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1 POTHNGDDFSAKVTQGSLDSTPQEVRKFVEGNAOTCOPEY
PQVHNQALSAPRVLQGDLAALGPALREFVESSASLCQPDS
Q $\downarrow M T E L Q D A G A V K Q G N L N R L S A V Q N F I L A N A K I C Q P D Y$ NERLRKWVEEMVALCKPDK PADHQQAQ PATLSALPHDVRAYVEEKQRLCQPSA HAVRVLSGQMERLPPAVREFVVKGAELCDPQN PQLPNGLNYSAKVVQGTLDSLPQAVREFVETNASLCQPEC AHTKNPELRAWI DE $\square A A L C E P D T$ GAKRTSNKKLLAWIDEMAELCTPDR
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MSQPTVPGPAPTKHAKLVQWVGE AELTQPDR NQP■MAGVTVNEPAYVRNERLAWVAKVAALTEPDA
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MS $\square Q V P G L D Q A P T S H T E L D W V R Q D A E L T K P D R$ MSAMQLNAPDFVKNQKLLQWVQETADLCQPDS MNQPTMKGVAALNAPKLINWVAEVAALTKPAE ALAPKLRQFIVEENAKLCQPDN MSAPDIPGEAPTTNKALLEWVAEVAELTQPKK MNHRFSEAALAATPTYVRKWVAG\|AALTEPER TTTNQRLKDWVAEWAAIMQPAD NLNLKHKKLQAWI EEVAKMCQPDD
PVISNTSTP HPKVRAF KEEAVRECRPDM HERLKKWVAE IAALTEPAQ PGTMCNYARAFSVVHGNLDNLQPSVRKFIVDSANLCQPDK STASQVLYGKWNDLPKKVQHYVQDNVKLCKPDT MPATDPGLQATPPTHPALLEWVATIADLTQPDR NFEHYSFAVSYGKLTSLKPKVRTFVEDTARLCRPDK

TTTMPGDEGQVPTDHAEMLAWI AEVAELTQPDR PQDHKQRQDNUPTSYGDASSDTAGVRSFVEEAVALCQPDQ MSNATNSVSVPTNNPKLIAWVEEVRALCKPEQ

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SATDPGDPGTAPTKHPELLAWVAEVAELTQPDR
MTAATTPGNTPTTHPRLLAWVREVAELATPDD MATAVKGLEGQAPTENEQLIAWINEAVDLFQPDN MNTSAQGUQAPAYVKNPKLVAWVAKMAALCKPAR PADRNCRLLSSVFTSPQLQSLGEGVKQFVKDNVELCQPDS MTMTIPGLADAPPTENTALLDWIRECVELCQPDA IVNGDVQRDSPKIRSFIEESAGLCOPDK AAPTRHRLAAWVDE\|AALTKPDR PPVENGDFNSLPKKVQDFVTENVELCQPDK $\square P V V_{K G D F V S L P K H V Q R F V A E K A E L M K P S A}$ VKMSYEVKNKQLLAWVKEVAEMCQPDS MTSATIDGSDPTKHAKLIEWVREVAEMTQPER AEAKS LPSKVRSFVEDCVKLCQPSQ HQKLIDWVAEVAALTKPAA MNAPVMQGLS
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 GQNGTKK
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 KKCYS L RIIASAMARDEG K K C Y S L RI A S VMARDEG

 K K C F A L R I A S ILARNE G K K C Y A L R I A S A M A H D E G K K C F A L RI A S TM GRDQG K K C F A L RI G S T I A K R E G K K C Y A L R I A SVMA R D D G
 K K C L A A L R I A S K I A K D E G K K C Y A L R I A S A M A H DE G K K C F A L RII G SVIA K RE G K K C F A L RI A S N M G R D E G K K C F A L R I A S TMGRDQG K K C F A L R I A S N M GR D Q G K K C Y A L RI A S VMARDEG K K C Y S L R I A S AMAR DE G K K C F A L R I A CN I A R D E G K K C F A L R I A S S CMARRD E G



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VP!LK G

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 T T A A Q $\square$ S GAAP T RHAGLIA WVREIAELTRPDR QQLI NWVTEVAS LTTRPAR NAKLI A WVERIA HLTTQAEK STNPALLDWVKKMADLTQPAA APAHVKHARLI A WVAEVAALTEPKD MSAP LLVGEAPTQNKELINWINDAVAMFQPED HE KLK NWI K EVVID HVVQPD D

RA WVQ $V$ Q
DST■APAAAAHPVVTHKGVVQKWVVTQMIAQMCEPDCD
S Q NTTAGAGDQAPSYVKHARLVAWVAEMAALTEAKD

 MATAITKGLVGPAPTEHEEMLAWI AEAVELFEPKB

 HRALDE WV E Q A A HT QPD Q TRHQRLQTWVDECATLCQPDH
NAK T $\square$ S S S LSMLGGTKVRDFVEEK I I L C QP D N
PAVPLSTNPNLVKWVEKMAELTKPAA


 M T A L T I P G Q A P VK H E R L L S W W V R E V A E

## MT I D T L K

V P T K GDFHADP
$M G \square T P$ T K G D F H A LDPKKVQKFI AF YVD YM


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$\qquad$


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170
180
S P Y｜V｜AVNMR｜｜MT RMGRA｜V｜YDVL｜GDGDF｜V｜PC｜V｜HT｜V｜GAP｜L｜EA SPYVVASMRIMARMGSPVLEHLGKGDFVRALHSVGTPSNG
 S A Y V AV A M RTMTARMGKAVL D E L L G D G F F



 S R Y V V A S M R V M T R I T P K V






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HAYVAASMSUVVRTGTDVGQHEGNGEFEKCKHSVGVPG
HAYVAASGSVVRTGTDVLOHCGNGEFEKCLHSVGVPGGG

$$
\begin{aligned}
& \text { SQYVVCSMKIMARMGAAVMDEVLNKEFKCLHSVGTP EN } \\
& \text { SPYVVLSMTVMTVSPRVLDVIDAGDWVAAHSGAPRED }
\end{aligned}
$$

$$
\begin{aligned}
& \text { SPYVVLSMTVMTRVSPRVLDVIDAGDWVPAAHSVGAPRED } \\
& \text { SFYVVISMUMTMGADIDAGDRWVADHSGAPI }
\end{aligned}
$$

SAYVVNSMRVMARHGTDVLRKMEETEFVPACHSVGAP ED
SEYVVASMRVMARCGTKVLKRIVEEAKYVRALHSLGAPLAD



250
K K C F A L RII A S N M G R D Q G K K C F A L R I G S T I A K R E G
 K K C Y A L R I A S V M A R D E G K K C L LA L RI A S AIIA R K K K C F A L R I A S N I A R D E G

 K K C F A L R I A S R I A K D E G K K C F A L R I G S TII A QREEG K K C F A L R I G S T A A H R E G K K C Y A L R I A S VL GR D E G K K C L L A L R I A S A M G R E Q G
 K K C Y A A L R 1 A S TMMARRDE G
 K K C F A L R I A S TM G Q A Q G K K C Y S L R I A S VMAR DE G K K C F A L R I A S S V M A R D E G K K C F A L R I A SVI IA R D E G K K C Y S L RI A S AMA H DE G K K C F A L R I G S T I A R K E G K K C F A L R I A S VMAR D E G K K C C A K K C Y A L R I A S V M A R D E G K K C F A L R I A S SMGRA Q G K K C F A L R I A S R M G R D Q G K K C F A L R I A S N M ARDEG K K C F A L R I A S T M A R D E G
 K K C C L A A L R I A A S V M G K E E E G $\begin{array}{lllllllllllllll}K & K & C & Y & S & L & R & I & A & S & A & I & A & R & D \\ K & E & G \\ K & K & C & F & A & L & R & I & A & G & R & I & A & Y & D \\ E & G\end{array}$
 K K C L A L R I A S I M A R D G G K K C FALRI A S TMGRDQG K K C F A L R I A S T M A R R D G K K C F A L R I G S I LAA R N E G K K C Y A L R I A S V M A R D E G K K C Y A L R I A S V M G R S E G K K C F A L R I A S CMA R D E G K K C F A L R I G S T I A R D E G K K C F A L R I A S V L A R D E G K K CFAALRI A SVVMARDEG K K C CLLA L R I A S V V M G R D E G

 K K C C L A L R I G S T I A K R E G K K C Y A L R I A S VI G R D E G K K C Y A L R I A S V VM A R D E G
 K K C C F A
 K K C C F A L R 1 G K K C Y A L R I A S V M A R D E G K K C Y S L RII A SVMM R E E G
 K K C F A A L $\begin{array}{llll}R & A & A & \text { A A M A R D E G }\end{array}$ K K C L A L R I A S VMA R D D G K K C C L A L R I A S V I I A R D E G K K C F A L R I A SVMGRDGG K K C F A L R I A S V M A R D E G K K C Y A L R I A S TMAR DE G KKCFALRI A SAMARREG K K CFS L RII A S SMAKEGG K K C L LA L R I A S C I G R D E G QK WF GL D WA SVLAHRE G QKWF GL D WA SVLAHREG K K CFA L R I A SVIA R D E G K K C Y A L R I A SVVMAR DE G K K C F A L R I A G SMAYDE G K K C F A L RI G S T I A QRE G K K C F A L R I A S A I GRD E G K K C Y A A L R 1 A S A A M A H H D E G

 K K C VVA L R L A S YMARTQG K K CLLA L R I A S V M G R E E G K K C Y A L R I A S V M G R D E G K K C Y A L R I A TVVGSREAG K K C V V A L R A A Y L G H K Q G


 K K C F A L R I A SVMARDEG | $K$ | $K$ | $C$ | $F$ | $A$ | $L$ | $R$ | $A$ | $A$ | $T$ | $M$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |$\quad D \quad Q \quad G$

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 $K K N \square S N S \prod P V I R G G L T S M S P K V Q R F V V E K A D L M R P K D$ TGLNEAVKDALDSAPTTHAHLLSWVREMAELTQPDR VQ Y G D P T L LT P DARA Y L K D S DA L C Q P D R SVIPVIK GKAPEATMRRHLI R WV E K M A D D L T Q P D H $V L A A A P K N A P K E V V D W V \square K V A E L A K P K A$
 HARLAEWVSEVAELTQPRD D GPSKNAAVNEWVR DVALLTKPDN APPTSHT QL LE WVS SVAAARTQPEN AT $\square P S L P K A V A E F V S D A V A E C K P A K$ QLKD F V E E S V R L C R P S N
TKNKHLDRWVEKMAELCRPDS
TTNTAL QA WV DEVAALTTMPDK
VE G A P A GTS P A L L L S WV L L E V
P S T H P P G
MTTTATPGQAPTTHGPLLEWVREVAELTTPQR M S L P A LE S A DA DLPP NVVKA YVKEKA VWCQPD S
$R M Q R G M G L A R R R L S$

A APT THAKLA A WVQEVAELTKPDH
PGTQGSAPTKNPELLAWVAKMAQMTQPDQ
GARPTAHQTLLA WVDEDA GLTRPEA
$T L S T Q Q D T T H P G L A A W V R E D A A A L T A P C D S$
NAPFCKGKFSDLD QVAQP FVVGHWANVCTMCD

D R P L A $\square$ QP S A VP T D H T G GV L S WV A E VA E L T A P D R IA S $\square K$ TELKK WV ESMGKHFAPEK TEASDATRASRGTMDPALRAWVDEDAGLTKPDE

TRNAKLLS IVEKKMEMCRPDD N K K A L A W I K E Q IAA LDC T P D K A P F VKGK LS DLP K C C Q G FV A H WI NVCK P K D K E LK R WL D K MI ELC QPED NAPTTHAGLLEWVRETAQLTKPET
 MNTDLPTRHKALTKWVKKMIDLLEPKD
$M H Q Q L Q T T G G T T H A E L D W V K E V A A H T Q P D D$

$P Q R K V E M S I A T K T H F S A P D G T D H S V I T W V N E I A T V T C P D E$ NAPTQNETILQFVKRVASLSTPDQ K S FPK K I QEFVVECADTMCEPKE NPPT D Y RELVVDWV REVAAELATPDR


A L E A WV E E I A A L T T R P D Q NKKLVSWI NEVSAMVKPD S
VP HLDP TVVP G E P LDD L
 HD GLLKKWLADFDSLTTPDA
MTATAPDATYTTSHAGLQAWIDEVAALTTPDQ

T S P A A R P T S N A H L L L G W WV
GWAS GLT DEVRVFVE ETAA L C QPR D
TAPAALARVSEWVGEVAGLTRPDR


KAREF I E SVKLMKPEE

H T L P P R G L R D F V V A E E V
M NAMPPVVKPA TQNPAVLABVVDQARSSLFKPER M TVT TLLP P A VD RTPA R L R A WV A DV A D L T E P D A
$P G L H T R S L H A L Q V L N G D L E R L S R P V R E F V V S G A Q L C Q P E N$ ME QCMNAVAPLTQMPAGSVPPALADWVAAVARRTRPDR
 PDVRAWVDRIARLRAPDA

GALPTHTRMLA WLREVVQLVEPAA
NAPTENPRILDFVRSIAERTTPDS

VP V VK GF F L E L P L K VQE F V A T Y VDL LQ P K G T N N K NVLNWVDEMVAL CKPDK
 NLHPSVY QWI DEMAKITTKPDK
PTGEPATHAVSSGDKMPQHRALEQWVDQVARVTRPDR
$P Q L S D G L N Y S A K I V R G S L D S L P Q A V R S F V E S S A K L C R P D Q$



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 KSILTDLYRGSMKGRTMYVIPFVMGHLEAEDPKFGVEITD REELTTLFAGSMRGRTMYVVPFSMGPLGGPDSQLGVQVTD KEVMEELYLGSMRGRTMHVIPFCMGPLDATVPMFGVQ1 TD DSAVAERFPGCMEGRTMYVIPFSMGPLDSPFSKLGVQLTD RRRLKQLFKGCMRGRTMYVLPFSMGPVGSAMSGGGVQLTD KATMTELYKGCMKGRTMYVIPFVMGHLDATVPMFGVEITD KQTLRTLFKGSMQGRTLYVIPFSMGPLGSKISHLGVQI TD
 KAVMRDLYAGCMRGRTMYVIPFVMGHZDAEQPMFG|E:CD QKAFSVRFPGCMKGRTMYVIPFSMGPLGGPDSKIGIELTD RAELRGVFEGSMRGRTMYVVPFSMGPVGGPDSQVGQQVTD QAAVQERFPGCMAGRPLYVIPFSMGPPTSPLAKLGVQVTD KSMLNGVFDGAMRGRTMYVIPFVMGPRDAEQPQYGVEITD YTKLSHLFTGSMKGRTMYVVPYVMGPLGSPFAKVGVELTD


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 KALLTERFRGSMRGRTMYVIPYCMGPLNAAQPMLGVELTD Y RKL GADF DGSMKGRTMYVVPYVMGPSTSPFAKVGI EITD Y T K L GKL




 K A E LIWP R F E G S M R G R T M Y V I P F F V M G H L E A E E P K F G V E L T D

 $K A T L Q G L E D G M V G R A M Y V V P Y S M G P V G S P I A R I G L M V T D$
$R A E L A G V F E G S M R G R T M Y V V P F S M G P L G G P L S Q L G V Q L T D$
 H A K M D A L F E G C M R G R T M Y V V P Y C M G P


 K E H L R P L F R G S M R GRTMMYVMP F CMGPV T P P GA K F GVVEVS D


Y E K LG A MF D G VM K G R TM Y V I P Y C M G P V G S K L S K V G V E L T D HA KM D A L Y A G CM R GR TM Y V V P Y C M G P I D D S P L A R C G V



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##  <br> D

170
180
190
200
SEY|VV|ASMK\| MTRMGADVI|K|LLDDDQF|V|KC|L|HS|V|GAP|L|EP S P YVVASMHYMTRVGTEALQAMGTDDWVPAVHSVGAPLAE



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 s. S YVALNMGIMARMGKVALDRLGDSDFNRGLHSVAD



##  <br> S S S

 SAYAVLSMRIMTRIGREVLESMSENERFRCIHSVGAPRGK








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## 250

K K C Y AL R\| A S A $\square$ A HDEG KKCFALRIASVQARDEG KKCYALRIASVMARDEG KKCFALRIASNIARDEG KKCYALRIASAIAHDEG KKCFALRI GSTI ANREG
 K K CYALR I ASTMARRDG K K C DA L R I A S SMGH KKCYSLRIASA\ARDEG K K CYALRIASVIARDEG KKCFALR I A SVMARDEG K K C Y SLLRIA A SVMARDEG K K C F A L R A A S R I A K D E G
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 K K C Y ALLR A SVMARDEG KKCFALRIASTLGRKE KKCFALRIASVIARDEG K K CYALRIA SVMGRDEG $K K C Y A L R I A S A V A H D E G$
$K K C F T L L M A S C M A R D E G$
 KKCFALRIASFQGKNEG

 KKCHSLRIASWIGREEG

TSNRAVLAWLDEMAAMTQPD Q
NRKLSAWVDEVA DQTRPDR $M G L P A M T S T L A A L N Q Q L V A D E M A R L L T Q P M R$ TDNEELLDWVSEVAELTQPDS T T N K S V L A WI D E M K E L V Q P D K


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T N P HVREYVA HWAAVTGAAR
MSHSSEVL ARAGVSNPHVHEFVAEWARILEPDR D D S $\square R \mathrm{R} \|$ Y K K N QELGNRIVGYVSDFMAMTGATS

N P T VLE F I S K Y V S L C N P K S
 MKNSNSLSAVMDKS SLEKLNPDLHKFIAEAVRLCCPDR
 DFELPAVPAELRA PHVRAFVAEWAAIDEPAR NQHADKVVEEADKLCKPAK

PALHQQPQ
 R M S R D M L E K L L R $\square R D P E L H R W I A D V I R V T E P A M$
 NPSLVH F S K T DE LT T P D R
D A G L S N E A V R D
 N E V L T T E F 1 N P RLWRD LA EVALLVARPAS

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VFWVD GSEEEKQFLT GRAVQQGVLIDLNKLPGCYYHRSNP IV V WI T G E E E Q L E A L R K Q A V E E GLLL I K L N K L P G C Y LiH R T D P $V$ HVCD GSSDAENS H L LDD LDMLK S G S V P L P K Y R NCY L A R T D P $\vee M W I D G S E E Q L D A L R A K A C E T G E M T K L N E L P G C L L H R T K P$ VVLID GS E E Q A E QL RAEACAS GEMFK L V H L CD GS DEEFNELLLNKQMQQGT LVK L NKRPNSYLAR S S I



 $V Y W L D G T R V E R D A L T Q R A V S D G V L I P L N Q R P G C Y L H R S N B$ | $V$ | $Y$ |  |
| :--- | :--- | :--- |
| $V$ | $I$ | $M D$ |
| $H$ | $V$ | S G E E A E K L A N D |

 $\square H D C D G S E D E S K\|L Q E L M L T Q G T\| T P L K K Y N N C W L A R T N P$ $V$ VFA D G S D E E WQRLLCD HL V E V G T F K R L N K H P N S Y L A L S D P
 PKNDNWWEACT DP

ITY VD GSEQQ IVNLKKELIDTKLMVPLKTYDNNWLVRTDP I Y I C D G S QLLEMMN L K R K I T Q M G M A K E L K A L I D C H L V T T D D





 IE V V S A A D D A R L I A E S LAA A GEEL LPA GEGRYYSRSY F




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UniRef90
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UniRef90 A0A058Z5Be UniRef90 B1GZY5 UniRef90-A0A058Z5JO UniRef90-UPIO00368BD29 UniRef90_R4WUFO UniRef90_X1VE74 UniRef90-C7LY35 UniRef90-A0A034WLG6 UniRef90-X8BKB3 UniRef90-TOM3T7 UniRef90 B9VR20 UniRef90-UPIo004423AF5 UniRef90_E1FLW4 UniRef90-F1L063 UniRef90-B8D6H4 UniRef90-FOL131
UniRef90-O9HLV2 UniRef90-TOZMR9
UniRef9O-B8BGV8 UniRef90-E1QNG4 UniRef90-D1JEQ1 UniRef90-D5TZI6 UniRef90-UPIO00299FF3E UniRef90-P58306 UniRef90_UPIOOO3602330 UniRef90 X1JWR5 UniRef90-13TFG5 UniRef90-D3T9B7 UniRef90-M7TBR7 UniRef90-A7BS85 UniRef90 UPIO0036DCAAE UniRef90_A1SQ84 UniRef90-UP1000303CA67 UniRe90_TOLHF5 UniRef90-AOAO26WDT5 UniRef90-10G.J61 UniRef90-K1ENW9 UniRet90_Q3A3P8 UniRef90-A0A031LTK7 UniRef90-SOAM68 UniRef90-UPI000468108C UniRef90 UPIOOO37E681A UniRef90-X1D3G1 UniRef90_FO.J9R3 UniRef90 A1SPDO UniRef90-A2BMQ8
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UniRef90_V4JVN5

YAK LKKLYTGAMKGRTMYVIPPYSMGVVGSPFAKYG\|IELITD DEKLRKLFNGCMKGRTMYLLPFSMGPLGSPDSKPGI QLTD
 HARMDALEAGCMRGRTDYVVPYCMGPIDSPDARCGVEI TD HEKLKKLFKGSMKGRTMYVIPFSMGAI GSPFAKYGI EITD

 HAKMDALFDGCMEGRTMYVIPYCMGPIDSPDSRCGVEI TD
 YAKMRKLFDGSMKGRTMYVIPYSMGVVGSKFSKDGIEITD YELLRGIAKDSMKGRTMYVIPFSMGAVGSPFAKVGI ETTD YKMLYDIARDSYKGRTMYVIPYSMGPVGSKFSKIGUDGTD KALLTPMYNGVMKGRTMYVIPYSMGPIGSPDAKVGVEVTD
 YERLKKIYRGSMKGRTMYVIPYSMGDVGSDFAKYGIELTD KKVLKKKFSGCMHGRTMYI I PFSMGPIGSPDSHDGIIEITD YLKLGXDFDGAMKGRTMYVMPF DMGPEGSTFSKVGIVLTD YEMLYDIAKDSYQGRTMYIDPYSMGPVGSPFSKI GAE TDD YDKLYTRFPGCMKSRTMYV PGSMGPLGSPLSK GA ELTD YEKMYALADGAYKGRTMYVIPYSMS IIGSPDAKYGFELTD QKALDERFPGCMKGRTMYVIPFSMGPLGSPDGKDGDQLTD YKMLY C DARDSYKGRTMYI I PYSMGPVGSPFSK』GVELTD ETAI DDRFPGCMKGRTMYVIPFSMGPVGGSDSKYGVQLTD
 DKAlLERFPGCMK
QARVWPLFAGAMKDRTMYVVPY LMGPAGSPFSRVGVELTD KAKLHEILRCAMAGRTMYVIPYSMGVIGSPFAKYGI EVTD HS LYERLFSGCMRKRTLYVVPYCMGPTDSPWSQLGVEVTD SF QVYSRFTGCMHGRVMYVIPFSMGPIGGRYSUYAVQLTD
 KEKMMGFFKGAMKGRTMYVIPFVMGPPKSKYAKNCIQVTD KAELKAKFNKCMEGRTLYVVPFLMGPKGSKDARVGVQLTD


 RSTMTDLFRACGWSHSVWAPGRRGP GBMAGBGD
NRIVDRLLKNSMRGRTMYVVPYDMGPEDSPYAEVGDETTD GVELDERFPAAMAGRVMYVVPFSLGPDGGLHADNGIQLTD HADRQGH $\square$ KRCMS GRSMCVVPNSMGPVNSSLAKFGVQVTD QEAVEDRFPGCMKGRTMYVIPYSMGPIDSPLSKDGIQLTD SDELDSRFPKCMAGRTLYVVPFSLGATGAPLCDSGVLLTD S LE
 K S KLF QLLRSSLNGKTMYVIPYWLGPKGSAHGQGGIQVTD RATLQPLFDGCMKGRTMYVVPFSMGPDGSPDAHDGIELSD

 LKKEIRELMKGVMKGKELFVCFFVLGPKNSDFTIPAVQLTD
 VEEVRSFLKDSMVGREMLVCFWCLGPADSDFSLPCDQUCD GKELDSRFPGCMTGRVMYV PPFSGGVICGPFSKIGVELTD LKEIHKIMTNDMEGHELFVKFFCLGPDNSVFSUPCVQLTD KEMLTNLTKGCMRGRTMYVLPYMMGHPDSPYARACVQLTD KAKLVELMTGASAGKTMYVIPYLMAPAGSPLDRFGVQLTD RAAQ GRMRGAMRGKTMYVVPYLMAPPGSPLSRWGVQLSD ERADLERFPGCMKGRTMYVIPFSMGPVGSPGAKGGAETVTD TEEVHK LRNDMFGRTMYVLFYVLGPENSPETVPAMQLTD

 KPLLVERMRGASRGKTMYVVPYLMAPPGTPLEAFGVELTD LKEVNSFLDGSMTGKEMLVRFFSLGPTNSMFSLKALQUTD LKE:FGDMKNDMHDRELYILFFCLGPANSNFSIPA:QLTD QKALDERFPGCMKGRTMYVIPFSMGPDGSPDGQDGIQL KELLEGLMRGASTGKTMYVIPYLMAPPGSPMERFGVQVTD TALQKENMRGAMAGKTMYVIPY胃MSQPASPGELAGQVQVTD RPIVEGHMKGAFAGKEMYVGPYLMAPPGSPSEKYGVE TD LINELLDLLRGSMKEKTMLVLFASLGPVNSVFSDPCVECTD




CRPVVLHM\RMSRVGVHH\NDLADNSFVRAVHVTGDLENL


 S WYVA H S I NVLYR S GYEMFVNLP EDDDFK F L H SA GE L
S P Y V L H S E II L Y R T A Y E D FVVKKPN L N F MK F V H S
SAYVAHSEEILYRNGYRDFVEKGEEEYMLFI HSAG
S $\square Y V V L N M L D M T R V G N N V L E A D G D S D Y \square K G L H S K A T L$
UniRef90 G9YS58
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UniRef9- B7P5D6
UniRef90-B7P5D6
UniRef90-R6I6G1 UniRef90-Q8MYL6 UniRef90_R6WGIO UniRef90-X6NX09 UniRef90_E91FE7
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UniRef90_B8BGV8 UniRef90-E1QNG4 UniRef90_D1JEQ1 UniRef90-D5TZI6 UniRef90-UPI000299FF3E UniRef90 P58306 UniRef90_UPIOO03602330 UniRef90- X1JWR5 UniRef90-I3TFG5 UniRef90-F1KZ65 UniRef90_D3T9B7 UniRef90-M7TBR7 UniRef90-A7BS85 UniRef90_UPI00036DCAAE UniRef90-A1SQ84 UniRef90_UPI000303CA67 UniRef90_TOLHF5 UniRef90-A0A026WDT5 UniRef90-IOGJ61 UniRef90-K1ENW9 UniRef90_A0A031LTK7 UniRef90-S0AM68 UniRef90-UPI000468108C UniRef90_UPI00037E681A UniRef90_X1D3G1 UniRef90-F0J9R3 UniRef90_A1SPD0 UniRef90-A2BMQ8 UniRef90_UPI0003756D0A UniRef90_Q4J9S8 UniRef90-N0E4B6 UniRef90_UPI0003B4A1DD UniRef90-UPI0003687097 UniRef90_S5ZNI4 UniRef90-R6STS3

210
220
230
240
TDPENRYIVHFPEDNTTMSVNSGYGGNVLLG
P ADPYHWPC

NPERY VHPEELS QSYGSGYGGNALLG
1DAEKRYIMHFPEDNTIMSVNSGYGGNVLLG
DPERRFIMHFPQDLT I KSYGSGYGGNALL G
DPRYI CHFPQDNAI WSVNSGYGGNVLLG
KAPLDNSWPCNPEERY:VQFPEDNT:MSDNSGYGGNVLQG VNAENKYI AQFPEENTIWSINSAYGGNVLLG
 VDPEKRY
G QVD CP WP CD H T K Y
V N P E R R Y I


KKPGVNNWP
CQPER
ASEWNEPLLC
IDPEKRYICQFPQDNTIISVNSAYGGNVLLG KAPLVNNWPCDPSRVLVTHNPAKTEIVSYGSGYGGNSLLG NNRYIVHFPEDNTIWS WNSGYGGNVLL G AVGD SPWPCND TKYIVHFPEKRRI WSYGSGYGGNAILG SKVSVSHWPCDPERTUI LHKPAKNEIVSYGSGYGGNSLLG SPDRRFVVHFPETLEV WS IGGGYGGNALLS DPENRYI
SPD LHYPAENL QSIGSGYGGNALLG TTPSKCGWLCNPDRFFLALRPLDNEI WSFGSAFGENAFLS

CDPDRRFVMHFPKDNVILSYGSGYGGNALL G VNPDRRFI MHFPQENLVMSFGSGYGGNALL G SSKS TPWPCNDDKRVIAHFPDSREI WSFGSGYGGNALLGG ETPVPHWPCDKNKY
 HGDPVGQWPCNPEKTLI GHVPDQREIVSFGSGYGGNSLLG G I DTVPSWPCDPERTII DH GQKDV PWPCNDTKY THFPETREDWSYGSGYGGNALLG DPENRY LHFPWERHVVS $\square$ NSAYGGNALLS TYKDTNNWPCVPELALLAMNSDKQEI WSYGDG SESAVLC KAPLINQWPCNPEKVLI SHLPDDSRQILSFGSGYGGNSLLGG
 QKQ QNWRCNLEKALTVHLINERQVWSFGTTYGYNTLTS G SNNN WSKNVSKRRIYV DLLENMTYSVNTQYAGNA L DERKTSKNLDKRRIY Y DVLESETVYSVNTQYGGNTVIG GQQDVS WPCNPKNKY CHEFPEENEVYSVNSNYGGNALLS
K
DARKTS SKN KQRRI
 DERKTSKNLDRRRVYIDDVGDTVYSVNTQYGGNS IVG DERKTCKNDEKRRIYDDDEGETVYSVNTQYGG
 G RRHVTRNWPCNTDLAFLVHRPAEREIWSFGSGFGSNSLLG
 $G Q A D V P W P C N P E K Y I C H F P E E K L I W S F G S G Y G G N A L L G G$


GQGTPD QRYFVTVADERTILHYGSSYGGNALLG ERGENGWSKNDDKRRVYVDADDYTVYSVNTQYGGNTGiG GQGTPDD KRYFVTVADERTILHFGSSYGGNALLG D IIK K R R I MI DVK ENTVYSVNTTYAGNSVGG GQGTPENQVSKNYDKKRIYIVDYDTNTVYSVNTQYAGNSVVG GELDERKVSKNLRERRIYFDNEGLTAFSVNTQYAGNTVGG ERDENGWSKNVENRRI FDDLEGNSVYSVNTQYAGNTVGG

DADNRYI VHFPEENTIWSVNSGYGGNVLDG

## 250

K K CFALRDASHLGRQQG KKCFALRIGSVIARDEG KKCFALRRIASTMARDEG KKCHALRIASWQARQEG KKCLALRIASYLGQKQG K K C F A L R A A Y L GKNEG KKCHAALRAASFQARSEG KKCFALR I ASCQARDEG KKCHALRIASHQARREG KKCFALRIASYLGEQEG KKCFALLRAASRIAKDEG


 KKCYSLR KKCLALR R G S Y L GRKEG KKCFALRIASYLGRKE K K CFAARIASCMARDQG K K CLLALRAASY LINKQG

 KKCFALRIASNLGRKEG

KKCFADRDASYQGWKE K K CFALRI GSTIA KKCFALRIASYLGRNEG KKCLALRLASVMARDEG KKCFALRIGST $\square$ ARKEG KKCHALRIASAQARAEG KKCFSLRIASVLGRREG KKCHALRIASWNARQE G K K SLLGLRLASYRGWKE G K K CFALRAASY LGQKEG KKCLALRMASHAGWRDG

 K K CFALRIGSTDAK

K K C Y S LRRIA S VMA
KKCHALRIASVEARQQG KNEVSLRLASVIAKQEG KKCFALRIASRIAKDEG KKCFALRIA A SC: AKDEG I K CFGLLQA SVLA Y K

 KKCHADRIASVRARKEG KKCHALRIASTRARNEG KKCFALRAASTMGRDQG LKK KLALLRLTMKRAMEE G LKKLAMRPAITRASKEG

 MKK LAMRLAARRGDREG LKKKLAMRALALQKASREG LKKLSLRGCVNQGKKEG RKSMALVVASADARDE


 K I A H GLLRQGSYDGWKNG K I AHGLRQGSYDGW KKCHALRDASFESKANG

 LKKLALRLADRKADQEG
 KK GYALRI A S V H A R D


K $\square$ AHGLRQAAYDG
LKKDMFRDCDYKGYDEG
 KIAHGLRQAAYDGWR FKKLALLRLAARKAHREG
 LKK L A L R L A VYKGYRE



N S Y V EE F I E K T A ELLCNPS S
LRTRNSRLLRDI A A VILVAKPSS
Y A KLT A L N Q KVY D F V GE FAEHCDPA S



K $\square$ S S A K LD S
 S S S MLS KL L QL L N N Y L V T F L S S S I V E L L C E P D S
 PR QTNTMMVPVPVIVGDLSWLSLEVSMFLNECVRLMTPSAA
 $S$ LHPVVDERSQTIL DQLNPAFNELLLDAI ELMRPS S LK I T H P EVLKRI A N AVLVCNPDK $\left.\begin{array}{ccc|ccc|ccccc}H & P & E & L & K & R & I & A & N & A & V \\ N & V & C & C & N & P & E & K \\ N & P & A & I & R & S & F & V & E & E & W\end{array}\right)$ $\square S K L K K D N Q K D V E L I$ A N T I A M
 NEEARL $\mathrm{K}_{\mathrm{K}}$ A A N A A L R P S K

EWVDSVRQLTEPA D NEEALLKVANAIAMCDPDQ LKDKHPEVLVRIA DS VLCNPSA
SRSLSVVIVGKLVNLKPKVRNFVEESARLCRPAN EKALIKI ANA IVMGDPDA MTGAAQAVPGPAPTTHAGVLLWVAEMAELLEPDK

A P $\square$ T T S E E A L V K I N E N VI K I V N E F V D L C R P S K
 N A E A
$K \square Y S T Q L D G L Q S S \| R Q Y V L E K A D M C R P D N$ MTSATDPGTAPTNHQGLLAWVEEVAELTQPDR


[^0]


ПH DCDGSETENASLDEKLQKDGMDTPLKKYDNCWLARTDP VVFADGSDEEWQRLCDHLVEVGTFKRLNKHPNSYGALSDP $F \bigvee R T D S A E D A Q Y \backslash R K K A \downarrow E N G E E K K L A D E G H T V H F D G Y$

[^1][^2]




[^3]

lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm



GQGTPED
Q Q G
GQGTDND
GQG
GQGTPDD
GC
RHGTPED QRLFATVADQRTILHFGSSYGGNALLG
TDDDRRLFATLADERTII HYGSAYGGNALLG
TKNLDRYFMGM
TDKNVT

- TDKNVTK EVVDDRKVSK

KNIANRRI Y IDDLEANRVFSUNNQYAGNSVGG ERGWSKNTDKRRIYIDVENSTVYSVNTQYAGNTVG



$\square R S \square V K N S P P N S T G S F I V L K H D E Q Q \prod W S H G Y S F G R T S R F G$ DR D DKKRRI MI DLEG VVYSVNTTYAGNSVGG
 D L P D A $\mathrm{D} L \mathrm{~L} P \mathrm{D}$
G


R FMDRQYQTTYSFKCTYAGNTLLL


## DVP

D L P D A R VF M
RAR $\square Y$ MDRS WQTTFSF $\square C T Y A G N T L L M$
D R K F
KTTYSWKCTYAGNTLLL
$D \square P N A R V L M D R K D R T T Y S F N C T Y A G N T L L L$
DVP GDPPVTKNLDKRRIVV

DLPQARVFMDRSYDTTYAYKCTYAGNTLML




T A R LK S NWMCNTDQYF LA QR LAA ENDV
TARLKSNWMCNTDQYFLAQRLAENDV

[^4]

| UniRef90_R7Y284 | $\mathrm{K} \prod \mathrm{AHGLL} \mathrm{RQGA} \mathrm{~A}^{250} \mathrm{Y} \text { G W }$ |
| :---: | :---: |
| UniRef90-UPI000304B5DC | KI AHGLRQASYDGYASG |
| UniRef90-E9UN56 | KI AHGLRQACYDGRASG |
| UniRef90-UPIO002485629 | KI AHALRLASYDGQRTG |
| UniRef90-E2S8D0 | KIA HGLRLASYDGWKNG |
| UniRef90_G8QS09 | LKKHSMRLAINKAGQEG |
| UniRef90-UPI0003A34DEA |  |
| UniRef90-UPI00040EC115 | KIAHGLRQASYDGYTS G |
| UniRef90-X4QNY9 | KI A H GLR L G S Y D GWA S G |
| UniRef90-S2VTD6 | KIA HGLRQASYDGWAS G |
| UniRef90-X1FVF6 | LKKLDALRLATINKAVNE |
| UniRef90-TOMSG5 | LKKMAFRITI ARALNEG |
| UniRef90-E3LZK8 | KTFSIHAASWLGTKKG |
| UniRef90-UPI00040483E4 | K $\square$ A HGLRQASYDGW |
| UniRef90_Q972S7 | LKKLAL R L T I A K AVKKE G |
| UniRef90-A1S0E8 | LKKLALR R A V Y K G Y K E G |
| UniRef90-H3FH92 | RSSMCLRIGSVIGREMG |
| UniRef90-E1R9D7 | LKK HAMRLA ${ }^{\text {L }}$ NKS GKE G |
| UniRef90_A8X2X0 |  |
| UniRef90-G0NCI6 | KTFSIHAASWIGGKRG |
| UniRef90-TON2B5 | KKCHALRIASFRAKREG |
| UniRef90-A0A031LR41 | LKKLALRLLTLNRAIKEG |
| UniRef90-H2C7H9 | LKKLALRLTLR R AVNEG |
| UniRef90-A4YGQ7 | LKKLALLRLTLNMAVKE G |
| UniRef90-V8NLN4 |  |
| UniRef90-H2VJ36 | K T F S VHACSW $\mathrm{V}^{\text {G A K K G }}$ |
| UniRef90-F4G1V7 | LKKLIALRLLTLNKAVNEG |
| UniRef90_Q9TYQ8 | K T F S V HAASWLGAKQG |
| UniRef90_A8B1Z3 | K K La L R L A |
| UniRef90_UPI0003B64F87 | KKGFAVDKAVYEN |
| UniRef90-S0FUU8 | KKGFAVDKAVHKNRGE |
| UniRef90-N6X4D9 | K $\square$ A H S L R Q A A D GWK S G |
| UniRef90-E1Y834 | KKGFSVDKAVYKNR |
| UniRef90-15B3C0 | KKGFAVDKAVYRDR |
| UniRef90-E0RRB2 | KKGFAVDYSTYYKVEE |
| UniRef90_T0ZWJ6 |  |
| UniRef90-E8RGJ5 | KKGFASDCAMYKRNGE |
| UniRef90-K0NJX3 | K K GFAVDKAVY |
| UniRef90_GOZJ75 |  |
| UniRef90-A8ZT22 | K K G F A V D K A V Y EHRGE |
| UniRef90-X8CZ93 |  |
| UniRef90-V4KVG9 | K K GFCVD Y A T Y F K E E |
| UniRef90-XOYLC3 |  |
| UniRef90-C0QCF6 | KKGFAVDKAVYKNR |
| UniRef90-D8FEC9 | KKGFSVDRAVYTNR |
| UniRef90-K1Y9M1 | KKGFSVDYA TYY K VEE |
| UniRef90-X1SAF0 | $\square \mathrm{K}$ K $\square \mathrm{A}$ L R L A $\square$ Q K A SKE G |
| UniRef90-W4XTW8 |  |
| UniRef90-X8BIT2 |  |
| UniRef90-X1QD00 |  |
| UniRef90-X1IKX7 | LK K L S M R L A I N R G S K E G |
| UniRef90-X1SMV0 | L K KLAMRLA HRASQEG |
| UniRef90_X1CJM1 | L K K L All T K Q El |
| UniRef90-X1EBE8 | LKK K L A L R Q A $\square$ NKASKEG |
| UniRef90-X1HS88 |  |
| UniRef90-X1LUE7 |  |
| UniRef90-A0A016WAV0 |  |
| UniRef90_A0A016WA64 |  |

lupas_21
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    conf
    sol25
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    jhmm
    jpssm

[^1]:    VTVMT DAKED $\square$ A Y V R N $\square \mathrm{A} \square \mathrm{N}$ NGEEKKM KMKGHTDHFDGY VVVVTTDSLEDTRYI RDKAKELEEETRL LIDDGHTVHFDGY $V S F C \square Q H L R D S N G L L T L R S E E G V C R K L K G I E E L L T E Q L N Q$

[^2]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
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    sol5
    sol5
    jhmm
    jpssm

[^3]:    lupas_21
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    conf
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    sol5
    jhmm
    jpssm

[^4]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

