

[illegible]

		110	120	130	140	150
Jannaschia_sp_CCSI_ABD53137		LVRARWRS			R	GVEPIADRTD
Dinoroseobacter_shibae_WP_012180235		LWRGFRRR			R	QLTVVENRTG
Ruegeria_pomeroyi_AAV93367		LLRCIRKS			R	ELRAVQNNTA
Ruegeria_pomeroyi_AAV93368		LWRAFRSR			R	ALTALADRTA
Ruegeria_sp_TM1040_ABF62750		LWRAYRAR			R	QLRCIVDNTI
Paracoccus_denitrificans_WP_011748578		LARALRRG			R	QLRPVVRDTG
Ruegeria_sp_TM1040_ABF62751		RNLHCVQN			N	TSR---
Rhizobium_etli_CFN42_ABC92155		RLRRSLKA			R	QIRYDLRS-
Geodermatophilus_obscurus_WP_012946629		HVRRI LKR			R	QIRPVVIRP-
Nostoc_sp_PCC7120_BAB73679		YFYVWLVN			K	HL---HGKRLT
Pseudovibrio_sp_FO-BEG1_WP_014283852		TSVRDLFD			F	---DEFPKI
Ochrobactrum_anthropi_WP_012090710		SVPHRKKS			A	NLI AASGSFE
Beijerinckia_indica_WP_012385681		MLH-			P	DLKRIDAHCV
Sinorhizobium_fredii_WP_012708451						MVCLREGGP
Ruegeria_pomeroyi_AAV94731		SPMNTSPT				
Ruegeria_pomeroyi_AAV94670		MRQIMKAT				
Dinoroseobacter_shibae_WP_012179538		MPKSO-				
Jannaschia_sp_CCSI_ABD56186		MS-				
Ruegeria_pomeroyi_AAV95896		M-R-				
Ruegeria_sp_TM1040_ABF64507		M-R-				
Jannaschia_sp_CCSI_ABD56187		M-AG-				
Jannaschia_sp_CCSI_ABD53753		M-AQ-				
Synechococcus_sp_WH8102_CAE07032		MKTN-				
Ruegeria_pomeroyi_AAV95846		VFLVKV-				
Ruegeria_pomeroyi_AAV94320		DLFLAGNF			D	FPALVROARP
Methylobacterium_radiotolerans_WP_012317373						
Porphyromonas_asaccharolytica_WP_004330966					MAK	RHRRTGDTGH
Jannaschia_sp_CCSI_ABD56179						
Gluconobacter_oxydans_AAW60025						
Streptococcus_suis_CYU93668						
Acidiphilium_cryptum_ABQ29611						
Selenomonas_sputigena_WP_006193730						
Thalassiosira_pseudonana_XP_002288249		WYKSITHWPP	NADKINKPELL	MSNRMKRANI	TNFPSGKGKTN	EAEFSNWF CG
Nematostella_vectensis_XP_001635452		FSLLILN-	L G-		TN	FALAQDTSGE
Rattus_norvegicus_NP_001099537		LLLLLLL-	L GPRG		ADG	YFPEERWSPE
Gloeobacter_violaceus_BAC90139						
Granulibacter_bethesdensis_ABI61222						
Rhodothermus_marinus_WP_012843638						
XpXylT_MH673349						
Paenibacillus_sp_JDR-2_WP_015843614						
Methylorubrum_extorquens_WP_003600880						MSDPVQ
		160	170	180	190	200
Jannaschia_sp_CCSI_ABD53137		AIKEGDI	LCFCTLRN	ERVRITYFLNLY		
Dinoroseobacter_shibae_WP_012180235		EIGASDI	LA FVTLRN	ERIRLPYFLDY		
Ruegeria_pomeroyi_AAV93367		AIRPSDV	LL VSTVRN	EKIRLPYFLRY		
Ruegeria_pomeroyi_AAV93368		AIRPGQV	LA VTTLRN	EVLRLPWFLDY		
Ruegeria_sp_TM1040_ABF62750		NI GRDDI	LV VVVLRN	EA QRLPYFLEY		
Paracoccus_denitrificans_WP_011748578		RI NPGDI	LL FATMRN	EA LRLPWFLDY		
Ruegeria_sp_TM1040_ABF62751		I RPGDI	LL VCTFRN	EQVRLPYFLQY		
Rhizobium_etli_CFN42_ABC92155		TLGQARH	VV I CVIRD	EG HRLAFLFQY		
Geodermatophilus_obscurus_WP_012946629		GLQS AHL	VA AVMWKN	EA HRLPALLRH		
Nostoc_sp_PCC7120_BAB73679		WWSKSDC	TV LSVVRD	CE DYIESFIQH		
Pseudovibrio_sp_FO-BEG1_WP_014283852		SLPEDGI	IV I TRARN	EM LRPFFLEH		
Ochrobactrum_anthropi_WP_012090710		ALRP GD L	PL VCVVRN	AA PYMKSF LRY		
Beijerinckia_indica_WP_012385681		PEDKGEV	RL FAVVRN	ES LRLPYFFDY		
Sinorhizobium_fredii_WP_012708451		PLAKNDL	PL VFNTHN	DI KLMPAF LAH		
Ruegeria_pomeroyi_AAV94731		-W-	GV VATVKA	PE HEILRF AAW		
Ruegeria_pomeroyi_AAV94670		-W-	SV FSVVRE	PV HILGRFVEH		
Dinoroseobacter_shibae_WP_012179538		-W-	DI VALAQE	AP DLILAWAAY		
Jannaschia_sp_CCSI_ABD56186		-F-	TV ATIARE	PW PVUNRFLTW		
Ruegeria_pomeroyi_AAV95896		-S-	LA VLTVRN	EA AFLELEWLAH		
Ruegeria_sp_TM1040_ABF64507		-T-	LA VLTVRN	EG AFLELEWLAH		
Jannaschia_sp_CCSI_ABD56187		-R-	TI VTMMKD	EA PFLELHWLAH		
Jannaschia_sp_CCSI_ABD53753		-K-	AV VACMRN	EA I FLELWLAH		
Synechococcus_sp_WH8102_CAE07032		-T-	KL I AIAKN	EA AYL PQWLYH		
Ruegeria_pomeroyi_AAV95846		-DSNT-	AV VTI CRD	DA YFLTRFVQY		
Ruegeria_pomeroyi_AAV94320		CLNERMKI	CA I TMVYR	DH WALGQVYRH		
Methylobacterium_radiotolerans_WP_012317373		-KRPL-	AA VTMTYN	EA TMLPLWLKH		
Porphyromonas_asaccharolytica_WP_004330966		MKTKRV	AA LTMVRN	DD FYLRKWTAY		
Jannaschia_sp_CCSI_ABD56179		VQHLKTS-	KH GDVLA	VSMMKD	EA PFLELEWA	
Gluconobacter_oxydans_AAW60025		-M-	M-SKSA	ILFVHN	EV DTIGWWLA	
Streptococcus_suis_CYU93668			MKII S	FTMVNN	ES EIESFIR	
Acidiphilium_cryptum_ABQ29611		-M-	SK YRFSI	VACARW	EE NYIQEWWL	
Selenomonas_sputigena_WP_006193730		MNKI	I A	VSVLAD	SA DIIESFVR	
Thalassiosira_pseudonana_XP_002288249		HVERVREF	VALHPSHAL	EVDI MNNV	VI LGEVFGI E	SSCWGHSNKN
Nematostella_vectensis_XP_001635452		SEFKYPTV	LI SVIARN	AA HLLPNWL		
Rattus_norvegicus_NP_001099537		SPLQAPRV	LI ALLARN	AA PALPATL		
Gloeobacter_violaceus_BAC90139			MTRIHA	LCLARN	EG DVLAQTLT	
Granulibacter_bethesdensis_ABI61222		-M-	ENMNIIG	ITRVFN	ED DIIESFVR	
Rhodothermus_marinus_WP_012843638		MWR	PAEKQATLIC	MTPVRN	EA WLERFLQ	
XpXylT_MH673349		-M-	TGMRLIL	TLLCRN	EA DYLGSMLD	
Paenibacillus_sp_JDR-2_WP_015843614			-MATL	ISHFYN	EA YLIPWML-	
Methylorubrum_extorquens_WP_003600880		GRVQDSLQDP	VDAERPDV	VV LALARN	CA ATLPALFR	

		210		220		230		240		250
		Jannaschia_sp_CCSI_ABD53137	Y	RE						RGVN
		Dinoroseobacter_shibae_WP_012180235	Y	RK						QGI D
		Ruegeria_pomeroyi_AAV93367	Y	RE						LGI D
		Ruegeria_pomeroyi_AAV93368	Y	RT						LGVG
		Ruegeria_sp_TM1040_ABF62750	Y	RR						LGA
		Paracoccus_denitrificans_WP_011748578	Y	RA						MGI R
		Ruegeria_sp_TM1040_ABF62751	Y	RS						LGVN
		Rhizobium_etli_CFN42_ABC92155	Y	RD						LGE
		Geodermatophilus_obscurus_WP_012946629	Y	RR						LGEV
		Nostoc_sp_PCC7120_BAB73679	Y	LA						LGVK
		Pseudovibrio_sp_FO-BEG1_WP_014283852	Y	RS						I GAS
		Ochrobactrum_anthropi_WP_012090710	Y	RE						MGVT
		Beijerinckia_indica_WP_012385681	Y	RR						LGVK
		Sinorhizobium_fredii_WP_012708451	Y	RK						LGV
		Ruegeria_pomeroyi_AAV94731	H	LE						LGAH
		Ruegeria_pomeroyi_AAV94670	N	LS						AGAS
		Dinoroseobacter_shibae_WP_012179538	H	LN						LGVR
		Jannaschia_sp_CCSI_ABD56186	H	LD						QGA
		Ruegeria_pomeroyi_AAV95896	H	QA						LGFT
		Ruegeria_sp_TM1040_ABF64507	H	KA						VGFT
		Jannaschia_sp_CCSI_ABD56187	H	RL						I GFD
		Jannaschia_sp_CCSI_ABD53753	Q	LV						I GFD
		Synechococcus_sp_WH8102_CAE07032	H	FL						I GFD
		Ruegeria_pomeroyi_AAV95846	Y	GGL						FGRN
		Ruegeria_pomeroyi_AAV94320	Y	FAQ						LGA
		Methylobacterium_radiotolerans_WP_012317373	Y	ERQ						VGA
		Porphyromonas_asaccharolytica_WP_004330966	Y	GRE						LGE
		Jannaschia_sp_CCSI_ABD56179	H	LA						VGFT
		Gluconobacter_oxydans_AAW60025	H	AT						I GFS
		Streptococcus_suis_CYU93668	Y	NYN						F I D
		Acidiphilium_cryptum_ABQ29611	Y	KN						L DFD
		Selenomonas_spitigena_WP_006193730	H	LT						YADE
		Thalassiosira_pseudonana_XP_002288249	P	V M E S D Q A T V	S R Q L I T V P L S	V G E G V I A S H P	S I Q C P P G W S I	S L P S Y T R H R L		
		Nematostella_vectensis_XP_001635452		G C I E	N L					O Y P K D R I
		Rattus_norvegicus_NP_001099537		G A L E	R L					R H P R E R T
		Gloeobacter_violaceus_BAC90139	H	A S						R F C H R
		Granulibacter_bethesdensis_ABI61222	H	A S						I F F N S
		Rhodothermus_marinus_WP_012843638	H	C A S						T W A D Y
		XpXyIT_MH673349	H	F L						S R G V D L
		Paenibacillus_sp_JDR-2_WP_015843614	H	H V						P L F D H G
		Methylorubrum_extorquens_WP_003600880	H	F I						S L R D A G
		Jannaschia_sp_CCSI_ABD53137	H	F L F V	D N D S G D	G T	R E Y L A D Q P D			
		Dinoroseobacter_shibae_WP_012180235	H	F L I V	D N G S D D	G S	T S Y L A D Q P D			
		Ruegeria_pomeroyi_AAV93367	H	F L I V	D N D S T D	G T	L D Y L G G Q S D			
		Ruegeria_pomeroyi_AAV93368	H	F L M V	D N G S D D	G S	V E M L A A Q P D			
		Ruegeria_sp_TM1040_ABF62750	H	F L V V	D N T S E D	G S	L A L L Q R E A R R			
		Paracoccus_denitrificans_WP_011748578	H	F L V V	D N G S D D	G G	R D Y L S G Q E D			
		Ruegeria_sp_TM1040_ABF62751	H	F L F I	D N G S T D	G A	Q G Y L A G L Q D			
		Rhizobium_etli_CFN42_ABC92155	H	F I C I	D N G S K D	G T	V E L L G G F D D			
		Geodermatophilus_obscurus_WP_012946629	H	F I F I	D N E S T D	T L	L S L I J G V N D			
		Nostoc_sp_PCC7120_BAB73679	H	I V L M	D N G S K D	G T	I S R A A K Y K Q			
		Pseudovibrio_sp_FO-BEG1_WP_014283852	H	I F V V	D N D S T D	D T	A A F L E T Q P D			
		Ochrobactrum_anthropi_WP_012090710	R	F I V V	D D R S D D	G T	A E I L T R L D E M			
		Beijerinckia_indica_WP_012385681	R	F F V V	D N D S A D	G T	L D F L L A Q P D			
		Sinorhizobium_fredii_WP_012708451	R	F I C V	D D V S S D	G T	R E Y L S Q A D			
		Ruegeria_pomeroyi_AAV94731	R	L F L Y	L D D P D P	A V	F A R L K A H P R I			
		Ruegeria_pomeroyi_AAV94670	Y	V H L F	F D D P D D	P A	Y D T F A N Q P G V			
		Dinoroseobacter_shibae_WP_012179538	R	I N L F	L D T S I P	R V	E A V L G N H P R V			
		Jannaschia_sp_CCSI_ABD56186	R	I I L Y	L D D P D D	P S	L P R L R G E P R I			
		Ruegeria_pomeroyi_AAV95896	D	F L I F	S N D C Q D	G T	D Q M L D R L A E M			
		Ruegeria_sp_TM1040_ABF64507	D	F L V F	S N N C D D	P T	A E I L T R L D E M			
		Jannaschia_sp_CCSI_ABD56187	R	I V V F	T N D C S D	G T	D A M L D R L E R M			
		Jannaschia_sp_CCSI_ABD53753	L	V A V V	T N D C T D	G T	D R I L D R L A E F			
		Synechococcus_sp_WH8102_CAE07032	E	I E I Y	I N D T T D	N S	V A I C E K I Q K N			
		Ruegeria_pomeroyi_AAV95846	N	L Y I I	S H G E D P	L V	R E L A Q G C N			
		Ruegeria_pomeroyi_AAV94320	H	L Y V V	A H G A D P	E I	A R I C P G A S			
		Methylobacterium_radiotolerans_WP_012317373	N	C Y I L	D H G T D D	G S	T T G L R A N			
		Porphyromonas_asaccharolytica_WP_004330966	H	L Y I Y	L D G K D Q	P L	P D W C P Q A T			
		Jannaschia_sp_CCSI_ABD56179	D	I L V Y	T N D C S D	G T	D T M L R Q R L			
		Gluconobacter_oxydans_AAW60025	T	L I V C	D D H S T D	G T	A A A L R S N A			
		Streptococcus_suis_CYU93668	E	M V I I	D N G C T D	N T	M Q I I F N L			
		Acidiphilium_cryptum_ABQ29611	H	I Y L Y	C N D	D	C P Y T L L E K L			
		Selenomonas_spitigena_WP_006193730	M	L V D D	H A A T	D	G T A N I L C A L			
		Thalassiosira_pseudonana_XP_002288249	L	S A A M R S S R Y	V W M L S S G A H E	I L H V A S P H T Q	Q A H L S R G A A Y	A S H F N R Q H I R		
		Nematostella_vectensis_XP_001635452	S	I W I T	S D H N E D	N T	T E L L K E W			
		Rattus_norvegicus_NP_001099537	A	L W A	T D H N T D	N T	S A I L R E W			
		Gloeobacter_violaceus_BAC90139	I	Y V W	D N G S E D	D T	W E Q V K R V E S			
		Granulibacter_bethesdensis_ABI61222	H	F I	D N G S S D	Q T	V D I L K L K N E			
		Rhodothermus_marinus_WP_012843638	I	V I A	D Q Q S T D	G S	R E I A R R F E K			
		XpXyIT_MH673349	I	J A T	D N G S S D	G T	A T V L Q A Y A D R			
		Paenibacillus_sp_JDR-2_WP_015843614		I M I	N R G S T D	R S	A D I I R K L A P			
		Methylorubrum_extorquens_WP_003600880	C	C R A L V	G E N D S	R D	G T G A L L W A A			

		310		320		330		340		350
				CSVYVWT	DD			YKRSRF		
				VSLSWST	PDS			YRRARY		
				VSVVWHT	THS			YKSATF		
				VSVLWQT	GAS			YRDARF		
				GLSLWQT	HDS			YRASRF		
				VSVVWLA	HTS			YKAARF		
				VSVWNA	QGS			YKRATF		
				VSLSLSA	HGS			YKAARF		
				VSJYRA	EGS			FSSARY		
				VTIVEC	H			LSFAEY		
				VTRFHT	S			KLYKQF		
				VDLFTS	DVG			YQAADR		
				CCCVFTY	ARS			FAYANF		
				VEVWGS	PLR			YRDARR		
				VFAADD	SYW		QR	RKL	SRPVKH	
				AQRCD	AYW		RG	LNR	RRPPYV	
				RLAVCD	AFW		QN	HPAGARPPKQ		
				ARPCTP	AFW		RO	IGL	KQDARF	
				GQLVHLRN				DGPFYDKGGI		
				GHLAHVEN				TGPFYDKGGI		
				GEVTHRRN				VPDGGPK		
				DDRILHIR				NEIGESGP		
				YSNTFHHL	ADK		LR	LDS	KENRSF	
				IFPVP	ATL		TS	QFTMLHWR		
				ILTIPT	RAD		LS	REDTRRGD		
				VLRLP	RLP		LN	EWERAH		
				IYAVD	KIQ		GQ	VVS	AEKERLA	
				EELG				I	AEGIKP	Q
				ATLY				DTTLPERLD		R
				IKEG				ESLEAYN		Y
				SPFL				TFYHHKKI		Q
				RAEG				ESALCHD		E
				TTDLQIMEKN	TVSVSTR	HS	CHVGGDVFEH	TELVVSFQFH	VONYDEVP	SY
				ANNAKHL	YHRTVMNF			GSPSNYGD	LE	ASD
				LVAVKGL	YHSVWRPA			EEPSSYPDE	EG	PKH
					AVI	VP		YR	REGSPFHFGL	
				GFN	ILF			E	NKSIILFQEM	
				VVLVD				NP	CEAYDEGARQ	
				GLRLHL				Q	PLQTHQAV	
				HWEIR				DS	VVPDFHAKV	
				QAR				GE	LSHVPTAFAMA	
		360		370		380		390		400
				GMDWNRLL	RLHGHK		W	CLTV		PDE
				GVDWLTWLQ	RTYGHKH		W	CLTV		VDE
				GVDWMNWLK	RSYAHDH		W	CLVVD		PDE
				GLDWMTWLQ	I	RHAHG	W	CLMVD		VDE
				GLDWSGWL	MQHGS	GH	W	CLTV		PDE
				GMDWLNWL	HRHGAGH		W	CLTV		ADE
				GDVWANA	L	RYGHGH	W	CLVVD		ADE
				GNDWNEV	NRHCQEK		W	VLYVD		ADE
				GLDWLNTVL	SRHCS	GK	W	VHVVD		ADE
				KRDMRQFLI	DHYSF	NR	W	CLLVD		CDE
				KRNWLAL	L	NEYCTDR	W	TLAD		TDE
				GRVWRDALF	NLYGRGR		W	YLSVD		ADE
				GMDWNSLS	DRYGNH		W	IIFAD		ADE
				GREWREAF	DRYGADR		W	YVNV		SDE
				QARQTMNAR	HAYNRAD		W	LAHID		VDE
				ERRQLVNGR	VAYERCLT		W	QAHF		VDE
				GRPQKAILQ	DVVDHSTAD		W	VFHD		VDE
				TRRQRGVL	QAYHELE		W	LLVL		ADE
				QFTALKA	A	RHLVKQAD	W	ILPLD		VDE
				QFTAMKRAD	KHRLAKRAD		W	IMALD		VDE
				QPLALRRAG	KLAEVTGS		W	LIALD		VDE
				QLAGMRHAL	NHPRI	AEAEY		LLHCD		VDE
				QISAYNNSL	HHSSN		W	LMALD		LDE
				TKNHLKNAL	RQW	YK	W	VLVCD		VDE
				MLNAFQNL	NQI		W	YIRTD		ADE
				TVRDFCASL	FI	G	Y	VLYAD		SDE
				FLSERAKL	LTTGGYD		W	VIGVD		ADE
				PSALKHAQA	EPIVRQ		W	VLVFD		ADE
				QTRFHEMAL	EQGRNE		W	MMILA		ADE
				RLDNKYLTK	I	IAEKN	FDL	IILPD		ADE
				QFDMYLHFI	I	NHINE	Y	VSFFD		ID
				MTALMHRFA	DERGA		W	VVPVD		ADE
				PGRSGFVYSN	DYQLEQ	QVVL	TA	ADHVNAY	NPTI	RFVIST
				WTERYAH		VAYLRQAL	TD	ARYWADY		LFVVD
				WSDRYEH		VMKLRQAL	KS	ARDMWADY		ILFVD
						RAQMFADI	R	PTCPGD	W	ILFVD
						QINTEFYK	ANNMNP	D		IIMYD
						RLLIDSA	RQ	LPVSGKR	I	LIALD
						WVTRMARM	A	EHHGAD	W	VINS
						DK	EVMSI	EKAVSG	W	KIVNL
						DIRGLARM	ARGREH	L		KRVLD
										GQGRAPA

[illegible]

	Jannaschia_sp_CCST_ABD53137	TRNRP--DYGNLW-IQGGPRA-RSFF-----	510	520	530	540	550
	Dinoroseobacter_shibae_WP_012180235	SQNPF-EFGNLW-IQGGRAR-RTFF-----					
	Ruegeria_pomeroyi_AAIV93367	KKNP-EYGNLW-IQQGPRS-RVFF-----					
	Ruegeria_pomeroyi_AAIV93368	QRQQLPLGNLW-VQGGARE-RMFF-----					
	Ruegeria_sp_TM1040_ABIF62750	VROA-PQGNLW-LQGGARR-RMFF-----					
	Paracoccus_denitrificans_WP_011748578	RKNG-EYGNLW-VQGGPRA-RAFF-----					
	Ruegeria_sp_TM1040_ABIF62751	TRNK-RYGNLW-IQGGPRA-RVFF-----					
	Rhizobium_etl_CFN42_ABC92155	HFDV--RNRTTW-IKGGVRG-RIYF-----					
	Geodermatophilus_obscurus_WP_012946629	HHHW-ASATW-VKGGVRG-RLFF-----					
	Nostoc_sp_PCC7120_BAB73679	NKKMK-DKANLK-HYGVGRR-RVF-----					
	Pseudovibrio_sp_FO-BEG1_WP_014283852	SLEF--KGPRFE-I RGGI RN RLFGIPPKRR EVLPISLLRN LYLAPARVHQ					
	Ochrobactrum_anthropi_WP_012090710	KF-----GVAVRGGPRLRLF-----					
	Beijerinckia_indica_WP_012385681	FLKP-AFPPIE-PTGGPRLRLCFPPRONTP KLWPRLRVKL IRLLSHFAFR					
	Sinorhizobium_freddiei_WP_012708451	-----TKRALSIITGGPRK RKCAF-----					
	Ruegeria_pomeroyi_AAIV94731	YPTE-GAFVKGGFM SHVAG KVFARTGM EK VDFRIHNIFR NKE--MNPH					
	Ruegeria_pomeroyi_AAIV94730	YGDD--LVQF RNLGFHYQG KSLIRLAGLG QWGHIHFPRP ASAE--IENA					
	Dinoroseobacter_shibae_WP_012179538	DGAATPYLRQGMTAYCGG KSASFRRIG LAVGIHGKPP P-----KPAT					
	Jannaschia_sp_CCST_ABD56186	SGLL-RARF--GFTYHP EG KSFHRAGOR LNMLKHWAQD ANGDRTPGPV					
	Ruegeria_pomeroyi_AAIV95896	YRNDGTYYR KLGVHRRSP VERLEEJS HWVDGHGRPL EEMFRENI F					
	Ruegeria_sp_TM1040_ABIF64507	YRNS-GVYRKIGI HRPRNV KDEAAARDQY RWDCVGR EL MGDFKTKRVF					
	Jannaschia_sp_CCST_ABD56187	FQCP-FDQM KLGI HRPVTY GRDKAALAGR AWWNGSAKPM TRGFMEGMR					
	Jannaschia_sp_CCST_ABD53753	FRP-RDRFY YAI DHMPKDP VADDITAMNA QRDAI PAHDL FRASSSEWR					
	Synechococcus_sp_WH8102_CAEO7032	SKLS-RKVH SCSHNNFI YK KEERV--LNLLGGTILRL DDNI NTQSRR					
	Ruegeria_pomeroyi_AAIV95846	KPCI-VSRP AKLGRGGHYA EYE-----					
	Ruegeria_pomeroyi_AAIV94320	KAWA-VNRRI GLKSHGVQL RPARVEGF-----					
Methylobacterium_radiotolerans_WP_012317373	KSTJ-VSER IDWHVGFHCL IQD-----						
Porphyromonas_asaccharolytica_WP_004330966	KPCV--IAQP VVWGS GFHL KGH-----						
	Jannaschia_sp_CCST_ABD56179	LFK--FDAKYWK-L-GIH RPSINKKWLE TDFPDSVTL NSGSRPMEDY					
	Gluconobacter_oxydans-AAW60025	LVQ--PRRI GNTL-N-PDP -----FSAL ERNATI---					
	Streptococcus_suis_CYU93668	IIS--AKYY KKM-N----- LKLS MGHTTVFGNP					
	Acidiphilium_cryptum_ABQ29611	ITR--SEKI KNK-YIEK GA MTDFWHYWNG VKNF KDIDI VNALGEDARS Y					
	Selenomonas_sputigena_WP_006193730	RRKHEMMQ KAIVGREAAH APYLAQGH TLYRMERGE--RVPA PALP					
	Thalassiosira_pseudonana_XP_002288249	VYGSND AVKI WSTGRI QLD SFVNMLANE LGTEEDVFLS DVLPLLKEA					
	Nematostella_vetensis_XP_001635452	VH--SYTL VD LR RRARS ELRYYPHPD YRGHHDILV FAHS ARMA					
	Rattus_norvegicus_NP_001099537	VH--SYTL ID LRKAASRL NAFAYPHPD YTWSFD ILV FAES CKQA					
	Gloeobacter_violaceus_BAC90139	GVDA-ARP RGYAMPKL KK CSR-----					
	Granulibacter_bethesdensis_ABI61222	IEAG-NHGV IIDRYARDC KSHQ-----					
	Rhodothermus_marinus_WP_012843638	P---HSPR VPYPKEPAL YFDE-----					
	XpXyt_MH673349	IDGG-NHAV TL DGQPLATT SCDG-----					
	Paenibacillus_sp_JDR-2_WP_015843614	ALYH-GRFI HKYRS GGTY AGRH-----					
	Methylorubrum_extorquens_WP_003600880	RHRRLGALGYRFFSDTIY PAOS-----					
	Jannaschia_sp_CCST_ABD53137	-----ADNPK RA-----PALNK TP LVNWQHXYTT ASST-HMLLP	560	570	580	590	600
	Dinoroseobacter_shibae_WP_012180235	-----TDTP EA-----PALNK IP LVKWDSRYVV VDSST-HMLLP					
	Ruegeria_pomeroyi_AAIV93367	-----PDNPK KA-----PALNK TP LVKWNRYYAY VSST-HALLP					
	Ruegeria_pomeroyi_AAIV93368	-----ADDDR RS-----PTLNKI PL IRWDRRYYAY VNCS-HS ALP					
	Ruegeria_sp_TM1040_ABIF62750	-----ADTPE RA-----PTLNKI PL LMWHWRYAY TNAT-HALLP					
	Paracoccus_denitrificans_WP_011748578	-----ADDEP NA-----PALNK IP LVRWRGRMAY VSST-HMLLP					
	Ruegeria_sp_TM1040_ABIF62751	-----ADR PK LA-----PALNK IP LVKWDRYYAY VSST-HMLLP					
	Rhizobium_etl_CFN42_ABC92155	-----RDRLW DG-----PALNK IP LYVVTGERLF KRSS-HQVWP					
	Geodermatophilus_obscurus_WP_012946629	-----PDRWF EG-----PALNK TP LVRWRYYAY LRAAH LI WP					
	Nostoc_sp_PCC7120_BAB73679	-----N NS-----PFLSKFA LLKP NFRL QL VGS-HLVQW					
	Pseudovibrio_sp_FO-BEG1_WP_014283852	KL PFERNYIER RLK--R FLR KOCPQL MKVP LI RWNTPTY SE LWGT-HEL DI					
	Ochrobactrum_anthropi_WP_012090710	-----G RS-----MRLSK FP LI WDDEKT DY RRGST HGP GP					
	Beijerinckia_indica_WP_012385681	LGL VRKVGGE NS A--P QA FK MP LI KWKRGY AY INN-HRL NP					
	Sinorhizobium_freddiei_WP_012708451	-----V-----LELI KYP LI FWDNRCSL SVSIT-HOPLP					
	Ruegeria_pomeroyi_AAIV94731	-----QVEL-----DMVDLCHRH GADWDHW AA YRYRI AOGSY					
	Ruegeria_pomeroyi_AAIV94670	-----HEM-----DNAAV AHMH CENRLD WNR LTNKMRRDGS Y					
	Dinoroseobacter_shibae_WP_012179538	-----GRLL-----TDL DLL HFD GLTPKHWWY RLRLLRQGS					
	Jannaschia_sp_CCST_ABD56186	-----WGRA-----ERAYL MHYA APDYARWRAK VNWRA GA--					
	Ruegeria_pomeroyi_AAIV95896	-----SSYGRPNY-----GLVQL NHYP LGSMESFVLK ADRGRAV--					
	Ruegeria_sp_TM1040_ABIF64507	-----SSYGDQNY-----QLAQL NHYP LGAMESYI LK ANRGRAV--					
	Jannaschia_sp_CCST_ABD56187	-----SSLATLGY-----RFAEJ AHYA TQSQEAF LRL AARGVGN--					
	Jannaschia_sp_CCST_ABD53753	-----IDPLGYSW-----DYACI HHYA I RAKDVF LMK NVRGDGMAMP					
	Synechococcus_sp_WH8102_CAEO7032	-----SKLTKHQL NAI-----SAES TE PWFVLHCI YKSEEEYLAS LCRGRGH--N					
	Ruegeria_pomeroyi_AAIV95846	-----KLNMDFLY MFHMKYCD-----YGLY					
	Ruegeria_pomeroyi_AAIV94320	-----PFTVMPRGAY LVHLKYAN-----SAA					
	Methylobacterium_radiotolerans_WP_012317373	-----HRP DFDRLF LFHLAYLD-----HDI L					
Porphyromonas_asaccharolytica_WP_004330966		-----NFTI DPQL LFHFGYDMK RI EARFADPD					
	Jannaschia_sp_CCST_ABD56179	FKFGRWRSIR RT-----VG YDAWQMNHYA VKSVDAYAVR KFRGNVNNKK					
	Gluconobacter_oxydans-AAW60025	-----VSDRI L HFA AGDHSF LRR NSSATPD--					
	Streptococcus_suis_CYU93668	NV-----RI-----EH WNDLKF AHR AISQEQLI YK TI CYTIR--					
	Acidiphilium_cryptum_ABQ29611	YSDI EOTKIN ISDNKYFDNI I KNAVLCHFA FKSKEDFLLR ARRSVSD--					
	Selenomonas_sputigena_WP_006193730	ISFLH-----FAHFQWRGGS I H TAVKVLNG W ANAAKYSL					
	Thalassiosira_pseudonana_XP_002288249	GVS VQYDSTI CTLDAP PDES VLSQCGAQD I TTKHDL EAA MGLQCQVASYH					
	Nematostella_vetensis_XP_001635452	GVKLH-----IN-----KH I YGHLI L PFEA RESLEDMRI Q F L DGLK GYY					
	Rattus_norvegicus_NP_001099537	EVQMY-----V CN-----KEV YGFLVPV LRS HSLSQDEAES F MHVQL EVM					
	Gloeobacter_violaceus_BAC90139	-----LANCHYQ YRDPEQMQLR LATRLAARAA					
	Granulibacter_bethesdensis_ABI61222	-----VKL AHFN RRSVWQLT K I I I GHKAI S					
	Rhodothermus_marinus_WP_012843638	-----IKVLHYQ YADNRMR SK QRWVQWVERL					
	XpXyt_MH673349	-----LEI LHFP VRRYDQLERK I REGTESLJA					
	Paenibacillus_sp_JDR-2_WP_015843614	-----WTKPYE VLLI PAFI M KFSF SPW--					
	Methylorubrum_extorquens_WP_003600880	-----ALTRERE TTCLSAFNGL TLYRGADYRL					

		610		620		630		640		650
	Jannaschia_sp_CCSI_ABD53137	RG		LNRV	YDEWGGEKAS	GVL LHA KFLD	TF SVKAAE			
	Dinoroseobacter_shibae_WP_012180235	RG		LNRV	YETGGGERIS	GCL LH TKFLD	TF VAKAAS			
	Ruegeria_pomeroyi_AAV93367	RG		LNOV	YDEWGGEKAS	GALL HTKFLD	TFT VKAAE			
	Ruegeria_pomeroyi_AAV93368	RQ		LNAV	YGGPGDSAPS	GVL LH TKFLP	DI VSRSAA			
	Ruegeria_sp_TM1040_ABF62750	PR		LNAI	YGGTEGQAOS	GVL LH TKFLP	EI VSKSKQ			
	Paracoccus_denitrificans_WP_011748578	RS		LNLV	YDDDGGEKAS	GCL LH AKFSL	TF AEKSAE			
	Ruegeria_sp_TM1040_ABF62751	RG		LNOV	YEI NGGEKAS	GI LMHTKFLD	TF PAKAE			
	Rhizobium_etli_CFN42_ABC92155	LS		LN-L	GD MHGAIV	CVS GLL HFKFSL	TF VHVKVA			
	Geodermatophilus_obscurus_WP_012946629	RN		LNG		GLKTAE	LAL LH FKFTP	SASAL MW-		
	Nostoc_sp_PCC7120_BAB73679	AN				ADI T	CVM FHYKFLP	QFT QVVVD		
	Pseudovibrio_sp_FO-BEG1_WP_014283852	RT		R-L		ADDW	GGML HFKFQQ	DF KFVRVE		
	Ochrobactrum_anthropi_WP_012090710	CF		RNF		LPAT	GALL HYRFSS	LS VGFEKK		
	Beijerinckia_indica_WP_012385681	VR		L		APVT	GAML HF KYFO	DF SARVHD		
	Sinorhizobium_fredii_WP_012708451	CE		RNF		LDI S	GVL LH FKFFS	DY REKI E		
	Ruegeria_pomeroyi_AAV94731	R				PDL APNVPRE	AGGL SMHELL	SGI EEEQ		
	Ruegeria_pomeroyi_AAV94670	NL		RTGN	YDI LPYVAPE	AALADNPTEE	DLL			
	Dinoroseobacter_shibae_WP_012179538				PNAIR	RN	ETEHRQQLL	KMDTLOG		
	Jannaschia_sp_CCSI_ABD56186					SG	FVL PVKEQIT	EI AESND		
	Ruegeria_pomeroyi_AAV95896	HS		EHM	LVDVYWERN	FNT DSDSI L	RYGERSA			
	Ruegeria_sp_TM1040_ABF64507	HS		EDL	LVDVYWERN	FNT DETSIR	RYRAARD			
	Jannaschia_sp_CCSI_ABD56187	AK		PKD	YNATY YGMFD	RNETAQV GLL	TAAEAETR			
	Jannaschia_sp_CCSI_ABD53763	SE		KYF	VNS SFWRBYN	RNQEVPEAQ	QHL WAYT			
	Synechococcus_sp_WH8102_CAE07032	ND		QRP	LKVNRWGMSP	YPFYPOKPI H	WHPSKTR			
	Ruegeria_pomeroyi_AAV95846	VE		TLNR	RNAFI EKQKE	VAGDGTVRTN	PKWFADG			
	Ruegeria_pomeroyi_AAV94320	AR		SADH	RREVAEQ		PGLNGP	QAWL NPG		
Methylobacterium_radiotolerans_WP_012317373	FR			RQQK	RNAAPRI		GI PNSHAI D	PTEFLTFT		
Porphyrmonas_asacharolytica_WP_004330966	RR			EAGW	TKHI AKR	SK	TI QOVTKYKA	RS WDSTA		
	Jannaschia_sp_CCSI_ABD56179	DK			NNDYWSLQD	RNEVEDQAAL	I HAEKR			
	Gluconobacter_oxydans_AAW60025				KAWONFD	RNDAAEYTGAS	RWL PES			
	Streptococcus_suis_CYU93668				DI ATMEN	NI ETAQRTN	MALI ES	GVDM		
	Acidiphilium_cryptum_ABQ29611				VFAQQAD	HEKAYIDGRA	DAML AH			
	Selenomonas_sputigena_WP_006193730	H			TARCYY	WKEHFDTVFQ	GDPVVPT			
	Thalassiosira_pseudonana_XP_002288249	FDDVKKSOPT	SCSWKTDKLI	STIGSIKRER	NTAAICLI VS	NEEMYLD		XD		
	Nematostella_vectensis_XP_001635452	VD	HPE	HL MPLSPHLT	VPPVPADKL G	FDEI YMI NLK	RRPLRR			
	Rattus_norvegicus_NP_001099537	VK	HP	PVQLSRFIS	APKKTADKM G	FDEFVMI NLK	RRLDRR			
	Gloeobacter_violaceus_BAC90139	NR				H	NFQHRYNI DE	NFDW		
	Granulibacter_bethesdensis_ABI61222	TG			KEAKERN	WSAHYKPFYE	KI KNKPWEI			
	Rhodothermus_marinus_WP_012843638	ND			PKKRPVT	I FRQYHHMAE	AI BRAGPV RP			
	XpXyIT_MH673349	N			PRVDPK	VGDTRWHLYS	QH			
	Paenibacillus_sp_JDR-2_WP_015843614				N	H	AMRARMKQI G	PT		
	Methylorubrum_extorquens_WP_003600880	GS				N	YLDD	D	YARCELHTLN	RR
	Jannaschia_sp_CCSI_ABD53137		660		670		680		690	
	Dinoroseobacter_shibae_WP_012180235	EVD RREH	--	YAASAEYK	AYANGMKEN	--	PEFWKW	--	SEKYI N	--
	Ruegeria_pomeroyi_AAV93367	ELTRRH	--	YSNSVEYK	AYADRVDQD	--	PDL WCKW	--	SEKYI N	--
	Ruegeria_pomeroyi_AAV93368	EKTRQH	--	FHTPADFD	HYDDLTA S	--	PDFWTPS	--	STRFTG	--
	Ruegeria_sp_TM1040_ABF62750	ERSRAEH	--	FHNPTLFE	GYYAQETK	--	PDFWHPD	--	SQEYHS	--
	Paracoccus_denitrificans_WP_011748578	ELTRRH	--	YADSQEYL	AYHAGLRDD	--	PDFWCEQ	--	SCALRD	--
	Ruegeria_sp_TM1040_ABF62751	ELKRREH	--	YAGSVEYQ	AYVKEAES	--	PEL WCKW	--	SEKYI N	--
	Rhizobium_etli_CFN42_ABC92155	AEHLSQH	--	TEEYTVS	TDKGM	--	GGFVCD	--	TGT YAS	--
	Geodermatophilus_obscurus_WP_012946629	EGHRAQH	--	TTEYRAVD	NI RDV	--	I MVGDE	--	TROYRQ	--
	Nostoc_sp_PCC7120_BAB73679	AVREKQY	--	YNNSSYEYK	RYQEVLLEN	--	NTL I LHS HN	--	SI EYRN	--
	Pseudovibrio_sp_FO-BEG1_WP_014283852	ELNRQAY	--	HDNGAEYK	TYHGGLEK L	--	HHSPMYEG	--	SMKLTN	--
	Ochrobactrum_anthropi_WP_012090710	I ASEKSH	--	AGGAEHYR	AI VENERFSD	--	DL SLYEG	--	SVQYTG	--
	Beijerinckia_indica_WP_012385681	AI KREI H	--	FDGSAEYK	RYNELLSKN	--	PDL SFSEYG	--	STEYKN	--
	Sinorhizobium_fredii_WP_012708451	AVSDGOY	--	FDGAAI YR	KMLNDLQKT	--	GEFDFADEH	--	SVRFSG	--
	Ruegeria_pomeroyi_AAV94731	EDG	--	LRAFF	DELNACA	--	PEG			
	Ruegeria_pomeroyi_AAV94670	QL	--	LTGFY	DRVSVLS	--	EDL			
	Dinoroseobacter_shibae_WP_012179538	PEA	--	LREFY	L L LKQYT	--	PER			
	Jannaschia_sp_CCSI_ABD56186	EAG	--	YQDLY	RTLHGLT	--	DAQ			
	Ruegeria_pomeroyi_AAV95896	L RQALLA	--	DRKLARLH	QRAVEWRQKR	--	FTELMKQEPY	--	RALFARLLMT	--
	Ruegeria_sp_TM1040_ABF64507	I LDLFLA	--	DEALRKLH	ERAVQWRKDR	--	FME LMREEPY	--	RAL FGRL MMT	--
	Jannaschia_sp_CCSI_ABD56187	RVTGELS	--	DPALSALH	DRAMNWHALA	--	REAMRARASH	--	AADL AAL NTA	--
	Jannaschia_sp_CCSI_ABD53763	I LTRQLAL	--	SNRI KRVE	RDAL AAIFYA	--	RDTI LDAEQV	--	AKWTA	--
	Synechococcus_sp_WH8102_CAE07032	DQYKI G	--		ENFI QENRLT	--	EE MHI ARNFL	--	KE	--
	Ruegeria_pomeroyi_AAV95846	DDDAV	--	FSAFE	RRPVV	--	ES	--	FDLSHVREIM	--
	Ruegeria_pomeroyi_AAV94320	DSRRF	--	FKQFE	ALPELPWEEA	--	EP	--	RAYADSI	--
Methylobacterium_radiotolerans_WP_012317373	KADVG	--	RI	PRRRRV	MRPGE	--	AH	--	FE	--
Porphyrmonas_asacharolytica_WP_004330966	LARA	--		LQTYI	RPPI	--		--		--
	Jannaschia_sp_CCSI_ABD56179	DI MTELLKDP	VLN	--	ELH	FAALDRVEAR	LDAYRKTDAY	AELREGLIA		
	Gluconobacter_oxydans_AAW60025	RI ASSI VG	A	SLT	--	DLY	WLKATVTYHA	DRAYLQDLGL	TPAQLSAPSS	
	Streptococcus_suis_CYU93668	WETAREASYS	GYDCNVI	HAP	I	DL SFCKENI	VI KYNDLSR	TVAERVMKT		
	Acidiphilium_cryptum_ABQ29611	NAVDDYRI			RY	YWKSFYFRVC	NKTEI DL RNY	ESGSLI SNHC		
	Selenomonas_sputigena_WP_006193730	I ASDESET					VQGLI	LPGKQI ELRY	TEGATFSP L	
	Thalassiosira_pseudonana_XP_002288249	EWMDYHLGLG	F SHI YI	Y	D	NTDSDSLGRG	WLEERRPLDN	KVTVTSY		
	Nematostella_vectensis_XP_001635452	RMMASLAEFG	I QAKPVD	AVD		GKALTDAEVK	ALGI KMLPGY	YDPYGRKPLT		
	Rattus_norvegicus_NP_001099537	RMLRALHEQE	I DFQLVE	AVD		GKAMNTS QVE	AMGI QMLPGY	RDPYHGRPLT		
	Gloeobacter_violaceus_BAC90139					MRFVEPS	ADCHY YRGDG	RF		
	Granulibacter_bethesdensis_ABI61222				LKSDYI LS	KDNKNRQYFY	DP MNYLGGDL	RYTNKTDY		
	Rhodothermus_marinus_WP_012843638	EWLAGEYALG	I DMRSI SKSP			YYWDEVDLKV	LLVHEGTERF	RKLNI WDR		
	XpXyIT_MH673349					LLRGTL P	AYYSGLRPP	PAL	EAGL	
	Paenibacillus_sp_JDR-2_WP_015843614					I PEDALK	SNMGN	-HHL	F	
	Methylorubrum_extorquens_WP_003600880					I AAATGR	RLMVDPLGLV	R		

		710		720		730		740		750
	Jannaschia_sp_CCSI_ABD53137			WR	QLEI LGLMSK		GNW			A
	Dinoroseobacter_shibae_WP_012180235			WR	QLEI LGLLSK		GNW			A
	Ruegeria_pomeroyi_AAV93367			WR	QLEI LGLMSK		GNW			A
	Ruegeria_pomeroyi_AAV93368			WR	QLHDLGLLSP		GGW			EEG
	Ruegeria_sp_TM1040_ABF62750			PE	QLAELGLCRG		FDA			RTTV
	Paracoccus_denitrificans_WP_011748578			WR	QLEDGLLISK		GNW			A
	Ruegeria_sp_TM1040_ABF62751			WR	QLEI LGLMSK		GNW			
	Rhizobium_etli_CFN42_ABC92155			WR	DLSDHGLIQG		EGWKYWK	NVSEDEI		ETV
	Geodermatophilus_obscurus_WP_012946629			PA	DLTGHGLIAR					GSTF
	Nostoc_sp_PCC7120_BAB73679			IN	QLEELGFIKV		NKN			YI
	Pseudovibrio_sp_FO-BEG1_WP_014283852			VS	DIYTSQYAC		SPA			LQ
	Ochrobactrum_anthropi_WP_012090710			PD	CLVRRGFMAD		LHD			IE
	Beijerinckia_indica_WP_012385681			ST	DLVRLRLINS		FEW			
	Sinorhizobium_fredii_WP_012708451			SR	QLEELGFIAP		IPF			
	Ruegeria_pomeroyi_AAV94731			A	RLRAEGMLKH		RPLDLDG	AMQKQF		PK
	Ruegeria_pomeroyi_AAV94670			Q	RMEDLLLQY		HEVRLLD			
	Dinoroseobacter_shibae_WP_012179538			G	TLFAMGLLKT		HAFDPTI	GIATEFP		GVD
	Jannaschia_sp_CCSI_ABD56186			L	ALEAEAGLLR		D-GPKVL	DLGG		
	Ruegeria_pomeroyi_AAV95896			PSRLI	SAASARTLV		GFANLGR	METADDG		PEN
	Ruegeria_sp_TM1040_ABF64507			PSRPI	SQVTGRTLA		GFATLGH	QNQRRI		RVKK
	Jannaschia_sp_CCSI_ABD56187	AVI	PFAALDD	VLFPPQPLAPE	GKAMVARMQA	QGV	PDLQIAR	AYAQS		VOKLE
	Jannaschia_sp_CCSI_ABD53753									
	Synechococcus_sp_WH8102_CAE07032			S	TNFLADLLR		DQPHLRN	DHKKI		FAGTK
	Ruegeria_pomeroyi_AAV95846	L		WHFHRP	EYDELYMLPV	RFGGADCA				
	Ruegeria_pomeroyi_AAV94320	V		VRARRD	PLRLTRLDP	WFSAL				
	Methylobacterium_radiotolerans_WP_012317373				QAPDLWOLPE	RFVGSF				
	Porphyrmonas_asaccharolytica_WP_004330966	M		LIG	LCLI VEIPE	RFRNI V				
	Jannaschia_sp_CCSI_ABD56179	GKVPITQIEA	KPPKARDPAK	I AALMSRVEK	DAAAKPI EER	RSDTI	AGWAA			
	Gluconobacter_oxydans_AAW60025	RRTPPQFHFC	M	LGQ	TKQLMRDMQ			MGYLVSVG		
	Streptococcus_suis_CYU93668			GRE	MAVRAYNVE		RKQKEK	K		
	Acidiphilium_cryptum_ABO29611	RAI QSTTSE	WSC	VRDLEQDAS		GALNGV	I DGRAKFHTD			
	Selenomonas_sputigena_WP_006193730	QSLMCLAEQL	A	QDF	AQERVSRRK	LVSV	I V	PYFGNLSFWH		
	Thalassiosira_pseudonana_XP_002288249	KGQNKQGS SY	Q	HCA	QNYLI NRHRW	VGFDADEYL	VLKKHSNVVS			
	Nematostella_vectensis_XP_001635452	MGEI GCFLSH	Y	KIW	KEMI EKLGR	VLILE DDVR	FEPDFRRKLL			
	Rattus_norvegicus_NP_001099537	KGEL GCFLSH	Y	NIW	KEVVDRLQK	SLVFE DDLR	FEIFFKRRLM			
	Gloeobacter_violaceus_BAC90139			KI	TLAER		A	RLFRRYFGHH		
	Granulibacter_bethesdensis_ABI61222			DMK	SII SII NYFE	N	L	SQ	SHGDI	VDLLR
	Rhodothermus_marinus_WP_012843638			DWT	ALAAQKGLN	NGTLRDPRT		FEKAVHAWLR		
	XpXyIT_MH673349			ARG	DLI DD		B	RLQEALSMRR		
	Paenibacillus_sp_JDR-2_WP_015843614			LQ	ELEA			KYLALAGITE		
	Methylorubrum_extorquens_WP_003600880			PGD	HAQR			GFLSPFYAS		
			760		770		780		790	800
	Jannaschia_sp_CCSI_ABD53137									
	Dinoroseobacter_shibae_WP_012180235									
	Ruegeria_pomeroyi_AAV93367									
	Ruegeria_pomeroyi_AAV93368									
	Ruegeria_sp_TM1040_ABF62750	A		G	GOR	N	DF			
	Paracoccus_denitrificans_WP_011748578									
	Ruegeria_sp_TM1040_ABF62751									
	Rhizobium_etli_CFN42_ABC92155	QQNMPGSAQR	HPQRRHENRY		DPASLGSAS					
	Geodermatophilus_obscurus_WP_012946629									
	Nostoc_sp_PCC7120_BAB73679	Q		YKQEI NQ		QSENTRN				
	Pseudovibrio_sp_FO-BEG1_WP_014283852	K		YMK HLR		LSVG				
	Ochrobactrum_anthropi_WP_012090710	R		GAKPRSR		LSA				
	Beijerinckia_indica_WP_012385681			ENR						
	Sinorhizobium_fredii_WP_012708451			ASEPI A		TREATKR	K			
	Ruegeria_pomeroyi_AAV94731									
	Ruegeria_pomeroyi_AAV94670									
	Dinoroseobacter_shibae_WP_012179538	LD		LSM D	AFDTFKI	A				
	Jannaschia_sp_CCSI_ABD56186									
	Ruegeria_pomeroyi_AAV95896	DP		KPA						
	Ruegeria_sp_TM1040_ABF64507	DT		VPG	ETSPGDSPT	SPLPDKD				
	Jannaschia_sp_CCSI_ABD56187	AL		RDA	RD	AAELNAM	GVTDPHERW	G		
	Jannaschia_sp_CCSI_ABD53753									
	Synechococcus_sp_WH8102_CAE07032	YA								
	Ruegeria_pomeroyi_AAV95846									
	Ruegeria_pomeroyi_AAV94320									
	Methylobacterium_radiotolerans_WP_012317373									
	Porphyrmonas_asaccharolytica_WP_004330966									
	Jannaschia_sp_CCSI_ABD56179	SDGDPYVQGD	I DLSGEI G		LEWENHG	I ELP			ADPRVFS	
	Gluconobacter_oxydans_AAW60025	AGE MNF	GR	YN	PLI MA		LEV		SDGDVW	
	Streptococcus_suis_CYU93668		FL		KPI I FV		LDGLKGDE	YI HP		NP
	Acidiphilium_cryptum_ABO29611	LEDAPWWRVD	LGVVHGI R		EVRLFNRM	DQPA			VAERANR	
	Selenomonas_sputigena_WP_006193730	RTLENI ASQT	YP	YMEVA		VLDFADGA	SD		IQEMLAA	
	Thalassiosira_pseudonana_XP_002288249	FLLEYCTRGA	I SLSWOLHSW	NDRL QYSPD	VTKRFQGMHG	I DQHVKTI	SS			
	Nematostella_vectensis_XP_001635452	AMI ADANOLE	SKYNWDM		YVGRF RM	KTEL I GHVE			GSQYI NW	
	Rattus_norvegicus_NP_001099537	NLMQDVERE	GLDWDLI		YVGRK RM	QVEHPEKAVP			RVRNLVE	
	Gloeobacter_violaceus_BAC90139	TFFR		FDFLA						
	Granulibacter_bethesdensis_ABI61222	ENNI ES		MHSVI R	R	F				
	Rhodothermus_marinus_WP_012843638	ATQGSHTLP	VRAVQKL LQ		VFGW					
	XpXyIT_MH673349	HLDRPI		SDACSNDM						
	Paenibacillus_sp_JDR-2_WP_015843614	DLR		KIREFRSLR		LR				
	Methylorubrum_extorquens_WP_003600880	RVR		KMAVAR		RG				

		810	820	830	840	850
	Jannaschia_sp_CCSI_ABD53137					
	Dinoroseobacter_shibae_WP_012180235					
	Ruegeria_pomeroyi_AAV93367					
	Ruegeria_pomeroyi_AAV93368					
	Ruegeria_sp_TM1040_ABF62750					
	Paracoccus_denitrificans_WP_011748578					
	Ruegeria_sp_TM1040_ABF62751					
	Rhizobium_etli_CFN42_ABC92155					
	Geodermatophilus_obscurus_WP_012946629					
	Nostoc_sp_PCC7120_BAB73679					
	Pseudovibrio_sp_FO-BEG1_WP_014283852					
	Ochrobactrum_anthropi_WP_012090710					
	Beijerinckia_indica_WP_012385681					
	Sinorhizobium_fredii_WP_012708451					
	Ruegeria_pomeroyi_AAV94731					
	Ruegeria_pomeroyi_AAV94670					
	Dinoroseobacter_shibae_WP_012179538					
	Jannaschia_sp_CCSI_ABD56186					
	Ruegeria_pomeroyi_AAV95896					
	Ruegeria_sp_TM1040_ABF64507					
	Jannaschia_sp_CCSI_ABD56187					
	Jannaschia_sp_CCSI_ABD53753					
	Synechococcus_sp_WH8102_CAE07032					
	Ruegeria_pomeroyi_AAV95846					
	Ruegeria_pomeroyi_AAV94320					
Methylobacterium_radiotolerans_WP_012317373						
Porphyromonas_asaccharolytica_WP_004330966						
Jannaschia_sp_CCSI_ABD56179	PE					SLDA
Gluconobacter_oxydans_AAW60025	NA					CLFTEN
Streptococcus_suis_CYU93668	SN					HLIT
Acidiphilium_cryptum_ABO29611	LA					IDIGFD
Selenomonas_sputigena_WP_006193730	LHI					PHCIVRA
Thalassiosira_pseudonana_XP_002288249	VDAI	NLTATH	HPHYAF	LEK	YTQL	DTNGNE
Nematostella_vectensis_XP_001635452	VNY			TWW		
Rattus_norvegicus_NP_001099537	ADY			SYW		TLAYV
Gloeobacter_violaceus_BAC90139						
Granulibacter_bethesdensis_ABI61222						
Rhodothermus_marinus_WP_012843638						
XpXyIT_MH673349						
Paenibacillus_sp_JDR-2_WP_015843614						
Methylorubrum_extorquens_WP_003600880						
		860	870	880	890	900
	Jannaschia_sp_CCSI_ABD53137					
	Dinoroseobacter_shibae_WP_012180235					
	Ruegeria_pomeroyi_AAV93367					
	Ruegeria_pomeroyi_AAV93368					
	Ruegeria_sp_TM1040_ABF62750					
	Paracoccus_denitrificans_WP_011748578					
	Ruegeria_sp_TM1040_ABF62751					
	Rhizobium_etli_CFN42_ABC92155					
	Geodermatophilus_obscurus_WP_012946629					
	Nostoc_sp_PCC7120_BAB73679					
	Pseudovibrio_sp_FO-BEG1_WP_014283852					
	Ochrobactrum_anthropi_WP_012090710					
	Beijerinckia_indica_WP_012385681					
	Sinorhizobium_fredii_WP_012708451					
	Ruegeria_pomeroyi_AAV94731					
	Ruegeria_pomeroyi_AAV94670					
	Dinoroseobacter_shibae_WP_012179538					
	Jannaschia_sp_CCSI_ABD56186					
	Ruegeria_pomeroyi_AAV95896					
	Ruegeria_sp_TM1040_ABF64507					
	Jannaschia_sp_CCSI_ABD56187					
	Jannaschia_sp_CCSI_ABD53753					
	Synechococcus_sp_WH8102_CAE07032					
	Ruegeria_pomeroyi_AAV95846					
	Ruegeria_pomeroyi_AAV94320					
Methylobacterium_radiotolerans_WP_012317373						
Porphyromonas_asaccharolytica_WP_004330966						
Jannaschia_sp_CCSI_ABD56179	II	LSRFERRH	ARNI	AGYLE		NCP
Gluconobacter_oxydans_AAW60025	PLP	GRYLSLP	GSPT	LLP		MVP
Streptococcus_suis_CYU93668	IL	TEMYNVRG	LL	TDNHQI	K	FLK
Acidiphilium_cryptum_ABO29611	PE	HFI	EVFRR	ES	DEFP	GGV
Selenomonas_sputigena_WP_006193730	DS	P	GWGVR	LA	QTARGE	YI
Thalassiosira_pseudonana_XP_002288249	HCKS	WK	EYVA	KRM	GRAT	MS
Nematostella_vectensis_XP_001635452	I	KLEGARKLV	SAK	PLTKMM		A
Rattus_norvegicus_NP_001099537	I	SLQGAQKLL	AAK	PLAKML		P
Gloeobacter_violaceus_BAC90139						
Granulibacter_bethesdensis_ABI61222						
Rhodothermus_marinus_WP_012843638						
XpXyIT_MH673349						
Paenibacillus_sp_JDR-2_WP_015843614						
Methylorubrum_extorquens_WP_003600880						
	</					

		910	920	930	940	950
Jannaschia_sp_CCSI_ABD53137						
Dinoroseobacter_shibae_WP_012180235						
Ruegeria_pomeroyi_AAV93367						
Ruegeria_pomeroyi_AAV93368						
Ruegeria_sp_TM1040_ABF62750						
Paracoccus_denitrificans_WP_011748578						
Ruegeria_sp_TM1040_ABF62751						
Rhizobium_etli_CFN42_ABC92155						
Geodermatophilus_obscurus_WP_012946629						
Nostoc_sp_PCC7120_BAB73679						
Pseudovibrio_sp_FO-BEG1_WP_014283852						
Ochrobactrum_anthropi_WP_012090710						
Beijerinckia_indica_WP_012385681						
Sinorhizobium_fredii_WP_012708451						
Ruegeria_pomeroyi_AAV94731						
Ruegeria_pomeroyi_AAV94670						
Dinoroseobacter_shibae_WP_012179538						
Jannaschia_sp_CCSI_ABD56186						
Ruegeria_pomeroyi_AAV95896						
Ruegeria_sp_TM1040_ABF64507						
Jannaschia_sp_CCSI_ABD56187						
Jannaschia_sp_CCSI_ABD53753						
Synechococcus_sp_WH8102_CAE07032						
Ruegeria_pomeroyi_AAV95846						
Ruegeria_pomeroyi_AAV94320						
Methylobacterium_radiotolerans_WP_012317373						
Porphyromonas_asaccharolytica_WP_004330966						
Jannaschia_sp_CCSI_ABD56179	F I G M R M V K M S	E G L			Y Y M A Q	D G R A
Gluconobacter_oxydans_AAW60025	V L S P V S G E				E I R I A	
Streptococcus_suis_CYU93668	I I T P D F A K F L	P H E			F I V V	P
Acidiphilium_cryptum_ABQ29611	I P G R F V R V R L	L E R			N Y L H L	
Selenomonas_sputigena_WP_006193730	K I L Q M - V T T	L E L D D E L			S F V L A D	
Thalassiosira_pseudonana_XP_002288249	A W T K L K S V S I	K Y E V F E S S S L	H F R Q S S N H T S	S K K S T A I	C S V	V C D Q E A Y V D E
Nematostella_vectensis_XP_001635452	M Y D K H P N A E W	S A H F S P			R N L V A M T A	E P L L L
Rattus_norvegicus_NP_001099537	M F D K H P M S E Y	K S H F S P			R N L R A F S V	E P L L I
Gloeobacter_violaceus_BAC90139						
Granulibacter_bethesdensis_ABI61222						
Rhodothermus_marinus_WP_012843638						
XpXylT_MH673349						
Paenibacillus_sp_JDR-2_WP_015843614						
Methylorubrum_extorquens_WP_003600880						
	960	970	980	990	1000	
Jannaschia_sp_CCSI_ABD53137						
Dinoroseobacter_shibae_WP_012180235						
Ruegeria_pomeroyi_AAV93367						
Ruegeria_pomeroyi_AAV93368						
Ruegeria_sp_TM1040_ABF62750						
Paracoccus_denitrificans_WP_011748578						
Ruegeria_sp_TM1040_ABF62751						
Rhizobium_etli_CFN42_ABC92155						
Geodermatophilus_obscurus_WP_012946629						
Nostoc_sp_PCC7120_BAB73679						
Pseudovibrio_sp_FO-BEG1_WP_014283852						
Ochrobactrum_anthropi_WP_012090710						
Beijerinckia_indica_WP_012385681						
Sinorhizobium_fredii_WP_012708451						
Ruegeria_pomeroyi_AAV94731						
Ruegeria_pomeroyi_AAV94670						
Dinoroseobacter_shibae_WP_012179538						
Jannaschia_sp_CCSI_ABD56186						
Ruegeria_pomeroyi_AAV95896						
Ruegeria_sp_TM1040_ABF64507						
Jannaschia_sp_CCSI_ABD56187						
Jannaschia_sp_CCSI_ABD53753						
Synechococcus_sp_WH8102_CAE07032						
Ruegeria_pomeroyi_AAV95846						
Ruegeria_pomeroyi_AAV94320						
Methylobacterium_radiotolerans_WP_012317373						
Porphyromonas_asaccharolytica_WP_004330966						
Jannaschia_sp_CCSI_ABD56179	P L V R Y G R D L	A G R A D V A S D R	L K F T D G P L V F	P G D		
Gluconobacter_oxydans_AAW60025	P - G H A L	S				
Streptococcus_suis_CYU93668	D T L D I - F Q V	K S Q Y V G T G V D	L S	K L I		
Acidiphilium_cryptum_ABQ29611	D Q V E V Y G D V	L A Q F G				
Selenomonas_sputigena_WP_006193730	A E E T A T A E G	A D P E R F V F S M	H R S H C F V A A G	A		
Thalassiosira_pseudonana_XP_002288249	M D Y H L A L G V	S A V Y V L D S E	D F W M R Q W G E E	R G Q T A P I V V T	H F P G N V T N P S	
Nematostella_vectensis_XP_001635452	Y P T H Y I G D K	G Y F S D T E T A A	F V P E E I P T L T	S W		
Rattus_norvegicus_NP_001099537	Y P T H Y T G D D	G Y V S D T E T S V	V W N N E Q - V K T	D W		
Gloeobacter_violaceus_BAC90139						
Granulibacter_bethesdensis_ABI61222						
Rhodothermus_marinus_WP_012843638						
XpXylT_MH673349						
Paenibacillus_sp_JDR-2_WP_015843614						
Methylorubrum_extorquens_WP_003600880						

		1010.	1020.	1030.	1040.	1050.
Jannaschia_sp_CCSI_ABD53137						
Dinoroseobacter_shibae_WP_012180235						
Ruegeria_pomeroyi_AAV93367						
Ruegeria_pomeroyi_AAV93368						
Ruegeria_sp_TM1040_ABF62750						
Paracoccus_denitrificans_WP_011748578						
Ruegeria_sp_TM1040_ABF62751						
Rhizobium_etli_CFN42_ABC92155						
Geodermatophilus_obscurus_WP_012946629						
Nostoc_sp_PCC7120_BAB73679						
Pseudovibrio_sp_FO-BEG1_WP_014283852						
Ochrobactrum_anthropi_WP_012090710						
Beijerinckia_indica_WP_012385681						
Sinorhizobium_fredii_WP_012708451						
Ruegeria_pomeroyi_AAV94731						
Ruegeria_pomeroyi_AAV94670						
Dinoroseobacter_shibae_WP_012179538						
Jannaschia_sp_CCSI_ABD56186						
Ruegeria_pomeroyi_AAV95896						
Ruegeria_sp_TM1040_ABF64507						
Jannaschia_sp_CCSI_ABD56187						
Jannaschia_sp_CCSI_ABD53753						
Synechococcus_sp_WH8102_CAE07032						
Ruegeria_pomeroyi_AAV95846						
Ruegeria_pomeroyi_AAV94320						
Methylobacterium_radiotolerans_WP_012317373						
Porphyromonas_asaccharolytica_WP_004330966						
Jannaschia_sp_CCSI_ABD56179	WAAQASGLAA	YLADF KPDA L	RI GR		A	SDLPAE
Gluconobacter_oxydans_AAW60025	KI DATTALYT	RMTSF	MV LTAE		G	HGL AD
Streptococcus_suis_CYU93668	SLKEYRKEIG	FI GNL				YA
Acidiphilium_cryptum_ABQ29611						
Selenomonas_sputigena_WP_006193730	WHRAYALAAG	RTPMGGLSGV	LLRR RVLDA	CAWLELAFFR	KRFFPLAA	
Thalassiosira_pseudonana_XP_002288249	YKAKAYAKCL	ALHRHDHQAM	VFFDVNDFLV	FPDGKGLSSV	DHLVSSSTSSC	
Nematostella_vectensis_XP_001635452	SLAKRQQLRF	KQ				
Rattus_norvegicus_NP_001099537	DRAKSQKMRE	QQA LSR		EAKNSDV LQ	SPLDS	TAR DEL
Gloeobacter_violaceus_BAC90139						
Granulibacter_bethesdensis_ABI61222						
Rhodothermus_marinus_WP_012843638						
XpXyIT_MH673349						
Paenibacillus_sp_JDR-2_WP_015843614						
Methylorubrum_extorquens_WP_003600880						
		1060.	1070.	1080.	1090.	1100
Jannaschia_sp_CCSI_ABD53137						
Dinoroseobacter_shibae_WP_012180235						
Ruegeria_pomeroyi_AAV93367						
Ruegeria_pomeroyi_AAV93368						
Ruegeria_sp_TM1040_ABF62750						
Paracoccus_denitrificans_WP_011748578						
Ruegeria_sp_TM1040_ABF62751						
Rhizobium_etli_CFN42_ABC92155						
Geodermatophilus_obscurus_WP_012946629						
Nostoc_sp_PCC7120_BAB73679						
Pseudovibrio_sp_FO-BEG1_WP_014283852						
Ochrobactrum_anthropi_WP_012090710						
Beijerinckia_indica_WP_012385681						
Sinorhizobium_fredii_WP_012708451						
Ruegeria_pomeroyi_AAV94731						
Ruegeria_pomeroyi_AAV94670						
Dinoroseobacter_shibae_WP_012179538						
Jannaschia_sp_CCSI_ABD56186						
Ruegeria_pomeroyi_AAV95896						
Ruegeria_sp_TM1040_ABF64507						
Jannaschia_sp_CCSI_ABD56187						
Jannaschia_sp_CCSI_ABD53753						
Synechococcus_sp_WH8102_CAE07032						
Ruegeria_pomeroyi_AAV95846						
Ruegeria_pomeroyi_AAV94320						
Methylobacterium_radiotolerans_WP_012317373						
Porphyromonas_asaccharolytica_WP_004330966						
Jannaschia_sp_CCSI_ABD56179	LA	NQB	LI GLSR	ITP VI S	DAQADA	YRADYAPVLT
Gluconobacter_oxydans_AAW60025	LLR	GI DRLPAPDA	SALGCAI A		ML DP	EDAERLAQ T
Streptococcus_suis_CYU93668	LLG	FVPNM	LNR	IYL	YI	QRNG IAKT I K I K
Acidiphilium_cryptum_ABQ29611						
Selenomonas_sputigena_WP_006193730		FVLLFQME	KDFRAGVFDV	PLT	SEEPH	DEGT LVVHPA
Thalassiosira_pseudonana_XP_002288249	AFQI QRVYFG	NSGQFVFDP L	PVAKRFMF RV		ESKRELI HPA	EWAS LLL SCG
Nematostella_vectensis_XP_001635452						LI LHVGAERM
Rattus_norvegicus_NP_001099537						
Gloeobacter_violaceus_BAC90139						
Granulibacter_bethesdensis_ABI61222						
Rhodothermus_marinus_WP_012843638						
XpXyIT_MH673349						
Paenibacillus_sp_JDR-2_WP_015843614						
Methylorubrum_extorquens_WP_003600880						

		1100	1120	1140	1160	1180
Jannaschia_sp_CCSI_ABD53137						
Dinoroseobacter_shibae_WP_012180235						
Ruegeria_pomeroyi_AAV93367						
Ruegeria_pomeroyi_AAV93368						
Ruegeria_sp_TM1040_ABF62750						
Paracoccus_denitrificans_WP_011748578						
Ruegeria_sp_TM1040_ABF62751						
Rhizobium_etli_CFN42_ABC92155						
Geodermatophilus_obscurus_WP_012946629						
Nostoc_sp_PCC7120_BAB73679						
Pseudovibrio_sp_FO-BEG1_WP_014283852						
Ochrobactrum_anthropi_WP_012090710						
Beijerinckia_indica_WP_012385681						
Sinorhizobium_fredii_WP_012708451						
Ruegeria_pomeroyi_AAV94731						
Ruegeria_pomeroyi_AAV94670						
Dinoroseobacter_shibae_WP_012179538						
Jannaschia_sp_CCSI_ABD56186						
Ruegeria_pomeroyi_AAV95896						
Ruegeria_sp_TM1040_ABF64507						
Jannaschia_sp_CCSI_ABD56187						
Jannaschia_sp_CCSI_ABD53753						
Synechococcus_sp_WH8102_CAE07032						
Ruegeria_pomeroyi_AAV95846						
Ruegeria_pomeroyi_AAV94320						
Methylobacterium_radiotolerans_WP_012317373						
Porphyromonas_asaccharolytica_WP_004330966						
Jannaschia_sp_CCSI_ABD56179	DR			GFQEDP	DRASAGSLQF	
Gluconobacter_oxydans_AAW60025	FP			GLIPRS	LMPVRRPQP	
Streptococcus_suis_CYU93668	S			RL		
Acidiphilium_cryptum_ABQ29611						
Selenomonas_sputigena_WP_006193730	QE	LAAH	SFVEARG	TLAERA	REVFAREELR	
Thalassiosira_pseudonana_XP_002288249	GNDSLGML	EY	EISEYLYVSGA	WKSEICTGHT	SVPNNI AAYH	YLRSVKECMK
Nematostella_vectensis_XP_001635452						
Rattus_norvegicus_NP_001099537						
Gloeobacter_violaceus_BAC90139						
Granulibacter_bethesdensis_ABI61222						
Rhodothermus_marinus_WP_012843638						
XpXyIT_MH673349						
Paenibacillus_sp_JDR-2_WP_015843614						
Methylobacterium_extorquens_WP_003600880						
		1160	1170	1180		
Jannaschia_sp_CCSI_ABD53137						
Dinoroseobacter_shibae_WP_012180235						
Ruegeria_pomeroyi_AAV93367						
Ruegeria_pomeroyi_AAV93368						
Ruegeria_sp_TM1040_ABF62750						
Paracoccus_denitrificans_WP_011748578						
Ruegeria_sp_TM1040_ABF62751						
Rhizobium_etli_CFN42_ABC92155						
Geodermatophilus_obscurus_WP_012946629						
Nostoc_sp_PCC7120_BAB73679						
Pseudovibrio_sp_FO-BEG1_WP_014283852						
Ochrobactrum_anthropi_WP_012090710						
Beijerinckia_indica_WP_012385681						
Sinorhizobium_fredii_WP_012708451						
Ruegeria_pomeroyi_AAV94731						
Ruegeria_pomeroyi_AAV94670						
Dinoroseobacter_shibae_WP_012179538						
Jannaschia_sp_CCSI_ABD56186						
Ruegeria_pomeroyi_AAV95896						
Ruegeria_sp_TM1040_ABF64507						
Jannaschia_sp_CCSI_ABD56187						
Jannaschia_sp_CCSI_ABD53753						
Synechococcus_sp_WH8102_CAE07032						
Ruegeria_pomeroyi_AAV95846						
Ruegeria_pomeroyi_AAV94320						
Methylobacterium_radiotolerans_WP_012317373						
Porphyromonas_asaccharolytica_WP_004330966						
Jannaschia_sp_CCSI_ABD56179	NRAS					
Gluconobacter_oxydans_AAW60025						
Streptococcus_suis_CYU93668						
Acidiphilium_cryptum_ABQ29611						
Selenomonas_sputigena_WP_006193730	AHADFS		RARSIFE	ELFAAL	PE	
Thalassiosira_pseudonana_XP_002288249	DRGDEQLCNL	KGTVE	DQFAW	MQMQRLMPDY	SNFNGFI	
Nematostella_vectensis_XP_001635452						
Rattus_norvegicus_NP_001099537						
Gloeobacter_violaceus_BAC90139						
Granulibacter_bethesdensis_ABI61222						
Rhodothermus_marinus_WP_012843638						
XpXyIT_MH673349						
Paenibacillus_sp_JDR-2_WP_015843614						
Methylobacterium_extorquens_WP_003600880						