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## VSFNLGEA

VLIFNVGA
TMS S
GSFTDGETDKAD
LSLS NVKVKEG
VSLATDTVDEDV
VQFRVTGTTRQTY


पNFTIAGATVQSYTNFTRAVRGRLTTGADVHEDPVLPNR ELKVDLSTKEVYKNFI ERIIRRRVQDSGSSHGRPVLPPQ TNF:DGLRGLAEGGSVHSBPVLPTQ
 STLDLNNPT TY NTADATRES
NLQGTKAQ SITHDLVNPTAGQYTFLKQLRDDIKDPNLHYGLPVIKRP NISFSTSGATSNSYNTFIKALIRAQLTNGTAITYDIAVLNPS VGFELHENSPNGYANFLRRLRSAVSGPTRACNLNITQSN STAFNV
silafnv


TVD
A SSADY
$\square A F N V D T Q$ sTAFNV

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TEKT
THNLARSSADYVGFIAAIRNNLANPHSTHNRPVLPPV
ThDLARPTAAKYSSFLDQURNNMRDPRLKYERAVIKA
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UniRef90
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UniRef90_Q8GV51 60

70
 $V$ P D S Q R F V L V



 AS GS QWFRFFNLTNYNDETVVTVAVNVTNVYIVAYRADAVS
 $V$ S N T Q R F L S I N T N P K Y V L V E L Q G S N K K T I T L L M L R R N N L Y V V M Y T N K C R Y
 $V P \square N Q R F V L V Q L T N Q A E L S I T C A V D V T N A Y V V G Y R A G N N A$ A A N D K R FVVLVDLTTTSMKTITMADDVTDVYVVGYNNKDRA


 VA P N Q K F V V A K V I N VA N L E V S L G L N V VN A Y L V G Y K V G G T S $V G \square N Q R F V L V Q V T N Q A E L S I T M A V D V T N V Y V V G Y R A G N N A$
 VTSDNRFALVILTTSS GSTTTIALDVINAYVLGFKVGKKS
 V PIVVQRFVLVELSNWLQEPVILALDVTTANVVGFRAGKNA $V P D S R R F V Y V R L I N L D G N V V T I A V D V T S L Y V V A F S A N N N G$ AS R E A K Y L L V NI I N S GNK EIIT L GLL NVID A Y I L S Y K V G Y N S




 | $L$ | $P$ | $P$ | $T$ | $Q$ | $R$ | $F$ | $M$ | $N$ | $I$ | $N$ | $I$ | $G$ | $N$ | $Q$ | $N$ | $D$ | $E$ | $T$ | $I$ | $S$ | $L$ | $A$ | $D$ | $D$ | $R$ | $V$ | $N$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |



 I T DQNKYL LVELTNYDTKTVTGALTVLNVYVMGYS GTKS
 $V P D A Q R F L L V D L T N S G N N T D R L A D D V V N A Y V V G Y A A G G R S$
 $V \operatorname{P}$
 A S N E A K Y L L V $\operatorname{N}$ NI T T N S G N K E E I T L G L
 P T K P P D T Y $\operatorname{L}$ L $\operatorname{V}$ E


 T $\stackrel{L}{N}$

F T L L Q
 $V \operatorname{GP} P$ P S K E K F L R I N F Q S S R G TVV L G L K R D NL
 $P P \square D R E Y V Y I D G Q F S D T Q W V V L G M A A K D M Y D W G Y V D N R E S$ E P P P S R WF HIV V K T S P A S T L T T A T R A D N L Y WE G F K S S D G T
 T

## T T Q L N

$\begin{array}{lllll}T & L & P & T & D \\ T & W & D & L & G L \\ L\end{array}$
V

 PG K P T YLL LVELKVS K D M S I T L SLLS RNDLYVVGYS DKCRY LPSPSRWFHVELK TRTSTLTIAARADNLYLEGFRSSDGT
 $T \mathrm{QPPQGFD} \mathrm{C}$ V LTAGADRTTVRFRRDTLYLVGYQMQSGA EEPPTRFFDLVIRTNDHSVRFRLRMDNLYLIGYQMENGQ


## QUERY

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UniRef90 Q4U4NO UniRef90-Q5FO13 UniRet90-P10297 UniRef90-Q9M6E9 UniRef90-B9T150 UniRef90-Q09EH2
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UniRef90

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90
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140
 E N I D L G L P A L S S Al T T L F YYNA Q SAPSALLVLI QTTAAAA

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## QUERY <br> UniRef90 P29339 UniRef90-P24478 UniRef90 - D5LNF UniRef90-K7NE95 UniRef90-P16094 UniReforo-B1NOB9 UniRef90-P98184 UniRef90-P34967 UniRef90-P33183 UniRef9-P56626 UniRef90-Q4U4NO UniRef90-Q5FO13 UniRef90_P10297 UniRef90_OOO465 UniRef90-Q9M6E9 UniRef90_B9T1SO UniRef90_OO9EH2 UniRef9-113V675 UniRef90-P33186 UniRef90_P93543 UniRef90_OO4072 UniRef90-P93444 UniRef90-K9JF38 UniRef90-B9T7K2 UniRef90-B3F516 UniRef90-B9T1S1 UniRef90-B7X8M2 UniRef90-B9SSU3 UniRef90-I3V674 UniRef90-B9STV4 UniRef90 O8W2F7 UniRef90-Q5J7U5 UniRef90- B5AFH4 UniRef90 O8RY44

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RVQ
RFKYMERGTSAP PANFRQN M $\square A F Q N G W A R T S T L T H N A$ RFQTVSGFVAGVLHKSGK RFQLITNHIVTNWFDSTRLTSQLVRMQQSFGTFSSAVQRA RFQLITNHIVTNWFDSTRLTSQLVRMQQSFGTFSSAVQRA RFKYI EDQVINGMYSSFEAGARITLLENNWSKDSEQYHKS
 RFQPI TNHIVMNWYNSAPLPWQLVELQQGFESFSSAVQRA RLRSISALIETAWWNESSPGEHYTSQVRSWGRLSNAVQRT TFPYVERRMSAGMWNGVSNDGSLRGLQESWPDLSAAVQ
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UniRet90-B5MET5 UniRef90-Q2PA54 UniRef90-M5XB98 UniRet90-M5XS34 UniR Refo-BgRKZ9 UniRef90_Q8VWY2 UniRef90-13V676 UniRef90-Q1H8NO UniRef90_Q9AUE3 UniRef90-H2DQ02 UniRef90-Q70US9 UniRef90_QOPVD2 UniRef90-Q40772 UniRef90-Q7SIFO UniRef90-Q1H8M9 UniRef90_UKRF7 UniRef90-J5JPL8 UniRet90_B9SBQ1 UniRef90-E6YBC1
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 VA

DEKG
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 SFNGAFQPVQLGYASDPFYWDNVAQADTRLSGMLEVY QSVEGRFTPSVELVNREDQ
TSGDSTVT LPGDLKDENNKPW TTATMNDLKNDTMALL SGGQGTFASSATLQNAEDEPIVVDAVYHPTVAAVLALML TSLQGLFGSVVELYNSNNELIEVDSUYYP【ILANVALQLY
 TSVNDKFLIFPVQLQQEDCSTEKVSNV GVVQSKMGLL STRGAFSTTLVLSSPESTTWAVNNAAE GNMGLLGN KPSTTTATKQLUTSPDT DSPWDFKTVEE $\square K L V M G L L K$
$\square \mathrm{G}$ Tf $\square \mathrm{N}$ DAKNGVFNK DYDFGFGKVRQVKDE LQGLLMY

EPKCQAFPQP $\square R \square G$
DANAPPGKAPAKFTP直
T\TYGNVNE $\square$ RNETG! EKMGVRTAEQAAATLGULFVQQ
DFPYWT
DFPYWT
KLGGGQFT
DLPYWTNNTPLPNVPNPNE
YTDSTPL LANENQQKWELRT
DFPHWTNNTPLIPNVPNPR
RNEGHTW DFNGESTDTWSFTAA LDA DG $\square M H \square \square D$
ESYQGAFAAPVALQRSNGEWMLVDNVRRAV
FKGNPQTPAKDVTVRTCKNLKGI NQVQK
 OYAKMGVLIAEQAAATLGILRFVE DCKNGKFNK DYNFGFGNVRLVKDFH
DA DTSYKПQPQTDNGQTITTVE GLRPYGGIL



| QUERY | $\square \mathrm{GA} \mathrm{T}$ |
| :---: | :---: |
| UniRef90_P29339 | SRAS |
| UniRef90-P24478 | R N |
| UniRef90-D5LNF6 | V |
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UniRef90-B6ZXF5

SVNDDEMDADAYKKLLEDLRGELEACRRPDADHVLPPQ


VTFNVSGSGSDNYGDF $\square A G \square R K R V A N P H F S H N R P V L P P V$ VTFDVS SGDNYGDFDAGDRSRVANPRRNRPVLPPVEP




Y S A F $\square$ A S VR K D V $\square$ K H C T D H G $\square$ P VLPP E
 $N \mathrm{~L} V \mathrm{Y} N \mathrm{~V}$ D A A G G Y E AFMTAFRTGLGEHKEVEGHHVLAR Q 1 MF DLATQSWYHELYRPLKAALTDDGMGHAVVDLLDDD LR F DCST GVGDYKVFMKN LREQLTARHERLDRPLLAKR T F L DF L I LAALAA GSSNHGGAA A A A

Y VN F YM FRDDVS S QLQ QD N R Y I L S E Q
 GSSYGS FVVGVRDQLAGATRHLELVLLPPQ Y R D LI K K WR D LV L L N T R P E D H PV L A P Q
EFQQGEKGGANYKKSI E EFRDLI A PRENGGPRFLPA VTFNVS SSDNYGDFI A GIRNRLGNPHFSHPFPRTRPV


K T WI F DHR DK DP DD LAE Y G NP KLT VQ



 NVE Y T $\square$ G D A L L

$\square$ TYEV TKTKYMKFQQS $\square$ RMLTSSGREVENDPELAPQ
TK T K N MK FQQ S LR MLLA S S GREVENVPELAPQ VTFSSAHASVDEYRLLTSTIRSRAADAHGGFGAGAFHDP


GSSYGNFTSGVRDQLAGAMRHLELVLLPHQ $\square$ T C SVDFSSPKSYVDSLNKIRERLTTSQGNMS SVVVLS

VS F S P VHASADDYQLLTST DRSRAEDAQGFFGG DS $\mathrm{R}_{\mathrm{Q}}^{\mathrm{R}}$
VMAPQ
DAYSAFVQSDRNAAAGETQLENVGIMQAS LDA ID NGGERYQAEINRFRTE KGELDNGVLYLPHP KRLKGELADNPE DEG』PTLHGD
$K$
EFSVDFTSPQKYVQS $\square G A \square R A A M G D A M S \square T \square P Q \square R P D$
EFT\DFSTQQSYVSSLNS IRTEDSTPLETTSVSVINHT
FTLSFKDQSEYVKSLQAMRESLGDNVTVEGVYQLNPT
T Y D L K GAAGYNNMINQVRARAAS RVVYD KMDMT部
$\begin{array}{lll}l & R \\ V & Q \\ T & Q \\ D & P \\ E & A \\ K & K \\ H & Q \\ \text { Q S } \\ \text { T A } \\ \text { P K } \\ \text { T } & \text { V } \\ \text { S S }\end{array}$

## $\square$ $\square$ $T$ $V$

 TAGGQFFDVNLSYTDTATVQARFRTDNLYLVRYRPANS D
 $\square$ SVP WR WVMVDVVAPRDARTTLADADDDLYILGFANRTGH
 T T P A K Y L L Y I Di Q A D N G I I TAAA F D K N D L Y Y M G Y A H T K K V
 H GEPS WLHVVKL QVVEESSTTMLIMRVDSSYV CGFMDRNGK H GEPS WL HVVKLQVVEESSTTMIMRVDSSYVCGFMDRNGK ASSLA WHFTNLIGQSGDSTRLAFRSDNLYLVGFRNQDKW



 $V R V R L I G R G D D K T T V A V Q R H D L S F A G F T D G S G H$

 PDNPARWMHVKLV SDNHEATLADRDDTVYLIGFQARNGT PGDRPDLIVLHHVHGSSPPNASVAFQTHDLSFAGFANGGGH
 T P NPVDWKMGHLDGRGDDNAMLSIRADNLYVTGFANRTGH
 LTLRGSPENT SLAVQAYDLSLAGFTDESLH

 LP PVER WF HVVLLR TQTAAALTLATRADNLYLEGFRSSDGT TS L NK Q WRRI NLVHQDRPTVSLLIDESNGYLVGFRRGDGT
 EPPPSRWFHUVLKTSSASTLRLATRADNLYWEGFKSSDGT A
APNGF $D D Y F P B T$
DVVL $\qquad$ T N GNRVTLIFNA
SEAPESWNMAHLLGRDGDETMLSMRDDNLYV LIGANRSNA

 AE QP ARWL HI KLLEVVEDKSTTLLI RDDDLVVHGFMNQ
PPNPWDFQLLRGDGS GHEADAMAIRPDNRYWLGYFTRTGR PASWKMSHVIGRGEDEIMVAI RDDNDYVAGFADQTGQ

$\qquad$ ZQ0 UniRef90 A0A024 UniRef90_D6ECD9 UniRef90-M8BHQ4 UniRef90_C5WPJ5 UniRef90-T1N5W4 UniRef90-I1HK11
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UniRef90_M0YF33 UniRef90-MOVBT9 UniRef90-W5EHH1 UniRef90-J3MWB5
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UniRef90 B9FAJ6 UniRef90-Q32GM1 UniRef90_C5WW28 UniRef90-F2EDIO UniRef90-F2DED7
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UniRef90_K4AMP9 UniRef90_Q00531 UniRef90-W5FZQ1
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UniRef90 B6TDHO UniRef90-K3ZJG4 UniRef90_N1QXX8 UniRef90-A2XJU7 UniRef90-B8APM3 UniRef90-W4ZRN0
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UniRef9O-M3BOM4 UniRef90-S8AF23 UniRef90_l1QW51 UniRef90-Q6AVV8
UniRef90-M8CMS9 UniRef90-D5WND3 UniRef90_C5YFS7 UniRef90-I2XZ17 UniRef90-A0A023EB71 UniRef90_UPIO0036672BE UniRef90_Q84SV3
 NPEWRADADAGP LVPGS RALPGGFTYSRLETQAD LRR YFFNEPAAQASEFVFQGTKHQLLPYSGNYQKQQDAADKDR WLEFGRRRD YFLAENAPDPTHVLTRGTTRVPGRFNGTYSGLTRGAVEVL KFWEFSDSSMISGSSP K FWEFSDSSMISGSSP
WW WLEDERPSTQTGHLI EGSE LGFGGT WWEFGKTGD THLLDDDNPRWLGFGG
 $R Y Q$
$S$
$S K$ N K G


 YFF S NAPTDGLNNNFKGTDEPKL $\begin{array}{ll}W \\ W \\ W & L \\ V\end{array}$ VW

WHELTRGLIAGAT
WW
WW ELT G GGI LEAAA ELTPGULGAAPGGAAATYVGFGGS RLFKGAPTDVK LIPPDVTNKNNRYTGN GLWWEFNNEHNTHLIPNSN WLGFGGRYQDL VGQKGL WW EF FGKEGGARLIDAGST WL GFGGRYQDEI GQKG YRLIDEKTKSEPMI PRGDHNEDLGWPVNYTSLLGATGTKQ YTFKD
 WH TFAIIRRLIPGAT
$\begin{array}{ll}\text { YRFADFS } & H V T F P G T T A V \\ \text { WEFRGGS } & V V I D A A T\end{array}$



WHFND
QELPRNVGAGATY R AGFGGS



 | $H$ |
| :--- |
| $Y \quad D R L G T G P K G Y D A L$ | $S Y K E L G Q N A H L L L$

$N Y T N M E S A G Q V D R$ WEFRDSTQ R LDEGS RVLDFEGS WHAFERHA HLFRE DVTPLK KNDNYGSLLLGAGHKDR
 WYKFNGQSSSFKGL PGAT VLD PRQNYQDLIK GHANL
WHAFAGAEGFFKNPDP
WHFPRF
WHAFRGREG
WF F S D



EK|I|P|L|GRAFDSA\|TS LIFHYDSTAAAGAFLVTIQTTAEAS

 $E Q$ QF G R N QL DEAI RUL R S AVSQPEALGGVVII QMLSEAA E T L Q L G L P N L S N A L A N L A N N A L Q N CAARA L L V L T Q M I A E A A A GVVALGP QQMAEAVNAL S GAK QQQAREAVV ALLLMVNEAA LDDI SYNKNALQQDAVSKLASTNTRDRARSLIVVVSMFCEAT
 V $\mathrm{K} V \mathrm{~V}$ L R K T V V L D A V H R L S R Y T Q R G Q K R D L A R LI I V I C E S A KALNLGGGALI KALQLLSGTNGQQPNEALVVITIQMVLEAAA

 KELGLG $\square$ L LLLSTLMDAVNKKARKNEARFLLI AI QMTAEAA TGMEI NQARLDTAVQQQLARPSTNAVARALVVVIQMFSEAA STLLKLGKYTTSEAAGTLWNHNNKDLKKAV ATLCVVLSEAA EDIP L S S SRDGAAVT TLAGGDPGRRARAI LTLI FAIAAEAA RDIALGGGPTEGAVNALAQKGAPSHARSLIILI EAI SEAM
 HTVPL GRESAVQAVRTLANYNSAQLKLPIAKFAIMIISEAL

 D AVVTL G R A Q M A A A V D V L A K H D P Y A V V P K T M L A L V I M V C E GL E QI E L D R D F A V D A V R R L S H H H P D E D
 VGVQVGRKALMEAADVLSNYDPEDLKVALLRVLVMIPEAQ


 PGVPL GREAMLEAI RVLSAYRPEPVKRALAAMKVVMCEAA HATVLETSSTVIVAVRRLSGYRPHAVRLSLVRLIILVCESAA
 L LQV N L G K L F A 1 E A V R L L S E Y S T D N H K K A L A G L I L I I C E S A

 TGMQINRHS LTT S YLDDLMSHSTQSVARAMLRFVTVTAEAL E S V T L S K K D L E A S A G G A G S S S Q Q D T A R S L MV V A V MVVC E A I

 P Y F S V GRQS LRRHSYFVLLNYDAKRQRKALTELIILDFCEAA
 T NVAL GRQQMADAVTALYGRTQQQAREAVTTLLLMMVEAT V S V P L G R E S L L D A I HV L S N Y DP V N T P KA MA K I T L M GP E S L
 KMEFSKKELAAAVGVLAGSNKGARAKSSLVVIQMISEAA
 WK VA L G K K S A I H A TK QL A T Y D R A VT P D S L V R FVV MMC E G M E G G G M S F A I E A V R R L S S S T E K S A R V A L A G L I V MVVCE S A

 K DLDV D Q D A VARDVRFLSTYSRPDTAHSLGRLSLVVAEAA
 S GI L L GRRP L G DAVVMWLHRNDPQYTAHGMLVLSVVMLCDAA




 DSMRLGKTFAADAVRVLSRFSPDSARRALAGLIVMVCESA LG $\ F \mathrm{~F}$ GRRPDGDAVTWLHRNDPKCTAHGMLVLSEMICEAA


 Y NTRVGKSSLETA IVDTLNKASPKEAARAFLVLVTMLDPES $\square$

AVPVGRSSAVGAMEVLSRYDPAATTAAADAFMVMVTAAA
 DRTDLS $\square$ DDLIDNHVSSTRT $\square$ NGGAEARALLSYATVLSEAV WKVPL GKKSATHATKELATYDPEDTSKGVVRFVVMMSEGM



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UniRet90 ${ }^{\text {M8BHQ4 }}$ UniRef90-C5WPJ5 UniRef90-T1N5W4 UniRefofo-l1HK11 UniRef90-A8PMG6
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UniRef90-M3BOM4 UniRef90-S8AF23 UniRef90 11 QW51 | UniRef90-O6AVV8 |
| :--- |
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 RFKYVEKQI DDRHGRNEVPSLAADSLENEWSLLSKQULFAA RFRQKLRDWSA
RFQLITDHVVKNWYNSAPLTSQLVELQQGFVSFSSAVQRA $R F Q T V S G F V A G L M H N K G T I T G E M K A Q V N G W Q D L S A A L L K T$ RFVDIANHFAFNLESSEPPQWMQNDLEKNWVRFSFMILKS RFNTVSRTVEAGFNKGVTDSEMQGKQVQK WDRDSKAFDWA RMSSISTTLSTGWGQAATVNDDDTQYIHNWGNLSTA LER RMRPHYTTVNKGFDETTSLTKLHVFYLWNWGLMSRALR RFHPLFEHLREHWDEWGAPPPALVDLQNNWGDLSQDWWRG RMALDYDAV NAFDRQUSGNERQVDYLRNWWLMSRALLQD RFVTVSAFVAGLMHKSGVITALMKEQVNGWSDLSAALLRT

 RFRDISTLISNSWWNESTPGVQFANRVRSWARLSSAVQRT RSTVACEFI RSKWGTAEKPTLRUVTLENSWDPISKAI RLEPPRKAVNDGWDGESRVAPE HLPPYIEHWDTMSYEILRS RFLTVAELVGGFMNKSGTVTADMKEQVNGWKVLSRALL RFQTVSRLVAGLLMSKSGADTTAMRKQVNGWQVLSAAMLGT
RFTYIEGEIVSKFSDGFKCNDKAKSLENNWEKTSKTVKNS RFHTVYGTVDREFNTAAKTTEMDGKQVNKWDRISKAVLWA RFDTVSGRVDREFDAEVTUTEDEGKQVNKWDRUSAAVKWA RTNPLHDSFARGWSTGFSDEELMRKYVWRYGR
RTNPLHDSFARGWSTGFSDEELMRKYVWRYGR
RFFAVRKLVYNSWENGGVDDEDTAKLVVNWRRVCCALLDW RFVPVSTVIGKGWGEQVSVTAKEVSYIMDWGDLSRALLKW
 RFNTVSRTVDAGFNSGVTLTVTQGKQVQKWDRISKAFEWA RFNPIFRSIKAGWDTGLESTKQLFDYARSWRQDSVDLLCW RVRPIKETLNDGWDTGAHVAPEHLPYMEHWDTMSYEILRS RIRKLYDTISSGLGSA LTTWQVHYLWNWKRMSRLLL RLKAVSRAVGGRWEEESYLSSDEAKYVPYWGETSAMLVEW RLQPIHETVVRGWESESRVAPEHLPYIDHWDTUSYEIIRA RMISHFDTVINGWPRAGSISRQQVHYVWNWGNMSR
RLQPIHETVSGGWESESRVAPEHLPYYDHWDTMSYEDIRA RLKPI QASIQPKWLSGGA T TEKPLYVVRWSDMSCAVLVA RFRQIQRGFRTTLGRSYVMTAEDVDLTLNWGRLSSVL RFRSVAGHVMCNAARFGTLPAHMVAQVKNWSSLSEYWLGA RLK PIRKTVNDGWDGESRVAPEHLPYIEHWDTMSYEDI RS RFRSVGGHMMCNAARRGVLPTHMVDQVKNWSSGSEYWLGA
RFFPIRNAVEDGWDSVAYITSTDADRLVCWGQUSYMLEYS RTEEISNYLGDKWSTQKPLPAELIDEKENQWTDTDPALLGV RFLTVAEHVAGFMSESWR TGDMKEQVNGWQDLSEALLKM
 RFSPVSKVVNAGWDKDVSVTPDEVNYUKEWGDLSTALRSW RFQSVS
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RMNPLHKT TADGWNTGARFTKQL/MAY LEHWELIS $\square$ ALLD W RYPALADVMSRПWMTGGRLE
RLEPI RETVSSGWESGARVAAEHDPY胃HWDTMSFEVLRW RFRVI REAFSGDWETETHLTQPQAALVVNWTNTSVLLWKW RFRPIRDAYDLEWETNTYLTGGQTKYLVKWSEISKELVRW RFNDVEGTFRTAMGTQYGLPHQQQELENSWDSLSEYYQRV RПREISEHTGTSWGENETIPFTLVEKENGWKQ
RLKPVRRAVVERWEQVSYLSSDEVRDVPYYGKMSLMILEW RLHP LDET LTR GRGARVAAEHLPYI EHWDAMWEELKRW RFKPIRNQUKQSWLHPMTLTPEQYNTVFAWQDMSELFCRG RFRSIQGNFASTALGDDAFTPYRLSLEDSWDRLSDEIRKA RLRE: RETFSNNWEKETFITSTDQANSVVDWGTLSKLLITRW




UniRef90 BoEVM0 UniRef90_G3JUQ6 UniRef90-Q84L18 UniRef90- Q8L5M4 UniRef90 UPI00046E1D38 UniRef90-UPIOOO42B5579 UniRef90-M8BIX5 UniRef90- P 84786 UniRef90-C5XD70 UniRef90-M0W1M4 UniRef90-Q53PQ0 UniRef90 C4REH4 UniRef90-I1QXZ9 UniRef90-11H5Y4 UniRef90- ${ }^{-19 S 6 M 4}$ UniRef90-P27560 UniRef90-Q71SN2 UniRef90-M8AU74 UniRef90 M4GE37 UniRef90-G1XBL1 UniRef90-F2EJD5 UniRef90-11NKG1 UniRef90 A2X0X2 UniRef90-O9AS85 UniRef90-O48859 UniRef90- K3Y919 UniRef90- M8BSE2 UniRef90-UPIOOO350F31C UniRef90-UPI000350F31C UniRef90 A2XJE8 UniRef90-K7USD0 UniRef90-Q41851 UniRef90 C5YBN0 UniRef90-P25892 UniRef90-MOYF33 UniRef90-MOVBT9 UniRef90 W5EHH1 UniRef90-J3MWB5 UniRef90-Q10F32 UniRef90 W5B8D4 UniRef90-F2DU34 UniRef90-W5BF17 UniRef90-M7ZZH5 UniRef90 B9FAJ6 UniRef90-Q32GM1 UniRef90-C5WW28 UniRef90- F2EDIO UniRef90-F2DED7 UniRef90-Q69S32 UniRef90-S8AFA0 UniRef90 J3KWM6 UniRef90-Q2QX14 UniRef90-K4AMP9 UniRef90 Q00531
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UniRef90-B6ZXF!

DTT YTDSTPLLANENQLQKWELRT
AA DPTYR $\square Q P Q T \square N R K R \square T T V A G \square R P Y \square G T Y R$
D LP WTDNTP DPNV PN NRAHDWTVDTA
DSKNSKDKKPTPKGPEKFDKMGVKTADQAAATLGLLLFVA N A
KNPNAVIPDMQKL
RKQGPRYPWPKKLDAETH $\quad$ QKWRPWP $\square$ REDA RAVVQLLLN
QTTPW PRRLSSETGDN DDEQARRVVLLVLN
DARPPVVGEKGGLTKAKAEKMGVDTEEKAANTVGVVLF
TDGGVFPTDVGLRATNDPTNV ADLKNASALMLF DAKNGVFNK DYDFGFGKVRQVKD DARPSYN $\square G P F T \square$ NGNR $\square T$ DF $\square R \square R$ PY $\square G L L$ K
RNEGHTF
NRTGGPFTKMLETQAN $\square$ RSKEE A $\square$ AVVGLLLN
QSGNNWWPRP DSDGEDFEYTNVSQDAVKLVDLL
DARPPARFAPRR DMGVDTVEEAAATVGILLFVE
TGPR A K K
VDPEAKFP
VDPTAPFPDLVA LDVSN
NKTGGRWDSADELR $\quad$ RTGVRDPTQALNTVDTMLL
KSGGYKDDKPFQ PFKG G $\downarrow$ NNGEEALA VVALLKL
HKTNGPFTELLRKKADपHSKEEALAVVSVVANPTLADMAH DHPTAVIPDMQKL
NRTGGPFTKMLEMEAS $\square$ RSKEEA DAV
KDNG
NTTGGPFTNMLETEANTHSKEEALAV
QSSQGNSSDUWPRRDPQLEPGGITSARETG R\|VDLLLN
NSTGRW
NRTNGPFAKMDENDRSQEEA पAVVRV
NRTNGPFAKMLETQAN $\square R S Q E E A \square A V V R V V L H A D$
RQKKGRYDGP
DKYGRWWA
A LYGQKF LPP LVGAADGSQQR
$N$ RTGGPFTQMLEN $\backslash R S K E E A V A V M N M L M D A$
VLYGQPSPRP
AKRQRSNATPKGSVKSKGN
D A
RRCERDATPL DPNESPYG $\square$ TSREQVVVARGULF $\square V$
DTR
FKKFNG $\square \mathrm{G} \square$ TNGEEA $\square$ A $V$
DSGRKTWP
Q $\square G D G A F T T M Q A L$
HRNNGWW
KSENYAN $\square$ NPDP
E LT G
K S SNDNWPHP $\square$

HKNNGQW
RRTGRWDGPFTELLR KDAG $\square$ GGAEEAGAVAGVLI
K KNGVWN
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VS GPPPTP

DSDGGEF LRNHSEKGQDTGITTKEKALNTYDL
ESGRKRWTN NKDDTREFDKIHANSPQAARDVLLFL V PY $\square K$ ADADA $\square$ ASQRYDY $\square P Q K \| D C Q D H A M T A D G V A L$

## KDERGRWTMDPK पAD $\square$ G GVK


EKSGRKDF LKTKGARELKDELGUVSAEEAMGLVYLLL
SAGQ NATAPF $\square P S G G T V N G L D Q V R R$
KRTGWGELGPWANVDR
RWGGGPFAGELRERAS $\square$ GSAEEA $\square$ AV
D D DTDQTPVWTKGAKGSP

DWGGGEFTKHAEKVKRNSK
VT G A T Q A E NK L DVLL
QPNQEN
$N \square D A G N V R \square T G N N$

UniRef90 Q7G6L7 UniRef90 B9FVX7 UniRef90-A0A024YH03 UniRef90-M8CVP2 UniRef90 N1QW99 UniRef90-B4VB31 UniRef90_B9GC41 UniRef90 M8BYM1 UniRef90 ${ }^{-}$A0A024YQD2 UniRef90-M7YXY4 UniRef90-M3C9H7 UniRef90 K3ZL92 UniRef90-F2E938 UniRef90-B8BGK3 UniRef90-U6ZVF3 UniRef90-L8ELW0 UniRef90_J3LCA2 UniRef90_I1NVW7 UniRef90 A3ALG7 UniRef90-C9Z689 UniRef90-C3SA73 UniRef90-UPI000368ED0B UniRef90- M7YM64 UniRef90-L8EYS9 UniRef90_Q0ZHE3 UniRef90 C5XFG3 UniRef90-P10593 UniRef90-MOYZT9 UniRef90_K3YE11 UniRef90 UPI00029A499D UniRef90-UPI0003781F56 UniRef90-I1PER3 UniRef90 P27561 UniRef90-Q6AVI4 UniRef90-T1NOE2 UniRef90_B8AUA6 UniRef90 M8BAW5 UniRef90-UPIO003EACA28 UniRef90-B8APM2 UniRef90 C0HFG1 UniRef90 K4AKJ6 UniRef90_C7JA86 UniRef90-G0CSV4 UniRef90 W5G1R9 UniRef90-W6ABD3 UniRef90-Q6V1W8 UniRef90-I1QWY8 UniRef90-G8X772 UniRef90-M7ZCX4 UniRef90-M7YDS2 UniRef90 STSVU6 UniRef90-M7YQG2 UniRef90-M8BV38 UniRef90_A3ALK2 UniRef90 S5MW44 UniRef90_UPI00035E4778 UniRef90-Q2QYX3 UniRef90 UPI0003692933 UniRef90-B0WQ89 UniRef90-M0VF78 UniRef90-K9UZZ8 UniRef90 A2YLD4 UniRef90_C9ZG60 UniRef90-M7ZES1 UniRef90 L7F6I0 UniRef90- АЗСЕ39 UniRef90_W5GTL8 UniRef90-R7VZL7 UniRef90 C5WPB4 UniRef90-Q6K2U8 UniRef90_I1PERO UniRef90 K3YMZ7 UniRef90-M8CIH0 UniRef90-B9GB74 UniRef90-W0GPF8 UniRef90-J3NFC9 UniRef90-B8AXC9 UniRef90-T1N7Y5 UniRef90-Q17BD2 UniRef90 W6ABT7 UniRef90-M8ALL7 UniRef90-M3F761 UniRef90 Q2QPC5 UniRef90-J3L9K8 UniRef90_UPI0003510655 UniRef90_B9FFH3 UniRef90 J1RVC1 UniRef90-I1QFF2 UniRef90-K9VCC8 UniRef90 V5H1R3 UniRef90-M8APX4 UniRef90_UPI00037ED18E

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10
20
2030 30

40
LS DNEPRKTV${ }^{30} H$ GNHPVLAP K $D \bigvee S R S \boxtimes S G$

D R Y WN M I D QV HR I S GHDFY QQVLDET NYT $\quad$ DD P TK N YA DLKR L LVRNQTSRALAVRRPN TFNVQSSSAD YVT F LTGI R NKLGNPHFSHNRPVLPPV


S Y GRFVSSVRD QLAGAMRHLELVLLPPQ $\square L F S P A Q A S A H E Y R S L T S T \| R A K A E D G Q G F F G M P F L P$

NYWD L I DR $\square R Y$ TYGEPT GVNG HP TLA Q T
L R R F L A P T R A VF E
L S DNEPRKTVHGNHPVLAPK TAKGYESALTLVQKQLAKALDWKGVPMTESQ

 $F N V Q S S S A D Y V I F T T G H N K L G N P H F S H N R P V L P$ $D V T E L E G A T S T N Y R N L I A S L R Y W V G B R D E G A A R L Q E T$

VT MS P GRK T S LT Y A S VTGS I DK K DA GHGEFYGKPVCP P YSAF $\square A S V R K D V \square K H C T D H G \square P V L P P E$

A NRYRQMVARLRAASGHEMAGANTPAMLDT DASGEGYAHTISHLRS I DDGGHRVNGGRNLAVD
$S \square T \square D L V N P T A G Q Y S S F V D K \square R N N V K D P N L K Y G \square A V I G P$
$\square S$ F N VA T D D S Y $\square \mathrm{Y}$ T L L I Q D S S N K M WG P $\quad$ DVWVLH Q Q

DRTFNVV ADCERFEEY $\square$ GE LREAVRDPTEP PPLAAT
$S V V D L S A L S Y N K L M D D \square R F Q R R A H H N F R N V P \square$
AKEYRDLLARIGNAVSHP IVNGIGAIPEN


STTVDGMPVTPPD


G H P VT P P $\square$
TVF GEGVDSYNPF LDNVMHTLLEANTEPYDKYFLPK Q



NGQNY LT F $\square$ D S L R G D L S Q P N VA H G $\square R$ VT K T D D D Y $\square$ R A V S S $\square R \mathrm{NN} L \mathrm{~L} \square \mathrm{D}$ G S S T N P P Q $\square R \mathrm{RT}$
GS GAY L A M LDDHLRNLAA DTGVNTG $\square P \quad D$ $N V A V D F H M S D E A G G A L F L D Q Y E E Q M G D N T E T G G H Y D T P P E$ GSGAYREMLDRLRM LLADT EVNVVVT N VFFNPRTA SLANLINYMRDRLASGEDSCHLLDP KTA FLKQFEDGLAANTLPWGHYFTPEE SAHSYTRAI NKAREWCK SNTKVTDDPGAE DF TKNTYAS LVSS $\quad$ V V T R $\square T$ T R A TVEGKP VC
$H \square H F D L K T \quad E T F N Q L Y S K L R H L L E R T S T \quad P P Y$ D D D LA Q R Y E DFVR DI DR RLT K P A T Y Y G K P $\square$ T P N H $D \square E H V G D R T Y H T L M R S I H E N L Q N S P F T C C L A A$ R Y P
 S Q N Y EK C VK D $\quad$ R A A M D D G G K D T T V Y LGG I Q NL I S A LT E S DEVY GI KV T K R K S Y A S Q MER L R K H L K K K T L M K G K R K F

K T

 A D LY T H T VGN $\square$ R S A M L G P GS G H LI

R
T
TYTSY $\quad$ YR W $\square A A D R P R L G G N G$
DS YK T DLSK I R D RI R Q N G T LE T I
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UniRet90 QoZHE3 UniRef90-C5XFG3 UniRef90-P10593 UniReffo-MOYZT9 UniRef90 ${ }^{-K 3 Y E 11}$ UniRef90_UPI00029A499D UniRet90-UPIOOO3781F56 UniRef90-U1PER3 UniRef90-P27561 UniRef90-Q6AVI4
UniRef90 $-\frac{\text { T1NOE2 }}{}$ UniRef90-B8AUA 6 UniRef90_M8BAW5 UniRef90-UP10003EACA28 UniRef90-B8APM2 UniRef90-K4AKJ6 UniRef90-C7JA86 UniRef90-GOCSV4 UniRef90-W5G1R9 UniRef90 W6ABD3
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UniRef90 IIQFF2 UniRef90-K9VCC8 UniRef90-V5H1R3 UniRef90_M8APX4 UniRef90_UPI00037ED18E
 LTVINKGHGESTLAIRPDNVYLIGFRTQAAS TTMPDRLTQURVSHAGQYVVSLYYWANTLYLAGUYTGNRH FYDPARVILCHLNGDPQDKCVVAFADDDUSAMGFRNSTGH EPNPNRWFHIVLKTATASTLTLATRR
EEVSARYLPVRLQLRGELFELTQNSVRTTGFRNTFEN TSLNKQWRRINLVHQDRPTVSLLIDESNGYLVRFRKGNGT SRDGLRGLGVELF GPRQSALLRDRANNYMSAYRSSDGL TVPPATWHKPTLKGRGNDKVTLWFANDNEYFAGAYNNENNK RMDRGRWL HIGLLQVAGGTSVTLAGGMDDLYVAGFYATNSH ARPNYFI LLNMVNVPGRTATLALCDDDLYVQGFKDTKRW TAPPRKWLKMHVGRKPDRCTMALRFDTVYLMAFSTNQNQ PRGGRTNRVVR PNDNMYFVVVSWVGGPREPVKLDFAFRDLYLLGFLHGNQW ATSRGKLIMVDLLEYGSGAGTLAMRVDTIHAAGFANRSGH PPGPEMMMVDLRDYGNGVGTLAVRMDGLSVAGFANRSGH TTNGNALIGVSVHRYGTYVGALYFWTNDLYLAGFYEGGGH PNSPARWMHISSSAGGATTTLVLRDDTLYVVGFTGEGGS
HDEQNNYFTVDGSDDHPRDRGVRAHDLYVGYVTSTY LI E LOM L ERVANHF DEVQVLNPSQHHपSपYFRTNDपYLVGFAANSQR GFVNNNVF KKVPELWFYTELK TRTSSUTLALRMDNLYLVGFRTPGGV

VVVNLRGEDDDRVALALHAHDLCLAGFRNRSHH PTDTNRVIEVRVGGPSECHVKLYFSVDNLYLLGFTARGTH VTPGADHAY DDLTTAGATVHLIVRVSDMYVVGWQAGNVY PSKGKFLRTNFQSSRGTVSLGLKRDNLYVVAYLANBAY PPSDGLFVVGLTGGADELAAVALQGHDLSLAGFANRTRH AVNPFKWFILERGGAGDNKTMLAVQRHDLSFAGFTNGRGH PPTWILLTI QGTPREAVVLAliRTDNVYIVGFKNAAGV


TSNEEGWHDSDDMPESPSVQDLIDQRNAYLDADRNGAGQ TATNAR VDIEVLTSEGNAVTFHMLRRNMYIQAFTLSGTT VRDNPAPELMNLTLHLGEEVTLSVQTDNLYVVGFRNGEGT ASNRVEFYNLTGRMANGQSYRLIMNPDTLYIDGGVAGDRY PEDRQTFHIVELENPQDPTVQLLFRETDLYFVAFRSANGW VKDNEASCLLYLNAAFESRAC:PAPNASLYVIGFKGGDGR

VDGRDTFHVVELD SGKDSVEILFRESDLYFVGFNDDPRF PGPPAWWUSVEVK

VVENGH
PPGS YFAVDTRGLDVDHRRLIIEQNNDYVAGFVNTNTF NTRTNRFADIVISGHAAPTVHAVVRLSDLYVVRYTVRSPH $P Q D V T T F H D V G V V D T D G A R V R L L F R D S D L Y F V A F K T G S C W$

$R N Q A D N V Y F T V Q V E F E G N N \square G F V F R R R D L Y L Q G Y \square N N S T Y$ TGDDSSCHLVRLTHPDQQRVQLLFRDRDQYLLAFQRGDGR
 NKETRSFADIVIGGGNHAPVHAIVRDSDESVRFSDGTPH PQDVTTFHTVGVVDTDGARVRLLFRDSDLYFVAFKTGSCW PHQPPKWMLVELRDQSAK CGVYMRGDNLYDTAFRNQKNM AVDTPRWLVV QVPGKKVVAVLFRGDNGNNVGFINGYGT TTPAEGDFHLKLKFRERE LLTHIGGDLYLLGWGDRYGA GPSGYFEI LLFKHANGRVRLLFNYQNYYVAFKVQGKW VPKEVRGKVVDL DGGEATLAAHRHDLSFAGFANRSGH PTEGHSYFRVVFFSSTNDRVEFLIRDFDLYLLGLRRQDGE VTPAGGYHMI KLYKGQKSVRLLFRDSDGYLVAVEDDLGS VTPSMGHFIVELQPPAHKP:KLFRSRDGYVLGFLHGNDW GNFVVVVYPPPVWPDKNRQKLLFSYENLYLVGFSENNRW DNTSRGVYVIKITDSQYNLSLVATKYQAWFRGVVTNNGG DGDTK DRGSQKFDLITVSDYTGKRAVLI LNPEDLELQGFIDDSNT TDTQSFADIVISSGDTSTLHAVVRLSDFYVVRFLSNDGP ASTPLAYFSV RPPTSRWLMVD VAGGGGP
DHTPNGSFVIEETDGESQLMIVC NKYQTWLRGIVTHNGS GRSIRFLIQGRNLYLRGWKARDCV NPDPEAFQS TN DDDAGRAVRGLFRRSDNYLLGFYVRHED PPKGGGTFLVRLVPRRDEPVYLLFRWKDLYFEAFYSRGKW



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Y LF NDVTPKWPEWDP
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| :--- | :--- |
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M D K Q Y K D D A T $\square \mathrm{G} \square \mathrm{G} \square \mathrm{T}$ N GEK LAVVRLVKVVIRSNMA T N

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jpssm

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sol0
jhmm
jpssm
C C



RF TP TYESYDAHLDKENTVGQDNSKLIRNWGDLSKGFYR RFI AVLLEMVRRLEAGSVLPGEMWDMIT S W RLPIILRFVI DNFKAQVALGS ILAMWTNNWSK RFQAI PAQI AQA GGRTSWTVHNHADE IRSWDQRSGVVLRA $R F Y R \| T S G M S \square N W G E R \square R P T \quad V T N W G G \square T R$
lupas_21
lupas_14
lupas_28
jnet conf sol25 sol5 sol0 solo
jhmm
jpssm

```
lupas_21
lupas_14
lupas_28
jnet
conf```


[^0]:    

