

ICHMU				
PARTE				
PERM5	M			
GIAIB				
GIAIC				
TUBMM				
ASPAC				
ASPCL				
NEOFI				
ASPFN				
ASPGI				
ASPOR				
ASPTN				
EMEND				
EMENI				
ASPFU				
PENCH				
PENRW				
PARBA				
DOTSN				
PASFU				
ZYMTR				
AURPU				
LEPMJ				
PHAND				
PHANO				
COCLU				
BLUGR				
SCLS1				
COLGR				
COLSU				
VERDA				
VERDV				
HYPAI				
HYPJE				
HYPVG				
GIBM7				
FUSC1				
FUS04				
GIBZA				
NECHA				
CRYPA				
MAGGR				
MAG07				
THIHE				
NEUCR				
NEUT9				
PESFW				
DEBHA				
PICST				
CANTE				
ASHGO				
KAZNA				
KLULA				
LACTC				
CANGA				
YEAST				
YEASA				
YEAS0				
YEASV				
VANPO				
ZYGRO				
GL0TR				
CRYNJ				
VAVCU				
MUCCI				
RHIOR				
TURTR				
PTEVA				
CH0H0				
MACEU				
TETUR				
MEGSC				
DROBM				
THEKT				

CYAME	-----	-----	-----	-----	-----
GALSU	-----	-----	-----	-----	-----
BLAHO	-----	-----	-----	-----	-----
CHLRE	MG-----K	PKGKG-----	-----	AGGGS	D-----
VOLCA	MP-----	-----	-----	EKGKN	K-----
CHLVA	-----	-----	-----	-----	-----
OSTLU	MR-----	-GTAR-----	-----	DGGGG	G-----
OSTTA	MG-----K	FGRPG-----	-----	DGGGG	G-----
MICCC	-----	MGSRG-----	-----	PRVLD	A-----
KLEFL	-----	-----	-----	-----	-----
PHYPA	MSLCLPTASS	YSGKGLVRFL	YQSLRGSLSQ	ISHFHQRSGD	SSNISKGIDE
MARPO	-----	-----	-----	-----	-----
ORYBR	-----	-----	-----	-----	-----
ORYGL	-----	-----	-----	-----	-----
ORYNI	-----	-----	-----	-----	-----
ORYPU	-----	-----	-----	-----	-----
ORYRU	-----	-----	-----	-----	-----
ORYSI	-----	-----	-----	-----	-----
ORYSJ	-----	-----	-----	-----	-----
BRADI	-----	-----	-----	-----	-----
HORVV	-----	-----	-----	-----	-----
WHEAT	-----	-----	-----	-----	-----
TRIOA	-----	-----	-----	-----	-----
SORBI	-----	-----	-----	-----	-----
MAIZE	-----	-----	-----	-----	-----
SETIT	-----	-----	-----	-----	-----
MUSAC	-----	-----	-----	-----	-----
MUSAM	-----	-----	-----	-----	-----
CHEQI	-----	-----	-----	-----	-----
NICAT	-----	-----	-----	-----	-----
SOLLC	-----	-----	-----	-----	-----
SOLTU	-----	-----	-----	-----	-----
CUCSA	-----	-----	-----	-----	-----
LUPAN	-----	-----	-----	-----	-----
LOTJA	-----	-----	-----	-----	-----
SOYBN	-----	-----	-----	-----	-----
MEDTR	-----	-----	-----	-----	-----
MANES	-----	-----	-----	-----	-----
POPTR	-----	-----	-----	-----	-----
PRUPE	-----	-----	-----	-----	-----
ARAAL	-----	-----	-----	-----	-----
BRARP	-----	-----	-----	-----	-----
BRANA	-----	-----	-----	-----	-----
BRAOL	-----	-----	-----	-----	-----
ARALY	-----	-----	-----	-----	-----
ARATH	-----	-----	-----	-----	-----
THECC	-----	-----	-----	-----	-----
GOSHI	-----	-----	-----	-----	-----
GOSRA	-----	-----	-----	-----	-----
VITVI	-----	-----	-----	-----	-----
AMBTC	-----	-----	-----	-----	-----

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-----	-----	-----	-----	-----	-----
-----	IRRP	AASRGVHRSS	PIGVIKAP-G	S-NKNTPPRG	A-----
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
-----	MP	KAKKQPH	P-K	G--NSPYSR	TS-----
-----	MP	KVKQPKR	N-S	A-SKANPYAD	A-----
-----	MG	KAARGKR	N-A	S-GSNSPYQK	P-----
-----	MG	KAARGKR	N-A	P-SSSPYQK	P-----
-----	MG	KVARTKH	S-R	G--ANGPYQK	P-----
-----	MP	KVKTNKR	S-G	A-A-KSPYAD	A-----
-----	MG	KVARTKH	S-R	G--ANGPYQK	P-----
-----	-----	-----	-----	-----	-----
-----	MG	KADRKKS	A-R	A--SASPYQK	PS-----
-----	MG	KADRKKS	A-R	A--SASPYQK	PS-----
-----	MG	KAARGKR	N-A	P-SSSPYQK	P-----
-----	MP	KVNPKR	N-S	A-A-SQGLSD	A-----
-----	MP	KVNPKR	N-S	A-A-SQGLSD	A-----
-----	MP	KTLSKKR	N-S	A-SQASPYAQ	A-----
-----	MP	RPASSHG	G	GIMKSDPYAG	AS-----
-----	MP	KTPRPTS	SHG	GITKSDPYAG	AS-----
-----	MP	KSARKPA	S-N	GVGKSDPYAG	AA-----
-----	MP	KSARKNN	G-S	GASKTDPYAG	AA-----
-----	MP	KDKRKRA	S-A	A-GDASPYAK	P-----

-----MP	KDKRKR	-----S-G	A--DSSPYAK	PT-----
-----MP	KDKRKR	-----S-G	A--DSSPYAK	PT-----
-----MP	KAKQKR	-----K-A	ADNNASPYTK	PT-----
-----MG	KSKSQKR	-----N-H	S-ATSSPYSK	P-----
-----MP	KLKTSKR	-----N-T	A-AAGTPYEK	-----
-----MG	KAKAPKR	-----N-A	ASSSSGPYSR	P-----
-----MG	KAKAQKR	-----N-A	ASSSSGPYSR	P-----
-----MG	KAQGGKR	-----N-S	SAAGSSPYAK	P-----
-----MG	KAQGGKR	-----N-S	SAAGSSPYAK	P-----
-----MA	KADRSKR	-----N-N	A--SSGPYEK	P-----
-----MA	KAEKGKR	-----N-N	A--SSGPYEK	P-----
-----MA	KADRSKR	-----N-N	A--SSGPYEK	P-----
-----MP	KSSDSRR	-----G-G	A--RKGPYDK	P-----
-----MP	KSSDSRR	-----G-G	A--RKGPYDK	P-----
-----MP	KSSDSRR	-----G-G	A--RKGPYDK	P-----
-----MP	KATKGKN	-----A-G	P--RKGPYEK	P-----
-----MA	KIKHAKR	-----G-S	A--SSSPYER	PN-----
-----MG	ENSRKSS	-----	-----	-----
-----MG	KVKTPRR	-----A-G	A-ASSSPYDR	KG-----GN
-----MG	KVKTPRR	-----A-G	A-ASSSPYDR	KG-----GN
-----MP	KAQKQKR	-----A-A	A--SSGPYDR	K-----
-----MP	KAQKASK	-----K-S	G-GGPNPYDR	KG-----
-----MP	KAQKASK	-----K-S	G-GGPNPYDR	KG-----
-----MG	KAKSAKR	-----N-G	G-ASASPYER	PSKPGGGGGG
-----MA	KAARKKF	-----S-T	S--SDPTGS	T-----
-----MA	KAPKKKF	-----S-S	A--PNPTGA	T-----
-----MA	KAQKKKF	-----S-T	A--ADPTGK	R-----
-----MG	KAQKKKY	-----S-G	I----STGK	E-----
-----MP	KAEKKKY	-----G-G	S----TTKK	Q-----
-----MG	KAVKKKY	-----S-G	A--S-SGGK	E-----
-----MG	KAPKFSF	-----S-G	S--G-SKGN	Q-----
-----MA	KADKKKY	-----S-G	A----TTNK	Q-----
-----MG	KAQKKKY	-----S-G	A----TSSK	Q-----
-----MG	KAQKKKY	-----S-G	A----TSSK	Q-----
-----MG	KAQKKKY	-----S-G	A----TSSK	Q-----
-----MG	KAQKKKY	-----S-G	A----TSSK	Q-----
-----MG	KAQKKKY	-----S-G	A--P-GSGK	Q-----
-----MG	KAQKRSY	-----T-G	T--P-STNK	Q-----
-----MP	KATDRF	-----S-R	A--HRPSVK	QT-----
-----MP	KATSQTFRAQ	P-----AS-A	A--QRPKKG	GE-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----MP	KLTTKAA	-----K-K	T-----	-----
-----MP	KIKAGAS	-----G-R	C-----	-----
-----MP	KIKSGAS	-----G-R	RRAR-----	-----
-----MP	KVKSGTK	-----	-----	-----
-----MP	KGKSVTS	-----S-R	RRE-----	-----
-----MP	KFKSKTP	-----K	-----	-----
-----	-----	-----	-----	-----
-----MG	KAQKKKY	-----S-G	A----TSSK	Q-----
-----MA	KKNKVEK	-----	-----	-----
-----	MSPKR	-----	-----	-----
-----MG	K	-----	-----	-----
-----MG	KAERQRT	-----Q-R	I-----	-----
-----GGLRVAGG	VQKKSQK	-----	-----	-----
-----DGLRVAGG	IQKKTNR	-----	-----	-----
-----MA	HALSARG	-----R-G	A-----	-----
-----AGLRVAGG	AVRKKSH	-----G	-----	-----
-----GLRVAGG	GVVVRGK	-----	-----	-----
-----GIRVAGG	IAKHHSL	-----A-S	S-----	-----
-----MAGG	KAPRKAS	-----	-----	-----
-----RWDDTAMAGG	KAVKGGK	-----	-----	-----
-----	-----	-----	-----	-----
-----MAGG	KIQKKRQ	-----G	-----	-----
-----MAGG	KIQKKRH	-----G-G	G-----AGG	G-----
-----MAGG	KIQKKRH	-----G-G	G---AGGGGG	G-----
-----MAGG	KIQKKRH	-----G-G	G---GGGGGG	G-----
-----MAGG	KIQKKRH	-----G-G	G---AGGGGG	G-----
-----MAGG	KIQKKRH	-----G-G	G---AGGGGG	G-----
-----MAGG	KIQKKRH	-----G-G	G---AGGGGG	G-----
-----MAGG	KIQKKRQ	-----G	-----	-----
-----MAGG	KIQKKRH	-----G	-----GG	G-----
-----MAGG	KIQKKRH	-----G	-----GG	G-----
-----MAGG	KIQKKRH	-----G	-----GG	G-----
-----MAGG	KIQKKRH	-----G-A	A-----GG	A-----
-----MAGG	KIQKKRH	-----G	-----	-----

-----MAGG KIQKRRH---- -----G-A A-----GG A-----
-----MAGG KIEKRRH---- -----Q-Q -----
-----MAGG KIEKRRH---- -----Q-Q -----
-----MAGG KIRKEKQ-----
-----MAGG KMRRDKP---- -----H-R G-----AS AG-----
-----MAGG KMKKDKP---- -----Q-R G-----SS S-----
-----MAGG KMRKDKP---- -----Q-R G-----SS S-----
-----MAGG KIRKEKP---- -----K-A A-----
-----MAGG KIKKEKG---- -----K-----
-----MAGG KMKKEKG---- -----K-----
-----MAGG KVKKEKG---- -----K-P H-----
-----MAGG KIRKEKG---- -----K-P -----
-----MAGG KIKKEKQ---- -----K-S V-----
-----MAGG KIRKEKP---- -----S-S R-----
-----MAGG KTKKEKA---- -----R-----
-----MAGG KIKKEKP---- -----K-----
-----MAGG KIRKEKA---- -----K-----
-----MAGG KIRKEKA---- -----K-----
-----MAGG KIKKEKP---- -----K-----
-----MAGG KMRKEKP---- -----K-A S-----
-----MAGG KIRKEKP---- -----K-A S-----
-----MAGG KIKKEKQ---- -----K-G Q-----
-----MAGG KMKKDKQ---- -----K-G P-----
-----MAGG KMKKDKQ---- -----K-G P-----
-----MAGG KMKKEKP---- -----S-H G-----
-----MAGG KMQKKRP---- -----S-----

-----MKGNP VS---KNSMV FNK-SFGQHI LVNPQILHSI VEKSAIRPTD
-----MKNT VS---KSNMV FNK-SFGQHI LINQQILQMI VDKSAIRPTD
---GQKAAGG GG---GLALP LQK-KFGQHL LKNPGILDKI IEASDIKSTD
-----MQGFE LTK-QHGQHL LANPLVIKSI VEKAEIRSTD
-----MQGFE LTK-QHGQHL LANPLVIKSI VEKAEIRSTD
-TTAKEAASR AV---NNVFR MNT-DLGQHI LKNPGVAQAI VNKAGLKQSD
-----AAKTK AA---NSIFK MNT-DLGQHI LKNPGVAQRI VEKAEKQSD
---GGAPLSK AA---SAIFK FNT-DIGQHI LKNPTIADAI VDKANIQPSQ
---GGAPLSK AA---SAIFK FNT-DIGQHI LKNPTIADAI VDKANVQPSQ
---DQGPLGK AT---SAIFK FNT-DLGQHI LKNGAIADAI VDKANIQQGQ
-----AAKTK AA---SSVFR MNT-DIGQHV LKNPGIAQAI VDKAALKQSD
---DQGPLGK AT---SAIFK FNT-DLGQHI LKNGAIADAI VDKANIQQGQ

KGDGRSAAAK AG---SAIFK FNT-DLGQHI LKNGAIADNI VDKANVQPSQ
KGDGRSAAAK AG---SAIFK FNT-DLGQHI LKNGAIADNI VDKANVQPSQ
---GAPLSK AA---SAIFK FNT-DIGQHI LKNPTIADAI VDKANVQPSQ
-----AAKTK AA---HSIFK MNT-DIGQHV LKNPGIAAAI VEKAEKQSD
-----AAKTK AA---HSIFK MNT-DIGQHV LKNPGIAAAI VEKAEKQSD
-----AAKTK AA---NNVFR MNT-DIGQHV LKNPGVAQAI VDKAEKQSD
-----ARKQK ASASKNAIFK MNT-DIGQHI LKNPGVAQAI VDKADVQSD
-----ARKQK ASASKNAIFK MNT-DIGQHI LKNPGVAQAI VDKADVQSD
-----ARKSK AA---NNIFK MNT-DIGQHI LKNPGVAQAI VDKADVQSD
---SRKKGH SA---NNVFK FNT-DLGQHI LKNPGVAQAI VDKADLKQSD
-----SAKAS AA---HSIFK MDK-DLGQHI LKNPGVASAI VQKAYLKQSD
-----SAKAS AA---HSIFK MDK-DLGQHI LKNPGVASAI VQKAFKQSD
-----SAKAS AA---HSIFK MDK-DLGQHI LKNPGVASAI VQKAFKQSD
-----SAKAA AA---HSIFK MDK-DLGQHI LKNPGVATAI VQKAHLKQSD
-----EKA AA---NHVFK FNT-NVGQHI LKNPGVAEAI VAKAFLKPSD
-----AA AL---TNSFK HNK-DYGQHI LKNPGVAEAI VKANLKPTD
-----SQ KT---NNVFK FNT-NVGQHI LKNPGVADAI VHKAELKPTD
-----SQ KT---NNVFK FNT-NFGQHI LKNPGVADAI VHKAELKPTD
-----Q KS---NNVFK FN----- --KADLKPTD
-----Q KS---NNVFK FN----- --KADLKPTD
-----GDKNS KT---NNVFK FNT-NFGQHI LKNPGVSDAI VDKAFLKPTD
-----SGKSS KT---NNVFK FNT-NFGQHI LKNPGVSDAI VQKAFKPTD
-----SGASS KT---NNVFK FNT-NFGQHI LKNPGVSDAI VEKAFKPTD
-----ER---KNIFK YNT-NIGQHI LKNPGIADMI VAKANLKPTD
-----E AR---KSIFK YNT-NIGQHI LKNPGIADMI VAKANLKPTD
-----E AR---KSIFK YNT-NIGQHI LKNPGIADMI VAKANLKPTD
-----AA---NRVFK FNT-NIGQHI LKNPGIADTI VAKAYLKPTD
GSGGGSGSNS NK---NNVFK FNT-NFGQHI LKNPGVSDAI VEKAFKPTD
-----TSGAA AK---NNVFK FNT-NVGQHI LKNPGIADAI VDKANLKPTD
NAAAAAAAAAP TK---NNVFR FKK-DYGQHI LKNPGIAEEI VKKAYLRPTD
NAAAAAAAAAP TK---NNVFR FKK-DYGQHI LKNPGIAEEI VKKAYLRPTD
-----ASKA AA---ANIFR FDK-DYGQHI LKNPGISDAI VEKAFKPTD
---GGGGGKA TN---TNIFK FDK-DFGQHI LKNPGISDAI VDKAFLKPTD
---GGGGGKA TN---TNIFK FDK-DFGQHI LKNPGISDAI VDKAFLKPTD
GGGGGSSKA SS---NNIFK FNTSSYGQHI LKNPGVAEAI VVKANLKPTD
-----VSAEK HL---NSVFK FNT-NLGQHI LKNPLVAQGI VDKAGIKPSD

-----MAEKY HA---GTGIQ FHK-SKGQHI LKNPLIVDRI VEKAGIKNTD
 IVLEIGPGTG NLTSLLEKA -KKVIAIEID PRMIAELNKR FK--YSQ-HA
 IVLEIGPGTG NLTELLQRA -KQVICVEID PRMVIELTKR FK--YSQ-YS
 TVLEIGPGTG NLTMRLELA -KKVVALEID PRMAAEVKKR AQ---TA-GR
 TVLEIGPGTG NLTLALLEKA -KHVIAIEID PRMVSELKKR IA--AIPEYR
 TVLEIGPGTG NLTALLEKA -RHVIAIEID PRMVSELKKR IA--AIPEYR
 VVLEVGPGTG NLTVKILEQA -RKVIAVEMD PRMAAELTKR VQ--GKP-EQ
 VVLEIGPGTG NLTVKILEKA -KKVIAVELD PRMAAEVTKR VQ--GTP-AQ
 TVLEVGPGPG ILTTRILQKA -KKVVAVELD PRMAAELTKT VQ--ATP-AE
 TVLEVGPGTG ILTTRILEKA -KKVIAVELD PRMAAEVTKT VQ--GTP-AE
 TVLEVGPGPG VLTNRILAKA -KKVVAVEVD PRMAAELTKN VQ--GTP-AE
 VVLEIGPGTG NLTVKILEKA -KKCIAVELD PRMAAEITKR VQ--GTP-VQ
 TVLEVGPGPG VLTNRILAKA -KKVVAVEVD PRMAAELTKN VQ--GTP-AE
 ----- --MAAEVTKR VQ--GTP-AQ
 TVLEVGPGPG ILTTRILEKA -KKVVAVEFD PRMAAELTKR VQ--ATP-ME
 TVLEVGPGPG ILTTRILEKA -KKVVAVEFD PRMAAELTKR VQ--ATP-ME
 TVLEVGPGTG ILTTRILEKA -KKVIAVELD PRMAAEVTKT VQ--GTP-AE
 VVLEIGPGTG NLTAKILEKA -KKCIAVELD PRMAAEVTKR FQ--STP-YQ
 VVLEIGPGTG NLTAKILEKA -KKCIAVELD PRMAAEVTKR FQ--STP-YQ
 TVLEIGPGTG NLTVKILEKA -KKVIAVELD PRMAAEVTKR VQ--GKP-EQ
 IVLEVGPGTG NLTTRILEKA -KRVIAVEQD PRMAAELTKR FQ--GTP-MA
 IVLEVGPGTG NLTTRILEKA -KRVIAVEQD PRMAAELTKR FQ--GTS-AA
 IVLEVGPGTG NLTTRILEKA -KKVICVEQD PRMAAEITKR FQ--GTP-AA
 IVLEVGPGTG NLTTKILEKA -KKVIAVEAD PRMAAEITKR FQ--GTP-AQ
 HVLEVGPGTG NLTVLILKAA -KAVTAVEMD PRMAAELTKR VQ--GTA-EA
 HVLEVGPGTG NLTVLILKAA -KAVTAVEMD PRMAAELTKR VQ--GTP-EA
 HVLEVGPGTG NLTVLILKAA -KAVTAVEMD PRMAAELTKR VQ--GTP-EA
 HVLEVGPGTG NLTVLILKAV -KQVTAVEMD PRMAAELTKR VQ--GTP-EE
 TVLEVGPGTG NLTVRILQQA -QKVIAVELD PRMAAEVTKR VQ--GKP-EQ
 TVLEVGPGTG NLTVRILESA -KKVIAVEVD PRMAAEVTKR VQ--GKP-EQ
 TVLEIGPGTG NLTVRILEKS -KKLIAIEFD PRMAAEVTKR VQ--GTP-EQ
 TVLEIGPGTG NLTVRILEKS -KKLIAIEFD PRMAAEVTKR VQ--GTP-EQ
 TVLEIGPGTG NLTVRILENA -KKLIAIEFD PRMAAEVT--
 TVLEIGPGTG NLTVRILENA -KKLIAIEFD PRMAAEVT--
 TVLEVGPGTG NLTVRILEKA -KKCICVELD PRMAAEVTKR VQ--GKP-EQ
 TVLEVGPGTG NLTVRILEQA -KKCICVELD PRMAAEVTKR VQ--GKP-EQ
 TVLEVGPGTG NLTVRILERA -KKCICVELD PRMAAEVTKR VQ--GKP-EQ
 TVLEIGPGTG VLTTRILEQA -KAVKAVELD IRMGAEELTKR VQ--GKP-EQ
 TVLEIGPGTG VLTTRILEQA -KAVKAVELD IRMGAEELTKR VQ--GKP-EQ
 TVLEIGPGTG VLTTRILEQA -KAVKAVELD IRMGAEELTKR VQ--GKP-EQ
 TVLEIGPGTG VLTTRILEQA -KAVKAVELD TRMAAELTKR VQ--GGP-LQ
 TVLEVGPGTG NLTVRILERA -KKCICVEVD PRMAAEVTKR VQ--GTP-EQ
 TVLEIGPGTG NISVRILEKA -KRLVAVELD PRMASEITKR VM--GTP-SQ
 TVLEVGPGTG NLSVKILERA -QKLIARELD PRMGAEELTKR VQ--GKP-EQ
 TVLEVGPGTG NLSVKILERA -QKLIARELD PRMGAEELTKR VQ--GKP-EQ
 VVVEVGPGTG NITVRILEKA -KKVIAIELD PRMGAEVTKR VQ--GGP-LA
 VVVEVGPGTG NITVRILEKA -KKVIAIELD PRMGAEVTKR VQ--GTP-LA
 VVVEVGPGTG NITVRILEKA -KKVIAIELD PRMGAEVTKR VQ--GTP-LA
 TVLEIGPGSG NLTVRILERA -KKVIAVEID PRMAAEVTKR VQ--GTP-EQ
 IVLEVGPGTG NLTVRILEQA -RKVIASEMD PRMAAELTKR VH--GTP-NQ
 IVLEVGPGTG NLTVRILEQA -RKVVAVEMD PRMAAELTKR VH--GTP-QQ
 TVLEVGPGTG NLTVRILEQA -KNVIAVEMD PRMAAELTKR VH--GTP-QQ
 IVLEVGPGTG NLTVRILEQA -RKVVAVEFD PRMAAELTKR VH--GTP-AE
 IVLEVGPGTG NLTVRILEKA -KKVVAVEMD PRMAAELTKR VH--GTP-AE
 IVLEIGPGTG NLTVRILEQA -RKVVAVEFD PRMAAELTKR VH--GTP-VE
 VVLEVGPGTG NLTVRILEQA -RKVIAVEMD PRMGAEELTKR VH--GTA-GE
 IVLEVGPGTG NLTVRILEQA -RKVVAVEMD PRMAAELTKR VH--GTP-AE
 VVLEVGPGTG NLTVRILEQA -KNVVAVEMD PRMAAELTKR VR--GTP-VE
 VVLEVGPGTG NLTVRILEQA -KNVVAVEMD PRMAAELTKR VR--GTP-VE
 VVLEVGPGTG NLTVRILEQA -KNVVAVEMD PRMAAELTKR VR--GTP-VE
 VVLEVGPGTG NLTVRILEQA -KNVVAVEMD PRMAAELTKR VR--GTP-VE
 IVLEVGPGTG NLTVRILEQA -RKVVAVEMD PRMAAELTKR VH--GTP-AE
 TVLEVGPGTG NLTVRILEQV -RKAVAVEMD PRMAAELTKR VR--GTD-GE
 TVLEVGPGTG NLTVRILEKA -KSVVAIEMD PRMAAELTKR VQ--GTG-AQ
 VVLEVGPGTG NLTVRILPAC -RKVVAVEMD PRMAAEVQKR VL--GKP-EQ
 TVLEIGSGTG NLTIKLLAKA -KRVICYEK ERMAAELVCR VK--SLN-LC
 TVLEIGPGTG NLTVRILQAC -KKVVAVEMD PRLAAELQKR VH--GTS-DQ
 TVLEIGPGTG NLTVRILQAC -KKVVAVEMD PRLAAELQKR VN--GTP-DQ
 VVLEVGPGTG NMTVKLLEKA -KKVIAVELD VRLVAELHCR VQ--GTP-LA
 VVLEVGPGTG NMTVKLLEKA -KKVIAVELD PRLVAELHCR VQ--GTP-LA
 VVLEVGPGTG NMTVKLLEKA -KKVIAVELD PRLVAELHCR VQ--GTP-LA
 ----- --RREQKN -AGVIAVELD PRLVAELHCR VQ--GTP-QA
 VVLEIGPGTG NMTVKILPHV -KKLVCEID IRLVGELEKR VQ--GTP-YR
 VVLEIGPGTG NMTIKILEKA -KKVVAVEID PRLAAELQKR VQ--GTP-YQ
 VVLEVGPGTG NLTVRILEQA -KNVVAVEMD PRMAAELTKR VR--GTP-VE

SRLKVIQGDV LK---C-D-- --LPYFDICV ANIPYQISSP LTFKLL--SH
SRLKVIQGDV LK---C-D-- --LPYFDICV ANIPYQISSP LTFKLL--SH
SRLKVIQGDV LK---C-E-- --LPYFDICV ANIPYQISSP LTFKLL--AH
SRLKVIQGDV LK---C-E-- --LPYFDICV ANIPYQISSP LTFKLL--AH
TRLKVIQGDV LK---C-E-- --LPYFDICV ANIPYQISSP LTFKLL--AH
NRLKVIQGDV LK---C-D-- --LPYFDICV ANIPYQISSP LTFKLL--AH
NRLKVIQGDV LK---C-D-- --LPYFDICV ANIPYQISSP LTFKLL--AH
NRLKVIQGDV LK---C-D-- --LPYFDICV ANIPYQISSP LTFKLL--AH
SRLKVIQGDV LK---T-E-- --LPYFDICV ANIPYQISSP LTFKLL--NH
NRLTVIQGDV LK---T-E-- --LPYFDICV ANIPYQISSP LTFKLL--GH
SRLTVIQGDV LR---T-E-- --LPYFDICV ANIPYQISSP LTFKLL--SH
NRLTVIQGDV LK---T-E-- --LPYFDICV ANIPYQISSP LTFKLL--KH
SRLTVIQGDV LK---T-E-- --LPYFDICV ANIPYQISSP LTFKLL--KH
NRLKVIQGDV LK---T-D-- --LPYFDICV ANIPYQISSP LTFKLL--NH
NRLKVIQGDV LK---T-D-- --LPYFDICV ANIPYQISSP LTFKLL--NH
NRLQVIQGDV LK---T-E-- --LPYFDICV ANIPYQISSP LTFKLL--KH
NRLKVIQGDV LK---T-E-- --LPRFDICV ANIPYQISSP LTFKLL--FH
NRLKVIQGDV LK---T-E-- --LPRFDICV ANIPYQISSP LTFKLL--FH
NRLKVIQGDV LK---T-E-- --LPRFDICV ANIPYQISSP LTFKLL--FH
NRLK----- -----ISSP LTFKLL--FH
NRLKVIQGDV LK---T-E-- --LPRFDICV ANIPYQISSP LTFKLL--FH
NRLKVIQGDV LK---T-E-- --LPRFDICV ANIPYQISSP LTFKLL--FH
SRLTVIQGDV LK---T-D-- --LPYFDICV ANIPYQISSP LTFKLL--FH
SRLKVIQGDV LK---T-D-- --LPYFDICV ANIPYQISSP LTFKLL--FH
NRLKVIQGDV LK---T-D-- --LPYFDICV ANIPYQISSP LTFKLL--FH
NRLKVIQGDV LR---C-D-- --LPYFDICV ANIPYQISSP LTFKLL--AH
DRLKVIQGDV LK---C-E-- --LPYFDVVCV ANIPYQISSP LTFKLL--SH

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QPLPRKFVLM FQLEFAQRLA AEPGQDQYSR LTVNTKLLSK TKIIRVSRN
SPAPRTCILM FQREFAMRVV AQPQDGLYCR LS-----
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PNPPRVAVLM FQREFAKRLV ARPGDALYSR LSVNVNFWAT CKHIMKVGKQ
PNPPRCSVLM FQREFALRLT ARPGDALYCR LSVNAQFWAR ITHILKVGKK

RPVFRCAVIM	FQREFAMRLV	AQPGDNLYCR	LS-----	-----
RPMFRSATIM	FQREFAMRLV	AKPGDSL YCR	LSVNTQLLAR	VSHLLKVGKN
NFKPPPKVES	SVIRIQPK--	N-PA--PQIN	YLEWDGLLRI	CFMRKNKQLS
NFKPPPKVES	SVVRIEPK--	N-PI--PNIN	YIEWDGLLRI	CFNRKNKQLS
SFNPPPEVDS	MIVKFVLH--	K-DP--INVD	FPEFDGLLRV	AFTRKNKTLH
SFKPPPNVDS	AVVEMYPI--	G-PP--PGLD	LDEFNGLTRI	LFSKKNKTLG
SFKPPPNVDS	AVVEMYPV--	G-PP--PGLD	LDEFNGLTRI	LFSKKNKTLG
-----VES	SVIRIEPK--	N-PR--PPIS	YDEWDGLLRI	VFVRKNKTIA
NFKPPPLVES	SVVRLVPK--	N-PR--PQIN	YDEWDGLLRI	LFVRKNKTIR
NFRPPPVQES	SVVRVEPK--	A-DR--PDIS	WDEWDGMLRI	CFVRKNKTLR
NFRPPPVQES	SVVRIEPK--	A-DR--PNIS	WDEWDGMLRI	CFVRKNKTLR
NFRPPPVQES	SVVRVEPK--	S-DR--PAIS	WDEWDGMLRI	CFVRKNKTLR
NFKPPPLVES	SVVRLVPK--	N-PR--PQIS	YEEWDGLLRI	VFVRKNKTIR
NFRPPPVQES	SVVRVEPK--	S-DR--PAIS	WDEWDGMLRI	CFVRKNKTLR
NFKPPPLVDS	SVVRLVPK--	N-PR--PQIN	YEEWDGLLRI	CFVRKNKTIR
NFRPPPVQES	SVVRIEPK--	L-GK--PEIS	WDEWDGMLRI	CFVRKNKTLR
NFRPPPVQES	SVVRIEPK--	L-GK--PEIS	WDEWDGMLRI	CFVRKNKTLR
NFRPPPVQES	SVVRIEPK--	A-DR--PNIS	WDEWDGMLRI	CFVRKNKTLR
NFKPPPVQES	SVIRMVPK--	N-PR--PQIN	YEEWDGLLRI	VFVRKNKTLR
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NFNPPPVQES	NVVRISPK--	N-PR--PSIS	YDEWDGLLRV	CFVRKNRVLR
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NFNPPPLVES	NVRIEPK--	F-PR--PQIA	YEEWDGLLRI	AFVRKNRTRL
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NFNPPPVQES	NVRIEPK--	N-PR--PQIA	YEEWDGLLRI	CFVRKNRTRL
NFKPPPVQES	SVVRIEPLG	S-ER--PGVS	WEEWDGMLRI	CFVRKNRSMR
NFRPPPVQES	SVVRIEPTG	K-ER--PGVS	WEEWDGMLRI	CFVRKNRTMR
NFRPPPVQDS	CVVRIVPKQG	A-ER--PTIA	FEEDGLLRI	CFNRKNRTMR
NFRPPPVQDS	CVVRIVPKQG	A-ER--PTIA	FEEDGLLRV	CFNRKNRTMR
NFRPPPVQDS	CVVRIVPKQG	S-ER--PSIA	FEEDGLLRI	CFNRKNRTMR
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NFRPPPVQES	SVVRIEPMG	K-DR--PNVS	WDEWDGLLRV	CFVRKNKTLR
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NFSPPPEVES	VVRLEPR--	P-EV--PAAN	IQELDGMLRI	CFSRKNKTLR
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NFRPPPVQES	SVVRIEPLG	K-DR--PAVS	WAEFDGLLRI	VFVRKNKTVR
-----VES	SVVRIEPLG	R-ER--PNVS	WEEWDGMLRV	CFNRKNKTLH
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NFNPPPLVES	SVVKIEPKMG	A-DR--PQVS	WTEWDGMLRV	CFNRRNKTMR
NFRPPPVQES	SVVRIEVK--	V-PR--PNID	FNEWDGLLRI	CFVRKNKTIA
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NFRPPPVQES	SVVRIEIK--	N-PR--PEVD	FNEWDGLLRI	VFVRKNRTIA
NFRPPPVQES	SVVRIEIK--	N-PR--PPIE	FNEWDGLLRI	VFVRKNKTIA
NFRPPPVQDS	SVVRLVPL--	D-PP--PPVK	FEEDGGLTRI	VFVSRNKTIVH
NFRPPPVQES	SVVRIMPR--	D-PP--PPVK	FEEDGGLNRI	IFSRANKTLR
NFNPMKVES	AVVRIRKR--	L-EQ--PSIN	IEEFANFLRI	CFKRKNKTLS
NFRPPPKVES	SVVRLEPK--	N-PP--PPVD	FDEFDGLLRI	LFTRKHKIFP
NFRPPPKVES	SVVRLEPK--	N-PP--PPVN	FKEFDGLLRI	LFTRKHKIFS
-----	-----	-----	FFEWDGLVRI	TFVRKNKTLS
NFRPPPKVES	SVVRLEPK--	N-PP--PPIN	FQLLHGF---	-----
NFRPPPKVES	SVVRIEPK--	N-PP--PPIN	FQ-----	----KNKTFS
NFRPPPKVES	SVVRIEPR--	N-PP--PPIN	F-----	-----
NFKPPPKVES	SVVRIEPI--	S-PQ--PDIN	LKEWDGMLRL	VFLRKNKTIG
NFKPPPKVES	AVVRIEPK--	N-PP--PPIN	YTEWDGLTRI	AFLRKNKTIA

SGFLGTTSMV EMLESNYRTY CAQNNI---- ---VLDDGPL DP---ADAA-
 ASFLGTAADV ELLASNYRLF CAQNDI---- ---LLDDSPI NP---NEGTL
 ASFLGTAADV ELLASNYRLF CAQNNI---- ---ELDDSPV GP---ED---
 ASFLGTAADV ELLASNYRLF CAQNNI---- ---ELDDSPV GP---ED---
 ASFMGTAAVL ELLTSNYRLY CAQNDI---- ---PIDDSPL DP---SEIAA
 ASWLGTKVEL AMIERNYRVW CAMNDV---- ---ALDDTII EG---EDAT-
 ASWLGTMKQVL AMCERNYRVY CSTNNI---- ---ALDETPV DD---EDED-
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 ASWLGTKVEL AMVERNYRTW CAMNGV---- ---PIDESVI EGAEEDDD-
 ASWLGTKVEL AMVERNYRTW CAMNGV---- ---PIDESL- -----
 ASWLGTKVEL AMVERNYRTW CAMNGV---- ---PIDESIV EGGADDEDDN
 ASF-IDSE--- ELCQRNWITW AAMDPE---- ---KVSEQDL QFFR-----
 ASF-IDSE--- ELCQRNWITW AAMDPE---- ---KVSEQDL QFFR-----
 ASF-IDSE--- ELCQRNWITW AAMDPE---- ---KVSEQDL QFFR-----
 ASF-LDSH--- EICERNWITW TSMYPD---- ---KVSEKDL DLLR-----
 ASWLGTKVEL AMVERNYRTW CAMNGV---- ---PVDDTL- -----
 ASF-GTKEVL ALVERNYRTW CALNNV---- ---PVDETIV ED---GGGDV
 ASFLGVKEVL AMAERNYKVV CTMNDI---- ---PIDESVV ET---TDGD-
 ASFLGVKEVL AMAERNYKVV CTMNDI---- ---PIDESVV ET---TDGD-
 AAF-SIKEVL ALCERNYKIY CSLNNI---- ---PIDESIV DS-----AT
 AGF-NQKEVL NMCERNYKVY CTLNNI---- ---PIDESLA SA---ADLAA
 AGF-NQKEVL NMCERNYKVY CTLNNI---- ---PIDESLA SA---ADLAA
 SSWLGTKVEL NMVERNYRVW CSMNNV---- ---ALEEGTV DE---DDDDE
 AGF-KSNNIL DILEKNYKTF LSTANAAANG DDSMMVD--- -----
 AGF-KSNNVI EILEKNYKTF LATSNT---- DDAMVVD--- -----
 AGF-KSNNVL DILEKNYKTF LAISNP---- EDVMMVD--- -----
 AGF-KSTAVL EIMEKNYKAY LATTND---- --AMVDD--- -----
 AGF-KSTTVL EILEKNYKAY LAMNNE---- ---MVDD--- -----
 AGF-KSTTVL EILEKNYKAF LATQSA---- ---VPTT--- -----
 AGF-KSTTVL EILEKNYKAF LATTGN---- GSDMVDD--- -----
 AGF-KSTTVL EILEKNYKTF LAINNQ---- ---SIDE--- -----
 AGF-KSTTVM DILEKNYKTF LAMNNE---- ---MVDD--- -----
 AGF-KSTTVM DILEKNYKTF LAMNNE---- ---MVDD--- -----
 AGF-KSTTVM DILEKNYKTF LAMNNE---- ---MVDD--- -----
 AGF-KSTTVM DILEKNYKTF LAMNNE---- ---MVDD--- -----
 AGF-KSTTVM DILEKNYKTF LAMNNE---- ---MVDD--- -----
 AGF-KSTSVL EILEKNYKTY LSMNNE---- ---MIDD--- -----
 AGF-KSSSVI DILEKNYKTF LAMNDE---- ---MVDD--- -----
 ANF-AAKGV L AMLESNWRTW CSEKDI---- ---TITD--- -----
 AGF-KAKGVV ELLEKNYRTW CAEQGA---- ---IIED--- -----
 GVF-GDKSVI KTVKKEKREI AEILSV---- -----
 ANF-KQTTVL NMLEQNYKTY CSAHEL---- ---MVES--- -----
 ANF-KQTTVL NMLEENYKTY CSAHGL---- ---MVEA--- -----
 AAF-KSSAVQ QLLEKNYRIH CSVHNI---- ---IIFE--- -----

 AAF-KSSAVQ QLLEKNYRIH CSVHNI---- ---IIFE--- -----
 ---QSSAVQ QLLEKNYRIH CSVHNI---- ---AVPE--- -----
 AIF-RLKAVI DLMEKNYRVY CSLKNI---- ---KLDD--- -----
 AAF-KQTSVM EMLDKNYKLH CSLHNK---- ---EVEA--- -----
 AGF-KSTTVM DILEKNYKTF LAMNNE---- ---MVDD--- -----
 SAF-R-----
 SLF-GQSRVV QLLQTNRARI RDEAAK---- ---SQNTTSA DT-----
 GIM-KQHAVL SLLNSNEKQL QMMQGL---- ---ESAMELT PM-----
 AIF-KNKSVL ELLQKNYEMY CALKDI---- ---VPRG--- -----
 AIF-KQTNL QALETNWRTY QALQGN---- ---AGAAAPP AA---AA---
 AIF-RQTNAL QALEANYRTY QALQGA---- ---GGGVAGA GG---ASGGG
 AIF-RQGNTL ALLEQNYAVA QALHRA---- ---ADGG--- -----
 GIF-RTKNVL ELLTNNFRTY KALQVV---- ---PDK--- -----
 GIF-RTKNVL ELLTNNYRTY KALKVV---- ---PDKKAAK AA-----
 GIF-RTKTVL ELLETNYKTY KALQL---- -----
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 SIF-RQKAVL ALIEKNYKTF QALQEA---- ---GGSEARV PA-----
 SIF-RQKAVC ALMEKNFKTH QALQGS---- ---LDNQADA DL-----
 AMF-KQKRVL ELLEKNYKTM QSLQLT---- ---S---GAET AE---EKMSA
 AIF-KQKRVL ELLEKNYKTM QSLQLT---- ---S---DAEK GE---EKMSP
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 SLF-KQKRVL ELLEKNYKTM QSLQLA---- ---Q---ESEM GE---EKMSP
 SLF-KQKRVL ELLEKNYKTM QSLQLA---- ---Q---ESEM GE---EKMSP
 SLF-KQKRVL ELLEKNYKTM QSLQLA---- ---Q---ESEM GE---EKMSP

SLF-KTKRVL ELLEKNYKTM QSLQLT---- --R--DADM GE---QKMSA
 SLF-KQKRVL ELLEKNYKTM QSLQTV---- --Q--DAEM GE---EKMSA
 SIF-KQKRVL ELLEKNYKTM QSLQLT---- --Q--DAEM GE---EKMSA
 SIF-RQKSVL SLLEKNYKTL QALQLT---- --R--KEQM EE-----
 SIF-RQKSVL SLLEKNYKTL QALQLT---- --R--KEQM EE-----
 SIF-GQKKVL EMLEKNYRTI ESLGQL---- --TNDSEA-----
 SIF-RQKSVL SLLEKNYRTL QALQLA---- --E--NVPS ED---VEMA-
 SIF-RQKSVL NILEKNYRTL QALQFS---- --E--KAPS ND---MEMA-
 SIF-RQKSVL NILEKNYRTL QALQFS---- --E--KAPS DD---MEMA-
 SIF-RQKSVL SLLEKNYKTL CSLNIL---- --Q--QSG GN---DDSA-
 AIF-RQKNVI SLLEKNYKTV QALKLS---- --Q--EGPL KE---TETK-
 SIF-RQKNVI SLLEKNYKTV QALKLS---- --Q--EGPL EE---TDTK-
 SIF-RQKSVI SLLEKNYRTV RALELG---- --Q--EDSL KE---VDAK-
 AIF-RQKNVI SMLEKNYKTV QALKLS---- --Q--EGLL KE---ADTK-
 SIF-RMKNVL SLLEKNYKTL QALQPS---- --E--D--- ----ADAE-
 SIF-RIKNVL SMLEKNYKTL QALQQL---- --Q--NGSS GS---TNAE-
 SIF-RQKSVI NLEKNYKTL QALNLA---- --PAQQGAL ED---TNDV-
 SIF-KQKSVL VMLEKNFKTL QAVLAS---- --IQNDGSN GE---A-AA-
 SIF-RQKSVL LMLEKNFKTL QAVLAS---- --L--NGST GE---A-AG-
 SIF-RQKSVL LMLEKNFKTL QAVLAS---- --L--NGST GE---A-AG-
 SIF-RQKSVL LMLEKNFKTL QAVLAS---- --L--NGST GE---A-AG-
 SIF-KQKSVL SMLEKNYKTL QAVLAS---- --LQNNGDA AL---N-TS-
 SIF-KQKSVL SMLEKNYKTL QAVLAS---- --LQNNGEP AL---NTTS-
 SIF-KQKNVL ALLEKNYKTL QALQGS---- --R--NVSL GG---ID-D-
 SIF-KQKNVL SLLEKNYKTL QALQGS---- --Q--NVSL SG---ND-D-
 SIF-KQKNVL SLLEKNYKTL QALQGP---- --Q--NVSL SG---ND-D-
 SIF-RQKSVL SLLEKNYKTV QALQLS---- --G-----
 SIF-RQKSIL SLLEKNFKTV QSLQEG---- --M----- ----ADVSI

-----NL VMDEE----- ----FEDEEQ QQKKNKNKNK -NDDQE-----
 S----- ----IMEEED VK-GKGKKDK -KDKKDKQNO

-----EDE ---AEVMD- -VDD-----
 AQG----GDD DMDMG----- ----D- -GEDAP-----
 LQG----VDE DMDMG----- ----QD- -GDEPV-----
 PME-----DV EMDTN----- ----ND- -ADDDV-----
 -----AMDIGDAQDN A-----EEED ---QDQTM- -VDD-----
 PME-----DV EMDTN----- ----ND- -ADDDV-----
 -----T EMDTGNAQDD E-----DME ---PEDDMD- -MD-----
 PEGKFANSKD DGDVD----- ----MD- -VDDAG-----
 PEGKFANSKD DGDVD----- ----MD- -VDDAG-----
 LQS----VDE DMDMD----- ----QD- -GDEAV-----
 -----M AMDMGEEQEE G---QAAEEP ---VDEVMD- -MDD-----
 -----M AMDMGEEQEE G---QAAEEP ---VDEVMD- -MDD-----
 -----PMNTVEDQGE P-----DEG ---LDGTMD- -VDD-----
 -----VDM- ---AGE ---QEVIMD- -IDD-----
 -----MEVD----- DGP ---EEEIMD- -IDD-----

-----MDTDMAADE -----QDED ---MEAIMD- -VDD-----
 E-----AE GMEVD----- ----EDD- ---FKGFS- -PDD-----
 E-----VE AMEVD----- ----AAEEE ---FNGFS- -PDD-----
 E-----VE AMEVD----- ----AAEEE ---FNGFS- -PDD-----
 A-----EE AETMD----- ----VDDE ---FKGFS- -PDD-----
 -----MEND----- GPEEE ---LDGIMD- -IDD-----
 -----MDLDDAP-- ----IAEEGE DE-WGGNMD- -TDK-----
 -----MEMD----- --DDADAG -----AD- -DDDVEP--
 -----MEMD----- --DDADPG -----AG- -EDDVEP--
 -----GD----- --DADEE -----MD- -LDDEAPE--
 -----GD----- --DADEE -----MD- -LDDEAPE--
 -----MEMDDGGA- ----AANDGE ---DAGMD- -VDD-----
 -----DMDMDEG--- ----ANDAE ---DAGMD- -VDD-----
 -----D-----D- -SEDTI-----
 -----D-----D- -SEDTI-----
 -----D-----D- -SEDTI-----
 -----D-----D- -SMDTA-----

VDE-----DA SMDVDG----- ----HDGDGE ---WGGIMD- -VDGAAEDQE
 -----VEMD----- ----ADDGE ---WGGIMD- -VDEDG-----
 -----VEMD----- ----ADDGE ---WGGIMD- -VDEDG-----
 ATA-----TDD GMDVD----- ----MDDDDG KDDGDDCDD- -GEDGE--GE
 AGA-----TND AMDVE----- ----MDDDNE DNDNEENND- --DD-----
 AGA-----TND AMDVE----- ----MDDDNE DNDNEENND- --DD-----


```

----- -MEIARLG-- -----DES -----ME- -MDDG-----
----- -GDAAVLGD- -----TSGDLS -----LE- -IDEAM-----

-----E EN--D----- -----MQEEN
QKGEESSED DE--D----- -----NNQQP
-----Q-----
-----QE-----AS GVIHA-----PSSGNS
-----HE-----GS NPSHS-----ASSIGA

-----ED--DVPDF FKE---QEN ARIQEAL-----KGRPSR
-----EAGD DE--D--DI FMD---LGD ENDTPTVATK GSLVAIGDQQ
-----EGGD DE--D--DI FMD---LGG ENDAPVTTSK GSLVAIGDQQ
-----PEMD ED--D---I LMG---DMGF EKKNVPEIPK GALLTIGNNK
-----PEMD ED--DVPDF FKE---QAN ARVQEAL---KKNPNR
-----PEMD ED--D---I LMG---DMGF EKKNVPEIPK GALLTIGNNK
-----ED--DVPDF FKE---QAN ARVQEAL---KNRPAR
-----PVVD ED--DVGDI FMN---GVEG GEKGAAVAQS GPVITVAGQQ
-----PVVD ED--DVGDI FMN---GVEG GEKGAAVAQS GPVITVAGQQ
-----QGGD DE--D--DI FMD---LGG ETEAPVTTSK GSLVAIGDQQ
-----D--DVPDF FKE---TTN ARLEAAL---KNGASR
-----D--DVPDF FKE---TTN ARLEAAL---KNGASR
-----DD--MHVHEF FAD---EPK LNSNVQ---KENPGR
-----EE--DLPDF FKE---EAD KKARKM---MDNPNR
-----GE--DLPDF FKE---EAD KKARKM---MDNPNR

-----ED--DMPDF FKE---EAD KKAKKL---LGNPNR
-----P DD--ELPDF FKQ---MQS EKK-----KNGINR
-----P DD--ELPDF FKQ---MQA EGKK-----KNGLNR
-----P DD--ELPDF FKQ---MQA EGKK-----KNGLNR
-----P DD--ELPDF FKQ---LQA ENKKS-----RNGVNR
-----A VD--ELPSF FAEESSRIAK MKG-----EKTCSK
-----GEDGF ED--EAPSF FQE---LKG TNK-----PKTKSK
-----M VD--DTPEF FKE---LGA AASKAP---EKTCSK
-----M DD--DTPEF FKE---LGA AASKTL---EKTCSK
-----QEQD DD--GATDF FAA---LKP AEA-----EKTCSK
-----QEQD DD--GATDF FAA---LKP AEA-----EKTCSK
-----L GD--DTPSF FQEL--KTAS ASV-----PKTKSK

-----D AD--EDTPSF FKDL--KSAG ANA-----PKTKSK
-----D AH--Q-----SVCGIP
-----D AH--Q-----SVCGIP
-----D AH--Q-----SVCGIP
-----EKAAD SK--Q-----SVCGVP

LEDEEDNDDD DD--DLPAF FKE---QTA THT-----AKTPSR
-----GDAGD DD--DVPEF FKE---KAP APV-----AKTPSK
-----GDAGD DD--DVPEF FKE---KAP APV-----AKTPSK
AGNEMDEGED DD--DMPTF FKE---MKD AEAKEA---AKTPSK
-----EAMEEDE DE--DMPVF FKE---QND ANAKD---AKTPSK
-----EAMEEDE DE--DMPVF FKE---QND ANAKD---AKTPSK
-----AEKGD SS--DLPSF FEEL--KQAS SEV-----PKTKSK

-----S-----

-----E-----
-----N-----

-----D-----
-----D-----
-----D-----

-----D-----
-----D-----
-----N-----

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-----D-----
-----
-----
-----D EN--E-----NAASSFVPP PDVMDTVPLE
-----ED DD--D-----
-----D-----
-----D ND--D--AM TVD--GGA GGGGG-----GGRGGR
-----G DD--D--AM TVD--GGP SARG-----KNGGGR
-----E-----
-----
-----
-----
-----P ED--DL-----VL-----
-----A DG--D--GM EIE--EED GA-----
-----G DF--D--TM D-E--DMD GS-----
-----DDD DD--D--EM EMD--DAD MA-----
-----D DD--D--EM EMD--DAD MV-----
-----D DD--D--EM EMD--DAD MV-----
-----D DD--D--EM EMD--DAD MV-----
-----D DD--D--EM EMD--DAD MV-----
-----D DD--D--EM EMD--DAD MV-----
-----D DD--D--EM EMD--DAD MV-----
-----K ED--D--EM EMD--DAD MV-----
-----R ED--D--EM EMD--DAN -A-----
-----K ED--D--DM EMD--DAD -A-----
-----K ED--D--DM EMD--DAD -A-----
-----K ED--D--EM EMD--DAD MA-----
-----K ED--D--EM EMD--DAD MA-----
-----K ED--D--EM EMD--DAD MV-----
-----D--KV SSE--DG-----
-----D--KV SSE--DG-----
-----A DE--D--EM DVK--GSD AD-----SD
-----K DD--D--EM EVD--DGD-----
-----N DD--D--DI EMD--DGD-----
-----N DD--D--DI EMD--DGD-----
-----G DE--E--EM DME--DGD AE-----
-----D DD--D--YEM EVE--DDE AK-----
-----M DD--D--EM EVE--DGG ID-----
-----A DD--D--EM EVE--DGE AD-----
-----V DDNDED--EM DVE--DGG-----
-----T DD--D--EM EME--DGD AD-----
-----T DD--D--EM EVE--DGD AD-----
-----V DD--D--GM EVE--DGN AE-----
-----M DD--D--DM EMD--EGE G-----
-----M DD--D--GDV EMD--EGQ G-----
-----M DD--D--GDV EMD--EGQ G-----
-----M DD--D--DDV EMD--EGQ G-----
-----M DD--D--DM EMD--DGE GD-----
-----M DD--D--DM EMD--EGE GD-----
-----M DD--E--MDV ECD--EA--E-----
-----M DD--D--MDM ECD--EAE GE-----
-----M DD--D--MDM ECD--EAE GE-----
-----R DD--D--DM EVE--GDD ME-----

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NENNDTKQLF KEKISKILI- D----- -NKFNEKRPS KLDIDDFLKL
EKQQTTONPF RLKINEILK- T----- -NDMFQKRPV KMDNDDFLQL
-----GPAF KAHVENTLR- A----- -SGLAESRAI KIDIDQYLAL
VTTVLTGTQI RERIAEALA- E----- -ANLADTRPN HMAIPDLLSL
KPSVLTGVQL RERIAEALA- E----- -ANLTDTRPN HMAIPDLLSL
-----EKV KGLVDSVLA- E----- -TELREKRAG KCDEADFLKL
KKRGKVGELV REKVRQVLEE E----- -TGLADKRAR MCDENDFLKL
VPRAMVTKLI QVKIQRVLE- Q----- -AGLSNARAN KCDENNFLQL
VPRAMVTKLV QAKIQQVLE- Q----- -ANLANARAQ KCDENNFLRL
VSRVMVTKLI QVKLQRILD- R----- -TELANARAQ KCDENNFLRL
KKKGKVAELV REKVRQVLED E----- -TKLADKRAR MCDENDFLKL
VSRVMVTKLI QVKLQRILD- R----- -TELANARAQ KCDENNFLRL
KKKGKVAELV REKVRQVLED D----- -TGLADKRAR MCDENDFLKL
VPRTSVTRLI QFKIERILD- T----- -AGLANHRAN KCDENNFLRL
VPRTSVTRLI QFKIERILD- T----- -AGLANHRAN KCDENNFLRL
VPRAMVTKLV QAKIQRVLE- Q----- -TNLANARAQ KCDENNFLRL
KKRGKVAELV REKVRQVLD D----- -TGLGEKRAR MCDENDFLKL
KKRGKVAELV REKVRQVLD D----- -TGLGEKRAR MCDENDFLKL
KKKGKVRELV REKVRQVLED E----- -TGLADKRAR MCEDEGFLKL
KKRGKVAELV RSKVKKVLEV D----- -TELAEKRAR LCDEGDFLKL
KKRGKVAELV RSKVKKVLEV D----- -TELAEKRAR LCDEGDFLKL

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---GKVSELV	RAKVMKVLET	D-----	-TELADKRSR	MCDEGDFLKL
KKKGKSELV	RQKVTKVLE	T-----	-TELCEKRAR	MCDEGDFLKL
KKKGRVSELV	REKVRKILED	E-----	-TQLAEKRAR	LCDEGDFLKL
KKKGRVSELV	REKVRKVLED	D-----	-TELADKRAR	MCDEGDFLKL
KKKGRVSELV	REKVRKVLED	D-----	-TELADKRAR	MCDEGDFLKL
KRKGRLAELV	REKVRKVLED	E-----	-TQLADKRAR	LCDEGDFLKL
KKRTRVYELV	REKIRKVLE-	D-----	VTELADQRAG	KCDENDFLRL
VPKTRVAELV	REKIRKVLE-	D-----	VTELADTRAG	KCDENDFLRL
RKKTKVAALV	RSKIERALE-	S-----	-TGLLEKRAR	LCDETFDLKL
RKKTKVAALV	RSKIERALE-	S-----	-TGLLEKRAR	SCDETFDLKL
RKKTKVAALV	RHKIESALD-	K-----	-TELLEKRAR	QCDETFDLKL
RKKTKVAALV	RHKIESALD-	K-----	-TELLEKRAR	QCDETFDLKL
RKKTKVAELV	REKIRKVLE-	D-----	VTELADKRSR	KCDENDFLRL
--KTKVAELV	REKIRKVLE-	D-----	VTELADKRAS	KCDENDFLRL
RKKTKVAELV	REKIRKVLE-	D-----	VTELADKRAG	KCDENDFLRL
VSKATLKSFV	RSKIEQVLE-	K-----	-TELSEARSA	KCDENDFLRL
VSKATLKSFV	RSKIEHVLE-	K-----	-TELSEARSA	KCDENDFLRL
VSKATLKSFV	RSKIEHVLE-	K-----	-TELSEARSA	KCDENDFLRL
VSKASLKNLI	RTKIEHVLE-	T-----	-TELAEARAV	KCDENDFLKL
--KTKVAELV	REKIRKVLE-	D-----	VTELADKRSR	KCDENDFLRL
RKKTKVAELV	RSKVTRVLQ-	G-----	-TDMADQRAG	KLDENAFDLKL
RKKTKVVELV	RSKIEKVLK-	D-----	-TDLAEQRAN	KCDQNDLRL
RKKTKVVELV	RSKIEKVLK-	D-----	-TDLAEQRAN	KCDQNDLRL
NPKSVALVV	RAKVDKVLV-	T-----	-TGLGDRRAR	QCDQNDLRL
NPKSVALIV	KAKLNKVLV-	S-----	-TGLADKRAR	QCDQNDLRL
NPKSVALIV	KAKLNKVLV-	S-----	-TGLADKRAR	QCDQNDLRL
RKKTKVAALV	REKIRKVLED	D-----	-TGLADQRSR	KCTENDFLRL
-DKSSMTDIV	KAKIEQVLT-	E-----	-TGFSDKRAA	KLDQTDLKL
-DKASMTVV	KNKIDQVLT-	E-----	-TGFAEKRAA	KLDQTDLKL
-SKMSLDVV	KTKIEQVLT-	N-----	-TGYSDKRAA	KLDQTDLKL
-AKGSLAEQV	KQKIETVLA-	E-----	-TGLSDKRAG	KCDQTDLKL
--DSNLLDTV	KQKIETVLR-	E-----	-TELNDKRAG	KCDQNDLRL
-SGDSLINLV	KEKIEQVLS-	E-----	-TGLAEKRAG	KCDQTDLKL
-TEKSMIDVV	KAKIETVLK-	E-----	-TGLSDKRAG	KCDQTDLKL
--TENLQSLI	KQKIETVLK-	E-----	-TGLAEKRAG	KCDQTDLKL
-TKGSMHDVV	KEKIDTVLK-	E-----	-TDLGDKRAG	KCDQNDLRL
-TKGSMHDVV	KEKIDTVLK-	E-----	-TDLGDKRAG	KCDQNDLRL
-TKGSMHDVV	KEKIDTVLK-	E-----	-TDLGDKRAG	KCDQNDLRL
-TKGSMHDVV	KEKIDTVLK-	E-----	-TDLGDKRAG	KCDQNDLRL
-TTGSMTEVV	KEKIDTVLQ-	E-----	-TKLSDKRAG	KCDQTDLRL
-TKGSMTQTV	KSKIETVLQ-	E-----	-TGLGEKRAG	KCDQTDLRL
-----EDF	KKKVESILE-	E-----	-SGYGAKRAA	SLDVDDFLKL
-----FDI	REKVESILV-	E-----	-TGFAESRAA	KMDVDDLLKL
-----	-----	-----	---YGTKRAN	KLQVEDFLQV
-----FDI	KTKVMQIIE-	S-----	-AGMSDMRAA	RCDLDDFLKL
-----FDI	KTKVMQILE-	S-----	-TGMADKRAA	KCDLDDFLNL
-----FSI	ADKIQQILT-	S-----	-TGFSDKRAR	SMDIDDFIRL
-----	-----	-----	-----	-----
-----FSV	ADKMHIPIS-	-----	-IGLGD----	-----L
-----FSI	ADKIQKILT-	D-----	-TGFSDKRAR	SMDIDDFIRL
-----FSC	KEMVEKVLE-	E-----	-SGFQESRAR	SMEIDQLLVL
-----FNI	QEK-----	N-----	-----	-----
-TKGSMHDVV	KEKIDTVLK-	E-----	-TDLGDKRAG	KCDQNDLRL
-----	-----	-----	-----	-----
AEDGSALTAV	RTEIHGILS-	E-----	-QGLLQTRAA	KMSLEDFLRL
DNETEELKGM	KEKIMRLLS-	Q-----	-NNFSKCRAS	KMSLDDFRRL
-----MDI	KQVVEEVLN-	SCWGISGSLG	VGELGQQRAS	KMSIEDFMRL
RAGGKVSPEF	KELVMKVLE-	D-----	-NGLDTNRSS	KMSQEEFLQL
KGGGRVSPEF	KELVMKVLT-	D-----	-NGLDTNRSS	KMTQEEFLQL
-----VDL	VAAVVEVLS-	G-----	-SGFLERRSA	KMTQDDFLQL
-----	QQLIEDVLA-	T-----	-DGFGEKRSS	KMSQDDFLRL
-SEASSQEVV	QQLIEDVLA-	T-----	-DGFGEKRSS	KMSQDDFLRL
-HDPSTPEGV	RKLVEEVLA-	T-----	-NGHENMRAS	KMSQDDFLVL
-KGKEGLAKV	KELALQVLK-	A-----	-NDFEDKRSS	KLQQDDFLRL
---QQGNTFF	KEKCLGVLA-	E-----	-GGYEDKRSS	KLQQDDFLRL
---TIPSTF	KDKGLAVLK-	E-----	-HDYEDKRSS	KLQQDDFLKL
---AESRASV	KEKITGILQ-	Q-----	-GDFAEKRAS	KLSQVDFLYL
---AESRACV	KEKIMGILQ-	Q-----	-GDFAEKRAS	KLSQVDFLYL
---VESRACV	KEKIMGILQ-	Q-----	-GDFAEKRAS	KLSQVDFLYL
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---VESRACV	KEKIMGILQ-	Q-----	-GDFAEKRAS	KLSQVDFLYL
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---GDDRASF	KEKIMGILQ-	Q-----	-GDFAEKRSS	KLSQVDFLYL
---ADGRASF	KEKIMGILQ-	Q-----	-GDFAEKRSS	KLSQVDFLYL
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---ADGRASF	KEKIMGILQ-	Q-----	-GDFAEKRSS	KLSQVDFLYL
---GDGAASF	KEKIMGILQ-	Q-----	-GDFAEKRRS	KLSQVDFLYL
---GDGAASF	KEKIMGILQ-	Q-----	-GDFAEKRRS	KLSQVDFLYL
---GGGAASF	KEKIMGILQ-	Q-----	-GDFAEKRRS	KLSQVDFLYL
-----SSF	KDKVLGVLR-	Q-----	-GDFAEKRAA	KLTQVDFLCL
-----SSF	KDKVLGVLR-	Q-----	-GDFAEKRAA	KLTQVDFLCL
NDMQANDPNF	KAKVIDVLK-	R-----	-YDYADKRSS	KLTQNEFIHL
---AKRSEF	KEKVLAVLK-	E-----	-GKYEDKRSS	KLAQADFMHL
---TKRAEF	KERVLAVLK-	E-----	-GNFEEKRSS	KLAQADFMHL
---TKRAEF	KEKVLAVLK-	E-----	-GNFEEKRSS	KLAQADFMHL
---EGEASEF	KGKVMGVLK-	E-----	-GDFEKRSS	KLTLQEFLYL
---EVQSEF	KGKVLGVLK-	E-----	-ADFEKRSS	KLSLQEFLYL
---EVQSEF	KDKVLSVLK-	E-----	-GDFEKRSS	KLSLQEFLYL
---EVQSEF	KDKVLGVLK-	E-----	-GDFEKRSS	KLTLQEFLYL
---PSEF	KDKVLGVLK-	E-----	-GDYEEKRSS	KLTLLEFIYL
---AEVSEF	KEKVLAVLK-	E-----	-KNFYEKRSS	KLSQEEFLYL
---GEASEF	KQKVLAVLK-	E-----	-RDYSEKRSS	KLSQEEFLHL
---GEVSEF	KKVLSVLK-	K-----	-AGFEGERS	KLKLQQFLDL
---GEVSEF	KEKVMNVLK-	E-----	-GGFEKRSS	KLSQEFLYL
---GEF	KEKVMNVLK-	E-----	-GGFEKRSS	KLSQQDFLYL
---GEF	KEKVMNVLK-	E-----	-GGFEKRSS	KLSQQDFLYL
---EEF	KEKVMNVLK-	E-----	-GGFEKRSS	KLSQEFLYL
---GGETSEF	KEKVMNVLK-	E-----	-GGFEKRSS	KLSQEFLYL
---GGETSEF	KEKVMNVLK-	E-----	-GGFEKRSS	KLSQEFLYL
---GEVSEF	KNKVLAVLK-	E-----	-GNFEEQRAS	KLSQESFLTL
---GEVSEF	KNKVISVLK-	E-----	-GKFEEQRAS	KLSQESFLTL
---GEVSEF	KNKVISVLK-	E-----	-GKFEEQRAS	KLSQESFLTL
---GEASDF	KEKVLNVLK-	Q-----	-GNFEDKRSS	KLTQVDFLYL
---AEASTF	KDKVLGILR-	E-----	-GDFAEKRSS	KLTQVDFLYL

LYLFNQNDIH	FK-----	-----	----
LCAMNAQGIH	FK-----	-----	----
LLEFHRNGIH	FVNVSDPSAT	NKASTDIFSM	EVDS
MCTLTAKGVR	FTN-----	-----	----
MCALAAKQVR	FTN-----	-----	----
LYAFNQGGIH	FS-----	-----	----
LWAFNQKGFH	FT-----	-----	----
LHGFNTEGIIH	FS-----	-----	----
LHGFNTEGIIH	FS-----	-----	----
LHACNKEGIIH	FS-----	-----	----
LWAFNQKGFH	FT-----	-----	----
LHACNKEGIIH	FS-----	-----	----
LWAFNQKGFH	FN-----	-----	----
LHACNTEGIIH	FS-----	-----	----
LHACNTEGIIH	FS-----	-----	----
LHGFNTEGIIH	FS-----	-----	----
LWAFNQKGIH	FN-----	-----	----
LWAFNQKGIH	FN-----	-----	----
LWAFNLKGIH	FS-----	-----	----
LWAFNQEGIIH	FA-----	-----	----
LWAFNQEGIIH	FA-----	-----	----
LYAFNQEGIIH	FA-----	-----	----
LYAFNQEGIIH	FS-----	-----	----
LYAFNQEGIIH	FS-----	-----	----
LYAFNQEGIIH	FS-----	-----	----
LYAFNQEGIIH	FS-----	-----	----
LYAFNQEGIIH	FS-----	-----	----
LCAFNDEGIIH	FS-----	-----	----
LFAFNEEGIIH	FS-----	-----	----
LSALNSEGIIH	FA-----	-----	----
LSALNSEGIIH	FA-----	-----	----
LHALNSEGIIH	FA-----	-----	----
LHALNSEGIIH	FA-----	-----	----
LFAFNEEGIIH	FS-----	-----	----
LFAFNEEGIIH	FS-----	-----	----
LFAFNEEGIIH	FS-----	-----	----
LLAFRENIIH	FT-----	-----	----
LLAFRENIIH	FT-----	-----	----
LLAFRENIIH	FT-----	-----	----
ILAFRENIIH	FT-----	-----	----
LFAFNEEGIIH	FS-----	-----	----
LYAFNKENIIH	FA-----	-----	----
LAAFNAEGIIH	FA-----	-----	----
LAAFNAEGIIH	FA-----	-----	----
LLAFHEEGIIH	FS-----	-----	----
LLAFHEEGIIH	FS-----	-----	----

LSMFNKAGIH FS----- -----
LSMFNMAGIH FS----- -----
LSLFNKDGIH FS----- -----
LSLFNRAGIH FS----- -----