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GDVKVQMFNGNTSATTNGI APRFYLVNTGSNSTNLSD SGDLTUQAYNGSTGASTNGIAPKFKVINTGNAPVQLSD EYYAEAKLEQENTERSQLTVHNESVHPPHFTG EYYAEAKLEQENTERSQLTVHNESVHPPHFTG
 SQGSUKVQMFNITTAEQSNSLSPKFKLVNTGTESIIDLSE VEAAVASGNNFVEKALLN NRSGWPARVSD VEAAVNASGNNFVEIKALLN NRSGWPARVSD AGSLAVQYRAGNTNAADNTI GPQFNTKNTGTTAVKLSG TGGQIKVLYKNMETNATTNTIRPWLKVVNSGSSAIDLSR TGGQUKVLYKNMETNATTNTVRPWLKVVNSGSSAADDSR VEASVNTSGSNFVEIRALLN NRSAWPARASD GRLILQYANGNGSDTTNTINPRFKMNNSGSPVKLSD TSVNASGSNFVETRAVLNNRSAWPASSSQ TSVNASGSNFVEIRAVLNNRSAWPASSSQ I Y N R T GWPPRVT D I Y NRTGWPPRVTD $\begin{array}{llllllllll}1 & Y & R & G & W & P & P & R & V & D \\ Y & N & R & T & G & W & P & P & R & T \\ V & D\end{array}$ AGTNASGTNFПETKATVNNQSGWPARATD AG| NASGTNFIE!KAIVNNQSGWPARATD A GIN A S GTNFI EI K AIVNNQSGWPARATD NFIEIKALLHNQSGWPARVAD
SASVKVYYKNNDSNPTDNQ!
TGNLVIQAFNGNTSASTNG E E
GTLEVQYRNGSSGTSVNAITPQFNVKNTGTTAVDLSK
E GDLILEYRTNDTNPGDNQFRPQFRIVNNGSTAISLSD
TEKIKVLYANGVTASSTSQLVIKVKVQNTGDRAIDLGR

VVKVEYRT ODNAS DNQuRFNL

 S Y GAL KVVW A NGNLSSPTNVLNPKIKIENVGTTAVDLSR

A GNLILAYRAGDTNLLDNQMKPQFVIVNNGTSTVSLNE S Y GAL KVLYANGATVSSTSQLVIVVKVQNTGDRAIDDGR

 A GDLTI QSFNGNTSASTNGVSPKFKLDNSGNMA』PLSD
 $V$ E A SVVAS GSNFVEI RALLN N NRTGWPARAS K

 $N L V V Q Y R T T D T N A T D S Q F R P Q L R I V N N G T T A V D L S K$
 GGLKVQMFNSSTANAVNAFSPR■KLVNTGTAAVSLAD



AGSLAVQYRAGNTNAADNADSPHFN VNNGAAAVNLS

 NQ G V V L Q Y R S D Q NAKDNAI R S EFNI KNT GTTAMVKLS D
 A GTI RII EMFNSNTSATGSSISPKFKLTNTGTTALNLSD



$S G D L V L Q Y R T G D T N A T$


QEK S L SVVQYR A GD G S VNGN Q IR P QL H I K N N G N T A V D L Q D
A G D L L A A

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2036E4A1A
5
 LKVRYWYTKNST QAE QYFCDWAQI GCSNI RAQFVSVLQPV
 L S F N Y Y I Dill S A I N A G H S A S D I K V S A A N Y N Q G A K V
 L
 VKLR Y Y Y T I D GEQQQQSFWTDWASIGGANVTGTFVKDDTPA MAARYYFSI SELLDAAGQSDNDVSLEDYYI SGVPVKVTGPA



 LK L R Y YFTKE GASS LN S WVD WA QVG SANVLRRSFGVAA GP



 L K F K Y F F I D L S E L I I N A G Y S A D V V V K V D T Y Y A E G A K I I S G P WN A


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 | $L$ | $S$ | $F$ | $R$ | $Y$ | $F$ | $L$ | $D$ | $L$ | $S$ | $E$ | $V$ | $Y$ | $A$ | $A$ | $G$ | $Y$ | $T$ | $V$ | $S$ | $D$ | $V$ | $H$ | $V$ | $T$ | $T$ | $A$ | $Y$ | $A$ | $E$ | $G$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $V$ | $S$ | $Q$ | $P$ | $V$ | $V$ | $V$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $S$ | $F$ | $R$ | $Y$ | $F$ | $L$ | $D$ | $L$ | $S$ | $E$ | $V$ | $Y$ | $A$ | $A$ | $G$ | $Y$ | $T$ | $V$ | $S$ | $D$ | $V$ | $H$ | $V$ | $T$ | $T$ | $A$ | $Y$ | $A$ | $E$ | $G$ | $A$ | $T$ |
| $V$ | $S$ | $Q$ | $P$ | $V$ | $V$ | $V$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |






 | $L$ | $T$ | $L$ | $R$ | $Y$ | $Y$ | $T$ | $V$ | $D$ | $G K$ | $D$ | $T$ | $F$ | $W C D$ | $H$ | $A$ | $A$ | $I$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $I$ | $T$ | $L$ | $R$ | $Y$ | $Y$ | $V$ | $K$ | $G$ | $T$ | $F$ | $V$ | $K$ | $M$ | $S$ | $S$ | $S$ |  |  |


 L T I $\quad$ R Y WY T A D S D Q A L N F NVV Y A V V G S S NV T G K F V K L P A A R V K L R Y Y Y T I D G D K A Q E F H C D Y A Q M G N G N V K A Q F V K L D T P V $V$ K L R Y Y Y T ID A NKP QAF WYD WASAGSSNLTGAFVAMTTP K L K I R Y Y Y T DE S K Q A Q Q F F VD WA R L G N E K V K G T IVVTMP N S K

 $V$ R L R Y Y F T TD GN QENFFWCDWS QVGGNSNVKGTFVKMMDNPT $V$ K L R Y Y Y T l D G D K S Q N F WC D WS S V G S S N V T G T F M K Y V T P Y
 L K L R Y Y F TK D GA GDMNAS ID WA QI GA SHI STAFANFT GS LTI RYYFTKE GTADMDSAIDDWAQVGSENI QRTF LKVRYWYS QDSAT QDNVY CD WA QVGCAN APAVIG!ASAPS
 LKLR Y Y F T P E GS QEMS S WID WA KVGQDNITRNFG


## QUERY UniRef90_Q9RFX5 UniRef90-Q9RFX5 UniRef90-G8LUZ6 UniRef90-Q9L8L8 UniRef90-Q9L8L8 UniRef9-Q02934 UniRef90-A9К UniRef90 W4CNI1 UniRet90_H6CML4 UniRef90-H6CML4 UniRef90-P50900 UniRef90-S9PLG5

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UniRef90-D6TEN6 UniRef90-A9Kт90 UniRef90-A9KT90
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UniRef90
Q3MUH UniRef90-W4D9M1 UniRef90-W4BWA4 UniRef90-UP1000466D1FB UniRef90 W4DHP7 UniRef90 W4DHP7 UniRef90-UPIOOO38033C2 UniRet90 W4DGX8 UniRef90 UPIOO035C5BC1 UniRef90-V9IR95 UniRef90 E3EAP2 UniRef90-W4D701 UniRef90_UPI0003725B66 UniRef90_W4D168 UniRef90-F8FIDO
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UniRef90-F2JPM5 UniRef90-UPI0001E2DE59 UniRef90 UPIO0001E2DE59 UniRef90_O8KKF7 UniRef90-UPI00035EE16F UniRef90 UPIO00047B6EEA UniRef90_UPIOOO47B6EEA
UniRet90 UPIO00287E98A UniRef90_UPIO0036682C8 UniRef90-H6CF70
UniRef90_P29719

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SGADSYIELSFTGGS VPAGGNTGEIQNRIHFTNWMNYNE
KDNDYYVEVDL SGTKIYPGGQSAYVQFRISAPEGTVFNP KDNDYYVEVDLSGGKIYPGGQSAYVQFRISAPEGTVFNP AGADYALEIGFTSAAGTLNPGQSAEIQTRFAKVNWSNYNQ ATGTYYYQFDWADSQTY GDRDLQFGLIAKQDHSHWDP ATGTYYYQFDWADSQUY GORDLQFGLIAKQDHSHWDP TGADYYMETGFTPQAGTLEPGASIEEVQGRFSKIDWTDYTQ ARADHYLEVGFDSAAGIPAGGDSGVIETRSHKVDWSNFDE DNHDYYTEVGFTGGTKIYPGGQSAYYQFRLSAPQHTSWNN GADYYTEVDFTAGKIYPGGQSAYIQFRLSAPQHTSWNN SGADYYLEGFKSGAGQLQPGDTGEI QiRFNKSDWSNYNQ SGADYY DNHIYYTEVDFT GTSIYPGGQSAFVQFR】AAPNTTFWDN NNADYYLEIGFTE

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SKNLYYILVDFT
NRNMYVLVDF
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FT
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 GTK Y YPGGEKKQAQFKISVPQGVPWDP


## S S S N N T A A S G T G G G A A G G <br> N <br> <br> A

 <br> <br> A}$A N N I V Y V N V D F \quad S G T K I Y P G G Q S A Y V Q F R I A G P Q N V N W D N$



A GA DHY L I I SFAS GAGTLEPGASGDI QI RVNKSDWSNYNE
 TGAD Y Y V E I GFK S GA GVLAA GQSTKI RLS SQKKGSGS YN Q


 A GA D H Y L E V GF TSAA GS LNA GQSAEI QTRFSKNNWSNYT Q DA GKR I Y A V TA DFTGT K 1 YP GGEGEVVQFRDT GP Q GA WNA DAGKRIVYAVTADFTGTKIYPGGEGEVQFRITGPGQGAWNA DAANYYTKVDFT GTLIYPGGQSAEI QFRIAAPLNTNWNN DAANYYTKVDFT GTLLYPGGQSAEI QFRIAAPDNTNWNN PGADNYFEI AFAPTAGTLAP GDSGDI QDRINNSNWTNFAE TGSDHYLEI GFTS GAGSLAAGASDELQIRVNKTDWTNYT Q
 TSADYYLEVSFNSDAGVLAPGGSGEI QTRIHKTDWSNYNE S GADHYLELGFTAAAGSLAPGASIDI QMRASKADWSNYS Q NN A D T Y L E S S F T G G T L E P GA HVVQ
A GADYAFELGFAPSAGTLDPGESAE
TGAD Y Y LIE I S F GA GA G SLA P GA T GD
TGADTYVEISFTAAA GSIPGGQTGDIMQRNKTDWSNYNE

A GADYYMEVSF GPGA GSSLAPGQTGEVQTRVNKTDWSNYNE
T GADTYFEI GFTNASGSLAPGASSE\|QLRIARTDWTNYTQQ AKADKYVEI SFTDGAGSI QPGESGDI KSRIHAANWSNFDE
 TGADHVLIEI GFTASAGTLNAGQSTEI HTRDSKNNWTNYTQ


 T D S Y V E L S F TAA A G S I P G GQ T G D
 $K G A D T Y L Q V G F K N \quad G T L S P G A S G E$


UniRef90_EOR9U8
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UniRef90-DgUGLO UniRef90-UPIO004700E75 UniRef90-H6CQ04 UniRef90_UPI0001E2E79C UniRef90 EOIFA5 UniRef90_UPI0003743698 UniRef90-UPIO0037E989D UniRef90-W4C332 UniRef90-F7ZNZ8 UniRef90-W4VCJ1 UniRef90-W4VCJ1 UniRef90-UPIO001E2E76D UniRef90-UPIO003669766 UniRef90-P29718 UniRef90-G8M373 UniRef90-UP10004659922 UniRef90-UPIO004659922 UniRef90-W4CR05 UniRef90-UPIO00374438F UniRef90-UPIOOO1E2BE38 UniRef90-UPIO001E2BE38 UniRef90-W4EB13 UniRet90-S9PAV9 UniRef90-S9PAV9 UniRef90-UPIO0035F01C0 UniRef90_UPI00035F01C0 UniRef90-D5SLEE

1
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 AATSLTLQYRAGDTNATDNQLKPYFNUKNNGTAAVNLS

K D
SGSTLAVQYRTGVSGATASQSAPWFKDRNTGTAAVPLSS QGKISVKMFNATTVAEVNSTNPKFQITNTGNVPINLSD AGAVKVQMFNGNKTASVQSINPKFKLTNTGTSSISLSD SNKILN
SNKILN
QMYNGTTSSSTNGIT

ADGSVSVOYRTSAVGATADOSEPWFKVRDTCHPPRFTG GSTGALKVQYRTSDTSPTDSQRRMGLQVVNTGQSAVNLAD SAVTVQYRQSATG SDQVEPWLKVVNTGSTSVPLAQ SGLKVLYKNNETSASTGSI RPWFKIVNGGSSSVDLSR SLVAQYKVNNGNANDNQIYATFNIVNTGNTAVNLSD
EGALKVAAYNGTTAPASNTLNPRIKLRNTGSEAMALSD GGLALYYRTADTNATDSQIKPHFYIKNNGSSAVSLSG GTTSNLVLQYRAADSDATNNHIKPYFNIKNNGTSAVNLSGGTTS

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T T${ }_{\mathrm{N}}^{\mathrm{N}} \mathrm{L}$

GSIKVQLYNYSTASSANTLY AANTIAVQYRAGDNNN
A A
 A ${ }^{\text {S }}$

促
KLQMFNINNSTSSNVVSGKFK UNTDSNSVNLSD SGQAFSVQYRTSASGATADQSEPWLQVTNTGSGTVALER YYCEARVATADSTQVVLRIHNESCQPPHYTG AAGTLAVQYRTSATGATADQSEPWFKVRNTGSGSLPLSE ATSAVAVQYHTGSTG SDQAEPWLKVRNTGDTAVSLSA

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QYRTSASGATADQSEPWLKVRNTGSTSVPLAD LRVHNESSQPPHYTG
SSNTTVQYKNGDATSSVSVICPIFKMTNNGNTSVKDSD EYY YEAKVEQENKERTQIKYYNDTCRPPRFTG EYYIEAKVEQENKERTQUKIYNDTCRPPRFTG
VTV GDPQAAILYRAGETGTAVNSARASLQLKNESGASIIPLHE
QGVLKVQAYNGNDMDTVNTVNPRUKMETGTSRVSLAD TTGNLVVQYKLLNSNATDNQI YASFNIKNTGTTPVSLSG GGGGAVKAQYKNTDAAVTDNQIRMGLQLVNTGSTPVDLAT

LKVAYRNNDASADDNAI RPGLRVANTGPTAVDLTG SSNLALYYRAADTNATDNSIKPYFNIYNNGTTAVNLNG
 ASGEDQVMYFSSNSSSSTNTMTPMEKLHNNTASADKLSE GNAKVLYRVGETGTAVNALRASLQLKNESGASIPLSE
APELKLI QYRAADTNAADNQLKPSFNV YYCEAKVATADSTQVVLK

KNTGTSA
胃 YYCEAKVATADSTQVVLKDHNESSQPPHYTG TQTFKVQSYNASRSSVTNTMFRISFENTSKSTLQLSS TTGALKAQYKNNDSSATDNQURPGLQLVNTGSTAVDLST
 VNNVSWPARMGD
$V N N V S S W P A R M G D$
V S LK A M H K N T D $\vee \mathrm{S}$ LKAMHKNTD

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VKLGYYYTVDGDKAQEFHCDYAQLGSSNIGGRFVKLDKAV VTVRYWFTGDGASTYGTWCDWSPLGCATVIHRVAALSSPS LKIRYYFTKDSNQTLNSA TDWAQVGNNNIQVAFADYTG
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LMARYFFNDSELLDAGQSIDDVKIGPAEVRGP VK RYYFKADSGATYRFACSWAVRGCSGITGTFGTLDRPT VKLRYWFTPDGSSAVNSTCDWAQLGCGGVTHTVEQASGSA VKVRYYFKADAGASYTYACSWAVKGCANLTGTFGTLANPT VKLRYYFTKDSSATGNSYVDWAQIGASNVNRTFVNTSG
VKXRYYFKGDAVGEYRFACSWAVKGCGNLTGTFGTWAHPT VTLRYYYTANGEQGQQUFFDWSTVGAEHLKGSFKKVTQP LKi RYYFTKDGSEGLNTVIDWAQ GAANITTSDGSDTA LQVRYYFHDDGKPGANLFVDWANVGPNNIVTSTGTPAAST
 VKGKYYYTNKDNSSQTFNCNMSSVGLINVTGTVENGQPAL LKLRYYLTRDGDADLLTFIDWAQMGAQHMTVTVGSLES ITVVRYWYKTNRKGQNFDCDYAQDGCSKMTHKFVQQKKAV VKVRYYFKSDGNASYRFACSWAVKGCGNITGTFGTLANPT

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 VTVRYYYTSDGNQEQNFWCDHADANTSKVTGKFVKFPNGT

 MKARYFFNIDGDDDVIFAVEYDQSMQQEPDKYTGPFKWD VKLRYYFKSDSVTAYRFACSWAVKGCANDTGTFGTLANPT VKVRYYFKADSAASYRFACSWAVRGCADVTGTFGTLAHPT LKVRYYFNNDGKSGDQTY円DWA QVGAANVTTTSKALSSSK LTIRYWYTADSDQALNFNVDYAVVGSSNVTGKFVKLPAAR LTARYWYTADSDQALNFNVDYAVVGSSNVTGKFVKLLPAAR MMARYFFNISEIDDVIFTIEYDEQUSMQQEPVVYRGPKWD VKVRYYFKGDSASAYRFACSWAVKGCANDTGTFGTGPNPT MTVKYFFNWSEDNDVIFAVEYDQSLQQDPDKYRGPFKWD IVIRYYYTKEGNESETFWCNDFTRDSSQVYGSFVKLNNPT MMARYFFNTSEDAGQTPEDLTVEDYYDENNASYATMRGPV VKLRYYFRSDNAAAYRFACSWAVKGCANVTGTFGTLAHPT LKMRYWYTRDGNTEQTVEFDYAVIGKEKLLTEVVPLTTPS
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## UniRef90 E0R9U8

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A TAD R
SANS YLESTAPGA
K GADAYLELGFRN
ATAD RYLEVGFTSGTGTLSPGASGE\|QGRLHNEDWSNYSQ AAGAQTGDMQLRFYRSDWQTLNQ GNCDTYLEIGFTDDASLLEPGQSDSDQTRDTKADWSNYNQ NSADYYLEVGFKTGSGTLEPGAFTEVVVRFATPDWSTYNQ
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## UniRef90 UPIO003764507

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Q T F K|V|ES F N A N R A S VT N T|I A P R\|I LFTNTSNST|I QLLSN SVE F Y N S N K S A Q T N S I T P II KIT N T S D S DLLNLN D
 MQASPNQTGSNF IEKAEVVNKS GWPARLTN

I KL H N E S S R P P H Y T G

 S I K L E T Y S P N K S S N I N T L F P R Y K L Y N N G N T P I K L S S A A GTLRLQ YRTSAPGATVDQVEPWFQLRNDGASAVPDSR

| $L$ | $R$ | $H$ | $N$ | $E$ | $T$ | $T$ | $R$ | $P$ | $P$ | $R$ | $Y$ | $T$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $R$ | $H$ | $H$ | $N$ | $E$ | $T$ | $T$ | $R$ | $P$ | $P$ | $R$ | $Y$ | $T$ |

TELQAYNH DRTSETKELQPRIKLDNTGNTPDTLSE SAGSIKVQYYNASRKVDNVQVNDVFNVVNTGSTTINLKD ATTQVKLEYCNTMASISTNTMGGKIKLTNTSNETINLED VIIKSFNANTNTTSNAIEPKI LLENT GDT QL KL S D



 | $T$ | $L$ | $L$ | $H$ | $K$ | $N$ | $G$ | $N$ | $N$ | $N$ | $T$ | $K$ | $V$ | $N$ | $T$ | $I$ | $R$ | $P$ | $Y$ | $L$ | $K$ | $L$ | $N$ | $N$ | $G$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | Q T S





 L K V L H R T T D GAP T D N A I R P E L R V A N T GT TA L D L S T
GALSVVLYRDGNNNPTTNQFRPHLRVKNGGTTSVVSLAD





QARDVK VQYMCDSTQASNQE $\square K G K F N I V N T G N R D Y S L K D$


 G A T P A L




 QV K K V Y S A A K N S D I T S S S liv T V L QV K V Y S A A K N S DITTS S




 N S A N I S L E F Y N G DFGA S V S S I S M N FR IT N N G S S Q I S L S D


GLS S I H Y M D G TLDDVKY Q S M R P Y I I I HNNS GMDVDMA D
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UniRef90-E6ULY0
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## UniRef90-I2GHQ0

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UniRef90_UPI0004642BDB UniRef90_UPIO0036BCCB6 UniRef90_Q50HRO UniRef90_Q50HRO UniRef90_C7Q718 UniRet90-D2VAE8 UniRef90-D2QPV6 UniRef90_UPI000470F42D UniRef90-A3DBH1 UniRef90_UPI0003B698C2 UniRef90_UPI0003B698C2 UniRef90_LOG2U2 UniRef90_LOG2U2 UniRef90_V9XQ23 UniRef90_UPIO001E2E6A5 UniRef90-Q9FDJ9 UniRef90-V9XM25 UniRef90_E6USP5 UniRef90_Q08YK6 UniRef90_UPI000248F609 D

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DAGTYYYEFDWSGREIY
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 NAGTYYYELDWSGN DWS GN PNADSYVEI GFTNSAGVLNPGEYVEI ISRIGNSEANNYDS EKADYYLEI GFKS GQLDPGKSTEVVVWFHKEDWS $\quad$ YK KQ ENADTYVEI GFKS GLSQLTPNGTIELQMRDTNSSWKNYNQ TQCDHYLEI SFSNSTEVLKPGEKVVVQGRFAK DDWSSYTQ TGADRYLEVGFTGGAGTLAAGASGEI QGRLNKSDWSNFDE NNADYYLDLSFNSN EVLKPNGNVYLYGR』HKNNWTNFNQ TGTDHY TFSGSTETLKPGESVLVQGRFSKADWSNYTQ A GASHYLEVSF GSGSLAAGASGEMQLRMNKSDWSNFDE Q GADLGYV EYSFDASAGSLAPGTSGEVQSRVAKQNWTDFNE

 TGASHYLQVGF GGGSLAAGASGEI QLRINNKDWSAFQE Q GAEYCCLEISFTSEAGVFLPGKNAEVQAFVLKSDWGKYS Q
 NNANSYLV $\square$ S F S DAA GEDGA GESVEL S VGFAKNDWS QYN Q


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 ATAD H Y L EVGGFTG G S L A P G A S G DL Q L R M N A A GWA PVK Q



 E GAY GYVVQYDF GS G NVI P S G Q N S G E I K S A I Y D E D W S A L D E

 AKANKYA E I GFTTGAGNDAPGGSGVMQLVLKKVTNGYYEQ
 YAE IGGFTSDA G IIK G GNS GQL QLVLKKDSNGYYD Q



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SAKVVRVLHRDVDNSVGNNVIKPTLQIVNEGDAPVVYS Q

 DKQNAI NFVETKAVVYNRSAWPARVTD DK Q N A I N FVVEI K A V V Y N R S A WP A R V T D

I EVK A L V Y N H T A WP A R I T D
EVK ALVYNHTAWPARIT D
A Y GKARVSYHNMDWSPTDNQIQHALQ\|VNTGTTPLDLTE

TANDLVV YSSDRNAYDNSSYPQMKVKNVSNKTDNLSD T G GQI KVLYANKETNSTTNTIRPWLKVVNSGSSSIDLSR A Y GRAKV S Y L N L D WS P T D N QVQFVA QVVNT GTQPLDLST

 AQSLVVQSSSAAGGSTSSAIRPMVNIMNTGSEDVNLSD

$T V K V T Q N K T A A D G N S V N M N L E V T N T G D E M D L D S$
SPVAGSINFGVE\|KNNGEEDNLSK
 GTTDFTVQYSNYDAAAPNDTIEAGDKIRNNTAASIPLSS T GS S GNDMA F K L F L N NRSAWPARLK D QLEVLYDSHAPQPS WVTPGIQVRNTGSESVYLAG GTADFTVQYQNNASGPNDS\|IEAG\|QLKNNTTAADPLST T NHSAWPARLKN
 $S L P V G Y F V G K A Q E K D D G I Q L K I V L H N R T V D P P R F E D$ A S G S N Y T E V K V L V N N R S A WP A R V E D

 A GKAQENDAGLQVK IVVHNRTINPPQFDD VEAS $\square$ NS S GNNYTE $\$ I RAQLN NRSGWPARKND NSSGNNYSE $\square R \square Q L N$ NRS GWPAK KT D AKVNASGPRFVLHNQSAWPARNSK
 GK A QEKED G IQLLKVVLHNRTVDPPRFED
 $\square E \square S A R V$ H N H T A WP ARTTQ

H N R S A WP S R N T D
A S $\square$ N S S GP TYT L $\quad$ N N Q S GWP A R VK D VEAK NGSGDSYTETKAW AMNHTAWPARVKD

 NGTAGTTYTEIKAW AMNHTAWPARVKD

 A LPVGGYFVGKAQEKEDGIQQKLVLHNRTDNPPRFED Y Y A D A K $\square$ Y E E N GI TVVDLNMYN IVTSPP QYS D NGKGNSYSEIKAW AMNHTAWPARVKD NHSAWPARVQN
VEAGDNSAGPNYTE $\square K$ AQ MTNQSGWPARIK D NSDNAFGSTVK IQNRTAWPARATD
 QATVNASGPNFT, Q Y Y TEA QLYK S NGVTVDLNL N P D F T
VEAADMSNDTTSTQDKA
G S VQLKVVVY NRTDN P
LTVE TTVTVARPR
LTVE T TVT QAEPRATGLKVMVYNKSAFPARLTN
 S I D QVYYN:KA S G S E S DDDLS K
A G V V A S GPTFTVRNQSAWPAPLTN
NTASGSNFTE $\square$ KALVYNKSAWPARLS Q

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 VKV R Y Y F T R E G R A D L E P A V Y H Y S II S N S E V K I S F H K V S LA YRYF VDDS DVLAA GYKASDMKI SANYNQAKDS SL P WD A



 L K A R Y F F D I S E E L S V Q V M Y D Q A S IVV D GVVKTNN N G P FM WD E
 L E L R Y F F N N D GNDNN K F E C D WA GLL N N GTV N A SVVKS D F V S N



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 LK F RYWVDLT EEMA A GYEATDVSVSTAYNQASSVTGGANA


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T DADHY|LILGFSAAAGS\|NAGASGESQ\|\|\|VNEVYDRMTQ Q GADRYMEYTFTSAAGMLPAGNSGS IETRIRKINQTDFNE $F N D Y R Y M D I N F A S G \square D P A G G N S G E V Q V R W Y Y G D T S T M D Q$ $N G A D T Y L E V G F K N$ GTLAPGATGEIQQRLHNDGWSNYAQ DSSHKYLEVTFEK GSIPPGDAAWVFGAITRDDWTEFNQ D M A D H Y L E I G F D E S C G T I G P D K K V E V M V S I S K E K Y K K F DQ


 Q GA WGY I E YRFE ESAGQQLAPGQSGDIQSSGIA KQTNTNVNE ANADSY, QVGFNG GTLAAGQSAQVQASVNKDGWKDYNQ
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 GH TLYPGGQRLEVQFRIT GNSKWDY
 GTLKK GEYA S GSEMYMEIKFNS
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 GTLSPGAST
 S GAD Y Y L E
TPVPGHVRLTFTDDGVLPGES GPDQLRFHRQNWTADDE D YGNTYAKI KFNTDVELLQPNKQFVI HFRLNAAD WSNWDT T GADRYAEI RFTSGAGNLAPGATTQAADDLGVVFGTNVDE TGADSYLELRFNAEAGIIPAGGTGDMSFTIRRSSGS G STASHYLGLSF SGDYSLDTTAKVVVATRLANTNWSNFDQ

 GND D Y Y L S I K F D D K T S LTE GTK LI L Q GRLAKENWS S Y D Q


 A GATHY L D V R F L S V V D P S STTNDRFNVAFHASSSWQPFN Q T GADQYVEVRFTAAGSLAAGASTAPDDLGDTFGGGAAVVE $D G N D Y Y V Z E T Y P D G T V I C P S G Q S A E L Q R R I S V P D A S K W D A$ DTA DYYFE I GFDVVAAGTLE P

 GNNEYYAGI SF D GVDDYPGGQSAEVQQFRLSNTNNPDNDN D NGTYYVEI SWDGCAFY GTRVFHFGLI PKMDTTHWDP















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 SNDYSYGDLISFEDDNDKIPAYANGELVWGEEP ENDHSYQGLSHTLVKTRYMPVYDEGRLVFGKEP T NDYSFQGEQNVMKETPY
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 SNDPSWDDYGSAHVQAPKIALYDNGVLVWGQEP SNDYSVRSANS YI ENEKVTGYDDGAIVWGREP TSDPSWDNYSNSFVLADKI ALYDGNTLVWGEEP
 EGDPSWDSYDGAYKKAGKI AMYDGAELVWGEEP

 SNDFSNNNYYTPF
SNDWSFQG
SNDYSYEDDNSAAADTDKVTLLYAGDKLI WGTEP SNDFSYQGDGDTYKTLENIPIYKNGVLVAGKEP TNDWSYKGGIATATDNQNUPMYVNGVLVWGTEP SNDYSFQGLTDAMVDTPYMTMYDGDTLI WGTEP $S N D P S A Q G S G S G D V E S V N L P V Y D N G V L V F G Q E P$

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VEAAVMHNDTTSTQVKAVL VEAAVNATGKNFEEIKS K $\square Y N K T G W P A R V T D$ NSNNAFGSTVS $\square M F Q$ NRSAWPARVTD SVDFYAESKLEQENAERTQDNDHNETSRPPQFVD QYYTEAK】YKANTVT $\square \mathrm{DL}$ LMYNVVTSPPQYSG LSVEMQNETRSTGVKA】 V $V$ N K S AFP A R L TA A $V$ HNRTAWPAR DP A GVNASGTNFTE $\square K A D V R N Q S A W P A R L S D$ ANTTT $\square$ SET $\square$ NQTYTVVNATKTP DDLSK
 K VM $\left\lvert\, \begin{array}{llllllllll} & Y & N & K & S & A & Y & P & A & R \\ L & T & S \\ N & N & R & S & G & W & P & A & R & I \\ P & N\end{array}\right.$ VE A K S NATGP RH $\quad$ GE $\square$ A A K VY N R S A WP A N GDK

E Y Y CEA K $\square E S S S G \square T V D L N M Y N \square V T S P P Q Y E G$
 $V$ QA S V NATGSTFTE I KT LVVNHSAWPARLAD
 YVEATANSNNGVELKTYLYNKSGWPARVCD A GVNASGPNFMLY Y K S GWPAKVGD
 TLE LI S N R S VH P P A V D D


F Y A E S K L E QENTERTQVR IH NETSRPPEFVD $K T A S A S G V T V S F K L T N H T A W P A R V N N$ VE Y F C R G W IE GY GTLNLLLQQVNNRS GWPPTMKD $V 1$ N K S A WS ARTFT
CTSKGAESSGMTISFKITNHSAWPARVQD

 ATSDAGGVNLSLKKTNQTAWPARVED A A VN A A GPGFVIIDNK S GWPAR GS D $K V V V Y N K S A F P A R L T A$
NQASDHFTLNNRSSWPAR L K K K
 VR N R S A F P A S LT N
E Y Y A NATSEQTNFTE $\square S \square D L T N H S A W P A S L D R$ YAAVNAA GSTFTNMKATISNMTGWPPRMSD NMKVTLANMTGWPPRGSD

FKMTNHSAWPARVQD TETSGGVTLSFKLTNHSAWPARIED L R L MF QL L N R S S WP PTMK D

 S S D S GVTLLSFKFTNHSAWPARIE D S GPNAT GTNFHEPKVMMYNRSAWPAR LTN S D NLMEVQATI YNQSAWPARIPN NSTGPNYTE $\quad$ KA A VVNQTGWPARVTD

A GVNSSGPNYTVYNQTGWPARVTD YCSDAPEATGAGDTKLTFFVNTDS DEPHED

K N
QP Tl ThVN K T S WP P R $T L N L L L Q V N N R S G W P P T V K D$
 DK T NK $\square$ NF VEFKFMLD NHTA WPARVT D
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K Q S GANF LE $\square$ QA D $\square$ VN K S A S P A T LD N VE V L S K G G D S S G Q TVS

K N G D GAGTT
FKMTNHSAWPARVQD $Q V S F K V L S G E S K P S K K$ $R \vee T \square H N E S \square H P P H R E D$

TLNLMFQL N NRSAWPAAMKD
YGSSSGTSGNELQLMVSIRNQTGWPARGSD $V V Y L Q N Q D Q S G S S W Q I T F L V R V A N L G D G S \square D A G R$
 $V$ D A Y A V D D $\square$ Q T S GA G V T K L A $\square$ Q M R T N S DT P K T D Y A T A T L N Q N S N Q T QLTVT IT NTATHPPHFS G L K V L S G E T T P S K N
G GAGTTKDSMK
$\mathrm{V} M \mathrm{~T}$ D S $\square \mathrm{T}$ P R
L K V L T G S A K P K G N

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| Re |  |
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| UniRe990-R71 | - |
| UniRet90_R4LL | G |
| UniRef90-D9SS | NVSEFVNAGYSADDLKVTVGYNTGGTVSTPWDK |
| UniRet90-W7YB89 | DI SEGIDAGYSASDYIVSANGSNATYSELPADA |
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|  |  |
| A3DD31 | VFEAGYSVDDIKVTDGYCSGMDVETSPHL |
| UniRef90 R6ZZ839 | SAG NPSKTVYYSPAGAQLSA DQPWDK |
|  |  |
| UniRet90-D5UFH7 | 俍 |
| UP10001E2D8A9 |  |
|  | LSFRYFVDISEVVNAGYTVSASASNGAKVSPKLIEWDASK |
| UP10001E2 | 俍 |
|  | SYRYYMDS |
| UniRef90 UPIO001E2D | LSVRYYMDLSELIFEAGKGLDDVQITLEESQGAKLIGLKQY |
| UniRef90-W4VBC0 | FVDLSEGAD\DMSKFVTKVYYSPADATISELKPYD |
|  | E |
|  | - |
| A3D | QLY DQTAAETDYAAKLT GPHHY |
| - |  |
| UniRef90 P37700 | Y |
| UniRef90-SOFMQ1 |  |
|  |  |
|  |  |
|  | ISVRYYFDATGMSSLAADYDQAAAE TTYKATLSGPK |
| UniRef90-UPIO001E2 |  |
|  |  |
| UniRef90 A9KJ12 | V |
| UniRer90-E9SF24 | LKYRVFLDLKTDVINNGYVADDMSVSASYRNYAGTKITKYVL |
|  | G |
|  | N DLIISGGQGSSGKVSGPK |
| G8LWC1 | Y |
| Z6 |  |
|  | ISVRYYFDSTGMTSLEMRQLYDQTAAETDYAAEDSGPHLY |
| UniRef90 K9XXF8 |  |
|  | LSFRYFMDLSEVEDLVIRCDRDQAGMYAGKGYEDSKPDQY |
| 640CAC | NI SEMSDQSSTEDGAVGADGVLTGPF KYDKAA |
| UniRef90_C7NMC6 | DVSELLRDAGQSIDAVSVGSADVSG PIIAWDE |
|  |  |
| 04 |  |
| H2JGV8 |  |
| C4 |  |
| Un | V |
| A | ( |
| UniRef90-D4L9U6 |  |
| iRef90-U2LXH1 | GVISGPYQYDASY |
| Ref90-F7ZP04 | DLSLYKKGYTVNDVGVRANYAAGG GTLSGFI |
|  |  |
|  |  |
| UniRef90 W7V029 | VTVRYFDDASEVQDPS |
|  |  |

## UniRef90 Q5YLG1 <br> UniRef90- F7ZPO

UniRef90-UPIO00470659B UniRef90 SOFNP1 UniRef90 UPI0001E2BE39 UniRef90-R7H7U6
UniRef90-R4LLV88
UniRef90_D9SS71
UniRef90 W7YB89
UniRef90-UPIOOO47738C4
UniRef90-F2JL22
UniRef90-D2622
UniRef90-UPI00036ABBD6 UniRef90-UPI000288F8D9 UniRef90-K4KPQ8 UniRef90-DDST82 UniRef90-UPI000366143E UniRef90-W2EP46 UniRef90-UPIO001E2D41E UniRef90 E6UT45 UniRef90-M1MLG4 UniRef90-E4MYU5 UniRef90-E1ZND9 UniRef90-UPIOOO369C165 UniRef90-EORQU2 UniRef90-B817V7 UniRef90- R7H587 UniRef90-A3DBF5 UniRef90-W7SNN7 UniRef90_UPIOOO1C3768E UniRef90-H2JDD9 UniRef90-UPIO0046F27DE UniRef90 W8PWF7

90
DASSYFAEIIDFT DNN YYVNVDFTGGTKIYPGGQSAYYQFRMTAPDNATWDN ANGDYY DE DWSGN SFYGDREFQFALLVAAQSNWTHWDT KTGDCYI FMWDHCIIFYGKRTA IGFALQNADYQIWDA SGNDWYVEVDCTGYK APAGQSAYVQLKI GVABEGTWNP ANSIYYVEVTYNSDQVIYPGGQSTQIRVRLYEAPASAWNP GGGVHYVTVDC SGQVIAPAGQSQEVQFRI SSTGTWDP VNGKYLCTLKVNETGSLGVGTGSMNISDRMANKDWSKING EGKNGAV SCVGQD HPGGQSE QFRLTPAG WNP
   T G



 PGAAFLLNITLNSKAGMLLPNSENSVPSFFTKQGQAMLNA D PAD Y YTEVSFA GDMITFPGGQSAEVQR RASNTNASVVDS EANHYYVEASWPGSKLYY GKGVEFQFALA CYNASVVWDP


 ES GTYYVEFDWE GKQ\|YAARELQFALVAAQDKNFKSHWDP S G D I Y Y V E VT Y P D GRAAADPDS EGRY QMA A LVVFPNY GK WD S
 Y D NI Y Y I K I S Y $\square$ D G T NI CP $\square$ GQAAELQFRIAAAPQGT KWDP
 GGSLYYAELSCA GQNIHPGGQSQEIQFRVAAGTTGWDA


 D
K DN
K N N Y Y FTVVD F
D N H I Y Y V

KDNI YYVEI S WE GFALD ANSNKKYLGFALVGPYTWSGNDA
 Q N S T I Y Y I Q V DVVDGT QLY P G G E A Y V Q Q AKHIVYYNVDLA GENI YPGGQSAEVVQRI SAQGTSYWDP QYKDYYI EI SWPDYA $\quad$ SA ANSNKKYQLII GNYF GENWD S $K D N \square Y Y V E V K W P D B D A N S N K K Y Q F A I G T Y A W Q N W D P$ QYKDYYIEI SWPGYA $\square$ ANSNKKYQFALGTYAYQNWNP


 ENKI YYVEVTWDD GFS DANSNKKYQFALGTYA WQN WN P EKNI Y Y I EVV Y T G D R LFPGGQRRDSSLR\|AVPGNS GWNS

## D

SOMYYIEVKKWPGYVIGANSNKKYQFAI GTYA WQNWNP



 KDNDYYFTVDFT GTGIMPAEKDATVQUEYKNAAGSN


NGARYVLNLGFKTGAAVLLNETETSVRLRISRQFLREMNA


P Y D E Y Y V E A S WP G G Q LYG



$H G A R F L L H I M S T N P Y M L L P T G S S A V P A \mid L F S G G N E G A L N A$

|  |  |
| :---: | :---: |
| UniRef90-F7ZPO1 | P |
| UniRef90-UPIO00470659B | NDWSADGLTSSATESPNIPVYDNGVLVFGNEP |
| UniRef90-S0FNP1 | TNDWSRKDITKTYAVNERISVFKGGVKMFGQEP |
| UniRef90-UP10001E2BE39 | SNDFSTVGLTSTYTRMENIPIUKNGVQVSGKNP |
| UniRef90-R7H | SNDYSRDGLTEALK |
|  | ANDPSYQAA |
| UniRef90-D9SS | SDDFSYEGITKTPGETPNIPVYDNGVKVFGNEP |
| UniRef90_W7YB89 | SNDWSYEGVGSSLTGUPNIPLYADGELVYGNEP |
| UniRef90_UPIO0047738C4 <br> UniRef90 F2ل22 | ANSAYSYRN■PTTPVRTPNITLYSGATKIWGEPP |
| UniRef90-P26225 | G |
|  |  |
|  | P |
| UniRef90-UP1000 | SNDPSYEGLTGILVTEFDKVSIYSDGKLANGDEP |
| K4KP |  |
|  |  |
|  |  |
| Ref90-UP | ND |
| UniRet90_W2E | SNDWSYTGVATTPGATPDIPLYSGSTKIWGDA |
| UniRet90-UP10001E2 | TNDWSYUGATKNSAVVANDPVYDAGKFI F GVEEP |
| UniRef90-M1MLG4 | SNDFSYKGISTTPLQTSNTPVYDDNVLVYGNTP |
| UniRef90-E4MYU5 | TNDWSYQGISSTPVDAANIRLLDGGVPQWGAE |
|  |  |
| E1ZND9 |  |
| P100 | DPSFDPAYLSTSESTVIPVYTSEGLISGEEP |
| UniRef90-EORC | NDYSFQPSAEPDVMTEYIPVYRNGELIFGVEP |
| B87 | O |
| UniRef90- A3DBF5 | RKDPDYDATSFAPGLTPYIPVYDNGVLLWGEEP |
| UniRef90-W7SNN7 | GNDWSHGASGTTPVDDPRLVLAQGSSVLWGDQP |
| UniRef90-UP10001C | P |
|  | A K G |
|  | ANDYSADGLISTR】NSQKЏPMYDKGI |
| UniRef90_W8P | TNDWSYQDVAKTPGATPNMELYAGSTRLWGSAP |
| UniRer9o - Plooot |  |
| dLFJ4 | ND |
| UniRet90-P26224 UniRef90 10 H 6 U |  |
| 31 | DFSYQGTREDAKTKYMPVFDGA |
|  | - ${ }^{\text {P }}$ |
| UniRef90-SOFPY8 |  |
| UniRet90 D 5 UFH7 |  |
| 4A374 |  |
| UPI0001E2 |  |
|  | QTGAKTEYIPIYDNGVKIYGMEP |
| UniRef90-UPIO001E2EBE1 | ADDWSYQGLSGTPVKTDNVCVYDNGVLVGGDEP |
| UniReforo-uk | SNDYSNTDLLKNYVISDCIPVYQNGVLISGREP |
| UniRef90-UPIO001E2D42D | , |
| UniRef90 W4VBCO | SNDFSYEGLGNTYKTLENIPIYKNG JVW |
| UniRet90_UPI0003B6E756 |  |
|  |  |
| 3D | TDDWSYQNYTGTPARNNRICVYDAGVLVGGIEP |
| UniRef90 R9UF |  |
| 37700 | KNDFSYDPTTSTVNTVTNIPVYDNGVKVFGNEP |
| UniRef90-SOFMQ1 | KNDFSYKPSSSTVDTVQNIPIYDNGVKIFGNEP |
| UniRet90-W7ULT1 |  |
| G8L |  |
| D9SQT | DDWSHQGLSGTPVKTDHICVYDNGVLVGGTEP |
| UniRef90 UPIO001E2F590 | NDWSAQGLGSKTVRAEN |
|  | A |
|  | ADDWSYONATGTEVRNDNLKVYSGDKKVGGVEP |
| UniRei90-D2KFJ1 |  |
| UniRet90 SoFME1 | SDDWSYQGLKGTPV |
|  |  |
|  | D |
|  | DWSYEGAADTYQDNDHICVYSDGVLVGGVEP |
| UniRe990-F1T | TDDWSHKGLKGTPEKTDNICVYDNGVLVGGTEP |
| Uni | N NDWSUKGL |
| UniRef90 UP10001C37683 | SNDWSRKGIKELDGDYDNVVYADGKLVGGTEP |
| UniRet90-W7UFQ3 |  |
| UniRef90_UP10004640CA | SNDWSYQDSNDFFARTDY1CIYDDGVLVGGIEP |
|  | SNDPSFQD GEA |
| UniRee90--4A381 | SNDWS |
| UniRet90-H2JGV8 | ENDWSYQNLSSFAGMSKYIPVYDNG |
| niRef90_SOFPC4 | NDWS |
| UniRet90_D9SRK9 | DF |
| UniRef90 IOYU1 | SS |
| UniRef90- D4L9U6 | TNDWSYQG |
| f90- U2LX | TNDWSYQGIKDTYQDTDYICVYSNGELVGGIIEP |
| UniRef90-F7ZP | DFSRQ |
| ef90-A0LTI3 | STSYSLTGAAGTYAATPYIPVYQNGTRVFGQEP |
| C372C5 |  |
|  | S |
| UniRef90_R5V1U0 |  |
| A0A059LEE1 |  |

```
lupas_21
lupas_14


UniRef90_B817V6 UniRef90_C5BTU4

lupas_21
lupas_14
lupas_28
lupas_2
jnet
conf
sol25
sol5
sol5
sol0
jhmm
jpssm


UniRef90 B8I7V6 UniRef90_C5BTU4

lupas_21
lupas_14
lupas_28
lupa
jnet
conf
conf
sol25
sol5
sol0
solo
jpssm

UniRef90_B8I7V6 UniRef90_C5BTU4


 SNDPSFA GLNSTFELAYNVALYDSGELVWGQEP

```

