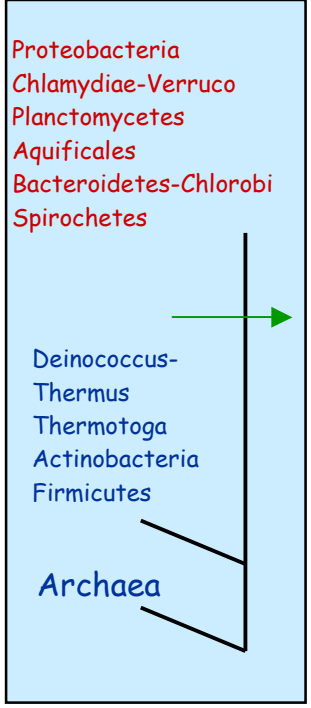


Main Line Signature in RNA Polymerase β' Subunit (RpoC)

Gupta, R.S.(2003) Photosynthesis Res.76:173-183; Griffiths and Gupta (2004) Int. Microbiol. 7, 41-52

		926	AASR (182aa) QES	1142
Proteobacteria	E. coli	223476	PGTQLTMRTFHIGG	GGTKDITGGLPRVA
	V. cholerae	NP_229983	-----T(182aa)-K-	--N-----
	Pas. multocida	15603601	-----A(182aa)-	V-----
	Pse. aeruginosa	15599465	----- (182aa) -T	SK-R-----
	Ral. solanaceum	17547752	----- (183aa) T-	QK-R-----
	Nei. meningitidis	15676061	----- (184aa) -A-	SK-R-----
	A. tumefaciens	NP_532635	-----L--T-NV(179aa)L-	AK-----
	Ca. crescentus	16124758	-----T-QV(177aa)T-G	AK-R-----
	Bde. bacteriovorus	NP_969780	-----L-----L-	SK-----
	Hel. pylori	15645812	-----L---V--T---	(326aa)KAT VKSR-----S
Aquificales	Camp. jejuni	15791843	-----L---S--T--T(331aa)KAA	AKS-----S
	Aqu. aeolicus	15606950	-----TA(184aa)K-T	AKVR--V-----E
	Sul. azorensis	TIGR	-----TA(150aa)K-K	AKVR--V----
	Per. marina	TIGR	-----TA(150aa)K-T	AKVR--V----
	Hydro. marinus	AY188438	-----V--- (181aa) -	AK-R-----F-
Chlamydiales and Verrucomicrobium	Cal. hydrogenophilum	AY288917	-----VA(200aa)K-M	AKVR--I----
	Proto. amoebophila	YP_007604	-----L--I--A(184aa)RSA	IK-----
	Sim. negevensis	TIGR	-----L--I-AA(184aa)RGA	IK-----
	Chl. trachomatis	15605035	-----L--I-AT(184aa)RGA	IK-----
	Chlam. pneumoniae	16752963	-----L--I-AT(184aa)RGA	IK-----
	Chlam. caviae	NP_829554	-----L--I-AT(184aa)RGA	IK-----
	Chlam. abortus	YP_220058	-----L--I-AT(184aa)RGA	IK-----
	Chlam. felis	YP_515238	-----L--I-AT(184aa)RGA	IK-----
	Ver. spinosum	TIGR	-----HV--V-AG(166aa)RKA	AK-----
	Planctomycetes	Gem. obscuriglobus	TIGR	-----QS(171aa)R-V
Rho. baltica		NP_866684	-----SV-K(156aa)R-T	--VS-----
Bla. marina		EAQ82610	-----V-VT(187aa)R--	--I-----
Bacteroidetes-Chlorobi Group	Cb. tepidum	NP_661062	-----L---Q-- --QG(151aa)NLD	RVGG--A---K-E
	Bact. fragilis	NP_213593	-----L---A--T-AN(174aa)RAV	-KAG-----T
	Por. gingivalis	NP_904701	-----L---V--I-SN(172aa)RSV	-KAG-----T
Spirochetes	Bor. burgdorferi	15594733	-----V-QA(186aa)KG-	EK-Q-----N
	Tre. pallidum	15639234	-----V--T--S(186aa)KAI	QK-S-----S
Cyanobacteria	Nostoc sp. 7120	BAB77962	-----T--VFTG(677aa)F-R	AK-G--IQ---IE
	Gloe. violaceus	NP_927224	-----T--VFTG(627aa)F-R	AK-G--IQ---E
	The. thermophilus	YP_005429	-----T--VA-AA--Q----	I
Deinococcus-Thermus	D. radiodurans	AAF10485	-----T--A-GG--M----	I
	T. maritima	15643225	-----V--M-AS--VS--TT-	E
	Cor. glutamicum	BAB97882	-----Q--VGG-----	Q
Actinobacteria	Myc. leprae	419676	-----Q--VGE-----	Q
	Bif. longum	ZP_00120580	-----L-S--S--VAAAS--Q----	T
	Str. coelicolor	NP_733644	-----T--VAGD--Q----	V
Firmicutes	Bac. subtilis	16077176	-----T--VAGD--Q---IQ	
	Clo. perfringens	18311394	-----T--VAGA--Q-----	E
	Sta. aureus	7470964	-----T--VAGS--Q---IQ	
Archaea	Strep. pneumoniae	15903818	-----T--ASNT--Q-----	Q
	Halo. sp. NCR-1	NP_281211	----M--N---YAEM-V-Q----	LI
	Meth. barkeri	ZP_00079002	----M-----YA	VAEINV-L----LI
	Sulf. solfataricus	AAK40565	----M-L----FA-	IRELNV-L----LI

No exceptions to the indicated pattern observed in sequences for >600 species.



The shared presence of a large (~180 aa) insert in RpoC homologs (boxed) in various species belonging to different groups of Proteobacteria, Spirochetes, *Bacteroidetes-Chlorobi*, *Chlamydiales*, *Planctomycetes*, *V. spinosum* and *Aquificales* phyla. The absence of this insert in various other phyla as well as archaeal homologs indicates that the groups lacking this insert are ancestral and the genetic change (RGC) responsible for this insert occurred at the evolutionary stage indicated in the interpretive diagram on the right. The cyanobacteria contain a much larger indel (~600aa) in this position, which is distinctive of them. Dashes in the alignment show identity with the amino acid on the top line. Sequence information for only representative species from different phyla is presented. However, all other available sequences from these groups behaved in the indicated manner. Sequences for a few of the species (marked TIGR) were obtained by Blast searches at The Institute for Genomic Research website at <http://www.tigr.org>.