehydratase (EC 4.2.1.-)	(3R)-hydroxymyristoyl-ACP dehydratase (EC 4.2.1.-)	
255764481	537021.9.peg.466	UDP-N-acetylglucosamine acyltransferase	Acyl-[acyl-carrier-protein]-UDP-N-acetylglucosamine O-acyltransferase (EC 2.3.1.129)	UDP-N-acetylglucosamine acyltransferase (EC 2.3.1.129)	
254780768	537021.9.peg.467	hypothetical protein	Protein of unknown function DUF1009 clustered with KDO2-Lipid A biosynthesis genes	unknown	
254780767	537021.9.peg.468	lipid-A-disaccharide synthase	Lipid-A-disaccharide synthase (EC 2.4.1.182)	lipid-A-disaccharide synthase (EC 2.4.1.182)	
254780766	537021.9.peg.469	recombination protein F	DNA recombination and repair protein RecF	DNA recombination protein F, RecF	
254780765	537021.9.peg.470	3-deoxy-manno-octulosonate cytidyltransferase	3-deoxy-manno-octulosonate cytidyltransferase (EC 2.7.7.38)	3-deoxy-manno-octulosonate cytidyltransferase (EC 2.7.7.38)	
254780764	537021.9.peg.471	hypothetical protein	hypothetical protein	signal transduction protein	has signal peptide
N/A	537021.9.peg.472	N/A	DNA polymerase III subunits gamma and tau (EC 2.7.7.7)	DNA polymerase III subunits gamma and tau	1/2 of the protein
N/A	537021.9.peg.473	N/A	hypothetical protein	DNA polymerase III subunits gamma and tau	1/2 of the protein
254780763	537021.9.peg.474	hypothetical protein	FIG000557: hypothetical protein	unknown	
254780762	537021.9.peg.475	recombination protein RecR	Recombination protein RecR	recombination protein RecR	
N/A	537021.9.peg.476	N/A	virulence factor MviN-like protein	integral membrane protein MviN	transmembrane protein, 1/2 of the protein
N/A	537021.9.peg.477	N/A	virulence factor MviN homolog	integral membrane protein MviN	transmembrane protein, 1/2 of the protein
254780761	537021.9.peg.478	probable FAD-dependent oxidoreductase protein	D-2-hydroxyglutarate dehydrogenase	glycolate oxidase subunit GlcD	
254780760	537021.9.peg.479	hypothetical protein	YrdC/Sua5 family protein, required for threonylcarbamoyladenosine (t(6)A) formation in tRNA	translational regulation protein	
254780759	537021.9.peg.480	hypothetical protein	hypothetical protein	unknown	has signal peptide

254780758	537021.9.peg.481	hypothetical protein	Hypothetical metal-binding enzyme, YcbL homolog	zn-depedent hydrolase	
254780757	537021.9.peg.482	glycyl-tRNA synthetase subunit alpha	Glycyl-tRNA synthetase alpha chain (EC 6.1.1.14)	glycyl-tRNA synthetase subunit alpha (EC 6.1.1.14)	
255764482	537021.9.peg.483	methyltransferase protein	COG4123: Predicted O-methyltransferase	O-methyltransferase	
254780755	537021.9.peg.484	octaprenyl-diphosphate synthase protein	Octaprenyl-diphosphate synthase (EC 2.5.1.-) / Dimethylallyltransferase (EC 2.5.1.1) / Geranyltranstransferase (farnesylidiphosphate synthase) (EC 2.5.1.10) / Geranylgeranyl pyrophosphate synthetase (EC 2.5.1.29)	octaprenyl-diphosphate synthase protein (EC 2.5.1.-)	
254780754	537021.9.peg.485	inorganic polyphosphate/ATP-NAD kinase	NAD kinase (EC 2.7.1.23)	inorganic polyphosphate/ATP-NAD kinase (EC 2.7.1.23)	
254780753	537021.9.peg.486	peptide chain release factor 2	Peptide chain release factor 2; programmed frameshift-containing	peptide chain release factor 2	
254780752	537021.9.peg.487	penicillin binding peptidoglycan synthetase protein	Multimodular transpeptidase-transglycosylase (EC 2.4.1.129) (EC 3.4.-.-)	penicillin binding peptidoglycan synthetase (EC 2.4.1.-) (EC 3.4.-.-)	transmembrane protein
254780751	537021.9.peg.488	ribonuclease E	Cytoplasmic axial filament protein CafA and Ribonuclease G (EC 3.1.4.-)	ribonuclease E	
254780750	537021.9.peg.489	DNA mismatch repair protein	DNA mismatch repair protein MutS	DNA mismatch repair protein, MutS	
254780749	537021.9.peg.490	lipoprotein signal peptidase transmembrane	Lipoprotein signal peptidase (EC 3.4.23.36)	Lipoprotein signal peptidase (EC 3.4.23.36)	transmembrane protein
254780748	537021.9.peg.491	integration host factor, beta subunit	Integration host factor beta subunit	integration host factor, beta subunit	
254780747	537021.9.peg.492	putative protease IV transmembrane protein	macromolecule metabolism; macromolecule degradation; degradation of proteins, peptides, glycopeptides	protease IV transmembrane protein	has signal peptide
254780746	537021.9.peg.494	hypothetical protein	hypothetical protein	outer membrane protein, involve in lipopolysaccharide export	transmembrane protein
254780745	537021.9.peg.495	OstA family protein	hypothetical protein	outer membrane protein, involve in lipopolysaccharide export	has signal peptide
254780744	537021.9.peg.496	ABC transporter nucleotide binding/ATPase protein	Lipopolysaccharide ABC transporter, ATP-binding protein LptB	ABC-type exporter for lipopolysaccharide, ATPase component	
254780743	537021.9.peg.497	putative uracil-DNA glycosylase	Uracil-DNA glycosylase, family 4	Uracil-DNA glycosylase	
254780742	537021.9.peg.498	hypothetical protein	Carboxynorspermidine dehydrogenase, putative (EC 1.1.1.-)	Saccharopine dehydrogenase and related protein	
254780741	537021.9.peg.499	carboxynorspermidine decarboxylase	Carboxynorspermidine decarboxylase, putative (EC 4.1.1.-)	carboxynorspermidine decarboxylase (EC 4.1.1.-)	
254780740	537021.9.peg.500	peptidase S16 lon domain protein	Uncharacterized protein, similar to the N-terminal domain of Lon protease	ATP-dependent protease, La	
254780739	537021.9.peg.501	hypothetical protein	protein of unknown function DUF343	unknown	
255764483	537021.9.peg.502	hypothetical protein	hypothetical protein	unknown	
254780737	537021.9.peg.503	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780736	537021.9.peg.504	hypothetical protein	Flp pilus assembly protein, pilin Flp	Flp pilus assembly protein, flp	transmembrane protein, but might be processed by cpaA and become periplasmic
254780735	537021.9.peg.505	hypothetical protein	hypothetical protein	Flp pilus assembly protein,flp	has signal peptide
254780734	537021.9.peg.506	Flp/Fap pilin component	hypothetical protein	Flp pilus assembly protein, flp	transmembrane protein, but might be processed by cpaA and become periplasmic
254780733	537021.9.peg.507	hypothetical protein	hypothetical protein	Flp pilus assembly protein, flp	transmembrane protein, but might be processed by cpaA and become periplasmic
254780732	537021.9.peg.508	hypothetical protein	Flp pilus assembly protein, pilin Flp	Flp pilus assembly protein, flp	transmembrane protein, but might be processed by cpaA and become periplasmic
254780730	537021.9.peg.510	hypothetical protein	Flp pilus assembly protein, pilin Flp	Flp pilus assembly protein, flp	transmembrane protein, but might be processed

					by cpaA and become periplasmic
254780729	537021.9.peg.511	peptidase A24A prepilin type IV	Type IV prepilin peptidase TadV/CpaA	Flp pilus assembly protein CpaA	transmembrane protein
254780728	537021.9.peg.512	pilus assembly protein	Flp pilus assembly protein RcpC/CpaB	Flp pilus assembly protein CpaB	has signal peptide
254780727	537021.9.peg.513	putative pilus assembly protein	Type II/IV secretion system secretin RcpA/CpaC, associated with Flp pilus assembly	Flp pilus assembly protein, secretin CpaC	has signal peptide
255764485	537021.9.peg.514	hypothetical protein	Flp pilus assembly protein CpaD	Flp pilus assembly protein, ATPase CpaD	has signal peptide
254780725	537021.9.peg.515	response regulator receiver protein	Type II/IV secretion system ATPase TadZ/CpaE, associated with Flp pilus assembly	Flp pilus assembly protein, ATPase CpaE	
254780724	537021.9.peg.516	component of type IV pilus	Type II/IV secretion system ATP hydrolase TadA/VirB11/CpaF, TadA subfamily	Flp pilus assembly protein, ATPase CpaF	
254780723	537021.9.peg.517	hypothetical protein	hypothetical protein	Flp pilus assembly protein TadB	transmembrane protein
254780722	537021.9.peg.518	pilus assembly protein	Flp pilus assembly protein TadB	Flp pilus assembly protein TadB	transmembrane protein, 1/2 of the protein
254780721	537021.9.peg.519	pilus component protein	Type II/IV secretion system protein TadC, associated with Flp pilus assembly	Flp pilus assembly protein TadC	transmembrane protein
254780720	537021.9.peg.520	Ferroxidase	Ferritin-like protein 2	Ferroxidase	
254780719	537021.9.peg.521	zinc uptake ABC transporter, permease protein	Zinc ABC transporter, inner membrane permease protein ZnuB	ABC-type importer for zinc, transmembrane component	transmembrane protein
254780718	537021.9.peg.522	putative high-affinity zinc uptake system ATP-binding component of ABC transporter protein	Zinc ABC transporter, ATP-binding protein ZnuC	ABC-type importer for zinc, ATPase component	
254780717	537021.9.peg.524	zinc uptake ABC transporter	Zinc ABC transporter, periplasmic-binding protein ZnuA	ABC-type importer for zinc, substrate binding component	has signal peptide
254780716	537021.9.peg.525	6-phosphogluconate dehydrogenase	6-phosphogluconate dehydrogenase, decarboxylating (EC 1.1.1.44)	6-phosphogluconate dehydrogenase (EC 1.1.1.44)	
254780715	537021.9.peg.526	50S ribosomal protein L19	LSU ribosomal protein L19p	50S ribosomal protein L19	
254780714	537021.9.peg.527	tRNA (guanine-N(1)-)-methyltransferase	tRNA (Guanine37-N1) -methyltransferase (EC 2.1.1.31)	tRNA-(guanine-N1)-methyltransferase, trmD (EC 2.1.1.31)	
254780713	537021.9.peg.528	16S rRNA-processing protein	16S rRNA processing protein RimM	rimM, 16S rRNA-processing protein	
254780712	537021.9.peg.529	30S ribosomal protein S16	SSU ribosomal protein S16p	30S ribosomal protein S16	
254780711	537021.9.peg.530	signal recognition particle protein	Signal recognition particle, subunit Ffh SRP54 (TC 3.A.5.1.1)	signal recognition particle protein	
254780710	537021.9.peg.531	diaminopimelate epimerase	Diaminopimelate epimerase (EC 5.1.1.7)	diaminopimelate epimerase (EC 5.1.1.7)	
254780709	537021.9.peg.533	cell division protein	Signal recognition particle receptor protein FtsY (=alpha subunit) (TC 3.A.5.1.1)	cell division protein FtsY	
254780708	537021.9.peg.534	intracellular septation protein A	hypothetical protein	intracellular septation protein A	transmembrane protein
254780707	537021.9.peg.535	putative phosphate-binding periplasmic protein	Phosphate ABC transporter, periplasmic phosphate-binding protein PstS (TC 3.A.1.7.1)	ABC-type importer for phosphate, substrate binding component	has signal peptide
255764486	537021.9.peg.536	ABC transporter, membrane spanning protein	Phosphate transport system permease protein PstC (TC 3.A.1.7.1)	ABC-type importer for phosphate, transmembrane component	transmembrane protein
254780705	537021.9.peg.537	phosphate ABC transporter, permease protein PstA	Phosphate transport system permease protein PstA (TC 3.A.1.7.1)	ABC-type importer for phosphate, transmembrane component	transmembrane protein
254780704	537021.9.peg.538	ABC transporter, nucleotide binding/ATPase protein	Phosphate transport ATP-binding protein PstB (TC 3.A.1.7.1)	ABC-type importer for phosphate, ATPase component	
254780703	537021.9.peg.539	putative phosphate transport system protein	Phosphate transport system regulatory protein PhoU	phosphate transport system regulatory protein	
255764487	537021.9.peg.540	heat shock protein	Heat shock protein GrpE	heat shock protein	
254780701	537021.9.peg.541	putative two-component sensor histidine kinase transcriptional regulatory protein	Sensor histidine kinase (EC 2.7.3.-)	two-component sensor histidine kinase (EC 2.7.3.-)	transmembrane protein
254780700	537021.9.peg.543	serine protease DO-like protease	putative serine protease	serine protease DO-like protease	has signal peptide
254780699	537021.9.peg.544	hypothetical protein	hypothetical protein	unknown	
254780698	537021.9.peg.545	D-alanyl-D-alanine carboxypeptidase 1 penicillin-binding protein	D-alanyl-D-alanine carboxypeptidase (EC 3.4.16.4)	D-alanyl-D-alanine carboxypeptidase (EC 3.4.16.4)	has signal peptide
254780697	537021.9.peg.546	large conductance mechanosensitive channel protein	Large-conductance mechanosensitive channel	large conductance mechanosensitive channel	transmembrane protein
254780696	537021.9.peg.547	glutathione synthetase	Glutathione synthetase (EC 6.3.2.3)	glutathione synthetase (EC 6.3.2.3)	
254780695	537021.9.peg.548	flagellar MS-ring protein	Flagellar M-ring protein FlhF	flagellar MS-ring protein	transmembrane protein

254780694	537021.9.peg.549	probable transcriptional regulator protein, LuxR family	transcriptional regulator	transcriptional regulator	
254780693	537021.9.peg.550	transcriptional regulator protein	PUTATIVE TRANSCRIPTION REGULATOR PROTEIN	transcriptional regulator	
254780691	537021.9.peg.551	hypothetical protein	hypothetical protein	unknown	
254780690	537021.9.peg.552	flagellar biosynthesis protein FlhB	Flagellar biosynthesis protein FlhB	flagellar biosynthesis protein FlhB	transmembrane protein
254780689	537021.9.peg.553	flagellar motor switch protein G	Flagellar motor switch protein FlhG	flagellar motor switch protein G	
254780688	537021.9.peg.554	putative flagellar motor switch protein	putative flagellar motor switch protein	putative flagellar motor switch protein	
254780687	537021.9.peg.555	flagellar C-ring protein	Flagellar motor switch protein FlhM	flagellar C-ring protein	
255764488	537021.9.peg.556	flagellar motor protein MotA	Flagellar motor rotation protein MotA	flagellar motor protein MotA	transmembrane protein
254780685	537021.9.peg.557	flagellar basal body rod protein FlgF	Flagellar basal-body rod protein flgF	flagellar basal body rod protein FlgF	outermembrane, transported by flagellar assembly machinery
254780684	537021.9.peg.558	flagellum-specific ATP synthase	Flagellum-specific ATP synthase FlhI	flagellum-specific ATP synthase	
254780683	537021.9.peg.559	lipoprotein	lipoprotein precursor protein	Peptidase M23	
254780682	537021.9.peg.560	hypothetical protein	hypothetical protein	Peptidase M23	
255764489	537021.9.peg.561	stationary phase survival protein SurE	5-nucleotidase SurE (EC 3.1.3.5)	stationary phase survival protein SurE (EC 3.1.3.5)	
254780680	537021.9.peg.562	seryl-tRNA synthetase	Seryl-tRNA synthetase (EC 6.1.1.11)	seryl-tRNA synthetase (EC 6.1.1.11)	
254780679	N/A	hypothetical protein	N/A	unknown	transmembrane protein
254780677	537021.9.peg.564	hypothetical protein	Putative oligoketide cyclase/lipid transport protein	Oligoketide cyclase/lipid transport protein	
254780676	537021.9.peg.565	lipoyl synthase	Lipoate synthase	lipoyl synthase	
254780675	537021.9.peg.566	dihydrolipoamide dehydrogenase	Dihydrolipoamide dehydrogenase of pyruvate dehydrogenase complex (EC 1.8.1.4)	Dihydrolipoamide dehydrogenase of pyruvate dehydrogenase complex (EC 1.8.1.4)	
254780674	537021.9.peg.567	pyruvate dehydrogenase complex dihydrolipoamide acetyltransferase	Dihydrolipoamide acetyltransferase component of pyruvate dehydrogenase complex (EC 2.3.1.12)	pyruvate dehydrogenase complex dihydrolipoamide acetyltransferase (EC 2.3.1.12)	
254780673	537021.9.peg.569	pyruvate dehydrogenase subunit beta	Pyruvate dehydrogenase E1 component beta subunit (EC 1.2.4.1)	pyruvate dehydrogenase subunit beta (EC 1.2.4.1)	
255764490	537021.9.peg.570	dehydrogenase, E1 component	Pyruvate dehydrogenase E1 component alpha subunit (EC 1.2.4.1)	dehydrogenase, E1 component (EC 1.2.4.1)	
254780671	537021.9.peg.571	putative cell division protein	Septum formation initiator	cell division protein	transmembrane protein
254780670	537021.9.peg.572	phosphopyruvate hydratase	Enolase (EC 4.2.1.11)	phosphopyruvate hydratase (EC 4.2.1.11)	
254780669	537021.9.peg.573	2-dehydro-3-deoxyphosphooctonate aldolase	2-Keto-3-deoxy-D-manno-octulosonate-8-phosphate synthase (EC 2.5.1.55)	2-dehydro-3-deoxyphosphooctonate aldolase (EC 2.5.1.55)	
254780668	537021.9.peg.575	hypothetical protein	hypothetical protein	unknown	
254780666	537021.9.peg.576	Fmu (Sun) domain protein	16S rRNA m(5)C 967 methyltransferase (EC 2.1.1.-)	tRNA and rRNA cytosine-C5-methylase (EC 2.1.1.-)	
254780664	537021.9.peg.578	bifunctional phosphoribosylaminoimidazolecarboxamide formyltransferase/IMP cyclohydrolase	IMP cyclohydrolase (EC 3.5.4.10) / Phosphoribosylaminoimidazolecarboxamide formyltransferase (EC 2.1.2.3)	bifunctional phosphoribosylaminoimidazolecarboxamide formyltransferase/IMP cyclohydrolase (EC 1.4.1.2) (EC 1.4.1.2)	
254780663	537021.9.peg.579	carbonate dehydratase	Carbonic anhydrase (EC 4.2.1.1)	carbonate dehydratase (EC 4.2.1.1)	
254780662	537021.9.peg.580	NAD-glutamate dehydrogenase	NAD-specific glutamate dehydrogenase (EC 1.4.1.2), large form	NAD-glutamate dehydrogenase (EC 1.4.1.2)	
254780661	537021.9.peg.581	exonuclease I	Exodeoxyribonuclease I (EC 3.1.11.1)	exonuclease I (EC 3.1.11.1)	
254780660	537021.9.peg.583	hypothetical protein	FIG000859: hypothetical protein	unknown	
254780659	537021.9.peg.584	hypothetical protein	FIG006542: Phosphoesterase	Calcineurin-like phosphoesterase	
254780658	537021.9.peg.585	5-formyltetrahydrofolate cyclo-ligase	5-formyltetrahydrofolate cyclo-ligase (EC 6.3.3.2)	5-formyltetrahydrofolate cyclo-ligase (EC 6.3.3.2)	1/2 of the protein
254780657	537021.9.peg.586	hypothetical protein	hypothetical protein	5-formyltetrahydrofolate cyclo-ligase (EC 6.3.3.2)	1/2 of the protein
255764492	537021.9.peg.587	hypothetical protein	hypothetical protein	unknown	
254780655	537021.9.peg.588	transketolase	Transketolase (EC 2.2.1.1)	transketolase (EC 2.2.1.1)	
254780654	537021.9.peg.589	Glyceraldehyde 3-Phosphate Dehydrogenase	NAD-dependent glyceraldehyde-3-phosphate dehydrogenase (EC 1.2.1.12)	Glyceraldehyde 3-Phosphate Dehydrogenase (EC 1.2.1.12)	
254780653	537021.9.peg.590	phosphoglycerate kinase	Phosphoglycerate kinase (EC 2.7.2.3)	phosphoglycerate kinase (EC 2.7.2.3)	
254780652	537021.9.peg.591	Fructose-bisphosphate aldolase	Fructose-bisphosphate aldolase class I (EC 4.1.2.13)	Fructose-bisphosphate aldolase (EC 4.1.2.13)	
254780650	537021.9.peg.592	hypothetical protein	hypothetical protein	unknown	
254780649	537021.9.peg.594	nicotinic acid mononucleotide adenyltransferase	Nicotinate-nucleotide adenyltransferase (EC 2.7.7.18)	nicotinic acid mononucleotide adenyltransferase (EC	

			bacterial NadD family	2.7.7.18)	
254780648	537021.9.peg.595	GTPase ObgE	COG0536: GTP-binding protein Obg	GTPase ObgE, regulator of replication	
254780647	537021.9.peg.596	50S ribosomal protein L27	LSU ribosomal protein L27p	50S ribosomal protein L27	
254780646	537021.9.peg.597	50S ribosomal protein L21	LSU ribosomal protein L21p	50S ribosomal protein L21	
254780645	537021.9.peg.599	hypothetical protein	hypothetical protein	unknown	
254780644	537021.9.peg.600	hypothetical protein	hypothetical protein	unknown	
254780642	537021.9.peg.601	hypothetical protein	hypothetical protein	unknown	
254780641	537021.9.peg.602	hypothetical protein	hypothetical protein	Chromosome segregation ATPases	1/2 of the protein
254780640	N/A	hypothetical protein	N/A	Chromosome segregation ATPases	1/2 of the protein
254780639	537021.9.peg.604	hypothetical protein	hypothetical protein	unknown	
254780638	537021.9.peg.605	molecular chaperone protein DnaJ	Chaperone protein DnaJ	molecular chaperone protein DnaJ	
255764494	537021.9.peg.606	molecular chaperone DnaK	Chaperone protein DnaK	molecular chaperone DnaK	
254780636	537021.9.peg.607	ribonuclease D	Ribonuclease D related protein	ribonuclease D	
254780635	537021.9.peg.608	hypothetical protein	Iron-regulated protein A precursor	Uncharacterized iron-regulated protein	has signal peptide
254780634	537021.9.peg.609	NOL1/NOP2/SUN family signature protein	Sun protein	rRNA and rRNA cytosine-C5-methylase	
254780633	537021.9.peg.610	creatinine amidohydrolase	Creatinine amidohydrolase (EC 3.5.2.10)	creatinine amidohydrolase (EC 3.5.2.10)	
254780632	537021.9.peg.611	hypothetical protein	hypothetical protein	unknown	
254780630	537021.9.peg.613	ribonuclease PH	Ribonuclease PH (EC 2.7.7.56)	ribonuclease PH (EC 2.7.7.56)	
254780629	537021.9.peg.614	putative deoxyribonucleotide triphosphate pyrophosphatase	Nucleoside 5-triphosphatase RdgB (dHATP, dTTP, XTP-specific) (EC 3.6.1.15)	putative deoxyribonucleotide triphosphate pyrophosphatase (EC 3.6.1.15)	
254780628	537021.9.peg.615	coproporphyrinogen III oxidase	Radical SAM family enzyme, similar to coproporphyrinogen III oxidase, oxygen-independent, clustered with nucleoside-triphosphatase RdgB	coproporphyrinogen III oxidase	
254780627	537021.9.peg.616	chromosomal replication initiation protein	Chromosomal replication initiator protein DnaA	chromosomal replication initiation protein	
254780626	537021.9.peg.617	30S ribosomal protein S20	SSU ribosomal protein S20p	30S ribosomal protein S20	
254780625	537021.9.peg.618	formamidopyrimidine-DNA glycosylase	Formamidopyrimidine-DNA glycosylase (EC 3.2.2.23)	formamidopyrimidine-DNA glycosylase (EC 3.2.2.23)	
254780624	537021.9.peg.619	ubiquinone/menaquinone biosynthesis methyltransferase	Ubiquinone/menaquinone biosynthesis methyltransferase UbiE (EC 2.1.1.-)	ubiquinone/menaquinone biosynthesis methyltransferase (EC 2.1.1.-)	
254780623	537021.9.peg.620	2-polyprenylphenol 6-hydroxylase	Ubiquinone biosynthesis monooxygenase UbiB	2-polyprenylphenol 6-hydroxylase	transmembrane protein
254780622	537021.9.peg.621	bifunctional phosphopantothenoylecysteine decarboxylase/phosphopantothenate synthase	Phosphopantothenoylecysteine decarboxylase (EC 4.1.1.36) / Phosphopantothenoylecysteine synthetase (EC 6.3.2.5)	Phosphopantothenoylecysteine decarboxylase (EC 4.1.1.36) / Phosphopantothenoylecysteine synthetase (EC 6.3.2.5)	
254780621	537021.9.peg.622	small heat shock protein	16 kDa heat shock protein A	small heat shock protein	
254780620	537021.9.peg.623	iron-responsive transcriptional regulator	Iron-responsive repressor RirA	iron-responsive transcriptional regulator	
254780619	537021.9.peg.624	primosome assembly protein PriA	Helicase PriA essential for oriC/DnaA-independent DNA replication	primosome assembly protein PriA	
254780618	537021.9.peg.625	FOF1 ATP synthase subunit delta	ATP synthase delta chain (EC 3.6.3.14)	FOF1 ATP synthase subunit delta (EC 3.6.3.14)	
254780617	537021.9.peg.626	FOF1 ATP synthase subunit alpha	ATP synthase alpha chain (EC 3.6.3.14)	FOF1 ATP synthase subunit alpha (EC 3.6.3.14)	
254780616	537021.9.peg.627	FOF1 ATP synthase subunit gamma	ATP synthase gamma chain (EC 3.6.3.14)	FOF1 ATP synthase subunit gamma (EC 3.6.3.14)	
254780615	537021.9.peg.628	FOF1 ATP synthase subunit beta	ATP synthase beta chain (EC 3.6.3.14)	FOF1 ATP synthase subunit beta (EC 3.6.3.14)	
254780614	537021.9.peg.629	FOF1 ATP synthase subunit epsilon	ATP synthase epsilon chain (EC 3.6.3.14)	FOF1 ATP synthase subunit epsilon (EC 3.6.3.14)	
254780613	537021.9.peg.630	adenylosuccinate synthetase	Adenylosuccinate synthetase (EC 6.3.4.4)	adenylosuccinate synthetase (EC 6.3.4.4)	
254780612	537021.9.peg.631	putative transmembrane protein	hypothetical protein	unknown	transmembrane protein
254780611	537021.9.peg.632	RNA polymerase factor sigma-32	RNA polymerase sigma factor RpoH	RNA polymerase factor sigma-32	
254780610	537021.9.peg.633	RNA-pseudouridylate synthase protein, ribosomal large subunit D	Ribosomal large subunit pseudouridine synthase D (EC 4.2.1.70)	ribosomal large subunit pseudouridine synthase D (EC 4.2.1.70)	
255764495	537021.9.peg.635	putative phosphoesterase protein	putative phosphohydrolases, Icc family	phosphoesterase protein	
254780608	537021.9.peg.636	ribosomal large subunit pseudouridine synthase C	Ribosomal large subunit pseudouridine synthase C (EC 4.2.1.70) LSU Psi955, Psi2504 and Psi2580	ribosomal large subunit pseudouridine synthase C (EC 4.2.1.70)	
254780607	537021.9.peg.637	hypothetical protein	Putative secreted protein	unknown	has signal peptide
254780606	537021.9.peg.638	cell division protein	Cell division protein FtsK	cell division protein FtsK	
254780605	537021.9.peg.639	putative aminopeptidase	Xaa-Pro aminopeptidase (EC 3.4.11.9)	aminopeptidase	
254780604	537021.9.peg.640	5-aminolevulinate synthase	5-aminolevulinate synthase (EC 2.3.1.37)	5-aminolevulinate synthase (EC 2.3.1.37)	
254780603	537021.9.peg.641	tRNA/rRNA methyltransferase protein	rRNA methylases	rRNA methylases	
254780602	537021.9.peg.642	aspartate aminotransferase	Aspartate aminotransferase (EC 2.6.1.1)	aspartate aminotransferase	

254780601	537021.9.peg.643	ATP-dependent RNA helicase protein	ATP-dependent RNA helicase, DEAD/DEAH box family	ATP-dependent RNA helicase protein	
254780600	537021.9.peg.644	CDP-diacylglycerol/glycerol-3-phosphate 3-phosphatidyltransferase	CDP-diacylglycerol--glycerol-3-phosphate 3-phosphatidyltransferase (EC 2.7.8.5)	CDP-diacylglycerol/glycerol-3-phosphate 3-phosphatidyltransferase (EC 2.7.8.5)	transmembrane protein
255764496	537021.9.peg.645	excinuclease ABC subunit C	Excinuclease ABC subunit C	excinuclease ABC subunit C, uvrC	
254780598	537021.9.peg.646	outer membrane protein	OmpA-like transmembrane region	outer membrane protein	has signal peptide
255764497	537021.9.peg.647	ABC transporter permease	ABC-type anion transport system, duplicated permease component	ABC-type importer for sulfonate-like oxoacid ion, transmembrane component	transmembrane protein
254780596	537021.9.peg.648	ABC transporter nucleotide binding/ATPase protein	ABC-type nitrate/sulfonate/bicarbonate transport system, ATPase component	ABC-type importer for sulfonate-like oxoacid ion, ATPase component	
254780595	537021.9.peg.649	nucleoside-diphosphate-sugar epimerase protein	Nucleoside-diphosphate-sugar epimerases	nucleoside-diphosphate-sugar epimerase protein	
254780594	537021.9.peg.650	Glutathione S-transferase domain protein	Glutathione S-transferase family protein	Glutathione S-transferase domain protein	
254780593	537021.9.peg.651	undecaprenyl pyrophosphate phosphatase	Undecaprenyl-diphosphatase (EC 3.6.1.27)	undecaprenyl pyrophosphate phosphatase (EC 3.6.1.27)	transmembrane protein
254780592	537021.9.peg.652	TPR repeat-containing protein	Flp pilus assembly protein TadD, contains TPR repeat	Flp pilus assembly protein, TadD	has signal peptide
254780591	537021.9.peg.653	aminomethyltransferase protein (glycine cleavage)	Folate-dependent protein for Fe/S cluster synthesis/repair in oxidative stress	aminomethyltransferase protein	
254780590	537021.9.peg.654	hypothetical protein	hypothetical protein	unknown	
254780589	537021.9.peg.655	hypothetical protein	probable exported protein STY0357	unknown	has signal peptide
254780588	537021.9.peg.656	acetyl-CoA carboxylase carboxyltransferase subunit alpha	Acetyl-coenzyme A carboxyl transferase alpha chain (EC 6.4.1.2)	acetyl-CoA carboxylase carboxyltransferase (EC 6.4.1.2)	
255764498	537021.9.peg.657	site-specific tyrosine recombinase XerD	Tyrosine recombinase XerD	site-specific tyrosine recombinase, XerD	
254780586	537021.9.peg.659	BolA family protein	Cell division protein BolA	Stress-induced morphogen, BolA family protein, involve in signal transduction	
254780585	537021.9.peg.660	molecular chaperone DnaJ family protein	FIG003437: hypothetical with DnaJ-like domain	molecular chaperone DnaJ family protein	
254780584	537021.9.peg.661	50S ribosomal protein L28	hypothetical protein	50S ribosomal protein L28	
254780583	537021.9.peg.662	glyoxalase II	Hydroxyacylglutathione hydrolase (EC 3.1.2.6)	glyoxalase II	
254780582	537021.9.peg.663	Methyltransferase type 11	SAM-dependent methyltransferase 2, in cluster with Hydroxyacylglutathione hydrolase (EC 3.1.2.6)	Methyltransferase	
255764499	537021.9.peg.664	1-acyl-sn-glycerol-3-phosphate acyltransferase	1-acyl-sn-glycerol-3-phosphate acyltransferase	1-acyl-sn-glycerol-3-phosphate acyltransferase	transmembrane protein
254780579	537021.9.peg.665	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780578	537021.9.peg.666	phosphatidylserine synthase	CDP-diacylglycerol--serine O-phosphatidyltransferase (EC 2.7.8.8)	phosphatidylserine synthase (EC 2.7.8.8)	transmembrane protein
254780577	537021.9.peg.667	phosphatidylserine decarboxylase	Phosphatidylserine decarboxylase (EC 4.1.1.65)	phosphatidylserine decarboxylase (EC 4.1.1.65)	transmembrane protein
254780576	537021.9.peg.668	ABC transporter related protein	putative ATP-binding component of ABC transporter	ABC-type ATPase and permease for heavy metal export	transmembrane protein
254780575	537021.9.peg.669	hypothetical protein	hypothetical protein	permeases, RarD	transmembrane protein
255764500	537021.9.peg.670	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780573	537021.9.peg.672	cysteinyl-tRNA synthetase	Cysteinyl-tRNA synthetase (EC 6.1.1.16)	cysteinyl-tRNA synthetase (EC 6.1.1.16)	
254780572	537021.9.peg.673	hypothetical protein	Similar to TadZ/CpaE, associated with Flp pilus assembly	Flp pilus assembly protein, TadG	transmembrane protein
254780571	537021.9.peg.674	hypothetical protein	hypothetical protein	Flp pilus assembly protein, TadG	transmembrane protein
254780570	537021.9.peg.675	phosphoribosylglycinamide formyltransferase	Phosphoribosylglycinamide formyltransferase (EC 2.1.2.2)	phosphoribosylglycinamide formyltransferase (EC 2.1.2.2)	
254780569	537021.9.peg.676	phosphoribosylaminoimidazole synthetase	Phosphoribosylformylglycinamidine cyclo-ligase (EC 6.3.3.1)	phosphoribosylaminoimidazole synthetase (EC 6.3.3.1)	
254780568	537021.9.peg.677	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780567	537021.9.peg.678	hypothetical protein	Chromosomal replication initiator protein DnaA	ATPase involved in DNA replication	
254780565	537021.9.peg.679	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780564	537021.9.peg.680	hypothetical protein	hypothetical protein	ABC transporter, extracellular binding protein	1/2 of the protein
254780563	537021.9.peg.681	extracellular solute-binding protein	iron ABC transporter, periplasmic iron-binding protein	ABC transporter, extracellular binding protein	has signal peptide, 1/2 of the protein
254780562	537021.9.peg.682	hypothetical protein	hypothetical protein	unknown	
254780561	537021.9.peg.684	thiamine transporter substrate binding subunit	Thiamin ABC transporter, substrate-binding component	ABC-type importer for Thiamine (vitamin B1), substrate binding component	has signal peptide

255764501	537021.9.peg.685	thiamine transporter membrane protein	Thiamin ABC transporter, transmembrane component	ABC-type importer for Thiamine (vitamin B1), transmembrane component	transmembrane protein
254780559	537021.9.peg.686	thiamine transporter ATP-binding subunit	Thiamin ABC transporter, ATPase component / Thiamine transport ATP-binding protein thiQ	ABC-type importer for Thiamine (vitamin B1), ATPase component	
254780558	537021.9.peg.687	hypothetical protein	Possible divergent polysaccharide deacetylase	Possible divergent polysaccharide deacetylase	transmembrane protein
254780557	537021.9.peg.688	dinucleoside polyphosphate hydrolase	FIG000735: Adenosine (5')-pentaphospho-(5'')-adenosine pyrophosphohydrolase (EC 3.6.1.-)	dinucleoside polyphosphate hydrolase	
254780556	537021.9.peg.689	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780555	537021.9.peg.690	hypothetical protein	hypothetical protein	prophage antirepressor	
254780554	537021.9.peg.692	Holliday junction resolvase	Crossover junction endodeoxyribonuclease RuvC (EC 3.1.22.4)	Holliday junction resolvase, ruvC (EC 3.1.22.4)	
254780553	537021.9.peg.693	Holliday junction DNA helicase RuvA	Holliday junction DNA helicase RuvA	Holliday junction DNA helicase RuvA	
254780552	537021.9.peg.694	Holliday junction DNA helicase RuvB	Holliday junction DNA helicase RuvB	Holliday junction DNA helicase RuvB	
254780551	537021.9.peg.695	tolQ protein	MotA/TolQ/ExbB proton channel family protein	biopolymer transport protein TolQ	transmembrane protein
255764502	537021.9.peg.696	hypothetical protein	hypothetical protein	Biopolymer transport protein	transmembrane protein
254780549	537021.9.peg.697	signal peptide protein	hypothetical protein	biopolymer transport protein TolA	transmembrane protein
254780548	537021.9.peg.698	translocation protein TolB	tolB protein precursor, periplasmic protein involved in the tonb-independent uptake of group A colicins	translocation protein TolB	has signal peptide
254780547	537021.9.peg.699	OmpA/MotB	18K peptidoglycan-associated outer membrane lipoprotein; Peptidoglycan-associated lipoprotein precursor; Outer membrane protein P6; OmpA/MotB precursor	Pal, the peptidoglycan-associated lipoprotein of Tol-Pal system	has signal peptide
254780546	537021.9.peg.700	hypothetical protein	tRNA(Ile)-lysidine synthetase	ATPase of the PP-loop superfamily involve in cell cycle control	
254780545	537021.9.peg.701	metalloprotease	Cell division protein FtsH (EC 3.4.24.-)	ATP-dependent Zn proteasase	transmembrane protein
254780544	537021.9.peg.702	phosphoglucosamine mutase protein	Phosphoglucosamine mutase (EC 5.4.2.10)	phosphoglucosamine mutase protein (EC 5.4.2.10)	
254780543	537021.9.peg.703	NADH dehydrogenase	NADH:ubiquinone oxidoreductase 17.2 kD subunit	NADH dehydrogenase	
254780542	537021.9.peg.704	hypothetical protein	hypothetical protein	unknown	has signal peptide
255764503	537021.9.peg.705	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780540	537021.9.peg.706	ABC transporter, membrane spanning protein (iron transport)	Manganese ABC transporter, inner membrane permease protein SitD	ABC-type importer for Manganese and iron, transmembrane component	transmembrane protein
254780539	537021.9.peg.707	ABC transporter, membrane spanning protein (iron)	Manganese ABC transporter, inner membrane permease protein SitC	ABC-type importer for Manganese and iron, transmembrane component	transmembrane protein
254780538	537021.9.peg.708	ABC transporter, nucleotide binding/ATPase protein (iron)	Manganese ABC transporter, ATP-binding protein SitB	ABC-type importer for Manganese and iron, ATPase component	
254780537	537021.9.peg.709	periplasmic solute binding protein	Manganese ABC transporter, periplasmic-binding protein SitA	ABC-type importer for Manganese and iron, substrate-binding component	has signal peptide
254780536	537021.9.peg.710	acyl-carrier-protein S-malonyltransferase	Malonyl CoA-acyl carrier protein transacylase (EC 2.3.1.39)	acyl-carrier-protein S-malonyltransferase (EC 2.3.1.39)	
254780535	537021.9.peg.711	3-ketoacyl-(acyl-carrier-protein) reductase	3-oxoacyl-[acyl-carrier protein] reductase (EC 1.1.1.100)	3-ketoacyl-(acyl-carrier-protein) reductase (EC 1.1.1.100)	
254780534	537021.9.peg.712	acyl carrier protein	Acyl carrier protein	acyl carrier protein	
254780533	537021.9.peg.713	3-oxoacyl-(acyl carrier protein) synthase II	3-oxoacyl-[acyl-carrier-protein] synthase, KASII (EC 2.3.1.41)	3-oxoacyl-(acyl carrier protein) synthase II (EC 2.3.1.41)	
254780532	537021.9.peg.714	aminodeoxychorismate lyase	FIG004453: protein YceG like	aminodeoxychorismate lyase, YceG-like	transmembrane protein
254780531	537021.9.peg.715	flagellin domain-containing protein	Flagellin protein FlaA	flagellin domain-containing protein	extracellular, flagellar component, exported by flagellar assembly machinery
254780530	537021.9.peg.716	hypothetical protein	hypothetical protein	flagellar assembly protein H	
254780529	537021.9.peg.717	flagellar motor protein MotB	Flagellar motor rotation protein MotB	flagellar motor protein MotB	transmembrane protein
254780528	537021.9.peg.718	chemotaxis protein	chemotaxis motility protein	chemotaxis protein	has signal peptide
254780527	537021.9.peg.719	hypothetical protein	hypothetical protein	unknown	
254780526	537021.9.peg.720	putative transcription regulator protein	Transcriptional regulator	transcriptional regulation protein	
254780525	537021.9.peg.721	flagellar hook protein FlgE	Flagellar hook protein FlgE	flagellar hook protein FlgE	extracellular, flagellar component, exported by

					flagellar assembly machinery
254780524	537021.9.peg.722	flagellar hook-associated protein FlgK	Flagellar hook-associated protein FlgK	flagellar hook-associated protein FlgK	extracellular, flagellar component, exported by flagellar assembly machinery
254780523	537021.9.peg.723	flagellar hook-associated protein FlgL	putative flagellar hook-associated protein	flagellar hook-associated protein FlgL	extracellular, flagellar component, exported by flagellar assembly machinery
254780522	537021.9.peg.724	flagellar biosynthesis regulatory protein FlaF	putative flagellar synthesis related protein	flagellar biosynthesis regulatory protein FlaF	
254780521	537021.9.peg.725	flagellar biosynthesis repressor FliB	putative flagellum biosynthesis repressor protein	flagellar biosynthesis repressor FliB	
254780520	537021.9.peg.726	flagellar basal body rod modification protein	Flagellar basal-body rod modification protein FlgD	flagellar basal body rod modification protein	extracellular, flagellar component, exported by flagellar assembly machinery
254780519	537021.9.peg.727	flagellar biosynthesis protein FliQ	Flagellar biosynthesis protein FliQ	flagellar biosynthesis protein FliQ	transmembrane protein
255764504	537021.9.peg.728	DNA-methyltransferase MKpn2kI	Cytosine-specific methyltransferase NlaX (EC 2.1.1.37) (M.NlaX)	type II DNA modification methyltransferase	1/2 of the protein
254780516	537021.9.peg.729	type II modification methyltransferase	Cytosine-specific methyltransferase NlaX (EC 2.1.1.37) (M.NlaX)	type II DNA modification methyltransferase	1/2 of the protein
254780515	537021.9.peg.730	hypothetical protein	hypothetical protein	restriction endonuclease	1/2 of the protein
254780514	N/A	type II restriction endonuclease	N/A	restriction endonuclease	1/2 of the protein
254780512	537021.9.peg.731	flagellar biosynthesis protein FliA	Flagellar biosynthesis protein FliA	flagellar biosynthesis protein FliA	transmembrane protein
254780511	537021.9.peg.732	flagellar biosynthesis protein FliR	Flagellar biosynthesis protein FliR	flagellar biosynthesis protein FliR	transmembrane protein
254780510	537021.9.peg.733	hypothetical protein	hypothetical protein	unknown	
254780509	537021.9.peg.734	hypothetical protein	hypothetical protein	flgJ, peptidoglycan hydrolase	
254780508	537021.9.peg.735	hypothetical protein	hypothetical protein	unknown	
254780507	537021.9.peg.736	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780506	537021.9.peg.737	methylenetetrahydrofolate dehydrogenase/cyclohydrolase protein	Methylenetetrahydrofolate dehydrogenase (NADP+) (EC 1.5.1.5) / Methenyltetrahydrofolate cyclohydrolase (EC 3.5.4.9)	Methylenetetrahydrofolate dehydrogenase (NADP+) (EC 1.5.1.5) / Methenyltetrahydrofolate cyclohydrolase (EC 3.5.4.9)	
254780505	537021.9.peg.738	6-phosphogluconolactonase	6-phosphogluconolactonase (EC 3.1.1.31), eukaryotic type	6-phosphogluconolactonase (EC 3.1.1.31)	
254780504	537021.9.peg.739	glucose-6-phosphate 1-dehydrogenase	Glucose-6-phosphate 1-dehydrogenase (EC 1.1.1.49)	glucose-6-phosphate 1-dehydrogenase (EC 1.1.1.49)	
254780503	537021.9.peg.740	putative glutamine synthetase	glutamine synthetase family protein	putative glutamine synthetase	
254780502	537021.9.peg.741	ribonucleotide-diphosphate reductase subunit alpha	Ribonucleotide reductase of class Ia (aerobic), alpha subunit (EC 1.17.4.1)	ribonucleotide-diphosphate reductase subunit alpha (EC 1.17.4.1)	
254780500	537021.9.peg.742	hypothetical protein	hypothetical protein	Small protein A (tmRNA-binding)	transmembrane protein
254780499	537021.9.peg.743	hypothetical protein	Functional role page for Conserved hypothetical protein, gene in Ubiquinol-cytochrome C chaperone locus	unknown	
254780498	537021.9.peg.744	putative glycerol-3-phosphate acyltransferase PlsX	Phosphate:acyl-ACP acyltransferase PlsX	glycerol-3-phosphate acyltransferase	
254780497	537021.9.peg.745	3-oxoacyl-(acyl carrier protein) synthase III	3-oxoacyl-[acyl-carrier-protein] synthase, KASIII (EC 2.3.1.41)	3-oxoacyl-(acyl carrier protein) synthase III (EC 2.3.1.41)	
254780496	537021.9.peg.746	integration host factor subunit alpha	Integration host factor alpha subunit	integration host factor subunit alpha	
254780495	537021.9.peg.747	superoxide dismutase	Superoxide dismutase [Fe] (EC 1.15.1.1)	superoxide dismutase (EC 1.15.1.1)	
254780494	537021.9.peg.748	cation diffusion facilitator family transporter, putative	Cobalt-zinc-cadmium resistance protein	Co/Zn/Cd cation transporters	transmembrane protein
254780493	537021.9.peg.749	phosphoribosylaminoimidazole-succinocarboxamide synthase	Phosphoribosylaminoimidazole-succinocarboxamide synthase (EC 6.3.2.6)	phosphoribosylaminoimidazole-succinocarboxamide synthase (EC 6.3.2.6)	
254780830	N/A	hypothetical protein	N/A	unknown	
254780831	537021.9.peg.750	hypothetical protein	Scaffold protein for [4Fe-4S] cluster assembly ApcC, MRP-like	ATPase	
254780832	537021.9.peg.751	putative potassium uptake transport system protein	Kup system potassium uptake protein	K+ transporter	transmembrane protein
254780833	537021.9.peg.752	hypothetical protein	von Willebrand factor type A	von Willebrand factor type A fused with TadE/F	transmembrane protein,

				involved in pilus assembly	but might be processed by cpaA and become periplasmic
N/A	537021.9.peg.753	N/A	DNA polymerase III alpha subunit (EC 2.7.7.7)	DNA polymerase III subunit alpha	1/2 of the protein
N/A	537021.9.peg.754	N/A	hypothetical protein	DNA polymerase III subunit alpha	1/2 of the protein
254780834	537021.9.peg.755	DNA primase	DNA primase (EC 2.7.7.-)	DNA primase (EC 2.7.7.-)	
255764505	537021.9.peg.756	polysialic acid capsule expression protein	Arabinose 5-phosphate isomerase (EC 5.3.1.13)	sugar phosphate isomerase involved in capsule formation	
254780836	537021.9.peg.757	putative type I restriction-modification system DNA methylase	Type I restriction-modification system, DNA-methyltransferase subunit M (EC 2.1.1.72)	Type I restriction-modification system, adenine methylase	
254780837	537021.9.peg.758	putative restriction endonuclease S subunit	Type I restriction-modification system, specificity subunit S (EC 3.1.21.3)	EcokI restriction-modification system protein, HsdS	
254780840	537021.9.peg.760	hypothetical protein	hypothetical protein	unknown	
254780841	537021.9.peg.761	phosphatidylcholine synthase protein	Phosphatidylcholine synthase (EC 2.7.8.24)	phosphatidylcholine synthase protein (EC 2.7.8.24)	transmembrane protein
254780842	537021.9.peg.762	2-octaprenyl-6-methoxyphenyl hydroxylase	hypothetical protein	2-octaprenyl-6-methoxyphenyl hydroxylase (EC 1.14.13.-)	
254780843	537021.9.peg.763	glucose/galactose transporter	glucose/galactose transporter	glucose/galactose/fucose transporter	transmembrane protein
254780844	537021.9.peg.764	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780845	537021.9.peg.765	ribonucleotide-diphosphate reductase subunit beta	Ribonucleotide reductase of class Ia (aerobic), beta subunit (EC 1.17.4.1)	ribonucleotide-diphosphate reductase subunit beta (EC 1.17.4.1)	
254780846	537021.9.peg.766	bifunctional riboflavin kinase/FMN adenylyltransferase	Riboflavin kinase (EC 2.7.1.26) / FMN adenylyltransferase (EC 2.7.7.2)	bifunctional riboflavin kinase/FMN adenylyltransferase	
254780847	537021.9.peg.767	hypothetical protein	HAD superfamily protein involved in N-acetyl-glucosamine catabolism	sugar phosphatase/HAD superfamily hydrolase	
254780848	537021.9.peg.768	co-chaperonin GroES	Heat shock protein 60 family co-chaperone GroES	co-chaperonin GroES	
254780849	537021.9.peg.769	chaperonin GroEL	Heat shock protein 60 family chaperone GroEL	chaperonin GroEL	
254780852	537021.9.peg.770	NADH dehydrogenase subunit A	NADH ubiquinone oxidoreductase chain A (EC 1.6.5.3)	NADH dehydrogenase subunit A (EC 1.6.5.3)	transmembrane protein
254780853	537021.9.peg.771	NADH dehydrogenase subunit B	NADH-ubiquinone oxidoreductase chain B (EC 1.6.5.3)	NADH dehydrogenase subunit B (EC 1.6.5.3)	
254780854	537021.9.peg.772	NADH dehydrogenase subunit C	NADH-ubiquinone oxidoreductase chain C (EC 1.6.5.3)	NADH dehydrogenase subunit C (EC 1.6.5.3)	
254780855	537021.9.peg.773	NADH dehydrogenase subunit D	NADH-ubiquinone oxidoreductase chain D (EC 1.6.5.3)	NADH dehydrogenase subunit D (EC 1.6.5.3)	
254780856	537021.9.peg.774	NADH-quinone oxidoreductase, E subunit	NADH-ubiquinone oxidoreductase chain E (EC 1.6.5.3)	NADH-quinone oxidoreductase, E subunit (EC 1.6.5.3)	
254780858	537021.9.peg.775	NADH dehydrogenase I subunit F	NADH-ubiquinone oxidoreductase chain F (EC 1.6.5.3)	NADH dehydrogenase I subunit F (EC 1.6.5.3)	
254780859	537021.9.peg.776	NADH dehydrogenase subunit G	NADH-ubiquinone oxidoreductase chain G (EC 1.6.5.3)	NADH dehydrogenase subunit G (EC 1.6.5.3)	
254780860	537021.9.peg.777	NADH dehydrogenase subunit H	NADH-ubiquinone oxidoreductase chain H (EC 1.6.5.3)	NADH dehydrogenase subunit H (EC 1.6.5.3)	transmembrane protein
254780861	537021.9.peg.778	NADH dehydrogenase subunit I	NADH-ubiquinone oxidoreductase chain I (EC 1.6.5.3)	NADH dehydrogenase subunit I (EC 1.6.5.3)	
254780862	537021.9.peg.779	NADH dehydrogenase subunit J	NADH-ubiquinone oxidoreductase chain J (EC 1.6.5.3)	NADH dehydrogenase subunit J (EC 1.6.5.3)	transmembrane protein
254780863	N/A	hypothetical protein	N/A	NADH-ubiquinone oxidoreductase, chain 4L	transmembrane protein, 1/2 of the protein
254780864	537021.9.peg.780	NADH-ubiquinone oxidoreductase, chain 4L	NADH-ubiquinone oxidoreductase chain K (EC 1.6.5.3)	NADH-ubiquinone oxidoreductase, chain 4L	transmembrane protein, 1/2 of the protein
254780865	537021.9.peg.781	NADH dehydrogenase subunit L	NADH-ubiquinone oxidoreductase chain L (EC 1.6.5.3)	NADH dehydrogenase subunit L (EC 1.6.5.3)	transmembrane protein
254780866	537021.9.peg.782	NADH dehydrogenase subunit M	NADH-ubiquinone oxidoreductase chain M (EC 1.6.5.3)	NADH dehydrogenase subunit M (EC 1.6.5.3)	transmembrane protein
254780867	537021.9.peg.783	NADH dehydrogenase subunit N	NADH-ubiquinone oxidoreductase chain N (EC 1.6.5.3)	NADH dehydrogenase subunit N (EC 1.6.5.3)	transmembrane protein
254780868	537021.9.peg.784	birA bifunctional protein	Biotin-protein ligase (EC 6.3.4.15)	birA bifunctional protein (EC 6.3.4.15)	
254780869	537021.9.peg.785	beta-lactamase domain-containing protein	Metallo-beta-lactamase family protein, RNA-specific	beta-lactamase domain-containing protein, hydrolase	
254780870	537021.9.peg.787	prolyl-tRNA synthetase	Prolyl-tRNA synthetase (EC 6.1.1.15) Bacterial type	prolyl-tRNA synthetase (EC 6.1.1.15)	
N/A	537021.9.peg.788	N/A	Lipoprotein releasing system transmembrane protein LoIC	lipoprotein ABC transporter, permease protein	transmembrane protein, 1/2 of the protein
N/A	537021.9.peg.789	N/A	hypothetical protein	lipoprotein ABC transporter, permease proteing	transmembrane protein, 1/2 of the protein
254780871	537021.9.peg.790	lipoprotein-releasing system ATP-binding protein loID	Lipoprotein releasing system ATP-binding protein LoID	ABC-type exporter of lipoprotein, ATPase component	
254780872	537021.9.peg.791	3-demethylubiquinone-9 3-methyltransferase	3-demethylubiquinone-9 3-methyltransferase (EC 2.1.1.64)	3-demethylubiquinone-9 3-methyltransferase (EC 2.1.1.64)	
254780873	537021.9.peg.792	aspartate kinase	Aspartokinase (EC 2.7.2.4)	aspartate kinase (EC 2.7.2.4)	

254780874	537021.9.peg.793	peptide chain release factor 1	Peptide chain release factor 1	Protein chain release factor A	
254780875	537021.9.peg.794	protoporphyrinogen oxidase (methyltransferase) protein	Methylase of polypeptide chain release factors	Methylase of polypeptide chain release factor, HemK	
254780876	537021.9.peg.795	hypothetical protein	Eukaryotic translation initiation factor 3 subunit 10	unknown	
254780877	537021.9.peg.796	ATP-dependent Clp protease, ATP-binding subunit protein	ClpB protein	ATP-dependent Clp protease, ATP-binding subunit	
254780878	537021.9.peg.797	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780879	537021.9.peg.798	hypothetical protein	Membrane proteins related to metalloendopeptidases	Membrane proteins related to metalloendopeptidase	transmembrane protein
254780880	N/A	hypothetical protein	N/A	unknown	
254780881	537021.9.peg.799	Mrp protein	Mrp protein	unknown	
254780882	537021.9.peg.800	site-specific tyrosine recombinase XerC	Integrase	site-specific tyrosine recombinase XerC	
254780883	537021.9.peg.801	hypothetical protein	YidD	unknown	
255764506	537021.9.peg.802	GTP cyclohydrolase I	GTP cyclohydrolase I (EC 3.5.4.16) type 1	GTP cyclohydrolase I (EC 3.5.4.16)	
254780885	537021.9.peg.803	hypothetical protein	hypothetical protein	pilus assembly protein, PlIZ	
254780886	N/A	hypothetical protein	N/A	unknown	has signal peptide, short piece
254780889	537021.9.peg.805	inosine 5'-monophosphate dehydrogenase	Inosine-5'-monophosphate dehydrogenase (EC 1.1.1.205)	inosine 5'-monophosphate dehydrogenase (EC 1.1.1.205)	
254780890	537021.9.peg.806	hypothetical protein	hypothetical protein	unknown	
254780891	537021.9.peg.807	hypothetical protein	hypothetical protein	two component system sensory kinase	
254780892	537021.9.peg.808	probable two-component response regulator protein	miscellaneous; not classified regulator	two-component response regulator	
254780893	537021.9.peg.809	two component response regulator	putative two-component response regulator transcriptional regulatory protein	two component response regulator	
254780894	537021.9.peg.810	hypothetical protein	Flagellar protein fliJ	possible flagellar protein fliJ	
254780895	537021.9.peg.811	hypothetical protein	hypothetical protein	unknown	
254780896	537021.9.peg.812	ABC transporter membrane spanning protein (branched chain amino acid)	Branched-chain amino acid transport system permease protein LivM (TC 3.A.1.4.1)	ABC-type permease	transmembrane protein
254780897	537021.9.peg.814	trigger factor	Cell division trigger factor (EC 5.2.1.8)	trigger factor	
254780898	537021.9.peg.815	hypothetical protein	hypothetical protein	tyrosine/serine phosphatase	has signal peptide
N/A	537021.9.peg.816	N/A	DNA repair protein RadC	DNA repair protein RadC	1/2 of the protein
N/A	537021.9.peg.817	N/A	DNA repair protein RadC	DNA repair protein RadC	1/2 of the protein
254780899	537021.9.peg.819	methionine aminopeptidase	Methionine aminopeptidase (EC 3.4.11.18)	methionine aminopeptidase (EC 3.4.11.18)	
254780900	537021.9.peg.820	homoserine dehydrogenase	Homoserine dehydrogenase (EC 1.1.1.3)	homoserine dehydrogenase (EC 1.1.1.3)	
254780901	537021.9.peg.821	single-stranded-DNA-specific exonuclease protein	Single-stranded-DNA-specific exonuclease RecJ (EC 3.1.-.-)	single-stranded-DNA-specific exonuclease (EC 3.1.-.-)	
254780902	537021.9.peg.822	isocitrate dehydrogenase	Isocitrate dehydrogenase [NADP] (EC 1.1.1.42)	isocitrate dehydrogenase (EC 1.1.1.42)	
254780903	537021.9.peg.823	two-component sensor histidine kinase protein	Two-component sensor histidine kinase PleC	two-component sensor histidine kinase protein	transmembrane protein
254780904	537021.9.peg.824	tRNA/rRNA methyltransferase	tRNA:Cm32/Um32 methyltransferase	tRNA/rRNA methyltransferase	
254780905	537021.9.peg.825	glutamate racemase	Glutamate racemase (EC 5.1.1.3)	glutamate racemase (EC 5.1.1.3)	
254780906	537021.9.peg.826	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780907	N/A	hypothetical protein	N/A	unknown	has signal peptide
254780908	537021.9.peg.827	hypothetical protein	hypothetical protein	unknown	
254780909	537021.9.peg.828	hypothetical protein	hypothetical protein	unknown	has signal peptide
255764507	537021.9.peg.829	guanylate kinase	Guanylate kinase (EC 2.7.4.8)	guanylate kinase (EC 2.7.4.8)	
254780911	537021.9.peg.830	formyltetrahydrofolate deformylase	Formyltetrahydrofolate deformylase (EC 3.5.1.10)	formyltetrahydrofolate deformylase (EC 3.5.1.10)	
254780912	537021.9.peg.831	hypothetical protein	hypothetical protein	unknown	
254780913	537021.9.peg.832	cold shock protein	Cold shock protein CspE	cold shock protein	
254780914	537021.9.peg.833	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780915	537021.9.peg.835	oligoendopeptidase F	Oligoendopeptidase F	oligoendopeptidase F	
254780916	537021.9.peg.836	putative sigma-54-dependent transcription regulator protein	two component, sigma54 specific, transcriptional regulator, Fis family	transcriptional regulator and a receptor in two component system	
254780917	537021.9.peg.837	ABC transporter, nucleotide binding/ATPase protein	Y4gM	ABC-type exporter for multiple drug and lipid, transmembrane and ATPase component	transmembrane protein
254780918	537021.9.peg.838	glycosyl transferase family protein	Glycosyl transferase, group 2 family protein	COG0463 Glycosyltransferases involved in cell wall	

				biogenesis	
254780919	537021.9.peg.839	dTDP-4-dehydrorhamnose 3,5-epimerase	dTDP-4-dehydrorhamnose 3,5-epimerase (EC 5.1.3.13)	dTDP-4-dehydrorhamnose 3,5-epimerase (EC 5.1.3.13)	
254780920	537021.9.peg.840	dTDP-glucose 4,6-dehydratase	dTDP-glucose 4,6-dehydratase (EC 4.2.1.46)	dTDP-glucose 4,6-dehydratase (EC 4.2.1.46)	
254780921	537021.9.peg.841	dTDP-4-dehydrorhamnose reductase	dTDP-4-dehydrorhamnose reductase (EC 1.1.1.133)	dTDP-4-dehydrorhamnose reductase (EC 1.1.1.133)	
254780922	537021.9.peg.842	glucose-1-phosphate thymidyltransferase	Glucose-1-phosphate thymidyltransferase (EC 2.7.7.24)	glucose-1-phosphate thymidyltransferase (EC 2.7.7.24)	
254780923	537021.9.peg.843	hypothetical protein	hypothetical protein	Lipopolysaccharide biosynthesis protein in cell wall biogenesis	
254780924	537021.9.peg.844	potassium-efflux system protein	Binding-protein-dependent transport systems inner membrane component:ATP/GTP-binding site motif A (P-loop) :TrkA-N:Potassium e	potassium-efflux system protein	transmembrane protein
254780925	537021.9.peg.845	bifunctional preprotein translocase subunit SecD/SecF	Protein-export membrane protein SecD (TC 3.A.5.1.1) / Protein-export membrane protein SecF (TC 3.A.5.1.1)	Preprotein translocase subunit SecD/SecF	transmembrane protein
254780926	537021.9.peg.846	hypothetical protein	hypothetical protein	unknown	
254780927	537021.9.peg.847	UDP-N-acetylglucosamine 1-carboxyvinyltransferase	UDP-N-acetylglucosamine 1-carboxyvinyltransferase (EC 2.5.1.7)	UDP-N-acetylglucosamine 1-carboxyvinyltransferase (EC 2.5.1.7)	
254780928	537021.9.peg.848	histidyl-tRNA synthetase	Histidyl-tRNA synthetase (EC 6.1.1.21)	histidyl-tRNA synthetase (EC 6.1.1.21)	
254780929	537021.9.peg.849	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780930	537021.9.peg.850	nodulation protein (outer membrane efflux protein)	RND efflux system, outer membrane lipoprotein CmeC	Type I secretion system outer membrane transport protein	has signal peptide
254780932	537021.9.peg.853	hypothetical protein	hypothetical protein	unknown	
254780933	537021.9.peg.854	valyl-tRNA synthetase	Valyl-tRNA synthetase (EC 6.1.1.9)	valyl-tRNA synthetase (EC 6.1.1.9)	
254780934	537021.9.peg.855	hypothetical protein	von Willebrand factor type A	von Willebrand factor type A fused with TadE/F involved in pilus assembly	transmembrane protein, but might be processed by cpaA and become periplasmic
254780935	537021.9.peg.856	rare lipoprotein A	Rare lipoprotein A precursor	rare lipoprotein A	has signal peptide
254780936	537021.9.peg.857	hypothetical protein	MII752 protein	unknown	
254780937	537021.9.peg.858	DNA-directed RNA polymerase subunit omega	DNA-directed RNA polymerase omega subunit (EC 2.7.7.6)	DNA-directed RNA polymerase subunit omega	
254780938	537021.9.peg.859	4'-phosphopantetheinyl transferase	Holo-[acyl-carrier protein] synthase (EC 2.7.8.7)	4'-phosphopantetheinyl transferase (EC 2.7.8.7)	
254780939	537021.9.peg.860	type I signal peptidase	Signal peptidase I (EC 3.4.21.89)	type I signal peptidase (EC 3.4.21.89)	transmembrane protein
254780940	537021.9.peg.861	ribonuclease III	Ribonuclease III (EC 3.1.26.3)	ribonuclease III (EC 3.1.26.3)	
254780941	537021.9.peg.862	GTP-binding protein Era	GTP-binding protein Era	GTP-binding protein Era	
254780942	537021.9.peg.863	UDP-N-acetylglucosamine pyrophosphorylase protein	N-acetylglucosamine-1-phosphate uridylyltransferase (EC 2.7.7.23) / Glucosamine-1-phosphate N-acetyltransferase (EC 2.3.1.157)	UDP-N-acetylglucosamine pyrophosphorylase (EC 2.7.7.23)	
254780943	537021.9.peg.864	glucosamine--fructose-6-phosphate aminotransferase	Glucosamine--fructose-6-phosphate aminotransferase [isomerizing] (EC 2.6.1.16)	glucosamine--fructose-6-phosphate aminotransferase (EC 2.6.1.16)	
254780944	537021.9.peg.865	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780945	537021.9.peg.866	ATP-dependent DNA helicase RecG	ATP-dependent DNA helicase RecG (EC 3.6.1.-)	ATP-dependent DNA helicase RecG (EC 3.6.1.-)	
254780946	537021.9.peg.867	hypothetical protein	YgfY COG2938	unknown	
254780947	537021.9.peg.868	transcription-repair coupling factor	Transcription-repair coupling factor	transcription-repair coupling factor	
254780948	537021.9.peg.870	DNA repair protein RecO	DNA recombination and repair protein RecO	DNA repair protein RecO	
254780949	537021.9.peg.871	tyrosyl-tRNA synthetase	Tyrosyl-tRNA synthetase (EC 6.1.1.1) cluster 1	tyrosyl-tRNA synthetase (EC 6.1.1.1)	
255764508	537021.9.peg.872	hypothetical protein	hypothetical protein	similar to YdcF-like protein, function unknown	transmembrane protein
254780951	537021.9.peg.875	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780952	537021.9.peg.876	DNA helicase II	ATP-dependent DNA helicase UvrD/PcrA	DNA helicase II	
254780953	537021.9.peg.877	OmpA/MotB	OmpA/MotB domain protein	outer membrane lipoprotein	has signal peptide
254780954	537021.9.peg.878	hypothetical protein	hypothetical protein	Uncharacterized protein involved in outer membrane biogenesis	has signal peptide
254780955	537021.9.peg.879	hypothetical protein	hypothetical protein	ClpXP protease specificity-enhancing factor, SspB	
254780956	537021.9.peg.881	thymidylate synthase	Thymidylate synthase (EC 2.1.1.45)	thymidylate synthase (EC 2.1.1.45)	
254780957	537021.9.peg.882	dihydrofolate reductase protein	Dihydrofolate reductase (EC 1.5.1.3)	dihydrofolate reductase protein (EC 1.5.1.3)	
254780958	537021.9.peg.883	HflK protein	HflK protein	Membrane protease subunit, hflK	transmembrane protein

254780959	537021.9.peg.884	putative hydrolase serine protease transmembrane protein	HfIC protein	Membrane protease subunit, hfIC	has signal peptide
254780960	537021.9.peg.886	phosphoserine phosphatase SerB	Phosphoserine phosphatase (EC 3.1.3.3)	phosphoserine phosphatase SerB (EC 3.1.3.3)	
N/A	537021.9.peg.887	N/A	tRNA delta(2)-isopentenylpyrophosphate transferase (EC 2.5.1.8)	tRNA delta(2)-isopentenylpyrophosphate transferase	1/2 of the protein
N/A	537021.9.peg.888	N/A	tRNA delta(2)-isopentenylpyrophosphate transferase (EC 2.5.1.8)	tRNA delta(2)-isopentenylpyrophosphate transferase	1/2 of the protein
254780961	537021.9.peg.890	hypothetical protein	hypothetical protein	peptidase	transmembrane protein
254780962	537021.9.peg.891	hypothetical protein	GCN5-related N-acetyltransferase	part of GCN5-related N-acetyltransferase, only a piece	strange, only piece of the protein
254780963	537021.9.peg.892	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780964	537021.9.peg.893	ribonucleotide-diphosphate reductase subunit beta	Ribonucleotide reductase of class Ia (aerobic), beta subunit (EC 1.17.4.1)	ribonucleotide-diphosphate reductase subunit beta	
254780965	537021.9.peg.894	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780966	537021.9.peg.895	hypothetical protein	hypothetical protein	unknown	
254780967	537021.9.peg.896	probable multidrug resistance transporter protein	Drug resistance transporter, Bcr/CflA family	multidrug resistance transporter	transmembrane protein
254780968	537021.9.peg.897	hypothetical protein	Uncharacterized monothiol glutaredoxin ycf64-like	Glutaredoxin-related protein	
254780969	537021.9.peg.898	hypothetical protein	YrbA protein	transcriptional regulator, BOLA	
254780970	537021.9.peg.899	phosphoribosylformylglycinamide synthase II	Phosphoribosylformylglycinamide synthase, synthetase subunit (EC 6.3.5.3)	phosphoribosylformylglycinamide synthase II (EC 6.3.5.3)	
254780971	537021.9.peg.900	phosphoribosylformylglycinamide synthase I	Phosphoribosylformylglycinamide synthase, glutamine amidotransferase subunit (EC 6.3.5.3)	phosphoribosylformylglycinamide synthase I (EC 6.3.5.3)	
254780972	537021.9.peg.901	phosphoribosylformylglycinamide synthase, PurS protein	Phosphoribosylformylglycinamide synthase, PurS subunit (EC 6.3.5.3)	phosphoribosylformylglycinamide synthase, PurS protein (EC 6.3.5.3)	
254780973	537021.9.peg.902	phosphoribosylaminoimidazole-succinocarboxamide synthase	Phosphoribosylaminoimidazole-succinocarboxamide synthase (EC 6.3.2.6)	phosphoribosylaminoimidazole-succinocarboxamide synthase (EC 6.3.2.6)	
254780974	537021.9.peg.903	adenylosuccinate lyase	Adenylosuccinate lyase (EC 4.3.2.2)	adenylosuccinate lyase (EC 4.3.2.2)	
254780975	537021.9.peg.904	D-ribulose-5 phosphate 3-epimerase protein	Ribulose-phosphate 3-epimerase (EC 5.1.3.1)	D-ribulose-5 phosphate 3-epimerase protein (EC 5.1.3.1)	
254780976	537021.9.peg.906	Holliday junction resolvase YqgF	Putative Holliday junction resolvase (EC 3.1.-.-)	Holliday junction resolvase YqgF-like protein (EC 3.1.-.-)	
254780977	537021.9.peg.907	putative glutamyl-tRNA(Gln) amidotransferase subunit C protein	Aspartyl-tRNA(Asn) amidotransferase subunit C (EC 6.3.5.6), Glutamyl-tRNA(Gln) amidotransferase subunit C (EC 6.3.5.7)	aspartyl/glutamyl-tRNA amidotransferase subunit C (EC 6.3.5.6)	
254780978	537021.9.peg.908	aspartyl/glutamyl-tRNA amidotransferase subunit A	Aspartyl-tRNA(Asn) amidotransferase subunit A (EC 6.3.5.6), Glutamyl-tRNA(Gln) amidotransferase subunit A (EC 6.3.5.7)	aspartyl/glutamyl-tRNA amidotransferase subunit A (EC 6.3.5.6)	
254780979	537021.9.peg.909	aspartyl/glutamyl-tRNA amidotransferase subunit B	Aspartyl-tRNA(Asn) amidotransferase subunit B (EC 6.3.5.6), Glutamyl-tRNA(Gln) amidotransferase subunit B (EC 6.3.5.7)	aspartyl/glutamyl-tRNA amidotransferase subunit B (EC 6.3.5.6)	
254780980	537021.9.peg.910	hypothetical protein	hypothetical protein	unknown	has signal peptide
254780981	N/A	hypothetical protein	N/A	unknown	has signal peptide
254780982	537021.9.peg.914	putative homoserine/homoserine lactone efflux protein	putative homoserine/homoserine lactone efflux protein	efflux system, permease	transmembrane protein
254780983	537021.9.peg.915	hypothetical protein	hypothetical protein	unknown	
254780984	N/A	hypothetical protein	N/A	unknown	has signal peptide
254780985	537021.9.peg.917	hypothetical protein	hypothetical protein	unknown	
254780986	537021.9.peg.918	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780987	537021.9.peg.919	hypothetical protein	hypothetical protein	transcriptional regulator	
254780988	537021.9.peg.920	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254780989	537021.9.peg.921	GCN5-related N-acetyltransferase	GCN5-related N-acetyltransferase	N-acetyltransferase	
254780991	537021.9.peg.922	excinuclease ABC subunit B	Excinuclease ABC subunit B	excinuclease ABC subunit B, uvrB	
254780992	537021.9.peg.923	acyl-CoA hydrolase	acyl-CoA hydrolase	acyl-CoA hydrolase	
254780993	537021.9.peg.924	hypothetical protein	hypothetical protein	permease	transmembrane protein
254780994	537021.9.peg.925	hypothetical protein	hypothetical protein	unknown	
254780995	537021.9.peg.926	Endonuclease/exonuclease/phosphatase	hypothetical protein	exonuclease	1/2 of the protein

254780996	537021.9.peg.927	hypothetical protein	hypothetical protein	exonuclease	1/2 of the protein
254780998	537021.9.peg.928	hypothetical protein	Sulfur acceptor protein Sufe for iron-sulfur cluster assembly	Sufe protein probably involved in Fe-S cluster assembly	
254780999	537021.9.peg.929	NAD synthetase	NAD synthetase (EC 6.3.1.5) / Glutamine amidotransferase chain of NAD synthetase	NAD synthetase (EC 6.3.1.5)	
254781000	537021.9.peg.932	tRNA (uracil-5-)-methyltransferase	tRNA (Uracil54-C5-)-methyltransferase (EC 2.1.1.35)	tRNA (uracil-5-)-methyltransferase	
254781001	537021.9.peg.933	hypothetical protein	hypothetical protein	unknown	
254781002	537021.9.peg.934	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254781003	537021.9.peg.935	hypothetical protein	hypothetical protein	endonuclease	has signal peptide
254781004	537021.9.peg.936	threonyl-tRNA synthetase	Threonyl-tRNA synthetase (EC 6.1.1.3)	threonyl-tRNA synthetase (EC 6.1.1.3)	
254781005	537021.9.peg.938	hypothetical protein	hypothetical protein	unknown	has signal peptide
254781006	537021.9.peg.939	ribonucleotide-diphosphate reductase subunit beta	Ribonucleotide reductase of class Ia (aerobic), beta subunit (EC 1.17.4.1)	ribonucleotide-diphosphate reductase subunit beta	
254781007	537021.9.peg.940	hypothetical protein	hypothetical protein	unknown	has signal peptide
254781008	537021.9.peg.941	hypothetical protein	hypothetical protein	unknown	
254781009	537021.9.peg.943	hypothetical protein	Flagellar basal-body rod protein FlgF	unknown	
254781010	537021.9.peg.944	hypothetical protein	hypothetical protein	unknown	has signal peptide
254781011	537021.9.peg.946	orotate phosphoribosyltransferase	Orotate phosphoribosyltransferase (EC 2.4.2.10)	orotate phosphoribosyltransferase (EC 2.4.2.10)	
254781012	537021.9.peg.947	dihydroorotase	Dihydroorotase (EC 3.5.2.3)	dihydroorotase (EC 3.5.2.3)	
254781013	537021.9.peg.948	phage-associated protein	hypothetical protein	phage associated protein	transmembrane protein
254781014	537021.9.peg.949	hypothetical protein	hypothetical protein	unknown	has signal peptide
254781015	537021.9.peg.951	hypothetical protein	hypothetical protein	unknown	
254781016	537021.9.peg.952	diphosphomevalonate decarboxylase/isopentenyl-diphosphate delta-isomerase	Diphosphomevalonate decarboxylase (EC 4.1.1.33)	diphosphomevalonate decarboxylase/isopentenyl-diphosphate delta-isomerase (EC 4.1.1.33)	
254781017	537021.9.peg.953	GHMP kinase	Mevalonate kinase (EC 2.7.1.36)	GHMP kinase (EC 2.7.1.36)	
254781018	537021.9.peg.954	GHMP kinase	Mevalonate kinase (EC 2.7.1.36)	GHMP kinase (EC 2.7.1.36)	
254781019	537021.9.peg.955	hydroxymethylglutaryl-coenzyme A synthase	Hydroxymethylglutaryl-CoA synthase (EC 2.3.3.10)	hydroxymethylglutaryl-coenzyme A synthase (EC 2.3.3.10)	
254781020	537021.9.peg.956	isopentenyl pyrophosphate isomerase	Isopentenyl-diphosphate delta-isomerase, FMN-dependent (EC 5.3.3.2)	isopentenyl pyrophosphate isomerase (EC 5.3.3.2)	
255764509	537021.9.peg.957	hydroxymethylglutaryl-coenzyme A (HMG-CoA) reductase	Hydroxymethylglutaryl-CoA reductase (EC 1.1.1.34)	hydroxymethylglutaryl-coenzyme A (HMG-CoA) reductase (EC 1.1.1.34)	
254781022	537021.9.peg.958	hypothetical protein	COG1988: Predicted membrane-bound metal-dependent hydrolases	possible membrane-bounded hydrolase	transmembrane protein
254781024	537021.9.peg.959	electron transfer flavoprotein-ubiquinone oxidoreductase	Electron transfer flavoprotein-ubiquinone oxidoreductase (EC 1.5.5.1)	electron transfer flavoprotein-ubiquinone oxidoreductase (EC 1.5.5.1)	
254781025	537021.9.peg.960	deoxyuridine 5' 27-triphosphate nucleotidohydrolase	Deoxyuridine 5'-triphosphate nucleotidohydrolase (EC 3.6.1.23)	deoxyuridine 5' 27-triphosphate nucleotidohydrolase (EC 3.6.1.23)	
254781026	537021.9.peg.962	hypothetical protein	MG(2+) CHELATASE FAMILY PROTEIN / ComM-related protein	Mg chelatase-related protein	1/3 of a protein
254781027	537021.9.peg.963	hypothetical protein	MG(2+) CHELATASE FAMILY PROTEIN / ComM-related protein	Mg chelatase-related protein	1/3 of a protein
254781028	537021.9.peg.964	putative Mg2+ chelatase family protein	putative Mg2+ chelatase family protein	Mg chelatase-related protein	1/3 of a protein
254781029	537021.9.peg.965	chemotaxis sensory transducer	hypothetical protein	unknown	transmembrane protein, has disordered domain
254781031	537021.9.peg.966	exsB protein	Queuosine Biosynthesis QueC ATPase	exsB/queuosine biosynthesis protein	
254781032	537021.9.peg.967	hypothetical protein	Queuosine biosynthesis QueD, PTPS-I	6-pyruvoyl-tetrahydropterin synthase	
254781033	537021.9.peg.968	HemY domain-containing protein	Homolog of E. coli HemY protein	HemY domain-containing protein	transmembrane protein
254781034	537021.9.peg.969	hypothetical protein	hypothetical protein	unknown	transmembrane protein
255764510	537021.9.peg.970	uroporphyrinogen-III synthase	Uroporphyrinogen-III synthase (EC 4.2.1.75)	uroporphyrinogen-III synthase (EC 4.2.1.75)	
254781036	537021.9.peg.971	hypothetical protein	hypothetical protein	unknown	
254781037	537021.9.peg.972	porphobilinogen deaminase	Porphobilinogen deaminase (EC 2.5.1.61)	porphobilinogen deaminase (EC 2.5.1.61)	
254781038	537021.9.peg.973	putative DNA-binding/iron metalloprotein/AP endonuclease	YgiD/KaeI/Qri7 family, required for threonylcarbamoyladenine (t(6)A) formation in tRNA	Metal-dependent proteases	
254781039	537021.9.peg.974	putative glycerol-3-phosphate dehydrogenase	Glycerol-3-phosphate dehydrogenase [NAD(P)+] (EC	putative glycerol-3-phosphate dehydrogenase (EC	

			1.1.1.94)	1.1.1.94)	
254781040	537021.9.peg.975	hypothetical protein	Protein of unknown function DUF55	unknown	
254781041	537021.9.peg.976	succinate dehydrogenase protein, cytochrome b subunit	Succinate dehydrogenase cytochrome b-556 subunit	succinate dehydrogenase protein, cytochrome b subunit	transmembrane protein
254781042	537021.9.peg.977	succinate dehydrogenase hydrophobic membrane anchor	Succinate dehydrogenase hydrophobic membrane anchor protein	succinate dehydrogenase hydrophobic membrane anchor	transmembrane protein
254781043	537021.9.peg.978	succinate dehydrogenase flavoprotein subunit	Succinate dehydrogenase flavoprotein subunit (EC 1.3.99.1)	succinate dehydrogenase flavoprotein subunit (EC 1.3.99.1)	
254781044	537021.9.peg.979	succinate dehydrogenase iron-sulfur subunit	Succinate dehydrogenase iron-sulfur protein (EC 1.3.99.1)	succinate dehydrogenase iron-sulfur subunit (EC 1.3.99.1)	
254781045	537021.9.peg.980	outer membrane lipoprotein omp19	hypothetical protein	unknown	has signal peptide
254781046	537021.9.peg.981	hypothetical protein	hypothetical protein	unknown	
254781047	537021.9.peg.982	AFG1-family ATPase	hypothetical protein	AFG1-family ATPase	
254781048	537021.9.peg.983	malate dehydrogenase	Malate dehydrogenase (EC 1.1.1.37)	malate dehydrogenase (EC 1.1.1.37)	
254781049	537021.9.peg.984	succinyl-CoA synthetase subunit beta	Succinyl-CoA ligase [ADP-forming] beta chain (EC 6.2.1.5)	succinyl-CoA synthetase subunit beta (EC 6.2.1.5)	
254781050	537021.9.peg.985	succinyl-CoA synthetase subunit alpha	Succinyl-CoA ligase [ADP-forming] alpha chain (EC 6.2.1.5)	succinyl-CoA synthetase subunit alpha (EC 6.2.1.5)	
254781051	537021.9.peg.986	alpha-ketoglutarate decarboxylase	2-oxoglutarate dehydrogenase E1 component (EC 1.2.4.2)	alpha-ketoglutarate decarboxylase (EC 1.2.4.2)	
254781052	537021.9.peg.987	dihydrolipoamide succinyltransferase	Dihydrolipoamide succinyltransferase component (E2) of 2-oxoglutarate dehydrogenase complex (EC 2.3.1.61)	dihydrolipoamide succinyltransferase (EC 2.3.1.61)	
254781053	537021.9.peg.988	dihydrolipoamide dehydrogenase	Dihydrolipoamide dehydrogenase of 2-oxoglutarate dehydrogenase (EC 1.8.1.4)	dihydrolipoamide dehydrogenase (EC 1.8.1.4)	
254781054	537021.9.peg.989	ribose-5-phosphate isomerase A	Ribose 5-phosphate isomerase A (EC 5.3.1.6)	ribose-5-phosphate isomerase A (EC 1.8.1.7)	
254781055	537021.9.peg.990	glutathione reductase	Glutathione reductase (EC 1.8.1.7)	glutathione reductase (EC 1.8.1.7)	
254781056	537021.9.peg.991	phage-related lysozyme	prophage LambdaMco1, lysozyme(EC:3.2.1.17)	phage-related lysozyme, degrade peptidoglycan	
254781057	N/A	hypothetical protein	N/A	phage-related lysozyme, degrade peptidoglycan	1/2 of the protein
254781058	537021.9.peg.992	phage-related lysozyme	prophage LambdaMco1, lysozyme	phage-related lysozyme, degrade peptidoglycan	1/2 of the protein
254781059	537021.9.peg.994	cysteine desulfurase activator complex subunit SufB	Iron-sulfur cluster assembly protein SufB	cysteine desulfurase activator complex subunit SufB	
254781060	537021.9.peg.995	ABC transporter, nucleotide binding/ATPase protein	Iron-sulfur cluster assembly ATPase protein SufC	SufC, ABC-type ATPase involve in Fe-S cluster assembly	
254781061	537021.9.peg.996	putative iron-sulfur cluster assembly protein	Iron-sulfur cluster assembly protein SufD	SufD, ABC-transporter involve in Fe-S cluster assembly	
254781062	537021.9.peg.997	putative aminotransferase involved in iron-sulfur cluster biogenesis	Cysteine desulfurase (EC 2.8.1.7), SufS subfamily	cystein Desulfurase, SufS (EC 2.8.1.7)	
254781063	537021.9.peg.998	hypothetical protein	PaaD-like protein (DUF59) involved in Fe-S cluster assembly	metal-sulfur cluster biosynthetic enzyme	
254781064	537021.9.peg.999	FeS assembly scaffold SufA	Iron binding protein SufA for iron-sulfur cluster assembly	FeS assembly scaffold SufA	
254781065	537021.9.peg.1000	L-lysine 2,3-aminomutase protein	Lysine 2,3-aminomutase (EC 5.4.3.2)	L-lysine 2,3-aminomutase protein (EC 5.4.3.2)	
254781066	537021.9.peg.1001	putative lysyl-tRNA synthetase protein	Lysyl-tRNA synthetase-related protein	lysyl-tRNA synthetase protein	
254781067	537021.9.peg.1002	elongation factor P	Translation elongation factor P	elongation factor P	
254781068	537021.9.peg.1003	hypothetical protein	hypothetical protein	glycoside hydrolase family protein	1/4 of the protein
254781069	537021.9.peg.1004	hypothetical protein	hypothetical protein	glycoside hydrolase family protein	1/4 of the protein
254781070	537021.9.peg.1005	hypothetical protein	hypothetical protein	glycoside hydrolase family protein	1/4 of the protein
254781071	537021.9.peg.1006	hypothetical protein	hypothetical protein	glycoside hydrolase family protein	1/4 of the protein
254781072	537021.9.peg.1007	hypothetical protein	hypothetical protein	unknown	
254781073	537021.9.peg.1008	coproporphyrinogen III oxidase	Coproporphyrinogen III oxidase, aerobic (EC 1.3.3.3)	coproporphyrinogen III oxidase (EC 1.3.3.3)	
254781074	537021.9.peg.1009	uracil-DNA glycosylase	Uracil-DNA glycosylase, family 1	uracil-DNA glycosylase	
254781075	537021.9.peg.1010	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254781076	537021.9.peg.1011	ribonuclease HIII	Ribonuclease HIII (EC 3.1.26.4)	ribonuclease HIII (EC 3.1.26.4)	
254781077	537021.9.peg.1012	hypothetical protein	hypothetical protein	unknown	
254781078	537021.9.peg.1013	hypothetical protein	hypothetical protein	outer membrane protein	has signal peptide

254781079	537021.9.peg.1014	diguanylate cyclase	diguanylate cyclase (GGDEF domain)	diguanylate cyclase	transmembrane protein
254781080	537021.9.peg.1015	hypothetical protein	COG3750: Uncharacterized protein conserved in bacteria	unknown	
254781081	537021.9.peg.1016	hypothetical protein	hypothetical protein	unknown	
254781082	537021.9.peg.1017	hypothetical protein	hypothetical protein	unknown	
254781083	537021.9.peg.1018	hypothetical protein	hypothetical protein	unknown	
254781084	537021.9.peg.1019	hypothetical protein	hypothetical protein	unknown	
254781085	537021.9.peg.1020	F0F1 ATP synthase subunit B	ATP synthase B chain (EC 3.6.3.14)	F0F1 ATP synthase subunit B (EC 3.6.3.14)	transmembrane protein
254781086	537021.9.peg.1021	F0F1 ATP synthase subunit B'	ATP synthase B' chain (EC 3.6.3.14)	F0F1 ATP synthase subunit B' (EC 3.6.3.14)	transmembrane protein
254781087	537021.9.peg.1022	H+-transporting two-sector ATPase C subunit	ATP synthase C chain (EC 3.6.3.14)	H+-transporting two-sector ATPase C subunit (EC 3.6.3.14)	transmembrane protein
254781088	537021.9.peg.1023	F0F1 ATP synthase subunit A	ATP synthase A chain (EC 3.6.3.14)	F0F1 ATP synthase subunit A (EC 3.6.3.14)	transmembrane protein
254781089	537021.9.peg.1024	hypothetical protein	hypothetical protein	unknown	
254781090	537021.9.peg.1025	hypothetical protein	hypothetical protein	unknown	
254781091	537021.9.peg.1026	putative pyridoxal-phosphate-dependent aminotransferase protein	Cysteine desulfurase (EC 2.8.1.7)	pyridoxal-phosphate-dependent aminotransferase protein (EC 2.8.1.7)	
254781093	537021.9.peg.1027	hypothetical protein	Alpha/beta hydrolase	hydrolase	
254781094	537021.9.peg.1028	glycyl-tRNA synthetase subunit beta	Glycyl-tRNA synthetase beta chain (EC 6.1.1.14)	glycyl-tRNA synthetase subunit beta (EC 6.1.1.14)	
254781095	537021.9.peg.1029	UDP-N-acetylenolpyruvoylglucosamine reductase	UDP-N-acetylenolpyruvoylglucosamine reductase (EC 1.1.1.158)	UDP-N-acetylenolpyruvoylglucosamine reductase (EC 1.1.1.158)	
254781096	537021.9.peg.1030	UDP-N-acetylmuramate--L-alanine ligase	UDP-N-acetylmuramate--alanine ligase (EC 6.3.2.8)	UDP-N-acetylmuramate--L-alanine ligase (EC 6.3.2.8)	
254781097	537021.9.peg.1031	N-acetylglucosaminyl transferase	UDP-N-acetylglucosamine--N-acetylmuramyl-(pentapeptide) pyrophosphoryl-undecaprenol N-acetylglucosamine transferase (EC 2.4.1.227)	N-acetylglucosaminyl transferase	
254781098	537021.9.peg.1032	cell division protein FtsW peptidoglycan synthesis	Cell division protein FtsW	cell division protein FtsW peptidoglycan synthetase	transmembrane protein
254781099	537021.9.peg.1033	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate synthetase	UDP-N-acetylmuramoylalanine--D-glutamate ligase (EC 6.3.2.9)	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate synthetase (EC 6.3.2.9)	
254781100	537021.9.peg.1034	phospho-N-acetylmuramoyl-pentapeptide-transferase	Phospho-N-acetylmuramoyl-pentapeptide-transferase (EC 2.7.8.13)	phospho-N-acetylmuramoyl-pentapeptide-transferase (EC 2.7.8.13)	transmembrane protein
254781101	537021.9.peg.1035	UDP-N-acetylmuramoylalanyl-D-glutamyl-2, 6-diaminopimelate/D-alanyl-D-alanyl ligase	UDP-N-acetylmuramoylalanyl-D-glutamyl-2,6-diaminopimelate--D-alanyl-D-alanine ligase (EC 6.3.2.10)	UDP-N-acetylmuramoylalanyl-D-glutamyl-2, 6-diaminopimelate/D-alanyl-D-alanyl ligase (EC 6.3.2.10)	
254781102	537021.9.peg.1036	UDP-N-acetylmuramoylalanyl-D-glutamate--2, 6-diaminopimelate ligase	UDP-N-acetylmuramoylalanyl-D-glutamate--2,6-diaminopimelate ligase (EC 6.3.2.13)	UDP-N-acetylmuramoylalanyl-D-glutamate--2,6-diaminopimelate ligase (EC 6.3.2.13)	
254781103	537021.9.peg.1037	penicillin-binding transmembrane protein	Cell division protein FtsI [Peptidoglycan synthetase] (EC 2.4.1.129)	penicillin-binding transmembrane protein (EC 2.4.1.129)	transmembrane protein
254781104	537021.9.peg.1038	hypothetical protein	hypothetical protein	unknown	transmembrane protein
255764511	537021.9.peg.1039	S-adenosyl-methyltransferase MraW	rRNA small subunit methyltransferase H	S-adenosyl-methyltransferase MraW	
254781106	537021.9.peg.1040	cell division protein MraZ	Cell division protein MraZ	cell division protein MraZ	
254781107	537021.9.peg.1041	phosphoglucomutase	Phosphoglucomutase (EC 5.4.2.2)	phosphoglucomutase (EC 5.4.2.2)	
254781108	537021.9.peg.1042	von Willebrand factor type A	hypothetical protein	von Willebrand factor type A fused with TadE/F involved in pilus assembly	transmembrane protein, but might be processed by cpaA and become periplasmic
254781109	N/A	hypothetical protein	N/A	unknown	transmembrane protein
254781110	537021.9.peg.1043	von Willebrand factor type A	conserved hypothetical protein	von Willebrand factor type A fused with TadE/F involved in pilus assembly	transmembrane protein, but might be processed by cpaA and become periplasmic
254781111	537021.9.peg.1045	geranyltranstransferase protein	Octaprenyl-diphosphate synthase (EC 2.5.1.-) / Dimethylallyltransferase (EC 2.5.1.1) / Geranyltranstransferase (farnesylidiphosphate synthase) (EC 2.5.1.10) / Geranylgeranyl pyrophosphate synthetase (EC 2.5.1.29)	geranyltranstransferase protein (EC 2.5.1.1)	
254781112	537021.9.peg.1046	putative amino acid-binding periplasmic ABC transporter protein	PUTATIVE AMINO ACID-BINDING PERIPLASMIC ABC TRANSPORTER PROTEIN	ABC-type substrate binding protein	has signal peptide

254781113	537021.9.peg.1047	amino acid ABC transporter (permease)	amino acid ABC transporter, permease protein	ABC-type permease	transmembrane protein
254781114	537021.9.peg.1048	glycosyl transferase family protein	Beta-1,4-galactosyltransferase	glycosyl transferase family protein	
254781115	537021.9.peg.1049	poly(A) polymerase protein	tRNA nucleotidyltransferase (EC 2.7.7.21) (EC 2.7.7.25)	poly(A) polymerase protein (EC 2.7.7.21) (EC 2.7.7.25)	
255764512	537021.9.peg.1050	preprotein translocase protein	Preprotein translocase subunit YajC (TC 3.A.5.1.1)	preprotein translocase protein, yajC	transmembrane protein
255764513	537021.9.peg.1051	glutamyl-tRNA synthetase	Glutamyl-tRNA synthetase (EC 6.1.1.17), Glutamyl-tRNA(Gln) synthetase (EC 6.1.1.24) unambiguous	glutamyl-tRNA synthetase (EC 6.1.1.17)	
254781118	537021.9.peg.1052	lysyl-tRNA synthetase	Lysyl-tRNA synthetase (class II) (EC 6.1.1.6)	lysyl-tRNA synthetase (EC 6.1.1.6)	
254781119	537021.9.peg.1053	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254781120	537021.9.peg.1054	radical SAM protein	Ribosomal RNA large subunit methyltransferase N (EC 2.1.1.-)	radical SAM protein	
254781121	537021.9.peg.1055	hypothetical protein	conserved hypothetical signal peptide protein	unknown	has signal peptide
254781122	537021.9.peg.1056	putative thiamine pyrophosphokinase	Thiamin pyrophosphokinase (EC 2.7.6.2)	thiamine pyrophosphokinase (EC 2.7.6.2)	
254781123	537021.9.peg.1057	putative ABC transporter, ATP-binding protein	ABC transporter, ATP-binding protein	ABC-type ATPase involved in transposon excision regulation, Uup	
254781124	N/A	hypothetical protein	N/A	unknown	
254781126	N/A	hypothetical protein	N/A	unknown	
254781127	537021.9.peg.1059	hypothetical protein	hypothetical protein	unknown	
254781128	537021.9.peg.1060	hypothetical protein	hypothetical protein	outer membrane protein	has signal peptide
254781129	537021.9.peg.1061	hypothetical protein	hypothetical protein	unknown	
254781130	537021.9.peg.1062	hypothetical protein	hypothetical protein	unknown	
254781131	537021.9.peg.1063	hypothetical protein	hypothetical protein	unknown	1/2 of the protein
N/A	537021.9.peg.1064	N/A	hypothetical protein	unknown	has signal peptide, 1/2 of the protein
254781133	537021.9.peg.1065	hypothetical protein	hypothetical protein	N-acetyltransferase	
254781134	537021.9.peg.1066	hypothetical protein	conserved hypothetical protein	unknown	1/3 of the protein
254781135	537021.9.peg.1067	hypothetical protein	hypothetical protein	unknown	1/3 of the protein
254781136	537021.9.peg.1068	hypothetical protein	hypothetical protein	unknown	1/3 of the protein
254781137	537021.9.peg.1069	hypothetical protein	conserved hypothetical protein	unknown	
254781138	537021.9.peg.1070	hypothetical protein	hypothetical protein	unknown	should be phage protein
254781139	537021.9.peg.1071	hypothetical protein	hypothetical protein	unknown	1/2 of a protein
254781140	537021.9.peg.1072	hypothetical protein	hypothetical protein	unknown	1/2 of a protein
N/A	537021.9.peg.1073	N/A	hypothetical protein	phage major head protein	1/2 of the protein
N/A	537021.9.peg.1074	N/A	hypothetical protein	phage major head protein	1/2 of the protein
254781141	537021.9.peg.1075	hypothetical protein	hypothetical protein	unknown	
254781143	N/A	hypothetical protein	N/A	unknown	
254781144	537021.9.peg.1076	hypothetical protein	putative portal protein	unknown	1/2 of the protein
254781145	537021.9.peg.1077	hypothetical protein	putative portal protein	phage portal protein	1/2 of the protein
N/A	537021.9.peg.1078	N/A	PROBABLE DNA PACKAGING PROTEIN GP2	DNA packaging protein Gp2	1/3 of the protein
N/A	537021.9.peg.1079	N/A	PROBABLE DNA PACKAGING PROTEIN GP2	DNA packaging protein Gp2	1/3 of the protein
N/A	537021.9.peg.1080	N/A	PROBABLE DNA PACKAGING PROTEIN GP2	DNA packaging protein Gp2	1/3 of the protein
254781146	537021.9.peg.1081	hypothetical protein	hypothetical protein	unknown	
254781147	537021.9.peg.1082	transcriptional regulator	transcriptional regulator	transcriptional regulator	
254781148	537021.9.peg.1084	hypothetical protein	hypothetical protein	replicative DNA helicase	1/2 of the protein, but still too short to form a functional protein, the structure is not complete
254781149	537021.9.peg.1085	replicative DNA helicase	DnaB helicase	replicative DNA helicase	1/2 of the protein, but still too short to form a functional protein, the structure is not complete
N/A	537021.9.peg.1087	N/A	hypothetical protein	just piece of phage protein	piece of phage protein
254781150	N/A	hypothetical protein	N/A	replicative DNA helicase (only a piece of the protein)	
254781151	537021.9.peg.1088	hypothetical protein	hypothetical protein	unknown	1/2 of a protein
254781152	537021.9.peg.1089	hypothetical protein	hypothetical protein	unknown	1/2 of a protein

254781153	N/A	hypothetical protein	N/A	ribonucleotide-diphosphate reductase subunit beta (only a piece of that protein)	just a piece of the homologous protein, maybe not real
254781154	537021.9.peg.1091	hypothetical protein	hypothetical protein	unknown	
254781155	N/A	hypothetical protein	N/A	unknown	
254781156	537021.9.peg.1092	hypothetical protein	hypothetical protein	unknown	has signal peptide
254781157	537021.9.peg.1093	hypothetical protein	hypothetical protein	unknown	has signal peptide
254781158	537021.9.peg.1094	peptidyl prolyl cis-trans isomerase D signal peptide protein	hypothetical protein	Parvulin-like peptidyl-prolyl isomerase	transmembrane protein
254781159	537021.9.peg.1095	hypothetical protein	hypothetical protein	unknown	has signal peptide
254781160	537021.9.peg.1097	16S rRNA m3U1498 methyltransferase	Ribosomal RNA small subunit methyltransferase E (EC 2.1.1.-)	16S rRNA m3U1498 methyltransferase (EC 2.1.1.-)	
254781161	537021.9.peg.1098	glutamate--cysteine ligase	Glutamate--cysteine ligase (EC 6.3.2.2)	glutamate--cysteine ligase (EC 6.3.2.2)	
254781162	537021.9.peg.1099	GCN5-related N-acetyltransferase	Acetyltransferase (EC 2.3.1.-)	acetyltransferase (EC 2.3.1.-)	
254781163	537021.9.peg.1100	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254781164	537021.9.peg.1102	hypothetical protein	hypothetical protein	unknown	
254781165	537021.9.peg.1103	pyridoxamine 5'-phosphate oxidase	Pyridoxamine 5'-phosphate oxidase (EC 1.4.3.5)	pyridoxamine 5'-phosphate oxidase (EC 1.4.3.5)	
254781166	537021.9.peg.1104	enoyl-(acyl carrier protein) reductase	Enoyl-[acyl-carrier-protein] reductase [NADH] (EC 1.3.1.9)	enoyl-(acyl carrier protein) reductase (EC 1.3.1.9)	
254781167	537021.9.peg.1105	tRNA-dihydrouridine synthase A	tRNA dihydrouridine synthase A (EC 1.-.-.-)	tRNA-dihydrouridine synthase A (EC 1.-.-.-)	
254781169	537021.9.peg.1106	PTS system ascorbate-specific transporter subunit IIC	Ascorbate-specific PTS system, EIIC component	PTS system, transporter	transmembrane protein
254781170	537021.9.peg.1108	deoxyribodipyrimidine photolyase	Deoxyribodipyrimidine photolyase (EC 4.1.99.3)	deoxyribodipyrimidine photolyase (EC 4.1.99.3)	
254781171	537021.9.peg.1109	hypothetical protein	Proton/glutamate symport protein, Sodium/glutamate symport protein	Na+/H+-dicarboxylate symporter	transmembrane protein
254781172	537021.9.peg.1110	NAD-dependent DNA ligase LigA	DNA ligase (EC 6.5.1.2)	NAD-dependent DNA ligase LigA (EC 6.5.1.2)	
255764514	537021.9.peg.1111	DNA repair protein RecN	DNA repair protein RecN	DNA repair protein RecN	
254781174	537021.9.peg.1112	outer membrane assembly lipoprotein YfiO	Competence lipoprotein comL precursor	outer membrane assembly lipoprotein YfiO, may involve in DNA uptake	has signal peptide
254781175	537021.9.peg.1113	UDP-3-O-[3-hydroxymyristoyl] N-acetylglucosamine deacetylase	UDP-3-O-[3-hydroxymyristoyl] N-acetylglucosamine deacetylase (EC 3.5.1.-)	UDP-3-O-[3-hydroxymyristoyl] N-acetylglucosamine deacetylase (EC 3.5.1.-)	
254781176	537021.9.peg.1114	cell division protein FtsZ	Cell division protein FtsZ (EC 3.4.24.-)	cell division protein FtsZ	
254781177	537021.9.peg.1115	cell division protein	Cell division protein FtsA	cell division protein	
254781178	537021.9.peg.1116	cell division protein	Cell division protein ftsQ	cell division protein	transmembrane protein
254781179	537021.9.peg.1117	D-alanine--D-alanine ligase	D-alanine--D-alanine ligase (EC 6.3.2.4)	D-alanine--D-alanine ligase (EC 6.3.2.4)	
254781180	537021.9.peg.1118	hypothetical protein	hypothetical protein	unknown	
254781181	537021.9.peg.1119	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254781182	537021.9.peg.1121	hypothetical protein	hypothetical protein	type I restriction enzyme	1/2 of a protein
254781183	537021.9.peg.1122	hypothetical protein	hypothetical protein	unknown	1/2 of a protein
254781184	537021.9.peg.1124	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254781186	537021.9.peg.1125	hypothetical protein	hypothetical protein	phage protein, terminase large subunit	1/2 of a protein
254781187	537021.9.peg.1126	putative phage terminase, large subunit	terminase B protein, putative	phage protein, terminase large subunit	1/2 of a protein
254781188	537021.9.peg.1127	hypothetical protein	hypothetical protein	phage protein, terminase small subunit	
254781189	537021.9.peg.1129	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254781191	537021.9.peg.1131	hypothetical protein	Phage protein	unknown	
254781190	537021.9.peg.1130	hypothetical protein	DR0530-like primase	primase	
254781192	537021.9.peg.1132	hypothetical protein	conserved hypothetical protein	single-strand DNA binding protein	
254781193	537021.9.peg.1133	putative DNA polymerase from bacteriophage origin	DNA polymerase, phage-associated	DNA polymerase from bacteriophage	
254781194	537021.9.peg.1134	hypothetical protein	hypothetical protein	endonuclease	
255764515	537021.9.peg.1135	SNF2 related	DNA helicase, phage-associated	ATP-dependent helicase	
254781196	537021.9.peg.1136	DNA ligase, NAD-dependent	DNA ligase, NAD-dependent	NAD-dependent DNA ligase	it is shorter than normal ones, only has one domain
254781197	537021.9.peg.1137	guanylate kinase	Guanylate kinase (EC 2.7.4.8)	guanylate kinase	

254781198	537021.9.peg.1138	guanylate kinase	hypothetical protein	unknown	transmembrane protein
254781199	537021.9.peg.1139	hypothetical protein	hypothetical protein	unknown	transmembrane protein
N/A	537021.9.peg.1140	N/A	hypothetical protein	unknown	transmembrane protein
255764516	537021.9.peg.1141	hypothetical protein	hypothetical protein	unknown	
N/A	537021.9.peg.1142	N/A	hypothetical protein	unknown	
255764517	537021.9.peg.1143	hypothetical protein	hypothetical protein	unknown	
254781202	537021.9.peg.1144	hypothetical protein	hypothetical protein	structural protein of bacteriophage	
254781203	537021.9.peg.1145	hypothetical protein	hypothetical protein	unknown	
254781204	537021.9.peg.1146	hypothetical protein	hypothetical protein	minor structure protein	
254781205	537021.9.peg.1147	hypothetical protein	hypothetical protein	unknown	
254781206	537021.9.peg.1148	hypothetical protein	hypothetical protein	unknown	
254781207	537021.9.peg.1149	hypothetical protein	hypothetical protein	unknown	has signal peptide
254781208	537021.9.peg.1150	hypothetical protein	hypothetical protein	unknown	
254781209	537021.9.peg.1151	hypothetical protein	hypothetical protein	tail tubular protein A of bacteriophage	
254781210	537021.9.peg.1152	hypothetical protein	hypothetical protein	major capsid protein	
254781211	537021.9.peg.1153	hypothetical protein	hypothetical protein	unknown	
254781212	537021.9.peg.1154	hypothetical protein	hypothetical protein	unknown	
254781213	537021.9.peg.1155	head-to-tail joining protein, putative	hypothetical protein	bacteriophage head-to-tail joining protein	
254781214	537021.9.peg.1156	hypothetical protein	hypothetical protein	unknown	
254781215	537021.9.peg.1157	putative phage terminase, large subunit	terminase B protein, putative	phage terminase, large subunit	
254781216	537021.9.peg.1158	hypothetical protein	hypothetical protein	unknown	
254781217	537021.9.peg.1159	hypothetical protein	hypothetical protein	phage protein, related to the packing of DNA, recognize DNA	
254781218	537021.9.peg.1160	hypothetical protein	hypothetical protein	transcriptional regulator	
254781219	537021.9.peg.1161	hypothetical protein	hypothetical protein	unknown	
254781220	537021.9.peg.1162	hypothetical protein	hypothetical protein	unknown	
254781221	537021.9.peg.1163	hypothetical protein	hypothetical protein	unknown	has signal peptide
254781222	537021.9.peg.1164	hypothetical protein	hypothetical protein	acyltransferase, phage related	1/2 of the protein
254781223	537021.9.peg.1165	intrrupted gp229, phage associated protein	hypothetical protein	acyltransferase, phage related	1/2 of the protein
254781224	537021.9.peg.1166	hypothetical protein	hypothetical protein	unknown	transmembrane protein
254781225	537021.9.peg.1167	P4 family phage/plasmid primase	hypothetical protein	P4 family phage/plasmid primase	
254781226	537021.9.peg.1168	hypothetical protein	hypothetical protein	unknown	
254781227	537021.9.peg.1169	hypothetical protein	hypothetical protein	unknown	
254781228	537021.9.peg.1170	hypothetical protein	hypothetical protein	unknown	