**Table 3. Annotated genome of *Blochmannia floridanus* (Bfl) (GenBank/EMBL/DDBJ accession no. BX248583)**

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl001 | gidA | 1 | 1905 | glucose inhibited division protein | | | | COG0445 | D |
| Bfl002 | atpB | 2294 | 3112 | ATP synthase subunit A | EC:3.6.3.14 | | | COG0356 | C |
| Bfl003 | atpE | 3181 | 3420 | ATP synthase subunit C | EC:3.6.3.14 | | | COG0636 | C |
| Bfl004 | atpF | 3490 | 3975 | ATP synthase subunit B | EC:3.6.3.14 | | | COG0711 | C |
| Bfl005 | atpH | 3976 | 4521 | ATP synthase delta subunit | EC:3.6.3.14 | | | COG0712 | C |
| Bfl006 | atpA | 4543 | 6084 | ATP synthase alpha subunit | EC:3.6.3.14 | | | COG0056 | C |
| Bfl007 | atpG | 6110 | 6976 | ATP synthase gamma subunit | EC:3.6.3.14 | | | COG0224 | C |
| Bfl008 | atpD | 7006 | 8400 | ATP synthase beta subunit | EC:3.6.3.14 | | | COG0055 | C |
| Bfl009 | atpC | 8460 | 8876 | ATP synthase epsilon subunit | EC:3.6.3.14 | | | COG0355 | C |
| Bfl010 | glmU | 9010 | 10407 | UDP-N-acetylglucosamine pyrophosphorylase | EC:2.7.7.23 | | | COG1207 | M |
| Bfl011 | thdF | 11961 | 10537 | GTPase for tRNA modification and thiophene and furan oxidation | | | | COG0486 | R |
| Bfl012 | yidC | 13740 | 12064 | putative Preprotein translocase subunit YidC | | | | COG0706 | R |
| Bfl013 | yidD | 14000 | 13776 | Uncharacterized conserved protein | | | | COG0759 | S |
| Bfl014 | rnpA | 14326 | 13964 | RNase P, protein component | EC:3.1.26.5 | | | COG0594 | L |
| Bfl015 | rpmH | 14514 | 14374 | 50s ribosomal protein l34 | | | | COG0230 | J |
| Bfl016 | dnaN | 14731 | 15834 | DNA polymerase III beta-subunit | EC:2.7.7.7 | | | COG0592 | L |
| Bfl017 | gyrB | 16096 | 18516 | DNA gyrase subunit B | EC:5.99.1.3 | | | COG0187 | L |
| Bfl018 | ibpA | 18765 | 19175 | heat shock protein A | | | | COG0071 | O |
| Bfl019 | Bfl019 | 20356 | 19346 | probable transmembrane protein | | | | COG0628 | P |
| Bfl020 | glyQ | 20794 | 21699 | glycine-tRNA synthetase, alpha subunit | EC:6.1.1.14 | | | COG0752 | J |
| Bfl021 | glyS | 21725 | 23710 | glycine-tRNA synthetase, beta subunit | EC:6.1.1.14 | | | COG0751 | J |
| Bfl022 | sodA | 24389 | 23766 | manganese superoxide dismutase | EC:1.15.1.1 | | | COG0605 | P |
| Bfl023 | prlC | 24707 | 26794 | oligopeptidase A | EC:3.4.24.70 | | | COG0339 | E |
| Bfl024 | pitA | 28562 | 26943 | putative low-affinity inorganic phosphate transporter | | | | COG0306 | P |
| Bfl025 | ubiA | 28887 | 29741 | 4-hydroxybenzoate octaprenyl transferase | EC:2.5.1.- | | | COG0382 | H |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl026 | zur | 30382 | 29903 | zinc uptake regulation protein | | | | COG0735 | P |
| Bfl027 | dnaB | 30665 | 32065 | replicative DNA helicase | EC:3.6.1.- | | | COG0305 | L |
| Bfl028 | ssb | 32202 | 32678 | single-strand DNA-binding protein | | | | COG0629 | L |
| Bfl029 | yjcE | 33060 | 34706 | putative sodium/hydrogen exchanger family protein | | | | COG0025 | P |
| Bfl030 | gltP | 35103 | 36392 | proton glutamate symport protein | | | | COG1301 | C |
| Bfl031 | yjgF | 36994 | 36578 | putative translation initiation inhibitor | | | | COG0251 | S |
| Bfl032 | argI | 38105 | 37062 | ornithine carbamoyltransferase | EC:2.1.3.3 | | | COG0078 | E |
| Bfl033 | valS | 41260 | 38360 | valyl-tRNA synthetase | EC:6.1.1.9 | | | COG0525 | J |
| Bfl034 | holC | 41718 | 41257 | DNA polymerase III, chi subunit | EC:2.7.7.7 | | | COG2927 | L |
| Bfl035 | pepA | 43352 | 41838 | cytosol aminopeptidase | EC:3.4.11.1 | | | COG0260 | E |
| Bfl036 | yjgP | 43484 | 44596 | putative inner membrane protein | | | | COG0795 | R |
| Bfl037 | yjgQ | 44598 | 45680 | putative inner membrane protein | | | | COG0795 | R |
| Bfl038 | yidZ | 46615 | 45692 | putative LysR-family transcriptional regulator | | | | COG0583 | K |
| Bfl039 | tRNA-Leu5 | 46904 | 46985 | tRNA-Leu anticodon CAA | | | | | |
| Bfl040 | Bfl040 | 47224 | 47880 | putative manganese transport system ATP-binding protein | | | | COG1121 | P |
| Bfl041 | Bfl041 | 47930 | 48793 | putative manganese transport system permease protein | | | | COG1108 | S |
| Bfl042 | yhbG | 49828 | 49103 | probable ABC transport protein, ATP-binding component | | | | COG1137 | R |
| Bfl043 | yhbN | 50347 | 49841 | conserved hypothetical protein | | | | COG1934 | S |
| Bfl044 | yrbK | 50936 | 50328 | possible exported protein | | | | COG3117 | S |
| Bfl045 | yrbA | 51122 | 51376 | conserved hypothetical protein | | | | COG0271 | T |
| Bfl046 | murA | 51431 | 52693 | UDP-N-acetylglucosamine 1-carboxyvinyltransferase | EC:2.5.1.7 | | | COG0766 | M |
| Bfl047 | degQ | 54183 | 52798 | serine protease | EC:3.4.21.- | | | COG0265 | O |
| Bfl048 | yhcB | 54803 | 54393 | conserved hypothetical protein | | | | COG3105 | J |
| Bfl049 | rplM | 55306 | 55725 | 50S ribosomal subunit protein L13 | | | | COG0102 | J |
| Bfl050 | rpsI | 55796 | 56188 | 30S ribosomal subunit protein S9 | | | | COG0103 | J |
| Bfl051 | yraP | 56943 | 56365 | possible lipoprotein | | | | COG2823 | S |
| Bfl052 | yraL | 57241 | 58146 | conserved hypothetical protein | | | | COG0313 | R |
| Bfl053 | rnpB | 58173 | 58584 | regulatory RNA; RNase P RNA component, M1 RNA, processes tRNA, 4.5S RNA | | | | | |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl054 | yqjA | 58900 | 59466 | putative membrane protein | | | | COG0586 | R |
| Bfl055 | tRNA-Met3 | 59570 | 59497 | tRNA-Met anticodon CAT | | | | | |
| Bfl056 | rpoD | 61550 | 59697 | RNA polymerase sigma-70 factor | | | | COG0568 | K |
| Bfl057 | dnaG | 63476 | 61710 | DNA primase | EC:2.7.7.- | | | COG0358 | L |
| Bfl058 | rpsU | 63837 | 63622 | 30S ribosomal subunit protein S21 | | | | COG0828 | J |
| Bfl059 | gcp | 64010 | 65071 | possible glycoprotease | EC:3.4.24.57 | | | COG0533 | O |
| Bfl060 | ygiH | 65733 | 65143 | putative membrane protein | | | | COG0344 | S |
| Bfl061 | folB | 65861 | 66229 | dihydroneopterin aldolase, also has dihydroneopterin triphosphate 2'-epimerase activity | EC:4.1.2.25 | | | COG1539 | H |
| Bfl062 | cca | 68011 | 66776 | tRNA nucleotidyltransferase | EC:2.7.7.25 | | | COG0617 | J |
| Bfl063 | rfaE | 68185 | 69624 | ADP-heptose synthase | EC:2.7.-.- | | | COG2870 | G |
| Bfl064 | yqjC | 70039 | 69770 | conserved hypothetical protein | | | | COG2960 | S |
| Bfl065 | ribB | 70261 | 70902 | 3,4-dihydroxy-2-butanone 4-phosphate synthase | | | | COG0108 | H |
| Bfl066 | plsC | 71182 | 71916 | 1-acyl-glycerol-3-phosphate acyltransferase | EC:2.3.1.51 | | | COG0204 | I |
| Bfl067 | metC | 73197 | 72022 | beta-cystathionase | EC:4.4.1.8 | | | COG0626 | E |
| Bfl068 | tRNA-Phe | 73366 | 73294 | tRNA-Phe anticodon GAA | | | | | |
| Bfl069 | cutA | 74061 | 73702 | periplasmic divalent cation tolerance protein CutA | | | | COG1324 | P |
| Bfl070 | mopB | 74437 | 74730 | GroES protein | | | | COG0234 | O |
| Bfl071 | mopA | 74787 | 76430 | GroEL protein | | | | COG0459 | O |
| Bfl072 | efp | 76578 | 77141 | elongation factor P (EF-P) | | | | COG0231 | J |
| Bfl073 | yjeP | 80439 | 77182 | putative membrane protein | | | | COG3264 | S |
| Bfl074 | psd | 81411 | 80515 | phosphatidylserine decarboxylase proenzyme | EC:4.1.1.65 | | | COG0688 | I |
| Bfl075 | orn | 81932 | 82474 | oligoribonuclease | EC:3.1.-.- | | | COG1949 | F |
| Bfl076 | tRNA-Gly2 | 82596 | 82669 | tRNA-Gly anticodon GCC | | | | | |
| Bfl077 | yjeE | 82974 | 83477 | putative nucleotide-binding protein | | | | COG0802 | R |
| Bfl078 | amiB | 83491 | 84750 | N-acetylmuramoyl-L-alanine amidase | EC:3.5.1.28 | | | COG0860 | M |
| Bfl079 | miaA | 84768 | 85739 | tRNA delta-2-isopentenylpyrophosphate (IPP) transferase | EC:2.5.1.8 | | | COG0324 | J |
| Bfl080 | hflX | 86066 | 87184 | HflX protein, putative GTP-binding protein | | | | COG2262 | R |
| Bfl081 | hflK | 87413 | 88735 | HflK protein | | | | COG0330 | O |

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|---|---|---|---|---|---|---|---|---|---|
| Bfl082 | hflC | 88740 | 89765 | HflC protein | EC:3.4.-.- | | | COG0330 | O |
| Bfl083 | purA | 89881 | 91197 | adenylosuccinate synthetase | EC:6.3.4.4 | | | COG0104 | F |
| Bfl084 | yjfH | 91405 | 92169 | probable tRNA/rRNA methyltransferase | EC:2.1.1.- | | | COG0566 | J |
| Bfl085 | rpsF | 92399 | 92761 | 30S ribosomal subunit protein S6 | | | | COG0360 | J |
| Bfl086 | rpsR | 92839 | 93075 | 30S ribosomal subunit protein S18 | | | | COG0238 | J |
| Bfl087 | rplI | 93152 | 93637 | 50S ribosomal subunit protein L9 | | | | COG0359 | J |
| Bfl088 | cysQ | 93801 | 94589 | cysQ protein | | | | COG1218 | P |
| Bfl089 | ytfM | 94765 | 96539 | pseudogene of putative exported protein | | | | COG0729 | M |
| Bfl090 | ytfN | 96536 | 100396 | putative exported protein | | | | COG2911 | S |
| Bfl091 | ppa | 101022 | 100483 | inorganic pyrophosphatase | EC:3.6.1.1 | | | COG0221 | C |
| Bfl092 | ispB | 102159 | 101185 | octaprenyl-diphosphate synthase | EC:2.5.1.- | | | COG0142 | H |
| Bfl093 | rplU | 102286 | 102669 | 50S ribosomal subunit protein L21 | | | | COG0261 | J |
| Bfl094 | rpmA | 102659 | 102916 | 50S ribosomal subunit protein L27 | | | | COG0211 | J |
| Bfl095 | yhbZ | 103318 | 104235 | probable GTP-binding protein | | | | COG0536 | R |
| Bfl096 | greA | 104321 | 104809 | transcription elongation factor, cleaves 3' nucleotide of paused mRNA | | | | COG0782 | K |
| Bfl097 | ftsJ | 105196 | 105816 | cell division protein 23S rRNA methyltransferase FtsJ | EC:2.1.1.- | | | COG0293 | D |
| Bfl098 | ftsH | 105868 | 107802 | cell division protein FtsH | EC:3.4.24.- | | | COG0465 | O |
| Bfl099 | folP | 107925 | 108770 | dihydropteroate synthase | EC:2.5.1.15 | | | COG0294 | H |
| Bfl100 | mrsA | 108772 | 110130 | PGM/PMM-family protein | EC:5.4.2.2 | | | COG1109 | G |
| Bfl101 | tRNA-Leu4 | 110685 | 110768 | tRNA-Leu anticodon GAG | | | | | |
| Bfl102 | tRNA-Met2 | 110836 | 110909 | tRNA-Met anticodon CAT | | | | | |
| Bfl103 | nusA | 111377 | 112882 | transcription pausing; L factor | | | | COG0195 | K |
| Bfl104 | infB | 112933 | 115626 | protein chain initiation factor 2 | | | | COG0532 | J |
| Bfl105 | rbfA | 115697 | 116050 | ribosome-binding factor A (P15B protein) | | | | COG0858 | J |
| Bfl106 | truB | 116087 | 116854 | tRNA pseudouridine 5S synthase | EC:4.2.1.70 | | | COG0130 | J |
| Bfl107 | rpsO | 116984 | 117256 | 30S ribosomal subunit protein S15 | | | | COG0184 | J |
| Bfl108 | pnp | 117421 | 119514 | polynucleotide phosphorylase, member of mRNA degradosome | EC:2.7.7.8 | | | COG1185 | J |

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|---|---|---|---|---|---|---|---|---|---|
| Bfl109 | deaD | 119755 | 121218 | Cold-shock DEAD-box protein A, inducible ATP-independent RNA helicase | | | | COG0513 | L |
| Bfl110 | holD | 121590 | 121997 | DNA polymerase III, psi subunit | EC:2.7.7.7 | | | COG3050 | L |
| Bfl111 | thrA | 122444 | 124900 | aspartokinase I/homoserine dehydrogenase I | EC:2.7.2.4 | EC:1.1.1.3 | | COG0527 | E |
| Bfl112 | thrB | 124937 | 125872 | homoserine kinase | EC:2.7.1.39 | | | COG0083 | E |
| Bfl113 | thrC | 125876 | 127207 | threonine synthase | EC:4.2.99.2 | | | COG0498 | E |
| Bfl114 | dnaK | 127463 | 129394 | DnaK protein (heat shock protein 70) | | | | COG0443 | O |
| Bfl115 | dnaJ | 129526 | 130659 | DnaJ protein | | | | COG0484 | O |
| Bfl116 | rpsT | 131019 | 130753 | 30S ribosomal protein S20 | | | | COG0268 | J |
| Bfl117 | ribF | 131171 | 132106 | riboflavin biosynthesis protein RibF | EC:2.7.1.26 | EC:2.7.7.2 | | COG0196 | H |
| Bfl118 | ileS | 132130 | 134991 | isoleucyl-tRNA synthetase | EC:6.1.1.5 | | | COG0060 | J |
| Bfl119 | lspA | 135013 | 135474 | lipoprotein signal peptidase | EC:3.4.23.36 | | | COG0597 | N |
| Bfl120 | lytB | 135590 | 136492 | pseudogene of LytB protein | | | | COG0761 | M |
| Bfl121 | dapB | 136567 | 137391 | dihydrodipicolinate reductase | EC:1.3.1.26 | | | COG0289 | E |
| Bfl122 | carA | 137577 | 138725 | carbamoyl-phosphate synthase small chain | EC:6.3.5.5 | | | COG0505 | E |
| Bfl123 | carB | 138746 | 142012 | carbamoyl-phosphate synthase large chain | EC:6.3.5.5 | | | COG0458 | E |
| Bfl124 | folA | 142060 | 142566 | dihydrofolate reductase type I | EC:1.5.1.3 | | | COG0262 | H |
| Bfl125 | apaH | 143440 | 142622 | bis(5'-nucleosyl)-tetraphosphatase | EC:3.6.1.41 | | | COG0639 | T |
| Bfl126 | ksgA | 144369 | 143554 | dimethyladenosine transferase | EC:2.1.1.- | | | COG0030 | J |
| Bfl127 | pdxA | 145378 | 144350 | pyridoxal phosphate biosynthetic protein PdxA | | | | COG1995 | H |
| Bfl128 | surA | 146651 | 145371 | survival protein SurA precursor | EC:5.2.1.8 | | | COG0760 | O |
| Bfl129 | imp | 149157 | 146701 | organic solvent tolerance protein precursor | | | | COG1452 | M |
| Bfl130 | leuD | 149950 | 149336 | 3-isopropylmalate dehydratase subunit 1 | EC:4.2.1.33 | | | COG0066 | E |
| Bfl131 | leuC | 151384 | 149984 | 3-isopropylmalate dehydratase subunit 2 | EC:4.2.1.33 | | | COG0065 | E |
| Bfl132 | leuB | 152490 | 151396 | 3-isopropylmalate dehydrogenase | EC:1.1.1.85 | | | COG0473 | E |
| Bfl133 | leuA | 154073 | 152514 | 2-isopropylmalate synthase | EC:4.1.3.12 | | | COG0119 | E |
| Bfl134 | yabC | 154460 | 155425 | putative S-adenosyl methionine adenyltransferase | EC:2.1.1.- | | | COG0275 | M |
| Bfl135 | ftsL | 155428 | 155739 | cell division protein FtsL | | | | COG3116 | M |
| Bfl136 | ftsI | 155840 | 157525 | penicillin-binding protein 3 precursor | | | | COG0768 | M |

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|---|---|---|---|---|---|---|---|---|---|
| Bfl137 | murE | 157557 | 159056 | UDP-N-acetylmuramoylalanyl-D-glutamate--2,6-diaminopimelate ligase | EC:6.3.2.13 | | | COG0769 | M |
| Bfl138 | murF | 159076 | 160464 | UDP-N-acetylmuramoylalanyl-D-glutamyl-2,6-diaminopimelate--D-alanyl-D-alanyl ligase | EC:6.3.2.15 | | | COG0770 | M |
| Bfl139 | mraY | 160449 | 161546 | phospho-N-acetylmuramoyl-pentapeptide transferase | EC:2.7.8.13 | | | COG0472 | M |
| Bfl140 | murD | 161558 | 162892 | UDP-N-acetylmuramoyl-L-alanine:D-glutamate ligase | EC:6.3.2.9 | | | COG0771 | M |
| Bfl141 | ftsW | 162965 | 164071 | cell division protein FtsW | | | | COG0772 | D |
| Bfl142 | murG | 164094 | 165176 | UDP-N-acetylglucosamine:N-acetylmuramyl- (pentapeptide) pyrophosphoryl-undecaprenol N-acetylglucosamine transferase | EC:2.4.1.- | | | COG0707 | M |
| Bfl143 | murC | 165206 | 166648 | UDP-N-acetylmuramate:alanine ligase | EC:6.3.2.8 | | | COG0773 | M |
| Bfl144 | ftsQ | 166732 | 167562 | cell division protein FtsQ | | | | COG1589 | M |
| Bfl145 | ftsA | 167555 | 168817 | cell division protein FtsA | | | | COG0849 | D |
| Bfl146 | ftsZ | 168893 | 170068 | cell division protein FtsZ | | | | COG0206 | D |
| Bfl147 | lpxC | 170136 | 171032 | UDP-3-O-[3-hydroxymyristoyl] N-acetylglucosamine deacetylase | EC:3.5.1.- | | | COG0774 | M |
| Bfl148 | secA | 171410 | 173932 | preprotein translocase SecA subunit | | | | COG0653 | N |
| Bfl149 | dksA | 174973 | 175434 | dosage-dependent dnaK suppressor protein | | | | COG1734 | T |
| Bfl150 | folK | 175495 | 175989 | 7,8-dihydro-6-hydroxymethylpterin-pyrophosphokinase | EC:2.7.6.3 | | | COG0801 | H |
| Bfl151 | lpdA | 178012 | 176600 | dihydrolipoamide dehydrogenase | EC:1.8.1.4 | | | COG1249 | C |
| Bfl152 | aceF | 179418 | 178141 | dihydrolipoamide acetyltransferase component (E2) of pyruvate dehydrogenase | EC:2.3.1.12 | | | COG0508 | C |
| Bfl153 | aceE | 182111 | 179433 | pyruvate dehydrogenase E1 component | EC:1.2.4.1 | | | COG2609 | C |
| Bfl154 | mrcB | 182581 | 184923 | penicillin-binding protein 1b; peptidoglycan synthetase | EC:2.4.2.- | EC:3.4.-.- | | COG0744 | M |
| Bfl155 | yadR | 185120 | 185479 | conserved hypothetical protein | | | | COG0316 | S |
| Bfl156 | pyrG | 185911 | 187563 | CTP synthetase | EC:6.3.4.2 | | | COG0504 | F |
| Bfl157 | eno | 187652 | 188995 | enolase | EC:4.2.1.11 | | | COG0148 | G |
| Bfl158 | cysJ | 189377 | 191209 | sulfite reductase (NADPH) flavoprotein beta subunit | EC:1.8.1.2 | | | COG0369 | P |
| Bfl159 | cysI | 191209 | 192918 | sulfite reductase (NADPH) hemoprotein alpha subunit | EC:1.8.1.2 | | | COG0155 | P |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl160 | cysH | 192957 | 193697 | 3'-phosphoadenosine 5'-phosphosulfate sulfotransferase | EC:1.8.99.4 | | | COG0175 | E |
| Bfl161 | cysG | 193837 | 195222 | siroheme synthase | EC:2.1.1.107 | EC:1.-.-.- | EC:4.99.1.- | COG0007 | H |
| Bfl162 | cysD | 195282 | 196199 | ATP sulfurylase (ATP:sulfate adenyltransferase) subunit 2 | EC:2.7.7.4 | | | COG0175 | E |
| Bfl163 | cysN | 196218 | 197660 | ATP sulfurylase (ATP:sulfate adenyltransferase) subunit 1 | EC:2.7.7.4 | | | COG2895 | J |
| Bfl164 | cysC | 197664 | 198296 | adenosine 5-phosphosulfate kinase | EC:2.7.1.25 | | | COG0529 | P |
| Bfl165 | ygbQ | 198470 | 198775 | conserved hypothetical protein | | | | COG2919 | R |
| Bfl166 | ygbP | 199342 | 199461 | pseudogene of 2-C-methyl-D-erythritol 4-phosphate cytidylyltransferase | EC:2.7.7.60 | | | COG1211 | I |
| Bfl167 | nlpD | 200374 | 201321 | lipoprotein NlpD precursor | | | | COG0739 | M |
| Bfl168 | alaS | 201467 | 204142 | alanyl-tRNA synthetase | EC:6.1.1.7 | | | COG0013 | J |
| Bfl169 | csrA | 204306 | 204503 | carbon storage regulator | | | | COG1551 | T |
| Bfl170 | tRNA-Ser4 | 204652 | 204742 | tRNA-Ser anticodon GCT | | | | | |
| Bfl171 | tRNA-Arg4 | 204800 | 204873 | tRNA-Arg anticodon ACG | | | | | |
| Bfl172 | ffh | 205013 | 206386 | 4.5S-RNP protein, GTP binding export factor, part of signal recognition particle with 4.5 RNA | | | | COG0541 | N |
| Bfl173 | rpsP | 206462 | 206710 | 30S ribosomal subunit protein S16 | | | | COG0228 | J |
| Bfl174 | rimM | 206757 | 207314 | 16S rRNA processing protein | | | | COG0806 | J |
| Bfl175 | trmD | 207348 | 208094 | tRNA(guanine-N1)methyltransferase | EC:2.1.1.31 | | | COG0336 | J |
| Bfl176 | rplS | 208123 | 208476 | 50S ribosomal subunit protein L19 | | | | COG0335 | J |
| Bfl177 | aroF | 208858 | 209943 | phospho-2-dehydro-3-deoxyheptonate aldolase, tyr-sensitive | EC:4.1.2.15 | | | COG0722 | E |
| Bfl178 | tyrA | 209950 | 211083 | chorismate mutase/prephenate dehydrogenase | EC:1.3.1.12 | EC:5.4.99.5 | | COG0287 | E |
| Bfl179 | pheA | 212052 | 211156 | prephenate dehydratase | EC:4.2.1.51 | | | COG1605 | E |
| Bfl180 | yfiO | 212889 | 212149 | putative lipoprotein | | | | COG0457 | R |
| Bfl181 | rluD | 213012 | 213977 | pseudouridine synthase (pseudouridines 1911, 1915, 1917 in 23S RNA) | EC:4.2.1.70 | | | COG0564 | J |
| Bfl182 | clpB | 214168 | 216786 | ATP-dependent protease, Hsp 100, part of novel multi-chaperone system with DnaK, DnaJ, and GrpE | | | | COG0542 | O |
| Bfl183 | murB | 216984 | 218021 | UDP-N-acetylenolpyruvoylglucosamine reductase | EC:1.1.1.158 | | | COG0812 | M |
| Bfl184 | birA | 218136 | 218960 | bifunctional protein: biotin operon repressor and biotin- | EC:6.3.4.15 | | | COG0340 | K |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| | | | | [acetyl-CoA carboxylase] synthetase | | | | | |
| Bfl185 | tRNA-Thr3 | 219918 | 219989 | tRNA-Thr anticodon TGT | | | | | |
| Bfl186 | tRNA-Tyr | 220004 | 220085 | tRNA-Tyr anticodon GTA | | | | | |
| Bfl187 | tRNA-Gly1 | 220138 | 220209 | tRNA-Gly anticodon TCC | | | | | |
| Bfl188 | tRNA-Thr2 | 220246 | 220317 | tRNA-Thr anticodon GGT | | | | | |
| Bfl189 | bfr | 220512 | 220982 | bacterioferritin | | | | COG2193 | P |
| Bfl190 | rpsJ | 221115 | 221426 | 30S ribosomal subunit protein S10 | | | | COG0051 | J |
| Bfl191 | rplC | 221527 | 222186 | 50S ribosomal subunit protein L3 | | | | COG0087 | J |
| Bfl192 | rplD | 222183 | 222821 | 50S ribosomal subunit protein L4 | | | | COG0088 | J |
| Bfl193 | rplW | 222830 | 223129 | 50S ribosomal subunit protein L23 | | | | COG0089 | J |
| Bfl194 | rplB | 223151 | 223981 | 50S ribosomal subunit protein L2 | | | | COG0090 | J |
| Bfl195 | rpsS | 224008 | 224289 | 30S ribosomal subunit protein S19 | | | | COG0185 | J |
| Bfl196 | rplV | 224342 | 224671 | 50S ribosomal subunit protein L22 | | | | COG0091 | J |
| Bfl197 | rpsC | 224731 | 225438 | 30S ribosomal subunit protein S3 | | | | COG0092 | J |
| Bfl198 | rplP | 225456 | 225857 | 50S ribosomal subunit protein L16 | | | | COG0197 | J |
| Bfl199 | rpmC | 225862 | 226062 | 50S ribosomal subunit protein L29 | | | | COG0255 | J |
| Bfl200 | rpsQ | 226109 | 226366 | 30S ribosomal subunit protein S17 | | | | COG0186 | J |
| Bfl201 | rplN | 226450 | 226821 | 50S ribosomal subunit protein L14 | | | | COG0093 | J |
| Bfl202 | rplX | 226853 | 227173 | 50S ribosomal subunit protein L24 | | | | COG0198 | J |
| Bfl203 | rplE | 227197 | 227769 | 50S ribosomal subunit protein L5 | | | | COG0094 | J |
| Bfl204 | rpsN | 227775 | 228080 | 30S ribosomal subunit protein S14 | | | | COG0199 | J |
| Bfl205 | rpsH | 228132 | 228527 | 30S ribosomal subunit protein S8 | | | | COG0096 | J |
| Bfl206 | rplF | 228550 | 229095 | 50S ribosomal subunit protein L6 | | | | COG0097 | J |
| Bfl207 | rplR | 229150 | 229503 | 50S ribosomal subunit protein L18 | | | | COG0256 | J |
| Bfl208 | rpsE | 229516 | 230049 | 30S ribosomal subunit protein S5 | | | | COG0098 | J |
| Bfl209 | rpmD | 230055 | 230231 | 50S ribosomal subunit protein L30 | | | | COG1841 | J |
| Bfl210 | rplO | 230238 | 230681 | 50S ribosomal subunit protein L15 | | | | COG0200 | J |
| Bfl211 | secY | 230690 | 232045 | preprotein translocase subunit secY | | | | COG0201 | N |
| Bfl212 | rpmJ | 232091 | 232207 | 50S ribosomal subunit protein L36 | | | | COG0257 | J |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl213 | rpsM | 232287 | 232643 | 30S ribosomal subunit protein S13 | | | | COG0099 | J |
| Bfl214 | rpsK | 232707 | 233099 | 30S ribosomal subunit protein S11 | | | | COG0100 | J |
| Bfl215 | rpsD | 233135 | 233758 | 30S ribosomal subunit protein S4 | | | | COG0522 | J |
| Bfl216 | rpoA | 233794 | 234789 | DNA-directed RNA polymerase alpha chain | EC:2.7.7.6 | | | COG0202 | K |
| Bfl217 | rplQ | 234854 | 235231 | 50S ribosomal subunit protein L17 | | | | COG0203 | J |
| Bfl218 | fmt | 236277 | 235306 | methionyl-tRNA formyltransferase | EC:2.1.2.9 | | | COG0223 | J |
| Bfl219 | def | 236831 | 236304 | polypeptide deformylase | EC:3.5.1.31 | | | COG0242 | J |
| Bfl220 | yrdC | 237099 | 237668 | conserved hypothetical protein | | | | COG0009 | J |
| Bfl221 | aroE | 237684 | 238568 | shikimate 5-dehydrogenase | EC:1.1.1.25 | | | COG0169 | E |
| Bfl222 | 5SrRNA | 238664 | 238785 | 5S rRNA | | | | | |
| Bfl223 | gloB | 239591 | 238821 | probable hydroxyacylglutathione hydrolase | EC:3.1.2.6 | | | COG0491 | R |
| Bfl224 | rnhA | 240144 | 239641 | ribonuclease H | EC:3.1.26.4 | | | COG0328 | L |
| Bfl225 | dnaQ | 240201 | 240977 | DNA polymerase III epsilon subunit | EC:2.7.7.7 | | | COG0847 | L |
| Bfl226 | lpcA | 241132 | 241713 | phosphoheptose isomerase | EC:5.-.-.- | | | COG0279 | G |
| Bfl227 | tRNA-Thr1 | 241865 | 241937 | tRNA-Thr anticodon CGT | | | | | |
| Bfl228 | ahpC | 242632 | 242033 | alkyl hydroperoxide reductase C22 protein | EC:1.6.4.- | | | COG0450 | O |
| Bfl229 | queA | 242932 | 243993 | S-adenosylmethionine:tRNA ribosyltransferase-isomerase | EC:5.-.-.- | | | COG0809 | J |
| Bfl230 | tgt | 244122 | 245258 | queuine tRNA-ribosyltransferase; tRNA-guanine transglycosylase | EC:2.4.2.29 | | | COG0343 | J |
| Bfl231 | yajC | 245301 | 245648 | preprotein translocase YajC subunit | | | | COG1862 | S |
| Bfl232 | secD | 245653 | 247527 | protein-export membrane protein SecD | | | | COG0342 | N |
| Bfl233 | secF | 247568 | 248470 | protein-export membrane protein SecF | | | | COG0341 | N |
| Bfl234 | ribD | 248862 | 249998 | bifunctional pyrimidine deaminase/reductase in pathway of riboflavin synthesis | EC:3.5.4.26 | EC:1.1.1.193 | | COG0117 | H |
| Bfl235 | ribH | 250136 | 250615 | 6,7-dimethyl-8-ribityllumazine synthase (riboflavin synthase beta chain) | EC:2.5.1.9 | | | COG0054 | H |
| Bfl236 | nusB | 250640 | 251056 | transcription termination; L factor | | | | COG0781 | K |
| Bfl237 | pgpA | 251094 | 251570 | phosphatidylglycerophosphatase A | EC:3.1.3.27 | | | COG1267 | I |
| Bfl238 | dxs | 253479 | 251626 | 1-deoxyxylulose-5-phosphate synthase | EC:4.1.3.7 | | | COG1154 | H |

| **Bfl gene number** | **Gene name*** | **Start** | **End** | **Product** | **EC1** | **EC2** | **EC3** | **Cluster of orthologous genes (COG) no.** | **COG category** |
|---|---|---|---|---|---|---|---|---|---|
| Bfl239 | thiI | 254257 | 255735 | thiamine biosynthesis protein ThiI | | | | COG0301 | H |
| Bfl240 | yajR | 257057 | 255873 | putative MFS family transporter | | | | COG0477 | G |
| Bfl241 | cyoE | 258063 | 257182 | protohaeme IX farnesyltransferase (haeme O biosynthesis) | EC:2.5.1.- | | | COG0109 | H |
| Bfl242 | cyoD | 258396 | 258094 | cytochrome O ubiquinol oxidase subunit CyoD | | | | COG3125 | C |
| Bfl243 | cyoC | 258991 | 258401 | cytochrome o ubiquinol oxidase subunit III | EC:1.10.3.- | | | COG1845 | C |
| Bfl244 | cyoB | 260939 | 258975 | cytochrome o ubiquinol oxidase subunit I | EC:1.10.3.- | | | COG0843 | C |
| Bfl245 | cyoA | 261893 | 261009 | cytochrome o ubiquinol oxidase subunit II | EC:1.10.3.- | | | COG1622 | C |
| Bfl246 | clpP | 262722 | 263351 | ATP-dependent Clp protease proteolytic subunit | EC:3.4.21.92 | | | COG0740 | O |
| Bfl247 | clpX | 263539 | 264819 | ATP-dependent Clp protease ATP-binding subunit ClpX | | | | COG1219 | O |
| Bfl248 | yggX | 265176 | 264937 | conserved hypothetical protein | | | | COG2924 | S |
| Bfl249 | mutY | 266297 | 265230 | A/G-specific adenine glycosylase | EC:3.2.2.- | | | COG1194 | L |
| Bfl250 | yqgF | 267389 | 266961 | putative endonuclease involved in recombination | | | | COG0816 | R |
| Bfl251 | yqgE | 267967 | 267386 | putative transcriptional regulator | | | | COG1678 | R |
| Bfl252 | metK | 269533 | 268376 | S-adenosylmethionine synthetase | EC:2.5.1.6 | | | COG0192 | H |
| Bfl253 | speB | 269924 | 270835 | agmatine ureohydrolase | EC:3.5.3.11 | | | COG0010 | E |
| Bfl254 | pgk | 271177 | 272379 | phosphoglycerate kinase | EC:2.7.2.3 | | | COG0126 | G |
| Bfl255 | fba | 272472 | 273548 | fructose 1,6-bisphosphate aldolase | EC:4.1.2.13 | | | COG0191 | G |
| Bfl256 | rpiA | 273801 | 274469 | ribose 5-phosphate isomerase | EC:5.3.1.6 | | | COG0120 | G |
| Bfl257 | ygfA | 275194 | 274607 | putative ligase | | | | COG0212 | H |
| Bfl258 | ygfE | 275633 | 275289 | conserved hypothetical protein | | | | COG3027 | S |
| Bfl259 | ubiH | 276061 | 277245 | 2-octaprenyl-6-methoxyphenol hydroxylase | EC:1.14.13.- | | | COG0654 | H |
| Bfl260 | ygfZ | 278759 | 277749 | putative aminomethyltransferase | | | | COG0354 | R |
| Bfl261 | prfB | 279048 | 280145 | peptide chain release factor 2 (RF-2) | | | | COG1186 | J |
| Bfl262 | lysS | 280221 | 281678 | lysyl-tRNA synthetase | EC:6.1.1.6 | | | COG1190 | J |
| Bfl263 | lysA | 281804 | 283081 | diaminopimelate decarboxylase | EC:4.1.1.20 | | | COG0019 | E |
| Bfl264 | ygdP | 283319 | 283795 | conserved hypothetical protein | EC:3.6.1.- | | | COG0494 | L |
| Bfl265 | lgt | 283950 | 284804 | prolipoprotein diacylglyceryl transferase | EC:2.4.99.- | | | COG0682 | M |
| Bfl266 | recC | 285021 | 288440 | exonuclease V, subunit | EC:3.1.11.5 | | | COG1330 | L |
| Bfl267 | recD | 290416 | 288494 | exonuclease V, alpha chain | EC:3.1.11.5 | | | COG0507 | L |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl268 | recB | 294249 | 290623 | exonuclease V, beta chain | EC:3.1.11.5 | | | COG1074 | L |
| Bfl269 | dapD | 295209 | 294367 | 2,3,4,5-tetrahydropyridine-2-carboxylate N-succinyltransferase | EC:2.3.1.117 | | | COG2171 | E |
| Bfl270 | map | 296016 | 295222 | methionine aminopeptidase | EC:3.4.11.18 | | | COG0024 | J |
| Bfl271 | rpsB | 296283 | 296978 | 30S ribosomal protein S2 | | | | COG0052 | J |
| Bfl272 | tsf | 297058 | 297867 | elongation factor Ts (EF-Ts) | | | | COG0264 | J |
| Bfl273 | pyrH | 298001 | 298732 | uridine 5'-monophosphate kinase | EC:2.7.4.- | | | COG0528 | F |
| Bfl274 | frr | 298800 | 299366 | ribosome recycling factor | | | | COG0233 | J |
| Bfl275 | dxr | 299486 | 300661 | 1-deoxy-D-xylulose 5-phosphate reductoisomerase | EC:1.1.1.- | | | COG0743 | I |
| Bfl276 | uppS | 300736 | 301488 | undecaprenyl pyrophosphate synthetase | EC:2.5.1.31 | | | COG0020 | I |
| Bfl277 | cdsA | 301540 | 302406 | phosphatidate cytidylyltransferase | EC:2.7.7.41 | | | COG0575 | I |
| Bfl278 | yaeL | 302432 | 303820 | putative membrane-associated Zn-dependent protease | EC:3.4.24.- | | | COG0750 | M |
| Bfl279 | yaeT | 303837 | 306302 | outer membrane protein precursor | | | | COG0729 | M |
| Bfl280 | hlpA | 306394 | 306900 | histone-like protein, located in outer membrane | | | | COG2825 | L |
| Bfl281 | lpxD | 306928 | 308037 | UDP-3-O-[3-hydroxymyristoyl] glucosamine N-acyltransferase | EC:2.3.1.- | | | COG1044 | M |
| Bfl282 | fabZ | 308041 | 308496 | (3R)-hydroxymyristol acyl carrier protein dehydrase | EC:4.2.1.- | | | COG0764 | I |
| Bfl283 | lpxA | 308500 | 309288 | acyl-[acyl-carrier-protein]:UDP-N- acetylglucosamine O-acyltransferase | EC:2.3.1.129 | | | COG1043 | M |
| Bfl284 | lpxB | 309315 | 310469 | lipid-A-disaccharide synthase | EC:2.4.1.182 | | | COG0763 | M |
| Bfl285 | rnhB | 310493 | 311110 | ribonuclease HII | EC:3.1.26.4 | | | COG0164 | L |
| Bfl286 | dnaE | 311183 | 314683 | DNA polymerase III, alpha chain | EC:2.7.7.7 | | | COG0587 | L |
| Bfl287 | accA | 314706 | 315665 | acetyl-coenzyme A carboxylase carboxyl transferase subunit alpha | EC:6.4.1.2 | | | COG0825 | I |
| Bfl288 | mesJ | 315871 | 317466 | cell cycle protein MesJ | | | | COG0037 | R |
| Bfl289 | proS | 319333 | 317588 | prolyl-tRNA synthetase | EC:6.1.1.15 | | | COG0442 | J |
| Bfl290 | yaeD | 319544 | 320070 | pseudogene of conserved hypothetical protein | | | | COG0241 | E |
| Bfl291 | accC | 321577 | 320225 | acetyl CoA carboxylase, biotin carboxylase subunit | EC:6.3.4.14 | | | COG0439 | I |
| Bfl292 | accB | 322030 | 321596 | acetylCoA carboxylase, BCCP subunit, carrier of biotin | | | | COG0511 | I |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl293 | aroQ | 322506 | 322066 | 3-dehydroquinate dehydratase II | | | | COG0757 | E |
| Bfl294 | mreB | 322853 | 323896 | rod shape-determining protein MreB | | | | COG1077 | D |
| Bfl295 | mreC | 323987 | 324805 | rod shape-determining protein MreC | | | | COG1792 | M |
| Bfl296 | mreD | 324845 | 325333 | rod shape-determining protein MreD | | | | COG2891 | M |
| Bfl297 | tldD | 325620 | 327092 | TldD protein | | | | COG0312 | R |
| Bfl298 | pmbA | 327138 | 328481 | putative PmbA protein | | | | COG0312 | R |
| Bfl299 | lon | 328887 | 331223 | Lon protease | EC:3.4.21.53 | | | COG0466 | O |
| Bfl300 | apt | 331775 | 332326 | adenine phosphoribosyltransferase | EC:2.4.2.7 | | | COG0503 | F |
| Bfl301 | dnaX | 332391 | 334016 | DNA polymerase III subunit gamma | EC:2.7.7.7 | | | COG2812 | L |
| Bfl302 | adk | 334622 | 335302 | adenylate kinase | EC:2.7.4.3 | | | COG0563 | F |
| Bfl303 | ybbF | 336046 | 335303 | UDP-2,3-diacylglucosamine hydrolase | EC:3.6.1.- | | | COG2908 | M |
| Bfl304 | cysS | 336243 | 337667 | cysteinyl-tRNA synthetase | EC:6.1.1.16 | | | COG0215 | J |
| Bfl305 | folD | 338554 | 337664 | FolD bifunctional protein [includes: methylenetetrahydrofolate dehydrogenase; methenyltetrahydrofolate cyclohydrolase | EC:1.5.1.5 | EC:3.5.4.9 | | COG0190 | H |
| Bfl306 | tRNA-Arg3 | 338731 | 338804 | tRNA-Arg anticodon TCT | | | | | |
| Bfl307 | ytfF | 338935 | 339897 | putative membrane protein | | | | COG0697 | R |
| Bfl308 | mrdB | 341089 | 339974 | rod shape-determining membrane protein; cell elongation in e phase | | | | COG0772 | D |
| Bfl309 | mrdA | 342966 | 341107 | penicillin-binding protein 2 | | | | COG0768 | M |
| Bfl310 | ybeB | 343366 | 343061 | conserved hypothetical protein | | | | COG0799 | S |
| Bfl311 | holA | 344675 | 343641 | DNA polymerase III, delta subunit | EC:2.7.7.7 | | | COG1466 | L |
| Bfl312 | rlpB | 345364 | 344753 | rare lipoprotein B precursor | | | | COG2980 | M |
| Bfl313 | leuS | 347912 | 345309 | leucyl-tRNA synthetase | EC:6.1.1.4 | | | COG0495 | J |
| Bfl314 | lnt | 349649 | 348081 | apolipoprotein N-acyltransferase | EC:2.3.1.- | | | COG0815 | M |
| Bfl315 | ybeX | 350561 | 349686 | haemolysin-related protein | | | | COG1253 | R |
| Bfl316 | ybeY | 351064 | 350603 | conserved hypothetical protein | | | | COG0319 | S |
| Bfl317 | phoL | 352168 | 351161 | PhoH-like ATP-binding protein | | | | COG1702 | T |
| Bfl318 | ubiF | 352518 | 353711 | putative monooxygenase | EC:1.14.13.- | | | COG0654 | H |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl319 | tRNA-Gln | 353907 | 353836 | tRNA-Gln anticodon TTG | | | | | |
| Bfl320 | tRNA-Leu3 | 354041 | 353960 | tRNA-Leu anticodon TAG | | | | | |
| Bfl321 | tRNA-Met1 | 354170 | 354097 | tRNA-Met anticodon CAT | | | | | |
| Bfl322 | nagA | 355509 | 354355 | N-acetylglucosamine-6-phosphate deacetylase | EC:3.5.1.25 | | | COG1820 | G |
| Bfl323 | nagB | 356327 | 355524 | glucosamine-6-phosphate isomerase | EC:3.5.99.6 | | | COG0363 | G |
| Bfl324 | glnS | 356593 | 358263 | glutaminyl-tRNA synthetase | EC:6.1.1.18 | | | COG0008 | J |
| Bfl325 | fldA | 358897 | 358370 | flavodoxin 1 | | | | COG0716 | C |
| Bfl326 | pgm | 359724 | 361370 | phosphoglucomutase | EC:5.4.2.2 | | | COG0033 | G |
| Bfl327 | sdhC | 362199 | 362594 | succinate dehydrogenase cytochrome b-556 subunit | EC:1.3.99.1 | | | COG2009 | C |
| Bfl328 | sdhD | 362582 | 362929 | succinate dehydrogenase hydrophobic membrane anchor protein | EC:1.3.99.1 | | | COG2142 | C |
| Bfl329 | sdhA | 362932 | 364740 | succinate dehydrogenase flavoprotein subunit | EC:1.3.99.1 | | | COG1053 | C |
| Bfl330 | sdhB | 364754 | 365482 | succinate dehydrogenase iron-sulfur protein | EC:1.3.99.1 | | | COG0479 | C |
| Bfl331 | sucA | 365626 | 368538 | 2-oxoglutarate dehydrogenase E1 component | EC:1.2.4.2 | | | COG0567 | C |
| Bfl332 | sucB | 368546 | 369862 | dihydrolipoamide succinyltransferase component (E2) | EC:2.3.1.61 | | | COG0508 | C |
| Bfl333 | sucC | 369959 | 371158 | succinyl-CoA synthetase beta chain | EC:6.2.1.5 | | | COG0045 | C |
| Bfl334 | sucD | 371161 | 372051 | succinyl-CoA synthetase alpha chain | EC:6.2.1.5 | | | COG0074 | C |
| Bfl335 | tolQ | 372131 | 372880 | TolQ protein | | | | COG0811 | N |
| Bfl336 | tolR | 372843 | 373271 | tolR protein | | | | COG0848 | N |
| Bfl337 | tolA | 373293 | 374597 | tolA protein | | | | COG3064 | N |
| Bfl338 | tolB | 374679 | 376061 | tolB protein precursor | | | | COG0823 | N |
| Bfl339 | pal | 376113 | 376637 | peptidoglycan-associated lipoprotein precursor | | | | COG2885 | N |
| Bfl340 | ybgF | 376643 | 377443 | putative exported protein | | | | COG1729 | S |
| Bfl341 | ybhE | 378604 | 377588 | conserved hypothetical protein | | | | COG2706 | R |
| Bfl342 | gpmA | 378754 | 379452 | phosphoglycerate mutase 1 | EC:5.4.2.1 | | | COG0588 | G |
| Bfl343 | ybhL | 379588 | 380298 | putative permease | | | | COG0670 | R |
| Bfl344 | ychF | 381457 | 380411 | putative ATP/GTP-binding protein | | | | COG0012 | R |
| Bfl345 | pth | 382176 | 381583 | peptidyl-tRNA hydrolase | EC:3.1.1.29 | | | COG0193 | J |
| Bfl346 | prsA | 383272 | 382328 | ribose-phosphate pyrophosphokinase | EC:2.7.6.1 | | | COG0462 | F |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl347 | ipk | 384036 | 383269 | isopentenyl monophosphate kinase | EC:2.7.1.148 | | | COG1947 | S |
| Bfl348 | prfA | 384855 | 385931 | peptide chain release factor 1 (RF-1) | | | | COG0216 | J |
| Bfl349 | hemK | 385928 | 386773 | putative protoporphyrinogen oxidase | EC:2.1.1.- | | | COG2890 | R |
| Bfl350 | kdsA | 386930 | 387766 | 2-dehydro-3-deoxyphosphooctonate aldolase | EC:4.1.2.16 | | | COG2877 | E |
| Bfl351 | thrS | 388653 | 389885 | threonyl-tRNA synthetase | EC:6.1.1.3 | | | COG0441 | J |
| Bfl352 | infC | 389909 | 390436 | translation initiation factor IF-3 | | | | COG0290 | J |
| Bfl353 | rpmI | 390531 | 390728 | 50S ribosomal subunit protein L35 | | | | COG0291 | J |
| Bfl354 | rplT | 390826 | 391182 | 50S ribosomal subunit protein L20 | | | | COG0292 | J |
| Bfl355 | pheS | 391286 | 392293 | phenylalanyl-tRNA synthetase alpha chain | EC:6.1.1.20 | | | COG0016 | J |
| Bfl356 | pheT | 392329 | 394740 | phenylalanyl-tRNA synthetase beta chain | EC:6.1.1.20 | | | COG0072 | J |
| Bfl357 | lplA | 394844 | 395857 | lipoate-protein ligase A | EC:6.-.-.- | | | COG0095 | H |
| Bfl358 | sufA | 396027 | 396410 | putative HesB-like domain | | | | COG0316 | S |
| Bfl359 | sufB | 396424 | 397926 | putative ABC transporter sufB | | | | COG0719 | R |
| Bfl360 | sufC | 397993 | 398730 | probable ATP-dependent transporter sufC | | | | COG0396 | R |
| Bfl361 | sufD | 398714 | 400015 | required for stability of iron-sulfur component of FhuF | | | | COG0719 | R |
| Bfl362 | sufS | 400012 | 401247 | selenocysteine lyase | EC:4.4.1.16 | | | COG0520 | E |
| Bfl363 | ynhA | 401291 | 401722 | conserved hypothetical protein | | | | COG2166 | R |
| Bfl364 | lpp | 402058 | 401822 | major outer membrane lipoprotein | | | | COG4238 | M |
| Bfl365 | tRNA-Val2 | 402258 | 402185 | tRNA-Val anticodon GAC | | | | | |
| Bfl366 | ribE | 402614 | 403222 | riboflavin synthase alpha chain | EC:2.5.1.9 | | | COG0307 | H |
| Bfl367 | ydhD | 403359 | 403694 | conserved hypothetical protein | | | | COG0278 | O |
| Bfl368 | rnt | 404376 | 403705 | ribonuclease T | EC:3.1.13.- | | | COG0847 | L |
| Bfl369 | slyA | 404931 | 405365 | transcriptional regulator SlyA | | | | COG1846 | K |
| Bfl370 | pdxH | 405628 | 406272 | pyridoxamine 5'-phosphate oxidase | EC:1.4.3.5 | | | COG0259 | H |
| Bfl371 | tyrS | 406416 | 407684 | tyrosyl-tRNA synthetase | EC:6.1.1.1 | | | COG0162 | J |
| Bfl372 | nth | 408370 | 407729 | endonuclease III | EC:4.2.99.18 | | | COG0177 | L |
| Bfl373 | fumC | 409803 | 408457 | fumarate hydratase class II | EC:4.2.1.2 | | | COG0114 | C |
| Bfl374 | eaeH | 409944 | 411986 | putative adhesin | | | | | R |
| Bfl375 | ubiX | 412666 | 412067 | 3-octaprenyl-4-hydroxybenzoate carboxy-lyase | EC:4.1.1.- | | | COG0163 | H |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl376 | kdsB | 413506 | 412730 | 3-deoxy-manno-octulosonate cytidylyltransferase | EC:2.7.7.38 | | | COG1212 | M |
| Bfl377 | ycaR | 413688 | 413503 | conserved hypothetical protein | | | | COG2835 | S |
| Bfl378 | lpxK | 414751 | 413750 | tetraacyldisaccharide 4'-kinase | EC:2.7.1.130 | | | COG1663 | N |
| Bfl379 | msbA | 416502 | 414751 | probable transport ATP-binding protein MsbA | | | | COG1132 | R |
| Bfl380 | rpsA | 418705 | 416978 | 30S ribosomal protein S1 | | | | COG0539 | J |
| Bfl381 | cmk | 419514 | 418816 | cytidylate kinase | EC:2.7.4.14 | | | COG0283 | F |
| Bfl382 | aroA | 420936 | 419635 | 3-phosphoshikimate 1-carboxyvinyltransferase | EC:2.5.1.19 | | | COG0128 | E |
| Bfl383 | serC | 422155 | 421058 | phosphoserine aminotransferase | EC:2.6.1.52 | | | COG1932 | H |
| Bfl384 | serS | 423649 | 422339 | seryl-tRNA synthetase | EC:6.1.1.11 | | | COG0172 | J |
| Bfl385 | lolA | 424784 | 424152 | outer membrane lipoprotein carrier protein precursor | | | | COG2834 | M |
| Bfl386 | ftsK | 427235 | 424881 | cell division protein FtsK | | | | COG1674 | D |
| Bfl387 | trxB | 427554 | 428525 | thioredoxin reductase | EC:1.6.4.5 | | | COG0492 | O |
| Bfl388 | infA | 428649 | 428867 | initiation factor IF-1 | | | | COG0361 | J |
| Bfl389 | oprC | 431104 | 428942 | outer membrane protein OprC | | | | COG1629 | N |
| Bfl390 | yqeI | 431534 | 432172 | hypothetical protein | | | | COG3710 | S |
| Bfl391 | mltE | 433207 | 432452 | membrane-bound lytic murein transglycosylase E | EC:3.2.1.- | | | COG0741 | M |
| Bfl392 | trmU | 433593 | 434702 | tRNA (5-methylaminomethyl-2-thiouridylate)-methyltransferase | EC:2.1.1.61 | | | COG0482 | R |
| Bfl393 | purB | 434941 | 436326 | adenylosuccinate lyase | EC:4.3.2.2 | | | COG0015 | F |
| Bfl394 | lolE | 437679 | 436429 | ABC transporter integral membrane subunit | | | | COG4591 | M |
| Bfl395 | lolD | 438413 | 437706 | ABC transporter ATP-binding subunit | | | | COG1136 | M |
| Bfl396 | ycfU | 439620 | 438403 | ABC transporter integral membrane subunit | | | | COG4591 | M |
| Bfl397 | ycfM | 440303 | 439737 | putative lipoprotein | | | | COG3417 | S |
| Bfl398 | ycfF | 440895 | 440539 | putative protein kinase C inhibitor | | | | COG0537 | F |
| Bfl399 | ycfH | 441781 | 441002 | putative deoxyribonuclease | EC:3.1.21.- | | | COG0084 | R |
| Bfl400 | holB | 442801 | 441800 | DNA polymerase III, delta prime subunit | EC:2.7.7.7 | | | COG0470 | L |
| Bfl401 | tmk | 443448 | 442813 | thymidylate kinase | EC:2.7.4.9 | | | COG0125 | F |
| Bfl402 | pabC | 444440 | 443622 | 4-amino-4-deoxychorismate lyase | EC:4.-.-.- | | | COG0115 | E |
| Bfl403 | acpP | 444803 | 444567 | acyl carrier protein | | | | COG0236 | I |

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|---|---|---|---|---|---|---|---|---|---|
| Bfl404 | fabG | 445674 | 444940 | 3-oxoacyl-[acyl-carrier protein] reductase | EC:1.1.1.100 | | | COG1028 | R |
| Bfl405 | fabD | 446678 | 445713 | malonyl CoA-acyl carrier protein transacylase | EC:2.3.1.39 | | | COG0331 | I |
| Bfl406 | fabH | 447663 | 446707 | 3-oxoacyl-[acyl-carrier-protein] synthase III | EC:2.3.1.41 | | | COG0332 | I |
| Bfl407 | plsX | 448709 | 447675 | fatty acid/phospholipid synthesis protein PlsX | | | | COG0416 | I |
| Bfl408 | rpmF | 448900 | 448730 | 50S ribosomal protein L32 | | | | COG0333 | J |
| Bfl409 | rluC | 450316 | 449348 | ribosomal large subunit pseudouridine synthase C | EC:4.2.1.70 | | | COG0564 | J |
| Bfl410 | rne | 450736 | 452868 | ribonuclease E | EC:3.1.4.- | | | COG1530 | J |
| Bfl411 | htrB | 453267 | 454193 | lipid A biosynthesis lauroyl acyltransferase | EC:2.3.1.- | | | COG1560 | N |
| Bfl412 | ybiS | 454314 | 455209 | pseudogene of putative exported protein | | | | COG1376 | S |
| Bfl413 | tRNA-Leu2 | 455378 | 455296 | tRNA-Leu anticodon TAA | | | | | |
| Bfl414 | tRNA-Cys | 455468 | 455398 | tRNA-Cys anticodon GCA | | | | | |
| Bfl415 | pgsA | 456443 | 455871 | phosphotidylglycerophosphate synthetase | EC:2.7.8.5 | | | COG0558 | I |
| Bfl416 | tRNA-Lys2 | 456857 | 456786 | tRNA-Lys anticodon CTT | | | | | |
| Bfl417 | tRNA-Ser3 | 457082 | 456999 | tRNA-Ser anticodon TGA | | | | | |
| Bfl418 | yccK | 457230 | 457559 | putative sulfite reductase | EC:1.8.99.3 | | | COG2920 | R |
| Bfl419 | yccV | 457762 | 458079 | conserved hypothetical protein | | | | COG3785 | S |
| Bfl420 | fabA | 458444 | 458962 | D-3-hydroxydecanoyl-(acyl carrier-protein) | EC:4.2.1.60 | | | COG0764 | I |
| Bfl421 | asnS | 459061 | 460473 | asparaginyl-tRNA synthetase | EC:6.1.1.22 | | | COG0017 | J |
| Bfl422 | aspC | 460603 | 461823 | aspartate aminotransferase | EC:2.6.1.1 | | | COG1448 | E |
| Bfl423 | ycbL | 462523 | 461888 | conserved hypothetical protein | | | | COG0491 | R |
| Bfl424 | fabI | 463402 | 462617 | enoyl-[acyl-carrier-protein] reductase (NADH) | EC:1.3.1.9 | | | COG0623 | I |
| Bfl425 | ribA | 464182 | 464781 | GTP cyclohydrolase II | EC:3.5.4.25 | | | COG0807 | H |
| Bfl426 | trpE | 465508 | 467073 | anthranilate synthase component I | EC:4.1.3.27 | | | COG0147 | E |
| Bfl427 | trpG | 467081 | 467662 | anthranilate synthase component II | EC:4.1.3.27 | | | COG0512 | E |
| Bfl428 | trpD | 467677 | 468699 | anthranilate phosphoribosyltransferase | EC:2.4.2.18 | | | COG0512 | E |
| Bfl429 | trpC | 468711 | 470087 | indole-3-glycerol phosphate synthase | EC:4.1.1.48 | EC:5.3.1.24 | | COG0134 | E |
| Bfl430 | trpB | 470124 | 471320 | tryptophan synthase beta chain | EC:4.2.1.20 | | | COG0133 | E |
| Bfl431 | trpA | 471317 | 472132 | tryptophan synthase alpha chain | EC:4.2.1.20 | | | COG0159 | E |
| Bfl432 | tonB | 473616 | 472837 | TonB protein | | | | COG0810 | M |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl433 | cls | 473951 | 475426 | cardiolipin synthetase | EC:2.7.8.- | | | COG1502 | I |
| Bfl434 | tdk | 476183 | 475605 | thymidine kinase | EC:2.7.1.21 | | | COG1435 | F |
| Bfl435 | xthA | 477241 | 478044 | exodeoxyribonuclease III | EC:3.1.11.2 | | | COG0708 | L |
| Bfl436 | sppA | 478172 | 480049 | protease IV, a signal peptide peptidase | EC:3.4.21.- | | | COG0616 | N |
| Bfl437 | gapA | 480436 | 481437 | glyceraldehyde 3-phosphate dehydrogenase A | EC:1.2.1.12 | | | COG0057 | G |
| Bfl438 | dsbB | 481718 | 482242 | disulfide bond formation protein B | | | | COG1495 | O |
| Bfl439 | minC | 482387 | 483103 | septum site determining protein MinC | | | | COG0850 | D |
| Bfl440 | minD | 483114 | 483938 | septum site determining protein MinD | | | | COG2894 | D |
| Bfl441 | minE | 483945 | 484247 | cell division topological specificity factor | | | | COG0851 | D |
| Bfl442 | yeaZ | 484963 | 484301 | conserved hypothetical protein | | | | COG1214 | O |
| Bfl443 | pabB | 485126 | 486511 | para-aminobenzoate synthase component I | EC:4.1.3.- | | | COG0147 | E |
| Bfl444 | yoaE | 488134 | 486575 | putative membrane protein | | | | COG0861 | P |
| Bfl445 | manX | 488572 | 489561 | PTS system, mannose-specific IIAB component | EC:2.7.1.69 | | | COG2893 | G |
| Bfl446 | manY | 489677 | 490492 | phosphotransferase enzyme II, C component | | | | COG3715 | G |
| Bfl447 | manZ | 490505 | 491377 | phosphotransferase enzyme II, D component | | | | COG3716 | G |
| Bfl448 | cspC | 491758 | 491549 | cold shock-like protein CspC | | | | COG1278 | T |
| Bfl449 | zwf | 494125 | 492629 | glucose 6-phosphate dehydrogenase | EC:1.1.1.49 | | | COG0364 | G |
| Bfl450 | pykA | 494615 | 496081 | pyruvate kinase A | EC:2.7.1.40 | | | COG0469 | G |
| Bfl451 | yebA | 497569 | 496178 | conserved hypothetical protein | | | | COG0739 | M |
| Bfl452 | aspS | 499511 | 497781 | aspartyl-tRNA synthetase | EC:6.1.1.12 | | | COG0173 | J |
| Bfl453 | argS | 499941 | 501692 | arginyl-tRNA synthetase | EC:6.1.1.19 | | | COG0018 | J |
| Bfl454 | mviN | 503270 | 501714 | virulence factor MviN | | | | COG0728 | R |
| Bfl455 | yceL | 503795 | 505000 | putative membrane transporter | | | | COG0477 | G |
| Bfl456 | tRNA-Ser2 | 505261 | 505174 | tRNA-Ser anticodon GGA | | | | | |
| Bfl457 | tRNA-Ser1 | 505721 | 505634 | tRNA-Ser anticodon CGA | | | | | |
| Bfl458 | tRNA-Asn | 505969 | 505897 | tRNA-Asn anticodon GTT | | | | | |
| Bfl459 | gutQ | 507023 | 506043 | putative phosphosugar binding protein | | | | COG0517 | R |
| Bfl460 | yeeX | 507763 | 507437 | conserved hypothetical protein | | | | COG2926 | S |
| Bfl461 | sbcB | 508047 | 509552 | exodeoxyribonuclease I | EC:3.1.11.1 | | | COG2925 | L |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl462 | hisG | 509860 | 510759 | ATP phosphoribosyltransferase | EC:2.4.2.17 | | | COG0040 | E |
| Bfl463 | hisD | 510764 | 512077 | histidinol dehydrogenase | EC:1.1.1.23 | | | COG0141 | E |
| Bfl464 | hisC | 512074 | 513144 | histidinol-phosphate aminotransferase | EC:2.6.1.9 | | | COG0079 | E |
| Bfl465 | hisB | 513168 | 514241 | imidazoleglycerol-phosphate dehydratase; histidinol phosphatase | EC:3.1.3.15 | EC:4.2.1.19 | | COG0131 | E |
| Bfl466 | hisH | 514238 | 514828 | glutamine amidotransferase, subunit with HisF | EC:2.4.2.- | | | COG0118 | E |
| Bfl467 | hisA | 514835 | 515590 | phosphoribosylformimino-5-aminoimidazole carboxamide ribotide isomerase | EC:5.3.1.16 | | | COG0106 | E |
| Bfl468 | hisF | 515560 | 516336 | imidazole glycerol phosphate synthase, subunit with HisH | EC:4.1.3.- | | | COG0107 | E |
| Bfl469 | hisI | 516330 | 516971 | phosphoribosyl-AMP cyclohydrolase / phosphoribosyl-ATP pyrophosphohydrolase | EC:3.5.4.19 | EC:3.6.1.31 | | COG0140 | E |
| Bfl470 | gnd | 518526 | 517102 | 6-phosphogluconate dehydrogenase, decarboxylating | EC:1.1.1.44 | | | COG0362 | G |
| Bfl471 | metG | 518883 | 520520 | methionyl-tRNA synthetase | EC:6.1.1.10 | | | COG0143 | J |
| Bfl472 | folE | 521340 | 520675 | GTP cyclohydrolase I | EC:3.5.4.16 | | | COG0302 | H |
| Bfl473 | rplY | 521617 | 521928 | 50s ribosomal protein L25 | | | | COG1825 | J |
| Bfl474 | ddlA | 523025 | 521961 | D-alanine:D-alanine ligase A | EC:6.3.2.4 | | | COG1181 | M |
| Bfl475 | omp | 524270 | 523140 | outer membrane protein | | | | COG3203 | N |
| Bfl476 | gyrA | 527292 | 524704 | DNA gyrase subunit A | EC:5.99.1.3 | | | COG0188 | L |
| Bfl477 | ubiG | 527499 | 528236 | 3-demethylubiquinone-9 3-methyltransferase | EC:2.1.1.64 | | | COG2227 | H |
| Bfl478 | nrdA | 528624 | 530909 | ribonucleoside-diphosphate reductase 1 alpha chain | EC:1.17.4.1 | | | COG0209 | F |
| Bfl479 | nrdB | 530938 | 532068 | ribonucleoside-diphosphate reductase 1 beta chain | EC:1.17.4.1 | | | COG0208 | F |
| Bfl480 | yfaE | 532043 | 532330 | putative ferredoxin | | | | COG0633 | C |
| Bfl481 | nuoN | 533956 | 532442 | NADH dehydrogenase I chain N | EC:1.6.5.3 | | | COG1007 | C |
| Bfl482 | nuoM | 535561 | 534032 | NADH dehydrogenase I chain M | EC:1.6.5.3 | | | COG1008 | C |
| Bfl483 | nuoL | 537483 | 535606 | NADH dehydrogenase I chain L | EC:1.6.5.3 | | | COG1009 | C |
| Bfl484 | nuoK | 537782 | 537480 | NADH dehydrogenase I chain k | EC:1.6.5.3 | | | COG0713 | C |
| Bfl485 | nuoJ | 538333 | 537782 | NADH dehydrogenase I chain J | EC:1.6.5.3 | | | COG0839 | C |
| Bfl486 | nuoI | 538908 | 538363 | NADH dehydrogenase I chain I | EC:1.6.5.3 | | | COG1143 | C |
| Bfl487 | nuoH | 539903 | 538935 | NADH dehydrogenase I chain H | EC:1.6.5.3 | | | COG1005 | C |

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|---|---|---|---|---|---|---|---|---|---|
| Bfl488 | nuoG | 542725 | 539900 | NADH dehydrogenase I chain G | EC:1.6.5.3 |  |  | COG1034 | C |
| Bfl489 | nuoF | 544175 | 542838 | NADH dehydrogenase I chain F | EC:1.6.5.3 |  |  | COG1894 | C |
| Bfl490 | nuoE | 544642 | 544178 | NADH dehydrogenase I chain E | EC:1.6.5.3 |  |  | COG1905 | C |
| Bfl491 | nuoCD | 546523 | 544733 | NADH dehydrogenase I chain C; chain D | EC:1.6.5.3 |  |  | COG0649 | C |
| Bfl492 | nuoB | 547324 | 546653 | NADH dehydrogenase I chain B | EC:1.6.5.3 |  |  | COG0377 | C |
| Bfl493 | nuoA | 547761 | 547330 | NADH dehydrogenase I chain A | EC:1.6.5.3 |  |  | COG0838 | C |
| Bfl494 | folC | 549446 | 548199 | folylpolyglutamate synthase | EC:6.3.2.17 | EC:6.3.2.12 |  | COG0285 | H |
| Bfl495 | accD | 550403 | 549540 | acetyl-CoA carboxylase beta subunit | EC:6.4.1.2 |  |  | COG0777 | I |
| Bfl496 | truA | 551280 | 550522 | tRNA pseudouridine synthase A | EC:4.2.1.70 |  |  | COG0101 | J |
| Bfl497 | pdxB | 552555 | 551437 | erythronate-4-phosphate dehydrogenase | EC:1.1.1.- |  |  | COG0111 | C |
| Bfl498 | fabB | 554051 | 552834 | 3-oxoacyl-[acyl-carrier-protein] synthase I | EC:2.3.1.41 |  |  | COG0304 | I |
| Bfl499 | yfcB | 554680 | 555591 | conserved hypothetical protein | EC:2.1.1.72 |  |  | COG2890 | R |
| Bfl500 | aroC | 555595 | 556668 | chorismate synthase | EC:4.6.1.4 |  |  | COG0082 | E |
| Bfl501 | tRNA-Arg2 | 556932 | 556861 | tRNA-Arg anticodon CCT |  |  |  |  |  |
| Bfl502 | mntH | 558390 | 557152 | manganese transport protein MntH |  |  |  | COG1914 | P |
| Bfl503 | nupC | 558663 | 559877 | nucleoside permease NupC |  |  |  | COG1972 | F |
| Bfl504 | gltX | 561718 | 560267 | glutamyl-tRNA synthetase | EC:6.1.1.17 |  |  | COG0008 | J |
| Bfl505 | tRNA-Val1 | 561940 | 561868 | tRNA-Val anticodon TAC |  |  |  |  |  |
| Bfl506 | tRNA-Lys1 | 562056 | 561984 | tRNA-Lys anticodon TTT |  |  |  |  |  |
| Bfl507 | lig | 563944 | 562160 | DNA ligase | EC:6.5.1.2 |  |  | COG0272 | L |
| Bfl508 | cysK | 564242 | 565186 | cysteine synthase A | EC:4.2.99.8 |  |  | COG0031 | E |
| Bfl509 | ptsH | 565535 | 565807 | phosphocarrier protein HPr |  |  |  | COG1925 | G |
| Bfl510 | ptsI | 565839 | 567563 | phosphoenolpyruvate-protein phosphotransferase | EC:2.7.3.9 |  |  | COG1080 | G |
| Bfl511 | cysA | 568739 | 567687 | sulphate transport ATP-binding protein CysA |  |  |  | COG1118 | P |
| Bfl512 | cysW | 569626 | 568769 | sulphate transport system permease protein CysW |  |  |  | COG4208 | P |
| Bfl513 | cysU | 570464 | 569628 | sulphate transport system permease protein CysU |  |  |  | COG0555 | P |
| Bfl514 | cysP | 571503 | 570469 | thiosulphate-binding protein precursor |  |  |  | COG1613 | P |
| Bfl515 | talA | 572171 | 573142 | transaldolase A | EC:2.2.1.2 |  |  | COG0176 | G |
| Bfl516 | tktA | 573156 | 575150 | transketolase | EC:2.2.1.1 |  |  | COG0021 | G |

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|---|---|---|---|---|---|---|---|---|---|
| Bfl517 | dapE | 575233 | 576387 | succinyl-diaminopimelate desuccinylase | EC:3.5.1.18 | | | COG0624 | E |
| Bfl518 | dapA | 577859 | 576981 | dihydrodipicolinate synthase | EC:4.2.1.52 | | | COG0329 | E |
| Bfl519 | bcp | 578340 | 578819 | bacterioferritin comigratory protein | | | | COG1225 | O |
| Bfl520 | upp | 579510 | 578884 | uracil phosphoribosyltransferase | EC:2.4.2.9 | | | COG0035 | F |
| Bfl521 | ureG | 580938 | 580309 | putative urease accessory protein G | | | | COG0378 | F |
| Bfl522 | ureF | 581714 | 581031 | putative urease accessory protein F | | | | COG0830 | F |
| Bfl523 | ureC | 583716 | 582013 | putative urease structural subunit C (alpha) | EC:3.5.1.5 | | | COG0804 | F |
| Bfl524 | ureB | 584030 | 583719 | putative urease structural subunit B (beta) | EC:3.5.1.5 | | | COG0832 | F |
| Bfl525 | ureA | 584368 | 584066 | putative urease structural subunit A (gamma) | EC:3.5.1.5 | | | COG0831 | F |
| Bfl526 | ureD | 585245 | 584385 | putative urease accessory protein D | | | | COG0829 | F |
| Bfl527 | guaA | 586991 | 585411 | GMP synthase (glutamine-hydrolyzing) | EC:6.3.5.2 | | | COG0518 | F |
| Bfl528 | guaB | 588525 | 587056 | inosine-5'-monophosphate dehydrogenase | EC:1.1.1.205 | | | COG0516 | F |
| Bfl529 | mqo | 588920 | 590494 | probable malate:quinone oxidoreductase (malate dehydrogenase (acceptor)) | EC:1.1.99.16 | | | COG0579 | R |
| Bfl530 | engA | 592011 | 590554 | putative GTP-binding protein | | | | COG1160 | R |
| Bfl531 | hisS | 593408 | 592107 | histidyl-tRNA synthetase | EC:6.1.1.21 | | | COG0124 | J |
| Bfl532 | gcpE | 594331 | 593566 | pseudogene of GcpE protein (protein E) | | | | COG0821 | M |
| Bfl533 | ndk | 596452 | 596042 | nucleoside diphosphate kinase | EC:2.7.4.6 | | | COG0105 | F |
| Bfl534 | nifS | 597951 | 596764 | putative L-cysteine desulfurase | EC:4.4.1.- | | | COG1104 | E |
| Bfl535 | suhB | 598453 | 599277 | putative myo-inositol-1(or 4)-monophosphatase | EC:3.1.3.25 | | | COG0483 | G |
| Bfl536 | glyA | 600630 | 599386 | serine hydroxymethyltransferase | EC:2.1.2.1 | | | COG0112 | E |
| Bfl537 | yfhC | 601183 | 600704 | putative cytosine/adenosine deaminase | EC:3.5.4.1 | | | COG0590 | F |
| Bfl538 | acpS | 601704 | 601327 | holo-[acyl-carrier protein] synthase | EC:2.7.8.7 | | | COG0736 | I |
| Bfl539 | pdxJ | 602444 | 601701 | putative pyridoxal phosphate biosynthetic protein | | | | COG0854 | H |
| Bfl540 | rnc | 603368 | 602670 | ribonuclease III | EC:3.1.26.3 | | | COG0571 | K |
| Bfl541 | lepB | 604501 | 603503 | signal peptidase I | EC:3.4.21.89 | | | COG0681 | N |
| Bfl542 | lepA | 606344 | 604545 | GTP-binding protein LepA | | | | COG0481 | N |
| Bfl543 | ung | 606597 | 607262 | uracil-DNA glycosylase | EC:3.2.2.- | | | COG0692 | L |
| Bfl544 | grpE | 608081 | 607494 | heat shock protein GrpE | | | | COG0576 | O |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl545 | yfjB | 608206 | 609087 | probable inorganic polyphosphate/ATP-NAD kinase | EC:2.7.1.23 | | | COG0061 | R |
| Bfl546 | smpA | 609173 | 609520 | small membrane protein A | | | | COG2913 | S |
| Bfl547 | yfjG | 610048 | 609605 | conserved hypothetical protein | | | | COG2867 | S |
| Bfl548 | smpB | 610196 | 610642 | small protein B; putative tmRNA-binding protein | | | | COG0691 | O |
| Bfl549 | tmRNA | 611082 | 610694 | tmRNA | | | | | |
| Bfl550 | emrE | 611253 | 611582 | emrE protein (methyl viologen resistance protein C) (ethidium resistance protein) | | | | COG2076 | P |
| Bfl551 | pssA | 611675 | 613060 | phosphatidylserine synthase (CDP-diacylglycerol-serine O-phosphatidyltransferase) | EC:2.7.8.8 | | | COG1502 | I |
| Bfl552 | 23SrRNA | 616171 | 613128 | 23S rRNA | | | | | |
| Bfl553 | tRNA-Glu | 616408 | 616337 | tRNA-Glu anticodon TTC | | | | | |
| Bfl554 | 16SrRNA | 618033 | 616478 | 16S rRNA | | | | | |
| Bfl555 | purH | 618462 | 620111 | phosphoribosylaminoimidazolecarboxamide formyltransferase, IMP cyclohydrolase and MGS-like domain | EC:2.1.2.3 | EC:3.5.4.10 | | COG0138 | F |
| Bfl556 | rpoC | 624491 | 620229 | DNA-directed RNA polymerase, beta-prime-subunit | EC:2.7.7.6 | | | COG0086 | K |
| Bfl557 | rpoB | 628634 | 624606 | DNA-directed RNA polymerase, beta-subunit | EC:2.7.7.6 | | | COG0085 | K |
| Bfl558 | rplL | 629221 | 628841 | 50S ribosomal subunit protein L7/L12 | | | | COG0222 | J |
| Bfl559 | rplJ | 629813 | 629316 | 50S ribosomal subunit protein L10 | | | | COG0244 | J |
| Bfl560 | rplA | 630838 | 630131 | 50S ribosomal subunit protein L1 | | | | COG0081 | J |
| Bfl561 | rplK | 631275 | 630835 | 50S ribosomal subunit protein L11 | | | | COG0080 | J |
| Bfl562 | nusG | 631928 | 631383 | transcription antitermination protein NusG | | | | COG0250 | K |
| Bfl563 | secE | 632304 | 631930 | preprotein translocase SecE subunit | | | | COG0690 | N |
| Bfl564 | tuf | 633643 | 632459 | elongation factor Tu (EF-Tu) | EC:3.6.1.48 | | | COG0050 | J |
| Bfl565 | fusA | 635872 | 633743 | elongation factor G (EF-G) | EC:3.6.1.48 | | | COG0480 | J |
| Bfl566 | rpsG | 636453 | 635980 | 30S ribosomal subunit protein S7 | | | | COG0049 | J |
| Bfl567 | rpsL | 636975 | 636601 | 30S ribosomal subunit protein S12 | | | | COG0048 | J |
| Bfl568 | pabA | 638311 | 637730 | para-aminobenzoate synthase, glutamine amidotransferase component II | EC:4.1.3.- | | | COG0512 | E |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl569 | trpS | 639475 | 638471 | tryptophanyl-tRNA synthetase | EC:6.1.1.2 | | | COG0180 | J |
| Bfl570 | rpe | 640399 | 639719 | ribulose-phosphate 3-epimerase | EC:5.1.3.1 | | | COG0036 | G |
| Bfl571 | aroB | 641790 | 640696 | 3-dehydroquinate synthase | EC:4.6.1.3 | | | COG0337 | E |
| Bfl572 | aroK | 642392 | 641835 | shikimate kinase I | EC:2.7.1.71 | | | COG0703 | E |
| Bfl573 | yhgI | 643461 | 644078 | conserved hypothetical protein | | | | COG0694 | O |
| Bfl574 | asd | 645359 | 644244 | aspartate-semialdehyde dehydrogenase | EC:1.2.1.11 | | | COG0136 | E |
| Bfl575 | yhgN | 645579 | 646172 | putative inner membrane protein | | | | COG2095 | S |
| Bfl576 | yigL | 647322 | 646522 | putative hydrolase of the HAD superfamily | | | | COG0561 | R |
| Bfl577 | corA | 648511 | 647567 | magnesium and cobalt transport protein | | | | COG0598 | P |
| Bfl578 | yigB | 649628 | 648900 | putative hydrolase of the HAD superfamily | | | | COG1011 | R |
| Bfl579 | dapF | 650481 | 649651 | diaminopimelate epimerase | EC:5.1.1.7 | | | COG0253 | E |
| Bfl580 | hemC | 650907 | 651842 | porphobilinogen deaminase | EC:4.3.1.8 | | | COG0181 | H |
| Bfl581 | hemD | 651868 | 652611 | uroporphyrinogen III synthase | EC:4.2.1.75 | | | COG1587 | H |
| Bfl582 | tRNA-Pro | 652786 | 652713 | tRNA-Pro anticodon TGG | | | | | |
| Bfl583 | tRNA-Leu1 | 652885 | 652799 | tRNA-Leu anticodon CAG | | | | | |
| Bfl584 | tRNA-His | 652988 | 652916 | tRNA-His anticodon GTG | | | | | |
| Bfl585 | tRNA-Arg1 | 653133 | 653060 | tRNA-Arg anticodon CCG | | | | | |
| Bfl586 | rho | 654689 | 653430 | transcription termination factor Rho | | | | COG1158 | K |
| Bfl587 | trxA | 655399 | 655058 | thioredoxin 1, redox factor | | | | COG0526 | O |
| Bfl588 | ilvC | 657021 | 655543 | ketol-acid reductoisomerase | EC:1.1.1.86 | | | COG0059 | E |
| Bfl589 | ilvA | 658643 | 657099 | threonine deaminase | EC:4.2.1.16 | | | COG1171 | E |
| Bfl590 | ilvD | 660538 | 658682 | dihydroxyacid dehydratase | EC:4.2.1.9 | | | COG0129 | E |
| Bfl591 | ilvE | 661540 | 660617 | branched-chain amino-acid aminotransferase | EC:2.6.1.42 | | | COG0115 | E |
| Bfl592 | ilvM | 661847 | 661611 | acetolactate synthase II, small subunit | EC:4.1.3.18 | | | COG0440 | E |
| Bfl593 | ilvG | 663556 | 661892 | acetolactate synthase II, large subunit | EC:4.1.3.18 | | | COG0028 | E |
| Bfl594 | tRNA-Trp | 664046 | 663975 | tRNA-Trp anticodon CCA | | | | | |
| Bfl595 | tRNA-Asp | 664177 | 664104 | tRNA-Asp anticodon GTC | | | | | |
| Bfl596 | tRNA-Ala | 664314 | 664242 | tRNA-Ala anticodon TGC | | | | | |
| Bfl597 | metF | 666003 | 665107 | 5,10 methylenetetrahydrofolate reductase | EC:1.7.99.5 | | | COG0685 | E |

| Bfl gene number | Gene name* | Start | End | Product | EC1 | EC2 | EC3 | Cluster of orthologous genes (COG) no. | COG category |
|---|---|---|---|---|---|---|---|---|---|
| Bfl598 | metB | 667310 | 666153 | cystathionine gamma-synthase | EC:4.2.99.9 | | | COG0626 | E |
| Bfl599 | rpmE | 667721 | 667500 | 50S ribosomal protein L31 | | | | COG0254 | J |
| Bfl600 | fpr | 668321 | 669070 | ferredoxin--NADP reductase | EC:1.18.1.2 | | | COG1018 | C |
| Bfl601 | tpiA | 669260 | 670048 | triosephosphate isomerase | EC:5.3.1.1 | | | COG0149 | G |
| Bfl602 | pfkA | 671076 | 670114 | 6-phosphofructokinase | EC:2.7.1.11 | | | COG0205 | G |
| Bfl603 | cysE | 672145 | 671411 | serine acetyltransferase | EC:2.3.1.30 | | | COG1045 | E |
| Bfl604 | gpsA | 673232 | 672231 | glycerol-3-phosphate dehydrogenase | EC:1.1.1.94 | | | COG0240 | C |
| Bfl605 | grxC | 673941 | 673675 | glutaredoxin 3 | | | | COG0695 | O |
| Bfl606 | yibN | 674412 | 673969 | putative Rhodanese-related sulfurtransferases | | | | COG0607 | P |
| Bfl607 | rfaD | 674838 | 675773 | ADP-L-Glycero-D-mannoheptose-6-epimerase | EC:5.1.3.20 | | | COG0451 | M |
| Bfl608 | rfaF | 675817 | 676872 | ADP-heptose; lipopolysaccharide heptosyltransferase II | EC:2.4.1.- | | | COG0859 | M |
| Bfl609 | rfaC | 676893 | 677873 | lipopolysaccharide heptosyltransferase I | EC:2.4.1.- | | | COG0859 | M |
| Bfl610 | kdtA | 678180 | 679472 | 3-deoxy-D-manno-octulosonic-acid transferase | EC:2.4.99.- | | | COG1519 | M |
| Bfl611 | rpmG | 679688 | 679527 | 50S ribosomal subunit protein L33 | | | | COG0267 | J |
| Bfl612 | rpmB | 679936 | 679697 | 50S ribosomal subunit protein L28 | | | | COG0227 | J |
| Bfl613 | dut | 680447 | 680902 | deoxyuridine 5'-triphosphate nucleotidohydrolase | EC:3.6.1.23 | | | COG0756 | F |
| Bfl614 | yicC | 681103 | 681975 | putative stress-induced protein | | | | COG1561 | S |
| Bfl615 | Bfl615 | 682523 | 682957 | putative transcription regulator protein | | | | COG1846 | R |
| Bfl616 | gmk | 683158 | 683790 | guanylate kinase | EC:2.7.4.8 | | | COG0194 | F |
| Bfl617 | rpoZ | 683827 | 684009 | DNA-directed RNA polymerase omega chain | EC:2.7.7.6 | | | COG1758 | K |
| Bfl618 | glnA | 684080 | 685501 | glutamine synthetase | EC:6.3.1.2 | | | COG0174 | E |
| Bfl619 | polA | 688468 | 685637 | DNA polymerase I | EC:2.7.7.7 | | | COG0749 | L |
| Bfl620 | yigC | 690798 | 689299 | putative oxidoreductase | EC:4.1.1.- | | | COG0043 | S |
| Bfl621 | aarF | 692543 | 690906 | ubiquinone biosynthesis protein | | | | COG0661 | R |
| Bfl622 | ubiE | 693869 | 693105 | ubiquinone/menaquinone biosynthesis methyltransferase UbiE | EC:2.1.1.- | | | COG2226 | H |
| Bfl623 | rumC | 695451 | 693976 | putative membrane protein | | | | COG1322 | S |
| Bfl624 | udp | 696377 | 695562 | uridine phosphorylase | EC:2.4.2.3 | | | COG2820 | F |
| Bfl625 | metE | 698735 | 696426 | 5-methyltetrahydropteroyltriglutamate-homocysteine S- | EC:2.1.1.14 | | | COG0620 | E |

| **Bfl gene number** | **Gene name*** | **Start** | **End** | **Product** | **EC1** | **EC2** | **EC3** | **Cluster of orthologous genes (COG) no.** | **COG category** |
|---|---|---|---|---|---|---|---|---|---|
| | | | | methyltransferase | | | | | |
| Bfl626 | rpoH | 699829 | 698978 | RNA polymerase sigma-32 factor | | | | COG0568 | K |
| Bfl627 | ftsY | 701089 | 700163 | cell division protein FtsY | | | | COG0552 | N |
| Bfl628 | yhhF | 701183 | 701773 | putative methyltransferase | EC:2.1.1.- | | | COG0742 | L |
| Bfl629 | pgi | 703581 | 701905 | glucose-6-phosphate isomerase | EC:5.3.1.9 | | | COG0166 | G |
| Bfl630 | metA | 704748 | 703858 | homoserine O-succinyltransferase | EC:2.3.1.46 | | | COG1897 | E |
| Bfl631 | tRNA-Ile | 705085 | 705012 | tRNA-Ile anticodon GAT | | | | | |

*Pseudogenes are in shadowed boxes.