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FENLSEKLLQKALRKLTGKGKISENDI NQASREIRRLALL

 MF D TLSDRLS GIF A QL K GKGRLSDADIDRTAREI RMALLE
 M F E S L T D K L N S VF S K L K S R G K L S E K D I K A GL R E I R L A L L MF DS LT DRLGGALKSIT GQAKLTEENIVDTMREVRMALLE
FESLTD KLLQNVFKKLRSKGKLTEEDVKVAMKEVKMALLE $M F E N L S E R L S G V F D K L T R Q G A L T E A D V D A A M R E V R L A L L D D$

 $M$ F E N L L S E K L L E S A L Q Q
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 A DVVNFKVVVK GFI E R V R E R A V GR DV L E S L T P G Q Q V V K V V Y E A D V N N F K V V A D V N F K V V K A D V N N F K V V K K E L I A R I K E R S V G Q E V L E S L T P G Q H V I K I V H E




 A DVVNKV AKEFTAKVVTQRADGA DVMESLTTPGQMVI KIVVE



 A DVVNFKVVVK QLI E NIIK Q K A V G E E V L N N A L S P S Q Q V I K I V H E A D V A L P $\operatorname{P}$ V V K K E F V D E V R E K A L G E E V L
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 A D V A LIP V V K $\operatorname{L}$



 A DVNYKVVKDFVSKVRERAVGQEVLKSLTPGQQVIVVVNE



 A D V N L L V V K K D F I E E V R E S A L G A E V I T G V Q P D Q Q FI K I V H D A DVVLKVVKAFI A D V A L P V V K K D F I N R V K E R A V G Q DVVI R S I T P G Q M V V K I V N D



 A D V








 A D V S L L P $\mathrm{P}, ~ V \operatorname{V}$

 | $A$ | $D$ | $V$ | $N$ | $Y$ | $Q$ | $V$ | $A$ | $K$ | $D$ | $F$ | $T$ | $N$ | $R$ | $V$ | $K$ | $E$ | $A$ | $A$ | $T$ | $G$ | $E$ | $D$ | $V$ | $L$ | $T$ | $S$ | $V$ | $T$ | $P$ | $G$ | $Q$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $L$ | $T$ | $K$ | $I$ | $V$ | $Y$ | $D$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $A$ | $D$ | $V$ | $A$ | $L$ | $P$ | $V$ | $V$ | $K$ | $Q$ | $F$ | $V$ | $E$ | $T$ | $V$ | $R$ | $E$ | $R$ | $A$ | $V$ | $G$ | $Q$ | $E$ | $V$ | $I$ | $R$ | $S$ | $V$ | $T$ | $P$ | $A$ | $Q$ | A D V $V$ N L S $\mathrm{S} V \mathrm{~V}$ K A D V A D V $V$ N Y A DVVNF K V V K R F TN A V K E R A L G S DVI G QL N P GQQQV V K I V N D A DVVN F K V V K Q F V K S I E E R A V G A E V L E S L T P G Q Q V V K I V N E





 A D V $\operatorname{A}$



| QUE |  |
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 MLESLS D RL Q GVVGGLK S K G R L T P D DI DAAMREVRMALLE
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 MF Q S L TERLS GVLDKLTRRGALTENDVGEAMREVRRALLE MFENL QEKLS RVVFKNLS GRGKI TEKNVKDADREVKUSLLE

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 MF E GL S E R L G SVVF D R L R K R G A L S E A DVVTA A M R EVVRVVAL E

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 F E S L S E K I Q F S L R K L T G R G KV V E K D I MFENLTDRLQGAFDKLTSKGKLQESDVDLALREVRIALME



 $M F Q N L T D R L G Q T L K N I S G K G R L T D D N I K D T L R E V R M A L L E$

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 A DVV Y NVVKEFVGRVRERATGAEVSRALSPGQQVVKIVNE A DVVNF KVVVK E FVVNVV S E K A L G QEEI M E S L T P A Q Q L V K IV V N E
 A D V

 A D V S L Q A V R P F DA A V R E R A E G A E V S K A L N P A Q Q I I K I V N E






 A D V A A D $V \underset{A}{A}$ A D V


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 A D V $N$ N Y K



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 A D V

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 A DVVYNVVKDFTAKVSEKALGEDILKSLTPAQQIVKIVND
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| UniRet90-UPIO003780C66 |  |
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 MF NTLSDRLS GIF DKLTTRRGALSEADVNDAMREVRRALI E MFDNLSDRLNATFKKLKGRGTLSEKAIDEGLKQVRMALLE MF D A L A E R L E E S WK K L R G Q N K I S Q A N I Q D A L K D V K R A L I A




 M F E Y M G D R $L$ L $\operatorname{S}$ N A I I K N


 MFERLQEKLS KIFRSLS GRGKI TEKNIEEAVKQVK』SLLE FEALTENFQRSLAALRGLDKITETNIEPTLKEVRRALI D

 MF E S

F Q NL SERI A NVFEKMKNKGRLTELEI KQAMREI R DALLE

 MFENLSDRLS RSFKKITGKARLNHDNIKDALSDVRKALLE
 M F E N L S Q R L T R S L R N V M M G Q G R L
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 MFDTLTQRMTRDVKTLRGEARLTEANTQQMLREVRLALLE
 F E ML T D KL T A AI Q KI R G Q K T V T E Q D L K E T L R DV R R A L
 MLD S L T S K M S R V L K KII R G E A R L T E S N TK E M F R E I I R I A L L E $M F E S L S D K F S G V I G D L G K R G T L T E A D V A E A M R E V R L A M L V E$
 MLLE GL S QRLE E AL N K F K D K G K L S P D E I K K G L R E I R L A L L E


MF DELSSRFEDAVKGLRGEAKISENNINDALKEVKRALLD MFENLT DKLERSLKLLKGEGKITEDNVAETLKDIRKSLLD
 MFESL GNKLQDI LEKLGRERQLTEAQVKASMREI RMALLE

FESSLTDKLQNVFKGLRSKGKLSEAEVVAALLKEVKMALLE MFENLTDKLGNVFKGLAKRGALSEGDVDKALKEVRSALLE
 $M$ F E G L S D K L Q E A F K K LL K G K G K L T E K MF D NLTDRLSNSFKALQGKSKLSESNIKDAIRREVRSLLE








F A S L S D K L Q A I T T A K I
 MFENLKDKLA GVFDGLAKRGALREGDVDAALREVRLARLD




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 A D V

 A D V N L E V $V$ K A D V
 A D V $A$ A D V S L S A I K P F L K G V A DVVALPVVVKDFMANVKERAVGHEVIGGSLTPGQAFIVVVNQ A D V A L P V V K D V A D V
 A D V A DVNY QVVK QFCKDVTTAAAI GAEVI KSLHPGQVMVKIVND A DVNFKVVKEFVESVKAKALGEEVLRSLTPDQQFIMII R D
 A D V $N$ N $Y$ Y R V $V$ V $K$


 A D V A L P P V K | $A$ | $D$ | $V$ | $N$ | $Y$ | $K$ | $V$ | $A$ | $K$ | $K$ | $L$ | $I$ | $E$ | $D$ | $I$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $E$ | $K$ | $S$ | $L$ | $G$ | $E$ | $E$ | $V$ | $I$ | $K$ | $S$ | $V$ | $S$ | $P$ |
| $A$ | $A$ | $Q$ | $M$ | $I$ | $V$ | $K$ | $I$ | $V$ | $Y$ | $D$ |  |  |  |  | A D V $N$ N Y S S V V K S Fill


















\section*{A \\ A} A D $V |$| $A$ | $L$ |
| :--- | :--- |
| $N$ | $K$ | A A DVSFQLVKNFI


 A D $V$ V A


 A D V
 A DVNFGVEKDFVARVSEQAVGQQVLGSLNAGQTVIVLVHD

 A D V A D $V$ V $A$
 A D V $A \cdot L$ A D V A L A D V N F K V V E E F D E N V K A K A T G E K I L E S L T P Y Q H V V K I V N A DVNVKLVMQMSSHIVKERALKEEVPPGMNPREHVIMLVYQ


 A D V A L P V V R H L M T E AR E R A L GA D V A K S L N P G Q VI V K V L H D A D V S Y S V V A DVVSLP I ARRD F I K A I Q A K A S G Q A V T K S V K P G Q Q V V K IV




 A DVT DSVAK S
 A DVNLLVVKKF A DVN FKKVVKD F I N V K K K K A




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1
10
20 30
MFE GLTTSNLLKTALS GLLARGGK|LTEGNDRDG|REVVQALL|E M F D S I S D K F S T V V R T L A G K S K I T E K N I Q D A V E E I K V A L L D MF K S L T E N L N SVVFN KL K G K S I I S E D D F N L A M M E V R I A L I E



 $M \operatorname{L}$ D L L T
 $M L G N L G E N D T K T M K K L V G D S V I D K K T I E E V V K E I Q R A L I Q Q$
 D F L A G K L K K S I E K N L L K K S T L T E E TVV K E T L $M F E S$ L Q N GLK S A L K T L Q G K A R L T E S N MRE GL K L V E Q S L L E MFNNLSKRMQKS L E K M S A K T I L K E E D I L E I T R E I K L A L L E
 MD F L S K R M Q K S I E E K N M K K S T $\quad$ L T $\operatorname{C}$ E E N

 D F L S N R M K K S I E K NLLK K T T L N E E N I K E V L R E I R L A L L E MF DF L S E K F S S I F S R L T GK GY L S E D NL QEAI L K V K DA L L E




 LD ALGGRALSNALKK』ARAGTVDETQVKEVVRDIQRALI Q
 MFKNL T E R L S D I I K K M R R E V R L T K D NTEN MFREEI R DS L L E MLD S L G E S L R N TI I R K I S S K A G Y V D E S L I I K E V V R D i Q R A L L R





 VL NE E SVVE ESLREI RRVLL E MFESLTTNSLSNVIQRMQSKHVI SSEDFDATMEEVKVALLDE

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 MFENLTKSISGAFSKI RGKKVLSDKDIEESLLTIIKEALIIS V L D G L G K S L R G V L D R $V L D A L G D A L R N T L R K I A G A S H I S P E L I K E L V R D I Q R A L L Q Q$ EGVRRRAVAKFDRGGGVYEKAVDAFVKDLQRELI$K$

 E S N Q DV L R E V R DA L L E E G L R N A V T K F L K G G S T Y K D S V E E FI K D L Q R E L I K NFLSNSVQKII DKIGNKKY I KKEDI DN IMQEINPALLK $M L E N L T G R L Q G V I K N L R G Q A R L T E E N I A D A M R E V R M A L L E$

 $V$ L A D L G K R I T T S A V S D L A R S S N V V D $V L Q E L G D K L T G A L R R L Q T T T V V N D D V L N D L L Q D V C R A L V E$
 V L A D L G R K L T T T A L R S L G N S P V I N E DVVLK K C L K K D V Q S A L L E


 MF D S L A K Gl A S AVVKLLGGR | $V$ | $F$ | $D$ | $N$ | $R$ | $N$ | $A$ | $L$ | $T$ | $R$ | $F$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $L$ | $K$ |  |  |  |  |  |  |  |  |

G G DYEK SVVEEFI RELQKKELVR

 D G I R D A V R K F L G G N T S Y Y E V A V $V L A D L G G Q L A S A I R K F Q S S T \square A D E A A I D D C L I K E I A T A L L E K$



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A DVVINYEIIATSFIIERIVITEQSIVGEKIV LKSVVRPDEQ\|VIG\|V|HQ ADVNLRVVRRFVNGTMEEAMGEKVLKAVDPGQQFVKIVYD ADVNSKVVKRFVSDIKDKAVGGEQVIKAVSPGQQMIVKVVKD ADVSLPVVRRFVSSISEKALGSDLIRGVRPEQQLVKIVHD SDVNVRLVDQLTKRIQERALNEKPPAGVSPREHVIKIVYE ADVNLDVVKSFTEQLRTRLKGAEVKEGLTPPQTVLKEVFD ADVSLPVVRRFDKNEEKAIGTRVTKGVNAGQQLTKVVAD ADVNVKQVMQLSQTIKKRALDEQPPKGVTAREHVLRIVYE ADVDYDVVKSFLKKVRDRAINEDVKNKLSPADSVVLTVYE SDVNLALVDDLSKKIKKRALEEEPPKGITPREHVITIIYE ADVNLKVVKDFISNVKTKALEAELDGKLNPSQQFIKIVHE ADVNNEVVKDFIKNVEQKAKGEYI SEGLNASQMMI KIVHE A DVGLDVVRDFMGRVTEKAVGEKVGLALDPTQQVVGIVRD ADVNVKLVMQLSNTIKSRALDEKPAPGMNPREHVINIVYQ ADVALPVVREFINKVK IVALGQDTNKNLTPGQTFIKIIQR ADVNVEAVKE ISKVKEKALGDYI QDGANAHQQMVKIVHS ADVHYQVVRDI CEEVKQKALGTKVLESDRPGDQFIKI FHD ADVNVEVVKELTSKIKEKTVGEYVQEGVTSHQQMLKIVHE ADVEYNVATQFILEKVTAEAVGEKVLKSLRPDEQLIGIVHQ ADVDVSLVMDLSSSIKERALEEEPPGGTTARDHVLSIVYE ADVNIVVVKKFIKNIETKALGKFTEQGVRADQQMVKLVHE ADVPYKLVEEFVESIKTDLIGKKVIKSIKPSEQFVKIVHD
 ADVNLRVVRRFVNSTIEEAKGEKVLRSVDPGQQFIKIVHD ADVNYKI AKEFTSRAKEKALGQGVLTTLKPGQLLTKIVKD ADVDVKLVLETSRRMKERALKKSPPPGFSRRDLAVKILYE ADVSLPVVRAFDHRIKERARGAEVSSALNPAH
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 ADVNVKLTLDLSRKIEERSENEKPPAGMTPQDYTLKVVYE ADVNYHVVKDFIAKVKKRLLGEEVWKHVSPGQQFIQCLHE ADVNLEVVKNFTKEVKAKALSSQLDGKLNQQQTVLKOKCD ADVNYRLVQDFLGSVKEKATGKEVTKSVSPGQMMVKVVYD ADVSLVVVKDFISNVKEKDVGETTVKGVLPTQMIIKKIQD ADVSFDVVKRFVARVREKAAGEVVETKVTPQDHFVKDCHD ADVSVDVVKELISRIKTKAEGGYI QEGVKAHQQMVKLVHD
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 ADVNVRLVANLRNNVKKRVNMEQLASGLNKQKVIEKAVFD SDVNI RLVKQLRENVKSMINFDELAAGVNKRKLIESAVFN ADVALPVVKEFVDTVRREALGQAVLSSLTPGQAFIGVVHQ SDVNIKLVKELSENIKKKALEEEPPSGURKEWFI KIVYD ADVDYEVVIKFNELIKQQTLNMEILKGLTPQQQVIKIIQN ADVALPVVKDFDA AVKARAQGKDVLQSLTPGQAVI EVVND
 ADVNVKLVGNLRKSIKSLVNFKELAPGVNKKRLI QKTVFD ADVNVKLVSNLRKSIKHTVNFKELNPNVNKKRLIQKAVFD SDVNIKVVATLRKGIKEKVNDADAPAGLNRRKMVQRAVME S DVVI RLVQNLRNNVKKALNFEDMTGGVNKRRVIQKTVFQ A DVVNIKLVK QLTE GVKK QI DLDNDGTGLNKRRVI QTAVYK A D V $N$ V $V$ K L V S SKLL A DVVSLKLI I QMRKNIKKEQLKLDAMAAGLNKRRII KKVVVD A DVNLMVVEQFDGDVKSKIVGGEVVKGVLPEQMIIMLMEE A D V N L K L A A V E A DVVNVRMVGKLRDNVKTRANNADKGAGLNKRKIIEKAVVD A DVNVDV A D TVIDEGVRARSLGQEVLEGVTAE QQFVKAMYD A NVNV MLVKKLRENVRNVIDGDEMAGGLNKRRMIQSAVFK S DVVQV K L V F S LTTN KI K E R L K K E T P P S N L E R R E WF I K IV Y D
 S DVVNI KLVS QL R QKVKNSVKAT PNGASKKKVI QKALVD S D V



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UniRef90-A3Y137
UniRef90-L8X710
UniRef90-A0A059CXV2
UniRef90_17RQ9
UniRef90_- $88 M Z J 6$
UniRef90-F4NXE8
UniRef90 LTFMR0
A DVNV 50 60

70
80

 A DVNVKLVANLRKTI KSAVKFNELPAHANKKRII QKAVFD S DVALTVI DSFLRLNKKKSLGSAINKDLTPGQTLIKII FN A DVVLDLI K SFTDRAVQRMKEERPPPGI PLKDYVIYIIYD SDVNVKLVASDRQKVKAKVKVADKGKEVNRKSVI QKAVYD A DVNVKLVGKLRENVKRLNKNNADMDGANKRRYLQKUVVD A DVNVKLVANLRNKVKTK VAPADGSSGNKKSVIQRAVFD A DVVNVKK V L E LTTK K I R E R A L K E E P P P G DT R R E WF V N V V Y E

 SDVNVK LVASLRSRVRTKVKGADKAKEAQRRNVVQKTVGD A DVVAL NVI K L F L K K I K K K I K K K K $\square$ N K N L S P S Q NL DN I L K
 S DVVNVRLVMDLLTKKI K ERAA E E R P P P P GLLTRRDWFLDS VVE A DVVNF K L L A D M R A N I K K I V N L D D D A A GHMN K R K I I Q Q A V F N A D C S K E I V F D F S R R L K D S I N F K E DIP P G L S I R R V I E K A V F N S DVNVVKYVAKLKSNIDMKFKMED.S QGVNLKKMIQQAVVQ A DVVNVKTVKKELQQNVRAEVADTAEAACGLNKRKMLQTAVVN




 A DVNVKLVGKLRQNVRAAIDFEDMGAGLSKRRII QTSVFN



 A DVNDQQVIQLRNGIKAGLDFEKLPKGワNRRNHDKAVVYQ



 A DVNI K LV K QL RENVKKSAIDLLE EMAS GLLNKRKMLQHAVFK




 S DVNVK LVASLRKTVVKK S LE ESEKAGANKKNVVQKAVF YKI AK T FT DAVK EKALGQ DVLT SVNPGQMMVK VV H D
 A DVV YSVVQQDFMGHVSEKALGKRVLLSSLRPNEELVRIVHD S NVNTRVVLNVRKRILLERFKPQDI PTKSAKEKALQKIVGE N D V H H K V A R E L L K K V

 A D V Q M R MV Q E F R R K V T Q Q

 A DVVNI QL V S K L R A N I K A K L L D Q N S S K S G Q T K K L I Q K T V F D

 A D V A E S E N K G L S R I A K WV G P N Q K A E E L P K S A T V Y M M V M D


 S DVVA L P V A E S I DK RVVK E DLLT G QHKK F LDRST G DLLAE DALLR D AS AS F
S DVEM SVVE E L L D Q $\quad$ R G D L V G E E R K F T E S T D T L I E D A L R E A DV H H K T T K D L L N A I E L E T K K $\square \mathrm{G} \square \mathrm{G}$ Q $\quad$ D N
 A D V Q L R V V Q E F K R K V T Q Q I NT Q

 A DVVBVRVVQQFKA SV A DVVH HKVTK D L L A A I END IK K T GVGQKNFLDA TK S
 S D V $N D V N D K L V S S V R S N I K A R L L A D R R M G Q A Q T K Q L V Q K T V G E$






## N



| UniR | ELISNLIFGG |
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| UniRef90 UP1000441579B | ELVQL |
| UniRet90-E1GOW2 | EL MKL |
| UniRef90-N1OKIO | A $L$ V ${ }^{\text {d }}$ |
| UniRef90-F7WZU7 | ELVN |
| UniRet90-G4RNY1 | ELVRLLGG |
| UniRef90-M2R173 | E |
| UniRei90 UPIOOO3623E94 | Q V E ELGG |
| UniRef90-L1LFD1 | ELVSM |
| UniRef90-G7DSH8 | ELVQL |
| UniRef90-A3DML3 | ELSKFFGG |
| UniRef90-D8SVD6 | ELCSML |
| UniRef90-83R0: | TLVEVL |
| UniRef90-11HS49 | ELCNM |
| UniRef90-M5G902 | ELVS |
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| UniRef90-13TDS6 | QLVNLFGG |
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| UniRef90-H5VA5 UniRef90 M5E8T8 | Y ${ }_{\text {S }}$ |
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| UniRef90-25KGH1 |  |
| UniRef90-X1VKS8 |  |
| UniRef90 - 112CN3 |  |
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| UniRef90-P49970 | EL C K ML |
| UniRef90-B9L6B66 | T |
| UniRet90_U6JXT5 | VK |
| UniRef90-A8EW73 | T R |
| UniRef90-G3AIT5 | $-\mathrm{c}$ |
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| UniRet90_B6YUP3 |  |
| UniRef90_V4MW97 | L C K ML |
| UniRefolo-b8BT81 | LT S |
| UniRet90_L2V799 |  |
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| UniRet90-B0R7 ${ }^{\text {U }}$ | ALLS VI |
| UniRei90 M1 ${ }^{\text {M2 }}$ |  |
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| UniRef90_LOJS81 | AI Y DVI |
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| MF DK L R S A F S S AVKS F GEKEL K A S |  |  |  |  |  |
| DRLKTFSKFVNAVV |  |  |  |  |  |
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| K K Till S E K Dil |  |  |  |  |  |
|  |  |  |  |  |  |
| MF QK $\square R N A V Q N F V K Q \square S D A K T L D E K D I S R Y C D N L D N E L I E$ |  |  |  |  |  |

lupas 21
lupas_14
lupas_28
jnet
conf
sol25
sol5 sol0
jhmm
jpssm



```
lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol
solO
jhmm
jpssm
```

S L V V|K|L L

| $A$ | $L$ | $L$ | $Q$ | $L$ |
| :--- | :--- | :--- | :--- | :--- |
| $A$ | $L$ | $C$ |  |  |
| $C$ | $V$ | $L$ |  |  |




| A L L |  |  |
| :--- | :--- | :--- |
| S | L | K L L |


| $S V L Q Q$ | $L$ |  |
| :--- | :--- | :--- |
| $S L$ | $Y$ | $L$ |

AI SEIL
AI Y K V M

| $\mathrm{V} L$ | $R$ | $K$ | $L$ |
| :--- | :--- | :--- | :--- |
| $A$ | $T$ |  |  |

