

Fig. S1 Distribution of protein-coding genes across COG functional categories in CD0817 genome. Note: one protein-coding gene might be assigned to more than one category

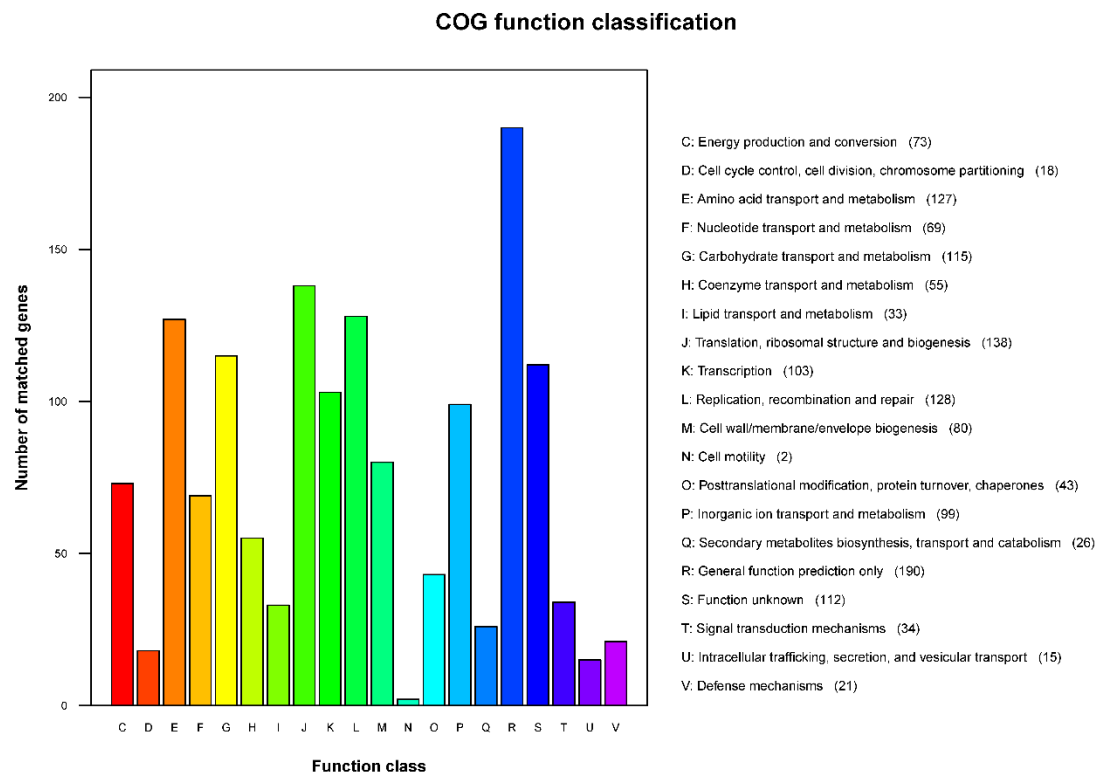


Fig. S2 Distribution of protein-coding genes across GO functional categories in CD0817 genome. Note: one protein-coding gene might be assigned to more than one category

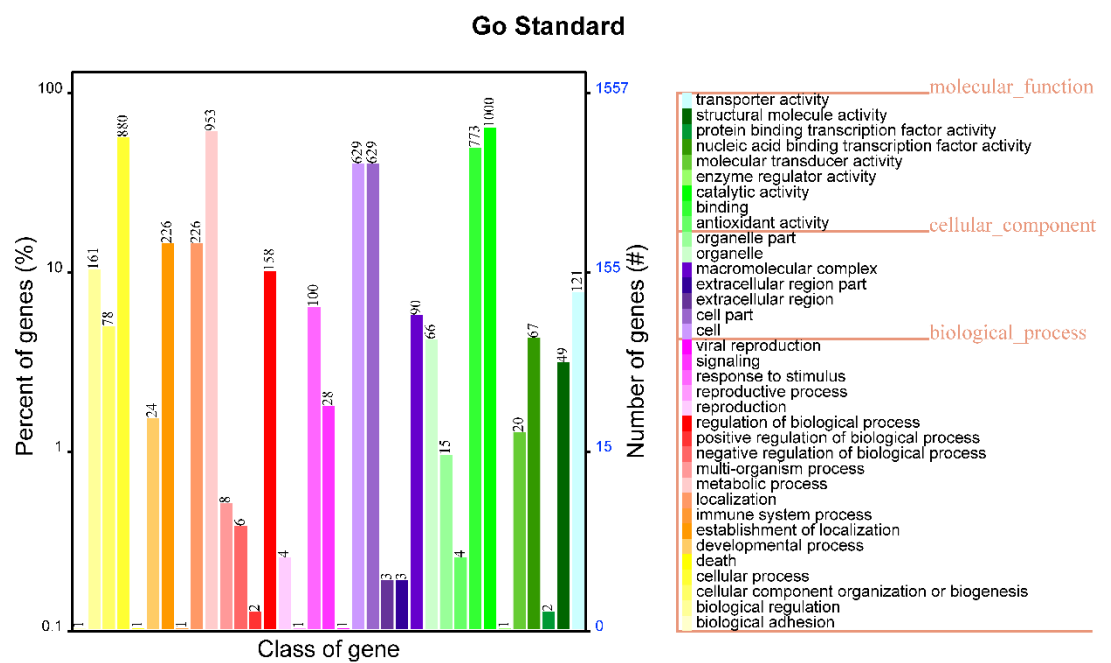


Fig. S3 Distribution of protein-coding genes across KEGG pathway categories in CD0817 genome. Note: one protein-coding gene might be assigned to more than one category

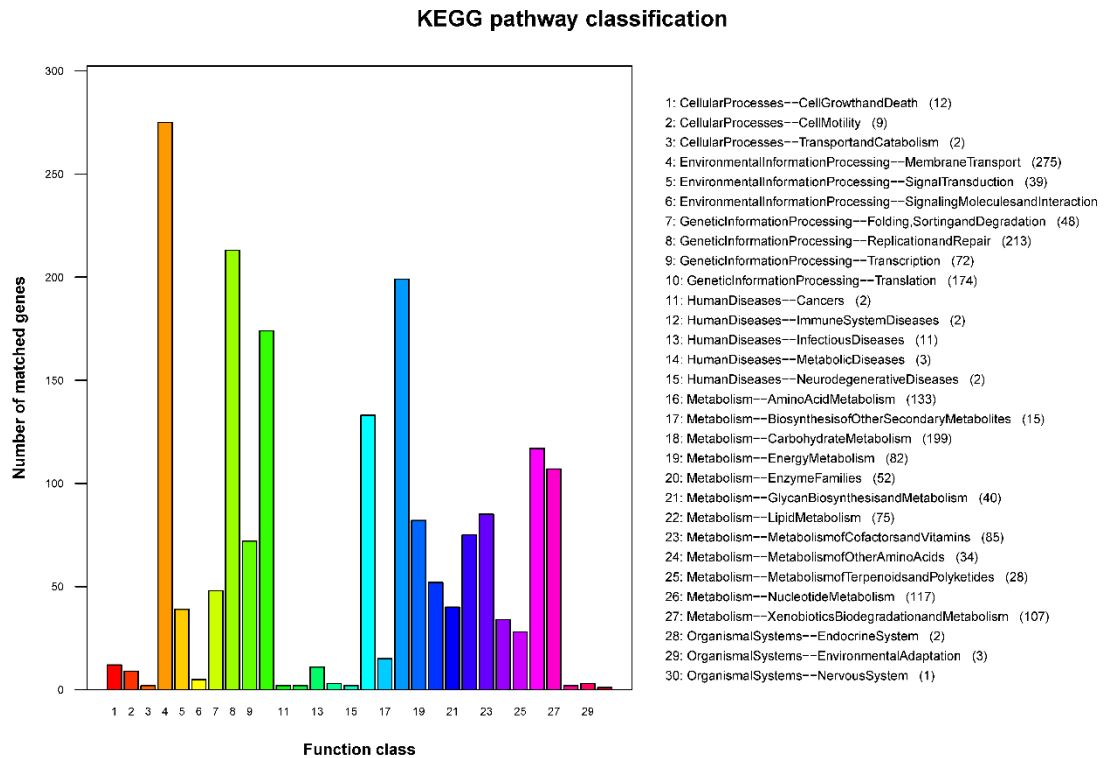


Fig. S4 Dilution curve of core genes from CD0817 and 15 completely sequenced reference *Lactobacillus brevis* genomes

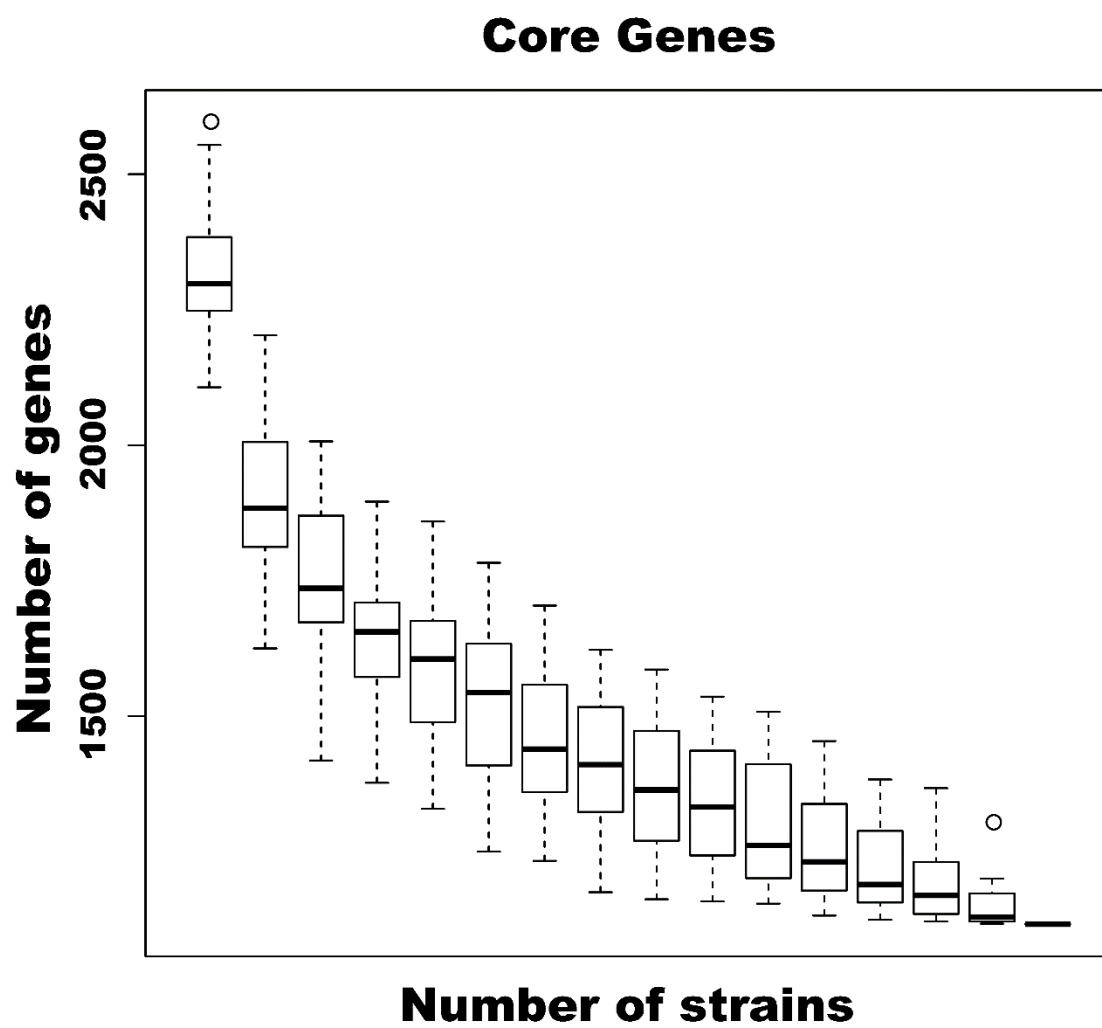


Fig. S5 Dilution curve of pan genes from CD0817 and 15 completely sequenced reference *Lactobacillus brevis* genomes

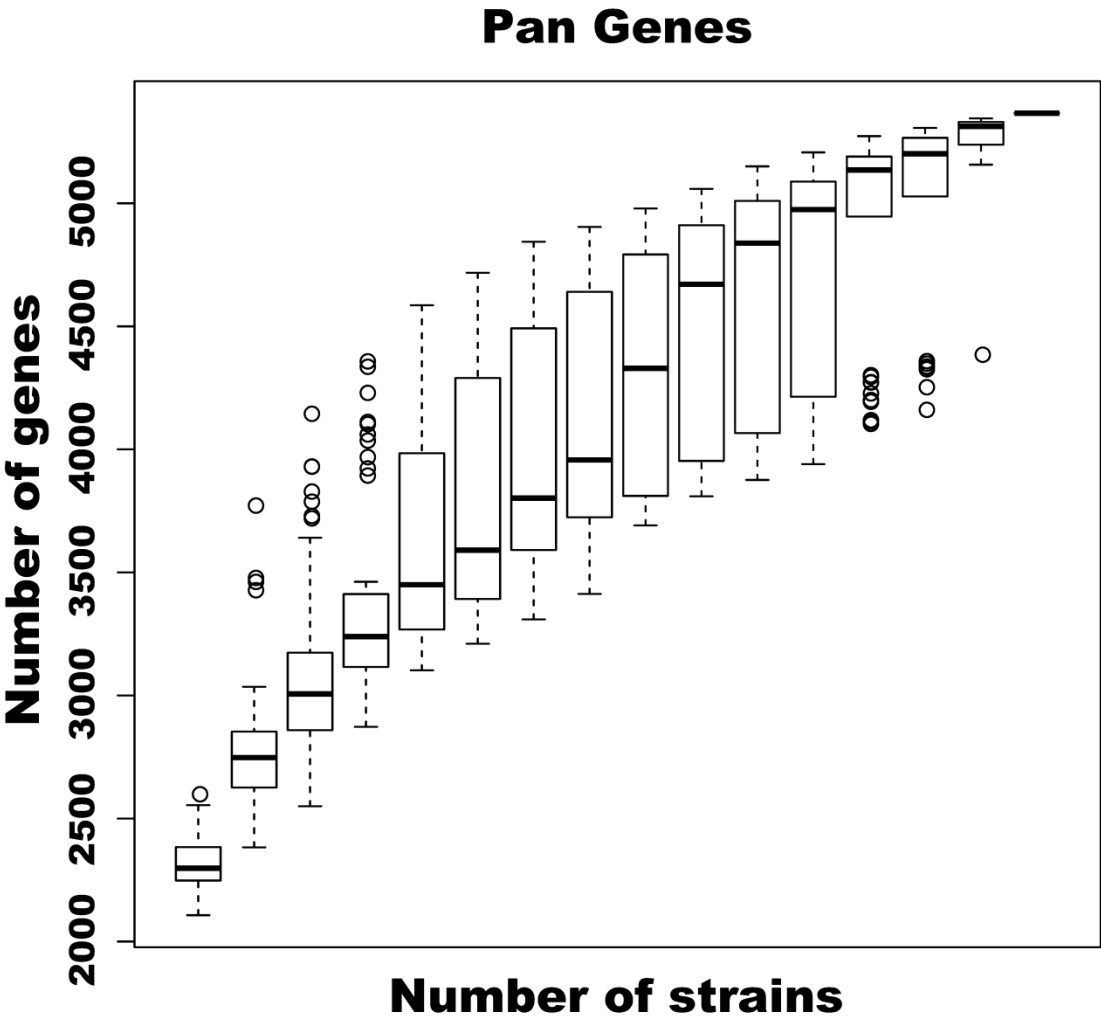


Fig. S6 Alignment of GadA primary structures of CD0817 and low GABA-producing lactobacilli strains. The amino acid residues in the black box are the conserved motif (HVDA [S/F] GG); the amino acid in green box are the pyridoxal 5'-phosphate binding domain

L. brevis CD0817 gadA	.MTKQDQETQIIISDVLDLEKTFGLSVEAGKSLPTNTLLEHPPMAPDVAQQLVVEHYRLNEAKA	60
L. brevis NPS-QW-145 gadA	.MKNKDQETQMINNVLDLEKTFGLSVEAGKSLPTNTLLEDDPPMAPDVAQQLVVEHYRLNEAKA	60
L. brevis CGMCC 1306 gadA	.MKNKDQETQMINNVLDLEKTFGLSVEAGKSLPTNTLLEDDPPMAPDVAQQLVVEHYRLNEAKA	60
L. brevis IFO 12005 gadA	MMKNKDQETQMINNVLDLEKTFGLSVEAGKSLPTNTLLEDDPPMAPDVAQQLVVEHYRLNEAKA	61
L. paracasei NFRI 7415 gadA	...MSEKNDQETMDEIGLEQNFGLSVEAGKSLPTNTLLEHPPMAPDVAQQLVVEHYRLNEAKA	58
Consensus	q i l e flgsveag slpt lp pm aaqlv h rlneka	
L. brevis CD0817 gadA	NONLATFCTTQMEPCADBLMKNALNTNAIDKSEYPKTAAMENYCVSMIAHLWGIFDNEKIY	121
L. brevis NPS-QW-145 gadA	NONLATFCTTQMEPCADBLMKNALNTNAIDKSEYPKTAAMENYCVSMIAHLWGIFDNEKIY	121
L. brevis CGMCC 1306 gadA	NONLATFCTTQMEPCADBLMKNALNTNAIDKSEYPKTAAMENYCVSMIAHLWGIFDNEKIY	121
L. brevis IFO 12005 gadA	NONLATFCTTQMEPCADBLMKNALNTNAIDKSEYPKTAAMENYCVSMIAHLWGIFDNEKIY	122
L. paracasei NFRI 7415 gadA	NONLATFCTTQMEPCADBLMKNALNTNAIDKSEYPKTAAMENYCVSMIAHLWGIFDNEKIY	119
Consensus	nqnlafcttqmep ad lm alntnaidkseypktaamenycvsm ahlwgip k y	
L. brevis CD0817 gadA	DDFIGTSTVGSSEGCMLGGIALHLSWKHRAKDLGFDIDDLHSHKPNLVIMSGYQVWVEKFC	182
L. brevis NPS-QW-145 gadA	DDFIGTSTVGSSEGCMLGGIALHLSWKHRAKDLGFDIDDLHSHKPNLVIMSGYQVWVEKFC	182
L. brevis CGMCC 1306 gadA	DDFIGTSTVGSSEGCMLGGIALHLSWKHRAKDLGFDIDDLHSHKPNLVIMSGYQVWVEKFC	182
L. brevis IFO 12005 gadA	DDFIGTSTVGSSEGCMLGGIALHLSWKHRAKDLGFDIDDLHSHKPNLVIMSGYQVWVEKFC	183
L. paracasei NFRI 7415 gadA	KDFIGTSTVGSSEGCMLGGIALHLSWKHRAKDLGFDIDDLHSHKPNLVIMSGYQVWVEKFC	180
Consensus	dfigtstvgsssegcmllggl ll swkhra gfd dlh h pnlvimsgyqvwwkfc	
L. brevis CD0817 gadA	TYWNVEMRQVPIINGDQVSLDMDVMGYVDENTIGIGIEGITYTGSVDDIQLDLVTEYN	243
L. brevis NPS-QW-145 gadA	TYWNVEMRQVPIINGDQVSLDMDVMGYVDENTIGIGIEGITYTGSVDDIQLDLVTEYN	243
L. brevis CGMCC 1306 gadA	TYWNVEMRQVPIINGDQVSLDMDVMGYVDENTIGIGIEGITYTGSVDDIQLDLVTEYN	243
L. brevis IFO 12005 gadA	TYWNVEMRQVPIINGDQVSLDMDVMGYVDENTIGIGIEGITYTGSVDDIQLDLVTEYN	244
L. paracasei NFRI 7415 gadA	TYWNVEMRQVPIINGDQVSLDMDVMGYVDENTIGIGIEGITYTGSVDDIQLDLVTEYN	241
Consensus	tywnve rqvpi s dmd vm yv dentigi gi gitytg vddiq ld lv ey n	
L. brevis CD0817 gadA	KTATMEVRIHVDAAFGGLFAPFVDGKFPWDFRLKNVVSINVSGHKYGMVYPGLGWIVWRHN	304
L. brevis NPS-QW-145 gadA	KTATMEVRIHVDAAFGGLFAPFVDGKFPWDFRLKNVVSINVSGHKYGMVYPGLGWIVWRHN	304
L. brevis CGMCC 1306 gadA	KTATMEVRIHVDAAFGGLFAPFVDGKFPWDFRLKNVVSINVSGHKYGMVYPGLGWIVWRHN	304
L. brevis IFO 12005 gadA	KTATMEVRIHVDAAFGGLFAPFVDGKFPWDFRLKNVVSINVSGHKYGMVYPGLGWIVWRHN	305
L. paracasei NFRI 7415 gadA	KTATMEVRIHVDAAFGGLFAPFVDGKFPWDFRLKNVVSINVSGHKYGMVYPGLGWIVWRHN	302
Consensus	kta p ihvd afggl fapfvdgk fpwdfrlknv sinvsghkygmvy pglgwivwrhn	
L. brevis CD0817 gadA	NADTLPAEMRRQVPYLGKTVDSIAINFHSHGAHISAQYNNIRFGLSGYKTTMQNVRKVSL	365
L. brevis NPS-QW-145 gadA	TADTLPAEMRRQVPYLGKTVDSIAINFHSHGAHISAQYNNIRFGLSGYKTTMQNVRKVSL	365
L. brevis CGMCC 1306 gadA	TADTLPAEMRRQVPYLGKTVDSIAINFHSHGAHISAQYNNIRFGLSGYKTTMQNVRKVSL	365
L. brevis IFO 12005 gadA	TADTLPAEMRRQVPYLGKTVDSIAINFHSHGAHISAQYNNIRFGLSGYKTTMQNVRKVSL	366
L. paracasei NFRI 7415 gadA	SEDLLPKEMRRQVPYLGSSVDSIAINFHSHGAHIVGTHNFRFGYKGYEAMNVRKVSL	363
Consensus	d lp emrrf vpylg vdsiainfshsgahi qy nf rfg gy im nvrkvsl	
L. brevis CD0817 gadA	KLTAALKTYGIFDILVDSQLPINCWKLADDAVPGWTLYDLESELAKYGWQVPAYPLPKNR	426
L. brevis NPS-QW-145 gadA	KLTAALKTYGIFDILVDSQLPINCWKLADDAVPGWTLYDLESELAKYGWQVPAYPLPKNR	426
L. brevis CGMCC 1306 gadA	KLTAALKTYGIFDILVDSQLPINCWKLADDAVPGWTLYDLESELAKYGWQVPAYPLPKNR	426
L. brevis IFO 12005 gadA	KLTAALKTYGIFDILVDSQLPINCWKLADDAVPGWTLYDLESELAKYGWQVPAYPLPKNR	427
L. paracasei NFRI 7415 gadA	RITEELKKFGIFDILVDSQLPINCWKLADDAVPGWTLYDLESELAKYGWQVPAYPLPKNR	424
Consensus	t lk gif il dgsqplincwkladda v wtlydle elakygwqvpayplpknr	
L. brevis CD0817 gadA	DDVTISRIVVRPSMTMTIADDFLDLKLAI DGLNHTFE...DAANADTDNKTTVH	480
L. brevis NPS-QW-145 gadA	DDVTISRIVVRPSMTMTIADDFLDLKLAI DGLNHTFE...VTTTVQDNKTTVR	478
L. brevis CGMCC 1306 gadA	DDVTISRIVVRPSMTMTIADDFLDLKLAI DGLNHTFE...VTTTVQDNKTTVR	478
L. brevis IFO 12005 gadA	DDVTISRIVVRPSMTMTIADDFLDLKLAI DGLNHTFE...VTTTVQDNKTTVR	479
L. paracasei NFRI 7415 gadA	DDVTISRIVVRPSMTMTIADDFLDLKLAI DGLNHTFE...VTTTVQDNKTTVR	480
Consensus	d tisrivvrpsmtmti ddf dlk ai ln g ttv	

Fig. S7 Alignment of GadC primary structures of CD0817 and low GABA-producing lactobacilli strains.

L. brevis CD0817 gadC	MDENKSGQQIDTQKANRITGFQLFSMTTSMVMTVYGFAAFKQGPTAFFYLFLAGILWFLPVT	63
L. brevis NPS-QW-145 gadC	MDENKSEQQIDTQKANRITGFQLFSMTTSMVMTVYGFAAFKQGPTAFFYLFLAGILWFLPVT	63
L. brevis CGMCC 1306 gadC	MDENKSEQQIDTQKANRITGFQLFSMTTSMVMTVYGFAAFKQGPTAFFYLFLAGILWFLPVT	63
L. brevis IFO-12005 gadC	MVFTGT	6
Consensus	t	
L. brevis CD0817 gadC	RTSGEMASIDGWSKGGIFTWSRNLGERAGWSALFYQWIHITVGMNTMMYFIIGCFSVTFGLP	126
L. brevis NPS-QW-145 gadC	RTSGEMASIDGWSKGGIFTWSRNLGERAGWSALFYQWIHITVGMNTMMYFIIGCFSVTFGLP	126
L. brevis CGMCC 1306 gadC	RTSGEMASIDGWSKGGIFTWSRNLGERAGWSALFYQWIHITVGMNTMMYFIIGCFSVTFGLP	126
L. brevis IFO-12005 gadC	RTSGEMASIDGWSKGGIFTWSRNLGERAGWSALFYQWIHITVGMNTMMYFIIGCFSVTFGLP	69
Consensus	rtsgemasidgwskggiftwsrnlgeragwsalfyqwhitvgmntmmyfiigcfsvtfglp	
L. brevis CD0817 gadC	IITDNPLVKFILMMIILWGLIALQCRGTSVTGKIAQWCFTLGVIIPVFLLFLFILYLVCGNP	189
L. brevis NPS-QW-145 gadC	IITDNPLVKFILMMIILWGLIALQCRGTSVTGKIAQWCFTLGVIIPVFLLFLFILYLVCGNP	189
L. brevis CGMCC 1306 gadC	IITDNPLVKFILMMIILWGLIALQCRGTSVTGKIAQWCFTLGVIIPVFLLFLFILYLVCGNP	189
L. brevis IFO-12005 gadC	IITDNPLVKFILMMIILWGLIALQCRGTSVTGKIAQWCFTLGVIIPVFLLFLFILYLVCGNP	132
Consensus	iitdnplvkfilmmilwgli lqq gtsvtgkiaqwcftlgviipvfllflfili ylv gnp	
L. brevis CD0817 gadC	TMIDVNVHTIIFPKNWSGSVLVGFVFPFILAFAGAEGSAPHVKDLDKPSIYPKVMMALAAIAICS	252
L. brevis NPS-QW-145 gadC	AMIEVNMHTIIFSSWNGSVLVGFVFPFILAFAGAEGSAPHVKDLDKPSIYPKVMMALAAIAICS	252
L. brevis CGMCC 1306 gadC	AMIEVNMHTIIFSSWNGSVLVGFVFPFILAFAGAEGSAPHVKDLDKPSIYPKVMMALAAIAICS	252
L. brevis IFO-12005 gadC	AMIEVNMHTIIFSSWNGSVLVGFVFPFILAFAGAEGSAPHVKDLDKPSIYPKVMMALAAIAICS	195
Consensus	mi vn hti p w gsvlvvgfvpfilafagaegsaphvkdldkps ypkvmmala aaics	
L. brevis CD0817 gadC	DIIGSMAIAMTIPNIIQQLSNGIVYAYGALVARYGVGVVFVEKLTGFLAVGVLGEISSWVVG	315
L. brevis NPS-QW-145 gadC	DIIGSMAIAMTIPNIIQQLSNGIVYAYGALVARYGVGVVFVEKLTGFLAVGVLGEISSWVVG	315
L. brevis CGMCC 1306 gadC	DIIGSMAIAMTIPNIIQQLSNGIVYAYGALVARYGVGVVFVEKLTGFLAVGVLGEISSWVVG	315
L. brevis IFO-12005 gadC	DIIGSMAIAMTIPNIIQQLSNGIVYAYGALVARYGVGVVFVEKLTGFLAVGVLGEISSWVVG	258
Consensus	diigsmaiamtipniiqlsngivaygalv ygv vvfveklgtgflavgvlgelsswvvg	
L. brevis CD0817 gadC	PNSGMFEAAKAGYLPFRFSKANKYGIETNVMVLQGVIVSIVGALLTFGAGGNKASLSFQTAMS	378
L. brevis NPS-QW-145 gadC	PNAGMFEAAKAGYLPFRFSKANKYGIETNVMVLQGVIVSIVGALLTFGAGGNKASLSFQTAMS	378
L. brevis CGMCC 1306 gadC	PNAGMFEAAKAGYLPFRFSKANKYGIETNVMVLQGVIVSIVGALLTFGAGGNKASLSFQTAMS	378
L. brevis IFO-12005 gadC	PNAGMFEAAKAGYLPFRFSKANKYGIETNVMVLQGVIVSIVGALLTFGAGGNKASLSFQTAMS	321
Consensus	pn gmfeaaakagylpprfskankygietnvm lqgvivsivgalltfgaggnk slsfq ams	
L. brevis CD0817 gadC	LTVALYTLMYMLMFISYLVLFQFVVDLHRSFVAASKSTLRIYVGGILGFILSAFGFVVTFFPPA	441
L. brevis NPS-QW-145 gadC	LTVALYTLMYMLMFISYLVLFQFVVDLHRSFVAASKRWLRITYCILGFILSAFGFVVTFFPPA	441
L. brevis CGMCC 1306 gadC	LTVALYTLMYMLMFISYLVLFQFVVDLHRSFVAASKRWLRITYCILGFILSAFGFVVTFFPPA	441
L. brevis IFO-12005 gadC	LTVALYTLMYMLMFISYLVLFQFVVDLHRSFVAASKRWLRITYCILGFILSAFGFVVTFFPPA	384
Consensus	ltvalytlmymlmfisylvlqf y dlhr fva ks lri yg lgfilsafgfvvtffppa	
L. brevis CD0817 gadC	DLSVASKHTYMLLVSAFVVMVLVLPFILYRFHDERWALQLGVNVDEVAAPTGHDALEKET	500
L. brevis NPS-QW-145 gadC	DLSVASKHTYMLLVSAFVVMVLVLPFILYRFHDERWALQLGVNVDEVAAPTGHDALEKET	500
L. brevis CGMCC 1306 gadC	DLSVASKHTYMLLVSAFVVMVLVLPFILYRFHDERWALQLGVNVDEVAAPTGHDALEKET	500
L. brevis IFO-12005 gadC	DLSVASKHTYMLLVSAFVVMVLVLPFILYRFHDERWALQLGVNVDEVAAPTGHDALEKET	443
Consensus	dls askhty ll safvvmvlvpfilyrfh wa qlg nvdev e leket	