

# Identification and Characterization of a $\beta$ -N-Acetylhexosaminidase with a Biosynthetic Activity from the Marine Bacterium *Paraglaciecola hydrolytica* S66<sup>T</sup>

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	80	90	100	110	120	130	140	
WP_082768773.1_Nah20B_P. hydro	..... ..... ..... ..... ..... ..... ..... ..... ..... .....							1
WP_068373836.1_Nah20A_P. hydro	-----							1
BAD00143.1_Nah20A_A. hydrophil	-----							1
BAF76001.1_NahB_A. hydrophila	-----							1
BAI94822.1_BbhI_B. bifidum	QNKAANEWIEVGLGGTKTVKQINIDFERKDADQNITSFKVELKQGDYTKVYQKDTRAKQQEIILLDQAO							140
AAQ05800.1_Hex20A_C. fimi	-----							1
BAI63641.1_Hex1t_Paenibacillus	-----							1
CAA55582.1_NahA_P. gingivalis	-----							1
BAA84281.1_Hex99_P. piscicida	-----							1
BAB84321.1_Hex86_P. piscicida	-----							1
AAB03808.1_Chb_S. marcescens	-----							1
AAS02154.1_GcnA_S. gordonii	-----							1
AAK98861.1_StrH_S. pneumoniae	AELQPEAPKTVETETPATDKVASLPKTEEKQEEVSSTPSDKAEVVTPTSAREKETANKKEEEASPKKEEA							137
CAB87223.1_HexA_S. coelicolor	-----							1
AAC38798.3_SpHex_S. plicatus	-----							1
AKC34128.1_Hex1_uncultured Act	-----							1
AKC34129.1_Hex2_uncultured Bac	-----							1
AAC44672.1_ExoI_V. furnissii	-----							1
AAA88682.1_Chb_V. harveyi	-----							1
AAD30612.1_AtHex1_A. thaliana	-----							1
AAM91092.1_AtHex3_A. thaliana	-----							1
BAE99290.1_AtHex3_A. thaliana	-----							1
AAM13977.1_HexA_A. oryzae	-----							1
AAT99455.1_BmGlcNAcase3_B. mor	-----							1
AAC60521.1_BmChiGlcNAcase_B. m	-----							1
CCD73477.2_CeHEX-4_C. elegans	-----							1
AAA34346.2_Hex1_C. albicans	-----							1
ADU20405.1_βHex_C. annuum	-----							1
ABB18373.1_CpHEX1_C. posadasii	-----							1
AAA33230.1_NagA_D. discoideum	-----							1
AAF46406.1_Hex2_D. melanogaste	-----							1
AAF47881.1_Hex1_D. melanogaste	-----							1
AAM29423.1_Fdl_D. melanogaster	-----							1
CAE46968.1_HexA_E. histolytica	-----							1
AAB00965.1_HexA_H. sapiens	-----							1
AAA52645.1_HexB_H. sapiens	-----							1
AAC53246.1_HexA_M. musculus	-----							1
AAA18776.1_HexB_M. musculus	-----							1
ABI81756.1_Hex1_O. furnacalis	-----							1
AEQ33603.1_HexTF_T. flavus	-----							1
ACI15900.1_NagA_T. maritima	-----							1
AAK16587.1_CbsA_T. neapolitana	-----							1
CAA63123.1_HexB_S. scrofa	-----							1

	150	160	170	180	190	200	210	
	..... ..... ..... ..... ..... ..... ..... .....							
WP_082768773.1_Nah20B_P. hydro	-----	MKGNNMGNTRRKFTLGSFCGLASLLCSSGSLSAAVADSTSAQQQL						44
WP_068373836.1_Nah20A_P. hydro	-----							1
BAD00143.1_Nah20A_A. hydrophil	-----	MNLKHSLLAIAMSTVFAGPALAADAAARQAVVDAL						34
BAF76001.1_NahB_A. hydrophila	-----	MSAPLIHTRVDHRD						14
BAI94822.1_BbhI_B. bifidum	QASAVKVTVLSADGGTMNWWNVGINEISVYSAPKETVLDTADTNHMLGATMTASSNETATLTDPKAIDQN							210
AAQ05800.1_Hex20A_C. fimi	-----							1
BAI63641.1_HexIt_Paenibacillus	-----							1
CAA55582.1_NahA_P. gingivalis	-----							1
BAA84281.1_Hex99_P. piscicida	-----	MFAKKQIIITASLSGLALLTASHYFAPHPDNLALR						36
BAB84321.1_Hex86_P. piscicida	-----							1
AAB03808.1_Chb_S. marcescens	-----	MNAFKLSALARLTATMGFLGGMGSAMADQQLVDQL						35
AAS02154.1_GcnA_S. gordonii	-----							1
AAK98861.1_StrH_S. pneumoniae	KEVDSKESNTDKTDKDKPAKKDEAKAEADKPETETGKERAA TVNEKLAKKKIVSIDAGRKYFSPEQLKEI							207
CAB87223.1_HexA_S. coelicolor	-----							1
AAC38798.3_SpHex_S. plicatus	-----							1
AKC34128.1_Hex1_uncultured Act	-----							1
AKC34129.1_Hex2_uncultured Bac	-----							1
AAC44672.1_ExoI_V. furnissii	-----	MNYRIDFAVLSEH						13
AAA88682.1_Chb_V. harveyi	-----	MLKHSLIAASVITT-LAGCSSLOSSEQOVNSL						32
AAD30612.1_AtHex1_A. thaliana	-----							1
AAM91092.1_AtHex3_A. thaliana	-----							1
BAE99290.1_AtHex3_A. thaliana	-----							1
AAM13977.1_HexA_A. oryzae	-----							1
AAT99455.1_BmGlcNAcase3_B. mor	-----							1
AAC60521.1_BmChiGlcNAcase_B. m	-----							1
CCD73477.2_CeHEX-4_C. elegans	-----							1
AAA34346.2_Hex1_C. albicans	-----							1
ADU20405.1_betaHex_C. annum	-----							1
ABB18373.1_CpHEX1_C. posadasii	-----							1
AAA33230.1_NagA_D. discoideum	-----							1
AAF46406.1_Hex2_D. melanogaste	-----							1
AAF47881.1_Hex1_D. melanogaste	-----							1
AAM29423.1_Fdl_D. melanogaster	-----							1
CAE46968.1_HexA_E. histolytica	-----							1
AAB00965.1_HexA_H. sapiens	-----							1
AAA52645.1_HexB_H. sapiens	-----							1
AAC53246.1_HexA_M. musculus	-----							1
AAA18776.1_HexB_M. musculus	-----							1
ABI81756.1_Hex1_O. furnacalis	-----							1
AEQ33603.1_HexTF_T. flavus	-----							1
ACI15900.1_NagA_T. maritima	-----							1
AAK16587.1_CbsA_T. neapolitana	-----							1
CAA63123.1_HexB_S. scrofa	-----							1

	220	230	240	250	260	270	280
WP_082768773.1_Nah20B_P. hydro	LDNIAAHMGLTYVINNNISVENCQ	QDDTGS	AQCYQGQIQ	LTFFK-QD	VALKDWQI	YFSNTS	NIKWGDGSE
WP_068373836.1_Nah20A_P. hydro	ASNLVVKYEVV	TNDGAGAGLDC	QALGSEWAS	CGVAKLHL	TNTGADV	TSKDWSI	YVSSIRRIQ
BAD00143.1_Nah20A_A. hydrophil	GDDVWFRFTLS	QLP-----	AAPWKLH	FCLARQID	PHSIEGGS		
BAF76001.1_NahB_A. hydrophila	RTGRNNRWAS	GYETPSNI	WLKAEFPRL	TAVKDIRI	YFFERDV	NPKPTNV	QSFDLSY
BAI94822.1_BbhI_B. bifidum	AAQ05800.1_Hex20A_C. fimi	CAA63641.1_Hex1t_Paenibacillus	CAA55582.1_NahA_P. gingivalis	BAA84281.1_Hex99_P. piscicida	BAB84321.1_Hex86_P. piscicida	AAB03808.1_Chb_S. marcescens	AAS02154.1_GcnA_S. gordonii
AAQ05800.1_Hex20A_C. fimi	CAA63641.1_Hex1t_Paenibacillus	CAA55582.1_NahA_P. gingivalis	BAA84281.1_Hex99_P. piscicida	BAB84321.1_Hex86_P. piscicida	AAB03808.1_Chb_S. marcescens	AAS02154.1_GcnA_S. gordonii	AAK98861.1_StrH_S. pneumoniae
BAI63641.1_Hex1t_Paenibacillus	CAA55582.1_NahA_P. gingivalis	BAA84281.1_Hex99_P. piscicida	BAB84321.1_Hex86_P. piscicida	AAB03808.1_Chb_S. marcescens	AAS02154.1_GcnA_S. gordonii	AAK98861.1_StrH_S. pneumoniae	CAB87223.1_HexA_S. coelicolor
CAA55582.1_NahA_P. gingivalis	BAA84281.1_Hex99_P. piscicida	BAB84321.1_Hex86_P. piscicida	AAB03808.1_Chb_S. marcescens	AAS02154.1_GcnA_S. gordonii	AAK98861.1_StrH_S. pneumoniae	CAB87223.1_HexA_S. coelicolor	AAC38798.3_SpHex_S. plicatus
BAA84281.1_Hex99_P. piscicida	BAB84321.1_Hex86_P. piscicida	AAB03808.1_Chb_S. marcescens	AAS02154.1_GcnA_S. gordonii	AAK98861.1_StrH_S. pneumoniae	CAB87223.1_HexA_S. coelicolor	AAC38798.3_SpHex_S. plicatus	AKC34128.1_Hex1_uncultured Act
BAB84321.1_Hex86_P. piscicida	AAB03808.1_Chb_S. marcescens	AAS02154.1_GcnA_S. gordonii	AAK98861.1_StrH_S. pneumoniae	CAB87223.1_HexA_S. coelicolor	AAC38798.3_SpHex_S. plicatus	AKC34128.1_Hex1_uncultured Act	AKC34129.1_Hex2_uncultured Bac
AAB03808.1_Chb_S. marcescens	AAS02154.1_GcnA_S. gordonii	AAK98861.1_StrH_S. pneumoniae	CAB87223.1_HexA_S. coelicolor	AAC38798.3_SpHex_S. plicatus	AKC34128.1_Hex1_uncultured Act	AKC34129.1_Hex2_uncultured Bac	AAC44672.1_ExoI_V. furnissii
AAS02154.1_GcnA_S. gordonii	AAK98861.1_StrH_S. pneumoniae	CAB87223.1_HexA_S. coelicolor	AAC38798.3_SpHex_S. plicatus	AKC34128.1_Hex1_uncultured Act	AKC34129.1_Hex2_uncultured Bac	AAC44672.1_ExoI_V. furnissii	AAA88682.1_Chb_V. harveyi
AAK98861.1_StrH_S. pneumoniae	CAB87223.1_HexA_S. coelicolor	AAC38798.3_SpHex_S. plicatus	AKC34128.1_Hex1_uncultured Act	AKC34129.1_Hex2_uncultured Bac	AAC44672.1_ExoI_V. furnissii	AAA88682.1_Chb_V. harveyi	AAD30612.1_AtHex1_A. thaliana
CAB87223.1_HexA_S. coelicolor	AAC38798.3_SpHex_S. plicatus	AKC34128.1_Hex1_uncultured Act	AKC34129.1_Hex2_uncultured Bac	AAC44672.1_ExoI_V. furnissii	AAA88682.1_Chb_V. harveyi	AAD30612.1_AtHex1_A. thaliana	AAM91092.1_AtHex3_A. thaliana
AAC38798.3_SpHex_S. plicatus	AKC34128.1_Hex1_uncultured Act	AKC34129.1_Hex2_uncultured Bac	AAC44672.1_ExoI_V. furnissii	AAA88682.1_Chb_V. harveyi	AAD30612.1_AtHex1_A. thaliana	AAM91092.1_AtHex3_A. thaliana	BAE99290.1_AtHex3_A. thaliana
AKC34128.1_Hex1_uncultured Act	AKC34129.1_Hex2_uncultured Bac	AAC44672.1_ExoI_V. furnissii	AAA88682.1_Chb_V. harveyi	AAD30612.1_AtHex1_A. thaliana	AAM91092.1_AtHex3_A. thaliana	BAE99290.1_AtHex3_A. thaliana	AAM13977.1_HexA_A. oryzae
AKC34129.1_Hex2_uncultured Bac	AAC44672.1_ExoI_V. furnissii	AAA88682.1_Chb_V. harveyi	AAD30612.1_AtHex1_A. thaliana	AAM91092.1_AtHex3_A. thaliana	BAE99290.1_AtHex3_A. thaliana	AAM13977.1_HexA_A. oryzae	AAT99455.1_BmGlcNAcase3_B. mor
AAC44672.1_ExoI_V. furnissii	AAA88682.1_Chb_V. harveyi	AAD30612.1_AtHex1_A. thaliana	AAM91092.1_AtHex3_A. thaliana	BAE99290.1_AtHex3_A. thaliana	AAM13977.1_HexA_A. oryzae	AAT99455.1_BmGlcNAcase3_B. mor	AAC60521.1_BmChiGlcNAcase_B. m
AAA88682.1_Chb_V. harveyi	AAD30612.1_AtHex1_A. thaliana	AAM91092.1_AtHex3_A. thaliana	BAE99290.1_AtHex3_A. thaliana	AAM13977.1_HexA_A. oryzae	AAT99455.1_BmGlcNAcase3_B. mor	AAC60521.1_BmChiGlcNAcase_B. m	CCD73477.2_CeHEX-4_C. elegans
AAD30612.1_AtHex1_A. thaliana	AAM91092.1_AtHex3_A. thaliana	BAE99290.1_AtHex3_A. thaliana	AAM13977.1_HexA_A. oryzae	AAT99455.1_BmGlcNAcase3_B. mor	AAC60521.1_BmChiGlcNAcase_B. m	CCD73477.2_CeHEX-4_C. elegans	AAA34346.2_Hex1_C. albicans
AAM91092.1_AtHex3_A. thaliana	BAE99290.1_AtHex3_A. thaliana	AAM13977.1_HexA_A. oryzae	AAT99455.1_BmGlcNAcase3_B. mor	AAC60521.1_BmChiGlcNAcase_B. m	CCD73477.2_CeHEX-4_C. elegans	AAA34346.2_Hex1_C. albicans	ADU20405.1_βHex_C. annum
BAE99290.1_AtHex3_A. thaliana	AAM13977.1_HexA_A. oryzae	AAT99455.1_BmGlcNAcase3_B. mor	AAC60521.1_BmChiGlcNAcase_B. m	CCD73477.2_CeHEX-4_C. elegans	AAA34346.2_Hex1_C. albicans	ADU20405.1_βHex_C. annum	ABB18373.1_CpHEX1_C. posadasii
AAM13977.1_HexA_A. oryzae	AAT99455.1_BmGlcNAcase3_B. mor	AAC60521.1_BmChiGlcNAcase_B. m	CCD73477.2_CeHEX-4_C. elegans	AAA34346.2_Hex1_C. albicans	ADU20405.1_βHex_C. annum	ABB18373.1_CpHEX1_C. posadasii	AAA33230.1_NagA_D. discoideum
AAT99455.1_BmGlcNAcase3_B. mor	AAC60521.1_BmChiGlcNAcase						

	290	300	310	320	330	340	350	
WP_082768773.1_Nah20B_P. hydro	..... ..... ..... ..... ..... ..... ..... .....	IQHTNGDIHVITPVS--QNLIKKGSYAIDFKGIGSLVNESEAFPNYFISATDLQARVIQMTVPLVDSDTQ	181					
WP_068373836.1_Nah20A_P. hydro	----- ----- ----- ----- ----- ----- ----- -----	-----MYKIIIIAGLGLWSITSHGMQPLNLMPPSEVQQQAGHFTLPSQLKVFTQH----	51					
BAD00143.1_Nah20A_A. hydrophil		ITHLTGDLRLTPTEKFQGFADATVEVPLVVEYVWLFESDIMPWYVASEGAEPKVLASMSNIDDASTY	174					
BAF76001.1_NahB_A. hydrophila		LERQSGSYKVMVPHEGVVS--ELRFCCRN-----TFLKHSDMPKGFFLSLESKGQLQPLVLKGEDLGLT	113					
BAI94822.1_BbhI_B. bifidum		AMTASGAGYVADVVIQLDQAVNARSILKLSNFAIKSSEYNNVSVAEWEAYSNDQAEFGATLDSVVDLESN	350					
AAQ05800.1_Hex20A_C. fimi		-----MPDVAVIERPVLLETTDGPFFVLTAAATILVVDSS--	33					
BAI63641.1_Hex1t_Paenibacillus		-----MMSFIP---ESASASTSQPSILPKVPVSYTVG-SGQFVLTKNASIFVAGNNV	47					
CAA55582.1_NahA_P. gingivalis		---MKRLTFGACICCLLSLMACSQKAKQVQIPEYDKGINIIPLMQLTES-DDSFEVDDKTTICVS----	62					
BAA84281.1_Hex99_P. piscicida		DDAKSGDYFVLKPVAGFAPIQPGESRTIEIVAQYWQLKNDSPSGFHHISYNNQAPQAVLVDVMMDPSPDPK	176					
BAB84321.1_Hex86_P. piscicida		---MN-----QSVFYTFQLQSSLLLSLLFTPLCTALQITKPLSASFG-NGHFNLTHTDSKITFN----	55					
AAB03808.1_Chb_S. marcescens		IAHLTGDLKLEPTAKFSGFPAGKAVEIPVVAEYWLFRNDFLPRWYATSGDAKPKMLANTD-TENLDQF	173					
AAS02154.1_GcnA_S. gordonii		ATFLGLSSKQEKALVRLDKYLNLEIAVSLVTDTSATSIKVEGRQGYQVSYKQPHQLYRALALLSAAALRS	71					
AAK98861.1_StrH_S. pneumoniae		INYAKDKGIGLIPTVNSPGHMDAILNAMKELGIQNPNSFYFGKKSARTVLDNEQAVAFTKALIDKYAAY	347					
CAB87223.1_HexA_S. coelicolor		TPRITRLLGSLLLVAAGVAMTTGAAPVRKAAAEPTPLDRVIPAPASVDPG-GAPYRITRGTHIRVD----	75					
AAC38798.3_SpHex_S. plicatus		-----MTTGAAPDRKAPVRPTPLDRVIPAPASVDPG-GAPYRITRGTHIRVD----	46					
AKC34128.1_Hex1_uncultured Act		-----MSP-----VMNTVIPRPSSVLGT-GRSFELPADARILVQP---	34					
AKC34129.1_Hex2_uncultured Bac		---MK-----TIASLLIAGSLATSAAEPP-----ALIPQPVSVQPG-EGSFKFSAGTGIRH----	47					
AAC44672.1_ExoI_V. furnissii		QIHQVGSFCSLTPEQDVINSNSHFYCEFSIKTAPFFHYTDTGIIKAAAFVQINDVEPRVRHDTVITPIALA	122					
AAA88682.1_Chb_V. harveyi		ISRVTGDLHKLEPTDKFDGFAAGEEVVLPVGEYWLFFETDFMFGAFVSAPNAEPKMIASLN-TEDVASF	171					
AAD30612.1_AtHex1_A. thaliana		-----MLTSLKFHVILIPILFFITLLSPLFSIALPINIWPCKPR----FLSWPQHKAIALSPNFT----	55					
AAM91092.1_AtHex3_A. thaliana		-----MRGSGAKIAGVLPFLFMIAGTISAFEDIER-LRIWPLPAQVSHGGRMYLSGDFKLVTGSK--	62					
BAE99290.1_AtHex3_A. thaliana		-----MSTNLLRLILLFITLSITSSLSTPSPADSPPYLWPLPAEFSFGNETLSVDPTVTTLIVAGN--	60					
AAM13977.1_HexA_A. oryzae		-----MRISQICTVLSTVTS--AVAVGVNPLPAPR-----EISWGSSGPKSIAGELQ----	45					
AAT99455.1_BmGlcNAcase3_B. mor		-----MFERLFVYLNILGAFVLVTGLHIVEPGPEYPASKGAIWPRPQMOSIEIPYKYFSDILEIKVVDHDC	65					
AAC60521.1_BmChiGlcNAcase_B. m		E-----NNRCKTIRNEPENKEPVLSEACKMFC-DYGLLWPKPT-IETNLGNFLSKINMNTIDIQ----	92					
CCD73477.2_CeHEX-4_C. elegans		-----MHKMSKLCFLALLSVTFMLIFVLTTTPYSNDRSSYAAYEGGIDPRKTRQFKNIIVHLDLKG----	60					
AAA34346.2_Hex1_C. albicans		-----MVLDKMIIFHLLWLNCNVVHAAKVEILPAPQ-----SVTWENDTAIIINPRLL----	49					
ADU20405.1_βHex_C. annum		-----MRGDTTFPFILS---LFVIFITQTIATNYPINVPKPT----TFNWPNPKIHLPLPNFT----	52					
ABB18373.1_CpHEX1_C. posadasii		-----MRFAYLATLAGSLLAGLAQAVKVNPLPAPQ----HIKWGESGPQYLDWNVK----	47					
AAA33230.1_NagA_D. discoideum		-----MIKKIILFFAVLIA--IVIGQQPLNVVPYPPQVVSIGTCVIPVAPGSILIESN----	50					
AAF46406.1_Hex2_D. melanogaste		SRTDICTAEGEMVAGLQYAPEIFESQRDCRLSCG-KYGAIWPMPTGKECTISHRRVRFPWKVRFH----	119					
AAF47881.1_Hex1_D. melanogaste		R-----SGYCQKVELSEENYVKAISLPVCRLFCGSSIGTLWPKPT-GTVRLDTLMRQVDISFIDFN----	94					
AAM29423.1_Fdl_D. melanogaster		E-----NDRCMRVGHGKS-AKRVSFISCSMTG--DVNIWPHPT-QKFLSSQTHSFSVEDVQLH----	122					
CAE46968.1_HexA_E. histolytica		-----MLFIFIVFISSVFAGNGLNVQNQLLLMPYPSSVSFQWKSPLAIALTSSIQLN----	52					
AAB00965.1_HexA_H. sapiens		-----MTSSRLWFSLLLAAAFAGRAT-----ALWPWPQNFQTSQRYVLYPNNFQFYD----	49					
AAA52645.1_HexB_H. sapiens		LLLATLLAAMLALLTQVALVVQVAEAAAPSVSAKPGPALWPLPLSVKMTPNLLHLAPENFYISHS----	82					
AAC53246.1_HexA_M. musculus		-----MAGCRLWVSLLLAAALACLAT-----ALWPWPQYIQTYHRRYTLYPNNFQFRYH----	49					
AAA18776.1_HexB_M. musculus		-----RSAPGLLLLQALVSLVSLALVAP---ARLQPALWPPRSVQMFPRLLYISAEDFSIDHS----	61					
ABI181756.1_Hex1_O. furnacalis		D-----NGKCVKLKNDPRSSEPALSLEACKMFCN-EYGLLWPRPT-GEADLGNFLSKINLNSIEVK----	90					
AEQ33603.1_HexTF_T. flavus		-----MRVS-LVTVSLCLASA--VAGVAVNPLPAPR-----SITWGTSGPISVPHNVD----	44					
ACI15900.1_NagA_T. maritima		-----MDVDLGKLFECGFNDNEEVKEIIRKYRPTGILIYPG---VLSKEYLLMDFMSFLSK----	54					
AAK16587.1_CbsA_T. neapolitana		-----MDVDLGKLFECGFDDFNEEAREVIQYRPAVLIYPG---VLSKEYLFLDFMNFLSR----	54					
CAA63123.1_HexB_S. scrofa		-----MEVATRPAAAGSGGAERWARDTSGAESLGLWPLPFAVDISPRSLHLSNNFFFGHS----	58					

	360	370	380	390	400	410	420	
WP_082768773.1 Nah20B_P. hydro	LLVYPHVL	PFVTPEQTKR	-----	RVGDKVPLATPEVMFEHYASINALAAESATTAPRLIPHTVSSQFDA	245			
WP_068373836.1 Nah20A_P. hydro	-----	-----	-----	VSEARCELILKEQLEQLQQVEVLWVT	76			
BAD00143.1 Nah20A_A. hydrophil	EKPMP	-----	ADGWKR	-----	TKDDNNILMNSETRFAANQSTLLPAGKIDDRILPSPMKQVVKAGP	231		
BAF76001.1 NahB_A. hydrophila	NPPSP	-----	-----	-----	GPDLPQVEAVN-GLVPQPAHLIYTEGN	144		
BAI94822.1 BbhI_B. bifidum	HLTIETD	DTLALPTVPDGYTVKFNGADYEQLIAADGTVNHPLVDKTVQVAYVVD	TATGNTKTTSDIPY	420				
AAQ05800.1 Hex20A_C. fimi	-----	-----	-----	-----	APELVAVGVLAADLLGRLSGRPVEVRY	60		
BAI63641.1 Hex1t_Paenibacillus	G	-----	-----	-----	ETDELFNIGQALAKKLNASTGYTISVVK	76		
CAA55582.1 NahA_P. gingivalis	-----	-----	-----	-----	AEELKPIAKLADKLRASADLSIQIEI	89		
BAA84281.1 Hex99_P. piscicida	QTKQAVN	-----	-----	-----	DNMPVQTSAIRFAENSATHMALPLKNRL	211		
BAB84321.1 Hex86_P. piscicida	-----	-----	-----	-----	QHQAQSVAAQQLATFLRSPTGYQLPVSQ	82		
AAB03808.1 Chb_S. marcescens	VAPFT	-----	GDQWKR	-----	TKDDKNILMTPASRFVSNADLQTLPGALRGKIVPTPMQVKVHAQD	230		
AAS02154.1 GcnA_S. gordonii	-----	-----	-----	-----	GQDEVQIEEEAAYEDLAYMADCSRNAV	99		
AAK98861.1 StrH_S. pneumoniae	FAKKEIF	FNIGLDEYANDATDAKGWSVLQADKYYPNEGYPVKGYEKFIAYAND	ARIKSHGLKPMFND	417				
CAB87223.1 HexA_S. coelicolor	-----	-----	-----	-----	DSREARRVGDYADLLRPATGYRLPVTS	103		
AAC38798.3 SpHex_S. plicatus	-----	-----	-----	-----	DSREARRVGDYADLLRPATGYRLPVTA	74		
AKC34128.1 Hex1_uncultured Act	-----	-----	-----	-----	NAPEVAQIGEFIAAALRPATGLALPVTA	62		
AKC34129.1 Hex2_uncultured Bac	-----	-----	-----	-----	DRALESEAKLASDLAKLTDSQPKTVV	74		
AAC44672.1 ExoI_V. furnissii	SPYRE	-----	-----	-----	RSEIPATDAATLSLLPKPNHIERLDGE	154		
AAA88682.1 Chb_V. harveyi	VTGLE	-----	GNNLKR	-----	TPDDNNVFANAVSRFEKNEDLATQDVSTT	225		
AAD30612.1 AtHex1_A. thaliana	-----	-----	-----	-----	ILAPEH---QYLSASVTRYHNLRSENY	80		
AAM91092.1 AtHex3_A. thaliana	-----	-----	-----	-----	YGDASGILKEGFDRMLGVVRLSHV	86		
BAE99290.1 AtHex3_A. thaliana	-----	-----	-----	-----	GGGSLIIRAAFDYRMGIIFKHAS	83		
AAM13977.1 HexA_A. oryzae	-----	-----	-----	-----	LRTSDSDADGIVADAWNRAWETIVALRW	73		
AAT99455.1 BmGlcNAcase3_B. mor	P	-----	-----	-----	ILSNAVQRSLAVIREMLRIASPYVNRNAP	95		
AAC60521.1 BmChiGlcNAcase_B. m	-----	-----	-----	-----	ITKQKSD-DLITAAADRFKTLVSSSV	119		
CCD73477.2 CeHEX-4_C. elegans	-----	-----	-----	-----	APPRVEYLIEFFKLLSKHHVDGILIEYE	88		
AAA34346.2 Hex1_C. albicans	-----	-----	-----	-----	QANTSC---PLEDAFVRTVSATEKSKW	74		
ADU20405.1 βHex_C. annum	-----	-----	-----	-----	ISHPTH---RYLTPTVYRYRRLILSEHY	77		
ABB18373.1 CpHEX1_C. posadasii	-----	-----	-----	-----	YSGPRD---RTIIAAWRRTWGSIVQLRW	72		
AAA33230.1 NagA_D. discoideum	-----	-----	-----	-----	IESATFSVSMdryTN-----LFFPFSNES	74		
AAF46406.1 Hex2_D. melanogaste	-----	-----	-----	-----	VVAPGEAATQFLRETNRFLVSNLLKECI	147		
AAF47881.1 Hex1_D. melanogaste	-----	-----	-----	-----	FNGIARQQ-KLWRAVEDRFMNMLEAQIP	121		
AAM29423.1 Fdl_D. melanogaster	-----	-----	-----	-----	VDTAHREVRKQQLAFDWFLKDLRLIQR	150		
CAE46968.1 HexA_E. histolytica	-----	-----	-----	-----	VKSTCNTDCMNFKSNFNHTISFPLQQQT	81		
AAB00965.1 HexA_H. sapiens	-----	-----	-----	-----	VSSAAQPGCSVLDEAFQRYRDLFGSGS	77		
AAA52645.1 HexB_H. sapiens	-----	-----	-----	-----	PNSTAGPSCSLDEAFRRYHGYIFGFYK	110		
AAC53246.1 HexA_M. musculus	-----	-----	-----	-----	VSSAAQGGCVLDEAFRRYRNLLFGSGS	77		
AAA18776.1 HexB_M. musculus	-----	-----	-----	-----	PNSTAGPSCSLDEAFRRYYNYVFGFYK	89		
ABI81756.1 Hex1_O. furnacalis	-----	-----	-----	-----	ILKKGATD-DLMEAAAKRFKEQVSLAIP	117		
AEQ33603.1 HexTF_T. flavus	-----	-----	-----	-----	VKLKPN---AIINDAWERAWTSIKQLRW	69		
ACI15900.1 NagA_T. maritima	-----	-----	-----	-----	EGDFLISSDHEGGQLEVLKYVPSSPGN	81		
AAK16587.1 CbsA_T. neapolitana	-----	-----	-----	-----	NGRFIVSSDHEGGQLEVLKYVPSFPGN	81		
CAA63123.1 HexB_S. scrofa	-----	-----	-----	-----	PTSKAGSSCEILDEAFRRYYDFIFGFYK	86		

	430	440	450	460	470	480	490	
WP_082768773.1_Nah20B_P. hydro	.... .... .... .... .... .... .... .... .... .... .... .... ....	TQRVSVSQG	-----	IAVDEASLSQFSAA	FORLAKKGLNTQSTG	-----	283	
WP_068373836.1_Nah20A_P. hydro		AKDQAN	-----	LLVEVEGVTVQMEVGGK	-----	99		
BAD00143.1_Nah20A_A. hydrophil		QVDFST-IK	-----	LNALDLPSPRAEALKTQLTKLGVTLSDTG	-----	268		
BAF76001.1_NahB_A. hydrophila		FRLAERAHV	-----	GGPVPLASLLAHFN	-ELTGLALTQDHD	-----	179	
BAI94822.1_BbhI_B. bifidum		VVKGTNQQQE	-----	GNNAKPTIIPETAEWHSTSAAKLAASAVTKVVYDDDSLKAVVDEFV	-----	476		
AAQ05800.1_Hex20A_C. fimi		TEGGAPSV	-----	VRLRLSED	-----	76		
BAI63641.1_Hex1t_Paenibacillus		SNQPTAGS	-----	IYLTTVGGN	-----	93		
CAA55582.1_NahA_P. gingivalis		GEEPSGN	-----	AIYIGVDTA	-----	105		
BAA84281.1_Hex99_P. piscicida		VPQPHSVVTP	-----	NDEFLTLMSQLTSISGAASLAKEATFLQTALRDILSGTFAIN	----	263		
BAB84321.1_Hex86_P. piscicida		ADSTTKN	-----	SIAFKIVD	-----	97		
AAB03808.1_Chb_S. marcescens		ADLRKG-VA	-----	LDLSTLVKPAADVVSQRFALLGVFVQTNG	-----	267		
AAS02154.1_GcnA_S. gordonii		NLSSAK	-----		-----	105		
AAK98861.1_StrH_S. pneumoniae		GIYNSDTSFGSFDKDIIVSMWTGGWGGYDVASSKLLAEKGHIILNTNDAWCYVLGRNADGGWYNLDQG	-----		-----	487		
CAB87223.1_HexA_S. coelicolor		---HGHGG	-----	IRLRLAEG	-----	116		
AAC38798.3_SpHex_S. plicatus		---HGHGG	-----	IRLRLAGG	-----	87		
AKC34128.1_Hex1_uncultured Act		GAAQERGT	-----	IHLTTAAAD	-----	79		
AKC34129.1_Hex2_uncultured Bac		KELTNALPS	-----	EILLDFSEK	-----	92		
AAC44672.1_ExoI_V. furnissii		FALTAGSQI	-----	SLQSSCAETAATWLKQELTHLYQWQPHDI	-----	192		
AAA88682.1_Chb_V. harveyi		VDIADG-IA	-----	LPKDAFDATQFAAIQDRAEVVGVVDVRG-D	-----	261		
AAD30612.1_AtHex1_A. thaliana		SPLIS	-----	YPVKLMKRYTLRN	-----	98		
AAM91092.1_AtHex3_A. thaliana		ISG	-----	DRNSSGTGGSALLQGLH	-----	106		
BAE99290.1_AtHex3_A. thaliana		GRGSL	-----	SRIRFLKMVEYDITSLK	-----	106		
AAM13977.1_HexA_A. oryzae		VPAATE	-----	APISSFEPFP--TPTAG	-----	98		
AAT99455.1_BmGlcNAcase3_B. mor		QQVLDD	-----	DTYDGPLKS---LSIYL	-----	115		
AAC60521.1_BmChiGlcNAcase_B. m		KGFSAK	-----	AAGKSVTVYLVN	-----	137		
CCD73477.2_CeHEX-4_C. elegans		DMFPYSG	-----		-----	95		
AAA34346.2_Hex1_C. albicans		HP	-----	FPIDDFNTANGKNIKTS	-----	93		
ADU20405.1_βHex_C. annum		RHIIT	-----	PSINLTSSTPLQH	-----	95		
ABB18373.1_CpHEX1_C. posadasii		TPAALE	-----	APIPTFAPFIVGNKRD	-----	98		
AAA33230.1_NagA_D. discoideum		-----	-----	EPSSNESFLLSVT	-----	87		
AAF46406.1_Hex2_D. melanogaste		RNCTLE	-----	TSKQILVRSTVAN	-----	166		
AAF47881.1_Hex1_D. melanogaste		DRKVLA	-----	RGYRMSVNINTP	-----	140		
AAM29423.1_Fdl_D. melanogaster		LDYGGG	-----	SSEPTVSESSSKSRHHA	-----	177		
CAE46968.1_HexA_E. histolytica		GLQDFKVSFL	-----	KEIDLPRITPSVSSVITDVVELS	-----	115		
AAB00965.1_HexA_H. sapiens		WPRPYL	-----	TGKRHTLEKNVLVSVV	-----	100		
AAA52645.1_HexB_H. sapiens		WHHEPA	-----	EFQAKTQVQQLLVISITL	-----	133		
AAC53246.1_HexA_M. musculus		WPRPSF	-----	SNKQOTLGKNILVSVV	-----	100		
AAA18776.1_HexB_M. musculus		RHHGPA	-----	RFRAEPQLQKLLVSITL	-----	112		
ABI81756.1_Hex1_O. furnacalis		RGSTPK	-----	LTGKAVDVYLVN	-----	135		
AEQ33603.1_HexTF_T. flavus		VPQATE	-----	APISSYEPFPTVAPTSASTASSTPLSSSSAAVAARS	-----	112		
ACI15900.1_NagA_T. maritima		LAFGKN	-----		-----	87		
AAK16587.1_CbsA_T. neapolitana		LAAGKV	-----		-----	87		
CAA63123.1_HexB_S. scrofa		WHQGSY	-----	QLCFGTELOQLQVHV	-----	107		



	570	580	590	600	610	620	630
WP_082768773.1 Nah20B_P. hydro	-----DNAGLFYGLMSLYQLLDGNN-----	-----LPVGNITDAPRYE-----	349				
WP_068373836.1 Nah20A_P. hydro	-----TERGMLHGVQTLLQLVNRQRS-----	-----IPAVDIDDKPREA-----	162				
BAD00143.1 Nah20A_A. hydrophil	-----DVDGAFWCAQSLLSLGVDK-----	-----LVSQMSVEDAPRE-----	334				
BAF76001.1 NahB_A. hydrophila	-----GEAGWRHGLVSLAOWALQHGES-----	-----LPLCLTVRDAPREG-----	243				
BAI94822.1 BbhI_B. bifidum	-----SVTGNMYAMQTILQMTKQDANG-----	-----FVIGSMRDYPRET-----	567				
AAQ05800.1 Hex20A_C. fimi	-----SAAGLVRAVVTILRQTVS-----SL-----GDGT-LTVPALRVEDHPRMA-----	-----	136				
BAI63641.1 Hex1t_Paenibacillus	-----KPEGVFRNQITLLQLLPAGIEKNTV-----	-----VSGVQWVPHSNISDKPEYE-----	160				
CAA55582.1 NahA_P. gingivalis	-----SAHGAFYGMQTILLQLPAEVESSE-----	-----V-LLPMTVPVGEIKDEPAFG-----	171				
BAA84281.1 Hex99_P. piscicida	-----SDAQGVFYGIQTLLROMIPTTVYKTAKNSATLSDNAVLPASTILLDAPRE-----	-----	357				
BAB84321.1 Hex86_P. piscicida	-----TATGLFWQMQLSRQLLPAEIESRMP-----	-----INQASWAIPEVEIKDQPRFS-----	164				
AAB03808.1 Chb_S. marcescens	-----DQAGVFGYGLQSILSLVPSDGS-----	-----KIATLDASDAPREP-----	339				
AAS02154.1 GcnA_S. gordonii	-----YFGYFRGRYTVAELOEIEDYAAD-----	-----FDMSFVPCIOTLAHLS-----	172				
AAK98861.1 StrH_S. pneumoniae	EVPKDLNRYTAESVAAVKEEAKAIRSLDSNLSRAQQDTIDQAIKLOETVNNLTLTPEAQKEEAKREVE	-----	627				
CAB87223.1 HexA_S. coelicolor	-----KAAGLFHGVQTLLRQLLPAAVEKDSA-----	-----QPGP-WLVAGGTIEDTPRYA-----	181				
AAC38798.3 SpHex_S. plicatus	-----KAAGLFHGVQTLLRQLLPAVEKDSA-----	-----QPGP-WLVAGGTIEDTPRYA-----	152				
AKC34128.1 Hex1_uncultured Act	-----RPAGLFRGVQTLLRQLLPAVERRTV-----	-----APGP-WTLPTGVLRDAPREA-----	145				
AKC34129.1 Hex2_uncultured Bac	-----DAAGVFICTRTILLQLLPAKLAEG-----	-----SAAIPAVTITDYPREA-----	153				
AAC44672.1 ExoI_V. furnissii	-----SHIGFVHASATLLQLVLRPDGDL-----	-----LVPHIVIKDAPREK-----	261				
AAA88682.1 Chb_V. harveyi	-----DQAGAFYAVQSIFGLVDSQAD-----	-----SLPQLSIKDAPRED-----	333				
AAD30612.1 AtHex1_A. thaliana	-----AHSAGWAMRGLETFSQMIWGTSPD-----	-----LCLPVG-IYIQDSPLIFG-----	172				
AAM91092.1 AtHex3_A. thaliana	-----EAKSVYCALHGLQTFSQLCHFNKKV-----	-----IEILMTPWNIIDQPRFS-----	183				
BAE99290.1 AtHex3_A. thaliana	-----EANTVYGALRGLETFSQLCAFDTITS-----	-----VOIYKAPWYIOGKPRFG-----	186				
AAM13977.1 HexA_A. oryzae	-----AETVWGALHAETTLQQLVVISDGHG-----	-----LIIEEP-VNIKDSPLYP-----	183				
AAT99455.1 BmGlcNAcase3_B. mor	-----SIWGILRGLESWTHLPHLSNDRD-----	-----QLHINK-GEVHDFPRYA-----	183				
AAC60521.1 BmChiGlcNAcase_B. m	-----GNSFFGVNRNGLETLSQLIVYDDIRNN-----	-----LLIVRD-VTIKDRPVYP-----	212				
CCD73477.2 CeHEX-4_C. elegans	-----LEVIPLIQSEGHLEFVLKSKFMG-----	-----LSEDLIDLN-----	155				
AAA34346.2 Hex1_C. albicans	-----AATTWGALHGLVSLQQLIIHTSEDK-----	-----YVVPSS-VTISDFPNK-----	167				
ADU20405.1 βHex_C. annum	-----AGTVWGAMRGLETFSQLVYGNP-----	-----TRVAG-VYISDLPIET-----	167				
ABB18373.1 CpHEX1_C. posadasii	-----AKTTWGLRAETTLQQLVIFKRGR-----	-----FLVEQP-VDIKDPLYP-----	178				
AAA33230.1 NagA_D. discoideum	-----NIYGAMRGLETTFKQLIVYNELE-----	-----NSYIVCVSISDSPRYP-----	156				
AAF46406.1 Hex2_D. melanogaste	-----ATTVYGARHAFETLSNLVTG-SLSNG-----	-----LLMVT-ANITDRPAPS-----	236				
AAF47881.1 Hex1_D. melanogaste	-----ASNFFGARHGLETLAQLIVYDDIRRE-----	-----VQVTAN-ATINDAPVYK-----	215				
AAM29423.1 FdI_D. melanogaster	-----ANSYFGARHGLSTLQQLIWFDDEDHL-----	-----LHTYAN-SKVKDAPKER-----	277				
CAE46968.1 HexA_E. histolytica	-----TVYGARHAFETLLQLIRISSNK-----	-----FVISQLPIKISDAPREK-----	184				
AAB00965.1 HexA_H. sapiens	-----TVWGALRGLETFSQLVWKSAG-----	-----TFFINK-TEIEDFPREP-----	168				
AAA52645.1 HexB_H. sapiens	-----RVWGALRGLETFSQLVYQDSYG-----	-----TFTTINE-STIIDSPPRES-----	201				
AAC53246.1 HexA_M. musculus	-----TVWGALRGLETFSQLVWKSAG-----	-----TFFINK-TKIKDFPREP-----	168				
AAA18776.1 HexB_M. musculus	-----SVWGALRGLETFSQLVYQDSFG-----	-----TFTTINE-SSIADSPREP-----	180				
ABI81756.1 Hex1_O. furnacalis	-----ANSFFGMRHGLTSLQQLFVDDIRDH-----	-----LLMVRD-VNISDKPVYP-----	210				
AEQ33603.1 HexTF_T. flavus	-----ANTTWGALHAETTLQQLVIYQDNS-----	-----LIIEQP-VHIEDSPLYP-----	208				
ACI15900.1 NagA_T. maritima	-----MVFAVPLDLLSEESS-----	-----VIDIRSYG-----	133				
AAK16587.1 CbsA_T. neapolitana	-----MVFAVPLDLLSEKGS-----	-----VVDLRSEF-----	133				
CAA63123.1 HexB_S. scrofa	-----TVWGALRGLETFSQLVYQDSYG-----	-----TFTTINE-SEIIDEFPREP-----	175				

	640	650	660	670	680	690	700		
WP_082768773.1_Nah20B_P. hydro	----	FRGLHVDVARNEH	SKAFTIN	LEQMAAL	KINKLH	EHLEAE	DAWRLEI	-----PGIP	405
WP_068373836.1_Nah20A_P. hydro	----	WRGLLIDSVRHE	MPVDTIK	RQLRGMA	SARKNV	LHWHHL	DDQGWRIAS	-----KAMP	218
BAD00143.1_Nah20A_A. hydrophil	----	YRCMQTDVARH	ERSPETM	KKLVDQ	MSAMKN	NVLHGL	TNDGWRLEI	-----PGIP	390
BAF76001.1_NahB_A. hydrophila	----	FRGIFLDCARH	EHSIATL	KRLKQMS	SLYKEN	RFHWHL	TDDEGWRLEI	-----KTFE	299
BAI94822.1_BbhI_B. bifidum	----	TRGLLLDVARKE	PVSLEMM	REITRTM	RYKKND	FQAHLS	SDNYIFLENY	GKGDNEDEAFKAYDAFRLE	633
AAQ05800.1_Hex20A_C. fimi	----	WRGLSIDVARH	EFTVDDL	KAIIGLL	AHYKIN	NVLHHL	TDQGWVRHL	-----PSRP	192
BAI63641.1_Hex1t_Paenibacillus	----	YRGLMLDVARH	EFTVDEV	KROIDL	ASQYKIN	KFHHLS	DDQGWRIEI	-----KSWP	216
CAA55582.1_NahA_P. gingivalis	----	YRGFMLDVCRH	ELSVEDI	KKHIDIM	AMFKIN	RFHWHL	TDQAWRIEI	-----KKYP	227
BAA84281.1_Hex99_P. piscicida	----	YRCMMLDVS	RNEFSKET	TVFKLL	DMAFYK	INNF	FEINLANDEGWRLEI	-----PGIP	413
BAB84321.1_Hex86_P. piscicida	----	YRCMHLDVS	RHFFDVA	FKRYID	WLAMHK	ENVF	QWHLTDQGWRIAI	-----DAYP	220
AAB03808.1_Chb_S. marcescens	----	YRGIFLDCARH	EHKDAVL	RLLDQMA	HYKIN	KFHHLS	DDQGWRIEI	-----PGIP	395
AAS02154.1_GcnA_S. gordonii	----	AFVKWGIKEV	QELRDVED	ILLIGE	EKVYDL	IEGMFQ	TMAHLHTRKINIG	-----MDEA	230
AAK98861.1_StrH_S. pneumoniae	KLAKN	KVISIDAG	RKYFTLD	QKRV	DKASEL	GYSDV	HLLGNDGLRFL	LLNDMTITANGKTYASDDVKKA	697
CAB87223.1_HexA_S. coelicolor	----	WRSAMLDVS	RHFFSVDE	VKRYID	RVALYK	YNKLH	HLISDDQGWRLAI	-----DSWP	237
AAC38798.3_SpHex_S. plicatus	----	WRSAMLDVS	RHFFGVDE	VKRYID	RVARYK	YNKLH	HLISDDQGWRIAI	-----DSWP	208
AKC34128.1_Hex1_uncultured Act	----	WRCAMLDVARH	FFPVADV	KRYDLL	AYYKEN	NVLHHL	TDQGWRIEI	-----KSWP	201
AKC34129.1_Hex2_uncultured Bac	----	WRCMMLDVG	RHFFPVPD	IKRFID	WMAFHK	INSE	FHWHLTDQGWRIEI	-----KKYP	209
AAC44672.1_ExoI_V. furnissii	----	YRCMMLDCA	RHFFPLERV	KRLINQ	LAHYKIN	TFHWHL	TDDEGWRLEI	-----KSLP	317
AAA88682.1_Chb_V. harveyi	----	YRCVMVDVARH	EHSKDAIL	ATLDQMA	AYKIN	KLHHL	TDDEGWRLEI	-----PGIP	389
AAD30612.1_AtHex1_A. thaliana	----	HRGVLLDTS	RNYYGVD	DMRTIK	AMSANK	INVE	FHHITDSQSFPLVL	-----PSEP	228
AAM91092.1_AtHex3_A. thaliana	----	YRGLLIDTS	RHYLP	LPVIK	NVIDSM	TYAKIN	NVLHHIVDTQSEPLEI	-----PSYP	239
BAE99290.1_AtHex3_A. thaliana	----	YRGLLIDTS	RHYLP	IDVIK	QIESM	SFAKIN	NVLHHIVDEQSEPLET	-----PTYE	242
AAM13977.1_HexA_A. oryzae	----	YRGIMLDTG	RNEVSLPK	IFEQLE	GMSLSK	INVLH	WHIDDAQSWPIWV	-----DVYP	239
AAT99455.1_BmGlcNAcase3_B. mor	----	HRCLLVDTS	RHYISMS	NILLID	DAMAMN	KINVE	FHHIVDDQSEFPYQS	-----ERFP	239
AAC60521.1_BmChiGlcNAcase_B. m	----	YRGILLDTA	RNEYSID	SIKRTD	AMAAYK	INVE	FHHITDSQSEPLVL	-----QKRN	268
CCD73477.2_CeHEX-4_C. elegans	----	TICISDSK	---	SIDIVK	QMIQ	IRRLHP	NSTRIHIGADEAYHVAED	-----QRCI	207
AAA34346.2_Hex1_C. albicans	----	HRGLMIDSG	RNELTVDS	ILEQID	IMALSK	NSLH	WHLADSQSWPVAL	-----ESYP	223
ADU20405.1_βHex_C. annum	----	HRGVMLDTS	RNYYGVD	LLRLIK	AMSMNK	INVE	FHHITDSHSEPLVV	-----PSEP	223
ABB18373.1_CpHEX1_C. posadasii	----	VRCIMIDTA	RNEISVKK	IFEQD	GMA	LSKIN	NVLHHITDQSWPEVEV	-----RSYP	234
AAA33230.1_NagA_D. discoideum	----	WRGFMVDS	SARHYIP	KNMILH	MDSLG	FSKENT	LHWHMVDAVAFPVES	-----TTYP	212
AAF46406.1_Hex2_D. melanogaste	----	HRGVLLDTA	RNEVPLKF	FIRSTD	AMAASK	INVLH	WHVVDTHSEPLEI	-----TRVP	292
AAF47881.1_Hex1_D. melanogaste	----	WRGLLLDTS	RNYYSVKS	IKRTLE	GMA	LVKIN	TEHWHITDSHSEPLEV	-----KKRP	271
AAM29423.1_Fdl_D. melanogaster	----	YRGLMLDTS	RHFFSVES	IKRTIV	GMGLAK	INRF	HWHLTDQSEFPYIS	-----RYYP	333
CAE46968.1_HexA_E. histolytica	----	WRGLMVDPS	RNPLSPL	MFKRIID	TLASV	KANVL	HLSDAQTFVFES	-----KKYP	240
AAB00965.1_HexA_H. sapiens	----	HRGLLLDTS	RHYLP	LSSTILD	TDMAYN	KINVE	FHHVDDPSEFPYES	-----FTFE	224
AAA52645.1_HexB_H. sapiens	----	HRGILIDTS	RHYLP	VKIILK	TIDAMA	FNKEN	NVLHHIVDDQSEFPYQS	-----ITFE	257
AAE53246.1_HexA_M. musculus	----	HRGVLLDTS	RHYLP	LSSTILD	TDMAYN	KINVE	FHHVDDQSEFPYES	-----FTFE	224
AAA18776.1_HexB_M. musculus	----	HRGILIDTS	RHYLP	VKTIILK	TIDAMA	FNKEN	NVLHHIVDDQSEFPYQS	-----ITFE	236
ABI81756.1_Hex1_O. furnacalis	----	YRGILLDTA	RNYYSIES	IKRTIE	AMAAYK	INVE	FHHITDSQSEFPVT	-----TKRN	266
AEQ33603.1_HexTF_T. flavus	----	WRCVMIDT	GRNEFIT	VPKIKE	QIDGMA	LSKIN	LHWHLDDQSWPVHM	-----DTYP	264
ACI15900.1_NagA_T. maritima	----	SDPKIVA	EHGARACE	GYLEGG	VIPCIK	HPG	HGKAREDSHLLTPEVVD	-----APFE	189
AAK16587.1_CbsA_T. neapolitana	----	SDPEVVA	SHGMEAC	MGYFKG	VIPCIK	HPG	HGKTADDSHYLLPTVN	-----ASFE	189
CAA63123.1_HexB_S. scrofa	----	HRGILIDT	GRHLSVKT	IFKTI	DAMA	FNKEN	NVLHHIVDDQSEFPYQS	-----INFG	231

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	710	720	730	740	750	760	770
WP_082768773.1 Nah20B_P. hydro	GGFRCFDPLEQTCLMPQLGSGPERK					TKVNGYLTTQD	441
WP_068373836.1 Nah20A_P. hydro	ASDG					LFYTOQQ	229
BAD00143.1 Nah20A_A. hydrophil	CSQRCHDESETKCLMPQLGSGPTSD					NQSGGFYSKAD	426
BAF76001.1 NahB_A. hydrophila	CAWRGHG---	LAVGPQLSGGP				DPYGGYYTQSE	328
BAI94822.1 BbbH_B. bifidum	SSLTNDKGES					PTAEDYSISKKT	655
AAQ05800.1 Hex20A_C. fimi	SAGT-----	SVGGG				PGGFYNPAQ	210
BAI63641.1 Hex1t_Paenibacillus	CSKG-----	QVGGG				PGGYTTQEQ	234
CAA55582.1 NahA_P. gingivalis	CSTR-----	TEGDGTQ				YSGFYTTQEQ	247
BAA84281.1 Hex99_P. piscicida	CAKRGYDLSESTMLHTFMGAANGFAPGDGIENKPTDETAANLGTAPSYQGFEIAQQNFLGKGWGYTVD						483
BAB84321.1 Hex86_P. piscicida	CATRPHTVVGHTYDYQPLFDNKT					VSGFYTKAQ	252
AAB03808.1 Chb_S. marcescens	GGQRCHDLSETTCLLPQYGGQP--D					VYG-GFFSRQD	428
AAS02154.1 GcnA_S. gordonii	GRYLIKHG					FQNRSLLMCOH	249
AAK98861.1 StrH_S. pneumoniae	IEGTKAYYD					DPNGTALTOAE	718
CAB87223.1 HexA_S. coelicolor	GGST-----	EVGGG				PGGHYTKAD	255
AAC38798.3 SpHex_S. plicatus	GGST-----	EVGGG				PGGYTKAE	226
AKC34128.1 Hex1_uncultured Act	GGST-----	AVDGA				PGGYTTQEQ	219
AKC34129.1 Hex2_uncultured Bac	CAFRESSPP---	YGNRNSDDGVR				YGGFYTTQEQ	238
AAC44672.1 ExoI_V. furnissii	CAWRGVD---	EVLEPQYSLLT				EKHGGFYTQEE	346
AAA88682.1 Chb_V. harveyi	CANRCFDTQEKSCLLPQLGSGPTTD					NFGSGYFSKAD	425
AAD30612.1 AtHex1_A. thaliana	CSLG-----					PDMVYTPED	241
AAM91092.1 AtHex3_A. thaliana	AYSS-----					SQRYTFED	251
BAE99290.1 AtHex3_A. thaliana	AYS-----					WERYTFED	254
AAM13977.1 HexA_A. oryzae	-AYS-----					PHEIYSRND	251
AAT99455.1 BmGlcNAcase3_B. mor	CAYH-----					ETLIYTKEN	252
AAC60521.1 BmChiGlcNAcase_B. m	CAYS-----					PTKVYTKQD	281
CCD73477.2 CeHEX-4_C. elegans	ESIG-----					KSDLKLEH	219
AAA34346.2 Hex1_C. albicans	-AYS-----					NDEVYSKND	235
ADU20405.1 βHex_C. annuum	CAYG-----					NEMMYSPAD	236
ABB18373.1 CpHEX1_C. posadasii	-AYS-----					RREYGPDS	246
AAA33230.1 NagA_D. discoideum	-AFS-----					PSATFSHDD	224
AAF46406.1 Hex2_D. melanogaste	CAYS-----					SSQTYSRQD	305
AAF47881.1 Hex1_D. melanogaste	CAYS-----					QRQVYTRRD	284
AAM29423.1 Fdl_D. melanogaster	CAYS-----					ESETYSED	346
CAE46968.1 HexA_E. histolytica	CMYD-----					ESFVLTSQF	253
AAB00965.1 HexA_H. sapiens	GSYNP-----					VTHIYTAQD	238
AAA52645.1 HexB_H. sapiens	GSYS-----					LSHVYTPND	270
AAC53246.1 HexA_M. musculus	GSFNP-----					VTHIYTAQD	238
AAA18776.1 HexB_M. musculus	GSYS-----					LSHVYTPND	249
ABI81756.1 Hex1_O. furnacalis	CALS-----					PQKVYTKAA	279
AEQ33603.1 HexTF_T. flavus	-AYS-----					PWQTYSHED	276
ACI15900.1 NagA_T. maritima	DLLP-----					FRKVLEREKK	203
AAK16587.1 CbsA_T. neapolitana	DLLP-----					FRRIQSRVK	203
CAA63123.1 HexB_S. scrofa	GSYS-----					LSHVYTPND	244

	780	790	800	810	820	830	840	
WP_082768773.1_Nah20B_P. hydro	YIDILREDAHFF	TEVIPSIDMPGHSRAAIKSMEARYKRLVSEEK	-----				TPEAE	490
WP_068373836.1_Nah20A_P. hydro	IREVVQYAALLG	IRVVPEFDVPGHASAIAVAYPELITQP	-----					268
BAD00143.1_Nah20A_A. hydrophil	YIDLVRyakARG	VTVIPEINMPAHARAAVVSMEARYKRLMSEK	-----				ETEAN	475
BAF76001.1_NahB_A. hydrophila	VRELVAAGLG	TTIPEIDIPGHCHAAIKALPE	-----					362
BAI94822.1_BbhI_B. bifidum	FKQFTQDERALG	MNVVPEIDVPAHANSFTKIWPELMVKGRVSPINSNRPLIDHLDVSKPETIAKIKEI	-----					723
AAQ05800.1_Hex20A_C. fimi	LAETVVARAARG	IRVVPEIDVPGHVNAATHAYGDLT	-----					246
BAI63641.1_Hex1t_Paenibacillus	FKDIVSYAAERY	TEVPEIDMPGHTNAALASYGELN	-----					270
CAA55582.1_NahA_P. gingivalis	VRDIVQYASDHF	ITVPMIEMPGHAMAALAAYPQFR	-----					283
BAA84281.1_Hex99_P. piscicida	FKEILQYAADRH	IDVIIIEYDFPAHARAIAKAMEHRYNKYKDS	-----				DPVEA	530
BAB84321.1_Hex86_P. piscicida	IKEIIEYAQARH	TEVPEIDIPGHSSAMLAAYPELS	-----					288
AAB03808.1_Chb_S. marcescens	YIDIIEKYAARQ	TEVPEIDMPAHARAAVVSMEARYKKLHAAGK	-----				EQEAN	477
AAS02154.1_GcnA_S. gordonii	LERVLDIADKYG	FNCQMWSDMFFKLMSADGQYDRDVEIP	-----					288
AAK98861.1_StrH_S. pneumoniae	VTELIEYAKSKD	IGLIPAINSPGHMDAMLVAMEKLGKIKN	-----					757
CAB87223.1_HexA_S. coelicolor	YEEIVRYAASRH	LEVVPIDMPGHTNAALASYAELN	-----					291
AAC38798.3_SpHex_S. plicatus	YKEIVRYAASRH	LEVVPIDMPGHTNAALASYAELN	-----					262
AKC34128.1_Hex1_uncultured Act	YADLARYAAERY	ITIVPEIDMPSETNAALASYALLN	-----					255
AKC34129.1_Hex2_uncultured Bac	LKDVVAYAAARH	ITVVPEIEMPGHAAAAIAAYPELG	-----					274
AAC44672.1_ExoI_V. furnissii	IREVIAVAAERG	ITVPEIDIPGHSRAAIKALPE	-----					380
AAA88682.1_Chb_V. harveyi	YVEILKYAKARN	TEVPEIDMPAHARAAVVSMEARYDRLMEEGK	-----				EAEAN	474
AAD30612.1_AtHex1_A. thaliana	VSKIVQYGFHGG	VRVLPEIDTPGHTGS-WGEAYPEIVTC	-----					279
AAM91092.1_AtHex3_A. thaliana	AAEIVNYARRRG	TEVLAIEIDVPGHALSWGKGYPALWPS	-----					289
BAE99290.1_AtHex3_A. thaliana	ASEIVREAKMRG	INVMAEVDVPGHAESWGTGYDPLWPS	-----					292
AAM13977.1_HexA_A. oryzae	VRNIVNYARARG	IRVPEIDMPSESSSGWKQVDPPEMVTG	-----					290
AAT99455.1_BmGlcNAcase3_B. mor	IQTVIDHARNRG	IRVPEFDVPGHTRSWSGVAKPDLTHC	-----					291
AAC60521.1_BmChiGlcNAcase_B. m	IREVVEYGLERG	VRVLPEFDAPAEVGEQWQDTG	-----					314
CCD73477.2_CeHEX-4_C. elegans	IAKIGKEARENAGFETVFAWDMFDKESEETIRKSKIN	-----					257	
AAA34346.2_Hex1_C. albicans	LKYIVDYARARG	VRVLPEIDMPGHARAGWKQVDPTIVEC	-----					274
ADU20405.1_βHex_C. annum	VEKIVEFGMEHG	VRVLPEIDMPAHTGS-WAEAYPEIITC	-----					274
ABB18373.1_CpHEX1_C. posadasii	IRKVIEYARARG	IRVVPEIDMPGHSASGWRKIDPDIVAC	-----					285
AAA33230.1_NagA_D. discoideum	IQEVVAYAKTYG	IRVPEEDIPGHAAAWGIGYPPELVATC	-----					263
AAF46406.1_Hex2_D. melanogaste	ALNLVKYARLRG	IRILLIEIDGPPSHAGNGWQWGAAGLGN	-----					344
AAF47881.1_Hex1_D. melanogaste	VAEVVEYGRVRG	IRVMPEFDAPAEVGEQWQHKH	-----					317
AAM29423.1_Fdl_D. melanogaster	VREVAEEFAKIYG	VQVPEIDAPAEHAGNGWDWGPGRGMGE	-----					385
CAE46968.1_HexA_E. histolytica	LRELAQYGANRG	VIVYGEIDTPAHTASWNLGYPGVVANC	-----					292
AAB00965.1_HexA_H. sapiens	VKEVIEYARLRG	IRVLAEFDTPGHTLSWGPPIGLLTTPC	-----					277
AAA52645.1_HexB_H. sapiens	VRMVIEYARLRG	IRVLPEDFTPGHTLSWKGQKDLLTPC	-----					309
AAC53246.1_HexA_M. musculus	VKEVIEYARLRG	IRVLAEFDTPGHTLSWGPAPGLLTTPC	-----					277
AAA18776.1_HexB_M. musculus	VRMVLEYARLRG	IRVPEFDTPGHTQSWGKGQKNLLTPC	-----					288
ABI81756.1_Hex1_O. furnacalis	IREVVREGLERG	VRVLPEFDAPAEVGEQWQDTG	-----					312
AEQ33603.1_HexTF_T. flavus	IKDIEYARARA	VRVVPEVDMPGHSAAAGWQVDPSPVAC	-----					315
ACI15900.1_NagA_T. maritima	VTVMTHAVRYSS	TDSLPATLSEKIITDVLREKIG	-----					237
AAK16587.1_CbsA_T. neapolitana	TAVMTAHVKYPA	VDDLPAATLSKKLITEVLREKLN	-----					237
CAA63123.1_HexB_S. scrofa	VRMVIEYARIRG	IRVMPEFDTPGHSRSWSGKGQKDLLTPC	-----					283

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	850	860	870	880	890	900	910	
WP_082768773.1_Nah20B_P. hydro	QYLLTEFADKSQYRSIQHYDDN-TTNPCLDSTVYHFDVKVLS	ELIKMHNKAGVA-LKRYHIGADETAGAWQ	558					
WP_068373836.1_Nah20A_P. hydro	-----GPYTMQRHWGVFEPIIDENPQVYQETETIISELAELEP-----	DVYVHIGGDEIEPTQW	323					
BAD00143.1_Nah20A_A. hydrophil	QFRLTDPADTSNVTSVQFYDKMSFNPCQPGAATSVAKVMDEVAQMHAAGQP-LTAWHYGGDEAKNIMQ	544						
BAF76001.1_NahB_A. hydrophila	--LLVEEADRSRYLSVQYFDDN-VNPPALPGTYRFLDAVMDEVCDLEPGS-----	QVHMGGDEV-----	419					
BAI94822.1_BbhI_B. bifidum	FDDYTKGDDPTFDSDTTVHIGADEFLYNTAYRKGTINEIVPYIKDNTNVRMWGGLTWINDHKTEITKDAI	793						
AAQ05800.1_Hex20A_C. fimi	---PSGE---PTDVYTGIEVGFSRTHDDLPATRPRLRDVFTDLAAMPGE-----	YVHIGGDEV-----	299					
BAI63641.1_Hex1t_Paenibacillus	---PDGK---RKAMRTDAGYSTIMPERAEITYQFVEDVISELAATSPSP-----	YIHLGGDES-----	323					
CAA55582.1_NahA_P. gingivalis	---CFPR-EFKPRII---WGVEQDVYCAGKDSVFRITSDVIDEVAPLEPGT-----	YEHIGGDECPKDRW	341					
BAA84281.1_Hex99_P. piscicida	NRFLRIDPLDQSQYYTPQFYTDNFVNEALESTFTFLNHVVRETRAIDAVPDATLTRLHGGGDELPHLGP	600						
BAB84321.1_Hex86_P. piscicida	---CHQR---AVKVQPQGFIFEDVLCF-REDVFAFLGVVYKEVAELEPSQ-----	YIHIGGDEVIKKQW	345					
AAB03808.1_Chb_S. marcescens	EFRLVDPTDTSNTTSVQFFNRSYFNPCLDSSQRFVDKVGIEAQMHEAGQP-IKTWHFGGDEAKNIRL	546						
AAS02154.1_GcnA_S. gordonii	-----EETRVYDRLRKERVTLVWYDYYQDSEEKYNRN---FQNHKISQDIAFAGG-	336						
AAK98861.1_StrH_S. pneumoniae	-----PQAHFDKVSKT'TMDLKNEEAMNSVKALIGKYMDFEAG---KTKIFNFGTDEYANDAT	811						
CAB87223.1_HexA_S. coelicolor	---CDGV---APPLYTGTKVGFSTLCVDKDVTYDFVDDVLGELAAALTPGR-----	YLHIGGDEA-----	344					
AAC38798.3_SpHex_S. plicatus	---CDGV---APPLYTGTKVGFSTLCVDKDVTYDFVDDVIGELAAALTPGR-----	YLHIGGDEA-----	315					
AKC34128.1_Hex1_uncultured Act	---CEGE---APALYTGTAVGFSTLCMGKETTFRMDVVLGELAAALTPGP-----	YLHIGGDEA-----	308					
AKC34129.1_Hex2_uncultured Bac	---NTDIPGYSKVMTRWGVHPYIFSP-KEETFTFLEDVLSVCDLEPSK-----	YIHIGGDEAPKDQW	334					
AAC44672.1_ExoI_V. furnissii	--WLFDEDDQSQYRSIQYYNDN-VTSEALPGTYRFLDCVLEEVAALPSH-----	FIHIGADEVP----	437					
AAA88682.1_Chb_V. harveyi	EYRLMDPQDTSNVTTVQFYFNKQSFNPCMESSTRFVDKVISSEVAAHQEAGAP-LTTWHFGGDEAKNIKL	543						
AAD30612.1_AtHex1_A. thaliana	ANMFWWPAGKSWEERLASEPGTGQNLNLSPKTYEVVKNVIQDIVNCEP-----	ESFFHGGGDEVIPGCW	343					
AAM91092.1_AtHex3_A. thaliana	-----KNCQEPDVSSTFTEKVIDGILSDFSKIEK-----FKFVHLGGDEVNTTCW	335						
BAE99290.1_AtHex3_A. thaliana	-----LSCREPLDVTKNFTFEDVISGILADMRLKIEP-----FELFHLGGDEVNTDCW	338						
AAM13977.1_HexA_A. oryzae	TDSWWSNDDWP--LHTAVEPNPGQDIIYNKTYEVVGNVYKELSDIEP-----	DHWEHVGGDEIQPNCF	352					
AAT99455.1_BmGlcNAcase3_B. mor	YDQDGDY-----VGLGPMNEIKDSTYTLQELFHEVQALEP-----ERYIHHIGGDEVLDLCW	343						
AAC60521.1_BmChiGlcNAcase_B. m	LTVCFKAEPPWT---KFCVEPPCGQINPTKEELYDLEDIYVEMAEAES-----TDMFHMGGDEVSERCW	376						
CCD73477.2_CeHEX-4_C. elegans	-----KFIVPVVWGYRTDVTENGYPDGLFERIFNVEDR-----FYVASAFKGADGAR	305						
AAA34346.2_Hex1_C. albicans	ADAFWTD-----AAVEPPPGQDNISEKTYEVISNVYNELSDIEI-----DDVFHVGNDELQEKCY	330						
ADU20405.1_βHex_C. annum	ANMFWWPAGNS--PALAAEPGTGQNLNLPKTYEVVKNVIHDTIAMEP-----DSLEHGGADEINSACW	336						
ABB18373.1_CpHEX1_C. posadasii	ADSWWSNDDWE--KHTAVQPNPQGDIIANNKTYKVVEKVYNDISRIET-----DDWEHVGGDELQPNCF	347						
AAA33230.1_NagA_D. discoideum	PDYAAVNN-----IPDDISNPATFTETIQNLFTETIAPLEI-----DNYFHTGGDELVTGCW	314						
AAF46406.1_Hex2_D. melanogaste	MSVCLNQSPWR---RFCVQPPCGQNLNLDHMYAVLKEIFEDVAEVGAP-----EETLHMGGDEVFLPCW	406						
AAF47881.1_Hex1_D. melanogaste	MTACFNAQPPWK---SFCVEPPCGQDDETVMEMYDVLEDIYGTMFQEN-----PDIFHMGGDEVSTSCW	378						
AAM29423.1_Fdl_D. melanogaster	LAMCINQPPWS---FYCGEPPCGQNLNKNYTYLILQRIYEELLQHTGP-----TDFHHLGGDEVNLDWCW	447						
CAE46968.1_HexA_E. histolytica	WDYIVSTSMRY-----GENVLSNPANPNTFPIIDALMKELSDTEG-----TDYVHVGGDEVWTSW	349						
AAB00965.1_HexA_H. sapiens	YSGSEPS-----GTFGPVNPSLNNTYEFMSTFFLEVSSVEP-----DFYLHLGGDEVDFTCW	329						
AAA52645.1_HexB_H. sapiens	YSRQNKI-----DSFGPINPTLNTYISLTTFFKEISEVEP-----DQFIHLGGDEVFEFKCW	361						
AA53246.1_HexA_M. musculus	YSGSHLS-----GTFGPVNPSLNNTYEFMSTLFLFLEISSVEP-----DFYLHLGGDEVDFTCW	329						
AAA18776.1_HexB_M. musculus	YNQKTKT-----QVFGPVDETVNTTYAFENTFFKEISSVEP-----DQFIHLGGDEVFEFCW	340						
ABI81756.1_Hex1_O. furnacalis	LTVCFKAEPPWK---SYCVEPPCGQNLNPKDELYQYLEDIYSDMAEVEDT-----TDIFHMGGDEVSEACW	374						
AEQ33603.1_HexTF_T. flavus	AHSWWSNDNWP--YHTAVEPTPGQDDELNNKTYGVVEKVYNELSGIET-----DDFFHVGGDELQTCY	377						
ACI15900.1_NagA_T. maritima	-----FDGTVISDAMEMSAVSNFVSVEEIVSL-----FLNAGGNMILLGDY	278						
AAK16587.1_CbsA_T. neapolitana	-----FKGVLSDAMEMKAISENFSVEEAVRF-----FIEAGGNMILLDNF	278						
CAA63123.1_HexB_S. scrofa	YRKQVLS-----GTFGPINPTLNTTYNLSKFFKEISTVEP-----DEFIHIGGDEVDFDCW	335						

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	990	1000	1010	1020	1030	1040	1050	
WP_082768773.1_Nah20B_P. hydro	E-----	AAAWDDGLSHAKAD--Q-----			LPQVQANITGGLPSNG-----			629
WP_068373836.1_Nah20A_P. hydro	Q-----	MMGWDEVFATDLPKDIVV-----		QSWRGLDSLQHIASSDYQVLLSTGGYVDQPO				411
BAD00143.1_Nah20A_A. hydrophil	ST-----	LQAWEDGLKYATDASVF-----		ATDKTRVNFWEETLYWGG-----				649
BAF76001.1_NahB_A. hydrophila	Q-----	MLGWEEILHG-----		DKVSREATVFAWTS-----				486
BAI94822.1_BbhI_B. bifidum	YQAVPSGDDQMLGAFAIWSDNIDKSASGLTESDLYWRFFDAMPFYAEKTWAATGKEKGTAAKLTALAAK							933
AAQ05800.1_Hex20A_C. fimi	K-----	VVGWQ-EISSTP-----		LEPGTVVQYWDINADPAP-----				353
BAI63641.1_Hex1t_Paenibacillus	K-----	VVGWDPSTSSG-----		ATSDSVLQNWTCASSTG-----				377
CAA55582.1_NahA_P. gingivalis	R-----	LIGWD-EILEGG-----		LAPSATVMWSRGEDGG-----				407
BAA84281.1_Hex99_P. piscicida	D-----	MATWGDVLSHNGTGNVSY-----		GEIYPVFWNNVWGWGNEH-----				678
BAB84321.1_Hex86_P. piscicida	T-----	VIGWD-EILEGG-----		VADDAVIMSWRGTEGG-----				411
AAB03808.1_Chb_S. marcescens	DR-----	MQAWDGLKDAESSKAF-----		ATSRVGVNFWDITLYWGG-----				646
AAS02154.1_GcnA_S. gordonii	K-----	EVIVTGWGDNGGETSQFSVLP-----		ALQIWAELAYRN-----				400
AAK98861.1_StrH_S. pneumoniae	QP-----	MAFNDGFFYEDKDDVQFD-----		KDVLISYWSKGWGWYN-----				880
CAB87223.1_HexA_S. coelicolor	T-----	VVGWH-QLAGAE-----		PVEGALVQYWGDLRTSDAE-----				399
AAC38798.3_SpHex_S. plicatus	T-----	VVGWH-QLAGAE-----		PVEGALVQYWGDLRTGDAE-----				370
AKC34128.1_Hex1_uncultured Act	T-----	VVGWG-EIAQAP-----		LTPGTMVQHWRODLT-----				359
AKC34129.1_Hex2_uncultured Bac	N-----	LIGWD-EIQEGG-----		LPKTATMMVTRDAKWA-----				400
AAC44672.1_ExoI_V. furnissii	R-----	MVGWEEAQHG-----		DKVSKDTVIYSWLS-----				504
AAA88682.1_Chb_V. harveyi	PN-----	FQAWQDGLKYSDEKAF-----		ATENTRVNFWDVLYWGG-----				645
AAD30612.1_AtHex1_A. thaliana		TVVYWEDVLLDAQIKADPS-----		VLPKEHTILOTNNGPEN-----				416
AAM91092.1_AtHex3_A. thaliana	I-----	INWEETFINFGSKLNR-----		KTVVHNWLNLTG-----				401
BAE99290.1_AtHex3_A. thaliana	P-----	VNWEETFSFGKDLDP-----		RTVIQNWLVSD-----				404
AAM13977.1_HexA_A. oryzae	E-----	RRIVMWEDIALS-ADNAH-----		DVP-KNIVMQSWNNGLEY-----				425
AAT99455.1_BmGlcNAcase3_B. mor	R-----	PIVWQEVFDEGVPLPK-----		DTIVQVWKENE-----				408
AAC60521.1_BmChiGlcNAcase_B. m	K-AFGKR-----	LPLILWTSTLTDTYTHVEKFL-----		DKD-EYIIQVWTTGADP-----				456
CCD73477.2_CeHEX-4_C. elegans	KVDG-----	IFVTGWSRFNHFN-----						351
AAA34346.2_Hex1_C. albicans		RKLTWDDVLLS-DVSAD-----		KIP-SNITLQVWH-EISG-----				393
ADU20405.1_βHex_C. annum		TVVYWEDVILSANVKVDPS-----		LLSPQHVMQTNNGPSN-----				409
ABB18373.1_CpHEX1_C. posadasii	N-----	RRLLMWEDVLLSGNMHAH-----		RVP-RDIIMQSWNNGGLAN-----				420
AAA33230.1_NagA_D. discoideum	TK-----	ITWNDPIDYGVQLNPE-----		TLVQVWSSGS-----				379
AAF46406.1_Hex2_D. melanogaste	EINERMPGIKEPKSVIIWSSHLTNPRYIETYL-----		PKE--RFIIQTWVESQDA-----					493
AAF47881.1_Hex1_D. melanogaste	KVANGTH-----	TPIILWTSGLTEEPFIDEYL-----		NPE--RYIIQIWTGVDP-----				459
AAM29423.1_Fdl_D. melanogaster	LANNGVAP-----	KHVAVWSSALTN---TKRL-----		PNS--QFTVQVWGGSTWQ-----				512
CAE46968.1_HexA_E. histolytica	HP-----	VVWEEVFKKG-NADKN-----		TIIQVWDDIR-----				417
AAB00965.1_HexA_H. sapiens	KG-----	YVWQEVFNDKNVKIQP-----		DTIIQVWREDIPVN-Y-----				400
AAA52645.1_HexB_H. sapiens	KG-----	SIVWQEVFDDKAKLAP-----		GTIVEVWKDSA---Y-----				429
AAC53246.1_HexA_M. musculus	KG-----	YVWQEVFNDKNVKVRP-----		DTIIQVWREEMPVE-Y-----				399
AAA18776.1_HexB_M. musculus	KN-----	SIVWQEVFDDKVELQP-----		GTVVEVWKSEH-----Y-----				408
ABI81756.1_Hex1_O. furnacalis	K-AFGKK-----	LPLILWTSTLTNYKHIDDYL-----		NKD--DYIIQVWTTGVDP-----				454
AEQ33603.1_HexTF_T. flavus		RKLVIWEDLIIN-NPHAP-----		NVSTENLLVQSWNNGLTN-----				450
ACI15900.1_NagA_T. maritima	S-----	IRTVEKYLAFAKKNSGVG-----		FLADVSMKAVEFLG-----				337
AAK16587.1_CbsA_T. neapolitana	S-----	IKIVDEYLSALENRFNSG-----		LIAEVAERAIECTR-----				337
CAA63123.1_HexB_S. scrofa	KR-----	PIVWQEAFFDRDKFMP-----		GTVVQVWKIED---Y-----				403

	1060	1070	1080	1090	1100	1110	1120
	..... ..... ..... ..... ..... ..... ..... .....						
WP_082768773.1_Nah20B_P. hydro	-----						629
WP_068373836.1_Nah20A_P. hydro	EAAYHYRNDPFTSFQPSFKTQDIKW-----						438
BAD00143.1_Nah20A_A. hydrophil	-----						649
BAF76001.1_NahB_A. hydrophila	-----						486
BAI94822.1_BbhI_B. bifidum	QGTGPRTPNPYYQATSKNSVYESYDFNDGLADASGNRDLTIGDGSKAAVKDQSLKLAGSSYATSKLDKL						1003
AAQ05800.1_Hex20A_C. fimi	-----						353
BAI63641.1_Hex1t_Paenibacillus	-----						377
CAA55582.1_NahA_P. gingivalis	-----						407
BAA84281.1_Hex99_P. piscicida	-----						678
BAB84321.1_Hex86_P. piscicida	-----						411
AAB03808.1_Chb_S. marcescens	-----						646
AAS02154.1_GcnA_S. gordonii	-----						400
AAK98861.1_StrH_S. pneumoniae	-----						880
CAB87223.1_HexA_S. coelicolor	-----						399
AAC38798.3_SpHex_S. plicatus	-----						370
AKC34128.1_Hex1_uncultured Act	-----						359
AKC34129.1_Hex2_uncultured Bac	-----						400
AAC44672.1_ExoI_V. furnissii	-----						504
AAA88682.1_Chb_V. harveyi	-----						645
AAD30612.1_AtHex1_A. thaliana	-----						416
AAM91092.1_AtHex3_A. thaliana	-----						401
BAE99290.1_AtHex3_A. thaliana	-----						404
AAM13977.1_HexA_A. oryzae	-----						425
AAT99455.1_BmGlcNAcase3_B. mor	-----						408
AAC60521.1_BmChiGlcNAcase_B. m	-----						456
CCD73477.2_CeHEX-4_C. elegans	-----						351
AAA34346.2_Hex1_C. albicans	-----						393
ADU20405.1_βHex_C. annuum	-----						409
ABB18373.1_CpHEX1_C. posadasii	-----						420
AAA33230.1_NagA_D. discoideum	-----						379
AAF46406.1_Hex2_D. melanogaste	-----						493
AAF47881.1_Hex1_D. melanogaste	-----						459
AAM29423.1_Fdl_D. melanogaster	-----						512
CAE46968.1_HexA_E. histolytica	-----						417
AAB00965.1_HexA_H. sapiens	-----						400
AAA52645.1_HexB_H. sapiens	-----						429
AAC53246.1_HexA_M. musculus	-----						399
AAA18776.1_HexB_M. musculus	-----						408
ABI81756.1_Hex1_O. furnacalis	-----						454
AEQ33603.1_HexTF_T. flavus	-----						450
ACI15900.1_NagA_T. maritima	-----						337
AAK16587.1_CbsA_T. neapolitana	-----						337
CAA63123.1_HexB_S. scrofa	-----						403

	1130	1140	1150	1160	1170	1180	1190
WP_082768773.1 Nah20B_P. hydro	..... ..... ..... ..... ..... ..... ..... .....						
WP_068373836.1 Nah20A_P. hydro	-----FDR	AHDFVN	RGWD	TVLS	SFPD	VLMF	DFPYQAD
BAD00143.1 Nah20A_A. hydrophil	-----QHW	QFTMP	RLKGS	SAVS	GEFV	LLSSE	AGKQVLLRFN
BAF76001.1 NahB_A. hydrophila	-----FNE	AMKWA	HKG	YDV	VL	SNPD	LYLMFDFPNEVH
BAI94822.1 BbhI_B. bifidum	-----FQ	AGLDAA	ASG	YPV	VM	APQH	YMLDLAWSQD
AAQ05800.1 Hex20A_C. fimi	-----FV	AAQA	CAH	VLM	SPGS	RAYL	DMKYDA
BAI63641.1 Hex1t_Paenibacillus	-----TA	AKAG	MKV	IV	SPAN	AYL	DMKYYS
CAA55582.1 NahA_P. gingivalis	-----IA	ANM	NHD	V	MT	PGS	GGLYLDHYQG
BAA84281.1 Hex99_P. piscicida	-----Q	AYK	FAN	Q	CHK	V	LAHATNL
BAB84321.1 Hex86_P. piscicida	-----I	QAKM	G	HO	V	IS	PIYQYIFDAYQS
AAB03808.1 Chb_S. marcescens	-----F	D	SVND	WANK	G	YEV	VVSNPDYVLMDFPYEVN
AAS02154.1 GcnA_S. gordonii	-----D	LKKV	SEH	FL	V	STGL	DFDDEMKIDLANLLP
AAK98861.1 StrH_S. pneumoniae	-----L	ASPQ	YL	ASK	G	YK	FLNTNGDWYVIGNHKQDEAYPLSKAVE
CAB87223.1 HexA_S. coelicolor	-----K	AQV	AAAA	ARN	G	TGL	ILSPADRTYLD
AAC38798.3 SpHex_S. plicatus	-----K	A	EVAE	AA	R	N	G
AKC34128.1 Hex1_uncultured Act	-----P	QAA	S	CH	K	V	ILSPAGKTYLD
AKC34129.1 Hex2_uncultured Bac	-----K	H	ALS	L	G	N	N
AAC44672.1 ExoI_V. furnissii	-----E	Q	A	L	N	C	A
AAA88682.1 Chb_V. harveyi	-----T	S	S	V	Y	E	W
AAD30612.1 AtHex1_A. thaliana	-----T	K	R				
AAM91092.1 AtHex3_A. thaliana	-----L	V	E	N	V	T	A
BAE99290.1 AtHex3_A. thaliana	-----I	C	Q	A	V	A	K
AAM13977.1 HexA_A. oryzae	-----I	S	N				
AAT99455.1 BmGlcNAcase3_B. mor	-----A	P	E	M	L	N	I
AAC60521.1 BmChiGlcNAcase_B. m	-----Q	I	Q	G	L	L	Q
CCD73477.2 CeHEX-4_C. elegans	-----A	L	C	E	L	L	P
AAA34346.2 Hex1_C. albicans	-----V	K	N				
ADU20405.1 βHex_C. annum	-----T	K	Q				
ABB18373.1 CpHEX1_C. posadasii	-----I	K	K				
AAA33230.1 NagA_D. discoideum	-----D	L	Q	G	I	V	N
AAF46406.1 Hex2_D. melanogaste	-----L	N	R	E	L	L	Q
AAF47881.1 Hex1_D. melanogaste	-----K	V	K	K	I	L	E
AAM29423.1 Fd1_D. melanogaster	-----E	N	Y	D	L	L	D
CAE46968.1 HexA_E. histolytica	-----L	L	Q	V	V	N	S
AAB00965.1 HexA_H. sapiens	-----M	K	E	L	V	T	K
AAA52645.1 HexB_H. sapiens	-----P	E	E	L	S	R	V
AAC53246.1 HexA_M. musculus	-----M	L	E	M	Q	D	I
AAA18776.1 HexB_M. musculus	-----S	Y	E	L	K	Q	V
ABI81756.1 Hex1_O. furnacalis	-----Q	I	K	G	L	L	E
AEQ33603.1 HexTF_T. flavus	-----I	N	N				
ACI15900.1 NagA_T. maritima	-----F	E	K	I	D	H	T
AAK16587.1 CbsA_T neapolitana	-----M	R	K	E	L	L	G
CAA63123.1 HexB_S. scrofa	-----K	W	E	Q	S	L	I

	1200	1210	1220	1230	1240	1250	1260	
WP_082768773.1_Nah20B_P. hydro	..... ..... ..... ..... ..... ..... ..... .....							705
WP_068373836.1_Nah20A_P. hydro	-----PKEPGYYW	-----GMRSID	-----SFKV	-----QFMPDNL	-----PAHA	-----EFTW	-----DAIGNDYQ	STE 705
BAD00143.1_Nah20A_A. hydrophil	RANLQRF	TV-----	DSWMGPS	QFELD	LDL	SKD	VIQ	QGRILIGNTP 550
BAF76001.1_NahB_A. hydrophila	-----PA	ERGGY	WATRE	NDTRK	VFA	FAPEN	LPQNA	ETSVDRDGN 725
BAI94822.1_BbhI_B. bifidum	-----I	HEPGL	YAG-	TLN	LAQ	VHAC	DP---	APADFHANDN 549
AAQ05800.1_Hex20A_C. fimi	QQT	TKLY	V	D	G	E	F	VSDATGKYIDK 1143
BAI63641.1_Hex1t_Paenibacillus	-----T	TELC	LEW	AG-	H	IELR	DA	MDWEP-STL 410
CAA55582.1_NahA_P. gingivalis	-----D	SPIC	L	Q	W	RG-	F	VNTNRA
BAA84281.1_Hex99_P. piscicida	-----D	P	T	V	E	P	V	AIGG-YAP 465
BAB84321.1_Hex86_P. piscicida	-----D	E	I	C	Y	H	W	AG-YTDT 751
AAB03808.1_Chb_S. marcescens	-----R	N	L	D	E	P	K	AIHG-L 468
AAS02154.1_GcnA_S. gordonii	-----P	D	E	R	G	Y	Y	W
AAK98861.1_StrH_S. pneumoniae	-----D	L	P	D	N	L	S	G
CAB87223.1_HexA_S. coelicolor	-----N	S	G	K	V	P	F	N
AAC38798.3_SpHex_S. plicatus	-----D	T	P	L	G	L	S	W
AKC34128.1_Hex1_uncultured Act	-----D	T	P	L	G	L	S	W
AKC34129.1_Hex2_uncultured Bac	-----A	T	P	F	C	L	S	W
AAC44672.1_ExoI_V. furnissii	-----A	K	G	V	E	Y	E	A
AAA88682.1_Chb_V. harveyi	-----P	E	E	P	G	V	D	W
AAD30612.1_AtHex1_A. thaliana	-----P	K	E	R	G	Y	Y	W
AAM91092.1_AtHex3_A. thaliana	-----K	E	S	G	-----	G	G	S
BAE99290.1_AtHex3_A. thaliana	-----A	P	W	Q	G	F	Y	A
AAM13977.1_HexA_A. oryzae	-----V	P	W	E	V	Y	N	T
AAT99455.1_BmGlcNAcase3_B. mor	AN-----	P	D	A	N	-----	P	N
AAC60521.1_BmChiGlcNAcase_B. m	-----T	G	D	W	T	E	F	N
CCD73477.2_CeHEX-4_C. elegans	-----G	N	N	W	C	S	P	Y
AAA34346.2_Hex1_C. albicans	ET-----	P	E	N	V	D	-----	F
ADU20405.1_βHex_C. annum	PG-----	T	D	Q	G	N	-----	G
ABB18373.1_CpHEX1_C. posadasii	EN-----	P	D	P	E	T	-----	P
AAA33230.1_NagA_D. discoideum	-----N	I	H	Y	E	W	Q	D
AAF46406.1_Hex2_D. melanogaste	-----Y	Y	N	W	R	T	V	Y
AAF47881.1_Hex1_D. melanogaste	-----G	N	N	W	C	S	P	Y
AAM29423.1_Fdl_D. melanogaster	-----G	D	A	A	C	A	Q	Y
CAE46968.1_HexA_E. histolytica	-----C	V	N	T	H	S	M	W
AAB00965.1_HexA_H. sapiens	-----Y	G	P	D	W	K	D	F
AAA52645.1_HexB_H. sapiens	-----Y	G	Q	D	W	R	K	Y
AAC53246.1_HexA_M. musculus	-----Y	G	P	D	W	K	D	M
AAA18776.1_HexB_M. musculus	-----Y	G	Q	D	W	K	N	Y
ABI81756.1_Hex1_O. furnacalis	-----G	N	N	W	C	S	P	Y
AEQ33603.1_HexTF_T. flavus	VN-----	P	D	A	V	D	G	L
ACI15900.1_NagA_T. maritima	-----G	G	D	Y	D	Q	I	P
AAK16587.1_CbsA_T. neapolitana	-----G	D	D	Y	D	L	I	P
CAA63123.1_HexB_S. scrofa	-----Y	G	Q	D	W	K	N	Y

	1270	1280	1290	1300	1310	1320	1330	
WP_082768773.1_Nah20B_P. hydro	KVS----	LQNQAKVSGIQ	AQLWSETVRS	DDSDSANYMLEP	----	RLIAFAERAWFK	PEWAVAYQAGQT	763
WP_068373836.1_Nah20A_P. hydro	SKVPTDL	PKLHKNIIG	GEAAIWSEIV	-RADNLDLRLWP	----	RLVATAERLWS	PATLTDEDAMYRR	611
BAD00143.1_Nah20A_A. hydrophil	DQ-----	DPVKFKCIS	GQOWSETVRT	DAQEYEMVYP	----	RIFVAERAWHK	GGFELD YVKGRE	780
BAF76001.1_NahB_A. hydrophila	-----	IIGVLSPLW	SELITSRDL	YMLEP	----	RMLATAEVAWS	T PARKVWEH	594
BAI94822.1_BbhI_B. bifidum	KSCWTGTTN	SETQYNDTE	GLLR YAFD	NNPSTI WHSN	WKGATDKLT	GSNSFYAE	IDMCQKYTINQFSF	1210
AAQ05800.1_Hex20A_C. fimi	-----	PESVIGVEA	AVWTEITL	DLGELTSMLEP	----	RLAAVAEVAWT	APQDRDWDDFSG	461
BAI63641.1_Hex1t_Paenibacillus	-----	NIYGVES	TLWTEITF	VTQDHLDYMLYP	----	KLLSNAE	VGWTARGDRNWDDFKE	480
CAA55582.1_NahA_P. gingivalis	-----	HRVVLGA	QANLWAEY	LYTSERYDYQAYP	----	RLIAVAELTWT	PLAKKDFADFCR	516
BAA84281.1_Hex99_P. piscicida	VLLSEAG--	KQNVQCIQ	AQLFGENQ	KSP EILDYMTF	----	KL LGAAERAW	VQDMPAQGAATTEA	810
BAB84321.1_Hex86_P. piscicida	-----	QAFIVGA	QSGALWTE	YIKTPRHA	EYMLEP	RLSATAETLWS	DKTQKSWSDYSQY	520
AAB03808.1_Chb_S. marcescens	DK-----	PWPGAY	AGLSAEY	TKRDPQMEYMLFP	----	RALSVAERS	SWHRAGWEQDYRAGRE	777
AAS02154.1_GcnA_S. gordonii	-----	KQHFASSA	QQLGELT	SKRAGEYAYIFET	----	QAQLNALLALK	ISITSGIQKAYRNGD	517
AAK98861.1_StrH_S. pneumoniae	ELMTAFADH	NKDYFRAN	YNALREEL	AKIPTNLE	GYSKESLEAL	DAKTALN	YNLNRNKQAE	1035
CAB87223.1_HexA_S. coelicolor	-----	AEAVRCV	EAPLWTEI	LSDPDQLDFMAFP	----	RLPGVAELGWS	PASTHDWD TYKV	510
AAC38798.3_SpHex_S. plicatus	-----	ADAVRCV	EAPLWTEI	LSDPDQLDYMAFP	----	RLPGVAELGWS	PASTHDWD TYKV	481
AKC34128.1_Hex1_uncultured Act	-----	EDAVAGV	EAPLWTEI	PTFAEA	EFMLEP	RLIAVAELGWS	PAGRTWDEFRS	466
AKC34129.1_Hex2_uncultured Bac	-----	EKQIIGT	QALWSEYF	KDMKKVEYHAF	----	RIAAAEVAWT	PLALKNFDGFSK	514
AAC44672.1_ExoI_V. furnissii	-----	IIGIQCAL	WCEL VNN	QDRMDYMIYP	----	RLTALAGS	GLDT	607
AAA88682.1_Chb_V. harveyi	EI-----	EAKPFY	GLSAQLW	SETVRNDE	QY EYMVEP	RVIAAAQ	RAWHRADWENDYKVGVE	776
AAD30612.1_AtHex1_A. thaliana	-----	VIGGEV	ALWSEQA	-DSTVLD	SRLWP	RASATAESLWS	GNRD-ERGVKRCGEA	537
AAM91092.1_AtHex3_A. thaliana	-----	VIGGEV	CMWGEHI	-DASDIE	QTIWP	RAAAAERLWT	PYAKLAKNPNNVTT	499
BAE99290.1_AtHex3_A. thaliana	-----	VIGGEV	CMWGETA	-DTSVVL	QTIWP	RAAAAERMW	STREAVSKGNITLTAL	503
AAM13977.1_HexA_A. oryzae	-----	IIGATAP	LWGEQV	-DDINV	SSMEWP	RAAATAELVWS	GNRD-ANGNKRTTEM	557
AAT99455.1_BmGlcNAcase3_B. mor	-----	IVGGEAC	MWAEV	-DDMNIM	SRVWP	RASAVAERLWG	-HESQATYQVHC	508
AAC60521.1_BmChiGlcNAcase_B. m	-----	IIGGEV	ALWSEQS	-DPATLD	GRLWP	RAAABAERMW	AEPSTAWQDAEH	563
CCD73477.2_CeHEX-4_C. elegans	-----	ILAE	STVHGCK	FPGADV	FEIIMHD	WKRAVD	RRIFGKPDQQPSPDSEAEILKN	451
AAA34346.2_Hex1_C. albicans	-----	VIGREAA	LWSEQV	-DSTVLT	TKIWP	RTAATAELTWS	GNKD-SNGHHRGYEF	520
ADU20405.1_βHex_C. annum	-----	VIGGEV	ALWSEQA	-DSTVMD	SRLWP	RASAMAETLWS	GNCD-ETGMKRYAEA	533
ABB18373.1_CpHEX1_C. posadasii	-----	VIGATAP	LWSEQA	-DDVVIS	NKMWP	RAAATAELVWS	GNVG-KDGKKRTTLM	552
AAA33230.1_NagA_D. discoideum	-----	IIGGEAT	MWAEQI	-NQVNWD	VRVWP	RAIGTAERLWS	AQSVNSVSLALP	481
AAF46406.1_Hex2_D. melanogaste	-----	VIGGEV	CMWSEYV	-DONSLE	SRLWP	RACAAAERMW	SNPKSSALLAQR	590
AAF47881.1_Hex1_D. melanogaste	-----	VIGCAE	GAIWSEQI	-DEHTLD	NREWP	RASATAERLWS	NPAEGWRQAES	566
AAM29423.1_Fdl_D. melanogaster	-----	VIGGEV	CMWTEQV	-DENQLD	NRLWP	RTAATAERLWT	DPDDHDMDIVPPDV	626
CAE46968.1_HexA_E. histolytica	-----	VIGGEC	CSWGEST	-DEQNFF	DRVEQ	RYSAATAERLWS	KESVVDKESHEV	529
AAB00965.1_HexA_H. sapiens	-----	VIGGEAC	MWGEYV	-DNTNLV	PRLWP	RACAVAERLWS	NKLTSDLT FAYE	498
AAA52645.1_HexB_H. sapiens	-----	FIGGEAC	LWGEYV	-DATNLT	PRLWP	RASAVGERLWS	SKDVRDMDDAYD	527
AA53246.1_HexA_M. musculus	-----	VIGGEAC	MWGEYV	-DSTNLV	PRLWP	RACAVAERLWS	SNLTNIDFAFK	497
AAA18776.1_HexB_M. musculus	-----	VIGGEAC	LWGEYV	-DATNLT	PRLWP	RASAVGERLWS	PKTVDLENAYK	506
ABI81756.1_Hex1_O. furnacalis	-----	VIGGEAA	LWSEQS	-DTSTLD	GRLWP	RAAATAERLW	AEPATSWQDAEY	561
AEQ33603.1_HexTF_T. flavus	-----	VKCAVAP	LWSEQV	-DDTVIS	GKMWP	RAAATAELVWS	GNKDPKTGDKRTTYM	585
ACI15900.1_NagA_T. maritima	-----	FVEGD	LIFDFVAD	IP-NEK	ALKA	HLSLPAEKT	VYFVLRNPFVRYFE	439
AAK16587.1_CbsA_T. neapolitana	-----	DVDGEL	IFDFV	VNASKNEQV	LQA	HLSLPSDRT	IYFIIRNPFDAKFFP	440
CAA63123.1_HexB_S. scrofa	-----	VIGGEAC	LWGEYV	-DATNLT	PRLWP	RASAVGERLWS	HKDVRDIHDAYS	501

	1340	1350	1360	1370	1380	1390	1400	
WP_082768773.1_Nah20B_P. hydro	.....	.....	.....	.....	.....	.....	.....	
WP_068373836.1_Nah20A_P. hydro	-----	YSRDSKLFTELKQQQMYQDWAQFSQTMG	SQILTDLARDEVLFRLPTPGAKIKQGWLHANS	MF	826			
BAD00143.1_Nah20A_A. hydrophil	-----	LTVMQTYASEVIGLEFTQQQRAGFKQLTSQ	DADIEPLIILAEAVEQAQYYTRHHSKFQHD	NYHQL	676			
BAF76001.1_NahB_A. hydrophila	-----	FSG-TTKHVNK--ATLNKEWNQFANVLGQ	RVLPLKLDQAGVEYRLSVPGAKVVNGVLE	ANVDLP	840			
BAI94822.1_BbhI_B. bifidum	-----	-----	FVARLPGQLHILDQLQVRYRVP		616			
AAQ05800.1_Hex20A_C. fimi	-----	TPRTSQDSGQVTKADLYVKANANDEWKQ	VATDQVFEASRAKKTTFMFDEQEVRYVK	FVAKSSNDGW	1275			
BAI63641.1_Hex1t_Paenibacillus	-----	RVAQHAPFWDVRGCFRWHASPQVSWPGPS	SAPGAAF		496			
CAA55582.1_NahA_P. gingivalis	-----	RLIEHTPRLQNKGIKFFADP-IVWELPIVQ	INSEWKMDGTGTVVKDTSGYLNGTLVGG	AKWT	542			
BAA84281.1_Hex99_P. piscicida	-----	RLDNACVRLDMHCINHYHPLPEQPGGS	DFIAFTDKAKLTFTTSRPMKMVYTLD	ETEPSLTST	579			
BAB84321.1_Hex86_P. piscicida	-----	-----	WHTFTNTLTGQYALPLDDYYQVVDINAQ	IPQQVGVNYRIPLPGAIEGGKLI	VNTRFV	867		
AAB03808.1_Chb_S. marcescens	-----	RLPALLKRYQKMHLNTAYSSHKP--IISSE	INGQQLIATITSEIADTVIYYTLDGSE	PTLQSQ	581			
AAS02154.1_GcnA_S. gordonii	-----	YKGGETHFVDT--QALEKDWLRFANILGQ	RELAKLDKGGVAYRLPVPGARVAAGKLE	ANIALP	838			
AAK98861.1_StrH_S. pneumoniae	-----	-----	KEHLSALAEKDFPQLYQMVEDFSDQFSRQ	WQENKIFGLDTIDIRFGLLKRIKRAQERLE	578			
CAB87223.1_HexA_S. coelicolor	-----	AALQGLKPAATHSGSLDENEVAANVETR	PELITRTEEIPFEVIKKENPNLPAGQENI	ITAGVKGERTHYI	1105			
AAC38798.3_SpHex_S. plicatus	-----	RLAGQAPHWEAMCIDYRSPQVPWT			535			
AKC34128.1_Hex1_uncultured Act	-----	RLAAQAPYWEAAGIDFYRSPQVPWT			506			
AKC34129.1_Hex2_uncultured Bac	-----	RLAHGPRLEGLCVNFFRAPEIDWPETL			494			
AAC44672.1_ExoI_V. furnissii	-----	RLLEGIMQHYEAGNLHYCKPSTEK			537			
AAA88682.1_Chb_V. harveyi	-----	-----	KIPA		611			
AAD30612.1_AtHex1_A. thaliana	-----	YSQ-NSNLVDK--ASLNQDYNRFANVLGQ	RELAKLEKSGIDYRLPVPGAKVEDGKL	AMNVQFP	836			
AAM91092.1_AtHex3_A. thaliana	-----	VDRLNLWRYRMVKRGIGAE--PIQPLWCL	KNPGMCNTVHGALQDQ		580			
BAE99290.1_AtHex3_A. thaliana	-----	RLAHFRCLLNQRCVAAA--PLVGG-GRVVP	FEPGSCLAQ		535			
AAM13977.1_HexA_A. oryzae	-----	BRLLHYFRCLLNRRVPA--PVDNFYAR	REPLGPGSCYAQ		541			
AAT99455.1_BmGlcNAcase3_B. mor	-----	TQILNLFREYLVANGVQAQ--ALVPKYCLQ	HPHACDLYRNQAAIQ		600			
AAC60521.1_BmChiGlcNAcase_B. m	-----	RLLEHTCRMNARGIHAQ--PPSGPGFCLG	V		536			
CCD73477.2_CeHEX-4_C. elegans	-----	RMLHVRERLVRMGIQAE--SLEPEWCYQ	NQGLCYG		596			
AAA34346.2_Hex1_C. albicans	-----	LKKSLSNQSILYKTDADDEVFNQYLHDY	HSLIAQNTREITN		491			
ADU20405.1_βHex_C. annum	-----	TQILNLFREYLVKLGYGVS--PLVPKYCL	LNPHACDLYKNPPVY		562			
ABB18373.1_CpHEX1_C. posadasii	-----	TDRLTEWRYRMVARGIGAE--PIQPLWC	VKNSGMCNTVHSFTS		574			
AAA33230.1_NagA_D. discoideum	-----	TQILNLFREYLVANGIMAA--PLQPKYCL	KHPHSCDLYYDQTVIM		595			
AAF46406.1_Hex2_D. melanogaste	-----	RIGHFTCDLSRRGIQS--GPLFPDYCP	MQDDLVTMPKNTKLSKSEIKLILNK		532			
AAF47881.1_Hex1_D. melanogaste	-----	RFYRYRERLLARCIHAD--AVIPHWCVL	HEGQCL		622			
AAM29423.1_Fdl_D. melanogaster	-----	RLLLHRQRLVDNGLGAE--AMQPQWCLQ	NEHECPIDACSRGSRGLGLIVLLLLTTLSA		622			
CAE46968.1_HexA_E. histolytica	-----	FRRLSLFRNRLVELGIRAE--ALFPKYCA	QNPGECI		660			
AAB00965.1_HexA_H. sapiens	-----	RANYLRCLDVRRDIMKGTGPLYHSFCQLP	KKEKSN		564			
AAA52645.1_HexB_H. sapiens	-----	RLSHFRCELLRRGVQAQ--PLN-VGFCEQ	EFEQT		529			
AAC53246.1_HexA_M. musculus	-----	RLTRHRCRMVERGIAAQ--PLY-AGYCN	HENM		556			
AAA18776.1_HexB_M. musculus	-----	RLSHFRCELVRRIQAQ--PLS-VGYCEQ	EFEQT		528			
ABI81756.1_Hex1_O. furnacalis	-----	RLAVHRCRMVSRGIAAQ--PLS-TGYC	NYENKI		536			
AEQ33603.1_HexTF_T. flavus	-----	RMLHIRERLVRMGIQAE--SLQPEWCYQ	NEGYCYS		594			
ACI15900.1_NagA_T. maritima	-----	TQILNLFREYLVANGVQAA--PLVPKYCLQ	HPHSCDLYYDQTA	VV	628			
AAK16587.1_CbsA_T. neapolitana	-----	-----	GRKIVVTRSTKPISIYKSLEHFLGR	CDS	467			
CAA63123.1_HexB_S. scrofa	-----	-----	GRSVVITHSTKPISVYKSFQHLLGR	CDS	467			
	-----	RLTIHRCRMVRRGIAAE--PLF-TGYC	NHEHRM		531			

	1410	1420	1430	1440	1450	1460	1470		
WP_082768773.1_Nah20B_P. hydro	.... .... .... .... .... .... .... .... .... .... .... .... ....	GLTIEYQQE	GEKQWQVYSQ	VPVK--VTKPVLLR	SSMPGLLRYSR	SVSVSMQ	QKVEE-----	879	
WP_068373836.1_Nah20A_P. hydro		VELNQYVDYLS	SAQSLGLVELK	RHIELFQQGDQ	QAKKFIEQLLQ	KWQKNLPKLK	LLIANYPKLH	SLAPLVT 746	
BAD00143.1_Nah20A_A. hydrophil		GLPIQYSLDG-	KSWSAYDAAAK	PTVDGKVYLRT	TTSFSGKRTSR	VTETLN-----		887	
BAF76001.1_NahB_A. hydrophila		QR-----						618	
BAI94822.1_BbhI_B. bifidum		VAVSEFGVANK	PSSTVRVFVA	ADPAEGGTVS	VAAEGETGTD	TAVDVASGAS	VTAKAVAADG	YRFSGWFTT 1345	
AAQ05800.1_Hex20A_C. fimi		-----						496	
BAI63641.1_Hex1t_Paenibacillus		AGKQNGVSV	FDGSSGYINL	GQDITGNWTA	AVWVYGQPN	TTNNETLLS	GTTSAIKINQ	YNKTGKVGIT	IY 612
CAA55582.1_NahA_P. gingivalis		PYTVPLEFA	QTGLLKIR-----	TVTAGG--	KMSPVRRIR	VEKQPFNMS	MEVPAPKPGL	TIRTA 635	
BAA84281.1_Hex99_P. piscicida		GMATEYSVD	QGVTWHRYE	GPVTLTASSK	VQLRTVSDSG	KVSRVATVN-----		914	
BAB84321.1_Hex86_P. piscicida		QYQKPLVIT	DETAXRAR-----	SYVSDLGQL	VGDARLTLS	PHLALGKEIT	LASLAAEGS	ATKL 639	
AAB03808.1_Chb_S. marcescens		GLGIEYSTD	GKGQWQRYDA	KAKPAVSGEV	QVRSVSPDG	KRYSRAEKV-----		885	
AAS02154.1_GcnA_S. gordonii		QFISQIDCV	EELEQEILP	FNDFYKDQGL	TATTANQWHL	IATASTIYTT-----		627	
AAK98861.1_StrH_S. pneumoniae		SVLTENGKT	TETVLD	SQVTKVINQ	VVEVGSPVTH	KDESGLAPTTE	VKPRLDIQEE	EIPFTTVTREN	PL 1175
CAB87223.1_HexA_S. coelicolor		-----						535	
AAC38798.3_SpHex_S. plicatus		-----						506	
AKC34128.1_Hex1_uncultured Act		-----						494	
AKC34129.1_Hex2_uncultured Bac		-----						537	
AAC44672.1_ExoI_V. furnissii		-----						611	
AAA88682.1_Chb_V. harveyi		GVTTLQYSL	DG-ENWLT	YADNARPN	VTGEVFIRS	VVSATGEK	VSRITSVK--	883	
AAD30612.1_AtHex1_A. thaliana		-----						580	
AAM91092.1_AtHex3_A. thaliana		-----						535	
BAE99290.1_AtHex3_A. thaliana		-----						541	
AAM13977.1_HexA_A. oryzae		-----						600	
AAT99455.1_BmGlcNAcase3_B. mor		-----						536	
AAC60521.1_BmChiGlcNAcase_B. m		-----						596	
CCD73477.2_CeHEX-4_C. elegans		-----						491	
AAA34346.2_Hex1_C. albicans		-----						562	
ADU20405.1_β Hex_C. annuum		-----						574	
ABB18373.1_CpHEX1_C. posadasii		-----						595	
AAA33230.1_NagA_D. discoideum		-----						532	
AAF46406.1_Hex2_D. melanogaste		-----						622	
AAF47881.1_Hex1_D. melanogaste		-----						622	
AAM29423.1_Fdl_D. melanogaster		-----						660	
CAE46968.1_HexA_E. histolytica		-----						564	
AAB00965.1_HexA_H. sapiens		-----						529	
AAA52645.1_HexB_H. sapiens		-----						556	
AAC53246.1_HexA_M. musculus		-----						528	
AAA18776.1_HexB_M. musculus		-----						536	
ABI81756.1_Hex1_O. furnacalis		-----						594	
AEQ33603.1_HexTF_T. flavus		-----						628	
ACI15900.1_NagA_T. maritima		-----						467	
AAK16587.1_CbsA_T. neapolitana		-----						467	
CAA63123.1_HexB_S. scrofa		-----						531	

	1480	1490	1500	1510	1520	1530	1540	
WP_082768773.1_Nah20B_P. hydro	..... ..... ..... ..... ..... ..... ..... .....							879
WP_068373836.1_Nah20A_P. hydro	..... ..... ..... ..... ..... ..... ..... .....							807
BAD00143.1_Nah20A_A. hydrophil	-----							887
BAF76001.1_NahB_A. hydrophila	-----							618
BAI94822.1_BbhI_B. bifidum	-----							1415
AAQ05800.1_Hex20A_C. fimi	-----							496
BAI63641.1_Hex1t_Paenibacillus	-----							682
CAA55582.1_NahA_P. gingivalis	-----							705
BAA84281.1_Hex99_P. piscicida	-----							914
BAB84321.1_Hex86_P. piscicida	-----							708
AAB03808.1_Chb_S. marcescens	-----							885
AAS02154.1_GcnA_S. gordonii	-----							627
AAK98861.1_StrH_S. pneumoniae	-----							1245
CAB87223.1_HexA_S. coelicolor	-----							535
AAC38798.3_SpHex_S. plicatus	-----							506
AKC34128.1_Hex1_uncultured Act	-----							494
AKC34129.1_Hex2_uncultured Bac	-----							537
AAC44672.1_ExoI_V. furnissii	-----							611
AAA88682.1_Chb_V. harveyi	-----							883
AAD30612.1_AtHex1_A. thaliana	-----							580
AAM91092.1_AtHex3_A. thaliana	-----							535
BAE99290.1_AtHex3_A. thaliana	-----							541
AAM13977.1_HexA_A. oryzae	-----							600
AAT99455.1_BmGlcNAcase3_B. mor	-----							536
AAC60521.1_BmChiGlcNAcase_B. m	-----							596
CCD73477.2_CeHEX-4_C. elegans	-----							491
AAA34346.2_Hex1_C. albicans	-----							562
ADU20405.1_βHex_C. annuum	-----							574
ABB18373.1_CpHEX1_C. posadasii	-----							595
AAA33230.1_NagA_D. discoideum	-----							532
AAF46406.1_Hex2_D. melanogaste	-----							622
AAF47881.1_Hex1_D. melanogaste	-----							622
AAM29423.1_Fdl_D. melanogaster	-----							660
CAE46968.1_HexA_E. histolytica	-----							564
AAB00965.1_HexA_H. sapiens	-----							529
AAA52645.1_HexB_H. sapiens	-----							556
AAC53246.1_HexA_M. musculus	-----							528
AAA18776.1_HexB_M. musculus	-----							536
ABI81756.1_Hex1_O. furnacalis	-----							594
AEQ33603.1_HexTF_T. flavus	-----							628
ACI15900.1_NagA_T. maritima	-----							467
AAK16587.1_CbsA_T. neapolitana	-----							467
CAA63123.1_HexB_S. scrofa	-----							531

	1550	1560	1570	1580	1590	1600	1610
WP_082768773.1_Nah20B_P. hydro	..... ..... ..... ..... ..... ..... ..... .....						879
WP_068373836.1_Nah20A_P. hydro	-----						807
BAD00143.1_Nah20A_A. hydrophil	-----						887
BAF76001.1_NahB_A. hydrophila	-----						618
BAI94822.1_BbhI_B. bifidum	SDGSTKTLTAGEYTLTSATQDGAVALDKAFKAGKVTVTVTANGKTATFDVTVAKDPDPEPATLKSIVK						1485
AAQ05800.1_Hex20A_C. fimi	-----						496
BAI63641.1_Hex1t_Paenibacillus	DELKIFNRALSASEVVELAKSPAPKASLTGPGQSANPGQSFQVDMGLSDVSPSEFGQMYAQDWTINYDSAK						752
CAA55582.1_NahA_P. gingivalis	DNVKLIDNVGEVKKFSSRRNSSRALQKGYHPIKTIWVGAIQGAWPTYWNYSRVMIRLKGEEKFKPISSDML						775
BAA84281.1_Hex99_P. piscicida	-----						914
BAB84321.1_Hex86_P. piscicida	TLAEVNNPRGPM SVLSFAPVSVRFLKVVA INSKQSDDIQIPKLP LYIDEI AVY-----						761
AAB03808.1_Chb_S. marcescens	-----						885
AAS02154.1_GcnA_S. gordonii	-----						627
AAK98861.1_StrH_S. pneumoniae	KPKLEIP SQPAPSTAPAEESKALPQDPAPVVTEKKLPETGTHDS AELVVAGLMSTLAAYGLTKRKED---						1312
CAB87223.1_HexA_S. coelicolor	-----						535
AAC38798.3_SpHex_S. plicatus	-----						506
AKC34128.1_Hex1_uncultured Act	-----						494
AKC34129.1_Hex2_uncultured Bac	-----						537
AAC44672.1_ExoI_V. furnissii	-----						611
AAA88682.1_Chb_V. harveyi	-----						883
AAD30612.1_AtHex1_A. thaliana	-----						580
AAM91092.1_AtHex3_A. thaliana	-----						535
BAE99290.1_AtHex3_A. thaliana	-----						541
AAM13977.1_HexA_A. oryzae	-----						600
AAT99455.1_BmGlcNAcase3_B. mor	-----						536
AAC60521.1_BmChiGlcNAcase_B. m	-----						596
CCD73477.2_CeHEX-4_C. elegans	-----						491
AAA34346.2_Hex1_C. albicans	-----						562
ADU20405.1_βHex_C. annuum	-----						574
ABB18373.1_CpHEX1_C. posadasii	-----						595
AAA33230.1_NagA_D. discoideum	-----						532
AAF46406.1_Hex2_D. melanogaste	-----						622
AAF47881.1_Hex1_D. melanogaste	-----						622
AAM29423.1_Fdl_D. melanogaster	-----						660
CAE46968.1_HexA_E. histolytica	-----						564
AAB00965.1_HexA_H. sapiens	-----						529
AAA52645.1_HexB_H. sapiens	-----						556
AAC53246.1_HexA_M. musculus	-----						528
AAA18776.1_HexB_M. musculus	-----						536
ABI81756.1_Hex1_O. furnacalis	-----						594
AEQ33603.1_HexTF_T. flavus	-----						628
ACI15900.1_NagA_T. maritima	-----						467
AAK16587.1_CbsA_T. neapolitana	-----						467
CAA63123.1_HexB_S. scrofa	-----						531

	1620	1630	1640	1650	1660	1670	1680
	..... ..... ..... ..... ..... ..... ..... .....						
WP_082768773.1_Nah20B_P. hydro	-----						879
WP_068373836.1_Nah20A_P. hydro	-----						807
BAD00143.1_Nah20A_A. hydrophil	-----						887
BAF76001.1_NahB_A. hydrophila	-----						618
BAI94822.1_BbhI_B. bifidum	TSKPKDKTTYTVDETF	AKTGLAVTGTWSDG	KTALLKDG	EYKLSAVD	ADGKTVDLTKP	FTAAGDVTVT	TSG 1555
AAQ05800.1_Hex20A_C. fimi	-----						496
BAI63641.1_Hex1t_Paenibacillus	LQLDSITS	LQDKFQVIDQ	KELAPGQIR	IVAANAAANQ	GVTPQGD	LFAFKFTVK	AGTDVKTTISADHIVIG 822
CAA55582.1_NahA_P. gingivalis	FQ-----						777
BAA84281.1_Hex99_P. piscicida	-----						914
BAB84321.1_Hex86_P. piscicida	-----						761
AAB03808.1_Chb_S. marcescens	-----						885
AAS02154.1_GcnA_S. gordonii	-----						627
AAK98861.1_StrH_S. pneumoniae	-----						1312
CAB87223.1_HexA_S. coelicolor	-----						535
AAC38798.3_SpHex_S. plicatus	-----						506
AKC34128.1_Hex1_uncultured Act	-----						494
AKC34129.1_Hex2_uncultured Bac	-----						537
AAC44672.1_ExoI_V. furnissii	-----						611
AAA88682.1_Chb_V. harveyi	-----						883
AAD30612.1_AtHex1_A. thaliana	-----						580
AAM91092.1_AtHex3_A. thaliana	-----						535
BAE99290.1_AtHex3_A. thaliana	-----						541
AAM13977.1_HexA_A. oryzae	-----						600
AAT99455.1_BmGlcNAcase3_B. mor	-----						536
AAC60521.1_BmChiGlcNAcase_B. m	-----						596
CCD73477.2_CeHEX-4_C. elegans	-----						491
AAA34346.2_Hex1_C. albicans	-----						562
ADU20405.1_β Hex_C. annuum	-----						574
ABB18373.1_CpHEX1_C. posadasii	-----						595
AAA33230.1_NagA_D. discoideum	-----						532
AAF46406.1_Hex2_D. melanogaste	-----						622
AAF47881.1_Hex1_D. melanogaste	-----						622
AAM29423.1_Fdl_D. melanogaster	-----						660
CAE46968.1_HexA_E. histolytica	-----						564
AAB00965.1_HexA_H. sapiens	-----						529
AAA52645.1_HexB_H. sapiens	-----						556
AAC53246.1_HexA_M. musculus	-----						528
AAA18776.1_HexB_M. musculus	-----						536
ABI81756.1_Hex1_O. furnacalis	-----						594
AEQ33603.1_HexTF_T. flavus	-----						628
ACI15900.1_NagA_T. maritima	-----						467
AAK16587.1_CbsA_T. neapolitana	-----						467
CAA63123.1_HexB_S. scrofa	-----						531

	1690	1700	1710	1720	1730	1740	1750	
	..... ..... ..... ..... ..... ..... ..... .....							
WP_082768773.1_Nah20B_P. hydro	-----						879	
WP_068373836.1_Nah20A_P. hydro	-----						807	
BAD00143.1_Nah20A_A. hydrophil	-----						887	
BAF76001.1_NahB_A. hydrophila	-----						618	
BAI94822.1_BbhI_B. bifidum	KLTD	SFTITV	KAKTVT	PAPGDN	KPGENK	PGADKPK	NPNTPDEVAKTGASVTAVVFSALLLLSAGYLLVRKR	1625
AAQ05800.1_Hex20A_C. fimi	-----						496	
BAI63641.1_Hex1t_Paenibacillus	NAQG	KELEI	IAGATHEI	QVSI	PVDKSQL	NVLIANA	QAKHDAAVEGNEDGLYAAGSKAQLQTAIHTAKAVAD	892
CAA55582.1_NahA_P. gingivalis	-----						777	
BAA84281.1_Hex99_P. piscicida	-----						914	
BAB84321.1_Hex86_P. piscicida	-----						761	
AAB03808.1_Chb_S. marcescens	-----						885	
AAS02154.1_GcnA_S. gordonii	-----						627	
AAK98861.1_StrH_S. pneumoniae	-----						1312	
CAB87223.1_HexA_S. coelicolor	-----						535	
AAC38798.3_SpHex_S. plicatus	-----						506	
AKC34128.1_Hex1_uncultured Act	-----						494	
AKC34129.1_Hex2_uncultured Bac	-----						537	
AAC44672.1_ExoI_V. furnissii	-----						611	
AAA88682.1_Chb_V. harveyi	-----						883	
AAD30612.1_AtHex1_A. thaliana	-----						580	
AAM91092.1_AtHex3_A. thaliana	-----						535	
BAE99290.1_AtHex3_A. thaliana	-----						541	
AAM13977.1_HexA_A. oryzae	-----						600	
AAT99455.1_BmGlcNAcase3_B. mor	-----						536	
AAC60521.1_BmChiGlcNAcase_B. m	-----						596	
CCD73477.2_CeHEX-4_C. elegans	-----						491	
AAA34346.2_Hex1_C. albicans	-----						562	
ADU20405.1_βHex_C. annum	-----						574	
ABB18373.1_CpHEX1_C. posadasii	-----						595	
AAA33230.1_NagA_D. discoideum	-----						532	
AAF46406.1_Hex2_D. melanogaste	-----						622	
AAF47881.1_Hex1_D. melanogaste	-----						622	
AAM29423.1_Fdl_D. melanogaster	-----						660	
CAE46968.1_HexA_E. histolytica	-----						564	
AAB00965.1_HexA_H. sapiens	-----						529	
AAA52645.1_HexB_H. sapiens	-----						556	
AAC53246.1_HexA_M. musculus	-----						528	
AAA18776.1_HexB_M. musculus	-----						536	
ABI81756.1_Hex1_O. furnacalis	-----						594	
AEQ33603.1_HexTF_T. flavus	-----						628	
ACI15900.1_NagA_T. maritima	-----						467	
AAK16587.1_CbsA_T. neapolitana	-----						467	
CAA63123.1_HexB_S. scrofa	-----						531	

	1760	1770	1780	1790	1800	1810	1820
	..... ..... ..... ..... ..... ..... ..... .....						
WP_082768773.1_Nah20B_P. hydro	-----						879
WP_068373836.1_Nah20A_P. hydro	-----						807
BAD00143.1_Nah20A_A. hydrophil	-----						887
BAF76001.1_NahB_A. hydrophila	-----						618
BAI94822.1_BbhI_B. bifidum	RI-----						1627
AAQ05800.1_Hex20A_C. fimi	-----						496
BAI63641.1_Hex1t_Paenibacillus	NSNASQQQVDSAKSALEEAVQVFESKKISADVNGDGQVSI						962
CAA55582.1_NahA_P. gingivalis	-----						777
BAA84281.1_Hex99_P. piscicida	-----						914
BAB84321.1_Hex86_P. piscicida	-----						761
AAB03808.1_Chb_S. marcescens	-----						885
AAS02154.1_GcnA_S. gordonii	-----						627
AAK98861.1_StrH_S. pneumoniae	-----						1312
CAB87223.1_HexA_S. coelicolor	-----						535
AAC38798.3_SpHex_S. plicatus	-----						506
AKC34128.1_Hex1_uncultured Act	-----						494
AKC34129.1_Hex2_uncultured Bac	-----						537
AAC44672.1_ExoI_V. furnissii	-----						611
AAA88682.1_Chb_V. harveyi	-----						883
AAD30612.1_AtHex1_A. thaliana	-----						580
AAM91092.1_AtHex3_A. thaliana	-----						535
BAE99290.1_AtHex3_A. thaliana	-----						541
AAM13977.1_HexA_A. oryzae	-----						600
AAT99455.1_BmGlcNAcase3_B. mor	-----						536
AAC60521.1_BmChiGlcNAcase_B. m	-----						596
CCD73477.2_CeHEX-4_C. elegans	-----						491
AAA34346.2_Hex1_C. albicans	-----						562
ADU20405.1_βHex_C. annuum	-----						574
ABB18373.1_CpHEX1_C. posadasii	-----						595
AAA33230.1_NagA_D. discoideum	-----						532
AAF46406.1_Hex2_D. melanogaste	-----						622
AAF47881.1_Hex1_D. melanogaste	-----						622
AAM29423.1_Fdl_D. melanogaster	-----						660
CAE46968.1_HexA_E. histolytica	-----						564
AAB00965.1_HexA_H. sapiens	-----						529
AAA52645.1_HexB_H. sapiens	-----						556
AAC53246.1_HexA_M. musculus	-----						528
AAA18776.1_HexB_M. musculus	-----						536
ABI81756.1_Hex1_O. furnacalis	-----						594
AEQ33603.1_HexTF_T. flavus	-----						628
ACI15900.1_NagA_T. maritima	-----						467
AAK16587.1_CbsA_T. neapolitana	-----						467
CAA63123.1_HexB_S. scrofa	-----						531

	..... ..... ..... .	
WP_082768773.1_Nah20B_P. hydro	-----	879
WP_068373836.1_Nah20A_P. hydro	-----	807
BAD00143.1_Nah20A_A. hydrophil	-----	887
BAF76001.1_NahB_A. hydrophila	-----	618
BAI94822.1_BbhI_B. bifidum	-----	1627
AAQ05800.1_Hex20A_C. fimi	-----	496
BAI63641.1_Hex1t_Paenibacillus	VDIIDLTIVAKAILQI	978
CAA55582.1_NahA_P. gingivalis	-----	777
BAA84281.1_Hex99_P. piscicida	-----	914
BAB84321.1_Hex86_P. piscicida	-----	761
AAB03808.1_Chb_S. marcescens	-----	885
AAS02154.1_GcnA_S. gordonii	-----	627
AAK98861.1_StrH_S. pneumoniae	-----	1312
CAB87223.1_HexA_S. coelicolor	-----	535
AAC38798.3_SpHex_S. plicatus	-----	506
AKC34128.1_Hex1_uncultured Act	-----	494
AKC34129.1_Hex2_uncultured Bac	-----	537
AAC44672.1_ExoI_V. furnissii	-----	611
AAA88682.1_Chb_V. harveyi	-----	883
AAD30612.1_AtHex1_A. thaliana	-----	580
AAM91092.1_AtHex3_A. thaliana	-----	535
BAE99290.1_AtHex3_A. thaliana	-----	541
AAM13977.1_HexA_A. oryzae	-----	600
AAT99455.1_BmGlcNAcase3_B. mor	-----	536
AAC60521.1_BmChiGlcNAcase_B. m	-----	596
CCD73477.2_CeHEX-4_C. elegans	-----	491
AAA34346.2_Hex1_C. albicans	-----	562
ADU20405.1_βHex_C. annum	-----	574
ABB18373.1_CpHEX1_C. posadasii	-----	595
AAA33230.1_NagA_D. discoideum	-----	532
AAF46406.1_Hex2_D. melanogaste	-----	622
AAF47881.1_Hex1_D. melanogaste	-----	622
AAM29423.1_Fdl_D. melanogaster	-----	660
CAE46968.1_HexA_E. histolytica	-----	564
AAB00965.1_HexA_H. sapiens	-----	529
AAA52645.1_HexB_H. sapiens	-----	556
AAC53246.1_HexA_M. musculus	-----	528
AAA18776.1_HexB_M. musculus	-----	536
ABI81756.1_Hex1_O. furnacalis	-----	594
AEQ33603.1_HexTF_T. flavus	-----	628
ACI15900.1_NagA_T. maritima	-----	467
AAK16587.1_CbsA_T. neapolitana	-----	467
CAA63123.1_HexB_S. scrofa	-----	531

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