Supplemental Article S1. Comparison of 31 putative LPMOs

	000000000000000000000000000000000000000
aa+vaqs	ala
1 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66	69
GL1034380GL1034380GL104 GALLARKVPLVAPAPQARMTN	APQ
GL0125011	AYG
GL0247266FSGS	VFA
<i>GL0213284</i>	AQA
<i>GL0658692</i>	AFA
GL0089352QTDN	PLR
<i>GL0393374</i>	QLR
<i>GL0681738</i>	QLR
GL0620585	ALA
GL0883009	APR
GL0293304	SLR
GL1004230 MGAHWLLFIFITKDCESNEMPERDARTGPLPFMRSFWDSKMSRTPLFWKFSARLALAAYGICCVAT	SYG
<i>GL0251010</i>	VVA
<i>GL0183513</i>	ASA
<i>GL0422153</i>	ANA
GL0522565	νна
<i>GL0999597</i>	ALA
<i>GL0555809</i>	VLA
GL0656018	ΑΥΑ
<i>GL0225724</i>	VSA
GL0391320	LSA
GL0200824	LSA
GL0338092	LSA
GL0066553MAPTEYIKVEHLTAFSQSTVPKFAIPKFTQLSLVALALTAGSSLLSQT	ASA
GL0600730FSLQ	ASA
GL0297948	ALA
<i>GL0489328</i>	ALA
<i>GL0507050</i>	ALA
<i>GL0875000</i>	ALA
<i>GL041711</i> 6	ALA
<i>GL0772141</i>	AFA

	HGyvesPasRayqcklgknslnys+afgdcgslvqyvigepqsvgeapkgfpala+g-
	70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 102 104 106 108 110 112 114 116 118 120 122 124 126 128 130 132 134 13
GL1034380	H G A M E M P I A R Q L M C Y E A G G F Y W P Y D G S G I R D A G C R A A Y Q Y Y A K F Q D D A Q Q A A Y Q F E Q W H E V S T N V A D
GL0125011	HGAIETPMARQYQCKLDGGQWQSSDGSSVPNAGCREAW RMLKDENPQRQFDQWNEFAAFAPN
GL0247266	HGAMENPKARQWECHTQGGHWNPSTMGNAACKAALEGSPSKQAAFDNWNGFTGFAPG
GL0213284	HGTLSKPMSRIYACRODNPENPANPACAAARVIGGAOPFYDWAAINOANANG-
GL0658692	HGTMTKPLSRVKQCHEGNPENPTNPACAAAKAIGGSQPFYDWAAINQANANG-
GL0089352	HGRVTTPASRGAVAIDLGVLSGWQVDEM-EGGKNFPALAAGI
GL0393374	H G R V I S P A S R G A V A I E Q G L L G G W Q V N E M - E G G K N F P A L A A G I
GL0593374 GL0681738	HGRVISPASRGAVAIEQGLLGGWQVNEM-EGGKNFPALVAG
GL0620585	HGYVEEPKSRSVIHEPPMNDKGEHSNVWPADAV-EAPK-LPAGNI
GL0820385 GL0883009	HGAVSSPKSRAYFAAEKGLIEGNLOYGIEWGKFFPAVTGGI
GL0293304	HGHIFSPKSRAYFAWEAGRMNAGQLNQREAGKFFPQLASGI
GL1004230	HGRVTEPPSRIVLCTMNDNADCYV-DAWHANAM-EKGKFFPATOAGI
GL004230 GL0251010	
GL0231010 GL0183513	
GL0183513 GL0422153	H G Y I Q D P P S R D F G C Q L G L N S
GL0422153 GL0522565	
	H G Y V S D P P S R A Y A C K L G L N Q Q C G P - V Q Y E P Q S V G E A P K G F P A S G
GL0999597	HGYVSQPASRAFMCNANMGSQNKDCGSGPLYEMQSV-EGADGFPELNNG
GL0555809 GL0656018	HGYITQPESRNYLCKTGGNSQCGA-IQWEPQSL-EAPSGFPNGG
	H G F V E K P A S R A A L C T Q N Y G A L N L M C G S - I M Y E P Q S L - E A P K G F P Q S G
GL0225724	H G Y V Q S P P A R G Y Q G Q L D S Q S L G W T A A F N I Y G N V I S N P Q S L - E A P K G F P V S G ·
GL0391320	HGYVLSPASRGYQGSLDKASLGYSVAFG KYGS - VIN EPGSL - EAPKGFPA LG
GL0200824	HGYVMSPASRGYQGSLDKATLGYSAAFS - IYGS - IIN EPGSL - EAPKGFPA - LG
GL0338092	HGYVLSPASRGYQGSLDKATLGYSTAFG IYGS - IIN EPGSL - EAPKGFPA FG
GL0066553	HGYVISPESRSYACKTGSNVNCGA-IQWEPQSV-EGPSGFPE-SG
GL0600730	HGYVESPASRAYQCKLQLNAQCGS-VQYEPQSV-EGPKGFPQSG
GL0297948	HGYVAFPPSRAYQCNTGKNSDCGS-VQWEPQSV-EQASGFPEG
GL0489328	HGYVESPASRAYMCKLGKNIDCGS-VQYEPQSV-ERTSGFPTG
GL0507050	HGYVESPASRAYMCKLGKNIDCGT-VQYEPQSV-ERTSGFPTG
GL0875000	H G Y V D T P A S R A Y M C K L G K N I D C G T - V Q Y E P Q S V - E R T S G F P A G
GL0417116	H G Y I E S P A S R A Y M C K Q G Q N I D C G L - V E Y E P Q S V - E R A S G F P S G
GL0772141	H G Y I E S P A S R A Y M C K L G H N I D C G S - V Q Y E P Q S V - E K A S G F P T G
	Region extracted to Figure 2

Region extracted to Figure 2

Motif Y[W]E[N]PQSV[L]E



	f++p++sd+++vapppdgkiasag+	
		96 198 200 202 204 207
GL1034380	YNNPEAVKAAIPDGTLCSAGNVLDNQDIPAVLQRVNEFINELHGRAVRISVRIN	
GL0125011	Q G Q S L E D V K R T V P N G L L C A G G D	P T K R G - M D
GL0247266	SHTVAESDVKDGMLCSGSN	A G F A G - F N
GL0213284	N H R A V V P D G Q L C S G G N	
GL0658692	NHRELVRDGELCSASI	P K Y R G - L D
GL0089352	FPAPFQTDNPSVAPPADGHILSGGK	FDARDCVNF-TD
GL0393374	FPAPFESDNPSVVPPADGHILSGGK	D D A R D C V N F - T D
GL0681738	F P A P F E S D N P S V V P P A D G Y I L S G G K	NDARDCVNF - TA
GL0620585	MSPTPIANEQLFQFPPDGKLASGGS	P A F S K - L D
GL0883009	K D P Y A S T D V A N I A P P V D G K I A S G E R	P G A T Y - L D
GL0293304	R D P I A P D D Q A N A L P P P D G R I A S A N Q	G D S I F - L D
GL1004230	A D V F A R D D A R N D Q P P D D G R I A G S S V	NGDLPV-LN
GL0251010	V P D G K I A S G A L	5 Q F A A - L D
GL0183513	P A D G R I I G G N G	A F S A - L N
GL0422153	P V D G K I A S G G V	RSDFGA-LD
GL0522565	P A D G K I A S G G V	RGDFAA-VD
GL0999597	PEDGHIASAGV	A S M S R - L D
GL0555809	P A D G Q I A S A G H	P Q F G E - L D
GL0656018	P M D G K I A S A G G	L F G G I L D
GL0225724	P A D G R I A S A N G	GLGQIGDFV-LD
GL0391320	P A D G K I A S A N G	SIGGDTM-LD
GL0200824	P A D G K I A S A N G	5 I G G D T T - L D
GL0338092	P A D G K I A S A N G	5 I G G D T T - L D
GL0066553	P A D G K I A S A A N	G A F S P - L D
GL0600730		5 T F F E - L D
GL0297948	A M P P D G Q L A S A G K	A N F S Q - L D
GL0489328	ALPPDAQLASAGI	
GL0507050	A L P P D G Q L A S A G I	
GL0875000	A L P P D G Q L A S A G I	
GL0417116		
GL0772141	A M P P D G Q L A S A G I	

	eqsadrlgrpft	wtktp+tpit	agptntftwyytapH	ktr+wryyitkqgwn	- pn - + pltraqfel
	208 212 214 216 218	220 222 224 226 228	230 232 234 236 238 240 242 24	4 246 248 250 252 254 256 258 260 26	2 264 266 268 270 272 276
GL1034380	R P - A P	WPTQTLTKNS	ENK-ATLTYRIATPH	SPSFWEIYISRPGYD	- PTREPLTWADLEA
GL0125011	A P Q S A G	FRKTEVQ	SGK-LTMKWYATATH	NPSFMRVFITKQGWR	- NT - QPLRWEDLE -
GL0247266	LPHKD	WTKTVLQPDS	HGK-VGMTYYYTAKH	TPSFIEFYINKKNVD	- PAKKALGWNDVEL
GL0213284	LDRSD	WSTTPIRADA	DGR-YTFEFLGSAPH	ATREWKFYVTREGWK	- AS - DGLRWSDLE -
GL0658692	LNRTD	WPTTPIRADA	RGR-YTFEFRAPAPH	ATREWKFYVTRDGWQ	- PG - SPLRWADLQ -
GL0089352	EEMSKKLNRAFT	WPLINVD	AGQVFKVTWKYTAPH	TTRGYRWLITKDGWD	- PK - QRISRAQLEA
GL0393374	EEMSKKLGRPFT	WPLLNVT	PGQTLEVKWEYTAPH	TTRGYRWLITKDGWD	- PK - QRITRAQLEA
GL0681738	EEMSKKLGRPFT	WPLLNVT	PGQTLEVKWEYTAPH	TTRGYRWLITKDGWD	- PK - QRITRAQLEA
GL0620585	DEKQNT	YN N P M S	AGP-HQFKWHLPAKH	RTTYFTYYITKPDWQSVP	GAD - SRLTRAMFED
GL0883009	RTDVD	WQK HKVY	GGEALDFVWRFVALH	KYRRFNYFITRVCWD	- PS - QPLSRAQFEA
GL0293304	EPGRH	WQKHDVE	SHQLLTVSWHYTARH	LTRRWNYFITRPDWN	- PD - LPLSREQFEE
GL1004230	EQTPRR	WKKNAVR	SGAMQ <mark>SFTWEYSAI</mark> H	KTRRWNYFITKSGWN	- AS - APLTRAQFEE
GL0251010	VQSATR	WHK TEIK	DRT - L NFDWYYKATH	PATKYEYFITRNGWN	- PN - AALARESFDL
GL0183513	EQTANR	WHL L P L D	KHE-IEFKWAYTAPH	VTSKWEYFITKNDWN	- PN - AALARASFES
GL0422153	EQAANR	WHLTPIH	DRN-MQFDWHYQAPH	PVTSWEYFITKAGWN	- PN - AALTRASFDA
GL0522565	EQSATR	WHL TSIT	QRE-LAFDWYYTIGH	PATKFEYFITKTGWN	- AN - EPLTRAAFEL
GL0999597	EQSETR	WVKHPIS	AGK-QSFTWTYTAPH	KTKSWDYYLTKSDWN	- PA - QPLTRGSFES
GL0555809	IQTSDR	WTKRPVQ	AGP - F <mark>AIGWNFTAN</mark> H	VTRNWRYYLTKQEWN	- PN - QPLTRDSFDL
GL0656018	QQTTDR	WFKNTIT	GGP - N T F T W K Y T A P H	LTSKWHYYITKRDWN	- PN - KPLTRADLE -
GL0225724	NQTSSR	WKKTSIS	TGS-NIFTWKYTAPH	KTTKWHYYMTKTGWD	- QN - APLKRSELEL
GL0391320	LQTADR	W K K T N I T	TGV - NAFIWKYLAYH	ATAKWHYYMTKQGWD	- PN - KPLSRQDLEL
GL0200824	IQTADR	WKKTNIT	TGV-NAFIWKYLAYH	ATAKWHYYMTKQGWN	- PN - QPLSRQDLEL
GL0338092	IQTADR	WKKTNIT	TGV - NAFIWKYLAYH	ATAKWHYYMTKQGWD	- PN - KPLARQDLEL
GL0066553	EQSPSR	WSKRDIK	AGW-NDFSWQFTANH	VTRNWRYYLTRQGWD	- QN - QALSRASFDL
GL0600730	QQSPAR	WNKLSLK	TGA - N S F T W N L T A R H	STTSWRYFITKQGWD	- AG - QPLTRASFEL
GL0297948	SQSPTR	WAK SAIK	SGA - NNFIWHHSAPH	KTTNWRYYITKQNWD	- QN - KPLTRSDFES
GL0489328	RQSLNA	WTKTPIS	AGP - NKEVWYHTAPH	KTVNWRWYMTKQDWN	- PN - KPLTRDQFES
GL0507050			and the second	KTVNWRWYITKQDWN	
GL0875000	RQSLNA	W T K T P I T	AGP - NKFVWYHTAPH	KTVNWRWYITKQDWN	- PN - KPLTRDQLEP
GL0417116				KTTNWRYYITKQNWN	
GL0772141	KQSLNA	WTK N P M T	AGP - HEFVWHHTAPH	KTTNWRYYITKQNWD	- PN - KPLTRDQFEL

Region extracted to Figure 2

	tpfctvngngqpy+spad++pka++thtcnvp-a+rtGyhvilavWevadt-gnaFyq+iDvd	fg
	277 280 282 284 286 288 290 292 294 296 298 300 302 304 306 308 310 312 314 316 318 320 322 324 326 328 330 332 334 336 338 340 342	345
GL1034380	PQRLEEV PAVDG KYELQVDLGNHSGRRVIYSRWQRVDAAGEGEYNCSDVN	v
GL0125011	PVYEGETPMPVGERYQYELQLP-PGRTGDAMIYSIWQRRDAGNEGFYNCADVT	ĸ
GL0247266	L K R F D I A S G D P S D R H T V N V T I P - <mark>E D R T G</mark> T A V I F T R <mark>W Q R I D A V G E G F</mark> Y N C S <mark>D</mark> V K I	ĸ
GL0213284	- A F C T L G D V P L S E G G V Y K L D C P L P - <mark>- R R T G Q H V I Y N T W Q R S D S - Q E A F</mark> Y T C A D V R F	E
GL0658692	- EFCTLGNTPLS EGGVY KLDCPLP - <mark>- KRGGQHIIYNTWQRSDS - LEAFYTCMDVR</mark>	E
GL0089352	Q P F A E D F Y P Q V P Y Y S H A G E L K A K V D H E V K L P - <mark>A N K K G</mark> R H V I V L M W I V A N T - G N A F Y Q A F D V D F	Q
GL0393374	K P F A E D F Y P Q V P Y Y S H S A E L K A K V N H A V K L P - <mark>A N K Q G R H V I V L M W I V A N T - G N A F</mark> Y Q A F <mark>D</mark> V D F	ĸ
GL0681738	Q P F A E D F Y P Q V P Y Y S H S A E L K A K V N H A V K L P - <mark>G N K Q G H H V I V L M W I V A N T - G N A F</mark> Y Q A F <mark>D V D F</mark>	ĸ
GL0620585	KPFCHKVYTYAPGNPSADIS LPTGFETHTCDVP - <mark>- EREGKQKIYAVWRVRDT - DNAFYQMID</mark> VDF	G
GL0883009	EPFATFLNTRQPYWSYTDAEM WPANPTTHTLTLP - <mark>- NREGYYVLLGVWEVAET - DKAFYQVIDLD</mark>	E L
GL0293304	K P F W Q V Q L S E Q P F W S H G E A L N P P N P T V H D V M L P E R T G Y H V L L A V W E V A D T - G N A F Y Q V I D L D I	v
GL1004230	K P F C T V Q N A G Q P Y W S P S A D L M P K N P T I H Q C R L P - <mark>- E R S G Y Q V I L A V W E V A D T - P M G F Y Q V I D T E P</mark>	v
GL0251010	T P F C T V D A G G K L P T D Q P Q G S E G P A R E K H T C Q I P - G E K S G H H V I L G I W T V H D T - P G A F H D V V D V N I	v
GL0183513	A P F C T I E G H G K A A N D S S H P K H T C A I P - <mark>A D R S G H H V I L G I W T V G D T - G S A F</mark> Y K A V <mark>D</mark> V D I	Q
GL0422153	TPFCVVDGKHQIPAAGTGTNPKHSCTLP- <mark>ADRSGQHVILGVWKVGDT-DKAF</mark> HSVADVDI	Q
GL0522565	TPFCTVDGKGEL PGDGHR PGPAREKHHCTLP - ADRAGQHVILGAWTVHDT - PAAFYNVMDVD	Q
GL0999597	K P F C H I E G N N I R P S A G P D M P H E C T V P - <mark>- E R E G</mark> Y H V I L A A W D V A D T - G A T F Y N V I D V D F	G
GL0555809	N P F C V I D G G M V Q P P K Q V T H Q C T L P A R T G Y Q V V L G V W E V G D T - A N S F Y N M I D V Q F	D
GL0656018	- PIGTVAHNGSA ASTNL THTINVP - TDRS GYHVILAV WDVADT - SNAFYNVIDVNI	v .
GL0225724	I GTINHDGSP ATNNL SHTINIP - <mark>TDRS</mark> GYHIVLAV <mark>WDVADT - SNAF</mark> YNVIDVN	/ N
GL0391320	I GTVTHNGTP PQDNV SHQIIVP - ANRTGYHIILAVWDVADT - TNAFYNVIDVNV	/ Т
GL0200824	I G T V T H N G T P P Q D N V S H Q I T V P - <mark>A N R T G</mark> Y H I I L A V <mark>W D V A D T - T N A F</mark> Y N V I <mark>D</mark> V N N	/т
GL0338092	I GTVTHNGTP PQDNV SHQITVP - ANRNGYHIILAVWDVADT - TNAFYNVIDVN	/ т
GL0066553	A P F C V I D G G M V Q P P K L V T H N C Y V P - E D R T G Y H V I L A V W E V G D T - T N S F Y N A I D V N I	s
GL0600730	T P F C Q F N D G G A I P A A K V T H Q C N I P - <mark>A D R S G S H V I L A V W D V A D T - G N A F</mark> Y Q A I <mark>D</mark> V D I	. s
GL0297948	K P F C Q I D G N G M T P A I E V T H S C N V P - <mark>- E R T G Y Q V I Y A V W E I A D T - A N S F Y Q A I D V D P</mark>	G
GL0489328	TPFCTVNGNGQAPAQRQEMNCNVP- <mark>-QRTGYQVIYAVWEIADT-TNSFYQAIDVD</mark>	
GL0507050	T P F C T V N G H G Q A P A Q R Q Q M T C N V P - <mark>- Q R T G Y Q V I Y A V W E I A D T - T N S F Y Q A I D</mark> V D F	
GL0875000	TPFCTVNGNGQAPAQRQEMNCNVPQRTGYQVIYAVWEIADT-SNSFYQAIDVDI	G
GL0417116	TPFCTVNGNGQA PAMTQ SMNCNVP ERTGYQVIYGVWEIADT - PNSFYQAIDVDF	
GL0772141	T P F C T I N G N G Q A P A M T K S M T C N V P - <mark>- E R T G Y Q V I Y G V W E I A D T - A N S F Y Q A I D V D P</mark>	

Region extracted to Figure 2

	gggvtpvdatptpps	ewqktlls-	- gsitagndln+	dkviar+fdangevasly	vteltiasagq
	6 350 352 354 356 358 360 3	62 364 366 368 370	372 374 376 378 380 382	84 386 388 390 392 394 396 398 400 402 40	04 406 408 410 414
GL1034380	G P				
GL0125011	N G T T P P S	Р W H Y K G	- PFVTPSLSPVAG	OKVRFRVLTGPGKQEIVD	DERIDVTAONL
GL0247266	RDGSEIPDGGGEEEG	GDESDWISK	GDFITAAHQPAVO	EQVRF RLMGGTRGDNLVD	VYLKITAQNI
GL0213284	G D V T P P P	Q W Q D A	- GALTARSALEVO	TTVSL RVFNVAGNDVERV	/DVVLASGQ
GL0658692	G D G V V P P P	Q W Q D A	- GAVTANGALDVE	STVTL RVFNANGNDLERV	/ E T T L A A G Q
GL0089352					
GL0393374					
GL0681738					
GL0620585	EVITKPVANVTPSSH	NLSTSTLSLI	DGSASTGKELKYS	VAVTSNADKVILENSTSAKAS	SIRLKAKPE
GL0883009	G G E G P				
GL0293304	A S V E P L	PAAPAGLRA	TSVSTGTVALAWN	A P S I P A S S Y R V Y R D N V L I T A V	/ S G L T F N D E G L
GL1004230	G N M				
GL0251010	E A E N P D	G W R P V	- GNITPHADLWV0	OKVKVRALTADGESAAYS	SQLTIASQED
GL0183513	D G G P A P	E W R Q V	- SSINPHRDLKVO	DEVKA RAFIGGNESQEFS	SASISIDTVEA
GL0422153	D G G P A P	EWPRL	- A E I S A N R D L E V O	OKVTA RAFDANGERTSHH	IVSITVANAEE
GL0522565	E G G T P P	Q W P Q V	- GSITPHRDLRQ(ОКVКА RAFIGTTESTQHS	SVSISIDNAED
GL0999597					
GL0555809	-			OKART RVFDANGERTDLC	
GL0656018	NDGNVDTEAPTQPNG	LНТТКV	- TSTSAELKWNPS	F D N V G V K E Y Q V L R D G K V V A T I	PGTTFTDKNL
GL0225724	K N S				
GL0391320		•		P D A V S Y A V F R N G Q S I Q Q V	
GL0200824	GTGVSAPATPTG	LTQVGV	- TSSSAKISWNAG	TDAASYNVFRNGQNIQQV	/STPTFQDTGL
GL0338092		-		5 D A V S Y S V F R N G Q N I Q Q V	-
GL0066553	G A V V P G	EWTDI	- GDINPSLDLKAG	OKVMT RVFDANGEQSAKO	ΣΤΟΙΤΙΑΟΑΤΟ
GL0600730					
GL0297948	T G D D A E N G S	•		OKVIA HFFNASGEVHSLO	
GL0489328	AGNVTPSDDTPVVVS	EWNKTL	- D G Q I A G N N V N E G	OKIIARFFDANGEVTSLF	RTEMTVASASQ
GL0507050	G G N V T P - D E T P A V V S	EWTNTL	- N G Q I S G N N V N A G	OKVIA RFFDANGEVVSMF	R T E L T V S S A S Q
GL0875000	GGNVTP-DETPAVVS	EWNKTL	- D G Q I S G N N V N A G	OKVIA RFFDANGEVASMR	≀ T E L T V S S A S Q
GL0417116				OKVIA RFFDANGEIASMA	
GL0772141	G G N V T P - D D T P A V I S	QWSKTL	- SGQVAGNNLNTO	OKVIA R F F D A N G E V A A L F	₹ T E L N I G S A A Q

	gaa+qwsydlqakgaq+inaahsdpvrvg+kdedgvi+pvhgannv+ak+gsglssvl+sye	eq+
	415 418 420 422 424 426 428 430 432 434 436 438 440 442 444 446 448 450 452 454 456 458 460 462 464 466 468 470 472 474 476 478 480	483
GL1034380		
GL0125011	TSWSWTL AEAISARHGAVVQIGKRDDADVIAFDRRDIPGNASWTTDKDAVAVTSLIPGG	GEP
GL0247266	NN - NQWVLDL GRELNRDHSNELQIGQLQTDGTVRLNEQQPRANQVFVSDKGYGYAIEIVKNA	
GL0213284	T A P A Q W P L V L A R K V N T S A A R - A R V G I L R - N G V I T P V A S A T A N H	
GL0658692	T A P A Q W P L A L A R K V N A S A Q H - A R V G V M K - N G V I A P V A S A T E	
GL0089352		
GL0393374		
GL0681738		
GL0620585	SDFTVNVKLTVTNDKNVSDSKTVTLNAKAEADST APEAKAGSDFTVHSNSESRGYDLNGS	ASV
GL0883009		AQS
GL0293304	N A G T R Y S Y A V S S V N A A G Q E S A R S Q S I A I I T L T N D A A D L P P T A P T N L H S M G V T A T S V S L M W G P	s s s
GL1004230	VSPFGTK	
GL0251010	G K S E N W S F K L A E Q I N T A Q T L - V R A G I R G D D G S I K P V K G A N N L Y A K A E S G V N R F E L Q T E	LVE
GL0183513	G L A S N W S Y R L A K Q I N D T Q V L - I S A G V K D A D G N I A P V K G S N I I F A K Q E S G V T N Y E F A F E	GSP
GL0422153	G I A A N W A Y K L A R Q I N E T H T L - V R A G Q M D E D G N I E P V Q G S N S I F A K A E S G L T N Y I L D F E	A A A
GL0522565	GIGAHWSHKL AKRINETQPL - VKAGQADAQGDI HPVLGANLIFAKAASGVTSYQLDFE	ткр
GL0999597		
GL0555809	G Q K N N W A H D L A A K I N A E Q S Q - I R A G Q Q T T D G Q F N P V Y G Q N P V Y L K A G S N L Q R V E V Q L E	QQQ
GL0656018	N S N T K Y T Y S V K A V D A A G N V S T V S E S L V V E T L H A A P D T E S P S Q P T S L H T M G I T S S S V D L M W G A	SED
GL0225724		
GL0391320	TANTVYTYEIQAKGSSGLTSEKSTPLNIKT - NSEGIQ EKPTAPSNLHSMGATENSVSLMWMA	sтн
GL0200824	TANTIYTYEIQAKGSSGLMSGKSAPLNVKT - NSEGTI EKPTAPSNLHSMSVTENSVSLMWMA	s т н
GL0338092	I A N T I Y T Y E I Q A K G S S G L T S G K S A P L S V K T - N S E G V P E K P T A P S N L H A M E V T E N S A S L M W T A	SAH
GL0066553	GAKQNWPFLL ASAINAQQPQ - LKAGQKNAAGVI SPVYGKNEIFAAPKSGLERVEVSFD	ΙΑΡ
GL0600730		
GL0297948	G K S S Q W S Y D L A E V I N T A H H D S L R A G V K D G S G N I N P I Y G V N Q V Y A P Q G S A L Q S V T L S Y S	ESQ
GL0489328	G Q A S Q W S Y D L A Q A I N A A H S D - V R V G V K D E S G E V N P V H G A N S V Y V K E G S T L K S V A I S Y E	EQQ
GL0507050	G Q A S Q W A F D L A Q A I N A A H S D - V R V G M K D E S G E V N P V H G A N N V Y V K D G S T L K S V A V S Y E	EQQ
GL0875000	G N A S Q W S Y D L A Q A I N A A H S D - V R V G T K D E S G V V N P V H G V N N V Y V K D G S T L K S V A I S Y E	EQQ
GL0417116	GDANQWAYDL AQKINSAHHD - VRVGVKDESGDV SPVHGANSVFVKEDSTLKSVAISYE	EQK
GL0772141	GDANQWSYDL AQKINAAHSD - MRVGVKDEAGEI SPVHGANSVFVKDGSTLQSVAISYE	-

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GL1034380					
GL0125011	DPVAPPQA	A K I S G P S T V K		AGETITLTN	EGTNNTTGQHYRYDWHAHGFTPMNGTAS
GL0247266	AISLDRYT	TLAPIATTTSGYSYAVTG	SSDKSGV	TWQWKNVAG	DGRITASPANQAKTQITVPGGVPAGTTA
GL0213284					VYLRPGHRFQLDTKVPDPVDPVDPP
GL0658692					- N R V Y L K P G N R F Q L E T Q V P G P V D P V D P P
GL0089352					
GL0393374					
GL0681738					
GL0620585	NAEKYQWT	T I V S G Q D I G A	LQVANGG	EWVSTVHAA	KARALIKPGKIGKVTYRLTVTAKNGKTS
GL0883009	GGPIDGFI	I I Y R D G	N E V	GRVPASQRT	F T D D N L T P D T R Y R Y T V K A F D A Q G Q L S A S
GL0293304	VNALQGYI	I V Y R D G	N E I	SRLPASQLS	Y L D T N V A P A N S Y R Y F V A A I D V Q G R L S V P
GL1004230					
GL0251010	D S G A S	SLSIQAFDKT	VELVKGR	ATLPLTVLG	NRTMNIEATVFDASHKAVGSATRVMEPG
GL0183513	PD A Y	YMHLHDLKSE	YVLKDGE	ATVGFSVMT	N R S L E V T A T L F D A T N K Q V G F Q R Q Q V N S T
GL0422153	G E P T T	Т М Н L Н D V К P E	YTIVDGK	GGVDFSVMT	N K A L T V T A R L F D S N N K Q V S Y S R Q N V N - G
GL0522565	V D D A Y	Y L H L H G I K P E	YVLKDGK	GAVDFSVMT	NRKLQVTSQLFDEHNQQVGHASQLVDAS
GL0999597					
GL0555809	PPASDSIS	S V S - - G L E S E - - - - - - - - -	YLLDNGK	VTLAFTVTA	EGDLAVTNTLYDHGGAAKGQTSADIKDS
GL0656018	NVAVDHYV	VIYRGSTKEQ	M T	AVGTSTITS	FKDMNLQSNTSYIYAVAAVDVAGNESIK
GL0225724					
GL0391320	TQGIKNYO	Q V F	E N G I	KVGETVQTS	FSRVGLAQDTEYLYTVRSVAMNDQISDM
GL0200824	SQGIKNYO	Q I F	E N G I	KVGETMQTN	F L R T G L T Q D T E Y R Y T V K S V A M N D Q L S D A
GL0338092	SQGIKNYH	H V F	E N G I	ΚΥΑΕΤΥQΤΤ	FLRTGLSQDTEYNYTVRSVGMNDQLSEV
GL0066553	A P G N C	QLNVTSLADD	YTIVDGV	AQVSFDVST	NADMQVSAYLFSHDGTAAGYVTQAVNNT
GL0600730					
GL0297948	EDDTAKES	SLSLSNVAAT	- PIENGK	ATVTFNAAA	KGEMHLIAVVSDHAGAEKGSLQQTIDNR
GL0489328	AQVSEDIA	A V T N V Q F S	- KIKSGA	ATVTFHVNT	Q G N V N L E A R V M N H A G A E K G Y V K Q E M N N A
GL0507050	SQVSEAIA	A V T N V K F S	- K I K N G A	ATVTFHVNT	Q G N V N L E A R V M N H A G A E K G Y V K Q D M N N A
GL0875000	AQVSENIA	A V S N V K F S	- KIANGN	ATVTFHVNT	Q G N V N L E A R V M N H A G A E K G Y L K Q D M N N A
GL0417116					QGDVNLEAHVLNHPGAEKGYLKQDMNNS
GL0772141					KGDVNVEAHVMSHSGAEKGYLKQEMNNA

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NNDSLKGAKIEWSALNHADKIQISSPNN
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TLDLMFKDPAS GGDYQYSFPEG
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FYACKIWKNKWYANPGELPGTNMVW - EE
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VINLMLEEKSEPTPAP - AGNYDYTFPDN VVDMMLENDASADTGT - TGKYDYTFPQS
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GL1034380				
GL0125011	LGTYKPGD			- F P H G G W C N
GL0247266	-	•		DEPGTGDYESWVAGKIYY -
GL0213284	IGSYVPGQ	T V V K G N	- D G K L Y A C R P	- F P E G A W C N
GL0658692	LGSYTPGE	т v v к g т	- D G K L Y A C R P	- F P E G A W C N
GL0089352				
GL0393374				
GL0681738				
GL0620585	FSTNLMGKHPYTDNVDV1	ΤΙ Q V K V T A P D T G K V S	Т А Т К V I К L R P A Q T D V К A -	- W D H S K T Y K T P C E K V S Y E G
GL0883009	K D S Y T T G E	V V R H	- N Q T L W Q C L A	
GL0293304	LRQWVRGT	T W Y T G E R V R H -	- N G L I W V C L Q	Q H
GL1004230				
GL0251010	IDSYVAGT	T V L Q P E	- D G K V Y E C K P	- F P A A G W C K
GL0183513	L A G Y T A G T	K V Y A K G	- T T D V Y E C K P	- F P Y S G Y C V
GL0422153	LSSYKAGT	K V L Q P K	- N G K V Y E C Q P	- F P N S G Y C V
GL0522565	IETYRAGT	L V L Q G K	- T G E V F E C K P	- F P A E G W C R
GL0999597			- N G K E Y Q A R	
GL0555809	L K S Y A A G T	K V L Q P K	- D G R I Y Q C K P	- Y P Y S G W C T
GL0656018	FKAYKKGD	K V E Y	- Q G K N Y E A V Q	S Y Q G Y G D
GL0225724			- S S Q V F G P F L	
GL0391320	ISVCTEGP	GCQSSGPVTYC	G A Q E Y N P A K T	- Y P T A G T K V F Y A C
GL0200824	V S T C T E G P	G C E S S G P V T Y C	G A Q E Y N P A K T	- Y P T A G V K V F Y S F
GL0338092	VSACTEGP	G C E S S G P V T Y C	G A Q E Y N P A K A	- Y P T A G T K V F H A C
GL0066553	I K S Y A A G T	K V L Q P K	- T G K V Y Q C K P	- W P Y S G Y C V
GL0600730				
GL0297948	LKSYTAGT	K V M Q P K	- N G K V Y Q C R P	- F P Y S G Y C V
GL0489328	IASYKAGT	V V L Q P K	- NGKTYQCKK	- A P Y N G Y C V
GL0507050	I A S Y K A G T	V V L Q P K	- N G K T Y K C K T	- A P Y S G Y C I
GL0875000	I K S Y K A G T	V V L Q P K	- D G K T Y K C K N	- A P Y S G Y C V
GL0417116	L A S Y K A G T	V V L Q P K	- D G K T Y E C K P	- F P Y S G Y C K
GL0772141	I A S Y K A G T	V V L Q P K	- D G K T Y E C K P	- F P Y S G Y C V

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GL1034380		
GL0125011	I A P N T P P A Q W P Y A P G G S G M P A A E D Q R A W K L A N	
GL0247266	Q G D T V S W N G V N Y I A G H W T T A E P G K G D N W K L H N N A K P V A W L S T M V Y L M G N I V S H D G K V W K A S Q	WIGQDLA
GL0213284	I H A A A Y N P G V G S D W R D A W I P Y	
GL0658692	I N A D A Y R P G T G Y A W R D A W V A Y	
GL0089352		
GL0393374		
GL0681738		
GL0620585	N I W L N S W E T R G V K P G S D G E W G - V W K K E G A A N M P K E C K	
GL0883009	SHTAHVESWAPGAADGFTLWKEYVGRR	
GL0293304	T S W L D A W A P G A V D G F T L W R E A R	
GL1004230		
GL0251010	I N G H H Y K P G T G S D W Q D A W I L K	
GL0183513	QWSESATQ YEPG KGSHWQMAWDKH	
GL0422153	Q Y S A G A T Q F E P G T G S H W N M A W T E K	
GL0522565	I Y S S N A N Q Y E P G V G S H W Q D A W I K R	
GL0999597	- W W T R G N Q P G V H E V W S E V K	
GL0555809	I W T S T A T O Y E P G V G T N W O D A W T L V N	
GL0656018	PNWINALS	
GL0225724		
GL0391320	KIWENKWY ANSG ETPGSNPVWKVIDTCTEGPGCT - SGLTSKEGSLSVIVSDHMIS	FSPEDYY
GL0200824	KIWENKWY ANPG ETPGSNAVWKVVSDCNEGSSCKSSVLTSKENNLSVMVSEHLIN	FTPESHY
GL0338092	KIWENKWY ANPG EAPGSNAVWKVVSDCNEGOACKTSALTHKENDLSVIVSEYMIN	FAPESYY
GL0066553	QWSPTATGFEPGVGSSWTMAWTEL	
GL0600730		
GL0297948	Q W S Q H A S Q Y E P G V G S D W A M A W T E V A Q	
GL0489328	Q Y A A G A N Q F E P G V G S H W Q M A W T L K N	
GL0507050	QYAAGANQ FEPG VGSHWTMAWTLKK	
GL0875000	QYAQNANQFEPGVGSHWQMAWTVK	
GL0417116	OYSSTSTOFEPGVGSDWKEAWMLKN	
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GL0225724					-	-		-			-		-	-		-			-		-	-		-			-		-	-		-	-		-	-		-	
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GL0338092	NTI	I S	R١	V D	L	Ι.	ТΡ	н	Gι	Q	I	ΙТ	F	тι	NP	E	к	N S	м	NI	S	R	LQ	2 S	G 1	ГΥ	F	V K	(I	L	YK	D	G	R S	I	т	кт	ГІ	RK
GL0066553		-			-	-		-			-		-	-		-			-		-	-		-			-		-	-		-	-		-	-		-	
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GL0489328					-	-		-			-		-	-		-			-		-	-		-			-		-	-		-	-		-	-		-	
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