

Table S2

class	order	family	species	Cr HPF-119 type				Cr HPF-125 type			
				KEGG	NCBI	number of amino acid	central region	KEGG	NCBI	number of amino acid	central region
Betaproteobacteria	Neisseriales	Neisseriaceae	<i>Neisseria mucosa</i> FDAARGOS_260	A6J88_01660	ARC50143	104	-				
		Chromobacteriaceae	<i>Chromobacterium violaceum</i>	CV_3333	AAQ60997	110	+				
	Burkholderiales	Burkholderiaceae	<i>Ralstonia solanacearum</i> GM11000	RSc0407	CAD13935	117	+				
			<i>Cupriavidus pinatubonensis</i> JMP134	Reut_A0354	AAZ59736	117	+				
			<i>Burkholderia multivorans</i> ATCC 17616 (JGI)	Bmul_0523	ABX14218	119	+				
			<i>Paraburkholderia xenovorans</i> LB400	Bxe_A4123	ABE28877	119	+				
			<i>Rubrivivax benzoatilyticus</i>	RBXJA2T_02797	EGJ09224	113	+	RBXJA2T_10781	EGJ10804	113	+
			<i>Polynucleobacter asymbioticus</i>	Pnuc_1912	ABP35124	107	+				
			<i>Pandoraea pnomenusa</i> 3kgm	U875_20915	AHB07515	117	+				
			<i>Paucibacter</i> sp. KCTC 42545	AT984_16610	ALT78570	113	+	AT984_11330	ALT77688	119	+
			<i>Thiomonas intermedia</i>	Tint_0031	ADG29447	110	+				
			<i>Cupriavidus necator</i> H16	H16_A0386	CAJ91536	116	+				
		Alcaligenaceae	<i>Bordetella parapertussis</i> 12822	BPP4033	CAE39316	112	-				
			<i>Achromobacter xylosoxidans</i> A8	AXYL_06142	ADP19435	112	-				
			<i>Pusillimonas</i> sp. T7-7	PT7_3341	AEC21881	109	-				
			<i>Alcaligenes faecalis</i> ZD02	UZ73_13135	ALO39120	108	-				
			<i>Paenalcaligenes hominis</i>	PAEH1_10025	AQS51807	119	-	PAEH1_03975	AQS50936	104	+
		Comamonadaceae	<i>Rhodoferrax ferrireducens</i>	Rfer_0750	ABD68500	109	+	Rfer_2154	ABD69878	115	+
			<i>Polaromonas</i> sp. JS666	Bpro_4613	ABE46496	109	+	Bpro_1902	ABE43835	120	+
			<i>Acidovorax avenae</i>	Acav_4478	ADX48361	110	+	Acav_4526	ADX48409	115	+
			<i>Delftia acidovorans</i>	Daci_1000	ABX33646	119	+	Daci_0918	ABX33564	126	+
			<i>Variovorax paradoxus</i> S110	Vapar_0403	ACS17066	109	+	Vapar_3632	ACS20249	119	+
			<i>Comamonas testosteroni</i> ATCC11996		WP_003072415.1	119	+		WP_003060358.1	125	+
			<i>Hydrogenophaga</i> sp. PAMC20947	E5678_19270	QCB47981	109	+	E5678_05160	QCB45467	122	+
			<i>Diaphorobacter nitroreducens</i>	BA022_16215	ASI69961	117	+	BA022_16030	ASI69926	114	+
			<i>Melaminivora</i> sp. SC2-9	C6568_10380	AVO49631	116	+	C6568_09890	AVO49545	120	+
			<i>Simplicispira suum</i>	C6571_08975	AVO41408	115	+	C6571_07975	AVO41233	115	+
			<i>Alicyclophilus denitrificans</i>	Alide2_4478	ADV01828	115	+	Alide2_4512	AEB86815	114	+
			<i>Pulveribacter suum</i>	C7H73_03075	AVP56761	118	+	C7H73_01120	AVP56407	120	+
			<i>Ramlibacter tataouinensis</i>	Rta_02230	AEG91287	109	+	Rta_27610	AEG93864	152	+
			<i>Schlegelella brevitalea</i>	AAW51_0289	AKJ26980	117	+	AAW51_0814	AKJ27505	116	+
		Oxalobacteraceae	<i>Janthinobacterium</i> sp. 1_2014MBL_MicDiv	YQ44_24525	APA70431	120	+	YQ44_20865	APA69835	125	+
			<i>Herbaspirillum seropedicae</i> SmR1	Hsero_3974	ADJ65445	108	+				
			<i>Collimonas fungivorans</i>	CFU_0461	AEK60298	117	+				
			<i>Massilia violaceinigra</i>	CR152_04865	ATQ73923	121	+	CR152_06660	ATQ74216	130	+
	Nitrosomonadales	Nitrosomonadaceae	<i>Duganella</i> sp. AF9R3	HH213_13620	QID91031	120	+	HH213_18460	QJD91899	125	+
			<i>Nitrosomonas communis</i>	AAW31_08715	AKH37877	110	-	AAW31_09735	AKH38035	117	+
		Methylophilaceae	<i>Methylophilus mobilis</i>	Mmol_2163	ACT49065	108	-				
		Sulfuricellaceae	<i>Sulfuriferula</i> sp. AH1	CAP31_13245	ARU32561	111	-				
		Gallionellaceae	<i>Gallionella capsiferriformans</i>	Galf_0281	ADL54326	106	-				
		Sterolibacteriaceae	<i>Methyloversatilis</i> sp. RAC08	BSY238_1616	AOF83801	106	-				
		Thiobacillaceae	<i>Thiobacillus denitrificans</i>	Tbd_0532	AAZ96485	111	-	Tbd_1447	AAZ97400	189	+
	Rhodocyclales	Rhodocyclaceae	<i>Azospira oryzae</i>	Dsui_0703	AEV25112	106	-	Dsui_1150	AEV25552	127	+
			<i>Aromatoleum aromaticum</i>	ebB108	CAI08042	107	-				
		Zoogloeaceae	<i>Azoarcus olearius</i> BH72	BH72: azo0503	CAL93120	107	-				
			<i>Thauera</i> sp. MZ1T	Tmz1t_0707	ACK53479	107	-				
		Azonexaceae	<i>Fluviibacter phosphoraccumulans</i>	SHINM1_020680	BCA66466	106	-				
Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Dechloromonas aromatica</i>	Daro_4148	AAZ48874	108	-				
			<i>Ferroplasma myxofaciens</i>	HO273_07925	QKE38662	108	-				
Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	<i>Escherichia coli</i> K-12 W3110	JW3170 (<i>Ec</i> HPF)	BAE77247	95	-				
				JW2578 (<i>Ec</i> YfiA)	BAA16481	113	-				