

Actinobacteria Signature (Glutamyl-tRNA)

B. Gao and R.S. Gupta (2005) IJSEM 55: 2401-2412

		194		241
Proteobacteria	<i>Escherichia coli</i>	NP_416899	ITHVIRGEDHINNTPRQINILKAL	KAPV PVYAH VSMINGDDGKLSKR
	<i>Haemophilus somnus</i>	ZP_00122037	----V-----	G--I -T--- ----Q----
	<i>Bordetella pertussis</i>	NP_881555	----L--D--V-----R--	G-TL -E-G--P--L--P--E----
	<i>Neisseria meningitidis</i>	NP_273069	V-----D--V-----K-----I	D-NL -E-G-LP--L-NEQ---I----
	<i>Geobacter sulfurreducens</i>	NP_952272	--T-----D-----L-LYE--	GY-- -RF--P--L--A-KTR----
	<i>Brucella melitensis</i>	NP_539754	V--I--D--LT-AA--TI--YN-M	GWD- -QMS-IPL-H--A--A----
	<i>Caulobacter crescentus</i>	NP_420712	V-----D--L--AA--TL--YQ-M	DWA- -AF--IPL-H--P--A----
	<i>Campylobacter jejuni</i>	NP_282434	VSD-----D--LS--K--VLYE--	GFKI -KFF--A--H--E-----
	<i>Helicobacter pylori</i>	NP_207274	--D-----D--LS--K--VLY--	NFKI -NFF--P--L--NNE-Q-----
	<i>Pseudomonas aeruginosa</i>	NP_251824	----L--E--EWLPSA-KL-KLYEYF	GWEQ -QLCYMPLLRNP-KS-----
Aquifex Chlamydiae CFBG Group	<i>Agrobacterium tumefaciens</i>	NP_356183	----A--E--EWLASV-KH-LLYRYF	GWDO -TFM-L-LMRNA-KS-----
	<i>Chlamydia muridarum</i>	AAF39540	----L--E--EWLSS--KHLLLYE-F	GWEP -QFF-MPLLLNP-GS-----
	<i>Bacteroides fragilis</i>	YP_101483	VS-----EWLPSA-LHVLLYR-F	GWEDTM-AF--LPPLLLKPEGNG--
	<i>Porphyromonas gingivalis</i>	AAQ66600	VS-----EWLPSA-LHVLLYR-F	GWEDTM-RF--LALLLKPEGNG--
	<i>Chlamydomphila caviae</i>	NP_829055	----L--E--EWLSS--KHLLLYE-F	GWEP -IFL- MPLLLNP--T-----
	<i>Aquifex aeolicus</i>	NP_213835	-----V-G--K--L--YE--	GF-- -KFF- LPV-L-E-RS-----
	<i>Cytophaga hutchinsonii</i>	ZP_00118857	-----EWLPSA-LHVLLYRF-	GWEDTM-QF--LPPLLLK-P-GNG----
	<i>Trichodesmium erythraeum</i>	ZP_00073521	-----A--AK--L-LYE--	GGKI -EFG- TPL-LNKE-R-----
	<i>Nostoc punctiforme</i>	ZP_00105808	-----A--AK--L-LYE-M	G-KI -EFS- TPL-LNKE-R-----
	<i>Synechococcus sp.</i>	CAD9422	-S-----A--AK--L-LYE--	G-A- -EF-- TPL-LNKE-R-----
Spirochetes Cyanobacteria	<i>Prochlorococcus marinus</i>	ZP_00104468	----V-----S--AK--L--Y--	NFKL -IF-- TPL-LNSE-----
	<i>Borrelia burgdorferi</i>	NP_212506	----L-AQEWVSSG-LHVLLY--F	-WKP -I-C-LP-VMGN-GQ-----
	<i>Leptospira interrogans</i>	NP_714370	-----V-G--L--L-LYE--	GYNI -EF-- A-E-V-M-----
	<i>Treponema denticola</i>	NP_970820	---M-AQEWLPS--MHVIMY--F	GWEP -QFC-LP-VMGN-GQ-----
	<i>Thermus thermophilus</i>	CAA5854	V-D--A-EWLVS--IHVLLYR-F	GWEA -RFY-MPLLRNP-KT -I----
	<i>Deinococcus radiodurans</i>	NP_294208	V--V-A-EW-TS--IHVLLYR-F	GW-E -F--MPLLRNA-KS -I----
	<i>Thermotoga maritima</i>	NP_229152	-----L--S--L--L-LAYE-F	EKAP -F-- -T-L-----
	<i>Thermoanaerobacter tengcongensis</i>	AAM24185	----I--A-E-LS--K--L--YE--	GV-L -QF-- -V-LAP-RT-----
	<i>Symbiobacterium thermophilum</i>	YP_073845	----L--G--P--V--L--YQ--	GF-- -EFG- LGHMTNPERG----
	<i>Oerskovia turbata</i>	AY876156	----L--L--LSS--V-VLYR--	LLELGV AHVM -EFG- LPYVM-EGN-----
Deinococcus Thermus Other bacteri	<i>Cellulomonas fimi</i>	AY876166	----L--L--LSS--V-VLYR--	LDDLGV ATVM -QFG- MPYVM-EGN-----
	<i>Kocuria rhizophila</i>	AY876157	--Q-L--L--LSS--ALYR--	VAIGV AEFI -EFG- LPYVM-EGN-----
	<i>Clavibacterium michiganensis</i>	AY876158	----L--L--LSS--ALYR--	YAIGV AEYM -EFG- LPYVM-QGN-----
	<i>Pseudonocardia halophobica</i>	AY876160	----L--L--LSS--AL-E--	QRVGI GNGP F---- LPVLT-EGNR-----
	<i>Trichotomospora caesia</i>	AY876161	----L--L--LSS--ALYR--	IELGV ATA -EFG- LPYVM-EGN-----
	<i>Nocardioides simplex</i>	AY876162	----L--L--LSS--ALYA--	EEVGI AKAT -QFG- FPYVM-RGH-----
	<i>Nocardia corynebacterioides</i>	AY876165	----L--L--LSS--APYE--	VRIGV ADR- -EFG- LPFVM--GN-----
	<i>Arthrobacter nicotinovorans</i>	AY876159	----L--L--LSS--ALYR--	YAIGV AEYM -EFG- LPYVM-QGN-----
	<i>Rhodococcus rhodochrous</i>	AY876163	----L--L--LSS--LALYA--	QRIGV TDFT -EFG- LPFVM-QGN-----
	<i>Kribbella sandramycini</i>	AY876164	----L--L--LSS--ALYA--	AEIGI GSGRT -RFG- LPMVMGPEGN-----
Actinobact eria	<i>Kineococcus radiotolerans</i>	ZP_00228423	----L--L--LSS--ALHE--	VDIGV SOA- -LFG- LPVVT-EGS-----
	<i>Mycobacterium leprae</i>	NP_302160	----L--L--LSS--VALYQ--	TRIGM AERI -EFG- FPSVL-EGT-----
	<i>Mycobacterium tuberculosis</i>	NP_217508	----L--L--LSS--LALHQ--	TRIGV AERI -KF-- LPVTL-EGT-----
	<i>Mycobacterium avium</i>	NP_961963	----L--L--LSS--LALYQ--	TRIGV AERI -QF-- LPVTL-EGT-----
	<i>Corynebacterium diphtheriae</i>	CAE49635	----L--L--LSS--LALYE--	KVIGV AQQT -EFG- LPFVM-EGN-----
	<i>Corynebacterium efficiens</i>	NP_737999	----L--L--LSS--ALYE--	KRIGV AKQT -FG- LPFVM-EGN-----
	<i>Corynebacterium glutamicum</i>	BAB98686	V--L--L--LSS--LALYE--	KRIGV AKAT -AFG- LPYVM-EGN-----
	<i>Streptomyces avermitilis</i>	NP_823867	----L--L--LSS--VALYR--	IELGI AKS- -EFG- LPYVM-EGN-----
	<i>Tropheryma whipplei</i>	NP_787337	----L--L--LSS--ALYK--	ITIGI TDY- -FFG- LPVVM-EGNR-----
	<i>Bifidobacterium longum</i>	ZP_00121389	----L--L--LSS--VLYRY--	MELGI AKEM -LFG- MPYVM-QGN-----
Firmicutes	<i>Leifsonia xyli</i>	YP_062250	V--L--L--LSS--ALYH--	TETGV TTF- -RFG- LPYVM-EGN-----
	<i>Thermobifida fusca</i>	ZP_00057289	----V--E-LS--K-QLLWE--	GQTP -W-- LPV-VNEKRQ-----
	<i>Propionibacterium Acnes</i>	YP_056550	-DT-V--E-W-SS--KHLLLY-W-	GWEA -KF-- MPLLRNT-KS-I----
	<i>Rubrobacter Xylanophilus</i>	ZP_00186416	-----D--S-----M-HR--	GHEL -AF-- -PQVL-P-R-----
	<i>Bacillus subtilis</i>	NP_387973	M--L--L--IS--K--M-YQ-F	GWDI -QFG- MTL-VNESR-----
	<i>Enterococcus faecalis</i>	NP_813853	-S--L--D--A--K-LM-YE-F	EWTP -FG-MTL-INSET-----
	<i>Lactobacillus johnsonii</i>	NP_964422	----L--D--VA--K-LVVE--	GWEP -KFG-MTL-INSET-----
	<i>Lactococcus lactis</i>	NP_268210	-S-----D--A--K-LVVD--	GWEA -QFG-MTL-INSET-----
	<i>Staphylococcus aureus</i>	AAW37684	-SD--D--S--K--M-YE-F	GWEP -RFG-M-L-VNEER-----
	<i>Mycoplasma penetrans</i>	NP_758418	-S-I--E-LS--Y--A-NE--	DINKN-I-FG-L-V-I-DET-----
<i>Listeria monocytogenes</i>	NP_463768	-S--L--D--S--K--L-YN-F	GWEP -IFG- MTL-VNESRR-----	
<i>Clostridium acetobutylicum</i>	NP_347626	----V--NEYLSSA-KYNRYE-F	GWN- -I-V- CPP-MK-AHS-----	
<i>Streptococcus pyogenes</i>	NP_663974	-S-----D--A--K-LMVE--	GWEA -EFG-MTLI--SET-----	

Fig. 3 Partial alignment of Glutamyl-tRNA synthetase sequences showing a signature consisting of an insert of 5 aa (outer box), which is specific for *Actinobacteria*.