

ДОПОЛНИТЕЛЬНЫЕ МАТЕРИАЛЫ К СТАТЬЕ
ПРОТЕОМ ВНЕКЛЕТОЧНЫХ МЕМБРАННЫХ ВЕЗИКУЛ *Bacillus pumilus* 3-19

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*Таблица S1. Идентифицированные гены *Bacillus pumilus* 3-19, выращенного на среде LPM*

№	Gene ID	Product	Reads
1	GZ55_RS05310	hypothetical protein	11437.37
2	GZ55_RS05465	hypothetical protein	9543.50
3	GZ55_RS05460	ArpU family transcriptional regulator	9066.41
4	GZ55_RS05535	transcriptional regulator	8455.64
5	GZ55_RS05430	terminase	7447.07
6	GZ55_RS05355	phage tail tape measure protein	7368.15
7	GZ55_RS05405	phage major capsid protein	6991.97
8	GZ55_RS05340	hypothetical protein	6868.47
9	GZ55_RS05425	terminase	6737.86
10	GZ55_RS05345	alkaline phosphatase	6685.45
11	GZ55_RS18020	phage antirepressor Ant	6119.21
12	GZ55_RS05470	hypothetical protein	6049.35
13	GZ55_RS05485	DNA primase	6010.71
14	GZ55_RS05445	hypothetical protein	5972.13
15	GZ55_RS05505	hypothetical protein	5657.94
16	GZ55_RS05335	hypothetical protein	5538.20
17	GZ55_RS05450	hypothetical protein	5473.38
18	GZ55_RS05415	phage portal protein	5455.42
19	GZ55_RS05350	phage tail component	5210.74
20	GZ55_RS05455	hypothetical protein	5197.36
21	GZ55_RS05480	hypothetical protein	5163.61
22	GZ55_RS05440	HNH endonuclease	5078.62
23	GZ55_RS05370	major tail protein	5067.85
24	GZ55_RS05410	peptidase U35	5064.10
25	GZ55_RS05435	hypothetical protein	5047.84
26	GZ55_RS05500	hypothetical protein	4976.41
27	GZ55_RS05510	hypothetical protein	4915.15
28	GZ55_RS05550	site-specific integrase	4660.72
29	GZ55_RS05325	holin	4650.60
30	GZ55_RS05395	phage protein	4361.33
31	GZ55_RS05320	N-acetylmuramoyl-L-alanine amidase	4280.73
32	GZ55_RS18210	hypothetical protein	4056.73
33	GZ55_RS05490	hypothetical protein	4011.40
34	GZ55_RS05545	hypothetical protein	3763.49
35	GZ55_RS05475	nuclease	3582.52
36	GZ55_RS05515	hypothetical protein	3313.03
37	GZ55_RS05380	hypothetical protein	3261.26
38	GZ55_RS17980	23S ribosomal RNA	3069.55
39	GZ55_RS17985	16S ribosomal RNA	3066.76

40	GZ55_RS05365	hypothetical protein	2837.09
41	GZ55_RS05400	hypothetical protein	2674.70
42	GZ55_RS05330	XkdX family protein	2596.03
43	GZ55_RS05540	transcriptional regulator	2356.06
44	GZ55_RS05525	DNA-binding protein	2066.84
45	GZ55_RS05385	phage head-tail adapter protein	1940.64
46	GZ55_RS05375	hypothetical protein	1747.57
47	GZ55_RS11240	tRNA-Arg	1721.58
48	GZ55_RS05390	DNA-packaging protein	1557.62
49	GZ55_RS05520	hypothetical protein	1405.66
50	GZ55_RS01225	tRNA-Arg	1010.35
51	GZ55_RS02120	sporulation histidine kinase inhibitor Sda	861.66
52	GZ55_RS15635	hypothetical protein	859.38
53	GZ55_RS18085	sporulation protein YjcZ	815.90
54	GZ55_RS01250	tRNA-Arg	812.67
55	GZ55_RS17775	protein sspF	753.69
56	GZ55_RS18290	sporulation protein YjcZ	751.95
57	GZ55_RS17575	16S ribosomal RNA	749.96
58	GZ55_RS03145	hypothetical protein	747.66
59	GZ55_RS12885	DNA-binding anti-repressor SinI	729.10
60	GZ55_RS05420	hypothetical protein	714.97
61	GZ55_RS13960	hypothetical protein	682.79
62	GZ55_RS07920	hypothetical protein	678.96
63	GZ55_RS18480	MOSC domain-containing protein	671.91
64	GZ55_RS05360	hypothetical protein	670.97
65	GZ55_RS14355	tRNA-Leu	667.55
66	GZ55_RS16900	hypothetical protein	662.82
67	GZ55_RS06515	bifunctional pyr operon transcriptional	654.03
68	GZ55_RS10755	YqzL family protein	649.01
69	GZ55_RS02330	small, acid-soluble spore protein, SspJ family	649.01
70	GZ55_RS13300	chemotaxis protein	645.30
71	GZ55_RS08010	tRNA-Val	640.12
72	GZ55_RS10170	hypothetical protein	630.93
73	GZ55_RS16550	hypothetical protein	623.05
74	GZ55_RS18080	YrzI family protein	623.05
75	GZ55_RS13135	transcriptional regulator	617.43
76	GZ55_RS05290	Appr-1-p processing protein	608.99
77	GZ55_RS17105	hypothetical protein	608.72
78	GZ55_RS12360	MerR family transcriptional regulator	595.81
79	GZ55_RS14320	cold-shock protein	595.56
80	GZ55_RS06570	YlmC/YmxH family sporulation protein	591.50
81	GZ55_RS15940	co-chaperone GroES	590.26
82	GZ55_RS15450	N-acetyltransferase	578.79
83	GZ55_RS17280	50S ribosomal protein L10	578.28
84	GZ55_RS00330	hypothetical protein	576.90
85	GZ55_RS13255	WXG100 family type VII secretion target	576.90
86	spoVM	stage V sporulation protein M	576.90

87	GZ55_RS13035	hypothetical protein	574.39
88	GZ55_RS18360	tryptophan RNA-binding attenuation protein	571.13
89	GZ55_RS07045	S26 family signal peptidase	570.61
90	GZ55_RS06975	sporulation protein YjcZ	570.40
91	GZ55_RS07535	hypothetical protein	566.41
92	GZ55_RS18350	hypothetical protein	557.95
93	GZ55_RS10505	hypothetical protein	557.20
94	GZ55_RS15490	hypothetical protein	552.07
95	GZ55_RS14510	glutamate synthase	551.37
96	GZ55_RS13645	hypothetical protein	551.16
97	GZ55_RS16080	hypothetical protein	548.37
98	GZ55_RS08395	DNA methyltransferase	544.41
99	GZ55_RS12400	fructose-6-phosphate aldolase	541.14
100	GZ55_RS16560	methyltransferase	540.54
101	GZ55_RS16960	cytochrome c'	538.09
102	GZ55_RS11550	hypothetical protein	538.09
103	GZ55_RS00570	bifunctional 3-deoxy-7-phosphoheptulonate	538.01
104	GZ55_RS00170	hypothetical protein	535.43
105	GZ55_RS15585	hypothetical protein	531.87
106	GZ55_RS08095	spore coat protein	530.54
107	GZ55_RS09075	MerR family transcriptional regulator	529.80
108	GZ55_RS07350	peptidoglycan-binding protein LysM	528.73
109	GZ55_RS09625	hypothetical protein	527.19
110	GZ55_RS00675	spore protein	526.52
111	GZ55_RS01010	translation initiation factor IF-3	525.24
112	GZ55_RS07230	hypothetical protein	519.21
113	GZ55_RS04595	hypothetical protein	519.21
114	GZ55_RS06630	cell division protein FtsZ	513.77
115	GZ55_RS05865	YlmC/YmxH family sporulation protein	513.50
116	GZ55_RS06775	hypothetical protein	513.50
117	GZ55_RS05675	hypothetical protein	512.63
118	GZ55_RS03790	transcription factor YdeB	512.63
119	GZ55_RS00260	gamma carbonic anhydrase family protein	507.13
120	GZ55_RS00040	tRNA-Gly	505.17
121	GZ55_RS13040	glutamate dehydrogenase	504.44
122	GZ55_RS00890	DUF441 family protein	502.46
123	GZ55_RS15315	cell wall hydrolase	501.05
124	GZ55_RS12860	UDP-glucose 4-epimerase GalE	498.81
125	GZ55_RS11065	RNA polymerase sigma-54 factor	496.42
126	GZ55_RS14530	thiol reductase thioredoxin	494.94
127	GZ55_RS12795	levansucrase	493.06
128	GZ55_RS15460	membrane protein	492.72
129	GZ55_RS12230	stage II sporulation protein D	491.88
130	GZ55_RS16580	bifunctional	491.88
131	GZ55_RS18215	Fur-regulated basic protein FbpA	491.88
132	GZ55_RS13275	5-methyltetrahydropteroyltriglutamate--	490.13
133	GZ55_RS13320	thiaminase II	489.73

134	GZ55_RS14730	spore germination protein	489.54
135	GZ55_RS15590	transcriptional regulator	488.66
136	GZ55_RS03415	ferredoxin	487.93
137	GZ55_RS12590	hypothetical protein	485.86
138	GZ55_RS14485	holo-ACP synthase	485.16
139	GZ55_RS15985	hypothetical protein	484.59
140	GZ55_RS01145	hypothetical protein	484.12
141	GZ55_RS13100	SrtB family sortase	484.04
142	GZ55_RS02265	30S ribosomal protein S21	483.40
143	GZ55_RS11030	phosphoglycerate kinase	481.09
144	GZ55_RS16625	PTS fructose transporter subunit IIA	480.75
145	GZ55_RS13025	phenolic acid decarboxylase	480.75
146	GZ55_RS10895	hypothetical protein	479.27
147	GZ55_RS11200	ABC-F type ribosomal protection protein	476.10
148	GZ55_RS07745	pyrroline-5-carboxylate reductase	475.78
149	GZ55_RS12575	SMI1/KNR4 family protein	475.61
150	GZ55_RS03320	protein RibT	475.21
151	GZ55_RS17480	hypothetical protein	474.70
152	GZ55_RS15125	DNA-directed RNA polymerase subunit alpha	474.70
153	GZ55_RS12520	penicillin-binding protein	474.06
154	GZ55_RS18280	YhfH family protein	474.06
155	GZ55_RS12455	hypothetical protein	473.48
156	GZ55_RS09345	tRNA (cytidine(34)-2'-O)-methyltransferase	473.20
157	GZ55_RS08075	hypothetical protein	472.85
158	GZ55_RS16380	tRNA-dihydrouridine synthase	471.13
159	GZ55_RS13340	hypothetical protein	470.91
160	GZ55_RS16070	LysR family transcriptional regulator	468.85
161	GZ55_RS15285	chemical-damaging agent resistance protein C	468.09
162	GZ55_RS14085	ribonuclease P protein component	467.29
163	GZ55_RS10260	membrane protein	465.83
164	GZ55_RS00630	30S ribosomal protein S4	464.96
165	GZ55_RS07255	cation transporter	464.65
166	GZ55_RS17865	hypothetical protein	463.97
167	GZ55_RS12555	hypothetical protein	463.08
168	GZ55_RS12295	ATP synthase I	462.42
169	GZ55_RS12815	NADPH-dependent oxidoreductase	461.05
170	GZ55_RS13210	DUF5082 domain-containing protein	460.70
171	GZ55_RS07475	hypothetical protein	459.62
172	GZ55_RS09000	spore protein	458.12
173	GZ55_RS02780	stage III sporulation protein AH	455.53
174	GZ55_RS12825	hypothetical protein	455.03
175	GZ55_RS15655	glycerol-3-phosphate transporter	455.03
176	GZ55_RS02395	spore coat protein	454.58
177	GZ55_RS14160	stress protein	452.21
178	GZ55_RS15755	glutamine--fructose-6-phosphate	450.96
179	GZ55_RS15600	proline--tRNA ligase	449.69
180	GZ55_RS10925	AbrB/MazE/SpoVT family DNA-binding	449.62

181	GZ55_RS13130	cell surface protein	447.94
182	GZ55_RS15775	anti-sigma W factor	447.16
183	GZ55_RS12750	aldehyde dehydrogenase	447.00
184	GZ55_RS13755	Spo0E family sporulation regulatory	445.03
185	GZ55_RS05145	TetR family transcriptional regulator	445.03
186	GZ55_RS14190	DNA-directed RNA polymerase subunit delta	445.03
187	GZ55_RS13545	hypothetical protein	445.03
188	GZ55_RS17725	transcription-repair coupling factor	444.28
189	GZ55_RS15170	hypothetical protein	443.27
190	GZ55_RS16665	membrane protein	443.27
191	GZ55_RS13770	N-acetyltransferase	442.16
192	GZ55_RS00620	hypothetical protein	441.67
193	GZ55_RS13270	hypothetical protein	441.10
194	GZ55_RS03675	membrane protein	440.54
195	GZ55_RS14685	membrane protein	440.54
196	GZ55_RS01570	phosphomethylpyrimidine synthase ThiC	440.48
197	GZ55_RS10820	manganese transporter	439.65
198	GZ55_RS15405	amino acid permease	439.24
199	GZ55_RS15565	alcohol dehydrogenase	438.89
200	GZ55_RS10935	transcriptional regulator	438.44
201	GZ55_RS10765	membrane protein	436.89
202	GZ55_RS10905	SsrA-binding protein	436.53
203	GZ55_RS12330	threonylcarbamoyl-AMP synthase	434.89
204	GZ55_RS08930	enoyl-CoA hydratase	434.68
205	GZ55_RS14665	tartrate dehydrogenase	433.65
206	GZ55_RS12435	acyl-CoA dehydrogenase	433.35
207	GZ55_RS06970	chromosome partitioning protein	433.06
208	GZ55_RS17785	sporulation peptidase YabG	432.96
209	GZ55_RS06710	division/cell wall cluster transcriptional	432.67
210	GZ55_RS13980	ring-cleaving dioxygenase	432.67
211	GZ55_RS11040	central glycolytic genes regulator	432.17
212	GZ55_RS13730	hypothetical protein	431.81
213	GZ55_RS02455	transcriptional regulator	431.81
214	GZ55_RS13590	hypothetical protein	431.17
215	GZ55_RS10250	membrane protein	431.04
216	GZ55_RS15215	membrane protein	431.04
217	GZ55_RS07135	thioredoxin	430.28
218	GZ55_RS16950	rhamnogalacturonan acetyltransferase	430.20
219	GZ55_RS15130	cephalosporin deacetylase	429.69
220	GZ55_RS11505	NAD(P)H nitroreductase	429.21
221	GZ55_RS17230	serine acetyltransferase	428.70
222	GZ55_RS13310	heme ABC transporter ATP-binding protein	426.66
223	GZ55_RS17660	serine/threonine protein kinase	426.49
224	GZ55_RS18150	IS5/IS1182 family transposase	426.42
225	GZ55_RS16995	thioredoxin	425.58
226	GZ55_RS18225	hypothetical protein	424.80
227	GZ55_RS07325	LacI family transcriptional regulator	424.80

228	GZ55_RS03895	YpzI family protein	424.80
229	GZ55_RS18130	hypothetical protein	424.80
230	GZ55_RS03810	PTS glucose transporter subunit IIA	423.97
231	GZ55_RS15040	hydantoin utilization protein B	423.52
232	GZ55_RS09120	5-dehydro-4-deoxyglucarate dehydratase	423.43
233	GZ55_RS15760	phosphoglucosamine mutase	423.23
234	ffs	signal recognition particle sRNA large type	423.20
235	GZ55_RS01750	amino acid ABC transporter ATPase	423.06
236	GZ55_RS11310	thioredoxin-disulfide reductase	422.57
237	GZ55_RS00275	rRNA methyltransferase	421.85
238	GZ55_RS12325	spore germination protein	420.98
239	GZ55_RS10160	membrane protein	420.98
240	GZ55_RS16095	5-(carboxyamino)imidazole ribonucleotide mutase	420.46
241	GZ55_RS13055	RNA polymerase sigma factor SigY	420.03
242	GZ55_RS13235	transcriptional regulator	419.36
243	GZ55_RS10380	peptidase M23	419.18
244	GZ55_RS15745	hypothetical protein	418.86
245	GZ55_RS04975	hypothetical protein	418.46
246	GZ55_RS00695	transcriptional regulator	418.15
247	GZ55_RS08450	DNA-binding response regulator	417.90
248	GZ55_RS08085	spore coat protein	417.90
249	GZ55_RS00995	YajQ family cyclic di-GMP-binding protein	417.90
250	GZ55_RS15735	ABC transporter ATP-binding protein	417.40
251	GZ55_RS00945	S-adenosylmethionine decarboxylase proenzyme	417.00
252	GZ55_RS02085	short-chain dehydrogenase	416.16
253	GZ55_RS11910	MFS transporter	415.82
254	GZ55_RS07565	hypothetical protein	415.36
255	GZ55_RS10290	diaminopimelate epimerase	415.36
256	GZ55_RS18155	hypothetical protein	415.36
257	GZ55_RS14745	KipI antagonist	414.75
258	GZ55_RS17625	cysteine synthase A	414.69
259	GZ55_RS15210	L-lactate dehydrogenase	414.05
260	GZ55_RS16455	MFS transporter	412.77
261	GZ55_RS03940	hypothetical protein	412.70
262	GZ55_RS13895	isochorismatase	412.61
263	GZ55_RS11080	nickel import ATP-binding protein Nike	412.31
264	GZ55_RS11315	peptidase C40	412.21
265	GZ55_RS13215	Na ⁺ /H ⁺ antiporter NhaC	411.53
266	GZ55_RS10565	3-hydroxyacyl-CoA dehydrogenase	410.93
267	GZ55_RS11270	D-glycerate dehydrogenase	410.91
268	GZ55_RS11885	2-deoxy-D-gluconate 3-dehydrogenase	410.53
269	GZ55_RS07520	DedA family protein	410.30
270	GZ55_RS15815	ATP--cob(I)alamin adenosyltransferase	409.90
271	GZ55_RS10675	N-acetylmuramic acid 6-phosphate etherase	409.90
272	GZ55_RS06725	GNAT family N-acetyltransferase	408.87
273	GZ55_RS14880	histidine kinase	408.74
274	GZ55_RS00525	PTS sugar transporter subunit IIC	408.70

275	GZ55_RS00545	DNA translocase FtsK	408.11
276	GZ55_RS13440	permease DsdX	407.86
277	GZ55_RS16895	hypothetical protein	407.60
278	GZ55_RS12320	protein-tyrosine-phosphatase	407.22
279	GZ55_RS15160	methyltransferase	407.02
280	GZ55_RS16585	tRNA	406.34
281	GZ55_RS15885	hypothetical protein	406.34
282	GZ55_RS12990	hypothetical protein	405.77
283	GZ55_RS13250	hypothetical protein	405.63
284	GZ55_RS15415	MarR family transcriptional regulator	405.41
285	GZ55_RS13145	GTP cyclohydrolase	404.74
286	GZ55_RS01165	hypothetical protein	404.58
287	GZ55_RS10670	membrane protein	404.27
288	GZ55_RS11250	MFS transporter	403.53
289	GZ55_RS07935	Rossmann fold protein, TIGR00730 family	403.53
290	GZ55_RS01445	stage II sporulation protein B	403.15
291	GZ55_RS12780	hypothetical protein	403.15
292	GZ55_RS09025	D-amino-acid transaminase	403.02
293	GZ55_RS16405	hypothetical protein	401.97
294	GZ55_RS00835	hypothetical protein	401.97
295	GZ55_RS10245	leucyl aminopeptidase	401.16
296	GZ55_RS12985	sugar ABC transporter substrate-binding protein	400.89
297	GZ55_RS13005	6-phospho-beta-glucosidase	400.83
298	GZ55_RS13985	glycine/betaine ABC transporter permease	400.18
299	GZ55_RS02030	hypothetical protein	400.12
300	GZ55_RS16490	MFS transporter	399.78
301	GZ55_RS09250	hypothetical protein	399.39
302	GZ55_RS01835	hypothetical protein	399.39
303	GZ55_RS11050	S-methyl-5-thioribose kinase	399.19
304	GZ55_RS07450	ornithine--oxo-acid transaminase	399.19
305	GZ55_RS13640	MFS transporter	399.19
306	GZ55_RS00590	acetoin dehydrogenase	398.63
307	GZ55_RS13330	thiamine biosynthesis protein ThiJ	398.29
308	GZ55_RS09140	methylmalonyl-CoA epimerase	397.69
309	GZ55_RS02955	GntR family transcriptional regulator	397.69
310	gatA	aspartyl/glutamyl-tRNA amidotransferase subunit	397.42
311	GZ55_RS02405	deoxyribonuclease IV	397.24
312	GZ55_RS09155	nitric oxide dioxygenase	397.19
313	GZ55_RS06340	50S ribosomal protein L28	395.59
314	GZ55_RS14800	chemotaxis protein	395.42
315	GZ55_RS15300	LLM class flavin-dependent oxidoreductase	395.29
316	GZ55_RS13565	hypothetical protein	394.89
317	GZ55_RS12610	phosphate acetyltransferase	394.21
318	GZ55_RS16040	GMP synthase (glutamine-hydrolyzing)	393.95
319	GZ55_RS14585	GlsB/YeaQ/YmgE family stress response membrane	393.88
320	GZ55_RS14420	RNA-binding transcriptional accessory protein	393.73

321	GZ55_RS13945	manganese-dependent inorganic pyrophosphatase	393.19
322	GZ55_RS04410	tRNA-binding protein	392.91
323	GZ55_RS16345	aspartyl/glutamyl-tRNA(Asn/Gln) amidotransferase	391.85
324	GZ55_RS12540	peptidase M84	390.84
325	GZ55_RS16695	methyl-accepting chemotaxis protein	390.08
326	GZ55_RS13735	hypothetical protein	389.40
327	GZ55_RS13390	undecaprenyl-diphosphatase	389.40
328	GZ55_RS04195	glyoxalase/bleomycin resistance/dioxygenase	389.40
329	GZ55_RS12110	peptidoglycan O-acetyltransferase	389.40
330	GZ55_RS12945	23S rRNA	389.40
331	GZ55_RS14660	DNA topoisomerase III	388.87
332	GZ55_RS11845	DNA-binding response regulator	388.58
333	GZ55_RS11810	N-acetylmannosaminyltransferase	387.89
334	GZ55_RS12010	alpha-acetolactate decarboxylase	387.89
335	GZ55_RS11500	amino acid permease	387.67
336	GZ55_RS07080	antimicrobial peptide abc transporter permease	387.54
337	GZ55_RS16830	hypothetical protein	387.10
338	GZ55_RS13915	iron-uptake system-binding protein	386.99
339	GZ55_RS11325	bifunctional phosphoribosyl-AMP	385.70
340	GZ55_RS12145	peptidase M23	385.50
341	GZ55_RS12105	MFS transporter	385.47
342	GZ55_RS00500	MBL fold metallo-hydrolase	385.28
343	GZ55_RS14870	MFS transporter	384.52
344	GZ55_RS01065	ribonuclease HIII	384.35
345	GZ55_RS02885	leucine dehydrogenase	384.07
346	GZ55_RS15410	acyl--CoA ligase	383.99
347	GZ55_RS15570	glyoxal reductase	383.76
348	GZ55_RS16170	aspartate aminotransferase family protein	383.41
349	GZ55_RS13085	iron ABC transporter ATP-binding protein	383.16
350	GZ55_RS07895	flagellin	382.94
351	GZ55_RS17720	stage V sporulation protein T	382.88
352	GZ55_RS10525	sporulation protein	382.57
353	GZ55_RS01585	intercompartmental signaling factor BofC	382.57
354	GZ55_RS00845	hypothetical protein	382.57
355	GZ55_RS17085	A/G-specific adenine glycosylase	381.98
356	GZ55_RS10215	WXG100 family type VII secretion target	381.46
357	GZ55_RS15230	peptidase	381.22
358	GZ55_RS18475	hypothetical protein	380.79
359	GZ55_RS16075	NCS2 family permease	380.59
360	GZ55_RS15645	L-itol 2-dehydrogenase	380.35
361	GZ55_RS07805	thioredoxin domain-containing protein	380.35
362	GZ55_RS17870	toxic anion resistance protein TelA	379.48
363	GZ55_RS15420	glutathione-dependent formaldehyde	379.10
364	GZ55_RS12925	LysR family transcriptional regulator	378.88
365	GZ55_RS17680	tRNA-Met	378.88
366	GZ55_RS10455	sensor histidine kinase	378.69

367	GZ55_RS12425	hypothetical protein	378.65
368	GZ55_RS05190	DNA-directed RNA polymerase subunit delta	378.65
369	GZ55_RS12445	3-hydroxybutyryl-CoA dehydrogenase	378.59
370	GZ55_RS08025	hypothetical protein	378.37
371	GZ55_RS06740	hypothetical protein	378.15
372	GZ55_RS15260	HAD family hydrolase	377.95
373	GZ55_RS01310	branched chain amino acid aminotransferase	377.91
374	GZ55_RS10680	hypothetical protein	377.60
375	GZ55_RS03850	heme ABC transporter ATP-binding protein	377.60
376	GZ55_RS05725	L-threonine 3-dehydrogenase	377.34
377	GZ55_RS13065	amino acid ABC transporter ATP-binding protein	377.28
378	GZ55_RS00560	hypothetical protein	377.00
379	GZ55_RS15365	transcriptional regulator	377.00
380	GZ55_RS17505	sortase	376.84
381	GZ55_RS13030	tRNA pseudouridine(38-40) synthase TruA	376.84
382	GZ55_RS12395	UDP-N-acetylglucosamine	376.73
383	GZ55_RS17040	1,4-dihydroxy-2-naphthoyl-CoA synthase	376.57
384	GZ55_RS00095	hypothetical protein	376.57
385	GZ55_RS04575	nitritotriacetate monooxygenase	376.34
386	GZ55_RS07345	multidrug transporter MatE	376.10
387	GZ55_RS14705	general stress protein	375.60
388	GZ55_RS14895	amino acid ABC transporter ATP-binding protein	375.33
389	GZ55_RS17305	50S ribosomal protein L7	375.33
390	GZ55_RS03185	stage II sporulation protein M	374.98
391	GZ55_RS07555	hypothetical protein	374.77
392	GZ55_RS13535	gluconate:proton symporter	374.71
393	GZ55_RS11045	amino acid permease	374.62
394	GZ55_RS12980	ABC transporter	374.58
395	GZ55_RS11450	ABC-ATPase UvrA	373.57
396	GZ55_RS16760	hypothetical protein	373.08
397	GZ55_RS17135	peptide ABC transporter permease	373.08
398	GZ55_RS03065	pyrroline-5-carboxylate reductase	372.47
399	GZ55_RS07040	hypothetical protein	372.47
400	GZ55_RS11125	pyruvyl transferase	372.38
401	GZ55_RS16360	ABC transporter substrate-binding protein	372.26
402	GZ55_RS00985	phospholipase	371.43
403	GZ55_RS00265	haloacid dehalogenase	371.43
404	GZ55_RS13260	peptidase T	371.40
405	GZ55_RS15765	hypothetical protein	371.18
406	GZ55_RS13875	thiol:disulfide interchange protein tlpA	370.86
407	GZ55_RS05105	enterobactin esterase	370.86
408	GZ55_RS11730	glycosyl transferase family 1	370.67
409	GZ55_RS12865	galactokinase	370.67
410	GZ55_RS08800	protoporphyrinogen oxidase	370.39
411	GZ55_RS03340	hypothetical protein	369.93
412	GZ55_RS13080	cytochrome ubiquinol oxidase subunit I	369.60
413	GZ55_RS17260	preprotein translocase subunit SecE	369.60

414	GZ55_RS16505	amino acid permease	369.26
415	GZ55_RS01870	formaldehyde dehydrogenase,	369.21
416	GZ55_RS14815	GNAT family N-acetyltransferase	369.17
417	GZ55_RS02035	PTS mannitol transporter subunit IIBC	369.17
418	GZ55_RS13690	hypothetical protein	368.67
419	GZ55_RS15135	nitrilase	368.60
420	GZ55_RS06770	16S rRNA (guanine(966)-N(2))-methyltransferase	368.47
421	GZ55_RS12800	hypothetical protein	368.47
422	GZ55_RS16955	thioredoxin reductase	368.08
423	GZ55_RS15535	6-phospho-beta-glucosidase	368.04
424	GZ55_RS07440	2,3-diketo-5-methylthiopentyl-1-phosphate	367.40
425	GZ55_RS15540	PTS beta-glucoside transporter subunit EIIBCA	366.79
426	GZ55_RS04180	membrane protein	366.50
427	GZ55_RS12680	glucose-1-phosphate thymidyltransferase	365.76
428	GZ55_RS16675	hypothetical protein	365.56
429	GZ55_RS15425	dioxygenase	365.42
430	GZ55_RS12070	beta-hydroxyacyl-ACP dehydratase	365.23
431	GZ55_RS14930	amino acid permease	364.96
432	GZ55_RS17810	hypothetical protein	364.85
433	GZ55_RS13650	methionine--tRNA ligase	364.85
434	GZ55_RS18205	hypothetical protein	364.71
435	GZ55_RS17140	peptide ABC transporter permease	364.66
436	GZ55_RS00235	peptidase	364.42
437	GZ55_RS02910	branched-chain alpha-keto acid dehydrogenase	364.31
438	GZ55_RS14130	tRNA-Arg	364.12
439	GZ55_RS01860	hypothetical protein	364.12
440	GZ55_RS07530	MarR family transcriptional regulator	364.12
441	GZ55_RS12245	membrane protein	364.12
442	GZ55_RS15090	amino acid ABC transporter substrate-binding	363.98
443	GZ55_RS08045	ATP-dependent DNA helicase Rep	363.80
444	GZ55_RS15650	peptidylprolyl isomerase	363.65
445	GZ55_RS07250	transporter	363.44
446	GZ55_RS15005	non-ribosomal peptide synthetase	363.20
447	GZ55_RS01515	GTPase Obg	363.08
448	GZ55_RS08715	alanine racemase	363.02
449	GZ55_RS13665	tellurium resistance protein	362.94
450	GZ55_RS12495	arginine--tRNA ligase	362.89
451	GZ55_RS08435	histidine kinase	362.50
452	GZ55_RS02690	hydrolase	362.24
453	GZ55_RS00340	rhodanese-like domain-containing protein	362.24
454	GZ55_RS17620	hypothetical protein	362.24
455	GZ55_RS15710	aminodeoxychorismate synthase, component I	362.24
456	GZ55_RS17555	chromosome partitioning protein ParA	361.83
457	GZ55_RS13375	2-deoxyribose-5-phosphate aldolase	361.59
458	GZ55_RS12725	spore coat protein GerQ	361.44
459	GZ55_RS09330	sporulation protein YhbH	361.30
460	GZ55_RS14015	hypothetical protein	361.19

461	GZ55_RS15485	hypothetical protein	361.19
462	GZ55_RS16215	hypothetical protein	361.19
463	GZ55_RS00600	tyrosine--tRNA ligase	360.87
464	GZ55_RS07455	S-methyl-5-thioribose-1-phosphate isomerase	360.80
465	GZ55_RS02830	50S ribosomal protein L27	360.71
466	GZ55_RS01505	TlyA family rRNA	360.71
467	GZ55_RS14850	GntR family transcriptional regulator	360.71
468	GZ55_RS17195	ATP-dependent Clp protease ATP-binding subunit	360.63
469	ssrA	spore coat protein	360.44
470	GZ55_RS01415	transfer-messenger RNA	360.44
471	GZ55_RS17960	GntR family transcriptional regulator	360.18
472	GZ55_RS00900	isocitrate dehydrogenase (NADP(+))	360.02
473	GZ55_RS00345	hypothetical protein	359.93
474	GZ55_RS13745	serine hydroxymethyltransferase	359.45
475	GZ55_RS15980	heme ABC transporter ATP-binding protein	359.45
476	GZ55_RS12305	hypothetical protein	359.45
477	GZ55_RS16370	23S rRNA (uracil-5-)-methyltransferase RumA	358.93
478	GZ55_RS04965	choline esterase	358.82
479	GZ55_RS06510	uracil permease	358.64
480	GZ55_RS13075	cytochrome C nitrate reductase	358.39
481	ligA	DNA ligase (NAD(+)) LigA	358.38
482	GZ55_RS13060	pectate lyase	358.07
483	GZ55_RS17545	transcriptional regulator	357.83
484	GZ55_RS13360	alkylated deoxynucleotide triphosphohydrolase	357.83
485	GZ55_RS12450	acetyl-CoA acetyltransferase	357.62
486	GZ55_RS10835	hypothetical protein	357.49
487	GZ55_RS14700	hypothetical protein	357.49
488	GZ55_RS12935	CidB/LrgB family autolysis modulator	356.81
489	GZ55_RS10500	ABC transporter ATP-binding protein	356.71
490	GZ55_RS14235	GNAT family acetyltransferase	356.71
491	GZ55_RS14010	GTP-binding protein YchF	356.51
492	GZ55_RS02435	transcriptional regulator	356.32
493	GZ55_RS00940	glyceraldehyde-3-phosphate dehydrogenase	356.29
494	GZ55_RS11945	hypothetical protein	356.03
495	GZ55_RS05030	hypothetical protein	356.03
496	GZ55_RS06990	hypothetical protein	356.03
497	GZ55_RS10405	transcriptional regulator	355.88
498	GZ55_RS09205	glycerol kinase	355.85
499	GZ55_RS01405	delta-aminolevulinic acid dehydratase	355.75
500	GZ55_RS14045	transposase	355.68
501	GZ55_RS12595	sporulation initiation inhibitor Soj	355.68
502	GZ55_RS08720	competence protein	355.10
503	gabD	NAD-dependent succinate-semialdehyde	355.07
504	GZ55_RS10850	ATP-binding protein	354.81
505	GZ55_RS15900	multidrug ABC transporter ATP-binding protein	354.78
506	GZ55_RS13485	arabinogalactan ABC transporter permease	354.52
507	GZ55_RS00575	catabolite control protein A	354.43

508	GZ55_RS11015	phosphopyruvate hydratase	354.17
509	GZ55_RS08830	peptidase M20	354.00
510	GZ55_RS12480	multidrug ABC transporter ATP-binding protein	354.00
511	GZ55_RS12500	hypothetical protein	353.50
512	GZ55_RS10225	alanine dehydrogenase	353.44
513	GZ55_RS15050	hypothetical protein	353.41
514	GZ55_RS03450	adaptor protein	353.27
515	GZ55_RS13015	PTS system, cellobiose-specific IIC component	353.06
516	GZ55_RS11455	excinuclease ABC subunit B	352.93
517	GZ55_RS10185	short-chain dehydrogenase	352.90
518	GZ55_RS17805	hydrolase TatD	352.90
519	GZ55_RS11365	hypothetical protein	352.67
520	GZ55_RS07795	alpha-ketoacid dehydrogenase subunit beta	352.49
521	GZ55_RS10175	lipase	352.43
522	GZ55_RS17335	30S ribosomal protein S10	352.16
523	GZ55_RS18220	hypothetical protein	351.72
524	GZ55_RS12370	NAD-dependent malic enzyme	351.63
525	GZ55_RS13105	iron ABC transporter ATP-binding protein	351.52
526	GZ55_RS15120	hypothetical protein	351.52
527	GZ55_RS10340	D-glycerate dehydrogenase	351.41
528	GZ55_RS11875	LacI family transcriptional regulator	351.27
529	GZ55_RS10800	membrane protein	351.23
530	GZ55_RS10910	ribonuclease R	351.16
531	GZ55_RS13110	ABC transporter permease	350.35
532	GZ55_RS17525	2-pyrone-4,6-dicarboxylate hydrolase	350.31
533	GZ55_RS04315	hypothetical protein	350.23
534	GZ55_RS12975	sugar ABC transporter permease	350.23
535	GZ55_RS15355	butanediol dehydrogenase	350.13
536	GZ55_RS01890	lipoprotein	350.13
537	GZ55_RS12115	MFS transporter	349.88
538	GZ55_RS02105	aspartate phosphatase	349.84
539	GZ55_RS03875	polysaccharide deacetylase	349.78
540	GZ55_RS04675	protein tyrosine phosphatase	349.67
541	GZ55_RS13185	PTS lactose transporter subunit IIC	349.31
542	GZ55_RS12915	thiamine phosphate synthase	349.24
543	GZ55_RS13230	XRE family transcriptional regulator	349.12
544	GZ55_RS16555	general stress protein	349.12
545	GZ55_RS16655	type I methionyl aminopeptidase	348.91
546	GZ55_RS00080	isochorismate synthase	348.82
547	GZ55_RS04100	hypothetical protein	348.72
548	GZ55_RS12515	spermidine synthase	348.64
549	GZ55_RS10495	Fe-S cluster assembly protein SufD	348.51
550	GZ55_RS00380	protein lplB	348.29
551	GZ55_RS13990	glycine/betaine ABC transporter ATP-binding	348.29
552	GZ55_RS03355	spore maturation protein	348.07
553	GZ55_RS00225	glycosyl transferase	347.98
554	GZ55_RS03285	MFS transporter	347.78

555	GZ55_RS09275	spore coat protein	347.75
556	GZ55_RS14845	4-aminobutyrate--2-oxoglutarate transaminase	347.71
557	GZ55_RS06610	RNA polymerase sporulation sigma factor SigG	347.47
558	GZ55_RS08105	hydroxymethylpyrimidine/phosphomethylpyrimidine	347.42
559	GZ55_RS15385	alpha/beta hydrolase	347.34
560	GZ55_RS00745	fatty acid desaturase	347.13
561	GZ55_RS06920	nicotinate-nucleotide diphosphorylase	346.14
562	GZ55_RS09160	uroporphyrin-III methyltransferase	346.14
563	GZ55_RS18090	hypothetical protein	346.14
564	GZ55_RS17755	Rrf2 family transcriptional regulator	346.14
565	GZ55_RS17535	ferrichrome ABC transporter permease	346.14
566	GZ55_RS16640	multidrug ABC transporter ATP-binding protein	346.14
567	GZ55_RS16515	acylphosphatase	346.14
568	GZ55_RS06445	D-alanyl-D-alanine carboxypeptidase	346.14
569	GZ55_RS01545	septation protein SpoVG	346.14
570	GZ55_RS11190	membrane protein	346.14
571	GZ55_RS18420	50S ribosomal protein L34	346.14
572	GZ55_RS13465	hypothetical protein	345.52
573	GZ55_RS15195	NTD biosynthesis operon protein NtdA	345.35
574	GZ55_RS13345	protease	345.27
575	GZ55_RS10240	sodium:proton antiporter	344.57
576	GZ55_RS10475	FMN-dependent NADH-azoreductase	344.54
577	GZ55_RS13970	NAD(P)H:quinone oxidoreductase type IV	344.47
578	GZ55_RS08125	glycine oxidase ThiO	344.27
579	GZ55_RS15320	DUF4352 domain-containing protein	344.18
580	GZ55_RS12710	spore coat protein	343.93
581	GZ55_RS16840	23S rRNA (uracil-5-)-methyltransferase RumA	343.89
582	GZ55_RS07225	MFS transporter	343.70
583	fecE	iron-dictrate transporter ATP-binding subunit	343.59
584	GZ55_RS03985	hypothetical protein	343.51
585	GZ55_RS13190	transcriptional regulator	343.49
586	GZ55_RS02200	GPR endopeptidase	343.35
587	GZ55_RS06005	30S ribosomal protein S2	343.31
588	GZ55_RS16310	GTP 3',8-cyclase MoaA	343.05
589	GZ55_RS12200	hypothetical protein	343.05
590	GZ55_RS16970	NADPH:quinone reductase	343.05
591	GZ55_RS05565	hypothetical protein	342.89
592	GZ55_RS01675	N-acetylmuramoyl-L-alanine amidase	342.85
593	GZ55_RS12995	branched chain amino acid aminotransferase	342.33
594	GZ55_RS07460	cysteine methyltransferase	341.92
595	GZ55_RS11460	hypothetical protein	341.92
596	GZ55_RS15075	transcriptional regulator	341.67
597	GZ55_RS02925	hypothetical protein	341.40
598	GZ55_RS12340	stage II sporulation protein R	341.40
599	GZ55_RS12300	uracil phosphoribosyltransferase	341.19
600	GZ55_RS15015	non-ribosomal peptide synthetase	341.10

601	GZ55_RS15155	methionine ABC transporter substrate-binding	341.08
602	GZ55_RS10510	NAD(+) synthetase	341.08
603	GZ55_RS12375	hypothetical protein	340.97
604	GZ55_RS10465	thymidine kinase	340.97
605	GZ55_RS17070	DNA-directed RNA polymerase sigma-70 factor	340.97
606	GZ55_RS17750	bifunctional N-acetylglucosamine-1-phosphate	340.84
607	GZ55_RS17880	hypothetical protein	340.73
608	GZ55_RS18315	sigma factor G inhibitor Gin	340.73
609	GZ55_RS08865	hypothetical protein	340.73
610	GZ55_RS14990	phytoene dehydrogenase	340.53
611	GZ55_RS00230	thioesterase	340.53
612	GZ55_RS08870	membrane protein	340.32
613	GZ55_RS09225	family transcriptional regulator	340.27
614	GZ55_RS10425	ribonuclease	340.23
615	GZ55_RS01305	6-phosphogluconolactonase	340.17
616	GZ55_RS13495	galactosidase	340.12
617	GZ55_RS11870	2-dehydro-3-deoxygluconokinase	340.01
618	GZ55_RS07660	QacE family quaternary ammonium compound efflux	339.84
619	GZ55_RS08470	iron transporter	339.84
620	GZ55_RS13165	PTS cellobiose transporter subunit IIA	339.84
621	GZ55_RS01960	3-hexulose-6-phosphate synthase	339.58
622	GZ55_RS15575	hypothetical protein	339.37
623	GZ55_RS10265	NADH dehydrogenase	339.28
624	GZ55_RS15235	glycine/betaine ABC transporter	339.07
625	GZ55_RS08170	CYTH domain-containing protein	338.96
626	GZ55_RS12560	Prespore transcriptional regulator RsfA	338.36
627	GZ55_RS00550	UDP-N-acetylmuramate--L-alanine ligase	338.14
628	GZ55_RS15520	fructokinase	337.92
629	GZ55_RS11225	nickel ABC transporter, nickel/metallophore	337.87
630	GZ55_RS06745	hypothetical protein	337.80
631	GZ55_RS17715	membrane protein	337.73
632	GZ55_RS11890	poly(glycerol-phosphate)	337.64
633	GZ55_RS11800	spore germination protein	337.64
634	GZ55_RS15455	Bcr/CflA family drug resistance efflux	337.61
635	GZ55_RS15560	sulfurtransferase	337.56
636	GZ55_RS16790	YebC/PmpR family DNA-binding transcriptional	337.48
637	GZ55_RS13845	acyl-CoA dehydrogenase	337.22
638	GZ55_RS01920	TetR family transcriptional regulator	337.22
639	GZ55_RS16570	membrane protein	337.10
640	GZ55_RS03680	serine/threonine protein kinase	337.10
641	GZ55_RS07305	phosphoenolpyruvate--protein phosphotransferase	337.08
642	GZ55_RS00680	acyl--CoA ligase	336.94
643	GZ55_RS11055	sigma-54-dependent Fis family transcriptional	336.78
644	GZ55_RS13160	polysaccharide deacetylase	336.49
645	GZ55_RS13240	hypothetical protein	336.30
646	GZ55_RS17765	pur operon repressor	336.18

647	GZ55_RS06840	protoheme IX farnesyltransferase	335.96
648	GZ55_RS15070	AAC(3) family N-acetyltransferase	335.84
649	GZ55_RS13220	aspartate ammonia-lyase	335.18
650	GZ55_RS03585	chorismate synthase	334.63
651	GZ55_RS00875	pyruvate kinase	334.34
652	GZ55_RS14825	hypothetical protein	334.32
653	GZ55_RS02510	phosphate ABC transporter ATP-binding protein	334.20
654	GZ55_RS00690	hypothetical protein	333.78
655	GZ55_RS01350	hypothetical protein	333.78
656	GZ55_RS16670	Crp/Fnr family transcriptional regulator	333.78
657	GZ55_RS17710	MazG family protein	333.55
658	GZ55_RS16520	GTP cyclohydrolase I Fole2	333.40
659	GZ55_RS17220	2-C-methyl-D-erythritol 2,4-cyclodiphosphate	333.08
660	GZ55_RS08495	diaminobutyrate--2-oxoglutarate transaminase	333.03
661	GZ55_RS14710	NAD(P)-dependent oxidoreductase	333.01
662	GZ55_RS15820	MurR/RpiR family transcriptional regulator	333.01
663	GZ55_RS12355	peptide chain release factor 1	332.53
664	GZ55_RS16290	non-ribosomal peptide synthetase	332.53
665	GZ55_RS12135	ammonia channel protein	332.39
666	GZ55_RS03475	membrane protein insertion efficiency factor	332.29
667	GZ55_RS00145	germination protein YpeB	332.29
668	GZ55_RS17950	isochorismate synthase	332.08
669	GZ55_RS13885	pyridoxal 5'-phosphate synthase glutaminase	332.08
670	GZ55_RS09200	glycerol-3-phosphate dehydrogenase	331.77
671	GZ55_RS04725	sulfite reductase subunit beta	331.64
672	GZ55_RS15350	oxidoreductase	331.62
673	GZ55_RS15220	hypothetical protein	331.41
674	GZ55_RS06865	glyoxal reductase	331.41
675	GZ55_RS10785	amidohydrolase	331.41
676	GZ55_RS13775	serine protease	331.24
677	GZ55_RS16205	FMN-binding glutamate synthase family protein	331.03
678	GZ55_RS00515	peptidase M28	330.67
679	GZ55_RS00070	hypothetical protein	330.60
680	GZ55_RS01400	uroporphyrinogen III methyltransferase	330.40
681	GZ55_RS05495	hypothetical protein	330.40
682	GZ55_RS06400	phosphopantothencysteine decarboxylase	329.94
683	GZ55_RS01680	histidine--tRNA ligase	329.85
684	GZ55_RS12960	glutamine ABC transporter substrate-binding	329.85
685	GZ55_RS00245	phosphoenolpyruvate carboxykinase (ATP)	329.78
686	GZ55_RS12490	LD-carboxypeptidase	329.50
687	GZ55_RS13780	metallohydrolase	329.16
688	GZ55_RS13965	catalase	329.16
689	GZ55_RS03950	homoserine O-succinyltransferase	329.00
690	GZ55_RS14555	AI-2E family transporter	328.88
691	GZ55_RS13680	GntR family transcriptional regulator	328.61
692	GZ55_RS11565	oligoendopeptidase	328.19
693	GZ55_RS09290	hypothetical protein	327.92

694	GZ55_RS01795	hypothetical protein	327.92
695	GZ55_RS18410	CxxH/CxxC protein	327.92
696	GZ55_RS14090	chromosomal replication initiation protein DnaA	327.55
697	GZ55_RS11230	UDP-glucosyltransferase	327.50
698	GZ55_RS10270	ferredoxin--NADP(+) reductase	327.43
699	GZ55_RS00980	threonine--tRNA ligase	327.41
700	prsA	foldase	327.36
701	GZ55_RS04500	glutamate synthase	327.26
702	GZ55_RS13315	ABC transporter ATP-binding protein	327.10
703	GZ55_RS10190	type VII secretion protein EssA	326.91
704	GZ55_RS11515	cell division protein	326.66
705	GZ55_RS15695	GntR family transcriptional regulator	326.60
706	GZ55_RS07590	DNA-binding response regulator	326.49
707	GZ55_RS15440	peptidase S8	326.41
708	GZ55_RS16620	peptidase M14	326.41
709	GZ55_RS16200	hypothetical protein	326.36
710	GZ55_RS11745	hypothetical protein	326.20
711	GZ55_RS16875	DNA alkylation repair protein	326.14
712	GZ55_RS09630	hypothetical protein	326.01
713	GZ55_RS12630	MFS transporter	325.92
714	GZ55_RS04780	PTS fructose transporter subunit IIBC	325.78
715	GZ55_RS15495	peptidase S8	325.52
716	GZ55_RS03935	cold-shock protein	325.47
717	GZ55_RS12635	bacilysin biosynthesis protein BacA	325.47
718	GZ55_RS02215	elongation factor 4	325.24
719	GZ55_RS07270	penicillin-binding protein	325.14
720	GZ55_RS00850	DNA polymerase III subunit alpha	324.97
721	GZ55_RS11855	LacI family transcriptional regulator	324.90
722	GZ55_RS03090	MFS transporter	324.87
723	GZ55_RS16300	polyketide synthase	324.80
724	GZ55_RS15605	long-chain fatty acid--CoA ligase	324.75
725	GZ55_RS08765	anion permease	324.75
726	GZ55_RS09070	membrane protein	324.36
727	GZ55_RS07905	alanine racemase	324.17
728	GZ55_RS12005	acetolactate synthase AlsS	324.16
729	GZ55_RS07575	peptidase	324.13
730	GZ55_RS16730	glutamine amidotransferase	324.13
731	GZ55_RS17530	N-acetyltransferase	324.13
732	GZ55_RS16220	transcriptional regulator	323.66
733	GZ55_RS10930	hypothetical protein	323.66
734	GZ55_RS15580	hypothetical protein	323.66
735	GZ55_RS15610	geranylgeranylgeranyl/heptaprenylglyceryl	323.66
736	GZ55_RS16295	polyketide synthase	323.55
737	GZ55_RS13505	citrate transporter	323.48
738	GZ55_RS07640	glutamate 5-kinase	323.44
739	GZ55_RS02545	glucokinase	323.28
740	GZ55_RS10370	hypothetical protein	323.28

741	GZ55_RS04830	transcriptional regulator	323.19
742	GZ55_RS08735	(2Fe-2S)-binding protein	323.11
743	GZ55_RS15555	amino acid:proton symporter	323.06
744	deoA	pyrimidine-nucleoside phosphorylase	323.01
745	GZ55_RS12000	LysR family transcriptional regulator	322.98
746	GZ55_RS05820	DNA translocase FtsK	322.94
747	GZ55_RS01830	membrane protein	322.75
748	GZ55_RS10005	MFS transporter	322.54
749	GZ55_RS07720	cytochrome c	322.46
750	GZ55_RS07930	para-nitrobenzyl esterase	322.27
751	GZ55_RS01950	stage V sporulation protein S	322.27
752	GZ55_RS16835	ClbS/DfsB family four-helix bundle protein	322.27
753	GZ55_RS12525	hypothetical protein	322.27
754	GZ55_RS18500	DNA-3-methyladenine glycosylase	322.27
755	GZ55_RS05735	YpzG family protein	322.27
756	GZ55_RS08610	DNA repair exonuclease	321.98
757	GZ55_RS08405	phosphatase	321.87
758	GZ55_RS02535	rhomboid family intramembrane serine protease	321.85
759	GZ55_RS16145	bifunctional	321.85
760	GZ55_RS09115	alkaline phosphatase	321.79
761	GZ55_RS06620	sigma-E processing peptidase SpoIIIGA	321.57
762	GZ55_RS10595	short-chain dehydrogenase	321.50
763	GZ55_RS15185	NTD biosynthesis operon oxidoreductase NtdC	321.34
764	GZ55_RS01720	hypothetical protein	321.32
765	GZ55_RS07005	potassium transporter Trk	321.30
766	GZ55_RS13430	YigZ family protein	321.30
767	GZ55_RS11685	GABA permease (4-amino butyrate transport	321.30
768	GZ55_RS09195	phosphoglucomutase	321.16
769	GZ55_RS02765	stage III sporulation protein AE	320.92
770	GZ55_RS16635	nitric oxide synthase	320.81
771	GZ55_RS14995	non-ribosomal peptide synthetase	320.42
772	GZ55_RS09335	protein PrkA	320.40
773	GZ55_RS00495	tRNA (guanosine(46)-N7)-methyltransferase TrmB	320.26
774	GZ55_RS14145	EamA family transporter	320.06
775	GZ55_RS13675	PTS beta-glucoside transporter subunit EIIBCA	319.89
776	GZ55_RS17120	ABC transporter ATP-binding protein	319.75
777	GZ55_RS08445	hypothetical protein	319.23
778	GZ55_RS05945	glycoside hydrolase	319.12
779	GZ55_RS16575	wd domain protein	318.97
780	GZ55_RS09170	hypothetical protein	318.88
781	GZ55_RS13205	phosphatidylglycerophosphatase A	318.60
782	GZ55_RS03995	hypothetical protein	318.60
783	GZ55_RS13095	iron-hydroxamate ABC transporter	318.49
784	GZ55_RS14680	GntR family transcriptional regulator	318.45
785	GZ55_RS15770	membrane protein	318.35
786	GZ55_RS03635	prephenate dehydrogenase	318.22

787	GZ55_RS15330	protein natB	317.88
788	GZ55_RS02080	alkene reductase	317.70
789	GZ55_RS10320	peptidase	317.69
790	GZ55_RS07210	2,4-dienoyl-CoA reductase	317.63
791	GZ55_RS18245	hypothetical protein	317.57
792	GZ55_RS12730	cupin	317.57
793	GZ55_RS11995	AraC family transcriptional regulator	317.57
794	GZ55_RS01790	acetyl-CoA acetyltransferase	317.53
795	GZ55_RS09040	mechanosensitive ion channel protein	317.53
796	GZ55_RS08295	hypothetical protein	317.40
797	GZ55_RS16350	hydroxyethylthiazole kinase	317.19
798	GZ55_RS12920	TetR family transcriptional regulator	317.19
799	GZ55_RS10350	phosphatidylglycerophosphatase A	317.12
800	GZ55_RS09340	hypothetical protein	317.04
801	GZ55_RS10605	DNA-binding response regulator	317.04
802	GZ55_RS01420	spore coat protein YsxE	316.96
803	GZ55_RS05745	ribonuclease Y	316.90
804	GZ55_RS14965	EamA family transporter	316.63
805	GZ55_RS15100	arsenical efflux pump membrane protein ArsB	316.56
806	GZ55_RS10545	glycine cleavage system protein H	316.39
807	GZ55_RS11940	poly-gamma-glutamate synthase PgsB	316.27
808	GZ55_RS16495	penicillin-binding protein	316.10
809	GZ55_RS12760	hypothetical protein	316.04
810	GZ55_RS10275	glycosyl transferase	316.04
811	GZ55_RS14675	AraC family transcriptional regulator	316.04
812	GZ55_RS16355	swarming motility protein SwrC	315.87
813	GZ55_RS03305	riboflavin synthase	315.83
814	GZ55_RS11300	glmZ(sRNA)-inactivating NTPase	315.73
815	GZ55_RS10295	thiaminase II	315.47
816	GZ55_RS14415	hypothetical protein	315.47
817	GZ55_RS08135	SprT family protein	315.47
818	GZ55_RS17225	glutamate--tRNA ligase	315.39
819	GZ55_RS16610	membrane protein	315.35
820	GZ55_RS09885	protein-glutamine gamma-glutamyltransferase	315.31
821	GZ55_RS17945	phosphoribosylamine--glycine ligase	315.19
822	GZ55_RS16150	serine--tRNA ligase	315.19
823	GZ55_RS02250	16S rRNA (uracil(1498)-N(3))-methyltransferase	315.16
824	GZ55_RS02195	30S ribosomal protein S20	315.02
825	GZ55_RS08155	NAD(+) kinase	315.02
826	GZ55_RS08485	PAS domain-containing sensor histidine kinase	314.67
827	GZ55_RS03385	siderophore biosynthesis protein IucA	314.67
828	GZ55_RS10870	copper-translocating P-type ATPase	314.59
829	GZ55_RS02640	sporulation protein	314.38
830	GZ55_RS02055	NUDIX domain-containing protein	314.14
831	GZ55_RS15435	ribonuclease III	314.04
832	GZ55_RS06285	amidase	314.04
833	GZ55_RS08070	spore coat protein	313.94

834	GZ55_RS11405	N-acetylglucosamine-6-phosphate deacetylase	313.88
835	GZ55_RS08840	ABC transporter permease EscB	313.82
836	GZ55_RS06385	methionyl-tRNA formyltransferase	313.48
837	GZ55_RS06935	arginine decarboxylase	313.40
838	GZ55_RS09020	stress protein	313.37
839	GZ55_RS10970	MarR family transcriptional regulator	313.26
840	GZ55_RS16510	glycosyl transferase	313.26
841	GZ55_RS11545	cell division ATP-binding protein FtsE	312.88
842	GZ55_RS15825	PTS sugar transporter subunit IIC	312.88
843	GZ55_RS08515	AraC family transcriptional regulator	312.60
844	GZ55_RS16705	trehalose permease IIC protein	312.17
845	GZ55_RS03130	prepilin peptidase	311.52
846	GZ55_RS13930	transpeptidase	311.52
847	GZ55_RS13995	hypothetical protein	311.52
848	GZ55_RS12165	spore coat protein	311.52
849	GZ55_RS13520	hypothetical protein	311.52
850	GZ55_RS16460	flagellin	311.52
851	GZ55_RS01440	YjzC family protein	311.52
852	GZ55_RS07885	glycerol-3-phosphate cytidyltransferase	311.52
853	GZ55_RS14165	ABC transporter ATP-binding protein	311.52
854	GZ55_RS15995	30S ribosomal protein S14	311.52
855	GZ55_RS18470	transcriptional regulator	311.52
856	GZ55_RS13415	bacitracin ABC transporter ATP-binding protein	311.52
857	GZ55_RS02950	50S ribosomal protein L9	311.52
858	GZ55_RS18430	30S ribosomal protein S18	311.52
859	GZ55_RS12195	aldo/keto reductase	311.52
860	GZ55_RS03830	anti-sigma B factor antagonist	311.52
861	GZ55_RS03885	hypothetical protein	311.52
862	GZ55_RS08345	hypothetical protein	311.52
863	GZ55_RS11805	hypothetical protein	311.52
864	GZ55_RS14440	Fur-regulated basic protein FbpB	311.52
865	GZ55_RS18235	DUF1540 domain-containing protein	311.52
866	GZ55_RS15000	non-ribosomal peptide synthetase	310.94
867	GZ55_RS10980	hypothetical protein	310.83
868	GZ55_RS01705	cysteine desulfurase	310.71
869	GZ55_RS10740	ferrichrome ABC transporter permease	310.64
870	GZ55_RS11130	glycosyl transferase	310.61
871	GZ55_RS13625	LacI family transcriptional regulator	310.61
872	GZ55_RS10855	aspartate ammonia-lyase	310.23
873	GZ55_RS16320	methyltransferase	310.17
874	GZ55_RS06315	DNA helicase RecG	310.16
875	GZ55_RS13120	SAM-dependent methyltransferase	309.97
876	GZ55_RS01865	cell surface protein	309.97
877	GZ55_RS15955	membrane protein	309.70
878	GZ55_RS16905	transcriptional regulator	309.67
879	GZ55_RS15630	squalene--hopene cyclase	309.59
880	GZ55_RS12390	fructose-bisphosphatase class II	309.59

881	GZ55_RS03060	hypothetical protein	309.59
882	GZ55_RS07735	peptide ABC transporter permease	309.53
883	GZ55_RS16015	GABA permease	309.51
884	GZ55_RS16430	6-phospho-beta-glucosidase	309.41
885	GZ55_RS14460	RsbT co-antagonist protein RsbRA	309.39
886	GZ55_RS12705	pyridoxal phosphate-dependent aminotransferase	309.15
887	GZ55_RS11105	pyridoxal phosphate-dependent aminotransferase	309.15
888	GZ55_RS13880	2,3-dihydro-2,3-dihydroxybenzoate dehydrogenase	309.15
889	GZ55_RS12905	cation acetate symporter	309.10
890	GZ55_RS00895	citrate synthase	309.02
891	GZ55_RS02100	RNA polymerase sporulation sigma factor SigK	308.95
892	GZ55_RS09265	endonuclease	308.95
893	GZ55_RS13425	histidine kinase	308.64
894	GZ55_RS07700	ABC transporter ATP-binding protein	308.63
895	GZ55_RS14735	FMN-dependent NADH-azoreductase	308.58
896	GZ55_RS00540	tRNA-binding protein	308.44
897	GZ55_RS17290	16S rRNA methyltransferase	308.44
898	GZ55_RS10615	histidine kinase	308.33
899	GZ55_RS00990	TetR family transcriptional regulator	308.33
900	argD	aspartate aminotransferase family protein	308.28
901	fliD	flagellar filament capping protein FliD	308.24
902	GZ55_RS09435	30S ribosomal protein S16	308.10
903	GZ55_RS13150	histidine phosphatase family protein	308.10
904	GZ55_RS06260	bifunctional	308.10
905	GZ55_RS12420	CTP synthetase	308.04
906	GZ55_RS17585	hypothetical protein	307.79
907	GZ55_RS00210	tRNA dihydrouridine synthase DusB	307.79
908	GZ55_RS08820	membrane protein	307.68
909	GZ55_RS02470	membrane protein	307.68
910	GZ55_RS00215	Heme-degrading monooxygenase HmoB	307.68
911	GZ55_RS11905	polypeptide N-acetylgalactosaminyltransferase	307.51
912	GZ55_RS10890	sensor domain-containing diguanylate cyclase	307.46
913	GZ55_RS15785	hypothetical protein	307.42
914	GZ55_RS10885	N-acetyltransferase	307.42
915	GZ55_RS11860	arginase	307.42
916	GZ55_RS12695	spore coat protein	307.37
917	GZ55_RS17860	dTMP kinase	307.14
918	GZ55_RS03825	hypothetical protein	307.03
919	GZ55_RS01040	carbon starvation protein A	306.84
920	GZ55_RS13070	thiol reductant ABC exporter subunit CydD	306.68
921	GZ55_RS07395	Clp protease ClpX	306.64
922	GZ55_RS03435	cell wall hydrolase lytn	306.62
923	GZ55_RS02390	4-hydroxy-3-methylbut-2-enyl diphosphate	306.58
924	GZ55_RS14280	glycine cleavage system protein T	306.42
925	GZ55_RS03925	zinc-finger domain-containing protein	306.42
926	GZ55_RS02675	capsular biosynthesis protein	306.42

927	GZ55_RS11165	MmcQ/YjbR family DNA-binding protein	306.42
928	GZ55_RS09180	GNAT family acetyltransferase	306.24
929	GZ55_RS17955	pyridoxal 5'-phosphate synthase lyase subunit	306.24
930	GZ55_RS07600	5-methyltetrahydropteroyltriglutamate--	306.22
931	GZ55_RS01885	MFS transporter	306.17
932	GZ55_RS07480	DUF421 domain-containing protein	306.12
933	GZ55_RS11035	type I glyceraldehyde-3-phosphate dehydrogenase	305.96
934	GZ55_RS14445	phosphoserine phosphatase	305.96
935	GZ55_RS08440	BMP family ABC transporter substrate-binding	305.79
936	GZ55_RS07150	acetyldiaminopimelate deacetylase	305.74
937	GZ55_RS14400	branched-chain alpha-keto acid dehydrogenase	305.74
938	GZ55_RS00865	acetyl-CoA carboxylase carboxyl transferase	305.48
939	GZ55_RS14715	flavodoxin	305.42
940	GZ55_RS07160	SAM-dependent methyltransferase	305.42
941	GZ55_RS14495	membrane protein	305.29
942	GZ55_RS13940	hypothetical protein	305.29
943	GZ55_RS10135	tRNA (guanine(37)-N(1))-methyltransferase	305.17
944	GZ55_RS06240	nicotinate phosphoribosyltransferase	305.17
945	GZ55_RS07115	glycerol-3-phosphate acyltransferase	305.10
946	GZ55_RS05070	molybdenum cofactor guanylyltransferase	305.10
947	GZ55_RS15010	non-ribosomal peptide synthetase	305.06
948	GZ55_RS15850	sodium-independent anion transporter	305.03
949	GZ55_RS13870	hypothetical protein	304.99
950	GZ55_RS13835	DUF445 domain-containing protein	304.93
951	GZ55_RS08970	membrane protein	304.93
952	GZ55_RS07290	chemotaxis protein	304.85
953	GZ55_RS08915	ATPase	304.82
954	GZ55_RS08975	barnase inhibitor	304.75
955	GZ55_RS08695	spore coat protein	304.75
956	GZ55_RS13595	isochorismatase	304.75
957	GZ55_RS11880	5-dehydro-4-deoxy-D-glucuronate isomerase	304.75
958	GZ55_RS10140	transcriptional regulator	304.75
959	GZ55_RS02665	hypothetical protein	304.50
960	GZ55_RS10040	heme ABC transporter ATP-binding protein	304.22
961	GZ55_RS16165	transcriptional regulator	304.20
962	GZ55_RS02095	oxidoreductase	304.15
963	GZ55_RS08730	NAD(P)-dependent oxidoreductase	303.93
964	GZ55_RS08195	oligoendopeptidase F	303.81
965	GZ55_RS06120	flagellar hook-length control protein FliK	303.75
966	GZ55_RS14245	MFS transporter	303.74
967	GZ55_RS10585	iron-enterobactin transporter ATP-binding	303.65
968	GZ55_RS08835	ABC transporter-associated protein EcsC	303.60
969	GZ55_RS13705	XRE family transcriptional regulator	303.43
970	GZ55_RS10025	two-component system sensor histidine kinase	303.36
971	GZ55_RS13525	alkylphosphonate utilization protein	303.25
972	GZ55_RS11965	LacI family transcriptional regulator	303.00
973	GZ55_RS13785	yycFG regulatory protein	302.87

974	GZ55_RS10695	glycoside hydrolase	302.78
975	GZ55_RS00415	hypothetical protein	302.62
976	GZ55_RS11090	nickel ABC transporter permease subunit NikC	302.56
977	GZ55_RS13540	sugar diacid utilization regulator	302.29
978	GZ55_RS00755	NAD kinase	302.22
979	GZ55_RS16615	citrate transporter	302.17
980	GZ55_RS15110	flotillin	301.86
981	GZ55_RS09565	L-glutamate gamma-semialdehyde dehydrogenase	301.86
982	GZ55_RS14630	amino acid permease	301.80
983	GZ55_RS07595	serine protease	301.79
984	GZ55_RS12735	transcriptional regulator	301.47
985	GZ55_RS18120	peptide deformylase	301.47
986	GZ55_RS17830	DUF423 domain-containing protein	301.47
987	GZ55_RS06980	hypothetical protein	301.47
988	GZ55_RS02065	sporulation protein YjcZ	301.47
989	GZ55_RS07860	N-acetylmuramoyl-L-alanine amidase	301.14
990	GZ55_RS04765	MurR/RpiR family transcriptional regulator	300.70
991	GZ55_RS10775	molybdate ABC transporter substrate-binding	300.70
992	GZ55_RS16120	phosphoribosylformylglycinamidine synthase I	300.59
993	GZ55_RS01430	valine--tRNA ligase	300.56
994	GZ55_RS12940	50S rRNA methyltransferase	300.45
995	GZ55_RS16130	amidophosphoribosyltransferase	300.42
996	GZ55_RS11145	glycosyl transferase	300.40
997	GZ55_RS09880	spore coat protein	300.26
998	GZ55_RS08260	tryptophan--tRNA ligase	300.26
999	GZ55_RS08080	chemotaxis protein	300.26
1000	GZ55_RS17235	cysteine--tRNA ligase	300.18
1001	GZ55_RS13635	shikimate dehydrogenase	300.14
1002	GZ55_RS11915	LytR family transcriptional regulator	299.91
1003	GZ55_RS02965	hypothetical protein	299.86
1004	GZ55_RS02845	SpoIVB peptidase	299.82
1005	GZ55_RS02305	HDIG domain-containing protein	299.79
1006	GZ55_RS15895	tRNA	299.72
1007	GZ55_RS00790	acetate kinase	299.69
1008	GZ55_RS01995	MFS transporter	299.68
1009	GZ55_RS01110	enoyl-CoA hydratase	299.54
1010	GZ55_RS06985	chemotaxis protein	299.54
1011	GZ55_RS03580	hydrolase Cof	299.54
1012	GZ55_RS17190	ATP--guanido phosphotransferase	299.54
1013	GZ55_RS11490	DNA-binding response regulator	299.28
1014	GZ55_RS12910	3-ketoacyl-ACP reductase	299.06
1015	GZ55_RS08955	coproporphyrinogen III oxidase	299.06
1016	GZ55_RS01880	polyketide cyclase	299.06
1017	GZ55_RS03210	purine-nucleoside phosphorylase	298.88
1018	GZ55_RS16410	Rrf2 family transcriptional regulator	298.72
1019	GZ55_RS14625	thiamine pyrophosphate-binding protein	298.50
1020	GZ55_RS01755	AI-2E family transporter	298.36

1021	GZ55_RS17740	50S ribosomal protein L25/general stress protein	298.11
1022	GZ55_RS13395	saccharopine dehydrogenase	297.91
1023	GZ55_RS05955	endoglucanase	297.89
1024	GZ55_RS00580	acetoin utilization protein AcuC	297.84
1025	GZ55_RS07485	Ktr system potassium uptake protein D	297.68
1026	GZ55_RS02045	hypothetical protein	297.63
1027	GZ55_RS16745	phosphotyrosine protein phosphatase	297.63
1028	GZ55_RS03180	peptidase S8	297.48
1029	GZ55_RS17005	transcriptional regulator	297.40
1030	GZ55_RS13935	hypothetical protein	297.36
1031	GZ55_RS03425	ATP-dependent DNA helicase	297.28
1032	GZ55_RS13575	transcription antiterminator BglG	297.21
1033	GZ55_RS15165	amino acid permease	297.02
1034	GZ55_RS04160	thiol reductase thioredoxin	296.69
1035	GZ55_RS07360	hypothetical protein	296.69
1036	GZ55_RS13405	peptidase S41	296.69
1037	GZ55_RS04170	hypothetical protein	296.69
1038	GZ55_RS01130	helix-turn-helix transcriptional regulator	296.69
1039	GZ55_RS13585	PTS beta-glucoside transporter subunit EIIBC A	296.45
1040	GZ55_RS09935	glucose-6-phosphate isomerase	296.36
1041	GZ55_RS01925	BPU family class D beta-lactamase	296.13
1042	GZ55_RS00735	DNA-binding response regulator	295.95
1043	GZ55_RS11700	GTP-binding protein	295.95
1044	GZ55_RS03890	teichuronic acid biosynthesis	295.95
1045	GZ55_RS09400	O-acetylhomoserine	295.66
1046	GZ55_RS15105	DUF5082 domain-containing protein	295.61
1047	GZ55_RS12605	hypothetical protein	295.61
1048	GZ55_RS02520	hypothetical protein	295.41
1049	GZ55_RS08790	hypothetical protein	295.34
1050	GZ55_RS09325	transporter	295.28
1051	GZ55_RS15115	proline dehydrogenase	295.23
1052	GZ55_RS01775	hypothetical protein	295.13
1053	GZ55_RS12855	galactose-1-phosphate uridylyltransferase	294.93
1054	GZ55_RS15640	hypothetical protein	294.93
1055	GZ55_RS11820	beta-N-acetylhexosaminidase	294.83
1056	GZ55_RS10620	class II fumarate hydratase	294.77
1057	GZ55_RS09045	DeoR family transcriptional regulator	294.68
1058	GZ55_RS00445	hypothetical protein	294.68
1059	GZ55_RS04025	threonine dehydratase	294.58
1060	GZ55_RS16540	acyl-CoA dehydrogenase	294.35
1061	GZ55_RS17645	RNA helicase	294.35
1062	GZ55_RS16280	cell division protein FtsH	294.35
1063	GZ55_RS02235	molecular chaperone DnaK	294.27
1064	GZ55_RS08455	bifunctional homocysteine	294.27
1065	GZ55_RS12310	TIGR01440 family protein	294.22
1066	GZ55_RS09190	histidine kinase	293.58
1067	GZ55_RS01555	SpoVID-associated morphogenetic protein	293.51

1068	GZ55_RS06795	hypothetical protein	293.46
1069	GZ55_RS14725	choloylglycine hydrolase	293.40
1070	GZ55_RS14960	GntR family transcriptional regulator	293.36
1071	GZ55_RS14570	histidine kinase	293.26
1072	GZ55_RS16125	phosphoribosylformylglycinamidine synthase II	293.10
1073	GZ55_RS16305	polyketide synthase	293.01
1074	GZ55_RS14465	mRNA interferase EndoA	292.89
1075	GZ55_RS16035	hypothetical protein	292.85
1076	GZ55_RS00355	peptide ABC transporter substrate-binding	292.83
1077	GZ55_RS06855	cystathionine gamma-synthase	292.82
1078	GZ55_RS01855	pyruvate carboxylase	292.82
1079	GZ55_RS05155	hypothetical protein	292.71
1080	GZ55_RS12040	ATP-dependent helicase	292.68
1081	GZ55_RS12805	peptidase S8	292.66
1082	GZ55_RS00595	acetate--CoA ligase	292.56
1083	GZ55_RS06625	peptidase S8	292.56
1084	GZ55_RS02575	hypothetical protein	292.51
1085	GZ55_RS05575	stage V sporulation protein K	292.05
1086	GZ55_RS16445	hypothetical protein	292.05
1087	GZ55_RS16285	hybrid non-ribosomal peptide synthetase/type I	291.99
1088	GZ55_RS14820	copper-binding protein	291.52
1089	GZ55_RS00750	RNA helicase	291.45
1090	GZ55_RS13790	hypothetical protein	291.21
1091	GZ55_RS07265	sporulation kinase	291.10
1092	GZ55_RS00365	MFS transporter	291.07
1093	GZ55_RS08960	stress response protein YhaX	291.04
1094	GZ55_RS10590	arginine repressor	290.76
1095	GZ55_RS06090	NADH-dependent flavin oxidoreductase	290.76
1096	GZ55_RS02835	flagellar motor switch phosphatase FliY	290.76
1097	GZ55_RS06720	2-dehydropantoate 2-reductase	290.76
1098	GZ55_RS03815	lipoprotein	290.76
1099	GZ55_RS06220	hypothetical protein	290.54
1100	GZ55_RS11400	homoserine kinase	290.49
1101	GZ55_RS10325	HPr kinase/phosphorylase	290.49
1102	GZ55_RS10125	Xaa-Pro dipeptidase	290.40
1103	GZ55_RS16500	hypothetical protein	290.40
1104	GZ55_RS02730	anion transporter	290.40
1105	GZ55_RS07010	gamma-glutamylcyclotransferase	290.31
1106	GZ55_RS08945	potassium transporter	290.14
1107	GZ55_RS00975	hypothetical protein	290.04
1108	GZ55_RS17780	hypothetical protein	289.79
1109	GZ55_RS04970	arsenate reductase	289.79
1110	GZ55_RS09895	hypothetical protein	289.79
1111	GZ55_RS11180	nitronate monooxygenase	289.79
1112	GZ55_RS00950	iron-hydroxamate ABC transporter	289.79
1113	GZ55_RS07190	hypothetical protein	289.79
1114	GZ55_RS15095	cysteine ABC transporter permease	289.47

1115	GZ55_RS07865	phage portal protein	289.39
1116	GZ55_RS01640	protein translocase subunit SecDF	289.30
1117	GZ55_RS05015	Rrf2 family transcriptional regulator	289.27
1118	GZ55_RS01700	arsenate reductase	289.27
1119	GZ55_RS11185	iron ABC transporter permease	289.14
1120	GZ55_RS07125	hypothetical protein	289.04
1121	GZ55_RS15290	chemical-damaging agent resistance protein C	289.04
1122	GZ55_RS02115	hypothetical protein	288.91
1123	GZ55_RS14945	polar amino acid ABC transporter ATP-binding	288.91
1124	GZ55_RS12460	cardiolipin synthase	288.88
1125	GZ55_RS10235	enoyl-[acyl-carrier-protein] reductase	288.67
1126	GZ55_RS08100	sporulation protein	288.67
1127	GZ55_RS08805	ferrochelataase	288.63
1128	GZ55_RS10555	glycine dehydrogenase	288.45
1129	GZ55_RS06715	bacillithiol biosynthesis cysteine-adding enzyme	288.45
1130	GZ55_RS02685	acyl-CoA dehydrogenase	288.45
1131	GZ55_RS12770	hydroxymethylpyrimidine/phosphomethylpyrimidine	288.45
1132	GZ55_RS11930	capsular biosynthesis protein	288.30
1133	GZ55_RS16440	MFS transporter	288.16
1134	GZ55_RS01695	recombinase RarA	287.90
1135	GZ55_RS15515	alpha-mannosidase	287.67
1136	GZ55_RS13900	non-ribosomal peptide synthetase	287.60
1137	GZ55_RS00785	SAM-dependent methyltransferase	287.56
1138	GZ55_RS16660	esterase	287.56
1139	GZ55_RS15310	sugar dehydrogenase	287.56
1140	GZ55_RS18380	hypothetical protein	287.56
1141	GZ55_RS06755	PTS sugar transporter	287.56
1142	GZ55_RS15705	hypothetical protein	287.56
1143	GZ55_RS11000	hypothetical protein	287.46
1144	GZ55_RS14480	DUF4367 domain-containing protein	287.42
1145	GZ55_RS00535	DUF1444 domain-containing protein	287.38
1146	GZ55_RS12870	AraC family transcriptional regulator	287.22
1147	GZ55_RS01315	acetolactate synthase catalytic subunit	287.14
1148	GZ55_RS12550	HD domain-containing protein	287.12
1149	GZ55_RS01760	alanine--tRNA ligase	287.07
1150	GZ55_RS13530	metal-dependent hydrolase	286.93
1151	GZ55_RS01475	septum site-determining protein MinC	286.93
1152	GZ55_RS00815	glycerate kinase	286.93
1153	GZ55_RS15480	amino acid transporter	286.84
1154	GZ55_RS01365	ATP-dependent protease LonB	286.78
1155	GZ55_RS12415	membrane protein	286.46
1156	GZ55_RS07390	hypothetical protein	286.46
1157	GZ55_RS11725	UDP-glucose 6-dehydrogenase	286.38
1158	GZ55_RS16100	5-(carboxyamino)imidazole ribonucleotide	286.18
1159	GZ55_RS13670	aryl-phospho-beta-D-glucosidase	286.16
1160	GZ55_RS11775	UTP--glucose-1-phosphate uridylyltransferase	286.09

1161	GZ55_RS11020	2,3-bisphosphoglycerate-independent	285.97
1162	GZ55_RS08910	3'-5' exoribonuclease YhaM	285.89
1163	GZ55_RS01355	trigger factor	285.87
1164	GZ55_RS05590	ribonucleotide-diphosphate reductase	285.80
1165	GZ55_RS05265	hypothetical protein	285.80
1166	GZ55_RS06955	branched-chain alpha-keto acid dehydrogenase	285.74
1167	GZ55_RS04485	multidrug ABC transporter ATP-binding protein	285.65
1168	GZ55_RS01655	single-stranded-DNA-specific exonuclease RecJ	285.40
1169	GZ55_RS07465	PAS domain-containing sensor histidine kinase	285.14
1170	GZ55_RS11990	D-ribose ABC transporter substrate-binding	285.05
1171	GZ55_RS11825	MBL fold metallo-hydrolase	284.99
1172	GZ55_RS03070	mannose-6-phosphate isomerase	284.99
1173	GZ55_RS11485	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate--2,	284.93
1174	GZ55_RS06685	surface antigen	284.93
1175	GZ55_RS09315	hypothetical protein	284.82
1176	GZ55_RS06965	flagellar biosynthesis regulator FlhF	284.73
1177	GZ55_RS06050	pyruvate dehydrogenase (acetyl-transferring) E1	284.73
1178	GZ55_RS12160	methylamine utilization protein	284.73
1179	GZ55_RS11675	DNA-binding response regulator	284.43
1180	GZ55_RS12890	SAM-dependent methyltransferase	284.43
1181	GZ55_RS01125	alpha-N-arabinofuranosidase	284.35
1182	GZ55_RS13115	heme ABC transporter substrate-binding protein	284.16
1183	GZ55_RS16880	hypothetical protein	283.92
1184	GZ55_RS11755	amidase	283.61
1185	GZ55_RS08545	hypothetical protein	283.20
1186	GZ55_RS02800	N utilization substance protein B	283.20
1187	GZ55_RS00705	hypothetical protein	283.20
1188	GZ55_RS17795	betaine-aldehyde dehydrogenase	283.20
1189	GZ55_RS04280	GntR family transcriptional regulator	283.20
1190	GZ55_RS05815	hypothetical protein	283.20
1191	GZ55_RS15470	hypothetical protein	283.20
1192	GZ55_RS11740	imidazole glycerol phosphate synthase cyclase	283.20
1193	GZ55_RS02855	Rrf2 family transcriptional regulator	283.20
1194	GZ55_RS11330	UDP-phosphate N-acetylgalactosaminyl-1-phosphate	283.20
1195	GZ55_RS11375	hypothetical protein	283.20
1196	GZ55_RS06890	ribonuclease M5	283.20
1197	GZ55_RS17130	ABC transporter substrate-binding protein	282.67
1198	GZ55_RS01990	L-arabinose isomerase	282.61
1199	GZ55_RS15665	PTS sucrose transporter subunit IIBC	282.59
1200	GZ55_RS12790	D-alanine/D-serine/glycine permease	282.59
1201	GZ55_RS11925	bifunctional murein DD-endopeptidase/murein	282.51
1202	GZ55_RS02555	hypothetical protein	282.45
1203	GZ55_RS02920	lipid kinase	282.25
1204	GZ55_RS10665	serine protease	281.92
1205	GZ55_RS05660	protein LiaH	281.92
1206	GZ55_RS11245	ATP-dependent Clp protease proteolytic subunit	281.78

1207	GZ55_RS06495	carbamoyl phosphate synthase small subunit	281.65
1208	GZ55_RS07425	acioreductone dioxygenase	281.60
1209	GZ55_RS10375	lipoyl synthase	281.31
1210	GZ55_RS07990	acetylxyloxy esterase	281.16
1211	GZ55_RS05680	hypothetical protein	281.07
1212	GZ55_RS04110	spore maturation protein	281.02
1213	GZ55_RS11420	hypothetical protein	281.00
1214	GZ55_RS07405	flagellar motor protein MotB	280.98
1215	GZ55_RS07375	7-carboxy-7-deazaguanine synthase QueE	280.88
1216	GZ55_RS17275	50S ribosomal protein L1	280.77
1217	GZ55_RS15270	bacillithiol biosynthesis deacetylase BshB2	280.65
1218	GZ55_RS04220	DNA-binding protein	280.65
1219	GZ55_RS12745	hypothetical protein	280.65
1220	GZ55_RS06270	hypothetical protein	280.65
1221	GZ55_RS00930	sporulation membrane protein YtaF	280.52
1222	GZ55_RS08605	hypothetical protein	280.37
1223	GZ55_RS13500	beta-galactosidase	280.33
1224	GZ55_RS16725	2',3'-cyclic-nucleotide 2'-phosphodiesterase	279.82
1225	GZ55_RS01140	aspartate kinase	279.77
1226	GZ55_RS12240	hypothetical protein	279.74
1227	GZ55_RS00650	septation ring formation regulator EzrA	279.71
1228	GZ55_RS10715	uronate isomerase	279.66
1229	GZ55_RS02670	ATP-dependent helicase	279.64
1230	GZ55_RS18035	hypothetical protein	279.30
1231	GZ55_RS14810	PTS mannitol transporter subunit IIA	279.30
1232	GZ55_RS00155	hypothetical protein	279.30
1233	GZ55_RS15545	transcription antiterminator LicT	279.14
1234	GZ55_RS08705	GntR family transcriptional regulator	279.07
1235	GZ55_RS09900	hypothetical protein	278.98
1236	GZ55_RS04735	hypothetical protein	278.98
1237	GZ55_RS13850	cytochrome P450	278.98
1238	GZ55_RS14450	serine/threonine protein kinase	278.98
1239	GZ55_RS16250	DNA repair protein RecO	278.80
1240	GZ55_RS10385	sporulation protein YunB	278.80
1241	GZ55_RS02335	glycosyl transferase	278.80
1242	GZ55_RS12715	serine hydrolase	278.80
1243	GZ55_RS12270	ATP synthase subunit alpha	278.70
1244	GZ55_RS00075	prenyltransferase	278.68
1245	GZ55_RS17665	hypothetical protein	278.60
1246	GZ55_RS09380	metallopeptidase	278.51
1247	araD	ribulose 5-phosphate epimerase	278.38
1248	GZ55_RS03725	3-methyl-2-oxobutanoate	278.15
1249	GZ55_RS07025	hypothetical protein	278.15
1250	GZ55_RS09980	rod shape-determining protein	278.15
1251	GZ55_RS11360	cystathionine beta-lyase	278.15
1252	GZ55_RS03920	ATP phosphoribosyltransferase regulatory	278.15
1253	GZ55_RS00665	cysteine desulfurase	278.00

1254	GZ55_RS11085	ABC transporter ATP-binding protein	277.94
1255	GZ55_RS05915	translation initiation factor IF-2	277.86
1256	GZ55_RS07715	peptidase S66	277.79
1257	GZ55_RS01115	electron transfer flavoprotein subunit beta	277.71
1258	GZ55_RS16365	diacylglycerol kinase	277.60
1259	GZ55_RS15335	hypothetical protein	277.47
1260	GZ55_RS08330	ABC transporter ATP-binding protein	277.47
1261	GZ55_RS08015	cystathionine gamma-synthase	277.44
1262	GZ55_RS15255	hypothetical protein	277.42
1263	GZ55_RS00860	acetyl-CoA carboxylase carboxyl transferase	277.38
1264	GZ55_RS01370	endopeptidase La	277.36
1265	GZ55_RS01455	hypothetical protein	276.91
1266	GZ55_RS12720	flagellar protein FliS	276.91
1267	GZ55_RS13380	hypothetical protein	276.91
1268	GZ55_RS11600	DNA-directed RNA polymerase sigma-70 factor	276.91
1269	GZ55_RS11470	phosphotransferase	276.83
1270	GZ55_RS09285	lipoprotein	276.50
1271	GZ55_RS00300	antibiotic ABC transporter ATP-binding protein	276.44
1272	GZ55_RS09270	histidine kinase	276.42
1273	GZ55_RS10430	frataxin; iron chaperone	276.35
1274	GZ55_RS05275	Fe-S oxidoreductase	276.35
1275	GZ55_RS17080	membrane protein	276.27
1276	GZ55_RS16990	phosphatidylglycerol lysyltransferase	276.26
1277	GZ55_RS12850	peptidase M24	276.14
1278	GZ55_RS12030	UDP-glucose 6-dehydrogenase	276.12
1279	GZ55_RS01820	transcription elongation factor GreA	276.03
1280	GZ55_RS05240	iron-sulfur cluster-binding protein	276.03
1281	GZ55_RS14840	amino acid permease	275.86
1282	GZ55_RS12785	sucrose-6-phosphate hydrolase	275.63
1283	GZ55_RS00885	sporulation integral membrane protein YtvI	275.61
1284	GZ55_RS01710	tRNA(5-methylaminomethyl-2-thiouridine)-	275.61
1285	GZ55_RS15660	glycerophosphodiester phosphodiesterase	275.50
1286	GZ55_RS17850	hypothetical protein	275.50
1287	GZ55_RS15360	sec-c motif domain protein	275.38
1288	GZ55_RS11350	hypothetical protein	275.30
1289	GZ55_RS10255	histidinol dehydrogenase	275.30
1290	GZ55_RS11555	membrane protein	275.20
1291	GZ55_RS10690	ABC transporter substrate-binding protein	275.16
1292	GZ55_RS08980	spore coat associated protein	275.08
1293	GZ55_RS16805	aspartate-semialdehyde dehydrogenase	274.87
1294	GZ55_RS05850	sodium:alanine symporter	274.87
1295	GZ55_RS15380	radical SAM/CxCxxxxC motif protein YfkAB	274.87
1296	GZ55_RS01785	acyl-CoA synthetase	274.50
1297	GZ55_RS04135	hypothetical protein	274.47
1298	GZ55_RS04240	superoxide dismutase	274.40
1299	GZ55_RS14030	hypothetical protein	274.35
1300	GZ55_RS05880	hypothetical protein	274.30

1301	GZ55_RS17910	tRNA-specific adenosine deaminase	274.30
1302	GZ55_RS08625	helicase-exonuclease AddAB subunit AddB	274.25
1303	GZ55_RS05670	phage-related replication protein	274.14
1304	GZ55_RS16005	4-carboxymuconolactone decarboxylase	274.14
1305	GZ55_RS09125	aldehyde dehydrogenase family protein	273.94
1306	GZ55_RS11435	spore coat protein	273.87
1307	GZ55_RS05700	DUF4097 domain-containing protein	273.87
1308	GZ55_RS04865	arabinoxylan arabinofuranohydrolase	273.80
1309	GZ55_RS13225	L-asparaginase 1	273.76
1310	GZ55_RS12365	hypothetical protein	273.44
1311	GZ55_RS08670	transcriptional regulator	273.44
1312	GZ55_RS03780	LytR family transcriptional regulator	273.44
1313	GZ55_RS07770	transporter	273.44
1314	GZ55_RS15615	hypothetical protein	273.41
1315	GZ55_RS12655	aspartate aminotransferase	273.27
1316	GZ55_RS08355	carbamoyl phosphate synthase large subunit	273.00
1317	GZ55_RS03405	phosphoglycerate dehydrogenase	272.95
1318	GZ55_RS08635	oxidoreductase	272.87
1319	GZ55_RS10770	hypothetical protein	272.65
1320	GZ55_RS14065	tRNA uridine-5-carboxymethylaminomethyl(34)	272.40
1321	GZ55_RS16315	alkaline phosphatase	272.33
1322	GZ55_RS09005	50S ribosomal protein L21	272.21
1323	GZ55_RS14545	hypothetical protein	272.21
1324	GZ55_RS06885	hypothetical protein	272.21
1325	GZ55_RS01495	ABC transporter ATP-binding protein	272.21
1326	GZ55_RS01435	folylpolyglutamate synthase	272.14
1327	GZ55_RS07165	hypothetical protein	271.80
1328	GZ55_RS07615	MarR family transcriptional regulator	271.80
1329	GZ55_RS01565	lysine transporter LysE	271.68
1330	GZ55_RS07260	aromatic amino acid aminotransferase	271.58
1331	GZ55_RS15910	redox-sensing transcriptional repressor Rex	271.51
1332	GZ55_RS02260	hypothetical protein	271.33
1333	GZ55_RS08815	penicillin-binding protein	271.27
1334	GZ55_RS03970	virulence factor	271.25
1335	GZ55_RS12100	2'-5' RNA ligase	270.89
1336	GZ55_RS17200	TOPRIM domain-containing protein	270.89
1337	GZ55_RS13760	MarR family transcriptional regulator	270.89
1338	GZ55_RS10535	membrane protein	270.89
1339	GZ55_RS00470	DNA repair protein RadA	270.89
1340	GZ55_RS04775	PTS fructose transporter subunit IIC	270.60
1341	GZ55_RS11785	Teichoic acid translocation permease TagG	270.56
1342	GZ55_RS12215	formate dehydrogenase	270.54
1343	GZ55_RS05740	metallophosphoesterase	270.38
1344	GZ55_RS02825	1-deoxy-D-xylulose-5-phosphate synthase	270.25
1345	GZ55_RS15965	glycerol-3-phosphate dehydrogenase	270.11
1346	GZ55_RS08885	sporulation protein YjcZ	270.11
1347	GZ55_RS03525	N-acetyltransferase	270.11

1348	GZ55_RS13280	6-phospho-beta-glucosidase	270.03
1349	GZ55_RS06805	CBS domain-containing protein	269.99
1350	GZ55_RS04155	peptidase M15	269.91
1351	GZ55_RS05805	membrane protein	269.85
1352	GZ55_RS11025	triose-phosphate isomerase	269.82
1353	GZ55_RS05720	8-amino-7-oxononanoate synthase	269.51
1354	GZ55_RS02345	glycine--tRNA ligase subunit beta	269.50
1355	GZ55_RS12265	F0F1 ATP synthase subunit gamma	269.48
1356	GZ55_RS15190	haloacid dehalogenase	269.48
1357	GZ55_RS12650	carboxylate--amine ligase	269.46
1358	GZ55_RS10705	transcriptional regulator	269.22
1359	GZ55_RS07420	altronate oxidoreductase	269.22
1360	GZ55_RS07645	formyltetrahydrofolate deformylase	269.09
1361	GZ55_RS02400	DEAD/DEAH box helicase	269.04
1362	GZ55_RS09235	DNA-formamidopyrimidine glycosylase	268.94
1363	GZ55_RS00925	glyoxalase/bleomycin resistance	268.94
1364	GZ55_RS03165	TIGR00375 family protein	268.83
1365	GZ55_RS01690	tRNA threonylcarbamoyladenosine dehydratase	268.77
1366	GZ55_RS17570	polysaccharide deacetylase family sporulation	268.77
1367	GZ55_RS06605	transcriptional regulator	268.73
1368	GZ55_RS15475	homocysteine S-methyltransferase	268.73
1369	GZ55_RS02450	glycosyl hydrolase family 88	268.70
1370	GZ55_RS00385	4-hydroxy-3-methylbut-2-en-1-yl diphosphate	268.70
1371	GZ55_RS03640	3-phosphoshikimate 1-carboxyvinyltransferase	268.68
1372	GZ55_RS14760	acyl-CoA thioesterase	268.55
1373	GZ55_RS07690	N-acetyl-gamma-glutamyl-phosphate reductase	268.55
1374	GZ55_RS08380	membrane protein	268.55
1375	GZ55_RS07275	hypothetical protein	268.35
1376	GZ55_RS03800	hypothetical protein	268.20
1377	GZ55_RS03440	spore coat protein	268.20
1378	GZ55_RS02960	methylmalonyl-CoA carboxyltransferase	268.11
1379	GZ55_RS07725	ABC transporter ATP-binding protein	268.08
1380	GZ55_RS16630	shikimate kinase	267.98
1381	GZ55_RS15150	PadR family transcriptional regulator	267.98
1382	GZ55_RS12530	zinc metalloprotease	267.83
1383	GZ55_RS14540	ABC transporter permease	267.72
1384	GZ55_RS04225	MATE family efflux transporter	267.61
1385	GZ55_RS14655	glycosyl hydrolase lipoprotein	267.51
1386	GZ55_RS03215	D-alanyl-D-alanine carboxypeptidase	267.47
1387	GZ55_RS16065	MFS transporter	267.47
1388	GZ55_RS10635	spore germination protein	267.26
1389	GZ55_RS12485	cardiolipin synthase	267.20
1390	GZ55_RS14920	hypothetical protein	267.02
1391	GZ55_RS01685	aspartate--tRNA ligase	267.02
1392	GZ55_RS05655	hypothetical protein	267.02
1393	GZ55_RS08525	phytoene synthase	267.02
1394	GZ55_RS00610	uronase	267.02

1395	GZ55_RS02485	penicillin-binding protein	266.90
1396	GZ55_RS14645	hypothetical protein	266.86
1397	GZ55_RS16530	tetracycline resistance MFS efflux pump	266.80
1398	GZ55_RS10415	MFS transporter	266.80
1399	GZ55_RS17635	molecular chaperone Hsp33	266.72
1400	GZ55_RS10610	TetR family transcriptional regulator	266.62
1401	GZ55_RS00640	two-component sensor histidine kinase	266.62
1402	GZ55_RS17655	hypothetical protein	266.26
1403	GZ55_RS00320	tRNA(Ile)-lysine synthetase	266.26
1404	GZ55_RS11670	fatty acid-binding protein DegV	266.07
1405	GZ55_RS01035	peptidase M28	266.04
1406	GZ55_RS14885	hypothetical protein	266.02
1407	GZ55_RS01100	long-chain fatty acid--CoA ligase	265.93
1408	GZ55_RS13695	ABC transporter permease	265.93
1409	gudD	glucarate dehydratase	265.85
1410	GZ55_RS10975	asparagine synthetase B	265.75
1411	GZ55_RS00255	membrane protein	265.75
1412	GZ55_RS01875	methylase	265.64
1413	GZ55_RS16270	hypothetical protein	265.50
1414	GZ55_RS10080	Na ⁺ /H ⁺ antiporter subunit D	265.40
1415	GZ55_RS15245	DNA/RNA helicase	265.13
1416	GZ55_RS11665	glycine/betaine ABC transporter ATP-binding	265.13
1417	GZ55_RS09945	NADH-dependent alcohol dehydrogenase	264.96
1418	GZ55_RS08285	ABC transporter ATP-binding protein	264.93
1419	GZ55_RS16245	non-ribosomal peptide synthetase	264.78
1420	GZ55_RS09130	MFS transporter	264.69
1421	GZ55_RS17745	DNA-binding response regulator	264.50
1422	rbsC	ribose-phosphate pyrophosphokinase	264.50
1423	GZ55_RS10645	ribose ABC transporter permease	264.50
1424	GZ55_RS13910	AraC family transcriptional regulator	264.39
1425	GZ55_RS08460	methionine synthase	264.37
1426	GZ55_RS12235	UDP-N-acetylglucosamine	264.37
1427	GZ55_RS13795	cell wall metabolism sensor histidine kinase	264.26
1428	GZ55_RS13800	two-component sensor histidine kinase	264.00
1429	GZ55_RS11495	DNA-binding response regulator	264.00
1430	GZ55_RS11280	arylamine N-acetyltransferase	263.79
1431	GZ55_RS13865	DUF4885 domain-containing protein	263.67
1432	GZ55_RS05110	tetracycline resistance protein	263.60
1433	GZ55_RS04980	aconitate hydratase	263.60
1434	GZ55_RS04085	capsule biosynthesis protein CapD	263.39
1435	GZ55_RS09665	orotate phosphoribosyltransferase	263.26
1436	GZ55_RS06470	hypothetical protein	263.26
1437	GZ55_RS16600	histidine kinase	263.01
1438	GZ55_RS05870	kanamycin kinase	262.97
1439	GZ55_RS00915	alkaline phosphatase	262.73
1440	GZ55_RS02285	hypothetical protein	262.73
1441	GZ55_RS13710	hypothetical protein	262.73

1442	GZ55_RS07750	serine protease	262.56
1443	GZ55_RS16140	nicotinate-nicotinamide nucleotide	262.34
1444	GZ55_RS09030	polysaccharide deacetylase	262.34
1445	GZ55_RS02145	phosphoribosylglycinamide formyltransferase	262.34
1446	GZ55_RS11680	histidine kinase	262.25
1447	GZ55_RS07940	LysR family transcriptional regulator	262.23
1448	GZ55_RS17300	DNA-directed RNA polymerase subunit beta'	262.20
1449	GZ55_RS04435	xylulokinase	261.68
1450	GZ55_RS07285	3-oxoacyl-ACP reductase	261.58
1451	GZ55_RS05845	aspartate kinase	261.53
1452	GZ55_RS14135	glutamate:protein symporter	261.47
1453	GZ55_RS15055	transcriptional repressor	261.42
1454	GZ55_RS12405	fructose-bisphosphate aldolase	261.42
1455	GZ55_RS15370	MurR/RpiR family transcriptional regulator	261.42
1456	GZ55_RS13450	anti-sigma factor	261.42
1457	GZ55_RS13950	sporulation protein	261.42
1458	GZ55_RS02430	ATP-binding protein	261.42
1459	GZ55_RS07505	SigI regulator RsgI	261.36
1460	GZ55_RS13140	glyoxalase	261.35
1461	GZ55_RS11305	7,8-dihydro-8-oxoguanine triphosphatase	261.28
1462	GZ55_RS17970	IMP dehydrogenase	261.20
1463	GZ55_RS09240	hydrolase	261.12
1464	GZ55_RS05685	hypothetical protein	261.05
1465	GZ55_RS13975	carboxylesterase	260.88
1466	GZ55_RS10420	aminotransferase V	260.85
1467	GZ55_RS09585	betaine-aldehyde dehydrogenase	260.66
1468	GZ55_RS05785	membrane protein	260.60
1469	GZ55_RS16135	phosphoribosylformylglycinamidine cyclo-ligase	260.35
1470	GZ55_RS03205	phosphopentomutase	260.26
1471	GZ55_RS11235	tryptophan RNA-binding attenuation protein	259.60
1472	GZ55_RS16020	peptide-methionine (R)-S-oxide reductase	259.60
1473	GZ55_RS14080	cytochrome ubiquinol oxidase subunit I	259.60
1474	GZ55_RS06895	membrane protein	259.60
1475	GZ55_RS07570	aminotransferase	259.60
1476	GZ55_RS06830	PTS lichenan transporter subunit IIC	259.60
1477	GZ55_RS11160	monovalent cation/H ⁺ antiporter subunit B	259.60
1478	GZ55_RS16965	tyrosine protein kinase	259.60
1479	GZ55_RS07825	iron-siderophore ABC transporter	259.60
1480	GZ55_RS13265	hypothetical protein	259.60
1481	GZ55_RS04080	hypothetical protein	259.60
1482	GZ55_RS16865	OxA-like protein precursor	259.60
1483	GZ55_RS10070	transporter	259.60
1484	GZ55_RS00185	hypothetical protein	259.60
1485	GZ55_RS13655	MerR family transcriptional regulator	259.60
1486	GZ55_RS16735	hypothetical protein	259.60
1487	GZ55_RS04275	squalene--hopene cyclase	259.19
1488	GZ55_RS16690	aspartate aminotransferase family protein	259.13

1489	GZ55_RS03540	stage IV sporulation protein A	259.08
1490	GZ55_RS11850	two-component sensor histidine kinase	259.06
1491	GZ55_RS15510	PTS fructose transporter subunit IIC	258.91
1492	GZ55_RS08560	hypothetical protein	258.88
1493	GZ55_RS06320	L-serine dehydratase, iron-sulfur-dependent	258.74
1494	GZ55_RS01895	manganese catalase	258.67
1495	GZ55_RS10035	BMP family ABC transporter substrate-binding	258.65
1496	GZ55_RS15670	hypothetical protein	258.58
1497	GZ55_RS16325	sodium:proline symporter	258.55
1498	GZ55_RS16110	acylneuraminate cytidylyltransferase	258.53
1499	GZ55_RS04090	phosphoribosylaminoimidazolesuccinocarboxamide	258.53
1500	GZ55_RS04655	glycolate oxidase subunit GlcD	258.50
1501	GZ55_RS06425	calcium-translocating P-type ATPase, SERCA-type	258.44
1502	GZ55_RS11840	ABC transporter substrate-binding protein	258.37
1503	GZ55_RS17295	DNA-directed RNA polymerase subunit beta	258.30
1504	GZ55_RS01135	excinuclease ABC subunit C	258.29
1505	GZ55_RS13090	iron ABC transporter permease	258.07
1506	GZ55_RS07335	heavy metal translocating P-type ATPase	257.98
1507	GZ55_RS04855	alpha-glucosidase/alpha-galactosidase	257.86
1508	GZ55_RS17770	hypothetical protein	257.81
1509	GZ55_RS10660	4-(cytidine	257.81
1510	GZ55_RS14560	glutamate:protein symporter	257.76
1511	GZ55_RS00855	malate dehydrogenase	257.71
1512	GZ55_RS12660	SDR family oxidoreductase	257.65
1513	GZ55_RS07900	kelch repeat protein	257.56
1514	GZ55_RS09150	stage V sporulation protein R	257.40
1515	GZ55_RS15045	amino acid ABC transporter permease	257.35
1516	GZ55_RS10950	dihydrolipoyl dehydrogenase	257.35
1517	GZ55_RS14395	hydantoin utilization protein A	257.35
1518	GZ55_RS07110	thiamine biosynthesis protein MoeB	257.31
1519	GZ55_RS03125	hypothetical protein	257.22
1520	GZ55_RS16255	hypothetical protein	257.22
1521	GZ55_RS03645	hypothetical protein	257.15
1522	GZ55_RS01560	spore cortex protein	257.08
1523	GZ55_RS16450	LysR family transcriptional regulator	257.03
1524	GZ55_RS12020	transporter	256.93
1525	GZ55_RS14000	single-stranded DNA-binding protein	256.75
1526	GZ55_RS02810	exodeoxyribonuclease VII large subunit	256.71
1527	GZ55_RS11780	teichoic acid ABC transporter ATP-binding	256.69
1528	GZ55_RS10195	type VII secretion protein EsaA	256.66
1529	GZ55_RS12170	hypothetical protein	256.55
1530	GZ55_RS09575	thiol:disulfide interchange protein	256.55
1531	GZ55_RS07800	pyruvate dehydrogenase (acetyl-transferring) E1	256.44
1532	GZ55_RS00250	methionine adenosyltransferase	256.37
1533	GZ55_RS12250	ribosome maturation factor RimP	256.32

1534	GZ55_RS12260	hypothetical protein	256.32
1535	GZ55_RS05935	ATP synthase subunit beta	256.32
1536	GZ55_RS05150	hypothetical protein	256.05
1537	GZ55_RS10625	spore germination protein	255.78
1538	GZ55_RS00670	tRNA 4-thiouridine(8) synthase ThiI	255.73
1539	GZ55_RS08745	phosphatase	255.61
1540	GZ55_RS08175	cytochrome CBB3	255.55
1541	GZ55_RS03670	RNA polymerase sigma factor SigD	255.55
1542	GZ55_RS08115	thiazole synthase	255.55
1543	GZ55_RS06015	ABC transporter ATP-binding protein	255.55
1544	GZ55_RS11290	DNA-binding protein WhiA	255.51
1545	GZ55_RS14690	hypothetical protein	255.48
1546	GZ55_RS16415	pyridine nucleotide-disulfide oxidoreductase	255.35
1547	GZ55_RS09870	chemotaxis protein	255.27
1548	GZ55_RS00350	ABC transporter permease	255.17
1549	GZ55_RS09940	NADH-dependent alcohol dehydrogenase	254.96
1550	GZ55_RS04360	transcriptional regulator	254.88
1551	GZ55_RS00740	sensor histidine kinase	254.81
1552	GZ55_RS15840	hypothetical protein	254.61
1553	GZ55_RS12615	heme-binding protein	254.55
1554	GZ55_RS07525	hypothetical protein	254.36
1555	GZ55_RS17560	hypothetical protein	254.30
1556	GZ55_RS13175	6-phospho-beta-glucosidase	254.17
1557	GZ55_RS07950	aspartate racemase	254.03
1558	GZ55_RS02715	membrane protein	253.91
1559	GZ55_RS04255	2-oxoglutarate dehydrogenase subunit E1	253.83
1560	GZ55_RS13890	2,3-dihydroxybenzoate-AMP ligase	253.83
1561	GZ55_RS06835	cytochrome c oxidase subunit II	253.77
1562	GZ55_RS07985	type A chloramphenicol O-acetyltransferase	253.73
1563	GZ55_RS15725	hypothetical protein	253.57
1564	GZ55_RS11100	nickel ABC transporter, nickel/metallophore	253.52
1565	GZ55_RS04685	acyl-CoA dehydrogenase	253.47
1566	GZ55_RS02995	glucose transporter GlcU	253.44
1567	GZ55_RS17390	transcriptional regulator	253.27
1568	GZ55_RS04565	50S ribosomal protein L14	253.27
1569	GZ55_RS06365	serine/threonine protein kinase	253.23
1570	GZ55_RS10050	hypothetical protein	253.11
1571	GZ55_RS06690	stage V sporulation protein D	253.11
1572	GZ55_RS02550	ABC transporter permease	253.11
1573	GZ55_RS05950	glycoside hydrolase	252.95
1574	GZ55_RS02505	phosphate ABC transporter ATP-binding protein	252.90
1575	GZ55_RS04840	binding protein msmE	252.79
1576	GZ55_RS01045	small acid-soluble spore protein SspI	252.59
1577	GZ55_RS12475	membrane protein	252.59
1578	GZ55_RS08215	amino acid ABC transporter substrate-binding	252.59
1579	GZ55_RS12335	general stress acyl- n-acyltransferase	252.59
1580	GZ55_RS12120	LD-carboxypeptidase	252.59

1581	GZ55_RS15265	hypothetical protein	252.59
1582	GZ55_RS17175	16S ribosomal RNA	252.59
1583	GZ55_RS18190	hypothetical protein	252.59
1584	GZ55_RS16105	adenylosuccinate lyase	252.39
1585	GZ55_RS11530	anion permease	252.25
1586	GZ55_RS02170	competence protein ComEA	252.19
1587	GZ55_RS00645	histidinol-phosphatase	251.97
1588	GZ55_RS14935	L-cystine-binding protein TcyA	251.97
1589	GZ55_RS04305	DNA helicase RecQ	251.88
1590	GZ55_RS09440	hypothetical protein	251.87
1591	GZ55_RS02820	farnesyl-diphosphate synthase	251.74
1592	GZ55_RS11575	protein translocase subunit SecA	251.59
1593	GZ55_RS11640	flagellar protein	251.54
1594	GZ55_RS12670	NAD(P)-dependent oxidoreductase	251.40
1595	GZ55_RS06950	dihydrolipoyl dehydrogenase	251.34
1596	GZ55_RS16375	homoserine dehydrogenase	251.23
1597	GZ55_RS13335	membrane protein	251.23
1598	GZ55_RS10335	DUF3816 family protein	251.23
1599	nusA	hypothetical protein	251.23
1600	GZ55_RS13750	transcription termination/antitermination	251.23
1601	GZ55_RS08520	MATE family efflux transporter	251.12
1602	GZ55_RS07445	aminotransferase	251.10
1603	GZ55_RS00720	ATP-binding protein	251.08
1604	GZ55_RS09855	oxidoreductase	251.08
1605	GZ55_RS00520	hypothetical protein	250.89
1606	GZ55_RS14720	PTS sugar transporter subunit IIA	250.65
1607	GZ55_RS07980	aspartate phosphatase	250.56
1608	GZ55_RS09960	aromatic amino acid aminotransferase	250.47
1609	GZ55_RS14670	EamA family transporter	250.42
1610	GZ55_RS14345	myo-inosose-2 dehydratase	250.33
1611	GZ55_RS09010	multidrug ABC transporter permease	250.33
1612	GZ55_RS10795	Na ⁺ /H ⁺ antiporter	250.33
1613	GZ55_RS04900	transcriptional regulator	250.33
1614	GZ55_RS09015	multidrug ABC transporter ATP-binding protein	249.86
1615	GZ55_RS09635	N-acetylmuramoyl-L-alanine amidase	249.82
1616	GZ55_RS06585	PTS sorbitol transporter subunit IIB	249.59
1617	GZ55_RS04425	XylR family transcriptional regulator	249.54
1618	GZ55_RS12410	rod shape-determining protein MreC	249.22
1619	GZ55_RS13470	biotin carboxylase	249.22
1620	GZ55_RS08950	peptidase M42	249.22
1621	GZ55_RS04695	ornithine monooxygenase	249.22
1622	GZ55_RS11395	hypothetical protein	249.22
1623	GZ55_RS12315	prolipoprotein diacylglyceryl transferase	249.22
1624	GZ55_RS08785	ribose-5-phosphate isomerase	249.22
1625	GZ55_RS01465	two-component system response regulator	249.22
1626	GZ55_RS14425	LysR family transcriptional regulator	249.22
1627	GZ55_RS09915	phosphoserine phosphatase	249.22

1628	GZ55_RS16050	hypothetical protein	248.92
1629	GZ55_RS14115	imidazole glycerol phosphate synthase subunit	248.63
1630	GZ55_RS11340	DNA gyrase subunit B	248.63
1631	GZ55_RS15780	RNA polymerase sigma factor SigW	248.56
1632	GZ55_RS11275	ribonuclease	248.45
1633	GZ55_RS05065	CoA-binding protein	248.32
1634	GZ55_RS03490	cytidylate kinase	248.12
1635	GZ55_RS12840	cytochrome ubiquinol oxidase subunit I	248.07
1636	GZ55_RS14755	DUF1445 domain-containing protein	247.80
1637	GZ55_RS17385	30S ribosomal protein S17	247.80
1638	GZ55_RS04535	pectinesterase	247.69
1639	GZ55_RS09050	glycerophosphodiester phosphodiesterase	247.65
1640	GZ55_RS02325	GTPase Era	247.57
1641	GZ55_RS18065	integrase	247.57
1642	GZ55_RS03600	anthranilate synthase component I	247.53
1643	GZ55_RS01840	SAM-dependent methyltransferase	247.47
1644	GZ55_RS14770	hypothetical protein	247.24
1645	GZ55_RS08675	aspartate phosphatase	247.24
1646	GZ55_RS00820	ABC transporter	247.24
1647	GZ55_RS07925	hypothetical protein	247.24
1648	GZ55_RS05885	polyribonucleotide nucleotidyltransferase	247.10
1649	GZ55_RS02515	hypothetical protein	246.94
1650	GZ55_RS04000	thymidylate synthase	246.87
1651	GZ55_RS07400	flagellar motor protein MotA	246.87
1652	GZ55_RS01590	argininosuccinate synthase	246.75
1653	GZ55_RS05230	Holliday junction branch migration protein RuvA	246.75
1654	GZ55_RS00800	EamA family transporter	246.75
1655	GZ55_RS14915	nitrilotriacetate monooxygenase	246.68
1656	GZ55_RS14095	aspartate phosphatase	246.59
1657	GZ55_RS07630	DNA polymerase III subunit beta	246.59
1658	GZ55_RS06995	ribonuclease J	246.53
1659	GZ55_RS06590	PTS sorbitol transporter subunit IIC	246.40
1660	GZ55_RS10330	threonine synthase	246.40
1661	GZ55_RS08780	glutamate:protein symporter	246.32
1662	GZ55_RS13245	hypothetical protein	246.26
1663	GZ55_RS18025	peptidoglycan endopeptidase	246.23
1664	GZ55_RS11980	proteinase inhibitor	245.94
1665	GZ55_RS08420	D-ribose transporter ATP-binding protein	245.94
1666	GZ55_RS16475	hypothetical protein	245.94
1667	GZ55_RS08280	peptide-binding protein	245.79
1668	GZ55_RS08205	cardiolipin synthase	245.78
1669	GZ55_RS10750	arginine:ornithine antiporter	245.76
1670	GZ55_RS01385	glutamyl-tRNA reductase	245.76
1671	GZ55_RS15720	DNA-binding response regulator	245.60
1672	GZ55_RS10725	multidrug ABC transporter ATP-binding protein	245.60
1673	GZ55_RS02475	superoxide dismutase	245.54
1674	GZ55_RS15200	NTD biosynthesis operon regulator NtdR	245.44

1675	GZ55_RS10600	serine protease	245.40
1676	GZ55_RS15690	gamma-glutamyltransferase	245.38
1677	GZ55_RS07830	sodium ABC transporter ATP-binding protein	245.38
1678	GZ55_RS03480	pilus assembly protein PilZ	245.18
1679	GZ55_RS16045	AraC family transcriptional regulator	245.13
1680	GZ55_RS10300	NADH dehydrogenase	245.02
1681	GZ55_RS12025	transporter	245.02
1682	GZ55_RS07205	diguanylate phosphodiesterase	244.93
1683	GZ55_RS07075	efflux permease	244.83
1684	GZ55_RS10815	hypothetical protein	244.77
1685	GZ55_RS12085	cadmium-translocating P-type ATPase	244.77
1686	GZ55_RS07995	flagellar basal body rod protein FlgC	244.77
1687	GZ55_RS02280	hypothetical protein	244.70
1688	GZ55_RS12765	succinate dehydrogenase iron-sulfur subunit	244.33
1689	GZ55_RS01160	RNA-binding protein	244.33
1690	GZ55_RS07835	galactarate dehydratase	244.33
1691	GZ55_RS09145	general stress protein 17m	244.33
1692	GZ55_RS10200	type VII secretion protein EssC	244.29
1693	GZ55_RS09655	membrane protein	244.10
1694	GZ55_RS09415	N-acetylmuramoyl-L-alanine amidase	244.10
1695	GZ55_RS17920	spore germination protein	244.05
1696	GZ55_RS09355	tRNA epoxyqueuosine(34) reductase QueG	244.01
1697	GZ55_RS00635	histidine kinase	243.96
1698	GZ55_RS07220	transpeptidase	243.96
1699	GZ55_RS09220	aspartate aminotransferase family protein	243.92
1700	GZ55_RS14070	membrane protein	243.80
1701	GZ55_RS17215	tRNA modification GTPase	243.80
1702	GZ55_RS08880	2-C-methyl-D-erythritol 4-phosphate	243.80
1703	GZ55_RS17900	YbaB/EbfC family nucleoid-associated protein	243.80
1704	GZ55_RS07695	hypothetical protein	243.71
1705	GZ55_RS08500	serine acetyltransferase	243.65
1706	GZ55_RS02050	ATP-dependent 6-phosphofructokinase	243.38
1707	GZ55_RS00870	hypothetical protein	243.38
1708	GZ55_RS16155	hypothetical protein	243.38
1709	GZ55_RS06535	isoleucine--tRNA ligase	243.27
1710	GZ55_RS17325	elongation factor Tu	243.26
1711	GZ55_RS17875	protein xpaC	243.14
1712	GZ55_RS12180	hypothetical protein	243.03
1713	GZ55_RS10305	hypothetical protein	242.75
1714	uvrE	UV damage endonuclease UvrE	242.62
1715	GZ55_RS07030	aminopeptidase	242.55
1716	GZ55_RS09965	AsnC family transcriptional regulator	242.50
1717	GZ55_RS04670	DNA-binding protein	242.43
1718	GZ55_RS14220	30S ribosomal protein S15	242.30
1719	GZ55_RS05890	hypothetical protein	242.30
1720	GZ55_RS06930	hypothetical protein	242.30
1721	GZ55_RS11010	GNAT family N-acetyltransferase	242.30

1722	GZ55_RS13720	Zn-dependent hydrolase	242.17
1723	GZ55_RS07415	two-component sensor histidine kinase	242.02
1724	GZ55_RS10460	DNA-binding response regulator	241.70
1725	GZ55_RS02890	butyrate kinase	241.56
1726	GZ55_RS04720	AMP-dependent synthetase	241.49
1727	GZ55_RS16700	competence protein	241.49
1728	GZ55_RS08200	hypothetical protein	241.49
1729	GZ55_RS03620	tryptophan synthase subunit beta	241.43
1730	GZ55_RS01980	ATPase	241.40
1731	GZ55_RS05050	DNA topoisomerase IV subunit A	241.40
1732	GZ55_RS13200	hypothetical protein	241.32
1733	GZ55_RS10400	DUF5082 domain-containing protein	241.32
1734	GZ55_RS14650	GGDEF domain-containing protein	241.32
1735	GZ55_RS16195	adenine deaminase	241.28
1736	GZ55_RS00480	lipid kinase	241.18
1737	GZ55_RS12965	aspartate phosphatase	240.96
1738	GZ55_RS11265	carbonic anhydrase	240.87
1739	GZ55_RS04505	MFS transporter	240.83
1740	GZ55_RS11120	membrane protein	240.58
1741	GZ55_RS03075	oxidoreductase	240.56
1742	GZ55_RS16535	RNA-binding protein S4	240.56
1743	GZ55_RS06545	heme ABC transporter ATP-binding protein	240.56
1744	GZ55_RS06705	16S rRNA	240.40
1745	GZ55_RS10710	LacI family transcriptional regulator	240.34
1746	GZ55_RS15700	membrane protein	240.27
1747	GZ55_RS07790	branched-chain alpha-keto acid dehydrogenase	240.18
1748	GZ55_RS17155	metallophosphoesterase	239.63
1749	GZ55_RS07620	Organic hydroperoxide resistance protein OhrA	239.63
1750	GZ55_RS13860	DUF2929 domain-containing protein	239.63
1751	GZ55_RS14195	hypothetical protein	239.63
1752	GZ55_RS07215	replicative DNA helicase	239.63
1753	GZ55_RS08335	LLM class flavin-dependent oxidoreductase	239.63
1754	GZ55_RS12565	DNA-binding response regulator	239.63
1755	GZ55_RS15340	peroxiredoxin	239.63
1756	GZ55_RS12820	rod shape-determining protein RodA	239.04
1757	GZ55_RS17125	oligopeptide ABC transporter ATP-binding protein	238.90
1758	GZ55_RS08270	peptide ABC transporter permease	238.83
1759	GZ55_RS06280	chromosome segregation protein SMC	238.83
1760	GZ55_RS01180	LysR family transcriptional regulator	238.80
1761	GZ55_RS04710	enoyl-CoA hydratase	238.72
1762	GZ55_RS17010	NAD(P)H nitroreductase	238.72
1763	GZ55_RS11525	peptidase S41	238.64
1764	GZ55_RS04810	PTS N-acetylgalactosamine transporter subunit	238.57
1765	GZ55_RS10560	acetyl-CoA acetyltransferase	238.41
1766	GZ55_RS16940	teicoplanin resistance protein VanZ	238.32
1767	GZ55_RS01460	rod shape-determining protein	238.22

1768	GZ55_RS12150	hypothetical protein	238.22
1769	GZ55_RS03765	phosphinothricin acetyltransferase	238.22
1770	GZ55_RS15375	glutaminase	238.17
1771	GZ55_RS11735	lipopolysaccharide biosynthesis protein	238.15
1772	GZ55_RS11170	transcriptional regulator	238.11
1773	GZ55_RS06205	succinate--CoA ligase subunit alpha	238.04
1774	GZ55_RS14140	LD-carboxypeptidase	237.99
1775	GZ55_RS17150	asparagine--tRNA ligase	237.97
1776	asnC	glutamate-1-semialdehyde 2,1-aminomutase	237.97
1777	GZ55_RS11770	UDP-N-acetylglucosamine 2-epimerase	237.74
1778	GZ55_RS04560	3-hydroxyisobutyrate dehydrogenase	237.71
1779	GZ55_RS14875	sigma-54-dependent Fis family transcriptional	237.55
1780	GZ55_RS04115	aspartate kinase	237.55
1781	GZ55_RS00450	NCS2 family permease	237.42
1782	GZ55_RS05010	arsenical efflux pump membrane protein ArsB	237.42
1783	GZ55_RS05840	4-hydroxy-tetrahydrodipicolinate synthase	237.15
1784	GZ55_RS14175	hypothetical protein	237.03
1785	GZ55_RS00490	N-acetyltransferase	237.03
1786	GZ55_RS13180	mannonate dehydratase	236.93
1787	GZ55_RS06275	signal recognition particle-docking protein	236.72
1788	GZ55_RS07155	2,3,4,5-tetrahydropyridine-2,6-dicarboxylate	236.60
1789	GZ55_RS10540	hypothetical protein	236.60
1790	GZ55_RS08750	peptidase S8	236.50
1791	GZ55_RS07785	dihydrolipoyl dehydrogenase	236.34
1792	GZ55_RS01490	stage IV sporulation protein FB	236.33
1793	GZ55_RS17495	energy-coupling factor transporter ATPase	236.33
1794	GZ55_RS15680	stage III sporulation protein AF	236.23
1795	GZ55_RS02770	TetR family transcriptional regulator	236.23
1796	GZ55_RS11795	CDP-glycerol--glycerophosphate	236.13
1797	GZ55_RS11260	sodium-independent anion transporter	236.09
1798	GZ55_RS07515	SMC-Scp complex subunit ScpB	236.00
1799	GZ55_RS17615	membrane protein	236.00
1800	GZ55_RS12430	hypothetical protein	236.00
1801	GZ55_RS03335	glutamine amidotransferase	236.00
1802	GZ55_RS08685	iron ABC transporter permease	235.85
1803	GZ55_RS03040	aminotransferase	235.79
1804	GZ55_RS13580	beta-glucosidase	235.71
1805	GZ55_RS16680	glycerol phosphate lipoteichoic acid synthase	235.65
1806	GZ55_RS17550	N-acetylmuramoyl-L-alanine amidase CwlD	235.61
1807	GZ55_RS12510	agmatinase	235.52
1808	GZ55_RS16225	DNA helicase PcrA	235.43
1809	GZ55_RS16480	glycosyl transferase	235.41
1810	GZ55_RS16395	PTS alpha-glucoside transporter subunit IIBC	235.26
1811	GZ55_RS09550	phosphatidate cytidyltransferase	235.11
1812	GZ55_RS05980	DNA-binding protein	235.11
1813	GZ55_RS05210	NADPH--cytochrome P450 reductase	234.83
1814	GZ55_RS08620	helicase-exonuclease AddAB subunit AddA	234.65

1815	GZ55_RS01080	DNA polymerase/3'-5' exonuclease PolX	234.60
1816	GZ55_RS17905	DNA polymerase III subunit gamma/tau	234.60
1817	GZ55_RS02695	octanoyltransferase	234.48
1818	GZ55_RS12095	transcriptional regulator	234.48
1819	GZ55_RS09610	hypothetical protein	234.48
1820	GZ55_RS09590	sporulation transcriptional regulator SpoIIID	234.48
1821	GZ55_RS07705	peptidase	234.15
1822	GZ55_RS04330	2-methylcitrate dehydratase	234.13
1823	GZ55_RS10435	DNA topoisomerase I	234.09
1824	GZ55_RS06195	iron ABC transporter permease	234.09
1825	GZ55_RS14590	manganese transporter MntH	234.01
1826	polC	DNA polymerase III subunit alpha	233.97
1827	GZ55_RS10345	spore coat protein YutH	233.64
1828	GZ55_RS08140	sodium:proton antiporter	233.39
1829	GZ55_RS01005	antiholin LrgB	233.30
1830	GZ55_RS02415	membrane protein	233.11
1831	GZ55_RS06000	elongation factor Ts	233.11
1832	GZ55_RS10065	Na ⁺ /H ⁺ antiporter subunit A	233.06
1833	GZ55_RS00715	bacitracin ABC transporter ATP-binding protein	233.03
1834	GZ55_RS03820	ATP-dependent helicase	232.91
1835	GZ55_RS07730	diguanylate cyclase	232.91
1836	GZ55_RS08320	BMP family ABC transporter substrate-binding	232.91
1837	GZ55_RS13490	arabinogalactan oligomer ABC transporter	232.81
1838	GZ55_RS02125	hypothetical protein	232.75
1839	GZ55_RS07760	serine/threonine protein kinase	232.59
1840	GZ55_RS16545	NADP-dependent oxidoreductase	232.48
1841	GZ55_RS06500	dihydroorotase	232.37
1842	GZ55_RS06875	hypothetical protein	232.19
1843	GZ55_RS14470	YggT family protein	231.99
1844	GZ55_RS06550	hypothetical protein	231.99
1845	GZ55_RS14950	adenylosuccinate synthetase	231.83
1846	GZ55_RS13840	membrane protein	231.83
1847	GZ55_RS17485	response regulator	231.71
1848	GZ55_RS11410	glucosamine-6-phosphate deaminase	231.71
1849	GZ55_RS06085	50S ribosomal protein L17	231.71
1850	GZ55_RS00375	AraC family transcriptional regulator	231.51
1851	GZ55_RS14250	TetR family transcriptional regulator	231.33
1852	GZ55_RS10395	5'-nucleotidase	231.26
1853	GZ55_RS16910	adhesin	231.25
1854	GZ55_RS06230	hypothetical protein	231.17
1855	GZ55_RS01535	ribosome biogenesis GTPase YlqF	231.17
1856	GZ55_RS05305	aspartate phosphatase	231.08
1857	GZ55_RS03460	ribonuclease PH	230.76
1858	GZ55_RS01210	hypothetical protein	230.76
1859	GZ55_RS11715	hypothetical protein	230.76
1860	GZ55_RS09805	Teichuronic acid biosynthesis protein TuaE	230.76
1861	GZ55_RS02985	DNA polymerase IV	230.48

1862	GZ55_RS06665	undecaprenyldiphospho-muramoylpentapeptide	230.44
1863	GZ55_RS08110	thiamine biosynthesis protein MoeB	230.42
1864	GZ55_RS11320	hypothetical protein	230.28
1865	GZ55_RS16975	metal-dependent hydrolase	230.10
1866	GZ55_RS03655	phosphate butyryltransferase	229.98
1867	GZ55_RS02880	hypothetical protein	229.98
1868	GZ55_RS13445	gluconate kinase	229.86
1869	GZ55_RS11510	hypothetical protein	229.81
1870	GZ55_RS06810	HxlR family transcriptional regulator	229.81
1871	GZ55_RS00475	hypothetical protein	229.65
1872	GZ55_RS01395	hydroxymethylbilane synthase	229.65
1873	GZ55_RS17815	N-acetyltransferase	229.54
1874	GZ55_RS14040	glycosyl transferase	229.54
1875	GZ55_RS08465	chromosome partitioning protein ParB	229.54
1876	GZ55_RS11150	AbrB/MazE/SpoVT family DNA-binding	229.54
1877	GZ55_RS17670	stage II sporulation protein E	229.50
1878	GZ55_RS04650	glycolate oxidase	229.47
1879	GZ55_RS08810	uroporphyrinogen decarboxylase	229.45
1880	GZ55_RS15145	methyltransferase	229.42
1881	GZ55_RS15875	DNA-binding protein	229.34
1882	GZ55_RS07675	thiamine-monophosphate kinase	229.34
1883	GZ55_RS14475	alanine racemase	229.29
1884	GZ55_RS14515	carboxylesterase	229.26
1885	GZ55_RS14955	4'-phosphopantetheinyl transferase	229.26
1886	GZ55_RS03880	chalcone synthase	229.19
1887	GZ55_RS04250	hypothetical protein	229.13
1888	GZ55_RS02190	glutamate racemase	229.06
1889	GZ55_RS18465	DNA polymerase III subunit delta	229.06
1890	GZ55_RS01200	AraC family transcriptional regulator	229.06
1891	GZ55_RS04325	citrate synthase 3	228.94
1892	GZ55_RS08340	MFS transporter	228.84
1893	GZ55_RS17605	fatty acid-binding protein DegV	228.74
1894	GZ55_RS08430	dihydropteroate synthase	228.74
1895	GZ55_RS11135	membrane protein	228.56
1896	GZ55_RS03975	dihydroxy-acid dehydratase	228.49
1897	GZ55_RS05650	hypothetical protein	228.45
1898	GZ55_RS13660	transposase	228.37
1899	GZ55_RS11790	hypothetical protein	228.30
1900	GZ55_RS14635	MFS transporter	228.27
1901	GZ55_RS04415	hypothetical protein	228.27
1902	GZ55_RS05875	peptidase M16	227.94
1903	GZ55_RS10220	hypothetical protein	227.94
1904	GZ55_RS08995	ABC transporter ATP-binding protein	227.94
1905	GZ55_RS15905	PucR family transcriptional regulator	227.94
1906	GZ55_RS08550	cyclic pyranopterin monophosphate synthase MoaC	227.94
1907	GZ55_RS16820	sugar epimerase	227.94

1908	GZ55_RS03465	PrsW family intramembrane metalloprotease	227.60
1909	GZ55_RS17370	30S ribosomal protein S3	227.60
1910	GZ55_RS14120	DNA gyrase subunit A	227.58
1911	GZ55_RS14270	ABC transporter permease	227.39
1912	GZ55_RS11830	hypothetical protein	227.39
1913	GZ55_RS02350	transcriptional regulator	227.29
1914	GZ55_RS15180	MFS transporter	227.18
1915	GZ55_RS05975	1-deoxy-D-xylulose-5-phosphate reductoisomerase	227.15
1916	GZ55_RS01185	damage-inducible protein CinA	227.08
1917	GZ55_RS14255	GNAT family acetyltransferase	226.94
1918	GZ55_RS03170	transcriptional regulator	226.94
1919	GZ55_RS04185	NAD(P)H nitroreductase	226.84
1920	GZ55_RS08660	TVP38/TMEM64 family protein	226.84
1921	GZ55_RS12835	cytochrome aa3 quinol oxidase subunit III	226.84
1922	GZ55_RS16780	hypothetical protein	226.78
1923	GZ55_RS06540	RNA methyltransferase	226.56
1924	GZ55_RS03845	septum formation initiator	226.56
1925	GZ55_RS18505	alpha/beta hydrolase	226.56
1926	GZ55_RS17100	DNA-directed RNA polymerase sigma-70 factor	226.56
1927	GZ55_RS13955	gamma-type small acid-soluble spore protein	226.56
1928	GZ55_RS09970	hypothetical protein	226.56
1929	GZ55_RS04705	hydroxymethylglutaryl-CoA lyase	226.19
1930	GZ55_RS08775	flagellar hook-length control protein FliK	226.11
1931	GZ55_RS07965	RNA methyltransferase	226.11
1932	GZ55_RS00625	SAM-dependent methyltransferase	226.11
1933	GZ55_RS02160	hypothetical protein	226.11
1934	GZ55_RS01050	hypothetical protein	226.11
1935	GZ55_RS04605	membrane protein	225.74
1936	GZ55_RS05180	LexA repressor	225.74
1937	GZ55_RS16400	6-phospho-alpha-glucosidase	225.71
1938	GZ55_RS17800	hypothetical protein	225.29
1939	GZ55_RS09825	penicillin-binding protein	225.20
1940	GZ55_RS09875	NADPH-dependent 7-cyano-7-deazaguanine reductase	225.20
1941	GZ55_RS01825	biotin synthase BioB	225.20
1942	GZ55_RS07370	chemotaxis protein	225.20
1943	GZ55_RS06055	flagellar biosynthesis protein FlhA	225.14
1944	GZ55_RS08855	ABC transporter ATP-binding protein	224.99
1945	GZ55_RS17205	3-phosphoserine/phosphohydroxythreonine	224.99
1946	GZ55_RS15445	DUF402 domain-containing protein	224.99
1947	GZ55_RS08240	dna integrity scanning protein disA	224.99
1948	GZ55_RS17065	rsbT co-antagonist protein rsbRD	224.81
1949	GZ55_RS02595	oxalate decarboxylase	224.81
1950	GZ55_RS07870	hypothetical protein	224.66
1951	GZ55_RS00435	cell division protein	224.57
1952	GZ55_RS16180	CoA-transferase	224.52

1953	GZ55_RS16750	hypothetical protein	224.52
1954	GZ55_RS03120	Expansin-YoaJ	224.40
1955	GZ55_RS06530	hypothetical protein	224.30
1956	GZ55_RS04310	peptidoglycan-binding protein	224.20
1957	GZ55_RS17025	recombination regulator RecX	224.20
1958	GZ55_RS17440	preprotein translocase subunit SecY	224.07
1959	GZ55_RS09230	membrane protein	223.97
1960	GZ55_RS00100	2-succinylbenzoate-CoA ligase	223.89
1961	GZ55_RS12810	hypothetical protein	223.85
1962	GZ55_RS02020	luciferase family oxidoreductase	223.85
1963	GZ55_RS07665	cysteine methyltransferase	223.80
1964	GZ55_RS15925	peptidase S51	223.58
1965	GZ55_RS00460	hydrolase	223.58
1966	GZ55_RS17050	hypothetical protein	223.55
1967	GZ55_RS15715	sporulation killing factor system integral	223.46
1968	GZ55_RS08265	hypothetical protein	223.40
1969	GZ55_RS17170	hypothetical protein	223.28
1970	GZ55_RS05940	glycoside hydrolase	223.11
1971	GZ55_RS15595	MFS transporter	223.09
1972	GZ55_RS08920	metallophosphoesterase	223.07
1973	GZ55_RS04260	dihydrolipoamide succinyltransferase	223.05
1974	GZ55_RS01630	stage V sporulation protein B	222.95
1975	GZ55_RS07175	DUF948 domain containing protein	222.52
1976	GZ55_RS10060	branched-chain amino acid transporter	222.52
1977	GZ55_RS07235	16S rRNA m5C967 methyltransferase	222.52
1978	GZ55_RS00660	DeoR family transcriptional regulator	222.52
1979	GZ55_RS06380	LysR family transcriptional regulator	222.52
1980	GZ55_RS15325	hypothetical protein	222.52
1981	GZ55_RS15175	hypothetical protein	222.52
1982	GZ55_RS00555	hypothetical protein	222.52
1983	GZ55_RS07060	amino acid transporter	222.52
1984	GZ55_RS10580	hypothetical protein	222.52
1985	GZ55_RS13620	D-alanine/D-serine/glycine permease	222.02
1986	GZ55_RS04820	PTS ascorbate transporter subunit IIC	221.99
1987	GZ55_RS10490	cysteine desulfurase	221.97
1988	GZ55_RS01085	endonuclease MutS2	221.67
1989	GZ55_RS05245	Fe-S oxidoreductase	221.59
1990	GZ55_RS13480	cyclodextrin-binding protein	221.46
1991	GZ55_RS13370	cysteine ABC transporter ATP-binding protein	221.39
1992	GZ55_RS04040	NupC/NupG family nucleoside CNT transporter	221.39
1993	GZ55_RS02220	coproporphyrinogen III oxidase	221.35
1994	GZ55_RS01335	3-isopropylmalate dehydrogenase	221.30
1995	GZ55_RS04790	MFS transporter	221.20
1996	GZ55_RS08000	hypothetical protein	221.20
1997	GZ55_RS06395	primosomal protein N'	221.13
1998	GZ55_RS00465	cysteine synthase A	221.08
1999	GZ55_RS16945	hypothetical protein	221.08

2000	GZ55_RS05730	antiporter	220.98
2001	GZ55_RS15020	ABC transporter permease	220.86
2002	GZ55_RS13560	ABC transporter ATP-binding protein	220.76
2003	GZ55_RS10480	Fe-S cluster assembly protein SufB	220.61
2004	GZ55_RS01060	phenylalanine--tRNA ligase subunit beta	220.58
2005	GZ55_RS11710	hypothetical protein	220.55
2006	GZ55_RS14350	dehydrogenase	220.46
2007	GZ55_RS02165	late competence protein ComER	220.16
2008	GZ55_RS01540	L-aspartate oxidase	220.11
2009	GZ55_RS15730	membrane protein	219.90
2010	GZ55_RS00085	2-succinyl-5-enolpyruvyl-6-hydroxy-3-	219.84
2011	GZ55_RS16240	MFS transporter	219.81
2012	GZ55_RS01120	electron transfer flavoprotein subunit alpha	219.79
2013	GZ55_RS05995	UMP kinase	219.75
2014	GZ55_RS16030	DUF58 domain-containing protein	219.71
2015	GZ55_RS17000	50S ribosomal protein L11 methyltransferase	219.66
2016	GZ55_RS02245	DUF393 domain-containing protein	219.66
2017	GZ55_RS14265	L-asparaginase	219.61
2018	GZ55_RS12285	2-succinyl-6-hydroxy-2,	219.38
2019	GZ55_RS00090	MarR family transcriptional regulator	219.38
2020	GZ55_RS04570	ATP synthase subunit C	219.38
2021	GZ55_RS07140	mechanosensitive ion channel protein	219.22
2022	GZ55_RS15525	chorismate mutase	219.04
2023	GZ55_RS03595	transcription antiterminator	219.04
2024	GZ55_RS06880	cell division protein FtsA	218.98
2025	GZ55_RS06635	hypothetical protein	218.98
2026	GZ55_RS10745	iron(3+)-hydroxamate-binding protein FhuD	218.96
2027	GZ55_RS17915	isochorismatase	218.91
2028	GZ55_RS14150	branched-chain amino acid ABC transporter	218.84
2029	GZ55_RS17250	cytochrome P450	218.61
2030	GZ55_RS09420	hypothetical protein	218.61
2031	GZ55_RS04450	hypothetical protein	218.61
2032	GZ55_RS06900	translational GTPase TypA	218.52
2033	GZ55_RS17965	D-alanyl-D-alanine carboxypeptidase	218.49
2034	GZ55_RS05055	DNA topoisomerase IV subunit B	218.45
2035	GZ55_RS13410	sugar-phosphatase	218.41
2036	GZ55_RS04795	transcriptional regulator	218.26
2037	GZ55_RS14550	dicarboxylate/amino acid:cation symporter	218.22
2038	GZ55_RS04895	hypothetical protein	218.07
2039	GZ55_RS03080	CoA-disulfide reductase	218.00
2040	GZ55_RS06490	carbamoyl phosphate synthase large subunit	217.95
2041	GZ55_RS07495	DNA-binding response regulator	217.94
2042	GZ55_RS05830	translocation-enhancing protein TepA	217.94
2043	GZ55_RS00910	hypothetical protein	217.94
2044	GZ55_RS16265	flagellar basal body-associated protein FliL	217.85
2045	GZ55_RS06100	3-hydroxybutyryl-CoA dehydrogenase	217.85
2046	GZ55_RS08510	hypothetical protein	217.73

2047	GZ55_RS05715	GCN5 family acetyltransferase	217.73
2048	GZ55_RS01155	succinate dehydrogenase flavoprotein subunit	217.59
2049	GZ55_RS14390	acetoin dehydrogenase	217.46
2050	GZ55_RS00795	molybdenum cofactor biosynthesis protein	217.34
2051	GZ55_RS08020	cystathionine gamma-synthase	217.15
2052	GZ55_RS14205	MarR family transcriptional regulator	216.88
2053	GZ55_RS05795	peptidase M16	216.84
2054	GZ55_RS02370	RNA polymerase sigma factor RpoD	216.57
2055	GZ55_RS06760	sporulation integral membrane protein YlbJ	216.44
2056	GZ55_RS02875	sigma-54-dependent Fis family transcriptional	216.40
2057	GZ55_RS16685	hypothetical protein	216.34
2058	GZ55_RS14100	hypothetical protein	216.34
2059	GZ55_RS11585	methyl-accepting chemotaxis protein	216.18
2060	GZ55_RS13550	MFS transporter	216.13
2061	GZ55_RS08860	tryptophan transporter	216.09
2062	GZ55_RS02355	phosphoenolpyruvate synthase regulatory protein	216.02
2063	GZ55_RS04475	MerR family transcriptional regulator	216.02
2064	GZ55_RS07000	adenine deaminase	215.96
2065	GZ55_RS09675	hypothetical protein	215.91
2066	GZ55_RS07070	macrolide ABC transporter ATP-binding protein	215.77
2067	GZ55_RS12580	hypothetical protein	215.67
2068	GZ55_RS15280	membrane protein	215.67
2069	GZ55_RS04730	sulfite reductase [NADPH] flavoprotein,	215.55
2070	GZ55_RS00195	nucleoside triphosphatase YtkD	215.52
2071	GZ55_RS13285	PTS beta-glucoside transporter subunit EIIBCA	215.52
2072	GZ55_RS13325	hypothetical protein	215.42
2073	GZ55_RS02840	DNA repair protein RecN	215.21
2074	GZ55_RS06095	flagellar motor switch protein FlIM	215.17
2075	GZ55_RS05200	3-methylitaconate isomerase	214.84
2076	GZ55_RS17165	sporulation protein	214.84
2077	GZ55_RS05985	isoprenyl transferase	214.84
2078	GZ55_RS11060	GntR family transcriptional regulator	214.84
2079	GZ55_RS01175	hypothetical protein	214.84
2080	GZ55_RS00505	NAD-dependent malic enzyme	214.65
2081	GZ55_RS07245	MFS transporter	214.61
2082	GZ55_RS04480	ABC transporter	214.49
2083	GZ55_RS12740	purine permease	214.35
2084	GZ55_RS16710	transcription factor FapR	214.28
2085	GZ55_RS06310	alpha,alpha-phosphotrehalase	214.28
2086	GZ55_RS12625	AsnC family transcriptional regulator	214.17
2087	GZ55_RS17515	short-chain dehydrogenase	214.02
2088	GZ55_RS13725	D-ribose pyranase	214.02
2089	GZ55_RS07775	MFS transporter	214.02
2090	GZ55_RS11975	30S ribosomal protein S9	214.02
2091	GZ55_RS15030	3-dehydroquinate synthase	213.96
2092	GZ55_RS03590	polyamine ABC transporter ATP-binding protein	213.96
2093	GZ55_RS02490	phosphate-binding protein	213.79

2094	GZ55_RS06675	UDP-N-acetylmuramoyl-L-alanine--D-glutamate	213.66
2095	GZ55_RS13825	ribosome maturation factor RimM	213.62
2096	GZ55_RS17520	peroxiredoxin	213.62
2097	GZ55_RS06245	acetyltransferase	213.62
2098	GZ55_RS03280	DNA starvation/stationary phase protection	213.37
2099	GZ55_RS13385	peptidyl-prolyl cis-trans isomerase	213.37
2100	GZ55_RS07330	hypothetical protein	213.37
2101	GZ55_RS14055	metallopeptidase	213.37
2102	GZ55_RS12700	GNAT family N-acetyltransferase	213.37
2103	GZ55_RS05185	aldose epimerase	213.37
2104	GZ55_RS00165	nucleoid occlusion protein	213.37
2105	GZ55_RS07560	magnesium transporter	213.18
2106	GZ55_RS05905	ATP-dependent DNA helicase RecQ	213.01
2107	GZ55_RS03420	ribosome-binding factor A	213.01
2108	GZ55_RS12675	dTDP-glucose 4,6-dehydratase	212.84
2109	GZ55_RS13555	ABC transporter ATP-binding protein	212.77
2110	GZ55_RS00220	glycerol acyltransferase	212.69
2111	GZ55_RS04245	hypothetical protein	212.64
2112	GZ55_RS09810	transcriptional regulator Spx	212.40
2113	GZ55_RS08220	transcriptional regulator	212.40
2114	GZ55_RS11815	CDP-glycerol--glycerophosphate	212.22
2115	GZ55_RS01975	GntR family transcriptional regulator	212.21
2116	GZ55_RS02990	phosphogluconate dehydrogenase	212.10
2117	GZ55_RS03705	bacillithiol biosynthesis deacetylase BshB1	212.10
2118	GZ55_RS04385	TetR family transcriptional regulator	212.03
2119	GZ55_RS07050	PTS fructose transporter subunit IIA	211.95
2120	GZ55_RS13765	multidrug ABC transporter ATP-binding protein	211.92
2121	GZ55_RS02295	stage IV sporulation protein	211.87
2122	btuC	corrino ABC transporter permease	211.80
2123	GZ55_RS17700	or 3'-5' exonuclease KapD	211.72
2124	GZ55_RS10000	sporulation protein YabP	211.72
2125	GZ55_RS15945	molecular chaperone GroEL	211.49
2126	GZ55_RS01625	DUF421 domain-containing protein	211.44
2127	GZ55_RS04350	membrane protein	211.44
2128	GZ55_RS01665	(p)ppGpp synthetase	211.35
2129	GZ55_RS10030	response regulator	211.20
2130	GZ55_RS04510	nitrite reductase	210.99
2131	GZ55_RS02070	TetR family transcriptional regulator	210.93
2132	GZ55_RS12190	thiol management oxidoreductase	210.81
2133	GZ55_RS08180	GTP-binding protein	210.81
2134	GZ55_RS07470	acyltransferase	210.74
2135	GZ55_RS17490	fatty acid-binding protein DegV	210.64
2136	GZ55_RS04035	energy-coupling factor transporter ATPase	210.64
2137	GZ55_RS08825	hypothetical protein	210.61
2138	GZ55_RS02480	MFS transporter	210.59
2139	GZ55_RS02340	glycine--tRNA ligase subunit alpha	210.49
2140	GZ55_RS08090	hypothetical protein	210.49

2141	GZ55_RS03175	spore coat protein	210.49
2142	GZ55_RS04370	transcriptional regulator	210.35
2143	GZ55_RS01645	hypothetical protein	210.23
2144	GZ55_RS16775	PTS lactose transporter subunit IIB	210.02
2145	GZ55_RS04815	calcium/proton exchanger	210.02
2146	GZ55_RS17345	50S ribosomal protein L4	209.68
2147	GZ55_RS01410	aspartate aminotransferase family protein	209.61
2148	GZ55_RS00325	biphenyl 2,3-dioxygenase	209.49
2149	GZ55_RS10550	ABC transporter permease	209.43
2150	GZ55_RS01900	aldehyde dehydrogenase family protein	209.43
2151	GZ55_RS04740	hypothetical protein	209.43
2152	GZ55_RS14765	LamB/YcsF family protein	209.32
2153	GZ55_RS05625	hypothetical protein	209.23
2154	GZ55_RS14305	hypothetical protein	209.23
2155	GZ55_RS10280	MerR family transcriptional regulator	209.23
2156	GZ55_RS08305	3-oxoacyl-ACP synthase III	209.01
2157	GZ55_RS00335	leucine--tRNA ligase	208.97
2158	GZ55_RS03720	bifunctional biotin--[acetyl-CoA-carboxylase]	208.95
2159	GZ55_RS11570	phytoene desaturase	208.95
2160	GZ55_RS08530	peptide chain release factor 2	208.95
2161	GZ55_RS11635	flagellar hook-associated protein FlgK	208.91
2162	GZ55_RS12685	S-adenosylmethionine:tRNA	208.89
2163	GZ55_RS01605	spore coat protein	208.89
2164	GZ55_RS17415	membrane protein	208.84
2165	GZ55_RS17145	50S ribosomal protein L6	208.84
2166	GZ55_RS05025	N-acetyltransferase	208.75
2167	GZ55_RS09580	alcohol dehydrogenase	208.71
2168	GZ55_RS14035	spore protease YyaC	208.68
2169	GZ55_RS00440	16S rRNA pseudouridine(516) synthase	208.55
2170	GZ55_RS12645	oxidoreductase	208.50
2171	GZ55_RS00830	oligoribonuclease	208.34
2172	GZ55_RS08540	asparagine synthetase B	208.02
2173	GZ55_RS04715	amino acid ABC transporter substrate-binding	207.68
2174	GZ55_RS09320	acetyl-CoA carboxylase biotin carboxylase	207.68
2175	GZ55_RS01745	carboxylase	207.68
2176	GZ55_RS10720	flagellar export apparatus protein FliQ	207.68
2177	GZ55_RS15140	flagellar assembly protein FliH	207.68
2178	GZ55_RS02790	QacE family quaternary ammonium compound efflux	207.68
2179	GZ55_RS17845	MFS transporter	207.68
2180	GZ55_RS07655	two-component sensor histidine kinase	207.68
2181	GZ55_RS06140	phage holin	207.68
2182	GZ55_RS11175	LysR family transcriptional regulator	207.68
2183	GZ55_RS06070	DNA polymerase III subunit delta'	207.68
2184	GZ55_RS03135	aspartate phosphatase	207.19
2185	GZ55_RS00485	phosphotransferase	206.92
2186	GZ55_RS05235	lactate utilization protein C	206.82

2187	GZ55_RS15225	short-chain dehydrogenase	206.82
2188	GZ55_RS00455	dipeptidase PepV	206.79
2189	GZ55_RS16740	transporter	206.76
2190	GZ55_RS14180	amino acid transporter LysE	206.62
2191	GZ55_RS03770	peptidase	206.53
2192	GZ55_RS15305	acyltransferase	206.49
2193	GZ55_RS02275	membrane protein	206.26
2194	GZ55_RS01810	protease	206.21
2195	GZ55_RS11205	ABC transporter ATP-binding protein	206.07
2196	GZ55_RS16565	hypothetical protein	205.97
2197	GZ55_RS08665	GTP cyclohydrolase	205.97
2198	GZ55_RS05205	peptidase	205.63
2199	GZ55_RS03955	formate--tetrahydrofolate ligase	205.46
2200	GZ55_RS14520	UDP-N-acetylmuramoyl-tripeptide--D-alanyl-D-	205.40
2201	GZ55_RS03455	glutamate dehydrogenase	205.24
2202	GZ55_RS12545	hypothetical protein	205.20
2203	GZ55_RS16715	trehalose operon repressor	205.12
2204	GZ55_RS14620	aspartate phosphatase	204.95
2205	GZ55_RS12665	MarR family transcriptional regulator	204.95
2206	GZ55_RS07410	spore coat protein	204.95
2207	GZ55_RS05250	transposase	204.95
2208	GZ55_RS13355	NAD(P)H nitroreductase	204.76
2209	GZ55_RS16235	hypothetical protein	204.54
2210	GZ55_RS03085	type I pantothenate kinase	204.44
2211	GZ55_RS05800	hypothetical protein	204.28
2212	GZ55_RS06520	peptidase M16	204.28
2213	GZ55_RS03485	pseudouridine synthase	204.28
2214	GZ55_RS03740	ATP-dependent helicase DinG	204.11
2215	GZ55_RS12050	fructokinase	204.10
2216	GZ55_RS10790	phosphatase	204.10
2217	GZ55_RS07880	chemotaxis protein	203.91
2218	GZ55_RS08755	peptidase M48	203.80
2219	GZ55_RS02860	hypothetical protein	203.72
2220	GZ55_RS06655	GTP-sensing pleiotropic transcriptional	203.69
2221	GZ55_RS06170	dihydropteridine reductase	203.69
2222	GZ55_RS06695	penicillin-binding protein	203.64
2223	GZ55_RS07915	tyrosine recombinase XerC	203.61
2224	GZ55_RS06185	DNA gyrase inhibitor	203.61
2225	GZ55_RS11560	carboxymethylenebutenolidase-related protein	203.44
2226	GZ55_RS15935	CPBP family intramembrane metalloprotease	203.44
2227	GZ55_RS04420	beta-xylosidase	203.42
2228	GZ55_RS00960	Replication initiation and membrane attachment	203.31
2229	GZ55_RS08535	phytoene desaturase	203.17
2230	GZ55_RS06350	thiamine pyrophosphokinase	202.85
2231	GZ55_RS02705	hypothetical protein	202.70
2232	GZ55_RS09280	hypothetical protein	202.70
2233	GZ55_RS00710	bacitracin ABC transporter permease	202.54

2234	GZ55_RS04020	Fis family transcriptional regulator	202.54
2235	GZ55_RS01345	3-isopropylmalate dehydratase small subunit	202.49
2236	GZ55_RS17940	hypothetical protein	202.43
2237	GZ55_RS14580	chemotaxis protein	202.43
2238	GZ55_RS02745	stage III sporulation protein AA	202.29
2239	GZ55_RS04800	amidinotransferase	202.29
2240	GZ55_RS08400	esterase	202.13
2241	GZ55_RS18310	hypothetical protein	202.07
2242	GZ55_RS06815	cytochrome c oxidase assembly factor CtaG	202.01
2243	GZ55_RS00565	hypothetical protein	201.91
2244	GZ55_RS03400	peptidase M23	201.91
2245	GZ55_RS02180	DNA internalization-related competence protein	201.76
2246	GZ55_RS17355	50S ribosomal protein L2	201.71
2247	GZ55_RS15205	L-lactate permease	201.54
2248	GZ55_RS10010	penicillin-binding protein	201.46
2249	GZ55_RS12205	sulfurtransferase FdhD	201.37
2250	GZ55_RS04455	membrane protein	201.32
2251	GZ55_RS04390	pyrroline-5-carboxylate reductase	201.32
2252	GZ55_RS06680	phospho-N-acetylmuramoyl-pentapeptide-	201.29
2253	GZ55_RS03500	type 2 isopentenyl-diphosphate Delta-isomerase	201.27
2254	GZ55_RS01770	Holliday junction resolvase RuvX	201.22
2255	GZ55_RS03015	PTS system, cellobiose-specific IIC component	201.21
2256	GZ55_RS09215	peptidase U32	200.98
2257	GZ55_RS08230	nucleotide exchange factor GrpE	200.98
2258	GZ55_RS17935	hypothetical protein	200.98
2259	GZ55_RS17180	hypothetical protein	200.98
2260	GZ55_RS01805	glycerol-3-phosphate responsive antiterminator	200.98
2261	GZ55_RS18460	hypothetical protein	200.98
2262	GZ55_RS02230	tRNA-Ser	200.98
2263	GZ55_RS07650	hypothetical protein	200.98
2264	GZ55_RS08475	lysine 6-monooxygenase	200.76
2265	GZ55_RS14410	acetoin:2,6-dichlorophenolindophenol	200.67
2266	GZ55_RS12350	protein-(glutamine-N5) methyltransferase,	200.64
2267	GZ55_RS06110	flagellar basal body rod protein FlgG	200.60
2268	GZ55_RS14505	DEAD/DEAH box helicase	200.58
2269	GZ55_RS12225	hypothetical protein	200.55
2270	GZ55_RS01660	adenine phosphoribosyltransferase	200.40
2271	GZ55_RS15060	methyl-accepting chemotaxis protein	200.38
2272	GZ55_RS10470	transcriptional regulator	200.34
2273	GZ55_RS01295	D-alanyl-lipoteichoic acid biosynthesis protein	200.21
2274	GZ55_RS09390	ABC transporter	200.18
2275	GZ55_RS16920	hypothetical protein	200.06
2276	GZ55_RS14805	5-formyltetrahydrofolate cyclo-ligase	199.91
2277	GZ55_RS02530	mannitol-1-phosphate 5-dehydrogenase	199.91
2278	GZ55_RS15830	penicillin binding protein PBP4B	199.87
2279	GZ55_RS01325	ketol-acid reductoisomerase	199.81
2280	GZ55_RS05570	hypothetical protein	199.79

2281	GZ55_RS01270	GTPase HflX	199.79
2282	GZ55_RS08580	spore germination protein GerPB	199.69
2283	GZ55_RS15835	hypothetical protein	199.57
2284	GZ55_RS08425	membrane protein	199.55
2285	GZ55_RS10840	TetR family transcriptional regulator	199.50
2286	GZ55_RS00305	ABC transporter ATP-binding protein	199.45
2287	GZ55_RS11155	endoribonuclease L-PSP	199.38
2288	GZ55_RS04995	Na ⁺ /H ⁺ antiporter subunit G	199.38
2289	GZ55_RS10095	polysaccharide biosynthesis protein EpsC	199.38
2290	GZ55_RS11540	ABC transporter permease	199.29
2291	GZ55_RS04760	phospholipase D family protein	199.27
2292	GZ55_RS05300	DNA-binding protein	199.26
2293	GZ55_RS05040	MFS transporter	199.18
2294	GZ55_RS07385	7-cyano-7-deazaguanine synthase	199.15
2295	GZ55_RS00905	malate dehydrogenase	199.06
2296	GZ55_RS00615	cysteine hydrolase	198.84
2297	GZ55_RS09920	hypothetical protein	198.84
2298	GZ55_RS11195	hypothetical protein	198.84
2299	GZ55_RS18165	collagen-like protein	198.84
2300	GZ55_RS10120	potassium channel protein	198.84
2301	GZ55_RS05255	hypothetical protein	198.84
2302	GZ55_RS05085	hypothetical protein	198.84
2303	GZ55_RS04210	hypothetical protein	198.84
2304	GZ55_RS01280	D-alanine--poly(phosphoribitol) ligase	198.58
2305	GZ55_RS03870	xanthine permease	198.24
2306	GZ55_RS07540	MerR family transcriptional regulator	198.24
2307	GZ55_RS14020	phage hydrolase	198.24
2308	GZ55_RS17930	deoxycytidine kinase	198.24
2309	GZ55_RS05140	cytochrome C biogenesis protein CcdA	198.00
2310	GZ55_RS17020	Mph(B) family macrolide 2'-phosphotransferase	197.96
2311	GZ55_RS07960	epimerase	197.96
2312	GZ55_RS15035	hypothetical protein	197.93
2313	GZ55_RS09670	ABC transporter ATP-binding protein	197.93
2314	GZ55_RS01425	hypothetical protein	197.79
2315	GZ55_RS01620	hypothetical protein	197.79
2316	GZ55_RS09260	membrane protein	197.79
2317	GZ55_RS07085	hypothetical protein	197.79
2318	GZ55_RS00290	class D sortase	197.79
2319	GZ55_RS08585	spore germination protein GerPC	197.55
2320	GZ55_RS16525	MerR family transcriptional regulator	197.44
2321	GZ55_RS11075	putrescine importer PuuP	197.35
2322	GZ55_RS04355	MATE family efflux transporter	197.35
2323	GZ55_RS14865	peptidase	197.30
2324	GZ55_RS14260	TetR family transcriptional regulator	197.30
2325	GZ55_RS03330	segregation/condensation protein A	197.27
2326	GZ55_RS18030	terminase	197.20
2327	GZ55_RS09830	hypothetical protein	197.17

2328	GZ55_RS16260	thioesterase	197.17
2329	GZ55_RS05580	N-acetylmuramoyl-L-alanine amidase	197.01
2330	GZ55_RS06915	inositol monophosphatase	196.87
2331	GZ55_RS08275	diguanylate cyclase	196.54
2332	GZ55_RS09245	hypothetical protein	196.46
2333	GZ55_RS04060	hypothetical protein	196.46
2334	GZ55_RS12830	cytochrome aa3 quinol oxidase subunit IV	196.24
2335	GZ55_RS08850	hypothetical protein	196.06
2336	GZ55_RS05130	protein hit	196.06
2337	GZ55_RS06045	flagellum site-determining protein YlxH	195.99
2338	GZ55_RS02785	acetyl-CoA carboxylase biotin carboxyl carrier	195.93
2339	GZ55_RS00390	hypothetical protein	195.81
2340	GZ55_RS03325	phosphodiesterase	195.81
2341	GZ55_RS01220	hypothetical protein	195.81
2342	GZ55_RS11955	spore germination protein	195.77
2343	GZ55_RS08650	N-acetyl-alpha-D-glucosaminyl L-malate synthase	195.72
2344	GZ55_RS11900	membrane protein	195.72
2345	GZ55_RS03710	spore germination protein GerA	195.72
2346	GZ55_RS04430	xylose isomerase	195.58
2347	GZ55_RS16465	glucose-1-phosphate cytidylyltransferase	195.47
2348	GZ55_RS17630	peptidylprolyl isomerase	195.34
2349	GZ55_RS09905	membrane protein	195.15
2350	GZ55_RS13295	teichoic acid D-Ala incorporation-associated	194.70
2351	GZ55_RS18445	stage III sporulation protein AG	194.70
2352	GZ55_RS09210	30S ribosomal protein S1	194.70
2353	GZ55_RS12930	gamma-glutamyl-phosphate reductase	194.70
2354	GZ55_RS12845	DsbA family protein	194.70
2355	GZ55_RS12880	glycerol transporter	194.70
2356	GZ55_RS07635	hypothetical protein	194.70
2357	GZ55_RS03495	cytochrome aa3 quinol oxidase subunit II	194.70
2358	GZ55_RS17330	hypothetical protein	194.70
2359	GZ55_RS09680	holin	194.70
2360	GZ55_RS08185	hypothetical protein	194.70
2361	GZ55_RS02775	hypothetical protein	194.70
2362	GZ55_RS16810	alpha/beta hydrolase	194.70
2363	GZ55_RS01275	hypothetical protein	194.70
2364	GZ55_RS05755	damage-inducible protein CinA	194.24
2365	GZ55_RS09705	hypothetical protein	194.12
2366	GZ55_RS16025	ATPase AAA	194.10
2367	GZ55_RS00205	spermidine/putrescine ABC transporter	193.94
2368	GZ55_RS06370	protein phosphatase	193.94
2369	GZ55_RS12220	hypothetical protein	193.84
2370	GZ55_RS05215	TetR family transcriptional regulator	193.69
2371	GZ55_RS14890	hydrolase	193.69
2372	GZ55_RS15345	TIGR01212 family radical SAM protein	193.49
2373	GZ55_RS00280	ATP-dependent helicase	193.49
2374	GZ55_RS03855	transcriptional regulator	193.49

2375	GZ55_RS13600	ATP-binding protein	193.49
2376	GZ55_RS06175	ATP-dependent protease ATP-binding subunit HslU	193.45
2377	GZ55_RS10360	hypothetical protein	193.36
2378	kbaY	50S ribosomal protein L16	193.36
2379	GZ55_RS17375	tagatose-bisphosphate aldolase	193.36
2380	GZ55_RS06250	hypothetical protein	193.19
2381	GZ55_RS06645	hypothetical protein	193.09
2382	GZ55_RS17115	multidrug ABC transporter ATP-binding protein	193.03
2383	GZ55_RS10440	hypothetical protein	192.98
2384	GZ55_RS04290	flagellar motor switch protein FliG	192.98
2385	GZ55_RS06145	siderophore ABC transporter permease	192.98
2386	GZ55_RS06460	anion permease	192.88
2387	GZ55_RS03470	spore cortex-lytic enzyme	192.80
2388	GZ55_RS10825	hypothetical protein	192.69
2389	GZ55_RS09100	manganese ABC transporter permease	192.69
2390	GZ55_RS02255	tRNA	192.55
2391	GZ55_RS09715	transglycosylase	192.55
2392	GZ55_RS07015	ribosome biogenesis GTPase Der	192.47
2393	GZ55_RS03520	PAS domain-containing sensor histidine kinase	192.47
2394	GZ55_RS08370	acetylglutamate kinase	192.45
2395	GZ55_RS13925	hypothetical protein	192.30
2396	GZ55_RS04005	dihydrofolate reductase	192.30
2397	GZ55_RS00240	cyanate MFS transporter	192.30
2398	GZ55_RS04515	nitrite reductase	192.24
2399	GZ55_RS05695	DNA mismatch repair protein MutS	192.21
2400	GZ55_RS06420	hypothetical protein	192.04
2401	GZ55_RS11535	ATP-dependent Clp protease ATP-binding subunit	191.93
2402	GZ55_RS01360	glucuronoxylanase	191.93
2403	GZ55_RS04870	hypothetical protein	191.93
2404	GZ55_RS07910	peptidase M23	191.93
2405	GZ55_RS04860	methylmalonate-semialdehyde dehydrogenase (CoA	191.90
2406	GZ55_RS07355	YqzE family protein	191.71
2407	GZ55_RS08700	hypothetical protein	191.71
2408	GZ55_RS02635	MFS transporter	191.71
2409	GZ55_RS14300	beta-glucanase	191.51
2410	GZ55_RS16435	MurR/RpiR family transcriptional regulator	191.51
2411	GZ55_RS08375	bifunctional ornithine	191.35
2412	GZ55_RS11255	hypothetical protein	191.29
2413	GZ55_RS14565	chemotaxis protein CheY	191.29
2414	GZ55_RS03055	hypothetical protein	191.08
2415	GZ55_RS06910	hypothetical protein	191.03
2416	GZ55_RS05035	3-isopropylmalate dehydrogenase	190.91
2417	GZ55_RS02005	MarR family transcriptional regulator	190.73
2418	GZ55_RS03360	hypothetical protein	190.73
2419	GZ55_RS13920	pseudouridine synthase	190.73

2420	GZ55_RS07380	small acid-soluble spore protein P	190.73
2421	GZ55_RS05120	6-carboxy-5,6,7,8-tetrahydropterin synthase	190.73
2422	GZ55_RS01195	esterase	190.73
2423	GZ55_RS14785	hypothetical protein	190.73
2424	GZ55_RS07710	dipeptide epimerase	190.38
2425	GZ55_RS03270	diaminopimelate decarboxylase	190.30
2426	GZ55_RS03000	sugar dehydrogenase	190.24
2427	GZ55_RS04015	hemolysin D	190.13
2428	GZ55_RS02500	phosphate ABC transporter, permease protein	190.08
2429	GZ55_RS11335	molybdenum cofactor biosynthesis protein MoaE	189.95
2430	GZ55_RS07095	1-(5-phosphoribosyl)-5-((5-	189.95
2431	GZ55_RS14525	D-alanine--D-alanine ligase A	189.85
2432	GZ55_RS03915	hypothetical protein	189.62
2433	GZ55_RS16930	YggS family pyridoxal phosphate enzyme	189.62
2434	GZ55_RS06560	multidrug resistance protein SMR	189.62
2435	GZ55_RS01915	amino acid ABC transporter ATP-binding protein	189.52
2436	GZ55_RS02725	3-dehydroquinate dehydratase	189.44
2437	GZ55_RS03505	hypothetical protein	189.32
2438	GZ55_RS03835	hypothetical protein	189.32
2439	GZ55_RS11950	spore germination protein	189.18
2440	GZ55_RS06565	glyoxal reductase	189.14
2441	GZ55_RS00360	laccase	189.14
2442	GZ55_RS10830	metal ABC transporter substrate-binding protein	189.10
2443	GZ55_RS06455	sulfate adenylyltransferase	189.05
2444	GZ55_RS06850	deoxyribodipyrimidine photo-lyase	189.00
2445	GZ55_RS12255	adhesin	188.80
2446	GZ55_RS00135	stage IV sporulation protein FA	188.80
2447	GZ55_RS05855	sporulation protein	188.80
2448	rnhA	dipicolinate synthase subunit B	188.80
2449	GZ55_RS01485	F0F1 ATP synthase subunit epsilon	188.80
2450	GZ55_RS01510	ribonuclease H	188.80
2451	GZ55_RS02605	competence protein ComGB	188.53
2452	GZ55_RS01580	serine/threonine protein kinase	188.36
2453	GZ55_RS09300	alanine acetyltransferase	188.28
2454	GZ55_RS06180	HslU--HslV peptidase proteolytic subunit	188.28
2455	GZ55_RS02460	hypothetical protein	188.28
2456	GZ55_RS02900	2-oxoisovalerate dehydrogenase	188.23
2457	GZ55_RS06265	signal recognition particle protein	188.17
2458	GZ55_RS06800	membrane protein	187.99
2459	GZ55_RS12140	2-hydroxy-3-keto-5-methylthiopentenyl-1-	187.99
2460	GZ55_RS07435	nitrogen regulatory PII	187.99
2461	GZ55_RS14830	BioY family transporter	187.85
2462	GZ55_RS10230	NAD(P)H dehydrogenase	187.85
2463	GZ55_RS12570	octanoyl-[GcvH]:protein N-octanoyltransferase	187.80
2464	GZ55_RS15250	toxic anion resistance protein	187.77
2465	GZ55_RS00655	branched-chain amino acid transporter	187.75
2466	GZ55_RS10150	NAD(P)-dependent oxidoreductase	187.66

2467	GZ55_RS06600	hypothetical protein	187.66
2468	GZ55_RS00605	esterase	187.49
2469	GZ55_RS08740	chemotaxis protein	187.49
2470	GZ55_RS07945	ribosomal-protein-serine acetyltransferase	187.29
2471	GZ55_RS08385	MFS transporter	187.25
2472	GZ55_RS04165	SAM-dependent methyltransferase	187.18
2473	GZ55_RS10965	glycine/betaine ABC transporter ATP-binding	187.08
2474	GZ55_RS02525	50S ribosomal protein L33	186.91
2475	GZ55_RS06780	hypothetical protein	186.91
2476	GZ55_RS04340	hypothetical protein	186.91
2477	GZ55_RS03105	regulator	186.91
2478	GZ55_RS02130	ribosome biogenesis GTPase YqeH	186.74
2479	GZ55_RS06020	chemotaxis protein CheD	186.54
2480	GZ55_RS04215	hypothetical protein	186.38
2481	GZ55_RS11920	hypothetical protein	186.29
2482	GZ55_RS10165	AI-2E family transporter	186.24
2483	GZ55_RS06190	FADH(2)-oxidizing	186.20
2484	GZ55_RS10445	iron ABC transporter substrate-binding protein	186.13
2485	GZ55_RS12035	6-phospho-beta-glucosidase	185.98
2486	GZ55_RS03020	hypothetical protein	185.98
2487	GZ55_RS13195	hypothetical protein	185.98
2488	GZ55_RS10110	histidine kinase	185.86
2489	GZ55_RS00190	stress protein	185.77
2490	GZ55_RS13435	hypothetical protein	185.73
2491	GZ55_RS07890	flagellin	185.68
2492	GZ55_RS15920	twin-arginine translocase subunit TatC	185.43
2493	GZ55_RS00315	macrolide ABC transporter permease	185.35
2494	GZ55_RS12620	MFS transporter	185.14
2495	GZ55_RS10530	thiol reductase thioredoxin	185.06
2496	GZ55_RS18295	potassium:proton antiporter	185.06
2497	GZ55_RS11295	hypothetical protein	184.97
2498	GZ55_RS01205	sporulation protein	184.80
2499	GZ55_RS15625	sulfurtransferase	184.80
2500	GZ55_RS14105	DNA replication and repair protein RecF	184.73
2501	GZ55_RS16765	MFS transporter	184.67
2502	GZ55_RS12175	hypothetical protein	184.61
2503	GZ55_RS16185	acetylornithine deacetylase	184.55
2504	GZ55_RS01910	amino acid ABC transporter substrate-binding	184.53
2505	GZ55_RS11630	flagellar hook-associated protein FlgL	184.45
2506	GZ55_RS01965	6-phospho-3-hexuloisomerase	184.23
2507	GZ55_RS06330	elongation factor P	184.23
2508	GZ55_RS02735	hypothetical protein	184.23
2509	GZ55_RS04985	TetR family transcriptional regulator	184.08
2510	GZ55_RS14275	oxidoreductase	183.97
2511	GZ55_RS07550	transcriptional regulator	183.89
2512	GZ55_RS10115	quorum-sensing protein	183.85
2513	GZ55_RS07820	PTS galactitol transporter subunit IIC	183.65

2514	GZ55_RS03030	glucose-6-phosphate dehydrogenase	183.62
2515	GZ55_RS05710	tRNA (N6-isopentenyl	183.61
2516	GZ55_RS04045	Nif3-like dinuclear metal center hexameric	183.25
2517	GZ55_RS16010	alpha/beta hydrolase	183.25
2518	GZ55_RS02385	hypothetical protein	183.25
2519	GZ55_RS03530	pantoate--beta-alanine ligase	183.25
2520	GZ55_RS03730	hypothetical protein	183.25
2521	GZ55_RS12055	acetyltransferase	183.25
2522	GZ55_RS09865	LLM class flavin-dependent oxidoreductase	183.25
2523	GZ55_RS15080	diguanylate cyclase	183.25
2524	GZ55_RS04550	chemotaxis protein	183.25
2525	GZ55_RS04600	hypothetical protein	183.25
2526	GZ55_RS03045	hypothetical protein	183.25
2527	GZ55_RS08245	protease	183.25
2528	GZ55_RS15970	copper oxidase	183.25
2529	GZ55_RS03560	heptaprenyl diphosphate synthase	182.53
2530	fabG	3-ketoacyl-ACP reductase	182.51
2531	GZ55_RS04540	D-alanyl-D-alanine carboxypeptidase	182.51
2532	GZ55_RS01800	SAM-dependent methyltransferase	182.42
2533	GZ55_RS11580	phosphohydrolase	182.27
2534	GZ55_RS02150	ribosomal subunit interface protein	182.27
2535	GZ55_RS04645	spore germination protein	182.14
2536	GZ55_RS17455	hypothetical protein	182.06
2537	GZ55_RS07280	oxidoreductase	181.99
2538	GZ55_RS11140	glycosyl transferase	181.95
2539	GZ55_RS02060	beta-ketoacyl-[acyl-carrier-protein] synthase	181.91
2540	GZ55_RS02465	hypothetical protein	181.82
2541	GZ55_RS16870	MFS transporter	181.76
2542	GZ55_RS08965	biotin--[acetyl-CoA-carboxylase] ligase	181.72
2543	GZ55_RS01170	hypothetical protein	181.72
2544	GZ55_RS14290	MFS transporter	181.72
2545	GZ55_RS05965	proline--tRNA ligase	181.63
2546	GZ55_RS10515	methionine ABC transporter permease	181.61
2547	GZ55_RS06960	2-oxoisovalerate dehydrogenase subunit beta	181.56
2548	GZ55_RS07840	hypothetical protein	181.47
2549	GZ55_RS18040	orthopoxvirus pf05708 family protein	181.47
2550	GZ55_RS10700	altronate hydrolase	181.41
2551	GZ55_RS07955	LysR family transcriptional regulator	181.37
2552	GZ55_RS17735	S26 family signal peptidase	181.31
2553	GZ55_RS09405	peptidyl-tRNA hydrolase	181.31
2554	GZ55_RS05220	phosphatase	181.27
2555	GZ55_RS06375	23S rRNA (adenine(2503)-C(2))- methyltransferase	181.22
2556	GZ55_RS08030	hypothetical protein	181.12
2557	GZ55_RS02940	peptide ABC transporter ATP-binding protein	180.97
2558	GZ55_RS01525	prephenate dehydratase	180.75
2559	GZ55_RS08300	hypothetical protein	180.59

2560	GZ55_RS02795	cytochrome B oxidoreductase	180.59
2561	GZ55_RS06825	beta-ketoacyl-[acyl-carrier-protein] synthase	180.59
2562	GZ55_RS15275	citrate lyase subunit beta	180.48
2563	GZ55_RS02905	alpha-ketoacid dehydrogenase subunit beta	180.46
2564	GZ55_RS02420	ABC transporter	180.42
2565	GZ55_RS17640	type III pantothenate kinase	180.42
2566	GZ55_RS02680	glycine dehydrogenase	180.39
2567	GZ55_RS14595	GCN5 family acetyltransferase	180.36
2568	GZ55_RS04845	glycerol-3-phosphate ABC transporter permease	180.30
2569	GZ55_RS02445	hypothetical protein	180.22
2570	GZ55_RS09790	positive control sigma-like factor	180.07
2571	GZ55_RS13740	cytochrome c assembly protein	179.94
2572	GZ55_RS01390	membrane protein	179.94
2573	GZ55_RS14855	NAD(P)H nitroreductase	179.73
2574	GZ55_RS14200	transcriptional regulator	179.73
2575	GZ55_RS17015	sporulation protein	179.73
2576	GZ55_RS03275	hypothetical protein	179.52
2577	GZ55_RS12950	peptide ABC transporter ATP-binding protein	179.48
2578	GZ55_RS16055	alanine acetyltransferase	179.41
2579	GZ55_RS13290	transcription antiterminator LicT	179.29
2580	GZ55_RS08565	spore coat protein	179.23
2581	GZ55_RS09910	peptidase	179.19
2582	GZ55_RS17470	30S ribosomal protein S13	178.74
2583	GZ55_RS17315	30S ribosomal protein S7	178.58
2584	GZ55_RS13615	Crp/Fnr family transcriptional regulator	178.41
2585	GZ55_RS04750	membrane protein	178.41
2586	GZ55_RS09410	glycerol phosphate lipoteichoic acid synthase	178.15
2587	GZ55_RS13305	hypothetical protein	178.01
2588	GZ55_RS11390	hypothetical protein	178.01
2589	GZ55_RS03785	membrane protein	178.01
2590	GZ55_RS02565	cobalt transporter	178.01
2591	GZ55_RS10205	type VII secretion protein EssB	177.81
2592	GZ55_RS04440	1,4-beta-xylanase	177.62
2593	GZ55_RS16935	TetR family transcriptional regulator	177.55
2594	GZ55_RS04200	S-ribosylhomocysteine lyase	177.45
2595	GZ55_RS00150	spore germination protein GerT	177.45
2596	GZ55_RS02865	hypothetical protein	177.29
2597	GZ55_RS08795	TetR family transcriptional regulator	177.25
2598	GZ55_RS05160	transketolase	177.21
2599	GZ55_RS12210	MFS transporter	177.17
2600	GZ55_RS06210	succinyl-CoA ligase subunit beta	177.09
2601	GZ55_RS05770	hypothetical protein	177.00
2602	GZ55_RS12075	phage holin	177.00
2603	GZ55_RS16815	aspartate phosphatase	177.00
2604	GZ55_RS14905	hypothetical protein	177.00
2605	GZ55_RS14600	amino acid ABC transporter substrate-binding	177.00
2606	GZ55_RS09660	delta-lactam-biosynthetic de-N-acetylase	177.00

2607	GZ55_RS05690	DNA mismatch repair protein MutL	176.89
2608	GZ55_RS00805	argininosuccinate lyase	176.85
2609	GZ55_RS11110	acetyltransferase	176.85
2610	GZ55_RS01300	hypothetical protein	176.75
2611	GZ55_RS04935	5-dehydro-2-deoxygluconokinase	176.69
2612	GZ55_RS03290	TetR family transcriptional regulator	176.64
2613	GZ55_RS08845	ABC transporter ATP-binding protein	176.57
2614	GZ55_RS12690	spore coat protein	176.57
2615	GZ55_RS07490	zinc metalloprotease HtpX	176.53
2616	GZ55_RS12440	aminoacetone oxidase family FAD-binding enzyme	176.33
2617	GZ55_RS05790	MarR family transcriptional regulator	176.33
2618	GZ55_RS00430	acyl-CoA dehydrogenase	176.33
2619	GZ55_RS07580	peptidase	176.08
2620	GZ55_RS06200	DNA processing protein DprA	175.94
2621	GZ55_RS06295	beta-ketoacyl-ACP reductase	175.86
2622	GZ55_RS08145	bis(5'-nucleosyl)-tetrphosphatase	175.86
2623	GZ55_RS14325	hypothetical protein	175.78
2624	GZ55_RS05605	hypothetical protein	175.51
2625	GZ55_RS04285	hypothetical protein	175.51
2626	GZ55_RS07430	methylthioribulose 1-phosphate dehydratase	175.51
2627	GZ55_RS16645	hypothetical protein	175.32
2628	GZ55_RS05810	MFS transporter	175.18
2629	GZ55_RS17450	NAD-dependent protein deacylase	175.15
2630	GZ55_RS09035	MFS transporter	175.15
2631	GZ55_RS14925	type I methionyl aminopeptidase	175.15
2632	GZ55_RS01025	membrane protein	175.01
2633	GZ55_RS11370	hypothetical protein	174.69
2634	GZ55_RS14155	branched-chain amino acid transporter AzlD	174.69
2635	GZ55_RS01480	septum site-determining protein MinD	174.36
2636	GZ55_RS05765	membrane protein	174.21
2637	GZ55_RS04075	peptide-methionine (S)-S-oxide reductase	174.04
2638	GZ55_RS01905	amino acid ABC transporter permease	173.81
2639	GZ55_RS05835	RNase J family beta-CASP ribonuclease	173.69
2640	GZ55_RS01285	D-alanyl-lipoteichoic acid biosynthesis protein	173.51
2641	GZ55_RS07035	hypothetical protein	173.07
2642	GZ55_RS11760	ABC transporter ATP-binding protein	173.07
2643	GZ55_RS17240	aspartyl-phosphate phosphatase	173.07
2644	GZ55_RS01945	hypothetical protein	173.07
2645	GZ55_RS18455	ribonuclease III	173.07
2646	GZ55_RS08570	hypothetical protein	173.07
2647	GZ55_RS00270	tetraprenyl-beta-curcumen synthase	173.07
2648	GZ55_RS09425	membrane protein	173.07
2649	GZ55_RS04320	hypothetical protein	173.07
2650	GZ55_RS17650	hypothetical protein	173.07
2651	GZ55_RS14985	hypoxanthine phosphoribosyltransferase	173.07
2652	GZ55_RS04530	DUF421 domain-containing protein	172.33

2653	GZ55_RS02700	peptidase U32	171.88
2654	GZ55_RS14740	hypothetical protein	171.71
2655	GZ55_RS09295	IclR family transcriptional regulator	171.71
2656	GZ55_RS11690	LytR family transcriptional regulator	171.17
2657	GZ55_RS16390	MurR/RpiR family transcriptional regulator	171.03
2658	GZ55_RS17045	glycosyltransferase	170.96
2659	GZ55_RS04905	MFS transporter	170.88
2660	GZ55_RS06870	primosomal protein DnaI	170.84
2661	GZ55_RS11220	glutaminase A	170.84
2662	GZ55_RS00965	nickel transporter permease NikB	170.84
2663	GZ55_RS17320	elongation factor G	170.82
2664	GZ55_RS00420	glycine/betaine ABC transporter permease	170.70
2665	GZ55_RS04270	superoxide dismutase	170.54
2666	GZ55_RS03230	RNA polymerase sporulation sigma factor SigF	170.36
2667	GZ55_RS16885	threonine--tRNA ligase	170.10
2668	GZ55_RS02205	stage II sporulation protein P	170.06
2669	GZ55_RS00920	DNA polymerase I	169.92
2670	GZ55_RS07740	D-aminopeptidase	169.92
2671	GZ55_RS07765	hypothetical protein	169.92
2672	GZ55_RS10045	ABC transporter permease	169.60
2673	GZ55_RS06325	L-serine dehydratase, iron-sulfur-dependent	169.15
2674	GZ55_RS11425	membrane protein	169.04
2675	GZ55_RS18045	antiholin LrgA	168.39
2676	GZ55_RS08210	hypothetical protein	168.39
2677	GZ55_RS02210	HxlR family transcriptional regulator	168.39
2678	GZ55_RS04190	adaptor protein MecA	168.39
2679	GZ55_RS13460	molybdenum ABC transporter permease subunit	168.39
2680	GZ55_RS01000	hypothetical protein	168.39
2681	GZ55_RS10780	hypothetical protein	168.39
2682	GZ55_RS02360	DUF188 domain-containing protein	167.89
2683	GZ55_RS03200	site-specific tyrosine recombinase XerD	167.82
2684	GZ55_RS09095	anti-sigma-M factor	167.68
2685	GZ55_RS10055	L-malate permease	167.64
2686	GZ55_RS10130	hypothetical protein	167.57
2687	GZ55_RS03860	carboxypeptidase M32	167.55
2688	GZ55_RS12385	transcription termination factor Rho	167.41
2689	GZ55_RS14170	LysR family transcriptional regulator	167.26
2690	GZ55_RS08615	hypothetical protein	166.89
2691	GZ55_RS05045	exonuclease sbcCD subunit D	166.89
2692	GZ55_RS07200	manganese catalase	166.70
2693	GZ55_RS09955	general stress protein	166.46
2694	GZ55_RS04400	hypothetical protein	166.17
2695	GZ55_RS01190	helix-turn-helix transcriptional regulator	166.15
2696	GZ55_RS03660	menaquinol-cytochrome C reductase iron-sulfur	165.90
2697	GZ55_RS14185	DNA-binding protein	165.70
2698	GZ55_RS03235	stage V sporulation protein AA	165.54
2699	GZ55_RS14335	mechanosensitive ion channel protein MscL	165.20

2700	GZ55_RS17475	hypothetical protein	165.20
2701	GZ55_RS12065	30S ribosomal protein S11	165.20
2702	GZ55_RS15960	flagellar basal body rod protein FlgC	165.05
2703	GZ55_RS06160	MarR family transcriptional regulator	165.05
2704	GZ55_RS01340	3-isopropylmalate dehydratase large subunit	165.00
2705	GZ55_RS02240	molecular chaperone DnaJ	164.83
2706	GZ55_RS04050	hypothetical protein	164.83
2707	GZ55_RS09255	RNA pseudouridine synthase	164.50
2708	GZ55_RS10735	iron ABC transporter permease	164.44
2709	GZ55_RS04470	hypothetical protein	163.96
2710	GZ55_RS11595	3,4-dihydroxy-2-butanone-4-phosphate synthase	163.96
2711	GZ55_RS17685	GCN5-related N-acetyltransferase	163.96
2712	GZ55_RS03310	chemotaxis protein CheY	163.96
2713	GZ55_RS06025	flagellar biosynthesis chaperone	163.96
2714	GZ55_RS18185	flagellar protein FliT	163.96
2715	GZ55_RS01095	RNA-binding protein S1	163.96
2716	GZ55_RS06130	hypothetical protein	163.96
2717	GZ55_RS09640	site-specific integrase	163.39
2718	GZ55_RS16175	acyl CoA:acetate/3-ketoacid CoA transferase	163.24
2719	GZ55_RS08160	GTP pyrophosphokinase	163.18
2720	GZ55_RS02750	stage III sporulation protein SpoAB	163.01
2721	GZ55_RS11750	N-acetylmuramoyl-L-alanine amidase	162.97
2722	GZ55_RS04335	methylisocitrate lyase	162.89
2723	GZ55_RS07120	hypothetical protein	162.89
2724	GZ55_RS15500	PTS glucose transporter subunit IIA	162.89
2725	GZ55_RS02850	sporulation transcription factor Spo0A	162.74
2726	GZ55_RS03695	4-hydroxy-tetrahydrodipicolinate reductase	162.74
2727	GZ55_RS03300	hypothetical protein	162.53
2728	GZ55_RS04520	hypothetical protein	162.53
2729	GZ55_RS03095	nitrite reductase large subunit	162.53
2730	GZ55_RS01330	2-isopropylmalate synthase	162.38
2731	GZ55_RS08235	ABC transporter ATP-binding protein	162.36
2732	GZ55_RS06860	cell division protein FtsW	161.93
2733	GZ55_RS06505	trp RNA-binding attenuation protein MtrB	161.83
2734	GZ55_RS06030	chemotaxis protein CheW	161.83
2735	GZ55_RS03555	aspartate carbamoyltransferase	161.83
2736	GZ55_RS08150	RNA pseudouridine synthase	161.69
2737	GZ55_RS13420	oxidoreductase	161.46
2738	GZ55_RS11625	hypothetical protein	161.41
2739	GZ55_RS17095	enoyl-[acyl-carrier-protein] reductase	161.35
2740	GZ55_RS07105	molybdopterin molybdenumtransferase	161.26
2741	GZ55_RS12505	purine-nucleoside phosphorylase	161.13
2742	GZ55_RS04150	hypothetical protein	161.13
2743	GZ55_RS18095	membrane protein	161.13
2744	GZ55_RS11480	MFS transporter	161.01
2745	GZ55_RS10860	proton glutamate symport protein	160.88
2746	GZ55_RS16485	ribonuclease Z	160.79

2747	GZ55_RS03035	6,7-dimethyl-8-ribityllumazine synthase	160.79
2748	GZ55_RS05900	tRNA pseudouridine(55) synthase	160.79
2749	GZ55_RS03315	hypothetical protein	160.79
2750	GZ55_RS04915	fructose-1,6-bisphosphate aldolase, class II	160.58
2751	GZ55_RS14310	hypothetical protein	160.21
2752	GZ55_RS07100	molybdopterin-guanine dinucleotide biosynthesis	160.21
2753	GZ55_RS04365	alcohol dehydrogenase	160.21
2754	GZ55_RS11355	ATP phosphoribosyltransferase	160.13
2755	GZ55_RS08990	transcriptional regulator	160.03
2756	GZ55_RS05595	ribonucleotide-diphosphate reductase	159.98
2757	GZ55_RS11210	OxaA-like protein precursor	159.76
2758	GZ55_RS02975	acyl carrier protein	159.76
2759	GZ55_RS08065	sporulation protein	159.76
2760	GZ55_RS06290	ABC transporter substrate-binding protein	159.76
2761	GZ55_RS08255	preprotein translocase subunit SecE	159.76
2762	GZ55_RS10920	ABC transporter ATP-binding protein	159.76
2763	GZ55_RS13475	LacI family transcriptional regulator	159.52
2764	GZ55_RS11970	ribokinase	159.48
2765	GZ55_RS04495	glutamate synthase subunit alpha	159.44
2766	GZ55_RS12955	amino acid ABC transporter permease	159.38
2767	GZ55_RS02720	amyloid fiber anchoring/assembly protein TapA	159.30
2768	GZ55_RS02645	hypothetical protein	159.30
2769	GZ55_RS09385	hypothetical protein	159.27
2770	GZ55_RS07585	two-component sensor histidine kinase	159.22
2771	GZ55_RS16855	hypothetical protein	159.17
2772	GZ55_RS03350	spore maturation protein	158.94
2773	GZ55_RS04295	NAD-dependent dehydratase	158.65
2774	GZ55_RS17110	hypothetical protein	158.40
2775	GZ55_RS06945	hypothetical protein	158.40
2776	GZ55_RS02365	DNA primase	158.32
2777	GZ55_RS11095	malonyl CoA-acyl carrier protein transacylase	158.23
2778	GZ55_RS06300	nickel ABC transporter permease subunit NikB	158.23
2779	GZ55_RS11005	ABC transporter ATP-binding protein	158.20
2780	GZ55_RS13400	SAM-dependent methyltransferase	158.18
2781	GZ55_RS13630	MFS transporter	158.13
2782	GZ55_RS16470	sugar dehydratase	158.09
2783	GZ55_RS13855	2-oxoglutarate dehydrogenase	158.02
2784	GZ55_RS10805	glyoxalase/bleomycin resistance/dioxygenase	158.02
2785	GZ55_RS11215	peptide ABC transporter permease	157.87
2786	GZ55_RS05295	TIGR01741 family protein	157.73
2787	GZ55_RS09950	DUF378 domain-containing protein	157.73
2788	GZ55_RS10355	haloacid dehalogenase	157.58
2789	GZ55_RS17265	transcription termination/antitermination	157.51
2790	GZ55_RS02895	dihydrolipoyl dehydrogenase	157.40
2791	GZ55_RS01635	hypothetical protein	157.34
2792	GZ55_RS10960	choline ABC transporter permease	157.19
2793	GZ55_RS07610	Organic hydroperoxide resistance protein OhrA	156.88

2794	GZ55_RS00065	tryptophan-rich sensory protein	156.74
2795	GZ55_RS12015	AsnC family transcriptional regulator	156.74
2796	GZ55_RS06040	chemotaxis response regulator protein-glutamate	156.63
2797	GZ55_RS07065	macrolide ABC transporter permease	156.54
2798	GZ55_RS06035	chemotaxis protein CheA	156.45
2799	GZ55_RS06485	dihydroorotate dehydrogenase electron transfer	156.36
2800	GZ55_RS06135	ATP synthase	156.12
2801	GZ55_RS02375	cytochrome c'	155.76
2802	GZ55_RS03805	sporulation protein	155.76
2803	GZ55_RS15750	Na ⁺ /H ⁺ antiporter subunit E	155.76
2804	GZ55_RS12345	hypothetical protein	155.76
2805	GZ55_RS10085	hypothetical protein	155.76
2806	GZ55_RS09840	AI-2E family transporter	155.35
2807	GZ55_RS03605	anthranilate phosphoribosyltransferase	155.31
2808	GZ55_RS04490	LysR family transcriptional regulator	155.24
2809	GZ55_RS03380	DNA-binding response regulator	155.12
2810	GZ55_RS05285	N-acetyltransferase	154.90
2811	GZ55_RS11835	bifunctional riboflavin kinase/FMN	154.79
2812	GZ55_RS05895	peptide deformylase	154.79
2813	GZ55_RS06765	pantetheine-phosphate adenylyltransferase	154.79
2814	GZ55_RS06390	sugar ABC transporter permease	154.79
2815	GZ55_RS08645	transcriptional regulator	154.66
2816	GZ55_RS15240	glycine/betaine ABC transporter	154.66
2817	GZ55_RS06060	hypothetical protein	154.47
2818	GZ55_RS17420	EscU/YscU/HrcU family type III secretion system	154.47
2819	GZ55_RS11415	GntR family transcriptional regulator	154.47
2820	GZ55_RS03535	50S ribosomal protein L18	154.47
2821	GZ55_RS00120	cytochrome ubiquinol oxidase subunit I	154.36
2822	GZ55_RS03945	D-alanyl-D-alanine carboxypeptidase	154.14
2823	GZ55_RS03345	diglucosyl diacylglycerol synthase	154.14
2824	GZ55_RS12275	ATP synthase subunit delta	154.05
2825	GZ55_RS01380	hypothetical protein	153.84
2826	GZ55_RS06660	UDP-N-acetylenolpyruvoylglucosamine reductase	153.71
2827	GZ55_RS04745	membrane protein	153.57
2828	GZ55_RS01055	phenylalanine--tRNA ligase subunit alpha	153.50
2829	GZ55_RS04140	succinate dehydrogenase	153.46
2830	GZ55_RS01150	phosphatase PAP2 family protein	153.46
2831	GZ55_RS03115	GNAT family N-acetyltransferase	153.37
2832	GZ55_RS17285	50S ribosomal protein L7/L12	153.21
2833	GZ55_RS02025	hypothetical protein	153.12
2834	GZ55_RS14435	sporulation protein	152.90
2835	GZ55_RS07340	anti-sigma B factor RsbW	152.90
2836	GZ55_RS00200	ABC transporter permease	152.82
2837	GZ55_RS06670	stage V sporulation protein E	152.79
2838	GZ55_RS03775	Holliday junction resolvase RecU	152.71
2839	GZ55_RS10760	phosphate-starvation-inducible protein PsiE	152.49
2840	GZ55_RS10450	MarR family transcriptional regulator	152.49

2841	GZ55_RS08290	ABC transporter ATP-binding protein	152.43
2842	GZ55_RS15845	hypothetical protein	152.43
2843	GZ55_RS03395	hypothetical protein	152.38
2844	GZ55_RS15990	ECF RNA polymerase sigma factor SigM	151.96
2845	GZ55_RS09090	hypothetical protein	151.96
2846	GZ55_RS10640	hypothetical protein	151.96
2847	GZ55_RS09760	phage major capsid protein	151.72
2848	GZ55_RS02040	hypothetical protein	151.55
2849	GZ55_RS12130	amino acid ABC transporter ATPase	151.35
2850	GZ55_RS07315	PTS glucose transporter subunit IICBA	151.31
2851	GZ55_RS09595	aspartate phosphatase	151.14
2852	GZ55_RS17055	hypothetical protein	151.04
2853	GZ55_RS12755	uracil-DNA glycosylase	150.96
2854	GZ55_RS16850	hypothetical protein	150.74
2855	GZ55_RS11720	ribosome-recycling factor	150.74
2856	GZ55_RS03795	UDP-glucose 4-epimerase	150.74
2857	GZ55_RS05990	hypothetical protein	150.74
2858	GZ55_RS15950	MxaA domain-containing protein	150.74
2859	GZ55_RS08875	hypothetical protein	150.49
2860	GZ55_RS17270	50S ribosomal protein L11	150.39
2861	GZ55_RS04545	MATE family efflux transporter	150.30
2862	GZ55_RS03140	serine peptidase	150.25
2863	GZ55_RS09745	hypothetical protein	150.13
2864	GZ55_RS06790	phage portal protein	150.13
2865	GZ55_RS15620	hypothetical protein	149.93
2866	GZ55_RS03685	membrane protein	149.87
2867	GZ55_RS07845	anion permease	149.68
2868	GZ55_RS08360	carbamoyl phosphate synthase small subunit	149.60
2869	GZ55_RS17580	lysine--tRNA ligase	149.53
2870	GZ55_RS12090	S49 family peptidase	149.23
2871	GZ55_RS00760	competence protein ComGF	149.23
2872	GZ55_RS02625	rod shape-determining protein	149.23
2873	GZ55_RS02560	MFS transporter	149.05
2874	GZ55_RS17435	50S ribosomal protein L15	148.68
2875	GZ55_RS08390	FAD-binding protein	148.65
2876	GZ55_RS17760	competence protein ComG	148.34
2877	GZ55_RS02600	RIP metalloprotease RseP	148.34
2878	GZ55_RS09815	hypothetical protein	148.34
2879	GZ55_RS12900	transcriptional regulator	148.34
2880	GZ55_RS05970	hypothetical protein	148.34
2881	GZ55_RS16770	osmotically inducible protein C	148.34
2882	GZ55_RS09650	endoribonuclease L-PSP	148.34
2883	GZ55_RS01845	5'-methylthioadenosine/S-adenosylhomocysteine	147.71
2884	GZ55_RS01815	uridine kinase	147.64
2885	GZ55_RS03715	CCA tRNA nucleotidyltransferase	147.60
2886	GZ55_RS01450	septum formation inhibitor Maf	147.56
2887	GZ55_RS07180	CBS domain-containing protein	147.34

2888	GZ55_RS09560	cell division protein FtsW	147.18
2889	GZ55_RS11960	spore germination protein LC	147.18
2890	GZ55_RS04940	methylmalonate-semialdehyde dehydrogenase (CoA)	147.13
2891	GZ55_RS00310	ABC transporter ATP-binding protein	147.07
2892	GZ55_RS03250	stage V sporulation protein AD	147.03
2893	GZ55_RS02650	signal peptidase I	146.79
2894	GZ55_RS04120	lysine 2,3-aminomutase	146.76
2895	GZ55_RS17840	stage 0 sporulation protein	146.73
2896	GZ55_RS14615	hypothetical protein	146.60
2897	GZ55_RS12470	hypothetical protein	146.60
2898	GZ55_RS12585	nucleoside-diphosphate kinase	146.35
2899	GZ55_RS03575	hypothetical protein	146.35
2900	GZ55_RS08325	hypothetical protein	146.03
2901	GZ55_RS09535	hypothetical protein	146.03
2902	GZ55_RS02630	hypothetical protein	146.03
2903	GZ55_RS08415	thiamine biosynthesis protein ThiT	146.03
2904	GZ55_RS10520	methionine ABC transporter ATP-binding protein	145.74
2905	GZ55_RS01265	hypothetical protein	145.57
2906	GZ55_RS04925	3D-(3,5/4)-trihydroxycyclohexane-1,2-dione	145.57
2907	GZ55_RS09555	rod shape-determining protein RodA	145.52
2908	GZ55_RS07295	spore photoproduct lyase	145.32
2909	GZ55_RS14295	nucleotidase	145.27
2910	GZ55_RS02440	TetR family transcriptional regulator	145.27
2911	GZ55_RS00770	sporulation protein	145.20
2912	GZ55_RS16800	mechanosensitive ion channel protein MscS	145.15
2913	GZ55_RS09350	heat-inducible transcriptional repressor HrcA	144.89
2914	GZ55_RS05860	diacylglycerol kinase	144.89
2915	GZ55_RS02225	dipicolinic acid synthetase subunit A	144.89
2916	GZ55_RS02315	hypothetical protein	144.89
2917	GZ55_RS03630	histidinol-phosphate transaminase	144.70
2918	GZ55_RS00395	oxidoreductase	144.56
2919	GZ55_RS01235	hypothetical protein	144.56
2920	GZ55_RS06575	molybdenum ABC transporter ATP-binding protein	144.34
2921	GZ55_RS04640	amino acid transporter	144.30
2922	GZ55_RS05170	serine recombinase	144.22
2923	GZ55_RS01470	rod shape-determining protein MreD	144.06
2924	polYB	DNA polymerase IV	144.01
2925	GZ55_RS09360	membrane protein FxsA	143.78
2926	GZ55_RS06065	flagellar biosynthesis protein FliR	143.78
2927	GZ55_RS11345	hypothetical protein	143.78
2928	GZ55_RS00880	imidazoglycerol-phosphate dehydratase	143.78
2929	GZ55_RS16160	putative beta-lysine N-acetyltransferase	143.61
2930	GZ55_RS08490	2,4-diaminobutyrate decarboxylase	143.59
2931	GZ55_RS04990	DNA-binding protein	143.56
2932	GZ55_RS11385	pyrophosphatase PpaX	143.56

2933	GZ55_RS01550	quinolinate synthetase	143.13
2934	GZ55_RS04945	MFS transporter	143.05
2935	GZ55_RS01740	glutamine ABC transporter permease	142.90
2936	GZ55_RS07130	cell division protein SepF	142.53
2937	GZ55_RS06555	thiol-disulfide oxidoreductase	142.53
2938	GZ55_RS09690	phage portal protein	142.41
2939	GZ55_RS09860	glutamine amidotransferase	142.41
2940	GZ55_RS03025	GntR family transcriptional regulator	142.19
2941	GZ55_RS06430	hypothetical protein	142.10
2942	GZ55_RS11765	LytR family transcriptional regulator	142.06
2943	GZ55_RS00115	membrane protein	142.01
2944	GZ55_RS10655	non-canonical purine NTP pyrophosphatase	141.60
2945	GZ55_RS03155	oxidoreductase	141.60
2946	GZ55_RS01215	chromosome condensation protein CrcB	141.60
2947	GZ55_RS09055	hypothetical protein	141.60
2948	GZ55_RS11115	sugar transferase	141.60
2949	GZ55_RS17885	sigma-K factor-processing regulatory protein	141.60
2950	GZ55_RS00105	o-succinylbenzoate synthase	141.22
2951	GZ55_RS03760	endonuclease III	140.96
2952	GZ55_RS03365	thiol-disulfide oxidoreductase	140.80
2953	GZ55_RS13000	hypothetical protein	140.54
2954	GZ55_RS05610	hypothetical protein	140.33
2955	GZ55_RS10180	membrane protein	140.01
2956	GZ55_RS11695	hypothetical protein	140.01
2957	GZ55_RS01075	phosphohydrolase	140.01
2958	GZ55_RS01765	undecaprenyl-phosphate	140.01
2959	GZ55_RS04680	hypothetical protein	139.67
2960	GZ55_RS03265	spore germination protein	139.58
2961	GZ55_RS16090	1-acyl-sn-glycerol-3-phosphate acyltransferase	139.49
2962	GZ55_RS16915	NETI motif-containing protein	139.49
2963	GZ55_RS09085	hypothetical protein	139.49
2964	GZ55_RS18110	sortase	139.49
2965	GZ55_RS16795	hypothetical protein	139.49
2966	GZ55_RS03650	DUF350 domain-containing protein	138.45
2967	GZ55_RS01090	hypothetical protein	138.45
2968	GZ55_RS07625	hypothetical protein	138.45
2969	GZ55_RS17820	rRNA (cytidine-2'-O-)-methyltransferase	138.22
2970	GZ55_RS03390	RNA polymerase sigma factor SigX	138.11
2971	GZ55_RS03050	NADPH dehydrogenase NamA	137.84
2972	GZ55_RS08760	hypothetical protein	137.44
2973	GZ55_RS10145	hypothetical protein	137.44
2974	GZ55_RS14315	transcription factor YdeB	137.15
2975	GZ55_RS04690	AMP-binding protein	136.93
2976	GZ55_RS03900	5'-3' exonuclease	136.82
2977	GZ55_RS15675	hypothetical protein	136.63
2978	GZ55_RS16825	magnesium and cobalt transport protein CorA	136.29
2979	GZ55_RS06750	hypothetical protein	136.23

2980	GZ55_RS05585	hypothetical protein	136.10
2981	GZ55_RS14285	esterase	135.90
2982	GZ55_RS03570	heptaprenyl diphosphate synthase component II	135.87
2983	GZ55_RS04635	spore germination protein	135.81
2984	GZ55_RS18485	pyridoxal-5'-phosphate-dependent protein subunit	135.45
2985	GZ55_RS17185	ribosome small subunit-dependent GTPase A	135.45
2986	GZ55_RS18255	hypothetical protein	135.45
2987	GZ55_RS16420	hypothetical protein	135.45
2988	GZ55_RS06360	hypothetical protein	135.45
2989	GZ55_RS05000	DUF2639 domain-containing protein	135.45
2990	GZ55_RS14405	alpha-ketoacid dehydrogenase subunit beta	135.05
2991	GZ55_RS04825	allulose-6-phosphate 3-epimerase	134.86
2992	GZ55_RS13570	c-type cytochrome biogenesis protein CcsB	134.76
2993	GZ55_RS03375	aspartate phosphatase	134.76
2994	GZ55_RS09545	acetyltransferase	134.71
2995	GZ55_RS16085	DUF2179 domain-containing protein	134.71
2996	GZ55_RS09835	undecaprenyl-diphosphatase	134.47
2997	GZ55_RS16860	hypothetical protein	134.33
2998	GZ55_RS08555	hypothetical protein	134.10
2999	GZ55_RS03545	transcriptional regulator	133.99
3000	GZ55_RS04460	glutamate 5-kinase	133.63
3001	GZ55_RS17340	membrane protein	133.51
3002	GZ55_RS11650	30S ribosomal protein S12	133.51
3003	GZ55_RS18060	50S ribosomal protein L3	133.51
3004	GZ55_RS17310	hypothetical protein	133.51
3005	GZ55_RS09080	membrane protein	133.31
3006	GZ55_RS06465	phosphoadenosine phosphosulfate reductase	133.13
3007	GZ55_RS04205	EamA family transporter	132.78
3008	GZ55_RS04465	hypothetical protein	132.56
3009	GZ55_RS17060	gamma-glutamyl-phosphate reductase	132.56
3010	GZ55_RS15430	TetR family transcriptional regulator	132.56
3011	GZ55_RS02740	integral inner membrane protein	132.56
3012	GZ55_RS06925	hypothetical protein	132.25
3013	GZ55_RS08770	lipoate--protein ligase	132.16
3014	GZ55_RS17835	initiation-control protein YabA	132.00
3015	GZ55_RS09395	TVP38/TMEM64 family protein	131.63
3016	GZ55_RS02000	hypothetical protein	131.63
3017	GZ55_RS00970	hypothetical protein	131.63
3018	GZ55_RS13155	fosfomycin resistance protein FosB	131.63
3019	GZ55_RS01850	cysteine synthase	131.49
3020	GZ55_RS04175	symporter	131.37
3021	GZ55_RS07320	PtsGHI operon antiterminator	131.17
3022	GZ55_RS02495	phosphate ABC transporter permease subunit PstC	131.06
3023	GZ55_RS10105	DNA-binding response regulator	131.01
3024	GZ55_RS02155	ribosome silencing factor RsfS	130.89
3025	GZ55_RS06440	sirohydrochlorin ferrochelatase	130.79
3026	GZ55_RS17425	30S ribosomal protein S5	130.58

3027	GZ55_RS09785	hypothetical protein	130.41
3028	GZ55_RS03445	hypothetical protein	130.30
3029	GZ55_RS06480	dihydroorotate dehydrogenase B catalytic	130.22
3030	GZ55_RS10845	transcriptional regulator	130.22
3031	GZ55_RS09605	50S ribosomal protein L20	129.80
3032	GZ55_RS16425	hypothetical protein	129.80
3033	GZ55_RS01020	spore germination protein	129.80
3034	GZ55_RS04805	hypothetical protein	129.80
3035	GZ55_RS08595	hypothetical protein	129.80
3036	GZ55_RS06355	ribulose-phosphate 3-epimerase	129.20
3037	GZ55_RS09185	DNA-binding response regulator	129.20
3038	GZ55_RS18325	hypothetical protein	129.20
3039	GZ55_RS03980	hypothetical protein	128.91
3040	GZ55_RS15025	ABC transporter permease	128.91
3041	GZ55_RS06335	Asp23/Gls24 family envelope stress response	128.73
3042	GZ55_RS09930	hypothetical protein	128.61
3043	GZ55_RS03410	RNA-binding protein	128.46
3044	GZ55_RS05760	riboflavin transporter FmnP	128.46
3045	GZ55_RS02140	CDP-diacylglycerol--glycerol-3-phosphate	128.46
3046	GZ55_RS05925	hypothetical protein	128.46
3047	GZ55_RS17255	hypothetical protein	128.02
3048	GZ55_RS07365	RNA polymerase sporulation sigma factor SigH	128.02
3049	GZ55_RS03625	tryptophan synthase subunit alpha	127.86
3050	GZ55_RS08165	hypothetical protein	127.67
3051	GZ55_RS17790	16S rRNA	127.59
3052	GZ55_RS11895	spore germination protein	127.33
3053	GZ55_RS00700	NAD(P)H dehydrogenase	127.15
3054	GZ55_RS13350	monooxygenase	127.15
3055	GZ55_RS18415	YycC family protein	127.15
3056	GZ55_RS07755	tRNA dimethylallyltransferase	126.95
3057	GZ55_RS05620	ring-cleaving dioxygenase	126.95
3058	GZ55_RS06640	hypothetical protein	126.64
3059	GZ55_RS04235	peptidoglycan endopeptidase	126.58
3060	GZ55_RS01245	hypothetical protein	126.57
3061	GZ55_RS04265	sodium transporter	126.56
3062	GZ55_RS04880	two-component sensor histidine kinase	126.47
3063	GZ55_RS01670	D-tyrosyl-tRNA(Tyr) deacylase	126.29
3064	GZ55_RS05615	RNA-binding protein Hfq	126.29
3065	GZ55_RS04095	spore maturation protein	126.16
3066	GZ55_RS02110	chitooligosaccharide deacetylase	126.12
3067	GZ55_RS04580	NADPH-dependent oxidoreductase	126.12
3068	GZ55_RS07875	hypothetical protein	125.61
3069	GZ55_RS16755	ribonuclease	125.52
3070	GZ55_RS08630	hypothetical protein	125.45
3071	GZ55_RS10485	iron-sulfur cluster assembly scaffold protein	125.45
3072	GZ55_RS00765	RDD family protein	125.33
3073	GZ55_RS17895	recombination protein RecR	125.24

3074	GZ55_RS12895	hypothetical protein	125.17
3075	GZ55_RS14750	carboxylesterase	125.11
3076	GZ55_RS10915	kinase inhibitor	125.11
3077	GZ55_RS04610	uroporphyrinogen-III synthase	125.06
3078	GZ55_RS02270	hypothetical protein	124.61
3079	GZ55_RS16385	hypothetical protein	124.61
3080	GZ55_RS17690	tRNA-Glu	124.61
3081	GZ55_RS04130	SMI1 / KNR4 family protein	124.61
3082	GZ55_RS18515	cell division protein DIVIC	124.61
3083	GZ55_RS15810	50S ribosomal protein L33	124.61
3084	GZ55_RS03610	indole-3-glycerol-phosphate synthase	124.11
3085	GZ55_RS17565	DedA family protein	123.99
3086	GZ55_RS04615	KinB-signaling pathway activation protein	123.99
3087	GZ55_RS00775	sporulation protein YtfJ	123.78
3088	GZ55_RS03190	transcriptional repressor	123.78
3089	GZ55_RS14780	RNA polymerase sigma factor SigI	123.62
3090	GZ55_RS07510	glyoxalase	123.62
3091	GZ55_RS04445	oxidoreductase	123.51
3092	GZ55_RS04395	hypothetical protein	123.38
3093	GZ55_RS06150	flagellar M-ring protein FlhF	123.20
3094	GZ55_RS08680	iron ABC transporter ATP-binding protein	123.13
3095	GZ55_RS13820	tRNA-Lys	122.97
3096	GZ55_RS18405	LysR family transcriptional regulator	122.97
3097	GZ55_RS09985	sporulation kinase	122.87
3098	GZ55_RS03370	cytochrome c biogenesis protein	122.38
3099	GZ55_RS06225	ribonuclease HII	122.17
3100	GZ55_RS05665	transcriptional regulator	122.01
3101	GZ55_RS00725	DNA-binding response regulator	121.90
3102	GZ55_RS09775	phage portal protein	121.79
3103	GZ55_RS15870	hypothetical protein	121.37
3104	GZ55_RS14940	cysteine ABC transporter permease	121.37
3105	GZ55_RS11445	tRNA-Asp	121.37
3106	GZ55_RS17610	4-amino-4-deoxychorismate lyase	121.09
3107	GZ55_RS03990	hypothetical protein	120.98
3108	GZ55_RS08130	thiamine phosphate synthase	120.98
3109	GZ55_RS01595	Holliday junction branch migration DNA helicase	120.89
3110	GZ55_RS07780	short-chain dehydrogenase	120.85
3111	GZ55_RS02805	bifunctional 5,10-methylene-tetrahydrofolate	120.66
3112	GZ55_RS09165	catalase	120.30
3113	GZ55_RS06125	rhodanese-like domain-containing protein	119.82
3114	GZ55_RS13605	stage III sporulation protein AD	119.82
3115	GZ55_RS00405	hypothetical protein	119.82
3116	GZ55_RS07670	hypothetical protein	119.82
3117	GZ55_RS06165	flagellar basal body rod protein FlgB	119.82
3118	GZ55_RS03295	N-acetyltransferase	119.82
3119	GZ55_RS14075	esterase	119.82
3120	GZ55_RS02760	coenzyme A pyrophosphatase	119.82

3121	GZ55_RS10100	protein jag	119.82
3122	GZ55_RS03755	DNA replication protein DnaD	119.31
3123	GZ55_RS06475	orotidine-5'-phosphate decarboxylase	119.31
3124	GZ55_RS09065	hypothetical protein	118.90
3125	GZ55_RS17210	PIN/TRAM domain-containing protein	118.84
3126	GZ55_RS04875	DNA-binding response regulator	118.80
3127	GZ55_RS08250	peptide ABC transporter permease	118.68
3128	GZ55_RS12045	biphenyl 2,3-dioxygenase	118.45
3129	GZ55_RS17975	hypothetical protein	118.43
3130	GZ55_RS05825	hypothetical protein	118.30
3131	GZ55_RS18050	hypothetical protein	118.30
3132	GZ55_RS14215	glyoxalase	118.00
3133	GZ55_RS08690	iron ABC transporter permease	117.93
3134	GZ55_RS15880	flagellar hook-basal body complex protein FliE	117.56
3135	GZ55_RS07170	flavodoxin	117.56
3136	GZ55_RS06155	tRNA	117.56
3137	GZ55_RS17410	30S ribosomal protein S8	117.11
3138	GZ55_RS04405	hypothetical protein	116.82
3139	GZ55_RS16985	MarR family transcriptional regulator	116.82
3140	GZ55_RS05750	DNA recombination/repair protein RecA	116.71
3141	GZ55_RS10940	hypothetical protein	116.24
3142	GZ55_RS09925	transcriptional regulator	116.24
3143	GZ55_RS01970	protein disulfide-isomerase	115.86
3144	GZ55_RS07195	carbonic anhydrase	115.38
3145	GZ55_RS02580	hypothetical protein	115.38
3146	GZ55_RS04660	membrane protein	115.38
3147	GZ55_RS01030	carbohydrate diacid regulator	115.38
3148	GZ55_RS04755	membrane protein	115.38
3149	GZ55_RS00140	small acid-soluble spore protein Tlp	115.38
3150	GZ55_RS05090	hypothetical protein	115.38
3151	GZ55_RS01735	glutamine ABC transporter permease	114.85
3152	GZ55_RS07685	PadR family transcriptional regulator	114.32
3153	GZ55_RS10650	sensor histidine kinase	114.08
3154	GZ55_RS12775	hypothetical protein	113.97
3155	GZ55_RS09370	hypothetical protein	113.80
3156	GZ55_RS14025	hypothetical protein	113.69
3157	GZ55_RS12060	hypothetical protein	113.69
3158	GZ55_RS15085	flagella biosynthesis protein FliZ	113.28
3159	GZ55_RS06080	sporulation protein	113.28
3160	GZ55_RS01260	hypothetical protein	112.99
3161	GZ55_RS08940	K ⁺ /H ⁺ antiporter subunit KhtT	112.60
3162	GZ55_RS04770	1-phosphofructokinase	112.35
3163	GZ55_RS03240	stage V sporulation protein AB	112.06
3164	GZ55_RS04300	general stress protein	111.92
3165	GZ55_RS03865	xanthine phosphoribosyltransferase	111.83
3166	engB	YihA family ribosome biogenesis GTP-binding	111.26
3167	GZ55_RS11440	methylglyoxal synthase	111.26

3168	GZ55_RS06845	heme A synthase	111.26
3169	GZ55_RS17595	membrane protein	111.26
3170	GZ55_RS03700	2-amino-4-hydroxy-6-	111.26
3171	GZ55_RS18345	DUF3970 domain-containing protein	111.26
3172	GZ55_RS02135	shikimate dehydrogenase	110.86
3173	GZ55_RS14900	ABC transporter permease	110.76
3174	GZ55_RS13685	hypothetical protein	110.60
3175	GZ55_RS15390	cystine transporter permease	110.27
3176	GZ55_RS12125	hypothetical protein	110.27
3177	GZ55_RS06450	adenylyl-sulfate kinase	110.13
3178	GZ55_RS15795	tRNA-Tyr	109.95
3179	GZ55_RS18160	signal peptidase I	109.31
3180	GZ55_RS08655	YozD family protein	109.31
3181	GZ55_RS11865	2-dehydro-3-deoxy-phosphogluconate aldolase	109.03
3182	GZ55_RS10810	dihydroneopterin aldolase	108.83
3183	GZ55_RS12875	sporulation protein	108.67
3184	GZ55_RS08050	hypothetical protein	108.67
3185	GZ55_RS15295	stress protein	108.49
3186	GZ55_RS04950	inositol 2-dehydrogenase	108.36
3187	GZ55_RS06650	hypothetical protein	108.36
3188	GZ55_RS04070	MarR family transcriptional regulator	108.17
3189	GZ55_RS15685	rhomboid family intramembrane serine protease	107.95
3190	GZ55_RS14490	multidrug ABC transporter permease	107.95
3191	GZ55_RS05705	exodeoxyribonuclease 7 small subunit	107.42
3192	GZ55_RS08505	stage V sporulation protein AE	107.42
3193	GZ55_RS03260	hypothetical protein	107.42
3194	GZ55_RS06735	50S ribosomal protein L32	107.42
3195	GZ55_RS17705	hypothetical protein	107.42
3196	GZ55_RS02815	hypothetical protein	107.42
3197	GZ55_RS02300	PhoH family protein	107.09
3198	GZ55_RS03965	phosphohydrolase	106.90
3199	GZ55_RS17510	transcriptional repressor	106.69
3200	GZ55_RS17160	50S ribosomal protein L13	106.69
3201	GZ55_RS03225	anti-sigma F factor	105.96
3202	GZ55_RS09570	stage II sporulation protein SB	105.60
3203	GZ55_RS07855	hypothetical protein	105.60
3204	GZ55_RS01520	hypothetical protein	105.24
3205	GZ55_RS17925	deoxyguanosine kinase	104.84
3206	GZ55_RS01955	HxlR family transcriptional regulator	104.71
3207	GZ55_RS06580	PTS sorbitol transporter subunit IIA	104.71
3208	GZ55_RS09750	phage portal protein	104.71
3209	GZ55_RS07810	flagellar hook assembly protein FlgD	104.54
3210	GZ55_RS06115	hypothetical protein	104.54
3211	GZ55_RS02380	SAM-dependent methyltransferase	104.28
3212	GZ55_RS01255	hypothetical protein	103.84
3213	GZ55_RS06010	hypothetical protein	103.84
3214	GZ55_RS14060	hypothetical protein	103.84

3215	GZ55_RS09310	hypothetical protein	103.84
3216	GZ55_RS06415	ribosomal RNA small subunit methyltransferase G	103.84
3217	GZ55_RS16275	acyl carrier protein	103.84
3218	GZ55_RS10285	iron-sulfur cluster assembly accessory protein	102.98
3219	GZ55_RS12080	tRNA-Ser	102.70
3220	GZ55_RS00055	flagellar hook-basal body protein FlhP	102.70
3221	GZ55_RS09740	hypothetical protein	102.47
3222	GZ55_RS14210	hypothetical protein	102.14
3223	GZ55_RS15400	camphor resistance protein CrcB	102.14
3224	GZ55_RS09060	hypothetical protein	102.14
3225	GZ55_RS01575	VOC family protein	102.14
3226	GZ55_RS10955	osmoprotectant ABC transporter substrate-binding	101.81
3227	GZ55_RS12290	ATP synthase subunit A	101.72
3228	GZ55_RS13700	ABC transporter ATP-binding protein	101.72
3229	GZ55_RS00730	ABC transporter substrate-binding protein	101.58
3230	GZ55_RS18330	hypothetical protein	101.58
3231	GZ55_RS06215	hypothetical protein	101.58
3232	GZ55_RS04850	maltose ABC transporter permease	101.22
3233	GZ55_RS01930	protoheme IX farnesyltransferase	101.14
3234	GZ55_RS08480	N-acetyltransferase	101.03
3235	GZ55_RS18385	hypothetical protein	101.03
3236	GZ55_RS17360	HxlR family transcriptional regulator	100.49
3237	GZ55_RS00370	30S ribosomal protein S19	100.49
3238	GZ55_RS08640	peptidase M56	100.13
3239	GZ55_RS13125	hypothetical protein	100.03
3240	GZ55_RS01715	heme uptake protein IsdC	100.03
3241	GZ55_RS04125	YokU family protein	99.42
3242	GZ55_RS02090	oxidoreductase	99.29
3243	GZ55_RS02075	hydrolase	99.07
3244	GZ55_RS05195	RsbT co-antagonist protein RsbRB	99.07
3245	GZ55_RS16890	biotin transporter BioY	98.90
3246	GZ55_RS01780	hypothetical protein	98.90
3247	GZ55_RS18490	hypothetical protein	98.90
3248	GZ55_RS03550	GTP cyclohydrolase I FolE	98.38
3249	GZ55_RS08350	ornithine carbamoyltransferase	98.27
3250	GZ55_RS02945	hypothetical protein	97.96
3251	GZ55_RS01610	tRNA-guanine(34) transglycosylase	97.86
3252	GZ55_RS02425	metal ABC transporter permease	97.69
3253	GZ55_RS03110	hypothetical protein	97.35
3254	GZ55_RS14005	GNAT family N-acetyltransferase	97.35
3255	GZ55_RS09430	hypothetical protein	97.35
3256	GZ55_RS00110	30S ribosomal protein S6	97.35
3257	GZ55_RS15740	hypothetical protein	97.35
3258	GZ55_RS17350	50S ribosomal protein L23	97.35
3259	GZ55_RS03665	cytochrome b6	96.92
3260	GZ55_RS05280	undecaprenyl-diphosphatase	96.35
3261	GZ55_RS03745	hypothetical protein	96.15

3262	GZ55_RS00400	membrane protein	95.64
3263	GZ55_RS11660	competence protein ComFB	95.36
3264	GZ55_RS00295	GntR family transcriptional regulator	95.12
3265	GZ55_RS00425	hypothetical protein	94.40
3266	GZ55_RS08315	competence protein ComG	94.40
3267	GZ55_RS17825	hypothetical protein	94.40
3268	GZ55_RS17500	cobalt ABC transporter permease	93.69
3269	GZ55_RS14575	C4-dicarboxylate ABC transporter	93.63
3270	GZ55_RS06305	phosphate acyltransferase	93.55
3271	GZ55_RS00780	2-Cys peroxiredoxin	93.27
3272	GZ55_RS16605	DNA-binding response regulator	93.19
3273	GZ55_RS09305	cold-shock protein	92.99
3274	GZ55_RS00840	hypothetical protein	92.72
3275	GZ55_RS05920	membrane protein	92.53
3276	GZ55_RS00825	50S ribosomal protein L7	92.53
3277	GZ55_RS00175	hypothetical protein	92.30
3278	GZ55_RS06405	DNA-directed RNA polymerase subunit omega	91.62
3279	GZ55_RS10390	cell cycle protein GpsB	91.62
3280	GZ55_RS13020	hypothetical protein	91.62
3281	GZ55_RS03840	PTS sugar transporter subunit IIB	91.62
3282	GZ55_RS06410	guanylate kinase	91.18
3283	GZ55_RS05560	MerR family transcriptional regulator	90.96
3284	GZ55_RS00180	hypothetical protein	90.74
3285	GZ55_RS10875	copper resistance protein CopZ	90.30
3286	GZ55_RS09730	phage portal protein	90.20
3287	GZ55_RS01725	PRC-barrel domain-containing protein	90.04
3288	GZ55_RS05175	peptidoglycan-binding protein	89.86
3289	GZ55_RS15530	isomerase	89.65
3290	GZ55_RS15975	NAD(+)-rifampin ADP-ribosyltransferase	89.65
3291	GZ55_RS04910	hypothetical protein	89.65
3292	GZ55_RS17030	hypothetical protein	89.01
3293	GZ55_RS14640	glycosyl transferase	88.38
3294	GZ55_RS04145	hypothetical protein	88.17
3295	GZ55_RS15465	PadR family transcriptional regulator	88.17
3296	GZ55_RS13045	hypothetical protein	87.75
3297	GZ55_RS17695	spore cortex biosynthesis protein YabQ	87.75
3298	GZ55_RS10945	transcriptional regulator	87.34
3299	GZ55_RS18105	hypothetical protein	87.34
3300	GZ55_RS13510	membrane protein	87.14
3301	GZ55_RS15890	ribosomal-protein-alanine N-acetyltransferase	87.14
3302	GZ55_RS06595	glucitol operon activator protein (GutM)	86.53
3303	GZ55_RS17400	50S ribosomal protein L5	86.53
3304	GZ55_RS18180	hypothetical protein	86.31
3305	GZ55_RS04955	protein iolH	86.23
3306	GZ55_RS16720	hypothetical protein	85.94
3307	GZ55_RS13010	PTS cellobiose transporter subunit IIA	85.74
3308	GZ55_RS17445	adenylate kinase	85.74

3309	GZ55_RS05635	TetR family transcriptional regulator	85.58
3310	GZ55_RS02935	arginine ABC transporter permease	85.35
3311	GZ55_RS17460	translation initiation factor IF-1	85.35
3312	GZ55_RS15505	PTS fructose transporter subunit IIB	84.96
3313	GZ55_RS17855	hypothetical protein	84.96
3314	GZ55_RS09720	phage portal protein	84.77
3315	GZ55_RS08060	hypothetical protein	84.20
3316	GZ55_RS16190	spore germination protein	84.20
3317	GZ55_RS08575	membrane protein	84.20
3318	GZ55_RS02615	hypothetical protein	83.63
3319	GZ55_RS14610	hypothetical protein	83.63
3320	GZ55_RS03690	hypothetical protein	83.44
3321	GZ55_RS11935	carbon storage regulator	83.07
3322	GZ55_RS14605	poly-gamma-glutamate biosynthesis protein PgsC	83.07
3323	GZ55_RS11615	hypothetical protein	83.07
3324	GZ55_RS13455	hypothetical protein	82.71
3325	GZ55_RS01500	hypothetical protein	82.71
3326	GZ55_RS03245	stage V sporulation protein AC	82.52
3327	GZ55_RS07240	chemotaxis protein CheV	82.25
3328	GZ55_RS08905	1-phosphofructokinase	81.98
3329	GZ55_RS07055	sporulation protein	81.98
3330	GZ55_RS14860	hypothetical protein	81.98
3331	GZ55_RS17365	50S ribosomal protein L22	81.98
3332	GZ55_RS02655	spore coat protein	81.67
3333	GZ55_RS11475	TetR family transcriptional regulator	81.55
3334	GZ55_RS16210	hypothetical protein	80.92
3335	GZ55_RS08225	N-acetyltransferase	80.71
3336	GZ55_RS05005	transcriptional regulator	80.57
3337	GZ55_RS06235	50S ribosomal protein L19	80.57
3338	GZ55_RS14330	cell division protein FtsL	80.57
3339	GZ55_RS06700	hypothetical protein	80.57
3340	GZ55_RS10985	GNAT family N-acetyltransferase	80.39
3341	GZ55_RS01105	TetR family transcriptional regulator	79.88
3342	GZ55_RS18125	molybdopterin synthase sulfur carrier subunit	79.88
3343	GZ55_RS07090	hypothetical protein	79.88
3344	GZ55_RS07605	tRNA-specific adenosine deaminase	79.37
3345	GZ55_RS12640	anti-sigma F factor antagonist	79.20
3346	GZ55_RS03220	cupin	79.20
3347	GZ55_RS04930	5-deoxy-glucuronate isomerase	79.01
3348	GZ55_RS14975	hypothetical protein	78.87
3349	GZ55_RS10315	AraC family transcriptional regulator	78.87
3350	GZ55_RS04375	hypothetical protein	78.87
3351	GZ55_RS08725	NifU family protein	78.87
3352	GZ55_RS02870	hypothetical protein	78.87
3353	GZ55_RS18010	hypothetical protein	78.87
3354	GZ55_RS13515	ABC transporter ATP-binding protein	78.37
3355	GZ55_RS14500	membrane protein	77.88

3356	GZ55_RS04345	hypothetical protein	77.45
3357	GZ55_RS08710	hypothetical protein	77.40
3358	GZ55_RS07970	SMI1 / KNR4 family protein	77.24
3359	GZ55_RS05555	type I glutamate--ammonia ligase	77.01
3360	GZ55_RS07145	50S ribosomal protein L31	76.92
3361	GZ55_RS00130	hypothetical protein	76.92
3362	GZ55_RS10630	spore germination protein	76.81
3363	ssrS	6S RNA	76.40
3364	GZ55_RS05270	hypothetical protein	75.98
3365	GZ55_RS06255	KH domain-containing protein	75.98
3366	GZ55_RS07545	mannose-6-phosphate isomerase	75.37
3367	GZ55_RS00685	lysine transporter LysE	75.13
3368	GZ55_RS09175	hypothetical protein	75.07
3369	GZ55_RS09890	hypothetical protein	75.07
3370	GZ55_RS10570	hypothetical protein	75.07
3371	GZ55_RS07680	NADH dehydrogenase	74.47
3372	GZ55_RS11705	glycosyl transferase	74.17
3373	GZ55_RS03510	membrane protein	73.92
3374	GZ55_RS12970	GTP pyrophosphokinase	73.82
3375	GZ55_RS02585	regulatory protein MgsR	73.59
3376	GZ55_RS02410	tRNA methyltransferase	73.30
3377	rnpB	aspartate 1-decarboxylase	73.01
3378	GZ55_RS03735	RNase P RNA component class B	73.01
3379	GZ55_RS00585	acetoin utilization protein AcuB	72.79
3380	GZ55_RS03430	CPBP family intramembrane metalloprotease	72.79
3381	GZ55_RS05775	hypothetical protein	72.45
3382	GZ55_RS12280	ATP synthase F0 subunit B	71.61
3383	GZ55_RS09845	hypothetical protein	71.34
3384	GZ55_RS09685	hypothetical protein	70.80
3385	GZ55_RS05600	class Ib ribonucleoside-diphosphate reductase	70.27
3386	GZ55_RS06075	flagellar biosynthetic protein FliP	70.16
3387	GZ55_RS06730	RsfA family transcriptional regulator	69.23
3388	GZ55_RS14225	membrane protein	69.23
3389	GZ55_RS10015	hypothetical protein	68.22
3390	GZ55_RS18275	hypothetical protein	67.72
3391	GZ55_RS10365	ABC transporter ATPase	67.72
3392	GZ55_RS14980	sporulation protein YjcZ	67.72
3393	GZ55_RS07020	AbrB family transcriptional regulator	66.99
3394	GZ55_RS02980	sporulation protein YqfC	66.28
3395	GZ55_RS03565	hypothetical protein	66.28
3396	GZ55_RS02290	demethylmenaquinone methyltransferase	66.28
3397	GZ55_RS09375	hypothetical protein	66.28
3398	GZ55_RS10990	hypothetical protein	66.28
3399	GZ55_RS16845	TetR family transcriptional regulator	65.93
3400	GZ55_RS03150	hypothetical protein	65.58
3401	GZ55_RS09620	necrosis and ethylene inducing protein	64.63
3402	GZ55_RS16335	aspartyl/glutamyl-tRNA(Asn/Gln)	64.23

		amidotransferase	
3403	GZ55_RS09780	terminase	64.01
3404	GZ55_RS02610	competence protein ComG	63.58
3405	GZ55_RS02915	hypothetical protein	63.58
3406	GZ55_RS01935	TetR family transcriptional regulator	61.99
3407	GZ55_RS00955	transcriptional regulator NrdR	61.08
3408	GZ55_RS10880	DNA-binding protein	61.08
3409	GZ55_RS04920	transcriptional regulator	61.08
3410	GZ55_RS07850	stage II sporulation protein SA	60.61
3411	GZ55_RS02970	chemotaxis protein	60.56
3412	GZ55_RS03005	PTS sugar transporter subunit IIB	59.91
3413	GZ55_RS16925	QacE family quaternary ammonium compound efflux	59.34
3414	GZ55_RS14230	N-acetyltransferase	59.15
3415	GZ55_RS13170	PTS sugar transporter subunit IIB	57.69
3416	GZ55_RS03615	N-(5'-phosphoribosyl)anthranilate isomerase	56.64
3417	GZ55_RS18100	DNA-binding anti-repressor SinI	56.64
3418	GZ55_RS09710	ABC transporter	55.88
3419	GZ55_RS02010	phage portal protein	55.88
3420	GZ55_RS14535	precorrin-2 dehydrogenase	55.63
3421	GZ55_RS06435	hypothetical protein	55.63
3422	GZ55_RS11610	flagellar protein FlaG	54.65
3423	GZ55_RS18140	DUF4264 domain-containing protein	54.65
3424	GZ55_RS05260	hypothetical protein	54.18
3425	GZ55_RS11380	acetyltransferase	54.02
3426	GZ55_RS01650	hypothetical protein	52.80
3427	GZ55_RS12155	hypothetical protein	52.80
3428	GZ55_RS11520	antioxidant, AhpC/TSA family protein	52.80
3429	GZ55_RS17540	hypothetical protein	51.92
3430	GZ55_RS06905	hypothetical protein	51.92
3431	GZ55_RS07975	DUF4825 domain-containing protein	51.92
3432	GZ55_RS17600	dihydroneopterin aldolase	51.49
3433	GZ55_RS02015	hypothetical protein	51.35
3434	GZ55_RS00410	Sporulation protein cse60	51.07
3435	GZ55_RS10900	hypothetical protein	50.74
3436	GZ55_RS12535	ADP-ribose pyrophosphatase	50.25
3437	GZ55_RS03160	hypothetical protein	50.25
3438	GZ55_RS10410	4-oxalocrotonate tautomerase	50.25
3439	GZ55_RS18285	hypothetical protein	50.25
3440	GZ55_RS18375	hypothetical protein	50.25
3441	GZ55_RS08005	hypothetical protein	49.45
3442	GZ55_RS08935	hypothetical protein	49.45
3443	GZ55_RS11590	hypothetical protein	49.06
3444	GZ55_RS09755	hypothetical protein	48.68
3445	GZ55_RS15065	DNA-entry nuclease	48.30
3446	GZ55_RS09995	kinase	47.56
3447	GZ55_RS14795	L-PSP family endoribonuclease	47.56

3448	GZ55_RS02320	cytidine deaminase	46.85
3449	GZ55_RS09800	hypothetical protein	46.85
3450	GZ55_RS05125	spore coat protein	46.50
3451	GZ55_RS15550	hypothetical protein	46.50
3452	GZ55_RS06785	hypothetical protein	45.81
3453	GZ55_RS02540	hypothetical protein	45.81
3454	GZ55_RS13610	hypothetical protein	45.15
3455	GZ55_RS09795	hypothetical protein	45.15
3456	GZ55_RS09615	transcriptional regulator	45.15
3457	GZ55_RS04010	acyltransferase	44.93
3458	GZ55_RS09695	phage portal protein	44.19
3459	GZ55_RS17075	hypothetical protein	43.27
3460	GZ55_RS04555	hypothetical protein	42.97
3461	GZ55_RS18270	hypothetical protein	42.67
3462	GZ55_RS18000	site-specific integrase	42.67
3463	GZ55_RS01940	hypothetical protein	42.48
3464	GZ55_RS07300	membrane protein	40.99
3465	GZ55_RS03195	transcriptional regulator	40.99
3466	GZ55_RS17730	spore germination protein	40.46
3467	GZ55_RS10155	hypothetical protein	40.46
3468	GZ55_RS06525	lipoprotein signal peptidase	39.94
3469	GZ55_RS08310	hypothetical protein	39.94
3470	GZ55_RS06615	endoribonuclease YbeY	38.94
3471	GZ55_RS02310	RNA polymerase sporulation sigma factor SigE	38.94
3472	GZ55_RS17245	hypothetical protein	37.38
3473	GZ55_RS14240	23S rRNA	37.38
3474	GZ55_RS05630	hypothetical protein	37.09
3475	GZ55_RS14910	acetyltransferase	37.09
3476	GZ55_RS02930	ABC transporter substrate-binding protein	36.65
3477	GZ55_RS11285	hypothetical protein	36.22
3478	GZ55_RS08040	phosphocarrier protein Chr	36.22
3479	GZ55_RS09975	hypothetical protein	35.81
3480	GZ55_RS14430	RNA polymerase sigma factor SigB	35.54
3481	GZ55_RS18250	hypothetical protein	35.40
3482	GZ55_RS01615	preprotein translocase subunit YajC	35.00
3483	GZ55_RS14775	calcium-binding protein	34.61
3484	GZ55_RS00285	hypothetical protein	33.86
3485	GZ55_RS10020	PTS galactitol transporter subunit IIB	33.50
3486	GZ55_RS07815	hypothetical protein	33.50
3487	GZ55_RS05075	hypothetical protein	32.45
3488	GZ55_RS04665	hypothetical protein	32.28
3489	GZ55_RS16980	hypothetical protein	32.12
3490	GZ55_RS14970	hypothetical protein	31.15
3491	GZ55_RS00935	dephospho-CoA kinase	30.84
3492	GZ55_RS05080	hypothetical protein	29.95
3493	GZ55_RS04230	hypothetical protein	29.81
3494	GZ55_RS00510	hypothetical protein	29.67

3495	GZ55_RS02620	competence protein ComGE	29.39
3496	GZ55_RS05640	QacE family quaternary ammonium compound efflux	29.39
3497	GZ55_RS02660	transcriptional regulator	27.33
3498	GZ55_RS10575	spore coat protein	26.86
3499	GZ55_RS04380	MBL fold hydrolase	25.96
3500	GZ55_RS05645	QacE family quaternary ammonium compound efflux	25.33
3501	GZ55_RS09600	hypothetical protein	21.94
3502	GZ55_RS08035	N-acetyltransferase	21.48
3503	GZ55_RS11620	flagellar assembly protein FliW	21.48
3504	GZ55_RS03960	glutathione peroxidase	19.35
3505	GZ55_RS05135	membrane protein	19.35
3506	GZ55_RS18440	hypothetical protein	18.77
3507	GZ55_RS16060	hypothetical protein	16.40

Таблица S2. Уникальные белки, обнаруженные в мембранных везикулах *Bacillus pumilus* 3-19 при росте на среде с низким (LPM) и высоким (HPM) содержанием фосфата

№	LPM	HPM
1	phosphate ABC transporter ATP-binding protein	peptidase S8
2	3~5~ exonuclease	MxaA domain-containing protein
3	phosphate ABC transporter ATP-binding protein	GTP-binding protein
4	tryptophan RNA-binding attenuation protein	2-oxoglutarate dehydrogenase
5	flagellar basal body rod protein FlgG	thymidylate synthase
6	Teichuronic acid biosynthesis protein TuaF	glutamate dehydrogenase
7	hypothetical protein	2-oxoisovalerate dehydrogenase
8	peptidase S8	leucine dehydrogenase
9	hypothetical protein	RNA polymerase sigma factor RpoD
10	DEAD/DEAH box helicase	glutamate-1-semialdehyde aminotransferase
11	phosphate ABC transporter permease	ATP synthase F0F1 subunit B
12	rod shape-determining protein MreC	ATP synthase subunit A
13	bacitracin ABC transporter ATP-binding protein	agmatinase
14	UDP-glucose 6-dehydrogenase	heme peroxidase
15	transcriptional regulator	PTS system sucrose-specific transporter subunits IIBC
16	LytR family transcriptional regulator	TenA family transcriptional regulator
17	signal peptide protein	DNA topoisomerase I
18	stress protein	signal recognition particle
19	GTP-binding protein TypA	hypothetical protein
20	serine/threonine protein kinase	hypothetical protein
21	glycerol kinase	peptidase
22	peptidase M15	butanol dehydrogenase
23	glucose-6-phosphate dehydrogenase	branched-chain amino acid ABC transporter permease
24	manganese transport transcriptional regulator	imidazoleglycerol-phosphate dehydratase
25	superoxide dismutase	diacylglycerol transferase
26	rod shape-determining protein MreB	hypothetical protein
27	transcription termination factor Rho	flagellar motor protein MotA
28	zinc metalloprotease	magnesium transporter
29	UDP pyrophosphate phosphatase	hypothetical protein
30	membrane protein	enoyl-ACP reductase
31	Fe-S cluster assembly protein SufB	thiaminase
32	TetR family transcriptional regulator	ABC transporter
33	Clp protease	phosphatase
34	ribonuclease	GNAT family acetyltransferase
35	6-phosphofructokinase	sulfite reductase
36	glycine/betaine ABC transporter	hypothetical protein
37	phospholipase	alkaline phosphatase

38	hypothetical protein	acyl-CoA dehydrogenase
39	amino acid ABC transporter ATP-binding protein	FkbH
40	amino acid ABC transporter substrate-binding protein	phosphoribosylglycinamide formyltransferase
41	iron-uptake system-binding protein	succinate dehydrogenase
42	cell division protein MraZ	malate dehydrogenase
43	hypothetical protein	glucosamine--fructose-6-phosphate aminotransferase
44	pyruvate dehydrogenase	amino acid transporter
45	rod-share determining protein MreBH	chemical-damaging agent resistance protein C
46	cardiolipin synthetase	peptidase M28
47	cysteine synthase	PTS sugar transporter
48	pyridoxal biosynthesis protein	hypothetical protein
49	isoleucine--tRNA ligase	sodium:dicarboxylate symporter
50		50S ribosomal protein L29
51		50S ribosomal protein L13
52		methionyl-tRNA synthetase
53		purine operon repressor
54		lysyl-tRNA synthetase
55		proline dehydrogenase
56		dna binding protein
57		ATP-binding/permease CydC
58		amino acid ABC transporter ATPase
59		50S ribosomal protein L7/L12
60		sulfate adenylyltransferase
61		succinate dehydrogenase
62		succinyl-CoA synthetase subunit beta
63		ABC transporter substrate-binding protein
64		dihydrolipoamide dehydrogenase
65		glycine dehydrogenase
66		quinolinate synthetase
67		ATP-binding protein
68		cytochrome D ubiquinol oxidase subunit I
69		hypothetical protein
70		dihydrodipicolinate synthase
71		dihydroorotase
72		phage portal protein
73		homoserine dehydrogenase
74		iron ABC transporter substrate-binding protein
75		arginase
76		L-lactate permease
77		chorismate mutase
78		tyrosine--tRNA ligase
79		Crp/Fnr family transcriptional regulator

80		DNA polymerase III subunit beta
81		hypothetical protein
82		cell division protein FtsH
83		6,7-dimethyl-8-ribityllumazine synthase
84		valine--tRNA ligase
85		dihydroxy-acid dehydratase
86		D-3-phosphoglycerate dehydrogenase
87		2-isopropylmalate synthase
88		membrane protein
89		malate dehydrogenase
90		lactate dehydrogenase
91		1-pyrroline-5-carboxylate dehydrogenase
92		peptidase M32
93		aminopeptidase A
94		aconitate hydratase
95		glycine/betaine ABC transporter ATP-binding protein
96		hypothetical protein
97		glutamate synthase
98		cephalosporin deacetylase
99		peptidase M14
100		5-methyltetrahydropteroyltriglutamate--homocysteine methyltransferase
101		kelch repeat protein