

Table 3. Predicted essential and non-essential genes

Gene	Product
Essential	
acpA	acyl carrier protein
alaS	alanyl-tRNA synthetase
argS	arginyl-tRNA synthetase
asnS	asparaginyl-tRNA synthetase
aspS	aspartyl-tRNA synthetase
cysS	cysteinyl-tRNA synthetase
gatC	glutamyl-tRNA (Gln) amidotransferase subunit C
gltX	glutamyl-tRNA synthetase
glyQ	glycyl-tRNA synthetase alpha chain
glyS	glycyl-tRNA synthetase beta chain
gyrA	DNA gyrase subunit A
gyrB	DNA gyrase subunit B
ileS	isoleucyl-tRNA synthetase
leuS	leucyl-tRNA synthetase
metS	methionyl-tRNA synthetase
mraY	phospho- <i>N</i> -acetylmuramoyl-pentapeptide-transferase
murE	UDP- <i>N</i> -acetylmuramoylalanyl-D-glutamate--2,6-diaminopimelate ligase
pheS	phenylalanyl-tRNA synthetase α chain
pheT	phenylalanyl-tRNA synthetase β chain
proS	prolyl-tRNA synthetase
rnpA	ribonuclease P protein component
rplA	50S ribosomal protein L1
rplB	50S ribosomal protein L2
rplC	50S ribosomal protein L3
rplD	50S ribosomal protein L4
rplE	50S ribosomal protein L5
rplF	50S ribosomal protein L6
rplI	50S ribosomal protein L9
rplJ	50S ribosomal protein L10
rplL	50S ribosomal protein L7/L12
rplM	50S ribosomal protein L13
rplN	50S ribosomal protein L14
rplO	50S ribosomal protein L15
rplP	50S ribosomal protein L16
rplQ	50S ribosomal protein L17
rplR	50S ribosomal protein L18
rplS	50S ribosomal protein L19
rplT	50S ribosomal protein L20
rplU	50S ribosomal protein L21
rplV	50S ribosomal protein L22
rplW	50S ribosomal protein L23
rplX	50S ribosomal protein L24
rpmA	50S ribosomal protein L27
rpmB	50S ribosomal protein L28

rpmC	50S ribosomal protein L29
rpmD	50S ribosomal protein L30
rpmE	50S ribosomal protein L31
rpmF	50S ribosomal protein L32
rpmGA	possible ribosomal protein L33
rpmGB	50S ribosomal protein L33
rpmH	50S ribosomal protein L34
rpmI	50S ribosomal protein L35
rpmJ	50S ribosomal protein L36
rpoA	DNA-directed RNA polymerase α chain
rpoB	DNA-directed RNA polymerase β chain
rpsB	30S ribosomal protein S2
rpsC	30S ribosomal protein S3
rpsD	30S ribosomal protein S4
rpsE	30S ribosomal protein S5
rpsF	30S ribosomal protein S6
rpsG	30S ribosomal protein S7
rpsH	30S ribosomal protein S8
rpsI	30S ribosomal protein S9
rpsJ	30S ribosomal protein S10
rpsK	30S ribosomal protein S11
rpsL	30S ribosomal protein S12
rpsM	30S ribosomal protein S13
rpsN	30S ribosomal protein S14
rpsO	30S ribosomal protein S15
rpsP	30S ribosomal protein S16
rpsQ	30S ribosomal protein S17
rpsR	30S ribosomal protein S18
rpsS	30S ribosomal protein S19
rpsT	30S ribosomal protein S20
rpsU	30S ribosomal protein S21
serS	seryl-tRNA synthetase
ssb	single-strand binding protein
trpS	tryptophanyl-tRNA synthetase
valS	valyl-tRNA synthetase
Nonessential	
abnA	arabinan-endo 1,5- α -L-arabinase
ahpF	alkyl hydroperoxide reductase large subunit
amyD	multiple sugar transport system permease protein
amyX	pullulanase
argB	<i>N</i> -acetylglutamate 5-phosphotransferase
argC	<i>N</i> -acetylglutamate γ -semialdehyde dehydrogenase
argD	acetylornithine aminotransferase
argF	ornithine carbamoyltransferase, anabolic
argG	argininosuccinate synthase
argH	argininosuccinate lyase
argJ	glutamate <i>N</i> -acetyltransferase/amino-acid <i>N</i> -acetyltransferase
aspB	aspartate aminotransferase

atpB	ATP synthase a chain
atpE	ATP synthase c chain
atpI	ATP synthase protein i
bglH	β -glucosidase
bioD	dethiobiotin synthetase
bmrU	multidrug resistance protein cotranscribed with bmr
fhuB	ferrichrome transport system permease protein
fhuC	ferrichrome transport system ATP-binding protein
fhuD	ferrichrome transport system substrate-binding protein
fhuG	ferrichrome transport system permease protein
flgB	flagellar basal-body rod protein
flgC	flagellar basal-body rod protein
flgL	flagellar hook-associated protein 3 (HAP3)
flhP	flagellar hook-basal body protein
fliE	flagellar hook-basal body complex protein
fliF	flagellar basal-body M-ring protein
gerKA	spore germination protein KA
gerKB	spore germination protein KB
gerKC	spore germination protein KC
glnH	glutamine transport system substrate-binding protein
glnM	glutamine transport system permease protein
glnP	glutamine transport system permease protein
glnQ	glutamine transport system ATP-binding protein
gltB	glutamate synthase (NADPH) small chain
gltP	proton/glutamate symport protein
gltT	proton/sodium-glutamate symport protein
hisB	imidazoleglycerol-phosphate dehydratase
hisD	histidinol dehydrogenase
hisF	cyclase
hisI	phosphoribosyl-AMP cyclohydrolase/phosphoribosyl-ATP pyrophosphohydrolase
ilvH	acetolactate synthase small subunit
licA	PTS lichenan-specific enzyme IIA component
licB	PTS lichenan-specific enzyme IIB component
licH	6-phospho- β -glucosidase
lysA	diaminopimelate decarboxylase
metA	homoserine <i>O</i> -succinyltransferase
metE	cobalamin-independent methionine synthase
moaD	molybdopterin converting factor subunit 1
opuAA	glycine betaine transport system ATP-binding protein
opuBA	glycine betaine/proline/choline transport system ATP-binding protein
opuBB	glycine betaine/proline/choline transport system permease protein
opuBC	glycine betaine/proline/choline transport system substrate-binding protein
opuBD	glycine betaine/proline/choline transport system permease protein
opuCA	glycine betaine/carnitine/choline transport system ATP-binding protein
opuCB	glycine betaine/carnitine/choline transport system permease protein
opuCC	glycine betaine/carnitine/choline transport system substrate-binding protein
opuCD	glycine betaine/carnitine/choline transport system permease protein
padC	phenolic acid decarboxylase

panC	pantothenate synthetase
panD	aspartate 1-decarboxylase
pheA	prephenate dehydratase
pheB	chorismate mutase
phrF	regulator of the activity of phosphatase RapF
phrK	regulator of the activity of phosphatase RapK
proJ	glutamate 5-kinase
rapJ	response regulator aspartate phosphatase
rapK	response regulator aspartate phosphatase
rbsA	<i>D</i> -ribose transport system ATP-binding protein
rbsB	<i>D</i> -ribose transport system substrate-binding protein
rbsC	<i>D</i> -ribose transport system permease protein
rbsD	<i>D</i> -ribose transport system permease protein
rbsK	ribokinase
rbsR	transcriptional repressor of the ribose operon (LacI family)
ribA	GTP cyclohydrolase II/3,4-dihydroxy-2-butanone 4-phosphate synthase (dhbp synthase)
ribE	riboflavin synthase α chain
ribH	riboflavin synthase β chain
ribT	riboflavin biosynthesis, reductase
rocA	1-pyrroline-5-carboxylate dehydrogenase
rocB	arginine and ornithine utilization protein
rocC	amino-acid permease
sodF	superoxide dismutase
spsA	nucleotide-diphospho-sugar transferase
spsB	spore coat polysaccharide biosynthesis protein spsB
spsC	spore coat polysaccharide biosynthesis protein
spsD	spore coat polysaccharide biosynthesis protein spsD
spsE	spore coat polysaccharide biosynthesis protein spsE
spsF	spore coat polysaccharide biosynthesis protein spsF
spsG	spore coat polysaccharide biosynthesis protein spsG
spsI	spore coat polysaccharide biosynthesis protein spsI
spsJ	spore coat polysaccharide biosynthesis protein spsJ
spsK	spore coat polysaccharide biosynthesis protein spsK
spsL	spore coat polysaccharide biosynthesis protein spsL
sucC	succinyl-CoA synthetase β chain
sucD	succinyl-CoA synthetase α chain
thiD	phosphomethylpyrimidine kinase
thiE	thiamine-phosphate pyrophosphorylase
thiM	hydroxyethylthiazole kinase (thiamine biosynthesis)
thrB	homoserine kinase
uvrB	excinuclease ABC subunit B
xlyB	<i>N</i> -acetylmuramoyl-L-alanine amidase, peptidoglycan hydrolase
xsa	α -L-arabinofuranosidase 2 (arabinosidase)
xynD	endo-1,4- β -xylanase (xylanase D)
yodQ	acetylornithine deacetylase
ytmN	polar amino acid transport system ATP-binding protein
