

Supplemental Research Data Table C. Function classification of *Thermoanaerobacter tengcongensis* CDS. Each gene is assigned a unique numeric identifier beginning with "TTE". The names of known genes are listed, retrieved automatically from COG database and adjusted manually when necessary. Percentages refer to the identity found in the best alignment of BLASTP against NCBI non-redundant protein database.

Information storage and processing (378)			Identity(%)
<i>Translation, ribosomal structure and biogenesis (144)</i>			
TTE0025	SerS	Seryl-tRNA synthetase	62
TTE0052	RsuA	16S rRNA uridine-516 pseudouridylate synthase and related pseudouridylate synthases	53
TTE0109	PcnB	tRNA nucleotidyltransferase/poly(A) polymerase	31
TTE0110	MetG	Methionyl-tRNA synthetase	62
TTE0113	KsgA	Dimethyladenosine transferase (rRNA methylation)	42
TTE0139	RpmE	Ribosomal protein L31	61
TTE0142	HemK	Predicted rRNA or tRNA methylase	39
TTE0143	PrfA	Protein chain release factor A	54
TTE0145	SUA5	Putative translation factor (SUA5)	55
TTE0253	CspR	Predicted rRNA methylase (SpoU class)	53
TTE0324	LeuS	Leucyl-tRNA synthetase	51
TTE0474	GCD14	Predicted SAM-dependent methyltransferase involved in tRNA-Met maturation	44
TTE0516	-	Ribosome-associated protein Y (PSrp-1)	45
TTE0523	PrfB	Protein chain release factor B	51
TTE0606	GatC	Asp-tRNAAsn/Glu-tRNA Gln amidotransferase C subunit	46
TTE0607	GatA	Asp-tRNAAsn/Glu-tRNA Gln amidotransferase A subunit and related amidases	55
TTE0608	GatB	Asp-tRNAAsn/Glu-tRNA Gln amidotransferase B subunit (PET112 homolog)	58
TTE0618	Rph	RNase PH	61
TTE0716	YSH1	Predicted exonuclease of the beta-lactamase fold involved in RNA processing	45
TTE0781	ValS	Valyl-tRNA synthetase	55
TTE0911	CafA	Ribonucleases G and E	37
TTE0913	RplU	Ribosomal protein L21	60
TTE0914	-	Predicted ribosomal protein	30
TTE0915	RpmA	Ribosomal protein L27	78
TTE0929	GlnS	Glutamyl- and glutaminyl-tRNA synthetases	46
TTE0943	RpsT	Ribosomal protein S20	50
TTE0957	PmA	Ribosomal protein L11 methylase	47
TTE0962	MiaB	2-methylthioadenine synthetase	52
TTE0964	RpsU	Ribosomal protein S21	75
TTE0978	GRS1	Glycyl-tRNA synthetase, class II	67
TTE1182	QueA	S-adenosylmethionine:tRNA-ribosyltransferase-isomerase (queuine synthetase)	64
TTE1183	Tgt	Queuine/archaeosine tRNA-ribosyltransferase	66
TTE1196	Dtd	D-Tyr-tRNA ^{Tyr} deacylase	53
TTE1230	HisS	Histidyl-tRNA synthetase	48
TTE1231	AspS	Aspartyl-tRNA synthetase	58
TTE1243	TmU	Predicted tRNA(5-methylaminomethyl-2-thiouridylate) methyltransferase, contains the PP-loop ATPase domain	45
TTE1248	AlaS	Alanyl-tRNA synthetase	47
TTE1281	Efp	Translation elongation factor P/translation initiation factor eIF-5A	55
TTE1299	-	Predicted rRNA methylases	56
TTE1322	PcnB	tRNA nucleotidyltransferase/poly(A) polymerase	31
TTE1332	RsuA	16S rRNA uridine-516 pseudouridylate synthase and related pseudouridylate synthases	53

TTE1353	RpsA	Ribosomal protein S1	33
TTE1356	MiaB	2-methylthioadenine synthetase	51
TTE1359	MiaA	tRNA delta(2)-isopentenylpyrophosphate transferase	46
TTE1377	MiaB	2-methylthioadenine synthetase	47
TTE1387	Pnp	Polyribonucleotide nucleotidyltransferase (polynucleotide phosphorylase)	62
TTE1388	RpsO	Ribosomal protein S15P/S13E	72
TTE1390	TruB	Pseudouridine synthase	42
TTE1392	RbfA	Ribosome-binding factor A	46
TTE1393	InfB	Translation initiation factor 2 (GTPase)	62
TTE1394	RPL8A	Ribosomal protein HS6-type (S12/L30/L7a)	39
TTE1406	Frr	Ribosome recycling factor	63
TTE1408	Tsf	Translation elongation factor Ts	57
TTE1409	RpsB	Ribosomal protein S2	74
TTE1453	TrpS	Tryptophanyl-tRNA synthetase	56
TTE1457	RplS	Ribosomal protein L19	67
TTE1458	TmmD	tRNA-(guanine-N1)-methyltransferase	51
TTE1459	RimM	RimM protein, required for 16S rRNA processing	36
TTE1461	RpsP	Ribosomal protein S16	71
TTE1495	RpmB	Ribosomal protein L28	55
TTE1503	Sun	tRNA and rRNA cytosine-C5-methylases	35
TTE1506	Fmt	Methionyl-tRNA formyltransferase	47
TTE1507	Def	N-formylmethionyl-tRNA deformylase	59
TTE1518	LigT	2'-5' RNA ligase	32
TTE1538	RluA	Pseudouridyate synthases, 23S RNA-specific	51
TTE1540	RimL	Acetyltransferases, including N-acetylases of ribosomal proteins	46
TTE1542	RimL	Acetyltransferases, including N-acetylases of ribosomal proteins	44
TTE1590	GCN3	Translation initiation factor eIF-2B alpha subunit	53
TTE1594	IleS	Isoleucyl-tRNA synthetase	56
TTE1603	TdcF	Putative translation initiation inhibitor	59
TTE1688	PheT	Phenylalanyl-tRNA synthetase beta subunit	41
TTE1689	PheS	Phenylalanyl-tRNA synthetase alpha subunit	58
TTE1690	SpoU	rRNA methylases	39
TTE1691	RplT	Ribosomal protein L20	66
TTE1692	RpmI	Ribosomal protein L35	43
TTE1693	InfC	Translation initiation factor IF3	50
TTE1713	ThrS	Threonyl-tRNA synthetase	56
TTE1780	RluA	Pseudouridyate synthases, 23S RNA-specific	36
TTE1797	TmmA	SAM-dependent methyltransferases related to tRNA (uracil-5-)-methyltransferase	32
TTE1812	TmmA	SAM-dependent methyltransferases related to tRNA (uracil-5-)-methyltransferase	49
TTE1871	SelB	Selenocysteine-specific translation elongation factor	49
TTE1982	RplY	Ribosomal protein L25 (general stress protein Ctc)	38
TTE2040	RpsA	Ribosomal protein S1	27
TTE2140	HisS	Histidyl-tRNA synthetase	37
TTE2147	Sun	tRNA and rRNA cytosine-C5-methylases	35
TTE2256	RpsI	Ribosomal protein S9	71
TTE2257	RplM	Ribosomal protein L13	59
TTE2258	TruA	Pseudouridyate synthase (tRNA psi55)	40
TTE2262	RplQ	Ribosomal protein L17	69
TTE2264	RpsD	Ribosomal protein S4 and related proteins	60
TTE2265	RpsK	Ribosomal protein S11	66
TTE2266	RpsM	Ribosomal protein S13	78
TTE2267	RpmJ	Ribosomal protein L36	86

TTE2268	InfA	Translation initiation factor IF-1	80
TTE2270	Map	Methionine aminopeptidase	58
TTE2273	RplO	Ribosomal protein L15	70
TTE2274	RpsE	Ribosomal protein S5	67
TTE2275	RplR	Ribosomal protein L18	66
TTE2276	RplF	Ribosomal protein L6	58
TTE2277	RpsH	Ribosomal protein S8	71
TTE2278	RpsN	Ribosomal protein S14	63
TTE2279	RplE	Ribosomal protein L5	72
TTE2281	RplX	Ribosomal protein L24	53
TTE2282	RplN	Ribosomal protein L14	64
TTE2283	RpsQ	Ribosomal protein S17	67
TTE2284	RpmC	Ribosomal protein L29	71
TTE2285	RplP	Ribosomal protein L16/L10E	74
TTE2286	RpsC	Ribosomal protein S3	62
TTE2287	RplV	Ribosomal protein L22	64
TTE2289	RpsS	Ribosomal protein S19	61
TTE2290	RplB	Ribosomal protein L2	72
TTE2291	RplW	Ribosomal protein L23	68
TTE2292	RplD	Ribosomal protein L4	62
TTE2293	RplC	Ribosomal protein L3	65
TTE2294	RpsJ	Ribosomal protein S10	84
TTE2295	TufB	GTPases - translation elongation factors	77
TTE2296	FusA	Translation elongation and release factors (GTPases)	68
TTE2297	RpsG	Ribosomal protein S7	75
TTE2298	RpsL	Ribosomal protein S12	85
TTE2299	RPL8A	Ribosomal protein HS6-type (S12/L30/L7a)	56
TTE2303	RplL	Ribosomal protein L7/L12	55
TTE2304	RplJ	Ribosomal protein L10	44
TTE2305	RplA	Ribosomal protein L1	52
TTE2306	RplK	Ribosomal protein L11	72
TTE2309	RpmG	Ribosomal protein L33	71
TTE2310	TufB	GTPases - translation elongation factors	77
TTE2313	SpoU	rRNA methylases	52
TTE2315	CysS	CysteinyI-tRNA synthetase	53
TTE2317	GlnS	Glutamyl- and glutaminyI-tRNA synthetases	52
TTE2319	ProS	ProlyI-tRNA synthetase	54
TTE2333	FusA	Translation elongation and release factors (GTPases)	42
TTE2372	LysU	Lysyl-tRNA synthetase class II	60
TTE2443	VacB	Ribosomal protein S1 domains	48
TTE2452	-	Ribosome-associated heat shock protein implicated in the recycling of the 50S subunit (S4 paralog)	45
TTE2464	TmU	Predicted tRNA(5-methylaminomethyl-2-thiouridylate) methyltransferase, contains the PP-loop ATPase domain	42
TTE2533	ArgS	ArginyI-tRNA synthetase	51
TTE2567	Pth	Peptidyl-tRNA hydrolase	55
TTE2630	SpoU	rRNA methylases	58
TTE2679	TyrS	Tyrosyl-tRNA synthetase	45
TTE2775	RplI	Ribosomal protein L9	43
TTE2779	RpsR	Ribosomal protein S18	65
TTE2781	RpsF	Ribosomal protein S6	37
TTE2801	RnpA	RNase P protein component	36
TTE2802	RpmH	Ribosomal protein L34	

Transcription (100)

TTE0026	LytR	Transcriptional regulator	30
TTE0053	PurR	Transcriptional regulators	29
TTE0070	AcrR	Transcriptional regulator	38
TTE0081	SirA	Predicted transcriptional regulators	37
TTE0082	LysR	Transcriptional regulator	31
TTE0083	SirA	Predicted transcriptional regulators	56
TTE0090	NagC	Transcriptional regulators	42
TTE0118	FliA	DNA-directed RNA polymerase specialized sigma subunit	40
TTE0138	Rho	Transcription termination factor	62
TTE0184	DeoR	Transcriptional regulator, contains sigma factor-related N-terminal domain	37
TTE0201	PurR	Transcriptional regulators	40
TTE0211	RpiR	Transcriptional regulators	38
TTE0250	NikR	Predicted transcriptional regulators containing the CopG/Arc/MetJ DNA-binding domain and a metal-binding domain	54
TTE0316	AcrR	Transcriptional regulator	34
TTE0323	RpoE	DNA-directed RNA polymerase specialized sigma subunits, sigma24 homologs	34
TTE0349	PurR	Transcriptional regulators	42
TTE0389	WecD	Histone acetyltransferase HPA2 and related acetyltransferases	42
TTE0438	-	Predicted transcriptional regulators	35
TTE0461	PhnF	Transcriptional regulators	43
TTE0480	PurR	Transcriptional regulators	50
TTE0492	FlgM	Negative regulator of flagellin synthesis (anti-sigma-28 factor)	
TTE0730	NusG	Transcription antiterminator	37
TTE0736	LytR	Transcriptional regulator	34
TTE0760	PurR	Transcriptional regulators	40
TTE0761	NagC	Transcriptional regulators	32
TTE0782	WecD	Histone acetyltransferase HPA2 and related acetyltransferases	46
TTE0797	PurR	Transcriptional regulators	46
TTE0803	PurR	Transcriptional regulators	47
TTE0839	ARO8	Transcriptional regulators containing a DNA-binding HTH domain and an aminotransferase domain (MocR family) and their eukaryotic orthologs	39
TTE0864	PspC	Putative stress-responsive transcriptional regulator	45
TTE0872	RpoE	DNA-directed RNA polymerase specialized sigma subunits, sigma24 homologs	39
TTE0920	LytR	Transcriptional regulator	27
TTE0953	HrcA	Transcriptional regulator of heat shock gene	39
TTE0983	VacB	Exoribonucleases	49
TTE0987	LysR	Transcriptional regulator	34
TTE1069	AbrB	Regulators of stationary/sporulation gene expression	
TTE1078	-	Predicted transcriptional regulator	44
TTE1201	MarR	Transcriptional regulators	31
TTE1212	RpiR	Transcriptional regulators	37
TTE1242	-	Predicted transcriptional regulator	48
TTE1259	RpoD	DNA-directed RNA polymerase sigma subunits (sigma70/sigma32)	67
TTE1292	NusB	Transcription termination factor	37
TTE1317	FliA	DNA-directed RNA polymerase specialized sigma subunit	50
TTE1325	-	Predicted transcriptional regulator containing the HTH domain	40
TTE1343	RpiR	Transcriptional regulators	43
TTE1395	-	Predicted nucleic-acid-binding protein implicated in transcription termination	50
TTE1396	NusA	Transcription terminator	62
TTE1413	FliA	DNA-directed RNA polymerase specialized sigma subunit	39

TTE1468	ELP3	ELP3 component of the RNA polymerase II complex, consists of an N-terminal BioB/LipA-like domain and a C-terminal histone acetyltransferase domain (only BioB/LipA-like domain in Thermotoga)	40
TTE1469	Rnc	dsRNA-specific ribonuclease	45
TTE1510	RpoZ	DNA-directed RNA polymerase subunit K/omega	45
TTE1517	-	Predicted RNA-binding protein homologous to eukaryotic snRNP	40
TTE1557	RpoE	DNA-directed RNA polymerase specialized sigma subunits, sigma24 homologs	28
TTE1559	RpoE	DNA-directed RNA polymerase specialized sigma subunits, sigma24 homologs	35
TTE1634	-	Predicted transcriptional regulator, consists of a Zn-ribbon and ATP-cone domains	59
TTE1636	RpoD	DNA-directed RNA polymerase sigma subunits (sigma70/sigma32)	78
TTE1637	RpoD	DNA-directed RNA polymerase sigma subunits (sigma70/sigma32)	69
TTE1738	CspC	Cold shock proteins	72
TTE1755	RpoD	DNA-directed RNA polymerase sigma subunits (sigma70/sigma32)	69
TTE1763	DeoR	Transcriptional regulator, contains sigma factor-related N-terminal domain	40
TTE1764	RpoN	DNA-directed RNA polymerase specialized sigma subunits, sigma54 homologs	36
TTE1839	AcrR	Transcriptional regulator	26
TTE1883	SirA	Predicted transcriptional regulators	36
TTE1926	NagC	Transcriptional regulators	37
TTE1945	GlpR	Transcriptional regulators of sugar metabolism	34
TTE1952	PurR	Transcriptional regulators	44
TTE1961	NagC	Transcriptional regulators	41
TTE2004	GlpP	Glycerol-3-phosphate responsive antiterminator (mRNA-binding)	47
TTE2041	Spo0J	Predicted transcriptional regulators	25
TTE2046	HipB	Predicted transcriptional regulators	32
TTE2069	Spo0J	Predicted transcriptional regulators	27
TTE2081	Spo0J	Predicted transcriptional regulators	24
TTE2104	RpoD	DNA-directed RNA polymerase sigma subunits (sigma70/sigma32)	43
TTE2111	NusG	Transcription antiterminator	32
TTE2125	HipB	Predicted transcriptional regulators	29
TTE2167	NikR	Predicted transcriptional regulators containing the CopG/Arc/MetJ DNA-binding domain and a metal-binding domain	57
TTE2174	HipB	Predicted transcriptional regulators	
TTE2178	RpoE	DNA-directed RNA polymerase specialized sigma subunits, sigma24 homologs	33
TTE2263	RpoA	DNA-directed RNA polymerase alpha subunit/40 kD subunit	60
TTE2300	RpoC	DNA-directed RNA polymerase beta' subunit/160 kD subunit (split gene in archaea and Syn)	68
TTE2301	RpoB	DNA-directed RNA polymerase beta subunit/140 kD subunit (split gene in Mjan, Mthe, Aful)	65
TTE2307	NusG	Transcription antiterminator	56
TTE2311	RpoE	DNA-directed RNA polymerase specialized sigma subunits, sigma24 homologs	76
TTE2343	AraC	AraC-type DNA-binding domain-containing proteins	26
TTE2373	GreA	Transcription elongation factor	58
TTE2381	-	Putative transcriptional regulators, homologs of Bvg accessory factor	57
TTE2400	RpoE	DNA-directed RNA polymerase specialized sigma subunits, sigma24 homologs	27
TTE2418	NagC	Transcriptional regulators	33
TTE2419	RpiR	Transcriptional regulators	40
TTE2441	Lrp	Transcriptional regulators	58
TTE2468	ArsR	Predicted transcriptional regulators	47
TTE2503	ArsR	Predicted transcriptional regulators	45
TTE2515	MarR	Transcriptional regulators	38
TTE2558	GntR	Transcriptional regulators	28
TTE2576	PurR	Transcriptional regulators	49
TTE2588	GlpR	Transcriptional regulators of sugar metabolism	40
TTE2597	NagC	Transcriptional regulators	22
TTE2721	-	Predicted transcriptional regulator	79

TTE2790	Spo0J	Predicted transcriptional regulators	51
TTE2792	Spo0J	Predicted transcriptional regulators	44

DNA replication, recombination and repair (134)

TTE0001	DnaA	ATPase involved in DNA replication initiation	55
TTE0002	DnaN	DNA polymerase III beta subunit	35
TTE0004	RecF	Recombinational DNA repair ATPase	31
TTE0010	GyrB	DNA gyrase (topoisomerase II) B subunit	61
TTE0011	GyrA	DNA gyrase (topoisomerase II) A subunit	60
TTE0013	-	Transposase	49
TTE0027	-	transposase	35
TTE0039	DnaX	DNA polymerase III, gamma/tau subunits	37
TTE0041	RecR	Recombinational DNA repair protein	63
TTE0077	-	Uracil-DNA glycosylase	53
TTE0091	Tag	3-Methyladenine DNA glycosylase	49
TTE0097	HolB	ATPase involved in DNA replication	31
TTE0111	TatD	Mg-dependent DNase	47
TTE0153	-	Transposase	42
TTE0235	-	Transposase	49
TTE0239	-	Transposase	42
TTE0254	DinP	Nucleotidyltransferase/DNA polymerase involved in DNA repair	45
TTE0264	RecB	ATP-dependent exoDNase (exonuclease V) beta subunit (contains helicase and exonuclease domains)	38
TTE0265	SbcD	DNA repair exonuclease	40
TTE0266	SbcC	ATPase involved in DNA repair	34
TTE0312	-	Transposase	42
TTE0333	-	Transposase	49
TTE0347	-	Transposase	49
TTE0357	-	Transposase	49
TTE0401	-	Transposase	47
TTE0414	-	Transposase	49
TTE0422	-	Transposase	26
TTE0489	RecD	ATP-dependent exoDNase (exonuclease V), alpha subunit - helicase superfamily I member	42
TTE0515	-	Transposase	47
TTE0527	-	Predicted site-specific integrase-resolvase	40
TTE0574	AlkA	3-Methyladenine DNA glycosylase	29
TTE0586	-	Predicted site-specific integrase-resolvase	41
TTE0604	UvrD	Superfamily I DNA and RNA helicases	49
TTE0605	Lig	NAD-dependent DNA ligase (contains BRCT domain type II)	53
TTE0670	-	Transposase	26
TTE0672	-	Predicted ATP-dependent endonuclease of the OLD family	24
TTE0683	-	Predicted site-specific integrase-resolvase	41
TTE0691	-	Predicted site-specific integrase-resolvase	40
TTE0705	-	Predicted site-specific integrase-resolvase	40
TTE0714	-	Predicted site-specific integrase-resolvase	63
TTE0715	-	Predicted transposases	45
TTE0725	MutS	MutS-like ATPases involved in mismatch repair, family 2	28
TTE0737	Tra8	Transposase, IS30 family	48
TTE0741	-	Predicted site-specific integrase-resolvase	41
TTE0829	Ssb	Single-stranded DNA-binding protein	
TTE0846	-	Transposase	48
TTE0853	-	Transposase	49
TTE0865	-	Transposase	47
TTE0874	PolA	DNA polymerase I - 3'-5' exonuclease and polymerase domains	47

TTE0879	Tra8	Transposase, IS30 family	48
TTE0897	RadC	DNA repair proteins	50
TTE0926	ComEA	DNA uptake protein and related DNA-binding proteins	45
TTE0942	HolA	DNA polymerase III delta subunit	28
TTE0944	-	Transposase	49
TTE0976	RecO	Recombinational DNA repair protein	26
TTE1030	-	Transposase	49
TTE1046	-	Transposase	42
TTE1054	-	Transposase	49
TTE1104	-	Transposase	39
TTE1114	-	Predicted site-specific integrase-resolvase	41
TTE1129	MutT	NTP pyrophosphohydrolases including oxidative damage repair enzymes	38
TTE1151	-	Transposase	49
TTE1152	-	transposase	35
TTE1170	-	Transposase	49
TTE1171	-	Transposase	42
TTE1178	RuvC	Holliday junction resolvosome endonuclease subunit	39
TTE1179	RuvA	Holliday junction resolvosome DNA-binding subunit	31
TTE1180	RuvB	Holliday junction resolvosome helicase subunit	62
TTE1191	RecJ	Single-stranded DNA-specific exonuclease	38
TTE1226	-	transposase	35
TTE1227	-	Transposase	49
TTE1250	-	Predicted endonuclease involved in recombination (possible Holliday junction resolvase in <i>Mycoplasmas</i> and <i>B. subtilis</i>)	52
TTE1276	Nfo	Endonuclease IV	34
TTE1294	XseA	Exonuclease VII, large subunit	38
TTE1295	XseB	Exonuclease VII small subunit	49
TTE1302	RecN	ATPases involved in DNA repair	39
TTE1310	MutT	NTP pyrophosphohydrolases including oxidative damage repair enzymes	53
TTE1313	XerC	Integrase	39
TTE1357	MutS	MutS-like ATPases involved in mismatch repair, family 2	46
TTE1358	MutL	DNA mismatch repair enzyme (predicted ATPase)	36
TTE1362	RnhA	Ribonuclease HI	60
TTE1363	XerC	Integrase	35
TTE1374	RecA	RecA/RadA recombinase	73
TTE1379	-	Transposase	47
TTE1398	PolC	DNA polymerase III alpha subunit, the Gram-positive type	53
TTE1449	TopA	Topoisomerase IA	55
TTE1450	Smf	Predicted Rossmann-fold nucleotide-binding protein involved in DNA uptake	41
TTE1451	RnhB	Ribonuclease HII	43
TTE1452	-	Predicted endonuclease distantly related to archaeal Holliday junction resolvase	33
TTE1487	-	N6-adenine-specific methylase	39
TTE1492	RecG	RecG-like helicases	44
TTE1508	PriA	Primosomal protein N' (replication factor Y) - superfamily II helicase	41
TTE1545	HsdS	Restriction endonuclease S subunits	31
TTE1547	HsdM	Type I restriction-modification system methyltransferase subunit	38
TTE1670	-	Predicted site-specific integrase-resolvase	44
TTE1675	-	Transposase	49
TTE1685	-	MutS-like ATPases involved in mismatch repair, family 1	43
TTE1745	-	Reverse gyrase	48
TTE1756	DnaG	DNA primase (bacterial type)	41
TTE1769	Nth	Predicted EndoIII-related endonuclease	53
TTE1784	-	Uncharacterized ATPase related to the helicase subunit of the Holliday junction resolvase	52

TTE1786	-	Transposase	42
TTE1818	DnaE	DNA polymerase III alpha subunit	43
TTE1906	MutS	MutS-like ATPases involved in mismatch repair, family 2	36
TTE1966	UvrC	Nuclease subunit of the excinuclease complex	42
TTE1970	UvrA	Excinuclease ATPase subunit	65
TTE1971	UvrB	Helicase subunit of the DNA excision repair complex	70
TTE2016	-	Transposase	49
TTE2018	DnaG	DNA primase (bacterial type)	27
TTE2031	SbcC	ATPase involved in DNA repair	21
TTE2053	Ssb	Single-stranded DNA-binding protein	47
TTE2108	RecJ	Single-stranded DNA-specific exonuclease	31
TTE2109	RecD	ATP-dependent exoDNase (exonuclease V), alpha subunit - helicase superfamily I member	35
TTE2127	XerC	Integrase	28
TTE2162	-	Predicted site-specific integrase-resolvase	43
TTE2218	-	transposase	35
TTE2226	XthA	Exonuclease III	64
TTE2249	MutT	NTP pyrophosphohydrolases including oxidative damage repair enzymes	34
TTE2359	-	transposase	35
TTE2453	HimA	Bacterial nucleoid DNA-binding protein	68
TTE2490	-	transposase	35
TTE2516	POL4	DNA polymerase IV (family X)	44
TTE2519	Ada	Methylated DNA-protein cysteine methyltransferase	38
TTE2528	-	Predicted transposase	34
TTE2565	Mfd	Transcription-repair coupling factor - superfamily II helicase	48
TTE2637	-	transposase	35
TTE2638	-	Transposase	49
TTE2646	-	Transposase	47
TTE2659	-	RecB family exonuclease	34
TTE2677	SplB	DNA repair photolyase	22
TTE2693	DnaC	DNA replication protein	29
TTE2774	DnaB	Replicative DNA helicase	58
TTE2780	Ssb	Single-stranded DNA-binding protein	60
TTE2793	MutT	NTP pyrophosphohydrolases including oxidative damage repair enzymes	32

Cellular processes (404)

Cell division and chromosome partitioning (33)

TTE0073	MesJ	Predicted ATPase of the PP-loop superfamily implicated in cell cycle control	42
TTE0119	Mrp	ATPases involved in chromosome partitioning	39
TTE0168	SpoIID	Sporulation protein and related proteins	39
TTE0171	MreB	HSP70 class molecular chaperones involved in cell morphogenesis	57
TTE0734	Mrp	ATPases involved in chromosome partitioning	45
TTE0896	Maf	Nucleotide-binding protein implicated in inhibition of septum formation	41
TTE0898	MreB	HSP70 class molecular chaperones involved in cell morphogenesis	65
TTE0902	MinC	Septum formation inhibitor	34
TTE0903	MinD	Septum formation inhibitor-activating ATPase	58
TTE0904	MinE	Septum formation topological specificity factor	41
TTE0905	FtsW	Bacterial cell division membrane protein	42
TTE1110	GidA	NAD/FAD-utilizing enzyme apparently involved in cell division	59
TTE1126	SpoIID	Sporulation protein and related proteins	29
TTE1272	FtsA	Predicted ATPases of the HSP70 class involved in cell division	25
TTE1378	FtsK	DNA segregation ATPase FtsK/SpoIIIE and related proteins	53

TTE1420	-	ATPases involved in chromosome partitioning	29
TTE1465	Smc	Chromosome segregation ATPases	34
TTE1527	MesJ	Predicted ATPase of the PP-loop superfamily implicated in cell cycle control	36
TTE1596	DivIVA	Cell division initiation protein	49
TTE1639	FtsZ	Cell division GTPase	57
TTE1640	FtsA	Predicted ATPases of the HSP70 class involved in cell division	44
TTE1646	FtsW	Bacterial cell division membrane protein	40
TTE1709	CooC	CO dehydrogenas ematuration factor	45
TTE1968	FtsW	Bacterial cell division membrane protein	32
TTE1976	FtsX	Cell division protein	30
TTE1977	FtsE	Predicted ATPase involved in cell division	63
TTE1990	FtsA	Predicted ATPases of the HSP70 class involved in cell division	39
TTE2076	MinD	Septum formation inhibitor-activating ATPase	23
TTE2395	MesJ	Predicted ATPase of the PP-loop superfamily implicated in cell cycle control	23
TTE2451	SpoIID	Sporulation protein and related proteins	29
TTE2470	MesJ	Predicted ATPase of the PP-loop superfamily implicated in cell cycle control	50
TTE2791	Soj	ATPases involved in chromosome partitioning	62
TTE2795	GidA	NAD/FAD-utilizing enzyme apparently involved in cell division	59

Posttranslational modification, protein turnover, chaperones (66)

TTE0122	HflB	ATP-dependent Zn proteases	41
TTE0130	HypB	Ni ²⁺ -binding GTPase involved in regulation of expression and maturation of urease and hydrogenase	44
TTE0131	HypF	Hydrogenase maturation factor	42
TTE0132	HypC	Hydrogenase maturation factor	40
TTE0133	HypD	Hydrogenase maturation factor	49
TTE0134	HypE	Hydrogenase maturation factor	48
TTE0180	PspF	NtrC family transcriptional regulators, ATPase domain	34
TTE0268	PspF	NtrC family transcriptional regulators, ATPase domain	37
TTE0270	AhpC	Peroxiredoxin	65
TTE0331	PspF	NtrC family transcriptional regulators, ATPase domain	34
TTE0384	HflC	Membrane protease subunits, stomatin/prohibitin homologs	53
TTE0536	-	Inactive homologs of metal-dependent proteases, putative molecular chaperones	36
TTE0538	QRI7	Metal-dependent proteases with possible chaperone activity	49
TTE0550	PspF	NtrC family transcriptional regulators, ATPase domain	46
TTE0576	AprE	Subtilisin-like serine proteases	98
TTE0579	GroS	Co-chaperonin GroES (HSP10)	94
TTE0580	GroL	Chaperonin GroEL (HSP60 family)	88
TTE0624	Tig	FKBP-type peptidyl-prolyl cis-trans isomerase (trigger factor)	41
TTE0626	ClpX	ATP-dependent protease Clp, ATPase subunit	65
TTE0627	Lon	ATP-dependent Lon protease, bacterial type	54
TTE0678	Pcp	Pyrrolidone-carboxylate peptidase (N-terminal pyroglutamyl peptidase)	54
TTE0717	PspF	NtrC family transcriptional regulators, ATPase domain	39
TTE0824	AprE	Subtilisin-like serine proteases	38
TTE0825	PspF	NtrC family transcriptional regulators, ATPase domain	39
TTE0954	GrpE	Molecular chaperone GrpE (heat shock protein)	46
TTE0955	DnaK	Molecular chaperone	66
TTE0956	DnaJ	Molecular chaperones (contain C-terminal Zn finger domain)	49
TTE0985	SmpB	tmRNA-binding protein	57
TTE0991	HtpX	Zn-dependent protease with chaperone function	26
TTE1025	CcdA	Cytochrome c biogenesis protein	40
TTE1026	TrxA	Thiol-disulfide isomerase and thioredoxins	38
TTE1233	TrxA	Thiol-disulfide isomerase and thioredoxins	50
TTE1257	-	Collagenase and related proteases	44

TTE1366	SpoVK	ATPases of the AAA+ class	54
TTE1447	HslU	ATP-dependent protease, ATPase subunit	59
TTE1448	HslV	Proteasome protease subunit	60
TTE1455	-	Predicted ATPase with chaperone activity	50
TTE1537	HypE	Hydrogenase maturation factor	43
TTE1575	Bcp	Peroxiredoxin	56
TTE1612	Pcp	Pyrrolidone-carboxylate peptidase (N-terminal pyroglutamyl peptidase)	55
TTE1686	-	Collagenase and related proteases	32
TTE1710	PspF	NtrC family transcriptional regulators, ATPase domain	42
TTE1718	TrxA	Thiol-disulfide isomerase and thioredoxins	39
TTE1737	-	Disulfide bond chaperones of the HSP33 family	47
TTE1742	-	Thioredoxin-like proteins and domains	63
TTE1771	LonB	Predicted ATP-dependent protease	44
TTE1794	HtpX	Zn-dependent protease with chaperone function	42
TTE1849	PflA	Pyruvate-formate lyase-activating enzyme	36
TTE1880	TrxA	Thiol-disulfide isomerase and thioredoxins	45
TTE1881	TrxB	Thioredoxin reductase	53
TTE1955	PflA	Pyruvate-formate lyase-activating enzyme	51
TTE1973	DegQ	Trypsin-like serine proteases, typically periplasmic, contain C-terminal PDZ domain	24
TTE1992	HflB	ATP-dependent Zn proteases	52
TTE2078	SurA	Parvulin-like peptidyl-prolyl isomerase	26
TTE2186	AhpC	Peroxiredoxin	56
TTE2220	TrxB	Thioredoxin reductase	46
TTE2325	Sms	Predicted ATP-dependent serine protease	52
TTE2327	ClpA	ATPases with chaperone activity, ATP-binding subunit	60
TTE2393	HflB	ATP-dependent Zn proteases	58
TTE2564	SurA	Parvulin-like peptidyl-prolyl isomerase	35
TTE2568	DegQ	Trypsin-like serine proteases, typically periplasmic, contain C-terminal PDZ domain	34
TTE2578	IbpA	Molecular chaperone (small heat shock protein)	40
TTE2615	AprE	Subtilisin-like serine proteases	33
TTE2674	GroS	Co-chaperonin GroES (HSP10)	41
TTE2675	GxxC	Glutaredoxin and related proteins	49
TTE2683	DegQ	Trypsin-like serine proteases, typically periplasmic, contain C-terminal PDZ domain	44

Cell envelope biogenesis, outer membrane (88)

TTE0008	MurE	UDP-N-acetylmuramyl tripeptide synthase	38
TTE0065	GCD1	Nucleoside-diphosphate-sugar pyrophosphorylases involved in lipopolysaccharide biosynthesis/translation initiation factor eIF2B subunits	33
TTE0066	RfaG	Predicted glycosyltransferases	23
TTE0068	DdlA	D-alanine-D-alanine ligase and related ATP-grasp enzymes	29
TTE0154	Rfe	UDP-N-acetylmuramyl pentapeptide phosphotransferase/UDP-N- acetylglucosamine-1-phosphate transferase	39
TTE0155	WecB	UDP-N-acetylglucosamine 2-epimerase	56
TTE0158	MurA	UDP-N-acetylglucosamine enolpyruvyl transferase	57
TTE0169	NlpD	Membrane proteins related to metalloendopeptidases	35
TTE0209	MurI	Glutamate racemase	37
TTE0213	AmpC	Beta-lactamase class C and other penicillin binding proteins	35
TTE0234	AmpC	Beta-lactamase class C and other penicillin binding proteins	36
TTE0275	RfaG	Predicted glycosyltransferases	41
TTE0314	MrcA	Membrane carboxypeptidase (penicillin-binding protein)	35
TTE0500	RfaG	Predicted glycosyltransferases	30
TTE0501	WcaA	Glycosyltransferases involved in cell wall biogenesis	25
TTE0595	MurI	Glutamate racemase	40

TTE0651	WecE	Predicted pyridoxal phosphate-dependent enzyme apparently involved in regulation of cell wall biogenesis	46
TTE0652	WecC	UDP-N-acetyl-D-mannosaminuronate dehydrogenase	62
TTE0655	RfaG	Predicted glycosyltransferases	30
TTE0658	RfaG	Predicted glycosyltransferases	39
TTE0660	RfaG	Predicted glycosyltransferases	25
TTE0661	WecB	UDP-N-acetylglucosamine 2-epimerase	53
TTE0662	RfaG	Predicted glycosyltransferases	31
TTE0665	WcaJ	Sugar transferases involved in lipopolysaccharide synthesis	66
TTE0667	WecE	Predicted pyridoxal phosphate-dependent enzyme apparently involved in regulation of cell wall biogenesis	45
TTE0668	-	Predicted nucleoside-diphosphate sugar epimerases	49
TTE0732	GalU	UDP-glucose pyrophosphorylase	61
TTE0740	-	capsular polysaccharide biosynthesis	26
TTE0768	RfaE	ADP-heptose synthase, bifunctional sugar kinase/adenylyltransferase	29
TTE0841	NlpD	Membrane proteins related to metalloendopeptidases	37
TTE0876	MltE	Soluble lytic murein transglycosylase and related regulatory proteins (some contain LysM/invasin domains)	36
TTE0880	Spr	Cell wall-associated hydrolases (invasion-associated proteins)	32
TTE0883	MltE	Soluble lytic murein transglycosylase and related regulatory proteins (some contain LysM/invasin domains)	47
TTE0899	MreC	Rod shape-determining protein	28
TTE0901	FtsI	Cell division protein FtsI/penicillin-binding protein 2	32
TTE0907	NlpD	Membrane proteins related to metalloendopeptidases	45
TTE0925	DacC	D-alanyl-D-alanine carboxypeptidase	38
TTE0949	RfaG	Predicted glycosyltransferases	30
TTE0973	DgkA	Diacylglycerol kinase	41
TTE1207	Alr	Alanine racemase	33
TTE1225	MurI	Glutamate racemase	42
TTE1258	FtsI	Cell division protein FtsI/penicillin-binding protein 2	28
TTE1307	WcaA	Glycosyltransferases involved in cell wall biogenesis	40
TTE1314	DacC	D-alanyl-D-alanine carboxypeptidase	47
TTE1328	DacC	D-alanyl-D-alanine carboxypeptidase	42
TTE1399	WcaA	Glycosyltransferases involved in cell wall biogenesis	35
TTE1400	GcpE	Essential bacterial protein, involved in density-dependent regulation of peptidoglycan biosynthesis	62
TTE1401	-	Predicted membrane-associated Zn-dependent proteases 1	33
TTE1528	-	Putative peptidoglycan-binding domain-containing protein	49
TTE1643	FtsQ	Cell division septal protein	
TTE1644	MurA	UDP-N-acetylglucosamine enolpyruvyl transferase	46
TTE1645	MurG	UDP-N-acetylglucosamine:LPS N-acetylglucosamine transferase	43
TTE1647	MurD	UDP-N-acetylmuramoylalanine-D-glutamate ligase	40
TTE1648	Rfe	UDP-N-acetylmuramyl pentapeptide phosphotransferase/UDP-N- acetylglucosamine-1-phosphate transferase	44
TTE1649	MurE	UDP-N-acetylmuramyl tripeptide synthase	44
TTE1651	FtsI	Cell division protein FtsI/penicillin-binding protein 2	41
TTE1653	-	Predicted S-adenosylmethionine-dependent methyltransferase involved in cell envelope biogenesis	55
TTE1724	RacX	Aspartate racemase	54
TTE1744	Lgt	Prolipoprotein diacylglyceryltransferase	35
TTE1836	MurB	UDP-N-acetylmuramate dehydrogenase	45
TTE1864	-	S-layer domain	44
TTE1916	FtsI	Cell division protein FtsI/penicillin-binding protein 2	43
TTE1927	GalE	UDP-glucose 4-epimerase	61
TTE1967	FtsI	Cell division protein FtsI/penicillin-binding protein 2	32
TTE1974	Prc	Periplasmic protease	42
TTE1975	NlpD	Membrane proteins related to metalloendopeptidases	44

TTE2013	GCD1	Nucleoside-diphosphate-sugar pyrophosphorylases involved in lipopolysaccharide biosynthesis/translation initiation factor eIF2B subunits	32
TTE2058	SpoVG	Uncharacterized protein, involved in the regulation of septum location	35
TTE2092	NlpD	Membrane proteins related to metalloendopeptidases	50
TTE2163	WecG	Teichoic acid biosynthesis proteins	72
TTE2168	Alr	Alanine racemase	39
TTE2190	GlmS	Glucosamine 6-phosphate synthetase, contains amidotransferase and phosphosugar isomerase domains	48
TTE2217	AmiC	N-acetylmuramoyl-L-alanine amidase	28
TTE2356	Prc	Periplasmic protease	
TTE2424	AmiC	N-acetylmuramoyl-L-alanine amidase	43
TTE2535	DdpX	D-alanyl-D-alanine dipeptidase	34
TTE2545	DdlA	D-alanine-D-alanine ligase and related ATP-grasp enzymes	39
TTE2546	MurF	UDP-N-acetylmuramyl pentapeptide synthase	29
TTE2572	GlmU	N-acetylglucosamine-1-phosphate uridyltransferase (contains nucleotidyltransferase and I-patch acetyltransferase domains)	53
TTE2573	SpoVG	Uncharacterized protein, involved in the regulation of septum location	67
TTE2575	MurC	UDP-N-acetylmuramate-alanine ligase	42
TTE2617	Prc	Periplasmic protease	43
TTE2684	MurA	UDP-N-acetylglucosamine enolpyruvyl transferase	57
TTE2691	NlpD	Membrane proteins related to metalloendopeptidases	53
TTE2703	PgsA	Putative enzyme of poly-gamma-glutamate biosynthesis (capsule formation)	29
TTE2783	MscS	Small-conductance mechanosensitive channel	39
TTE2785	MurE	UDP-N-acetylmuramyl tripeptide synthase	44
TTE2794	GidB	Predicted S-adenosylmethionine-dependent methyltransferase involved in bacterial cell division	37

Cell motility and secretion (81)

TTE0024	LepB	Signal peptidase I	41
TTE0172	FlgE	Flagellar basal body and hook proteins	42
TTE0173	FlgE	Flagellar basal body and hook proteins	48
TTE0174	FlgJ	Flagellum-specific muramidase	31
TTE0322	TolB	Periplasmic component of the Tol biopolymer transport system	27
TTE0385	-	Membrane-bound serine protease (ClpP class)	38
TTE0448	Tar	Methyl-accepting chemotaxis protein	24
TTE0457	Med	Surface lipoprotein	41
TTE0465	Tar	Methyl-accepting chemotaxis protein	23
TTE0494	FlgK	Flagellar hook-associated protein	35
TTE0495	FlgL	Flagellin and related hook-associated proteins	35
TTE0499	FlgL	Flagellin and related hook-associated proteins	58
TTE0504	FlaG	Uncharacterized flagellar protein FlaG	35
TTE0505	FliD	Flagellar capping protein	28
TTE0506	FliS	Flagellar protein	43
TTE0522	SecA	Preprotein translocase subunit SecA (ATPase, RNA helicase)	54
TTE0541	MotA	Flagellar motor component	33
TTE0542	MotB	Flagellar motor protein	34
TTE0625	ClpP	Protease subunit of ATP-dependent Clp proteases	60
TTE0646	Tar	Methyl-accepting chemotaxis protein	31
TTE0680	Tar	Methyl-accepting chemotaxis protein	19
TTE0700	CheW	Chemotaxis signal transduction protein	37
TTE0702	Tar	Methyl-accepting chemotaxis protein	23
TTE0759	Tar	Methyl-accepting chemotaxis protein	22
TTE0850	SppA	Periplasmic serine proteases (ClpP class)	47
TTE0882	TypA	Predicted membrane GTPase involved in stress response	58
TTE0951	LepA	Membrane GTPase LepA	64

TTE1018	LytE	LysM-repeat proteins and domains	35
TTE1033	Tar	Methyl-accepting chemotaxis protein	35
TTE1034	CheW	Chemotaxis signal transduction protein	35
TTE1035	CheB	Chemotaxis response regulator CheB, consists of CheY-like receiver domain and a methylesterase (demethylase) domain	47
TTE1037	CheR	Methylase of chemotaxis methyl-accepting proteins	46
TTE1039	CheA	Chemotaxis protein histidine kinase and related kinases	43
TTE1136	CheW	Chemotaxis signal transduction protein	49
TTE1184	YajC	Preprotein translocase subunit YajC	31
TTE1188	SecD	Preprotein translocase subunit SecD	38
TTE1189	SecF	Preprotein translocase subunit SecF	33
TTE1262	GspE	Predicted ATPases involved in pili biogenesis, PilB homologs	40
TTE1263	-	Predicted ATPases involved in pili biogenesis, PilT homologs	61
TTE1264	HofF	General secretory pathway protein F	34
TTE1266	PppA	Signal peptidase, cleaves prepilin-like proteins	52
TTE1274	PilO	Fimbrial assembly protein	
TTE1337	LytE	LysM-repeat proteins and domains	35
TTE1355	CheR	Methylase of chemotaxis methyl-accepting proteins	47
TTE1381	ClpP	Protease subunit of ATP-dependent Clp proteases	62
TTE1414	CheD	Chemotaxis protein; stimulates methylation of MCP proteins	50
TTE1415	CheC	Chemotaxis protein CheC, inhibitor of MCP methylation	42
TTE1416	CheW	Chemotaxis signal transduction protein	42
TTE1417	CheA	Chemotaxis protein histidine kinase and related kinases	43
TTE1418	CheB	Chemotaxis response regulator CheB, consists of CheY-like receiver domain and a methylesterase (demethylase) domain	42
TTE1421	FlhF	Flagellar GTP-binding protein	32
TTE1422	FlhA	Flagellar biosynthesis/type III secretory pathway protein	48
TTE1423	FlhB	Flagellar biosynthesis/type III secretory pathway protein	40
TTE1424	FliR	Flagellar biosynthesis/type III secretory pathway protein	32
TTE1425	FliQ	Flagellar biosynthesis/type III secretory pathway protein	59
TTE1426	FliP	Flagellar biosynthesis/type III secretory pathway protein	63
TTE1429	CheC	Chemotaxis protein CheC, inhibitor of MCP methylation	46
TTE1430	FliM	Flagellar motor switch protein	41
TTE1431	FliL	Flagellar basal body-associated protein	29
TTE1432	FlgEa	Uncharacterized protein, possibly involved in motility	58
TTE1433	FlgE	Flagellar basal body and hook proteins	38
TTE1435	FlgD	Flagellar hook capping protein	37
TTE1439	FliI	Flagellar biosynthesis/type III secretory pathway ATPase	66
TTE1440	FliH	Flagellar biosynthesis/type III secretory pathway protein	24
TTE1441	FliG	Flagellar motor switch protein	66
TTE1442	FliF	Flagellar biosynthesis/type III secretory pathway lipoprotein	30
TTE1443	FliE	Flagellar hook-basal body protein	40
TTE1444	FlgC	Flagellar basal body rod protein	54
TTE1445	FlgB	Flagellar basal body protein	39
TTE1462	Ffh	Signal recognition particle GTPase	64
TTE1464	FtsY	Signal recognition particle GTPase	49
TTE1539	LspA	Lipoprotein signal peptidase	36
TTE1777	Tar	Methyl-accepting chemotaxis protein	25
TTE2042	TraG	ATPase involved in conjugal plasmid transfer	32
TTE2075	VirB11	Predicted ATPases involved in pili and flagella biosynthesis, VirB11 family	33
TTE2219	LytE	LysM-repeat proteins and domains	26
TTE2231	Tar	Methyl-accepting chemotaxis protein	24
TTE2272	SecY	Preprotein translocase subunit SecY	49

TTE2308	SecE	Preprotein translocase subunit SecE	42
TTE2560	LytE	LysM-repeat proteins and domains	
TTE2799	YidC	Preprotein translocase subunit YidC	31

Inorganic ion transport and metabolism (65)

TTE0030	MgtA	Cation transport ATPases	45
TTE0064	FocA	Formate/nitrite family of transporters	41
TTE0085	DsrE	Uncharacterized ACR involved in intracellular sulfur reduction	62
TTE0087	DsrH	Uncharacterized ACR involved in oxidation of intracellular sulfur	34
TTE0105	MMT1	Predicted Co/Zn/Cd cation transporters	30
TTE0144	-	Predicted divalent heavy-metal cations transporter	31
TTE0196	TrkG	Trk-type K ⁺ transport systems, membrane components	85
TTE0197	TrkA	K ⁺ transport systems, NAD-binding component	90
TTE0242	FeoA	Protein, probably involved in Fe ²⁺ transport	35
TTE0243	FeoB	Ferrous ion uptake system protein FeoB (predicted GTPase)	42
TTE0246	CbiO	ABC-type cobalt transport system, ATPase component	42
TTE0247	CbiQ	ABC-type cobalt transport system, permease component CbiQ and related transporters	32
TTE0259	-	Hemerythrin	41
TTE0262	ECM27	Ca ²⁺ /Na ⁺ antiporter	
TTE0271	Fur	Fe ²⁺ /Zn ²⁺ uptake regulation proteins	37
TTE0320	PstB	ABC-type phosphate transport system, ATPase component	46
TTE0329	PitA	Phosphate/sulphate permeases	35
TTE0330	-	Phosphate transport regulator (distant homolog of PhoU)	32
TTE0361	ZnuB	ABC-type Mn ²⁺ /Zn ²⁺ transport systems, permease components	35
TTE0362	ZnuC	ABC-type Mn/Zn transport systems, ATPase component	45
TTE0365	ZnuA	ABC-type Mn/Zn transport system, periplasmic Mn/Zn-binding (lipo)protein (surface adhesin A)	38
TTE0366	Fur	Fe ²⁺ /Zn ²⁺ uptake regulation proteins	40
TTE0372	FecB	ABC-type Fe ³⁺ -siderophores transport systems, periplasmic components	48
TTE0373	BtuC	ABC-type cobalamin/Fe ³⁺ -siderophores transport systems, permease components	39
TTE0374	FepC	ABC-type cobalamin/Fe ³⁺ -siderophores transport systems, ATPase components	37
TTE0641	TauC	ABC-type nitrate/sulfonate/taurine/bicarbonate transport systems, permease components	49
TTE0642	TauB	ABC-type nitrate/sulfonate/taurine/bicarbonate transport systems, ATPase components	49
TTE0643	TauA	ABC-type nitrate/sulfonate/taurine/bicarbonate transport systems, periplasmic components	48
TTE0686	MntA	Mn ²⁺ and Fe ²⁺ transporters of the NRAMP family	29
TTE0746	MgtA	Cation transport ATPases	48
TTE0857	SodA	Superoxide dismutase	47
TTE0959	Ftn	Ferritin-like protein	57
TTE1148	PspE	Rhodanese-related sulfurtransferases	33
TTE1213	MgtA	Cation transport ATPases	42
TTE1252	Fur	Fe ²⁺ /Zn ²⁺ uptake regulation proteins	46
TTE1588	CbiQ	ABC-type cobalt transport system, permease component CbiQ and related transporters	33
TTE1589	CbiO	ABC-type cobalt transport system, ATPase component	32
TTE1627	PhoU	Phosphate uptake regulator	45
TTE1628	PstB	ABC-type phosphate transport system, ATPase component	67
TTE1629	PstA	ABC-type phosphate transport system, permease component	48
TTE1630	PstC	ABC-type phosphate transport system, permease component	55
TTE1631	PstS	ABC-type phosphate transport system, periplasmic component	51
TTE1767	Fur	Fe ²⁺ /Zn ²⁺ uptake regulation proteins	40
TTE1801	-	Mn-containing catalase	58
TTE1851	Fur	Fe ²⁺ /Zn ²⁺ uptake regulation proteins	34
TTE1856	FeoB	Ferrous ion uptake system protein FeoB (predicted GTPase)	28
TTE1858	FeoB	Ferrous ion uptake system protein FeoB (predicted GTPase)	44
TTE1860	FeoA	Protein, probably involved in Fe ²⁺ transport	45

TTE1861	FeoA	Protein, probably involved in Fe ²⁺ transport	45
TTE1867	FepC	ABC-type cobalamin/Fe ³⁺ -siderophores transport systems, ATPase components	63
TTE1868	BtuC	ABC-type cobalamin/Fe ³⁺ -siderophores transport systems, permease components	50
TTE1869	FecB	ABC-type Fe ³⁺ -siderophores transport systems, periplasmic components	56
TTE1901	KefB	Kef-type K ⁺ transport systems, membrane components	27
TTE2010	KdpC	K ⁺ -transporting ATPase, c chain	54
TTE2011	KdpB	High-affinity K ⁺ transport system, ATPase chain B	63
TTE2012	KdpA	K ⁺ -transporting ATPase, A chain	53
TTE2014	NptA	Na ⁺ /phosphate symporter	33
TTE2259	CbiQ	ABC-type cobalt transport system, permease component CbiQ and related transporters	43
TTE2260	CbiO	ABC-type cobalt transport system, ATPase component	52
TTE2261	CbiO	ABC-type cobalt transport system, ATPase component	45
TTE2326	MntA	Mn ²⁺ and Fe ²⁺ transporters of the NRAMP family	47
TTE2463	ZntA	Cation transport ATPases	54
TTE2466	CopZ	Copper chaperone	52
TTE2467	ZntA	Cation transport ATPases	59
TTE2509	MgtA	Cation transport ATPases	53

Signal transduction mechanisms (71)

TTE0038	-	Response regulators consisting of a CheY-like receiver domain and an HD-GYP domain	30
TTE0042	-	HD-GYP domain	31
TTE0136	CheY	CheY-like receiver domains	31
TTE0191	AtoC	AAA superfamily ATPases with N-terminal receiver domain	31
TTE0200	-	Predicted ATPase related to phosphate starvation-inducible protein PhoH	54
TTE0288	CheY	CheY-like receiver domains	27
TTE0481	OmpR	Response regulators consisting of a CheY-like receiver domain and a HTH DNA-binding domain	46
TTE0482	BaeS	Sensory transduction histidine kinases	27
TTE0498	CsrA	Carbon storage regulator (could also regulate swarming and quorum sensing)	49
TTE0518	-	HD-GYP domain	33
TTE0561	LytT	Response regulators of cell autolysis	29
TTE0562	BaeS	Sensory transduction histidine kinases	31
TTE0773	BaeS	Sensory transduction histidine kinases	29
TTE0774	OmpR	Response regulators consisting of a CheY-like receiver domain and a HTH DNA-binding domain	41
TTE0869	CstA	Carbon starvation protein, predicted membrane protein	45
TTE0870	LytT	Response regulators of cell autolysis	36
TTE0871	-	Regulator of cell autolysis	39
TTE0886	RsbW	Anti-sigma regulatory factor (Ser/Thr protein kinase)	45
TTE0891	BaeS	Sensory transduction histidine kinases	39
TTE0970	PhoH	Phosphate starvation-inducible protein PhoH, predicted ATPase	56
TTE0984	RAD55	RecA-superfamily ATPases implicated in signal transduction	47
TTE1001	Wzb	Protein-tyrosine-phosphatase	63
TTE1016	OmpR	Response regulators consisting of a CheY-like receiver domain and a HTH DNA-binding domain	56
TTE1017	BaeS	Sensory transduction histidine kinases	34
TTE1031	SsmR	Regulator of polyketide synthase expression	30
TTE1032	-	HD-GYP domain	39
TTE1038	CheY	CheY-like receiver domains	47
TTE1049	RsbW	Anti-sigma regulatory factor (Ser/Thr protein kinase)	42
TTE1052	-	Diguanylate cyclase/phosphodiesterase domain 1 (GGDEF)	40
TTE1063	CheY	CheY-like receiver domains	
TTE1081	Rtn	Diguanylate cyclase/phosphodiesterase domain 2 (EAL)	36
TTE1100	-	Diguanylate cyclase/phosphodiesterase domain 1 (GGDEF)	37
TTE1101	CheY	CheY-like receiver domains	30
TTE1122	AcuC	Deacetylases, including yeast histone deacetylase and acetoin utilization protein	42

TTE1195	SpoT	Guanosine polyphosphate pyrophosphohydrolases/synthetases	56
TTE1202	BaeS	Sensory transduction histidine kinases	26
TTE1203	CheY	CheY-like receiver domains	36
TTE1304	CheY	CheY-like receiver domains	60
TTE1315	SpoIIAA	Anti-anti-sigma regulatory factor (antagonist of anti-sigma factor)	40
TTE1316	RsbW	Anti-sigma regulatory factor (Ser/Thr protein kinase)	56
TTE1428	CheY	CheY-like receiver domains	75
TTE1500	SPS1	Serine/threonine protein kinases	56
TTE1501	PTC1	Protein serine/threonine phosphatases	36
TTE1572	DksA	DnaK suppressor protein	38
TTE1614	Crp	cAMP-binding domains - Catabolite gene activator and regulatory subunit of cAMP-dependent protein kinases	28
TTE1632	BaeS	Sensory transduction histidine kinases	35
TTE1633	OmpR	Response regulators consisting of a CheY-like receiver domain and a HTH DNA-binding domain	56
TTE1681	CitB	Response regulators consisting of a CheY-like receiver domain and a HTH DNA-binding domain	45
TTE1682	BaeS	Sensory transduction histidine kinases	38
TTE1717	OmpR	Response regulators consisting of a CheY-like receiver domain and a HTH DNA-binding domain	36
TTE1721	-	HD-GYP domain	47
TTE1743	-	GAF domain-containing proteins	35
TTE1900	UspA	Universal stress protein UspA and related nucleotide-binding proteins	36
TTE1964	HprK	Serine kinase of the HPr protein, regulates carbohydrate metabolism	52
TTE1969	-	FHA-domain-containing proteins	42
TTE1978	SsmR	Regulator of polyketide synthase expression	30
TTE1998	AtoC	AAA superfamily ATPases with N-terminal receiver domain	41
TTE2009	KdpD	Osmosensitive K ⁺ channel His kinase sensor domain	46
TTE2055	-	HD-GYP domain	47
TTE2155	KdpD	Osmosensitive K ⁺ channel His kinase sensor domain	49
TTE2166	MazF	Growth inhibitor	77
TTE2335	-	Diguanylate cyclase/phosphodiesterase domain 1 (GGDEF)	27
TTE2392	BaeS	Sensory transduction histidine kinases	30
TTE2396	RsbU	Serine phosphatase RsbU, regulator of sigma subunit	25
TTE2473	BaeS	Sensory transduction histidine kinases	30
TTE2474	OmpR	Response regulators consisting of a CheY-like receiver domain and a HTH DNA-binding domain	48
TTE2569	BaeS	Sensory transduction histidine kinases	31
TTE2570	OmpR	Response regulators consisting of a CheY-like receiver domain and a HTH DNA-binding domain	51
TTE2688	BaeS	Sensory transduction histidine kinases	36
TTE2689	OmpR	Response regulators consisting of a CheY-like receiver domain and a HTH DNA-binding domain	60
TTE2773	Crp	cAMP-binding domains - Catabolite gene activator and regulatory subunit of cAMP-dependent protein kinases	29

Metabolism (671)

Energy production and conversion (119)

TTE0012	NemA	NADH:flavin oxidoreductases, Old Yellow Enzyme family	51
TTE0075	TtdA	Tartrate dehydratase alpha subunit/Fumarate hydratase class I, N-terminal domain	53
TTE0076	FumA	Tartrate dehydratase beta subunit/Fumarate hydratase class I, C-terminal domain	59
TTE0088	Lpd	Dihydrolipoamide dehydrogenase/glutathione oxidoreductase and related enzymes	37
TTE0123	NuoL	NADH:ubiquinone oxidoreductase subunit 5 (chain L)/Multisubunit Na ⁺ /H ⁺ antiporter, MnhA subunit	34
TTE0124	NuoH	NADH:ubiquinone oxidoreductase subunit 1 (chain H)	45
TTE0125	NuoB	NADH:ubiquinone oxidoreductase 20 kD subunit and related Fe-S oxidoreductases	57
TTE0127	NuoD	NADH:ubiquinone oxidoreductase 49 kD subunit 7	57
TTE0128	NuoI	Formate hydrogenlyase subunit 6/NADH:ubiquinone oxidoreductase 23 kD subunit (chain I)	43
TTE0186	AcoA	Thiamine pyrophosphate-dependent dehydrogenases, E1 component alpha subunit	56

TTE0187	AcoB	Thiamine pyrophosphate-dependent dehydrogenases, E1 component beta subunit	60
TTE0188	AceF	Dihydrolipoamide acyltransferases	35
TTE0224	GlcD	FAD/FMN-containing dehydrogenases	41
TTE0252	OadB	Na ⁺ -transporting methylmalonyl-CoA/oxaloacetate decarboxylase, beta subunit	53
TTE0273	GalT	Galactose-1-phosphate uridylyltransferase	40
TTE0281	FixC	Dehydrogenases (flavoproteins)	22
TTE0282	FixC	Dehydrogenases (flavoproteins)	
TTE0307	-	Predicted acetamidase/formamidase	54
TTE0313	-	Uncharacterized oxidoreductases, Fe-dependent alcohol dehydrogenase family	44
TTE0339	MtlA	Phosphotransferase system, mannitol-specific IIBC component	59
TTE0346	-	Ferredoxin 3	42
TTE0387	Icd	Isocitrate dehydrogenases	62
TTE0411	NatB	ABC-type Na ⁺ efflux pump, permease component	26
TTE0445	PorA	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, alpha subunit	68
TTE0473	AcnA	Aconitase A	57
TTE0487	-	Rubrerhythrin	60
TTE0546	FixA	Electron transfer flavoprotein beta-subunit	74
TTE0547	FixB	Electron transfer flavoprotein alpha-subunit	68
TTE0554	ACH1	Acetyl-CoA hydrolase	44
TTE0630	AtpB	F0F1-type ATP synthase a subunit	35
TTE0631	AtpE	F0F1-type ATP synthase c subunit/Archaeal/vacuolar-type H ⁺ -ATPase subunit K	
TTE0633	AtpF	F0F1-type ATP synthase b subunit	33
TTE0634	AtpH	F0F1-type ATP synthase delta subunit (mitochondrial oligomycin sensitivity protein)	32
TTE0635	AtpA	F0F1-type ATP synthase alpha subunit	68
TTE0636	AtpG	F0F1-type ATP synthase gamma subunit	33
TTE0637	AtpD	F0F1-type ATP synthase beta subunit	71
TTE0638	AtpC	F0F1-type ATP synthase epsilon subunit (mitochondrial delta subunit)	34
TTE0688	AcoA	Thiamine pyrophosphate-dependent dehydrogenases, E1 component alpha subunit	50
TTE0689	AcoB	Thiamine pyrophosphate-dependent dehydrogenases, E1 component beta subunit	58
TTE0690	AceF	Dihydrolipoamide acyltransferases	33
TTE0696	EutG	Alcohol dehydrogenase IV	84
TTE0697	NapF	Ferredoxin 2	40
TTE0796	-	Uncharacterized Fe-S protein	39
TTE0887	NapF	Ferredoxin 2	26
TTE0890	NuoE	NADH:ubiquinone oxidoreductase 24 kD subunit	47
TTE0892	-	Ferredoxin	38
TTE0893	NuoF	NADH:ubiquinone oxidoreductase, NADH-binding (51 kD) subunit	63
TTE0894	NuoG	NADH dehydrogenase/NADH:ubiquinone oxidoreductase 75 kD subunit (chain G)	61
TTE0909	-	Fe-S oxidoreductases family 2	48
TTE0932	-	Ferredoxin 3	81
TTE0960	PorB	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, beta subunit	56
TTE0961	PorA	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, alpha subunit	43
TTE0988	NemA	NADH:flavin oxidoreductases, Old Yellow Enzyme family	35
TTE0992	-	Fe-S oxidoreductases family 2	34
TTE0993	UgpQ	Glycerophosphoryl diester phosphodiesterase	42
TTE1000	-	Uncharacterized flavoproteins	47
TTE1096	NapH	Polyferredoxin	25
TTE1208	PycA	Pyruvate carboxylase, C-terminal domain/subunit	66
TTE1209	PorA	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, alpha subunit	53
TTE1210	PorB	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, beta subunit	61
TTE1211	PorG	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, gamma subunit	51
TTE1214	GltP	Na ⁺ /H ⁺ -dicarboxylate symporters	42

TTE1215	OadB	Na ⁺ -transporting methylmalonyl-CoA/oxaloacetate decarboxylase, beta subunit	53
TTE1216	-	Ferredoxin 3	40
TTE1336	PycA	Pyruvate carboxylase, C-terminal domain/subunit	66
TTE1339	NapF	Ferredoxin 2	49
TTE1340	PorA	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, alpha subunit	54
TTE1341	PorB	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, beta subunit	61
TTE1342	PorG	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, gamma subunit	52
TTE1481	ackA	Acetate kinase	77
TTE1482	Pta	Phosphotransacetylase	67
TTE1485	NtpF	Archaeal/vacuolar-type H ⁺ -ATPase subunit H	26
TTE1555	NfnB	Nitroreductase	31
TTE1605	NapF	Ferredoxin 2	47
TTE1617	GpsA	Glycerol 3-phosphate dehydrogenase	51
TTE1620	-	Fe-S oxidoreductase, related to NifB/MoaA family	38
TTE1668	AceF	Dihydrolipoamide acyltransferases	55
TTE1674	Lpd	Dihydrolipoamide dehydrogenase/glutathione oxidoreductase and related enzymes	46
TTE1696	HyaD	Ni,Fe-hydrogenase maturation factor	47
TTE1698	-	Ni,Fe-hydrogenase III small subunit	60
TTE1699	NuoI	Formate hydrogenlyase subunit 6/NADH:ubiquinone oxidoreductase 23 kD subunit (chain I)	47
TTE1700	HycE	Ni,Fe-hydrogenase III large subunit	63
TTE1701	NuoL	NADH:ubiquinone oxidoreductase subunit 5 (chain L)/Multisubunit Na ⁺ /H ⁺ antiporter, MnhA subunit	49
TTE1702	HyfB	Formate hydrogenlyase subunit 3/Multisubunit Na ⁺ /H ⁺ antiporter, MnhD subunit	46
TTE1705	HyfC	Formate hydrogenlyase subunit 4	49
TTE1706	HyfB	Formate hydrogenlyase subunit 3/Multisubunit Na ⁺ /H ⁺ antiporter, MnhD subunit	40
TTE1707	HybA	Fe-S-cluster-containing hydrogenase components 1	39
TTE1765	AcyP	Acylphosphatases	51
TTE1770	-	Uncharacterized Fe-S protein	42
TTE1774	Fer	Ferredoxin 1	69
TTE1783	PckA	Phosphoenolpyruvate carboxykinase (ATP)	62
TTE1798	OadB	Na ⁺ -transporting methylmalonyl-CoA/oxaloacetate decarboxylase, beta subunit	52
TTE1807	NfnB	Nitroreductase	43
TTE1865	-	Formylmethanofuran dehydrogenase subunit E	43
TTE1887	NapF	Ferredoxin 2	55
TTE1891	-	MinD superfamily P-loop ATPase containing an inserted ferredoxin domain	40
TTE1892	-	MinD superfamily P-loop ATPase containing an inserted ferredoxin domain	48
TTE1919	-	Predicted acetamidase/formamidase	40
TTE1943	LdhA	Lactate dehydrogenase and related dehydrogenases	33
TTE1946	LdhA	Lactate dehydrogenase and related dehydrogenases	55
TTE2002	GlpK	Glycerol kinase	75
TTE2131	NemA	NADH:flavin oxidoreductases, Old Yellow Enzyme family	43
TTE2154	-	Rubredoxin	84
TTE2156	NhaC	Na ⁺ /H ⁺ antiporter	28
TTE2193	PorG	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, gamma subunit	41
TTE2194	PorA	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, alpha subunit	44
TTE2195	Pta	Phosphotransacetylase	47
TTE2198	PorA	Pyruvate:ferredoxin oxidoreductase and related 2-oxoacid:ferredoxin oxidoreductases, alpha subunit	59
TTE2199	-	Ferredoxin 3	49
TTE2201	-	Butyrate kinase	57
TTE2204	Pta	Phosphotransacetylase	55
TTE2205	-	Butyrate kinase	54
TTE2229	-	Desulfoferredoxin	58
TTE2332	SfcA	Malic enzyme	60

TTE2447	PPX1	Inorganic pyrophosphatase/exopolyphosphatase	36
TTE2486	Ndh	NADH dehydrogenase, FAD-containing subunit	44
TTE2625	NemA	NADH:flavin oxidoreductases, Old Yellow Enzyme family	38
TTE2669	IscU	NifU homologs involved in Fe-S cluster formation	47
TTE2772	-	6Fe-6S prismane cluster-containing protein	67

Carbohydrate transport and metabolism (142)

TTE0006	-	Alpha-glucosidases, family 31 of glycosyl hydrolases	51
TTE0062	-	Predicted glycosylase	46
TTE0063	-	Predicted glycosylase	51
TTE0137	Fba	Fructose/tagatose bisphosphate aldolase	52
TTE0146	RpiB	Ribose 5-phosphate isomerase RpiB	57
TTE0164	PpsA	Phosphoenolpyruvate synthase/pyruvate phosphate dikinase	31
TTE0181	PtsN	Phosphotransferase system mannitol/fructose-specific IIA domain (Ntr-type)	40
TTE0185	Rpe	Pentose-5-phosphate-3-epimerase	41
TTE0190	TktA	Transketolase	65
TTE0192	ManX	Phosphotransferase system, mannose/fructose-specific component IIA	30
TTE0193	-	Phosphotransferase system, mannose/fructose/N-acetylgalactosamine-specific component IIB	36
TTE0195	Gnd	6-phosphogluconate dehydrogenase, family 1	62
TTE0202	RbsK	Sugar kinases, ribokinase family	41
TTE0203	RbsD	Uncharacterized components of ribose/xylose transport systems	44
TTE0204	MglA	ABC-type sugar (aldose) transport system, ATPase component	51
TTE0205	AraH	Ribose/xylose/arabinose/galactoside ABC-type transport systems, permease components	45
TTE0206	RbsB	Periplasmic sugar-binding proteins	62
TTE0215	BglX	Beta-glucosidase-related glycosidases	40
TTE0216	-	Predicted N-acetylglucosamine kinase	32
TTE0232	NagA	N-acetylglucosamine-6-phosphate deacetylase	45
TTE0241	BglX	Beta-glucosidase-related glycosidases	45
TTE0274	Ble	Uncharacterized protein, probably involved in trehalose biosynthesis	26
TTE0286	RbsB	Periplasmic sugar-binding proteins	31
TTE0289	RbsB	Periplasmic sugar-binding proteins	47
TTE0290	RbsB	Periplasmic sugar-binding proteins	32
TTE0291	MglA	ABC-type sugar (aldose) transport system, ATPase component	49
TTE0292	AraH	Ribose/xylose/arabinose/galactoside ABC-type transport systems, permease components	41
TTE0303	PtsN	Phosphotransferase system mannitol/fructose-specific IIA domain (Ntr-type)	28
TTE0305	SgaB	Phosphotransferase system component IIB of unknown specificity	38
TTE0326	RbsK	Sugar kinases, ribokinase family	37
TTE0332	CelB	Phosphotransferase system cellobiose-specific component IIC	46
TTE0335	CelA	Phosphotransferase system cellobiose-specific component IIB	45
TTE0336	CelC	Phosphotransferase system cellobiose-specific component IIA	53
TTE0337	CelF	Alpha-galactosidases/6-phospho-beta-glucosidases, family 4 of glycosyl hydrolases	60
TTE0338	BglB	Beta-glucosidase/6-phospho-beta-glucosidase/beta- galactosidase	68
TTE0341	PtsN	Phosphotransferase system mannitol/fructose-specific IIA domain (Ntr-type)	61
TTE0342	MtlD	Mannitol-1-phosphate/altronate dehydrogenases	53
TTE0358	BglB	Beta-glucosidase/6-phospho-beta-glucosidase/beta- galactosidase	90
TTE0395	ProP	Permeases of the major facilitator superfamily	24
TTE0441	FrvX	Cellulase M and related proteins	41
TTE0442	FrvX	Cellulase M and related proteins	44
TTE0443	FrvX	Cellulase M and related proteins	56
TTE0458	MglA	ABC-type sugar (aldose) transport system, ATPase component	52
TTE0463	DeoB	Phosphopentomutase	60
TTE0468	PtsG	Phosphotransferase system IIC components, glucose/maltose/N-acetylglucosamine-specific	49
TTE0469	NagE	Phosphotransferase system IIA components	50

TTE0600	CelA	Phosphotransferase system cellobiose-specific component IIB	35
TTE0601	CelB	Phosphotransferase system cellobiose-specific component IIC	35
TTE0602	CelC	Phosphotransferase system cellobiose-specific component IIA	37
TTE0639	RhaT	Permeases of the drug/metabolite transporter (DMT) superfamily	30
TTE0731	CpsG	Phosphomannomutase	44
TTE0749	ProP	Permeases of the major facilitator superfamily	32
TTE0762	GmhA	Phosphoheptose isomerase	43
TTE0763	MglA	ABC-type sugar (aldose) transport system, ATPase component	52
TTE0764	AraH	Ribose/xylose/arabinose/galactoside ABC-type transport systems, permease components	39
TTE0765	RbsB	Periplasmic sugar-binding proteins	33
TTE0789	ProP	Permeases of the major facilitator superfamily	
TTE0798	ATH1	Trehalose and maltose hydrolases (possible phosphorylases)	37
TTE0799	UgpB	Sugar-binding periplasmic proteins/domains	41
TTE0800	MalF	ABC-type sugar transport systems, permease components	41
TTE0801	MalG	Sugar permeases	51
TTE0804	MalF	ABC-type sugar transport systems, permease components	40
TTE0805	MalG	Sugar permeases	34
TTE0806	UgpB	Sugar-binding periplasmic proteins/domains	28
TTE0807	ATH1	Trehalose and maltose hydrolases (possible phosphorylases)	36
TTE0866	CDA1	Predicted xylanase/chitin deacetylase	42
TTE0906	MgsA	Methylglyoxal synthase	77
TTE0981	PpsA	Phosphoenolpyruvate synthase/pyruvate phosphate dikinase	66
TTE0994	ProP	Permeases of the major facilitator superfamily	36
TTE1005	Zwf	Glucose-6-phosphate 1-dehydrogenase	50
TTE1023	NagB	6-phosphogluconolactonase/Glucosamine-6-phosphate isomerase/deaminase	46
TTE1150	ProP	Permeases of the major facilitator superfamily	28
TTE1346	GpmB	Phosphoglycerate mutase/fructose-2,6-bisphosphatase	39
TTE1386	CDA1	Predicted xylanase/chitin deacetylase	44
TTE1498	Rpe	Pentose-5-phosphate-3-epimerase	61
TTE1515	ProP	Permeases of the major facilitator superfamily	39
TTE1592	AraD	Ribulose-5-phosphate 4-epimerase and related epimerases and aldolases	39
TTE1712	ProP	Permeases of the major facilitator superfamily	19
TTE1751	ManA	Phosphomannose isomerase	37
TTE1759	Eno	Enolase	74
TTE1760	TpiA	Triosephosphate isomerase	60
TTE1761	Pgk	3-phosphoglycerate kinase	65
TTE1762	GapA	Glyceraldehyde-3-phosphate dehydrogenase/erythrose-4-phosphate dehydrogenase	74
TTE1805	GlgP	Glucan phosphorylase	40
TTE1806	Pgi	Glucose-6-phosphate isomerase	68
TTE1815	PykF	Pyruvate kinase	57
TTE1816	PfkA	6-phosphofructokinase	61
TTE1820	FruB	Phosphotransferase system, HPr-related proteins	58
TTE1825	AmyA	Glycosidases	87
TTE1829	MalG	Sugar permeases	47
TTE1830	MalF	ABC-type sugar transport systems, permease components	50
TTE1831	MalE	Maltose-binding periplasmic proteins/domains	44
TTE1832	AmyA	Glycosidases	48
TTE1907	ProP	Permeases of the major facilitator superfamily	30
TTE1917	UgpB	Sugar-binding periplasmic proteins/domains	22
TTE1918	MipB	Transaldolase	68
TTE1928	GalK	Galactokinase	54
TTE1930	Chb	N-acetyl-beta-hexosaminidase	25

TTE1932	MelB	Na ⁺ /melibiose symporter and related transporters	27
TTE1934	-	Alpha-glucosidases, family 31 of glycosyl hydrolases	51
TTE1936	MalG	Sugar permeases	43
TTE1937	MalF	ABC-type sugar transport systems, permease components	39
TTE1938	UgpB	Sugar-binding periplasmic proteins/domains	25
TTE1939	UxaC	Glucuronate isomerase	64
TTE1940	MtlD	Mannitol-1-phosphate/altronate dehydrogenases	62
TTE1941	Gnd	6-phosphogluconate dehydrogenase, family 1	65
TTE1942	XylB	Sugar (pentulose and hexulose) kinases	31
TTE1948	IolE	Sugar phosphate isomerases/epimerases	40
TTE1949	IolE	Sugar phosphate isomerases/epimerases	37
TTE1979	MalK	ABC-type sugar/spermidine/putrescine/iron/thiamine transport systems, ATPase component	66
TTE1996	DAK1	Dihydroxyacetone kinase	59
TTE1997	DAK1	Dihydroxyacetone kinase	51
TTE2003	GlpF	Glycerol uptake facilitator and related permeases (Major Intrinsic Protein Family)	67
TTE2006	CDA1	Predicted xylanase/chitin deacetylase	50
TTE2170	-	Predicted sugar kinase	37
TTE2191	CpsG	Phosphomannomutase	52
TTE2245	ProP	Permeases of the major facilitator superfamily	23
TTE2248	ProP	Permeases of the major facilitator superfamily	27
TTE2334	PtsA	Phosphoenolpyruvate-protein kinase (PTS system EI component in bacteria)	54
TTE2345	UgpB	Sugar-binding periplasmic proteins/domains	26
TTE2346	MalF	ABC-type sugar transport systems, permease components	31
TTE2347	MalG	Sugar permeases	41
TTE2367	SfsA	Sugar fermentation stimulation protein (uncharacterized)	38
TTE2399	RhaT	Permeases of the drug/metabolite transporter (DMT) superfamily	35
TTE2415	MalG	Sugar permeases	35
TTE2416	MalF	ABC-type sugar transport systems, permease components	36
TTE2417	UgpB	Sugar-binding periplasmic proteins/domains	24
TTE2420	NanE	Putative N-acetylmannosamine-6-phosphate epimerase	52
TTE2456	ProP	Permeases of the major facilitator superfamily	34
TTE2458	MelB	Na ⁺ /melibiose symporter and related transporters	22
TTE2487	GpmA	Phosphoglycerate mutase 1	72
TTE2499	ProP	Permeases of the major facilitator superfamily	27
TTE2527	ProP	Permeases of the major facilitator superfamily	22
TTE2585	FruA	Phosphotransferase system, fructose-specific IIC component	62
TTE2586	PtsN	Phosphotransferase system mannitol/fructose-specific IIA domain (Ntr-type)	38
TTE2587	FruK	Fructose-1-phosphate kinase and related fructose-6-phosphate kinase (PfkB)	33
TTE2603	CDA1	Predicted xylanase/chitin deacetylase	30
TTE2616	-	Glycerate kinase	49
TTE2626	-	Predicted glycosylase	39
TTE2629	RhaT	Permeases of the drug/metabolite transporter (DMT) superfamily	30
TTE2704	CpsG	Phosphomannomutase	42
TTE2752	ProP	Permeases of the major facilitator superfamily	27

Amino acid transport and metabolism (199)

TTE0014	IlvH	Acetolactate synthase, small subunit	53
TTE0015	IlvC	Ketol-acid reductoisomerase	67
TTE0016	LeuA	Isopropylmalate/homocitrate/citramalate synthases	60
TTE0017	LeuC	3-isopropylmalate dehydratase large subunit	59
TTE0018	LeuD	3-isopropylmalate dehydratase small subunit	70
TTE0019	LeuB	Isocitrate/isopropylmalate dehydrogenase	62
TTE0020	IlvD	Dihydroxyacid dehydratase/phosphogluconate dehydratase	62

TTE0021	IlvB	Thiamine pyrophosphate-requiring enzymes [acetolactate synthase, pyruvate dehydrogenase (cytochrome), glyoxylate carboligase, phosphonopyruvate decarboxylase]	50
TTE0036	-	Transglutaminase-like enzymes, putative cysteine proteases	59
TTE0054	OppA	ABC-type dipeptide/oligopeptide/nickel transport systems, periplasmic components	23
TTE0055	DppB	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	36
TTE0056	DppC	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	29
TTE0057	DppD	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	41
TTE0058	OppF	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	39
TTE0089	GcvH	Glycine cleavage system H protein (lipoate-binding)	51
TTE0093	LdcC	Arginine/lysine/ornithine decarboxylases	38
TTE0103	ArcA	Arginine deiminase	49
TTE0161	Ald	Alanine dehydrogenase	59
TTE0208	OppA	ABC-type dipeptide/oligopeptide/nickel transport systems, periplasmic components	40
TTE0210	LysA	Diaminopimelate decarboxylase	52
TTE0225	DppB	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	32
TTE0226	DppC	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	36
TTE0227	DppD	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	41
TTE0228	OppF	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	43
TTE0231	OppA	ABC-type dipeptide/oligopeptide/nickel transport systems, periplasmic components	25
TTE0267	GLY1	Threonine aldolase	59
TTE0293	GcvP	Glycine cleavage system protein P (pyridoxal-binding), C-terminal domain	61
TTE0294	GcvP	Glycine cleavage system protein P (pyridoxal-binding), N-terminal domain	54
TTE0295	GcvH	Glycine cleavage system H protein (lipoate-binding)	56
TTE0296	GcvT	Glycine cleavage system T protein (aminomethyltransferase)	60
TTE0301	AvtA	PLP-dependent aminotransferases	51
TTE0350	OppA	ABC-type dipeptide/oligopeptide/nickel transport systems, periplasmic components	54
TTE0351	DppB	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	69
TTE0352	DppC	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	57
TTE0353	DppD	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	58
TTE0354	OppF	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	49
TTE0360	GloA	Lactoylglutathione lyase and related lyases	38
TTE0380	HisC	Histidinol-phosphate aminotransferase/Tyrosine aminotransferase	31
TTE0388	ArgE	Acetylornithine deacetylase/Succinyl-diaminopimelate desuccinylase and related deacylases	29
TTE0446	PotE	Amino acid transporters	50
TTE0449	HutU	Urocanate hydratase	64
TTE0450	-	Glutamate formiminotransferase	56
TTE0456	-	Methenyl tetrahydrofolate cyclohydrolase	34
TTE0472	LeuA	Isopropylmalate/homocitrate/citramalate synthases	54
TTE0512	ArtI	ABC-type amino acid transport system, periplasmic component	43
TTE0513	ArtM	ABC-type amino acid transport system, permease component	49
TTE0514	GlnQ	ABC-type polar amino acid transport system, ATPase component	73
TTE0531	ArcA	Arginine deiminase	45
TTE0532	ArgF	Ornithine carbamoyltransferase	67
TTE0533	ArcC	Carbamate kinase	55
TTE0539	SerA	Phosphoglycerate dehydrogenase and related dehydrogenases	38
TTE0567	GltD	NADPH-dependent glutamate synthase beta chain and related oxidoreductases	57
TTE0609	OppA	ABC-type dipeptide/oligopeptide/nickel transport systems, periplasmic components	41
TTE0611	OppA	ABC-type dipeptide/oligopeptide/nickel transport systems, periplasmic components	43
TTE0612	DppB	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	50
TTE0613	DppC	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	54
TTE0614	DppD	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	63
TTE0615	OppF	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	58
TTE0693	GltD	NADPH-dependent glutamate synthase beta chain and related oxidoreductases	59

TTE0695	Tdh	Threonine dehydrogenase and related Zn-dependent dehydrogenases	93
TTE0723	KamA	Lysine 2,3-aminomutase	75
TTE0728	PotE	Amino acid transporters	39
TTE0813	AspA	Aspartate ammonia-lyase	48
TTE0815	CarA	Carbamoylphosphate synthase small subunit	52
TTE0816	CarB	Carbamoylphosphate synthase large subunit (split gene in MJ)	55
TTE0817	AsnB	Asparagine synthase (glutamine-hydrolyzing)	51
TTE0818	GltB	Glutamate synthase domain 3	58
TTE0819	GltB	Glutamate synthase domain 2	63
TTE0820	GltB	Glutamate synthase domain 1	52
TTE0821	GlnA	Glutamine synthase	59
TTE0830	DapD	Tetrahydrodipicolinate N-succinyltransferase	53
TTE0831	DapB	Dihydrodipicolinate reductase	40
TTE0832	DapA	Dihydrodipicolinate synthase/N-acetylneuraminate lyase	49
TTE0833	Asd	Aspartate-semialdehyde dehydrogenase	57
TTE0844	HutH	Histidine ammonia-lyase	56
TTE0878	OppA	ABC-type dipeptide/oligopeptide/nickel transport systems, periplasmic components	29
TTE0924	MetH	Methionine synthase I, cobalamin-binding domain	
TTE0933	IlvE	Branched-chain amino acid aminotransferase/4-amino-4-deoxychorismate lyase	54
TTE0966	AnsB	L-asparaginase/archaeal Glu-tRNA ^{Gln} amidotransferase subunit D	45
TTE1008	SdaA	L-serine deaminase	45
TTE1009	SdaA	L-serine deaminase	53
TTE1010	-	Oligoendopeptidase F	52
TTE1011	AroB	3-dehydroquinate synthetase	45
TTE1012	PheA	Prephenate dehydratase	46
TTE1013	AroA	3-Deoxy-D-arabino-heptulosonate 7-phosphate (DAHP) synthase	55
TTE1014	TyrA	Prephenate dehydrogenase	37
TTE1015	AroA	5-enolpyruvylshikimate-3-phosphate synthase	53
TTE1027	LdcC	Arginine/lysine/ornithine decarboxylases	48
TTE1085	DmpA	L-aminopeptidase/D-esterase	55
TTE1121	HyuA	N-methylhydantoinase A	33
TTE1134	CysK	Cysteine synthase	60
TTE1204	KamA	Lysine 2,3-aminomutase	49
TTE1205	GdhA	Glutamate dehydrogenase/leucine dehydrogenase	54
TTE1206	AvtA	PLP-dependent aminotransferases	50
TTE1219	GloA	Lactoylglutathione lyase and related lyases	68
TTE1236	ThrC	Threonine synthase	27
TTE1261	AroE	Shikimate 5-dehydrogenase	50
TTE1275	AroK	Shikimate kinase	34
TTE1277	ProB	Glutamate 5-kinase	43
TTE1278	ProA	Gamma-glutamyl phosphate reductase	55
TTE1279	AroQ	3-dehydroquinate dehydratase II	50
TTE1280	PepP	Xaa-Pro aminopeptidase	52
TTE1301	ArgR	Arginine repressor	41
TTE1334	SpeE	Spermidine synthase	55
TTE1335	SpeB	Arginase/agmatinase/formimionoglutamate hydrolase, arginase family	47
TTE1344	GdhA	Glutamate dehydrogenase/leucine dehydrogenase	59
TTE1354	SpeD	S-adenosylmethionine decarboxylase	57
TTE1361	ProC	Pyrroline-5-carboxylate reductase	43
TTE1364	MetC	Cystathionine beta-lyases/cystathionine gamma-synthases	53
TTE1368	AvtA	PLP-dependent aminotransferases	49
TTE1382	LysC	Aspartokinases	47

TTE1514	DapF	Diaminopimelate epimerase	40
TTE1551	DAP2	Dipeptidyl aminopeptidases/acylaminoacyl-peptidases	64
TTE1552	OppA	ABC-type dipeptide/oligopeptide/nickel transport systems, periplasmic components	39
TTE1574	MetC	Cystathionine beta-lyases/cystathionine gamma-synthases	44
TTE1576	AroA	3-Deoxy-D-arabino-heptulosonate 7-phosphate (DAHP) synthase	61
TTE1577	TrpA	Tryptophan synthase alpha chain	47
TTE1578	TrpB	Tryptophan synthase beta chain	70
TTE1579	TrpF	Phosphoribosylanthranilate isomerase	38
TTE1580	TrpC	Indole-3-glycerol phosphate synthase	42
TTE1581	TrpD	Anthranilate phosphoribosyltransferase	44
TTE1582	PabA	Anthranilate/para-aminobenzoate synthases component II	61
TTE1583	TrpE	Anthranilate/para-aminobenzoate synthases component I	47
TTE1585	MetC	Cystathionine beta-lyases/cystathionine gamma-synthases	44
TTE1591	Tdh	Threonine dehydrogenase and related Zn-dependent dehydrogenases	35
TTE1602	TnaA	Tryptophanase	62
TTE1606	DUR1	Allophanate hydrolase subunit 2	40
TTE1607	DUR1	Allophanate hydrolase subunit 1	52
TTE1663	NifS	Cysteine sulfinate desulfinate/cysteine desulfurase and related enzymes	49
TTE1680	LAP4	Aspartyl aminopeptidase	44
TTE1711	AroC	Chorismate synthase	47
TTE1746	ArgE	Acetylornithine deacetylase/Succinyl-diaminopimelate desuccinylase and related deacylases	43
TTE1748	SpeE	Spermidine synthase	38
TTE1796	DmpA	L-aminopeptidase/D-esterase	45
TTE1803	MetH	Methionine synthase I, cobalamin-binding domain	38
TTE1804	MetF	5,10-methylenetetrahydrofolate reductase	38
TTE1808	PepD	Di- and tripeptidases	57
TTE1835	HIS2	Histidinol phosphatase and related hydrolases of the PHP family	28
TTE1872	SelA	Selenocysteine synthase [seryl-tRNA ^{Ser} selenium transferase]	47
TTE1873	SelD	Selenophosphate synthase	52
TTE1911	OppF	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	51
TTE1912	DppD	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	51
TTE1913	DppC	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	41
TTE1914	DppB	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	38
TTE1915	OppA	ABC-type dipeptide/oligopeptide/nickel transport systems, periplasmic components	30
TTE1922	PotE	Amino acid transporters	39
TTE1924	PotE	Amino acid transporters	38
TTE1963	HIS2	Histidinol phosphatase and related hydrolases of the PHP family	51
TTE1981	LysA	Diaminopimelate decarboxylase	57
TTE2129	-	Zn-dependent dipeptidase, microsomal dipeptidase homolog	39
TTE2130	GlyA	Glycine hydroxymethyltransferase	68
TTE2132	HisI	Phosphoribosyl-AMP cyclohydrolase	57
TTE2133	HisF	Imidazoleglycerol-phosphate synthase	72
TTE2134	HisA	Phosphoribosylformimino-5-aminoimidazole carboxamide ribonucleotide (ProFAR) isomerase	37
TTE2135	HisH	Glutamine amidotransferase	53
TTE2136	HisB	Imidazoleglycerol-phosphate dehydratase	55
TTE2137	HisC	Histidinol-phosphate aminotransferase/Tyrosine aminotransferase	35
TTE2138	HisD	Histidinol dehydrogenase	48
TTE2139	HisG	ATP phosphoribosyltransferase (histidine biosynthesis)	52
TTE2151	MET17	O-acetylhomoserine sulfhydrylase	62
TTE2152	ThrA	Homoserine dehydrogenase	39
TTE2202	GdhA	Glutamate dehydrogenase/leucine dehydrogenase	66
TTE2203	GdhA	Glutamate dehydrogenase/leucine dehydrogenase	63

TTE2213	-	Transglutaminase-like enzymes, putative cysteine proteases	26
TTE2316	CysE	Serine acetyltransferase	75
TTE2339	ArgD	PLP-dependent aminotransferases	40
TTE2342	DAP2	Dipeptidyl aminopeptidases/acylaminoacyl-peptidases	41
TTE2386	GloA	Lactoylglutathione lyase and related lyases	63
TTE2387	ArgK	Putative periplasmic protein kinase ArgK and related GTPases of G3E family	57
TTE2405	Tdh	Threonine dehydrogenase and related Zn-dependent dehydrogenases	55
TTE2440	AvtA	PLP-dependent aminotransferases	52
TTE2448	SerB	Phosphoserine phosphatase	25
TTE2465	NifS	Cysteine sulfinate desulfinate/cysteine desulfurase and related enzymes	57
TTE2478	CysK	Cysteine synthase	61
TTE2488	-	Oligoendopeptidase F	41
TTE2493	ArgH	Argininosuccinate lyase	52
TTE2494	ArgG	Argininosuccinate synthase	54
TTE2495	ArgD	PLP-dependent aminotransferases	55
TTE2496	ArgB	Acetylglutamate kinase	55
TTE2498	ArgC	Acetylglutamate semialdehyde dehydrogenase	56
TTE2522	OppA	ABC-type dipeptide/oligopeptide/nickel transport systems, periplasmic components	34
TTE2523	DppB	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	33
TTE2524	DppC	ABC-type dipeptide/oligopeptide/nickel transport systems, permease components	39
TTE2525	DppD	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	57
TTE2526	OppF	ABC-type dipeptide/oligopeptide/nickel transport system, ATPase component	61
TTE2536	PotE	Amino acid transporters	27
TTE2591	HyuA	N-methylhydantoinase A	45
TTE2610	HIS2	Histidinol phosphatase and related hydrolases of the PHP family	35
TTE2613	SerA	Phosphoglycerate dehydrogenase and related dehydrogenases	45
TTE2614	-	Serine-pyruvate aminotransferase/archaeal aspartate aminotransferase	44
TTE2618	ThrB	Homoserine kinase	38
TTE2619	ThrC	Threonine synthase	59
TTE2620	ThrA	Homoserine dehydrogenase	49
TTE2623	PotE	Amino acid transporters	44
TTE2670	CsdB	Selenocysteine lyase	57
TTE2694	PepN	Aminopeptidase N	28
TTE2705	-	Oligoendopeptidase F	50
TTE2723	PepE	Peptidase E	35
TTE2789	CsdB	Selenocysteine lyase	48

Nucleotide transport and metabolism (55)

TTE0037	-	Cytosine/adenosine deaminases	53
TTE0094	Tmk	Thymidylate kinase	45
TTE0140	Tdk	Thymidine kinase	61
TTE0147	Upp	Uracil phosphoribosyltransferase	74
TTE0148	ComEB	Deoxycytidylate deaminase	62
TTE0343	UshA	5'-nucleotidase/2',3'-cyclic phosphodiesterase and related esterases	36
TTE0462	Cdd	Cytidine deaminase	60
TTE0464	DeoA	Thymidine phosphorylase	61
TTE0582	GuaB	IMP dehydrogenase/GMP reductase	71
TTE0583	GuaA	GMP synthase - PP-ATPase domain	57
TTE0585	PurE	Phosphoribosylcarboxyaminoimidazole (NCAIR) mutase	54
TTE0588	PurC	Phosphoribosylaminoimidazolesuccinocarboxamide (SAICAR) synthase	51
TTE0590	PurM	Phosphoribosylaminoimidazol (AIR) synthetase	58
TTE0591	PurN	Folate-dependent phosphoribosylglycinamide formyltransferase PurN	43
TTE0592	PurH	AICAR transformylase/IMP cyclohydrolase PurH (only IMP cyclohydrolase domain in Aful)	60

TTE0593	PurD	Phosphoribosylamine-glycine ligase	47
TTE0620	-	Xanthosine triphosphate pyrophosphatase	42
TTE0747	Ndk	Nucleoside diphosphate kinase	59
TTE0809	PurS	Phosphoribosylformylglycinamide (FGAM) synthase, PurS component	51
TTE0810	PurL	Phosphoribosylformylglycinamide (FGAM) synthase, glutamine amidotransferase domain	64
TTE0811	PurL	Phosphoribosylformylglycinamide (FGAM) synthase, synthetase domain	56
TTE0812	PurF	Glutamine phosphoribosylpyrophosphate amidotransferase	48
TTE0963	Hit	Diadenosine tetraphosphate (Ap4A) hydrolase and other HIT family hydrolases	58
TTE0975	DeoC	Deoxyribose-phosphate aldolase	57
TTE1194	Apt	Adenine/guanine phosphoribosyltransferases and related PRPP-binding proteins	56
TTE1350	Cmk	Cytidylate kinase	45
TTE1367	PurB	Adenylosuccinate lyase	52
TTE1384	Dut	dUTPase	53
TTE1407	PyrH	Uridylate kinase	64
TTE1511	Gmk	Guanylate kinase	55
TTE1529	PyrE	Orotate phosphoribosyltransferase	59
TTE1530	PyrD	Dihydroorotate dehydrogenase	54
TTE1532	PyrF	Orotidine-5'-phosphate decarboxylase	36
TTE1533	PyrC	Dihydroorotase	45
TTE1534	PyrB	Aspartate carbamoyltransferase, catalytic chain	51
TTE1536	PyrR	Pyrimidine operon attenuation protein/uracil phosphoribosyltransferase	67
TTE1587	Pnp	Purine nucleoside phosphorylase	54
TTE1593	SsnA	Cytosine deaminase and related metal-dependent hydrolases	46
TTE1730	CodB	Purine-cytosine permease and related proteins	29
TTE1752	DeoD	Purine-nucleoside phosphorylase	64
TTE1757	Dgt	dGTP triphosphohydrolase	40
TTE1778	Udk	Uridine kinase	53
TTE1781	-	ADP-ribose pyrophosphatase	40
TTE1850	NrdD	Oxygen-sensitive ribonucleoside-triphosphate reductase	49
TTE2225	THY1	Predicted alternative thymidylate synthase	20
TTE2271	Adk	Adenylate kinase and related kinases	54
TTE2336	NrdA	Ribonucleotide reductase alpha subunit	37
TTE2391	MIS1	Formyltetrahydrofolate synthetase	67
TTE2394	Hpt	Hypoxanthine-guanine phosphoribosyltransferase	54
TTE2407	UraA	Xanthine/uracil permeases	42
TTE2442	GppA	Exopolyphosphatase	36
TTE2571	PrsA	Phosphoribosylpyrophosphate synthetase	66
TTE2574	Apt	Adenine/guanine phosphoribosyltransferases and related PRPP-binding proteins	46
TTE2609	PyrG	CTP synthase (UTP-ammonia lyase)	66
TTE2696	PurA	Adenylosuccinate synthase	54

Coenzyme metabolism (54)

TTE0249	CbiM	Cobalamin biosynthesis protein CbiM	45
TTE0297	LplA	Lipoate-protein ligase A	48
TTE0370	BtuR	ATP:corrinoid adenosyltransferase	54
TTE0375	CobB	Cobyric acid a,c-diamide synthase	38
TTE0376	CobQ	Cobyric acid synthase	48
TTE0377	CbiB	Cobalamin biosynthesis protein CobD/CbiB	41
TTE0381	CobU	Adenosyl cobinamide kinase/adenosyl cobinamide phosphate guanylyltransferase	43
TTE0382	CobS	Cobalamin-5-phosphate synthase	24
TTE0488	MetK	S-adenosylmethionine synthetase	73
TTE0526	BtuR	ATP:corrinoid adenosyltransferase	50
TTE0566	UbiB	2-polyprenylphenol hydroxylase and related flavodoxin oxidoreductases	50

TTE0640	NadE	NAD synthase	47
TTE0694	UbiB	2-polyprenylphenol hydroxylase and related flavodoxin oxidoreductases	53
TTE0783	FolC	Folypolyglutamate synthase	39
TTE0822	PDX2	Predicted glutamine amidotransferase involved in pyridoxine biosynthesis	42
TTE0823	SNZ1	Pyridoxine biosynthesis enzyme	70
TTE0875	CoaE	Dephospho-CoA kinase	42
TTE0877	PncB	Nicotinic acid phosphoribosyltransferase	46
TTE0918	NadD	Nicotinic acid mononucleotide adenylyltransferase	51
TTE0919	-	Predicted HD superfamily hydrolase involved in NAD metabolism	44
TTE0952	HemN	Coproporphyrinogen III oxidase and related FeS oxidoreductases	38
TTE1024	PaaK	Coenzyme F390 synthetase	21
TTE1073	BioB	Biotin synthase and related enzymes	51
TTE1293	FolD	5,10-methylene-tetrahydrofolate dehydrogenase	42
TTE1296	IspA	Geranylgeranyl pyrophosphate synthase	51
TTE1298	Dxs	Deoxyxylulose-5-phosphate synthase	53
TTE1329	UbiB	2-polyprenylphenol hydroxylase and related flavodoxin oxidoreductases	41
TTE1389	RibF	FAD synthase	35
TTE1486	CoaD	Phosphopantetheine adenylyltransferase	61
TTE1497	THI80	Thiamine pyrophosphokinase	28
TTE1509	Dfp	Phosphopantothenoylcysteine synthetase/decarboxylase	47
TTE1531	UbiB	2-polyprenylphenol hydroxylase and related flavodoxin oxidoreductases	35
TTE1565	ThiC	Thiamine biosynthesis protein ThiC	53
TTE1568	ThiH	Thiamine biosynthesis enzyme ThiH and related uncharacterized enzymes	53
TTE1570	SIR2	NAD-dependent protein deacetylases, SIR2 family	61
TTE1662	ThiI	Thiamine biosynthesis ATP pyrophosphatase	43
TTE1672	LipA	Lipoate synthase	53
TTE1673	LipB	Lipoate-protein ligase B	40
TTE1695	CbiM	Cobalamin biosynthesis protein CbiM	46
TTE1740	SIR2	NAD-dependent protein deacetylases, SIR2 family	47
TTE1885	BioB	Biotin synthase and related enzymes	53
TTE1965	BirA	Biotin-(acetyl-CoA carboxylase) ligase	38
TTE2232	ThiM	Hydroxyethylthiazole kinase, sugar kinase family	50
TTE2233	ThiE	Thiamine monophosphate synthase	46
TTE2235	ThiD	Hydroxymethylpyrimidine/phosphomethylpyrimidine kinase	52
TTE2368	-	6-pyruvoyl-tetrahydropterin synthase	50
TTE2369	FolK	7,8-dihydro-6-hydroxymethylpterin-pyrophosphokinase	44
TTE2370	FolP	Dihydropteroate synthase	54
TTE2371	FolE	GTP cyclohydrolase I	63
TTE2406	BioF	7-keto-8-aminopelargonate synthetase and related enzymes	39
TTE2471	ThiF	Dinucleotide-utilizing enzymes involved in molybdopterin and thiamine biosynthesis family 2	37
TTE2481	MenA	1,4-dihydroxy-2-naphthoate octaprenyltransferase	32
TTE2482	ApbE	Membrane-associated lipoprotein involved in thiamine biosynthesis	40
TTE2483	IspA	Geranylgeranyl pyrophosphate synthase	34

Lipid metabolism (48)

TTE0175	FabA	3-hydroxymyristoyl/3-hydroxydecanoyl-(acyl carrier protein) dehydratases	65
TTE0319	-	Activator of 2-hydroxyglutaryl-CoA dehydratase (HSP70-class ATPase domain)	35
TTE0419	PldB	Lysophospholipase	35
TTE0544	CaiD	Enoyl-CoA hydratase/carnithine racemase	63
TTE0545	CaiA	Acyl-CoA dehydrogenases	78
TTE0548	FadB	3-Hydroxyacyl-CoA dehydrogenase	74
TTE0549	PaaJ	Acetyl-CoA acetyltransferases	70
TTE0551	MaoC	Predicted acyl dehydratase	52

TTE0553	FabH	3-oxoacyl-[acyl-carrier-protein] synthase III	26
TTE0557	FabH	3-oxoacyl-[acyl-carrier-protein] synthase III	35
TTE0718	-	Acyl-CoA hydrolase	
TTE0720	AtoD	Acyl-CoA:acetate CoA transferase alpha subunit	67
TTE0721	AtoA	Acyl-CoA:acetate CoA transferase beta subunit	67
TTE0754	PgpB	Membrane-associated phospholipid phosphatase	29
TTE0757	PgsA	Phosphatidylglycerophosphate synthase	35
TTE0928	PgpA	Phosphatidylglycerophosphate A	55
TTE1113	-	Activator of 2-hydroxyglutaryl-CoA dehydratase (HSP70-class ATPase domain)	45
TTE1217	Sbm	Methylmalonyl-CoA mutase, N-terminal domain/subunit	70
TTE1218	Sbm	Methylmalonyl-CoA mutase, C-terminal domain/subunit (cobalamin-binding)	72
TTE1220	AccA	Acetyl-CoA carboxylase alpha subunit	69
TTE1222	AccB	Biotin carboxyl carrier protein	37
TTE1238	Sbm	Methylmalonyl-CoA mutase, C-terminal domain/subunit (cobalamin-binding)	27
TTE1351	PlsC	1-acyl-sn-glycerol-3-phosphate acyltransferase	45
TTE1352	LytB	Penicillin tolerance protein	43
TTE1376	PgsA	Phosphatidylglycerophosphate synthase	53
TTE1402	Dxr	1-deoxy-D-xylulose 5-phosphate reductoisomerase	50
TTE1403	CdsA	CDP-diglyceride synthetase	31
TTE1404	UppS	Undecaprenyl pyrophosphate synthase	57
TTE1470	FabB	3-oxoacyl-(acyl-carrier-protein) synthase	58
TTE1471	AcpP	Acyl carrier protein	52
TTE1473	FabD	(acyl-carrier-protein) S-malonyltransferase	48
TTE1475	FabH	3-oxoacyl-[acyl-carrier-protein] synthase III	70
TTE1476	PlsX	Fatty acid/phospholipid biosynthesis enzyme	69
TTE1604	-	Acyl-CoA hydrolase	36
TTE1874	PlsX	Fatty acid/phospholipid biosynthesis enzyme	54
TTE1875	FabH	3-oxoacyl-[acyl-carrier-protein] synthase III	57
TTE1960	CaiC	Acyl-CoA synthetases (AMP-forming)/AMP-acid ligases II	44
TTE1991	-	Activator of 2-hydroxyglutaryl-CoA dehydratase (HSP70-class ATPase domain)	37
TTE2171	AcpS	Phosphopantetheinyl transferase (holo-ACP synthase)	40
TTE2192	PlsC	1-acyl-sn-glycerol-3-phosphate acyltransferase	37
TTE2320	IspF	2C-methyl-D-erythritol 2,4-cyclodiphosphate synthase	50
TTE2322	IspD	4-diphosphocytidyl-2-methyl-D-erythritol synthase	42
TTE2383	AccB	Biotin carboxyl carrier protein	40
TTE2385	AccA	Acetyl-CoA carboxylase alpha subunit	69
TTE2388	Sbm	Methylmalonyl-CoA mutase, C-terminal domain/subunit (cobalamin-binding)	72
TTE2389	Sbm	Methylmalonyl-CoA mutase, N-terminal domain/subunit	70
TTE2511	PgpB	Membrane-associated phospholipid phosphatase	39
TTE2559	IspE	4-diphosphocytidyl-2C-methyl-D-erythritol 2-phosphate synthase	37

Secondary metabolites biosynthesis, transport and catabolism (54)

TTE0051	FabG	Dehydrogenases with different specificities (related to short-chain alcohol dehydrogenases)	40
TTE0069	FabG	Dehydrogenases with different specificities (related to short-chain alcohol dehydrogenases)	65
TTE0102	SmtA	SAM-dependent methyltransferases	41
TTE0255	NorM	Na ⁺ -driven multidrug efflux pump	29
TTE0256	AcrA	Membrane-fusion protein	22
TTE0260	MhpD	2-keto-4-pentenoate hydratase/2-oxohepta-3-ene-1,7-dioic acid hydratase (catechol pathway)	64
TTE0327	IndA	Uncharacterized enzyme involved in pigment biosynthesis	56
TTE0398	CcmA	ABC-type multidrug transport system, ATPase component	36
TTE0410	CcmA	ABC-type multidrug transport system, ATPase component	47
TTE0436	CcmA	ABC-type multidrug transport system, ATPase component	34
TTE0451	HutI	Imidazolonepropionase and related amidohydrolases	50

TTE0530	HutI	Imidazolonepropionase and related amidohydrolases	45
TTE0594	SmtA	SAM-dependent methyltransferases	22
TTE0687	AcoR	Putative regulator of acetoin metabolism	36
TTE0791	CcmA	ABC-type multidrug transport system, ATPase component	28
TTE0835	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	42
TTE0836	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	41
TTE0848	CcmA	ABC-type multidrug transport system, ATPase component	50
TTE1143	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	26
TTE1144	CcmA	ABC-type multidrug transport system, ATPase component	39
TTE1159	CcmA	ABC-type multidrug transport system, ATPase component	37
TTE1164	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	30
TTE1176	CcmA	ABC-type multidrug transport system, ATPase component	39
TTE1200	AcrA	Membrane-fusion protein	27
TTE1256	SmtA	SAM-dependent methyltransferases	39
TTE1472	FabG	Dehydrogenases with different specificities (related to short-chain alcohol dehydrogenases)	53
TTE1477	PaaI	Uncharacterized protein, possibly involved in aromatic compounds catabolism	71
TTE1601	AcrA	Membrane-fusion protein	21
TTE1790	FabG	Dehydrogenases with different specificities (related to short-chain alcohol dehydrogenases)	35
TTE1811	NorM	Na ⁺ -driven multidrug efflux pump	28
TTE1842	PncA	Amidases related to nicotinamidase	28
TTE1843	PaaI	Uncharacterized protein, possibly involved in aromatic compounds catabolism	31
TTE1863	CcmA	ABC-type multidrug transport system, ATPase component	52
TTE1895	SmtA	SAM-dependent methyltransferases	59
TTE1920	CcmA	ABC-type multidrug transport system, ATPase component	27
TTE2145	CcmA	ABC-type multidrug transport system, ATPase component	48
TTE2182	CcmA	ABC-type multidrug transport system, ATPase component	39
TTE2234	FabG	Dehydrogenases with different specificities (related to short-chain alcohol dehydrogenases)	37
TTE2239	CcmA	ABC-type multidrug transport system, ATPase component	38
TTE2353	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	25
TTE2354	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	28
TTE2398	SmtA	SAM-dependent methyltransferases	37
TTE2402	CcmA	ABC-type multidrug transport system, ATPase component	43
TTE2508	AcoR	Putative regulator of acetoin metabolism	25
TTE2513	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	43
TTE2514	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	46
TTE2531	CcmA	ABC-type multidrug transport system, ATPase component	46
TTE2709	FabG	Dehydrogenases with different specificities (related to short-chain alcohol dehydrogenases)	40
TTE2718	SmtA	SAM-dependent methyltransferases	32
TTE2720	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	29
TTE2733	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	26
TTE2736	CcmA	ABC-type multidrug transport system, ATPase component	37
TTE2741	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	28
TTE2769	MdlB	ABC-type multidrug/protein/lipid transport system, ATPase component	30

Poorly characterized (1135)

General function prediction only (202)

TTE0007	-	Predicted glutamine amidotransferase	53
TTE0009	ARC1	EMAP domain	58
TTE0022	PerM	Predicted permease	27
TTE0084	-	Predicted transporter components	51
TTE0100	-	Predicted permeases	52

TTE0104	-	Predicted methyltransferases	57
TTE0107	SpmA	Uncharacterized membrane protein, required for spore maturation in B.subtilis.	51
TTE0129	HybF	Zn finger protein HypA/HybF (possibly regulating hydrogenase expression)	30
TTE0176	MviN	Uncharacterized membrane protein, putative virulence factor	26
TTE0177	-	Uncharacterized Fe-S center protein	53
TTE0199	MviM	Predicted dehydrogenases and related proteins	29
TTE0212	-	Predicted sugar phosphate isomerase	56
TTE0218	RimI	Acetyltransferases	
TTE0220	RimI	Acetyltransferases	
TTE0244	-	Predicted nucleotidyltransferases	
TTE0257	PhnL	ABC-type transport systems, involved in lipoprotein release, ATPase components	57
TTE0258	-	ABC-type transport systems, involved in lipoprotein release, permease components	30
TTE0283	-	Predicted DNA-binding proteins with PD1-like DNA-binding motif	43
TTE0287	LytS	Predicted ATPase	31
TTE0321	-	Predicted permease	49
TTE0325	-	Predicted nucleotidyltransferases	35
TTE0344	-	Predicted TIM-barrel enzymes, possibly dehydrogenases, nifR3 family	49
TTE0367	-	MoxR-like ATPases	52
TTE0400	GlpG	Uncharacterized membrane protein (homolog of Drosophila rhomboid)	40
TTE0417	-	Predicted metal-dependent membrane protease	29
TTE0420	-	Predicted permeases	44
TTE0459	-	Uncharacterized ABC-type transport system, permease component	36
TTE0460	-	Uncharacterized ABC-type transport system, permease component	40
TTE0477	Cof	Predicted hydrolases of the HAD superfamily	35
TTE0490	ComFC	Predicted amidophosphoribosyltransferases	37
TTE0535	-	Predicted ATPase or kinase	40
TTE0537	RimI	Acetyltransferases	55
TTE0540	Uup	ATPase components of ABC transporters with duplicated ATPase domains	40
TTE0543	-	AT-rich DNA-binding protein	36
TTE0552	MhpC	Predicted hydrolases or acyltransferases (alpha/beta hydrolase superfamily)	39
TTE0555	LipA	Predicted acetyltransferases and hydrolases with the alpha/beta hydrolase fold	36
TTE0556	MhpC	Predicted hydrolases or acyltransferases (alpha/beta hydrolase superfamily)	23
TTE0575	-	Uncharacterized membrane protein, possible Na ⁺ channel or pump	45
TTE0581	RimI	Acetyltransferases	29
TTE0584	-	Permeases	46
TTE0596	AbgB	Metal-dependent amidase/aminoacylase/carboxypeptidase	42
TTE0597	RfbX	Membrane protein involved in the export of O-antigen and teichoic acid	28
TTE0621	-	Predicted phosphoesterase	34
TTE0628	-	Predicted GTPases	47
TTE0644	NrfG	TPR-repeat-containing proteins	
TTE0653	MviM	Predicted dehydrogenases and related proteins	53
TTE0654	WbbJ	Acetyltransferases (the isoleucine patch superfamily)	53
TTE0666	WbbJ	Acetyltransferases (the isoleucine patch superfamily)	26
TTE0681	-	Predicted phosphoesterase	37
TTE0712	-	Predicted nucleotidyltransferases	34
TTE0729	-	Predicted epimerase, PhzC/PhzF homolog	32
TTE0751	-	Predicted nucleotidyltransferases	52
TTE0769	-	ATP-utilizing enzymes of the PP-loop superfamily	44
TTE0770	-	NCAIR mutase (PurE)-related proteins	50
TTE0777	BioY	Uncharacterized ACR	41
TTE0787	NrfG	TPR-repeat-containing proteins	21
TTE0802	-	Predicted phosphatase/phosphohexomutase	51

TTE0814	-	Predicted GTPases	58
TTE0889	-	Predicted metal-dependent phosphoesterases (PHP family)	32
TTE0908	SpoIVFB	Zn-dependent proteases	25
TTE0917	Obg	Predicted GTPase	46
TTE0934	-	Predicted metal-dependent hydrolases related to alanyl-tRNA synthetase HxxxH domain	31
TTE0940	ElaC	Metal-dependent hydrolases of the beta-lactamase superfamily III	36
TTE0941	ComEC	Predicted hydrolases of metallo-beta-lactamase fold	27
TTE0971	-	Predicted membrane-associated HD superfamily hydrolase	33
TTE0972	-	Predicted metal-dependent hydrolase	48
TTE0974	Era	GTPases	52
TTE0979	-	CBS domains	49
TTE0982	-	Predicted HD superfamily hydrolase	39
TTE0986	ThiJ	Putative intracellular protease/amidase	43
TTE0989	MhpC	Predicted hydrolases or acyltransferases (alpha/beta hydrolase superfamily)	26
TTE1006	-	Uncharacterized ACR, predicted metal-dependent hydrolases	35
TTE1020	-	Uncharacterized protein, putative amidase	33
TTE1021	PaaY	Carbonic anhydrases/acetyltransferases, isoleucine patch superfamily	32
TTE1066	-	Predicted metal-dependent hydrolase with the TIM-barrel fold	42
TTE1089	-	Predicted phosphohydrolases	33
TTE1127	HflX	GTPases	43
TTE1131	-	Predicted CoA-binding protein	35
TTE1133	-	Predicted permeases	30
TTE1138	NrfG	TPR-repeat-containing proteins	23
TTE1142	-	ABC-type multidrug transport system, permease component	
TTE1145	-	ABC-type multidrug transport system, permease component	26
TTE1146	NrfG	TPR-repeat-containing proteins	23
TTE1149	-	Predicted Fe-S oxidoreductases	32
TTE1153	-	Predicted Fe-S oxidoreductases	27
TTE1158	AslB	Arylsulfatase regulator (Fe-S oxidoreductase)	38
TTE1160	-	ABC-type multidrug transport system, permease component	27
TTE1166	AslB	Arylsulfatase regulator (Fe-S oxidoreductase)	36
TTE1177	-	ABC-type multidrug transport system, permease component	26
TTE1186	AslB	Arylsulfatase regulator (Fe-S oxidoreductase)	25
TTE1187	PaaY	Carbonic anhydrases/acetyltransferases, isoleucine patch superfamily	57
TTE1190	AarF	Predicted unusual protein kinase	34
TTE1197	GloB	Zn-dependent hydrolases, including glyoxylases	39
TTE1198	-	ABC-type transport systems, involved in lipoprotein release, permease components	34
TTE1199	PhnL	ABC-type transport systems, involved in lipoprotein release, ATPase components	57
TTE1245	PerM	Predicted permease	30
TTE1253	-	Predicted hydrolase of the metallo-beta-lactamase superfamily	54
TTE1255	-	Predicted periplasmic solute-binding protein	36
TTE1260	-	Predicted hydrolase of the HAD superfamily	35
TTE1300	-	Predicted kinase	36
TTE1323	SpoIVFB	Zn-dependent proteases	43
TTE1338	SurE	Survival protein, predicted acid phosphatase	46
TTE1347	-	Predicted flavoproteins	42
TTE1360	Hfq	Uncharacterized ACR, host factor I protein	69
TTE1365	-	Predicted metal-dependent hydrolase of the TIM-barrel fold	25
TTE1369	-	Predicted metal-dependent phosphoesterases (PHP family)	45
TTE1372	-	Predicted HD superfamily hydrolase	61
TTE1373	OraA	Uncharacterized BCR	26
TTE1375	CinA	Predicted nucleotide-utilizing enzyme related to molybdopterin-biosynthesis enzyme MoeA	46

TTE1385	PqqL	Predicted Zn-dependent peptidases	40
TTE1391	-	Exopolyphosphatase-related proteins	35
TTE1456	-	Predicted GTPases	48
TTE1460	-	Predicted RNA-binding protein (KH domain)	53
TTE1474	-	Dioxygenases related to 2-nitropropane dioxygenase	52
TTE1493	-	Predicted kinase related to dihydroxyacetone kinase	40
TTE1499	-	Predicted GTPases	45
TTE1502	-	Predicted Fe-S-cluster redox enzyme	51
TTE1504	-	Predicted Zn-dependent protease	45
TTE1526	-	Predicted SAM-dependent methyltransferases	45
TTE1541	-	Predicted nucleotidyltransferases	57
TTE1554	-	Predicted permeases	28
TTE1563	-	Enzyme related to GTP cyclohydrolase I	46
TTE1600	-	Predicted enzyme with a TIM-barrel fold	54
TTE1608	-	Uncharacterized proteins, homologs of lactam utilization protein B	57
TTE1619	-	Predicted GTPases	52
TTE1655	PqqL	Predicted Zn-dependent peptidases	43
TTE1656	PqqL	Predicted Zn-dependent peptidases	32
TTE1658	-	Predicted GTPase	64
TTE1754	-	Predicted SAM-dependent methyltransferase	27
TTE1766	Cof	Predicted hydrolases of the HAD superfamily	29
TTE1776	-	Predicted Fe-S oxidoreductases	36
TTE1779	PflX	Uncharacterized Fe-S protein PflX, homolog of pyruvate formate lyase activating proteins	49
TTE1809	-	Hydrolases of the alpha/beta superfamily	37
TTE1814	FcbC	Predicted thioesterase	37
TTE1819	-	CBS domains	41
TTE1834	-	Predicted P-loop-containing kinase	50
TTE1838	RssA	Predicted esterase of the alpha-beta hydrolase superfamily	32
TTE1840	AarF	Predicted unusual protein kinase	35
TTE1845	-	Predicted DNA-binding proteins	41
TTE1862	NosY	ABC-type transport system involved in multi-copper enzyme maturation, permease component	46
TTE1884	HcaD	Uncharacterized NAD(FAD)-dependent dehydrogenases	46
TTE1889	-	Metal-dependent hydrolases of the beta-lactamase superfamily II	36
TTE1898	-	Predicted methyltransferases	46
TTE1899	-	Predicted GTPases (dynamin-related)	50
TTE1947	-	Predicted permeases	27
TTE1950	MviM	Predicted dehydrogenases and related proteins	38
TTE1951	MviM	Predicted dehydrogenases and related proteins	70
TTE1957	-	Predicted nucleotidyltransferases	36
TTE1983	-	Predicted phosphatase/phosphohexomutase	33
TTE1988	-	Predicted nucleotidyltransferases	37
TTE2000	HcaD	Uncharacterized NAD(FAD)-dependent dehydrogenases	42
TTE2001	-	Predicted dehydrogenase	44
TTE2005	-	Predicted integral membrane protein	23
TTE2037	-	Predicted nucleic acid-binding protein, contains PIN domain	31
TTE2105	PrfA	Penicillin-binding protein-related factor A, putative recombinase	37
TTE2117	-	Predicted membrane-bound metal-dependent hydrolases	30
TTE2141	-	Predicted nucleotidyltransferases	
TTE2144	NosY	ABC-type transport system involved in multi-copper enzyme maturation, permease component	29
TTE2148	MviM	Predicted dehydrogenases and related proteins	27
TTE2215	-	MoxR-like ATPases	58
TTE2216	Gph	Predicted phosphatases	42

TTE2238	-	ABC-type multidrug transport system, permease component	22
TTE2312	-	Predicted RNA-binding protein containing a PIN domain	36
TTE2321	LipA	Predicted acetyltransferases and hydrolases with the alpha/beta hydrolase fold	33
TTE2323	-	ATPases of the PilT family	50
TTE2344	LytS	Predicted ATPase	29
TTE2358	-	Predicted Fe-S oxidoreductases	27
TTE2403	NosY	ABC-type transport system involved in multi-copper enzyme maturation, permease component	22
TTE2427	MviM	Predicted dehydrogenases and related proteins	26
TTE2430	ComEC	Predicted hydrolases of metallo-beta-lactamase fold	33
TTE2454	MazG	Predicted pyrophosphatase	39
TTE2455	NrfG	TPR-repeat-containing proteins	25
TTE2497	ArgJ	Predicted kinase related to thiamine pyrophosphokinase	55
TTE2520	-	Predicted oxidoreductases of the aldo/keto reductase family	56
TTE2529	-	ABC-type multidrug transport system, permease component	23
TTE2530	-	ABC-type multidrug transport system, permease component	28
TTE2532	-	Predicted Zn-dependent hydrolases of the beta-lactamase fold	57
TTE2547	MhpC	Predicted hydrolases or acyltransferases (alpha/beta hydrolase superfamily)	28
TTE2577	-	Predicted metal-dependent membrane protease	28
TTE2607	-	Predicted nucleic acid-binding protein, contains PIN domain	35
TTE2624	PhnP	Metal-dependent hydrolases of the beta-lactamase superfamily I	41
TTE2628	-	Uncharacterized ACR, predicted metal-dependent hydrolases	39
TTE2635	-	Predicted nucleic acid-binding protein, contains PIN domain	38
TTE2639	-	Predicted hydrolase of the HD superfamily (permuted catalytic motifs)	24
TTE2660	-	Predicted helicases	30
TTE2671	-	Predicted membrane components of an uncharacterized iron-regulated ABC-type transporter SufB	26
TTE2672	-	Predicted membrane components of an uncharacterized iron-regulated ABC-type transporter SufB	60
TTE2673	-	Iron-regulated ABC transporter ATPase subunit SufC	54
TTE2697	-	Uncharacterized FAD-dependent dehydrogenases	50
TTE2700	-	Predicted glutamine amidotransferases	40
TTE2702	HcaD	Uncharacterized NAD(FAD)-dependent dehydrogenases	47
TTE2710	PhnL	ABC-type transport systems, involved in lipoprotein release, ATPase components	47
TTE2713	-	ABC-type transport systems, involved in lipoprotein release, permease components	24
TTE2714	PhnL	ABC-type transport systems, involved in lipoprotein release, ATPase components	45
TTE2724	TldD	Predicted Zn-dependent proteases and their inactivated homologs	24
TTE2725	TldD	Predicted Zn-dependent proteases and their inactivated homologs	32
TTE2735	-	ABC-type multidrug transport system, permease component	28
TTE2746	AslB	Arylsulfatase regulator (Fe-S oxidoreductase)	33
TTE2753	-	Predicted Fe-S oxidoreductases	30
TTE2776	-	Exopolyphosphatase-related proteins	40
TTE2796	ThdF	Predicted GTPase	50
TTE2798	Jag	Predicted RNA-binding protein	44

Conserved hypothetical (301)

TTE0003	-	conserved hypothetical protein	55
TTE0005		conserved hypothetical protein	53
TTE0032		conserved hypothetical protein	35
TTE0034	-	conserved hypothetical protein	43
TTE0035		conserved hypothetical protein	23
TTE0040		conserved hypothetical protein	52
TTE0061		conserved hypothetical protein	28
TTE0086		conserved hypothetical protein	46
TTE0095		conserved hypothetical protein	51
TTE0098		conserved hypothetical protein	58

TTE0099	conserved hypothetical protein	38
TTE0101	conserved hypothetical protein	25
TTE0108	conserved hypothetical protein	53
TTE0112	conserved hypothetical protein	33
TTE0120	conserved hypothetical protein	31
TTE0141	conserved hypothetical protein	36
TTE0157	conserved hypothetical protein	36
TTE0159	conserved hypothetical protein	33
TTE0160	conserved hypothetical protein	45
TTE0165	conserved hypothetical protein	26
TTE0179	conserved hypothetical protein	39
TTE0183	conserved hypothetical protein	47
TTE0189	conserved hypothetical protein	44
TTE0214	conserved hypothetical protein	48
TTE0217	conserved hypothetical protein	39
TTE0219	conserved hypothetical protein	28
TTE0240	conserved hypothetical protein	26
TTE0248	conserved hypothetical protein	41
TTE0261	conserved hypothetical protein	32
TTE0269	conserved hypothetical protein	32
TTE0272	conserved hypothetical protein	63
TTE0276	conserved hypothetical protein	32
TTE0278	conserved hypothetical protein	30
TTE0285	conserved hypothetical protein	65
TTE0299	conserved hypothetical protein	40
TTE0300	conserved hypothetical protein	29
TTE0304	conserved hypothetical protein	33
TTE0306	conserved hypothetical protein	45
TTE0315	conserved hypothetical protein	23
TTE0317	conserved hypothetical protein	23
TTE0318	conserved hypothetical protein	21
TTE0334	conserved hypothetical protein	35
TTE0345	conserved hypothetical protein	25
TTE0368	conserved hypothetical protein	31
TTE0379	conserved hypothetical protein	34
TTE0396	conserved hypothetical protein	38
TTE0403	conserved hypothetical protein	28
TTE0408	conserved hypothetical protein	60
TTE0418	conserved hypothetical protein	40
TTE0424	conserved hypothetical protein	25
TTE0444	conserved hypothetical protein	42
TTE0452	conserved hypothetical protein	25
TTE0453	conserved hypothetical protein	35
TTE0455	conserved hypothetical protein	81
TTE0466	conserved hypothetical protein	45
TTE0476	conserved hypothetical protein	37
TTE0483	conserved hypothetical protein	27
TTE0484	conserved hypothetical protein	40
TTE0486	conserved hypothetical protein	26
TTE0493	conserved hypothetical protein	30
TTE0496	conserved hypothetical protein	31
TTE0497	conserved hypothetical protein	38

TTE0517	conserved hypothetical protein	32
TTE0520	conserved hypothetical protein	48
TTE0521	conserved hypothetical protein	32
TTE0524	conserved hypothetical protein	37
TTE0529	conserved hypothetical protein	32
TTE0534	conserved hypothetical protein	37
TTE0558	conserved hypothetical protein	39
TTE0565	conserved hypothetical protein	34
TTE0573	conserved hypothetical protein	59
TTE0603	conserved hypothetical protein	60
TTE0623	conserved hypothetical protein	72
TTE0629	conserved hypothetical protein	31
TTE0645	conserved hypothetical protein	29
TTE0659	conserved hypothetical protein	32
TTE0673	conserved hypothetical protein	33
TTE0675	conserved hypothetical protein	32
TTE0676	conserved hypothetical protein	35
TTE0698	conserved hypothetical protein	35
TTE0709	conserved hypothetical protein	47
TTE0711	conserved hypothetical protein	34
TTE0719	conserved hypothetical protein	38
TTE0743	conserved hypothetical protein	30
TTE0745	conserved hypothetical protein	31
TTE0750	conserved hypothetical protein	38
TTE0752	conserved hypothetical protein	45
TTE0753	conserved hypothetical protein	38
TTE0778	conserved hypothetical protein	47
TTE0789a	conserved hypothetical protein	42
TTE0793	conserved hypothetical protein	27
TTE0808	conserved hypothetical protein	61
TTE0840	conserved hypothetical protein	37
TTE0847	conserved hypothetical protein	31
TTE0860	conserved hypothetical protein	45
TTE0861	conserved hypothetical protein	28
TTE0862	conserved hypothetical protein	29
TTE0885	conserved hypothetical protein	36
TTE0888	conserved hypothetical protein	30
TTE0910	conserved hypothetical protein	36
TTE0921	conserved hypothetical protein	50
TTE0922	conserved hypothetical protein	29
TTE0931	conserved hypothetical protein	31
TTE0937	conserved hypothetical protein	41
TTE0948	conserved hypothetical protein	24
TTE0958	conserved hypothetical protein	42
TTE0965	conserved hypothetical protein	45
TTE0967	conserved hypothetical protein	35
TTE0980	conserved hypothetical protein	52
TTE0995	conserved hypothetical protein	56
TTE0996	conserved hypothetical protein	41
TTE0998	conserved hypothetical protein	29
TTE0999	conserved hypothetical protein	32
TTE1003	conserved hypothetical protein	31

TTE1019	conserved hypothetical protein	27
TTE1028	conserved hypothetical protein	34
TTE1051	conserved hypothetical protein	27
TTE1077	conserved hypothetical protein	25
TTE1083	conserved hypothetical protein	29
TTE1107	conserved hypothetical protein	21
TTE1117	conserved hypothetical protein	34
TTE1125	conserved hypothetical protein	23
TTE1130	conserved hypothetical protein	51
TTE1135	conserved hypothetical protein	55
TTE1161	conserved hypothetical protein	22
TTE1174	conserved hypothetical protein	44
TTE1181	conserved hypothetical protein	56
TTE1185	conserved hypothetical protein	27
TTE1224	conserved hypothetical protein	25
TTE1232	conserved hypothetical protein	45
TTE1234	conserved hypothetical protein	36
TTE1249	conserved hypothetical protein	63
TTE1254	conserved hypothetical protein	35
TTE1291	conserved hypothetical protein	44
TTE1297	conserved hypothetical protein	26
TTE1305	conserved hypothetical protein	36
TTE1309	conserved hypothetical protein	39
TTE1311	conserved hypothetical protein	39
TTE1312	conserved hypothetical protein	30
TTE1318	conserved hypothetical protein	36
TTE1324	conserved hypothetical protein	37
TTE1327	conserved hypothetical protein	52
TTE1370	conserved hypothetical protein	88
TTE1371	conserved hypothetical protein	50
TTE1383	conserved hypothetical protein	38
TTE1397	conserved hypothetical protein	56
TTE1412	conserved hypothetical protein	30
TTE1419	conserved hypothetical protein	24
TTE1434	conserved hypothetical protein	35
TTE1437	conserved hypothetical protein	24
TTE1438	conserved hypothetical protein	29
TTE1454	conserved hypothetical protein	37
TTE1463	conserved hypothetical protein	58
TTE1467	conserved hypothetical protein	61
TTE1483	conserved hypothetical protein	38
TTE1484	conserved hypothetical protein	35
TTE1491	conserved hypothetical protein	33
TTE1494	conserved hypothetical protein	41
TTE1505	conserved hypothetical protein	29
TTE1513	conserved hypothetical protein	40
TTE1546	conserved hypothetical protein	33
TTE1561	conserved hypothetical protein	26
TTE1564	conserved hypothetical protein	31
TTE1571	conserved hypothetical protein	87
TTE1584	conserved hypothetical protein	63
TTE1595	conserved hypothetical protein	38

TTE1597	conserved hypothetical protein	39
TTE1599	conserved hypothetical protein	43
TTE1610	conserved hypothetical protein	39
TTE1611	conserved hypothetical protein	44
TTE1618	conserved hypothetical protein	37
TTE1624	conserved hypothetical protein	38
TTE1626	conserved hypothetical protein	33
TTE1635	conserved hypothetical protein	48
TTE1642	conserved hypothetical protein	30
TTE1654	conserved hypothetical protein	60
TTE1660	conserved hypothetical protein	22
TTE1661	conserved hypothetical protein	46
TTE1664	conserved hypothetical protein	
TTE1666	conserved hypothetical protein	41
TTE1679	conserved hypothetical protein	47
TTE1683	conserved hypothetical protein	35
TTE1684	conserved hypothetical protein	49
TTE1694	conserved hypothetical protein	35
TTE1715	conserved hypothetical protein	28
TTE1716	conserved hypothetical protein	41
TTE1731	conserved hypothetical protein	41
TTE1747	conserved hypothetical protein	28
TTE1750	conserved hypothetical protein	38
TTE1753	conserved hypothetical protein	42
TTE1768	conserved hypothetical protein	33
TTE1791	conserved hypothetical protein	
TTE1793	conserved hypothetical protein	43
TTE1795	conserved hypothetical protein	50
TTE1802	conserved hypothetical protein	42
TTE1813	conserved hypothetical protein	72
TTE1821	conserved hypothetical protein	45
TTE1826	conserved hypothetical protein	23
TTE1827	conserved hypothetical protein	22
TTE1828	conserved hypothetical protein	23
TTE1833	conserved hypothetical protein	72
TTE1841	conserved hypothetical protein	32
TTE1844	conserved hypothetical protein	48
TTE1866	conserved hypothetical protein	51
TTE1888	conserved hypothetical protein	36
TTE1890	conserved hypothetical protein	39
TTE1893	conserved hypothetical protein	43
TTE1909	conserved hypothetical protein	30
TTE1925	conserved hypothetical protein	35
TTE1933	conserved hypothetical protein	35
TTE1944	conserved hypothetical protein	38
TTE1956	conserved hypothetical protein	58
TTE1958	conserved hypothetical protein	37
TTE1972	conserved hypothetical protein	49
TTE1987	conserved hypothetical protein	31
TTE1995	conserved hypothetical protein	35
TTE1999	conserved hypothetical protein	50
TTE2029	conserved hypothetical protein	

TTE2052	conserved hypothetical protein	25
TTE2063	conserved hypothetical protein	26
TTE2067	conserved hypothetical protein	
TTE2097	conserved hypothetical protein	26
TTE2126	conserved hypothetical protein	37
TTE2128	conserved hypothetical protein	28
TTE2143	conserved hypothetical protein	29
TTE2157	conserved hypothetical protein	49
TTE2159	conserved hypothetical protein	40
TTE2164	conserved hypothetical protein	71
TTE2165	conserved hypothetical protein	65
TTE2176	conserved hypothetical protein	48
TTE2177	conserved hypothetical protein	38
TTE2180	conserved hypothetical protein	36
TTE2184	conserved hypothetical protein	27
TTE2189	conserved hypothetical protein	58
TTE2200	conserved hypothetical protein	41
TTE2207	conserved hypothetical protein	22
TTE2209	conserved hypothetical protein	50
TTE2211	conserved hypothetical protein	30
TTE2214	conserved hypothetical protein	30
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TTE2269	conserved hypothetical protein	30
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TTE2329	conserved hypothetical protein	44
TTE2338	conserved hypothetical protein	25
TTE2341	conserved hypothetical protein	36
TTE2374	conserved hypothetical protein	28
TTE2375	conserved hypothetical protein	43
TTE2390	conserved hypothetical protein	29
TTE2404	conserved hypothetical protein	41
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TTE2425	conserved hypothetical protein	32
TTE2426	conserved hypothetical protein	46
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TTE2450	conserved hypothetical protein	43
TTE2462	conserved hypothetical protein	33
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TTE2477	conserved hypothetical protein	58
TTE2479	conserved hypothetical protein	39
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TTE2557	conserved hypothetical protein	31
TTE2561	conserved hypothetical protein	58
TTE2562	conserved hypothetical protein	43
TTE2584	conserved hypothetical protein	31

TTE2598	conserved hypothetical protein	37
TTE2606	conserved hypothetical protein	33
TTE2611	conserved hypothetical protein	36
TTE2627	conserved hypothetical protein	45
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TTE2632	conserved hypothetical protein	33
TTE2633	conserved hypothetical protein	45
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TTE2681	conserved hypothetical protein	40
TTE2692	conserved hypothetical protein	32
TTE2695	conserved hypothetical protein	44
TTE2699	conserved hypothetical protein	52
TTE2701	conserved hypothetical protein	42
TTE2712	conserved hypothetical protein	21
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TTE2734	conserved hypothetical protein	23
TTE2751	conserved hypothetical protein	28
TTE2777	conserved hypothetical protein	21
TTE2782	conserved hypothetical protein	50
TTE2784	conserved hypothetical protein	56
TTE2787	conserved hypothetical protein	28
TTE2800	- conserved hypothetical protein	67

Hypothetical (523)

TTE0033	hypothetical protein
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TTE0046	hypothetical protein
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TTE0178	hypothetical protein
TTE0198	hypothetical protein

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TTE2169	hypothetical protein

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TTE2489	hypothetical protein
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TTE2492	hypothetical protein
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TTE2612	hypothetical protein
TTE2622	hypothetical protein
TTE2634	hypothetical protein
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TTE2767	hypothetical protein
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TTE2788	hypothetical protein

Unclassified (109)

TTE0092	sigma-F transcribed protein csfB	40
TTE0106	transcription regulator AbrB	86
TTE0116	S-layer homology domain	23
TTE0126	echD	40
TTE0162	Orf in partial transposon	44
TTE0166	S-layer homology domain	27
TTE0167	S-layer homology domain	30
TTE0170	transcription regulator of sigma-E/sigma-K-dependent gene spoIIID	66
TTE0182	PTS system, galactitol-specific enzyme II, B component	46
TTE0194	mannose-specific PTS enzyme IID	37
TTE0263	ATP-dependent nuclease	30
TTE0277	cellulose biosynthesis protein	25
TTE0284	vacuolar-type H ⁺ -translocating inorganic pyrophosphatase	48
TTE0328	thioredoxin-like protein tlp	51
TTE0340	putative transcriptional regulator	38
TTE0359	Cellulase	74
TTE0383	cobalt transport ATP-binding protein	40
TTE0491	flagellar protein	34
TTE0598	putative transcriptional regulator	31
TTE0701	HD domain	

TTE0726	D-lysine 5,6-aminomutase alpha subunit	71
TTE0727	D-lysine 5,6-aminomutase beta subunit	64
TTE0733	capsular polysaccharide biosynthesis homolog ywqC	37
TTE0735	capsular polysaccharide biosynthesis homolog ywqE	39
TTE0795	small acid-soluble spore protein	47
TTE0827	LysM domain	51
TTE0837	isoaspartyl dipeptidase	40
TTE0923	NAD/NADP octopine/nopaline dehydrogenas	43
TTE0930	SatD	23
TTE0946	spore protease	44
TTE0947	stage II sporulation protein P	29
TTE0969	stage IV sporulation protein	24
TTE0990	4Fe-4S binding domain	
TTE1047	STAS domain	40
TTE1048	STAS domain	39
TTE1056	HAMP domain	24
TTE1079	beta-lactamase regulatory protein 1	24
TTE1105	thiophene degradation protein F	95
TTE1111	glucose-inhibited division protein	50
TTE1112	2-hydroxyglutaryl-CoA dehydratase, subunit alpha	27
TTE1124	Transposase	27
TTE1156	Integrase core domain	42
TTE1239	methyiaspartate mutase	36
TTE1283	stage III sporulation protein spoIIIAA	45
TTE1284	stage III sporulation protein spoIIAB	36
TTE1286	mutants block sporulation after engulfment	40
TTE1287	mutants block sporulation after engulfment	33
TTE1288	STAGE III SPORULATION PROTEIN AF	29
TTE1289	STAGE III SPORULATION PROTEIN AG	34
TTE1290	STAGE III SPORULATION PROTEIN AH	23
TTE1303	sporulation protein IVB	42
TTE1319	spore formation protein spoVAC	49
TTE1320	spore formation protein spoVAD	47
TTE1321	sporulation protein	37
TTE1349	chorismate mutase	44
TTE1446	transcriptional pleiotropic repressor	60
TTE1489	Small, acid-soluble spore proteins, alpha/be	43
TTE1490	Small, acid-soluble spore proteins, alpha/be	50
TTE1560	serine protease inhibitor	31
TTE1616	stage IV sporulation protein A	49
TTE1625	STAGE II SPORULATION PROTEIN P	29
TTE1638	sporulation specific protein; SpoIIIGA	28
TTE1641	small basic protein	58
TTE1697	formate hydrogenlyase maturation protein	45
TTE1704	hydrogenase 4 membrane subunit	44
TTE1708	carbon monoxide dehydrogenase subunit CooS	66
TTE1726	proton /sodium-glutamate symport protein	45
TTE1773	Small, acid-soluble spore proteins, alpha/be	
TTE1800	spore coat peptide assembly protein cotJB	40
TTE1879	grdE proprotein	71
TTE1882	GrdX protein	42
TTE1929	galactose-1-phosphate uridylyltransferase	50
TTE2027	antirestriction protein	30
TTE2054	Helix-turn-helix	
TTE2087	S-layer homology domain	28
TTE2095	Transposase	26
TTE2124	Helix-turn-helix	
TTE2146	cyclic beta 1-2 glucan synthetase	38
TTE2242	Transposase	42
TTE2328	creatine kinase	49
TTE2330	transcription repressor of class III stress genes	40

TTE2348	O-Glycosyl hydrolase family 30	36
TTE2349	O-Glycosyl hydrolase family 30	30
TTE2378	germination protein	23
TTE2379	germination protein	50
TTE2380	germination protein	29
TTE2382	membrane protein	51
TTE2408	Transposase	26
TTE2411	S-layer homology domain	46
TTE2428	SEC-C motif	
TTE2457	putative GTP-binding protein	64
TTE2480	major membrane immunogen precursor	43
TTE2517	Nucleotidyltransferase domain	
TTE2518	Transposase	26
TTE2548	Small, acid-soluble spore proteins, alpha/be	61
TTE2551	spore cortex-lytic enzyme prepeptide	41
TTE2552	pro-sigma-E processing factor spoIIR	34
TTE2553	germination protein	25
TTE2554	spore germination protein homolog yndE	27
TTE2563	transcription regulator spoVT	56
TTE2589	putative membrane protein	36
TTE2594	putative transporter protein	29
TTE2604	Transposase	27
TTE2605	S-layer homology domain	38
TTE2621	chorismate mutase	50
TTE2750	Bacterial regulatory proteins	
TTE2770	astB/chuR-related protein	22
TTE2771	Helix-turn-helix	
TTE2786	cyanophycinase	40

Pseudogenes (65)

TTE0028	Authentic Frameshift, conserved hypothetical
TTE0151	Authentic Frameshift, transposase
TTE0221	Authentic Frameshift, electron transfer flavoprotein
TTE0237	Authentic Frameshift, transposase
TTE0309	Authentic Frameshift, transposase
TTE0356	Authentic Frameshift, conserved hypothetical
TTE0364	Authentic Frameshift, zinc ABC transporter substrate binding protein
TTE0470	Authentic Frameshift, transcriptional antiterminator
TTE0509	Authentic Frameshift, probable N-acyl-L-amino acid amidohydrolase
TTE0569	Authentic Frameshift, transposon
TTE0669	Pseudogene. UDPglucose 4-epimerase, Continued into TTE0671, interrupted by transposase
TTE0671	Pseudogene. UDPglucose 4-epimerase, Continued from TTE0669, interrupted by transposase
TTE0682	Pseudogene. aryl-alcohol dehydrogenase, Continues into TTE0685, interrupted by transposase
TTE0685	Pseudogene. aryl-alcohol dehydrogenase, Continued from TTE0682, interrupted by transposase
TTE0771	Authentic Frameshift, conserved hypothetical
TTE0856	Pseudogene, possible partial transposon
TTE1022	Authentic Frameshift, conserved hypothetical
TTE1040	Pseudogene, possible partial gene fragment, kinase
TTE1043	Authentic Frameshift, IS116 44.8 kd protein
TTE1065	Pseudogene, possible partial transposase fragment
TTE1068	Authentic Frameshift, IS1558 transposase
TTE1074	Pseudogene, several sequence confirmed mutations, probable transposase
TTE1080	Authentic Frameshift, putative transposase
TTE1093	Authentic Frameshift, putative transposase
TTE1099	Pseudogene, A point mutation introduces a stop codon, conserved hypothetical
TTE1106	Pseudogene, possible Partial transposase fragment
TTE1108	Authentic Frameshift, thiophen / furan oxidation protein
TTE1141	Pseudogene, a point mutation introduces a stop codon, daunorubicin resistance ATP-binding protein
TTE1157	Pseudogene, A point mutation introduces a stop codon IS21
TTE1192	Pseudogene, Multiple confirmed mutations, First ORF in transposase

TTE1229	Authentic Frameshift, putative cationic transporter protein
TTE1241	Authentic Frameshift, conserved hypothetical
TTE1331	Authentic Frameshift, conserved hypothetical
TTE1480	Pseudogene, a point mutation introduces a stop codon, conserved hypothetical
TTE1512	Authentic Frameshift, conserved hypothetical
TTE1544	Authentic Frameshift, transposase
TTE1550	Authentic Frameshift, restriction modification enzyme R subunit
TTE1615	Pseudogene, possible IS fragment
TTE1729	Pseudogene, partial transposase fragment with several confirmed mutations
TTE1733	Authentic Frameshift, hydroxymethylpyrimidine kinase
TTE1736	Pseudogene, Partial transposase fragment with Authentic Frameshift
TTE1788	Authentic Frameshift, transposase
TTE1877	Pseudogene, A point mutation introduce a stop codon, glycine reductase selenoprotein
TTE1878	Pseudogene, A point mutation introduce a stop codon, glycine reductase A
TTE1904	Authentic Frameshift, Muts-like ATPase
TTE1985	Pseudogene, possible Partial transposon fragment
TTE2106	Authentic Frameshift, conserved hypothetical
TTE2149	Authentic Frameshift, homoserine O-acetyltransferase
TTE2197	Authentic Frameshift, ketoisovalerate oxidoreductase
TTE2352	Authentic Frameshift, ABC transporter ATP-binding protein
TTE2413	Pseudogene, A point mutation introduce a stop codon, aminoglycoside N3'-acetyltransferase
TTE2438	Pseudogene, Partial gene fragment with confirmed point mutations, lyase
TTE2459	Authentic Frameshift, conserved hypothetical
TTE2539	Pseudogene, Partial transposon fragment
TTE2599	Authentic Frameshift, transposase
TTE2602	Authentic Frameshift, cell surface protein precursor
TTE2727	Authentic Frameshift, putative transposase
TTE2754	Pseudogene, Partial transposase fragment
TTE2760	Authentic Frameshift, transposase
TTE2768	Pseudogene, Partial gene fragment, ABC transporter tuberculosis
TTE1115	Authentic frameshift, hypothetical protein
TTE1846	Authentic frameshift, hypothetical protein
TTE2160	Pseudogene, A point mutation introduces a stop codon, hypothetical protein
TTE2537	Pseudogene, a point mutation introduces a stop codon, hypothetical protein
TTE2742	Authentic frameshift, hypothetical protein