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MSTTSREDAVYLAKLAEQAERYEGMVENMKSVASTDQE AEQDRAEAIYMAKLSEQAERYDEMVSQMKSVASGNSE MAAQDRETCVFLAKLAEQAERYDEMVAEMKKVAQHDQE DREQMVYKAKLAEQAERYDEMVESMKEVADQGDE MSTDSREDLVYMAKLAEQAERYEDMVSWMTKVTEGDTE S DKERETFVVMAKL SEQAERYDEMVETMKKVARVNSE TDRDDNVYKSKLAEQAERYDEMVEFMKKVAALDEE MAT REDHVYQAKLAEQAERYDEMVSAMKEVAMMGVN SDDRSENVYMAKLAEQAERYDEMVQQMKSI ASLDSE MDAETREKSVYLSKLAEQAERYDEMVQEMRKVAENTTE MPRDDSVYLAKLAEQAERYDEMVTFMKEVAKAEPE

Q N F V V Y T A K K L A E Q Q A E R R Y E E E M V KERDDLVYLAKLAEQAERFDEMVEHMKTVAGYSEE D R E D L V Y Q A K L A E Q A E R Y D E M V E S M K K V A G M D V E MDRDSLVF LAAKLAE QAERYDEMVDHMKAVANNHVE MDKLELI QKAKLAEQAERYDDMAACMKQVTEQGEE D R D D Ni NKAKLAE QAERYDEMVEAMKKVATGDNG

DRDNLVYQAKLAEQAERYDEMVESMKKVASMDVE
 MSET K D A V QRAK A brim
 $K D E L V Q R A K L A E Q A E R Y D D M A Q S M K R V T E D G T E$

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SKDELVQKAKLAE QAERYDDMAASMKKVTEDGAE
AMASLR REELVYMAKLAE QTERYDEMVEAMNSVAKIDEA MAEETKAEYVARAKL SEQAERYD DMADYMRKVTE SGDE D RELLVQKARLAE QAERYDDMAAAMKAVTELNEP RMHKTFLARLCE QAERYDEMVTYMK LGGE MSTDSRNELLHNAKLSEQAERYDDMASCMKKVTELGEE S SARSESVFMSKLAEQAERYDEMVEYMGKVVKAVDE SRERENLVY $\square$ AKLA E QAERFEDMVATMKKL AELDVE SKM N LV QKA KYAE QA E RY D D M A T A M K S VV T EA G HE DKDELVQRAKLAE QAERYDDMAAAMKSVTEITDS M G A T

R R R LVVYSAK L A E Q A E R Y D E MVVESMK A L C K D S G E
ESAKLI QKAKFAEQAERYD MDSATREKHVVY A K K I A

AEQAERFDEMVKEMSTVAREAGE MADKDME VVQKAKGAE AAERYDEKMEASMKKAGMDVE SREDSVVYMAKLAE QAERYYEMVTYMKDVAKVNQE TEREA LVVYRAKLAE QLERYDEMVDAMKEVVEMAEE TECDEEVYMAKI AE QAERYDEMVTFMKQVVQTGKA
ERERQVFMAKLAE QAERYGEMVESLKKI ARMDDE

A MEKDSRESHVYHARLAE QAERYDEMI EVVMRKI AKL DV E

REELV QKAKLAEQAERYDDMTACMKEVTEMDKE
DREKLVQLAKLAE A A A S T T REKYL Y MA K L A E

TSREDLVV LAK K L A E ATERELLALYS AKLSEQAERYM DMVSEMKKIAA QDQE MSSLSREENVYMAKLCEQCERYDEMVKAMKDVLESGAD
 ALTRE QYLYMAKLAE QAERYEEMVDFMDSLVSAGAE MEKTELI QKAKLAEQAECYDDMATCMKAMTEQGAK D MA DLV E Q A KLA E QCERYEDMAAAMKAEDQKNPQ MDKSELVQKAKLAE QAERYDDMAAAMKAVTEGDVE
 D K E E Q I Q K A R L A E Q A E R Y D D M A A A M K A V T E G E E E V MARNHQVQKAKLAEQAERYEDMADFMKAVVEHGDE REDYV FMA QL NENAERYDEMVVETMRKI S GME GE $D L S P T D L V Q \square A K L A E Q A E R Y D D M A A A M K A F T E L P A E$ QKPELVVQKAKLAEQAERYDDMAAAMKAVTEQGCE
T ERDDSVY LAAK SE QAERYDDMAEAMKKVVKLDNLE
TMDKSELVVQKAKLAE QVECYDDMAAADKAVMEQGHE
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 K H A E M A K E Y R Q K I E K E L R D IV C G DVV L N L L K K F L I P K A S K S E






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 D NAAWAREYCTKVEGELQQKICDTILLGLLDGKLI PAANNGK K NLVLIRRSYKKKI E E EL N QYCNDI L NLI D S HLI KTASTPE RKQ GMAKNYRAKVEEELSKDCEEVLDDLDKHLI PQTNKND A H K A L A E A Y R S KI E $\square \mathrm{E}$ L N E I C Q S I L K L L T D K L I P N T T E C E K K S QLLVK E EREEKI E KEELRDI CNEVVLGGLLDKY LI A N S S S S E K G V G P L K K Y R E Q L E S E I N K V S T E I L D L L D K Y L I K S T T G A D H N K N I A A T Y R K K V E E E L N N I C Q D I L N L L T K K L I P N T S E S E



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UniRef90 K1PHM8 UniRef90-H91ZF9 UniRef90 ${ }^{-}$K1PPQ1 UniRef90-KOSNTO UniRef90_O18NX6 UniRet90 H2UDY6 UniRef90-W5U6Y7
UniRef90 G7YR42 UniRef90 H2Z187 UniRef90 F6WRN9 UniRef90-I1FYH5 UniRef90_L8GF41 UniRef90 M4D765 UniRet90 G8HTC2 UniRef90-A7S4S2 UniRef90 E3TFA9 UniRef90-V4C4V3 UniRef90_S4SOHC UniRergo Q8iFK UniRef90-G4LWW0 UniRet90-A0A023FIY1 UniRef90_Q81821 UniRef90-TORAM5
UniRef90 ${ }^{-A 0 A 023 B 7 P 0}$ UniRef90-11FN90 UniRef90_UPI0002B8E781 UniRef90_UPI0002B8E781 UniRef90-B5G031 UniRef90 V5IRL8 UniRef90 Q4T5H6 UniRef90-Q5FX78 UniRef90_U66KL4 Une UniRef90-F7DMQ6 UniRef90_UPIO002C3743F UniRef90 G7Y7U4 UniRef90-11FN88 UniRef90-K8F2P4 UniRef90_O96945 UniRef90 M3Z1T6 UniRef90-C1L8E3 UniRef90_LOP9S5 UniRef90 W6KTT0 UniRef90_K2RXLZ
UniRef90-MOSP28
 DLS NTDLVH $\quad$ TAK KAE QAERYDDMAAAMKRYTEAS GN D TEDLVHKAKLAEQAERYDDMAAHMKAVTESQPK R D DFI Y MAKI TEQTERFEDMLDAMNKVVNANAD TDKNELMQKARLAKQAERYDDMAACRKSVTEQGAE AMDKSELVQK AKLAE QAERYDDMAAAMKAVTEQGHE DREELVQKAKLAE QAERYEDMAAAMKAVTELDQE
TEHLEIVQKAKLAE QSERYDDMAALMKKRVELDTP
 MAAKS REALLTKAKLAE Q I E RYDDMAQFMHKUVESAPE

REDNDYYARDAEQGERYEDMDRYMKEVANSGQE EREKVVCLAKLAEQAERYDDMVEFMKKLARMDVD MA Q S MK KVTE EGDE
MTREDNTYLARLSEQAGRYEDMVEYMKEDATGDQE MATKTREELLYLARLAEQCERYDEMVEYASDFAKGSEE MSREENVYMAKLAEQAERYEEMVEYMEKVAKTVDE SQLVQKAKLAEQAERYEDMKDFMKAYVAESGS
 MVENMKAVAVRPEE DRA QLIA RAK L A E QAERYEDMASAMKKVT EMGGS LS A LKR R E D L VY K A K LA E QA ERYEEMMDYMSEVTS SEEE

MSHLSEQELVDMAKLAEQAERYDDMVKFMKELTVKSKK EREDLVYQAKLAEQAERYDEMVVSMKNVAGMDVE AATTDRVTLVELDARLEQAERYDDMVRAMKKVTEMGDH EVEDNVYMAKLAEQAERYEEMVEYMKKVAQGKQE MS LDARQRCJVFEAKLAEQAERHDEQVKAMRALCEGVDA TQSKEELVASARLAEQAERYEDMVAEMKKFLELDAN

## VDREQLVQKARLAE QAERYDDMAAAMKNVTELNEP

ERSDNLYRAKLADQAKRYADMAEAMKKTVKMGEE MEKTELIQKAKLAEQAERYDDMATCMKAVTEQGAE MDKNELVQKAKLAEQTERYDDMAACMKSVTEQGAE

RERNDVLAKLCEQAERYDEMVKAMDE IATNTEE DEDVYMAKLAEQAERYEEMVEYMKKVATASDD $T L T R E Q F V Y L A K L A E Q A E R Y D E M A G F M E R L A R E H G E$ SRDELVVQWAKFAEQAERFEDMAEAMMKVVTEDSKE SVDKE ELVQRAK LAE QAERYDDMAAAMKEVTETGVE D REECIA NAKLA E QVERFDDMVAKMKVVATGS DP
EREENVYRAKLAE QAERYDEMVKSMKCVAASDCE MERKDLIVKAKLAEQSERYDDMAEMMKEVTEQGVD MERGDVVLKAKLAE QAERYDDMVACMREVTKAGHE DPEALL HDAKLAE HAERFTDMAAAMKKFTEDKKP DRDTIVRRAKLAEQAERYDDMSDMMKKCVTDFVN TEKMELI QKAKL PKKCYDDMATCDKA I TKKQGTK MEEES P E VVF E A K L A E Q T E R Y N D MVVDV MK KVV V K S K G P TTEREANLYEAKLAEQAERYDEMVAADKKVAKTGEG

DKGELLVIANDAEQAERYDDMDTVMKK\VTDGSE DKEEKHVYMAKLLAEQAERYDDMVNSMKEVAKMGTE SREELI HLAKMAEQAERYDDMVNAMSAVTKEGKP GCKDHDSLVNIAKLAEQAERFEDMAVAMKA AEMGTE $D Y V T K A K$ LA E QA E RYD DMAAAMKECVVERKDA
REENJLIAKYAEQADRYNDMVKYIKHVAKTNEE $S \square K D K D S L I T L A K D Q E Q A E R F N D M A C A M K K V V E T S K T$
 MASTDKE LLI QRAKLAE QAERYDDMAAAMKQVTKMTDE ASSLDRSSLVFLAQLAEQAERYDEMADYMKTVVTSDPP

 ADDRDTIV KRAKLAE QAERYDDMSNFMKTCAACSYF

VDRE QLVQKARLAE QAERYDDMAAAMKNVTELNEP
EQLVFLAKCAERAERYEDMAAAMKMHTEKDGK D RE S L V YTA KCLDEQAERF D DMADCMK EVTNFDQQE DRESLVAALAK I S DQSERRYNDMTCAMKKV VEMPS K

DELVCIA KYSERAERYDDMAAAMKLYTEVIGE
VK S VT E Q G A E
$M \square K V M N E V A K M P G E$
SASRSELLCEWAKLAEQCERYDDMCSRMKSLVEDDTD

TMDKSELVQKAKLAEQAERYDDMAAAMKAVTEQGHE
DRECSSVECAKLLCE QAE WY D DMVKKAVIDEVVK IE GE
DLVF MAKLTEEAERYDEMVLCMRKVVKLNNE
MAS ERETKSF LA GLCKQAKRYGDMAKYMKEVAKCGGE
MASEERERLLFMAKLAEQVHRYDEMADSMRKLAHLDVE



SKIV|F Y QKMKGDYYRY|VISEYAQGDDLTKSSENAANAYKEAT SKVVFYYKMKGDYHRYLAEFSTADARDEATTNSLEAYKKAS
 SEVVFYLKMKGDYYRYLAEVATEDTKKE』IQSSQQAYQEAY AKVFYHKMKGDYYRYI SEYTSGEARKKAGEDAHGAYKAAT

 S L V F Y L K M K G D Y Y R Y L A E V H S G K S K A D I I G L S K E A Y D M A Y S K V F Y L K M K G DYY RYG A EVVA A GEKK S CVVVESSSEAA Y K EA F S KVVFY YKMQGDYNRYLA EIAATASERDEVAKRSLDAYKVAT STVFF NKMKGDYYRYLAEFKSGNERKEAADQSLKAYEIAT A KVVF Y Y K MK G D Y Y R Y L G E F L S A D K R K DV V S Q A Q D S Y K L A T $N V V F F Y K M K G D Y Y R Y L A E F S T G T E K K A A A D Q S L M A Y Q H A M$ S RVVFYMKMKGDYFRYLAE IDAGGDNRNAVIEKSQQSYQEAL SKVFY LKMKGDYHRYLAEFKAGDGRNEAAESTGSDYAAAQ
 SKVFYLKMKGDYHRYLAEFKTGTERKESAESTMVAYKAAQ S K V F Y L K M K G D Y F R Y L S EVNPK D D D D A K V F Y L K M K G D Y Y R Y i A EFAAEEESSKKEASEKAKDA YN DA Y SKVVFYYKMKGDYHRYLAEFAQGDVRDRAGGDSQEAYQKAS P K V F Y Y K M Q GDY H R Y L T EF QQ GEAREGSAEKALQAY Q S A T
 SKVV YKKMKGDYWRYLA ATVVIFYYKMKGDYYRY L A A EFKNEHERKEAADQSMKAY QAAS GKVVY QKMKGDYYRYLVEVSSNEKRNELAAKSQQAYDEAT S KVF Y NKMKGDYHRYLAEFATGNHRKEAAENSLVAYKTAT D TVVF Y LK MK GDYFRYLVVEVK SENDRDDCAGKSEEAY LA A M
 A SVVF YRKMKGDYYRYMA S K V F Y Y K M K G D Y Y R Y L A A
SKVF Y Y K MKGDYHRY LA NKVFYSKMQADYCRYLA E
 SKVFY LKMKGDYY
S KVVYLKMKG DYHRY LAAEFKSGAERKDAAESTMNAYKAA H SKVF L NKMRGDYHRYRAEYSVGNQRKDAAENSLCAYKKAA A SVVFYLKMKADYYRYLAEFATPASKLEPANKAGEGYKAAS RVVFY K K MKGDYHRY IA EFKAGEERKAAADDTMSAYKAA Q S K V F F $L$ K M Q G DY Q R Y RA E Y A D E S L R S GVVI E EA QK S Y Q LA Y S KVVFYLKMKGDYYRY LAEVVATGETRHSVVEDSQKA YQDAF
 S QVF Y LK MKG DYYRNRAEFA DEKKREKDAQK SLGAY ESAM

 S EVVF Y LK MRGDYYRYI A EVVTDES QRETVVDDDSAKAYSSAY T GVF Y L K MKGGYFQYLAEVACGENQKQMTDNFQGAYQEAF SKVFYHKMSGGYYRYAAEYSTGDAKDNASRKSQEAYEKAT SKTF YYKMKG DYHRYMAEYSSGEGRQKAAEASSLQSYQSAA SKVF Y L K M K G D Y Y R Y LA EFK $\square$ GKERDAAADNTLAA YESA Q

 P QI F Y YKMMGDYYRHL AEVQTKESHEKSTASAEDAYSTAT SLVVF Y LK MK G DYYRYLA EVVSQSDEKDKVVEA SK Q S Y QDA K S KVV F L K MKG DYFRYG A EVVATGEKRD HVVVSNSEKA YKEAY T KVF Y L K M M G D Y Y RYL A EI FVD S ERKTASDNSLDAYKKAA GFVFYKKMEGDYYRYLAEVLTGDKSADVVKHSREAYQAAT
 D SVFYLKTQGDYYRYLAEFQS KEQGACEKALACYGQAT A Q V F Y W W M K G D Y Y R Y L C E FA GEANKAKATEAAKEAYERA T D A V F Y LLKMKG DYYRYG S EVVK T G D D K E K VVVENADNA YK K A S , SKVF Y L K MK G D Y Y R Y L S SRVFY MK MQGDYYRYCAEVASGDSKKDTV VAD TENRQAVDSSFDAYKKAM

 S KVVFYKKMEGDYYRYLSEVAGPEDRDRVVGSSLEAYEKAM | $S$ | $K$ | $V$ | $F$ | $Y$ | $L$ | $K$ | $M$ | $K$ | $G$ | $D$ | $Y$ | $F$ | $R$ | $Y$ | $L$ | $A$ | $E$ | $V$ | $A$ | $C$ | $G$ | $D$ | $D$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | CKVFFYKMKGDYERYLAEIAASGDARKQAAENS LVAYKAAS AKVFY L K MKG DYYRYG A EVQNNDNRDTVVSNGCEAYKKA Q S KVVF KKMKGDYWRYLA EFK G GAERKEAAEQTELAYAAAE S KVVF Y Q K M K G D Y Y R Y L A E VT S G D K R E DVVVVKA K D S Y N K A L

 SKVVFYYKMKGDYYRY LA EFATGEKRKSSSDDLSLKAYKDAS AKVFY LKMKGDYHRYYAE $\square$ S S DESQRNAA LEAYKKAT
UniRef90_T1WP50 UniRef90_A7TM53
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UniRef90 W6KTTO UniRef90-K2RXL7 UniRef90_MOSP28

170
 E I A T T E L P P T H P I R R G L A L N F S V F Y Y Y EII Q N S P D K A C H L A K TAA E NLLP T TH H P I R L GLLA L N F S V F F Y E I Q N D A A K A C E L A K DKSSEKMPATHPI RLGGALNFSVVYYEIVNSPEKACNLAN AIIAEEKLKT THPIRRGLALNYSVFYYEVNEDPGVACQLAK EI S K K E M Q P T H P MR L G L A L N F S V F Y Y E I L N S P E K A C S L A K
 D I S L K E ME A T H P I R L GL A L N F S V F Y Y E EKAKSFMQPTHPI RLGLSLNYSVFYYE
 $\left.\begin{array}{llllllllll|l|l|l|l|lll|l|l}D & G & T & A & E & L & Q & P & T & H & P & I & R & L & G & L & A & L & N\end{array}\right)$

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

 D E A T S S K L
 K V G E E K L A A TH H I R L G L A L N F S S V F Y Y E

T L

T
N
D $\begin{array}{lllllllll}T & N\end{array}$

NTAN

## D L

S STA ERRLAQP T H P I I TMANGKGPPTHPVRLGLALNHSVVHYE D V S E A H L K P T N P $\quad$ R L G L A L N F S V F Y Y E
 DVAVTELSPTHPIRLGLALNF




TAFDLLATAE LDDTLSEES YKDSTLIMMLLRDNLNLWN QAFDDAIA ELDDTLSEESYKDSTLIM
QAYDEAVTEVEVLDEEAYRESTLIVRLLRDNLNLWT

 $M D K N E L V Q K V K L A K Q A E Q Y D D M T A C M K S V T E Q G V E$

$Y$ QAKLA E QAEQYNVLWNSMKKVAGMDVE ASEQRQSMVERAKLAEHAEQYEDMAKCMKELVELDVV DKNLLVARAKMTE QAERWDDMVLCMKEVVEKDAV K NELI HKAKLLAE QAERYDDMAAAMKKVVTEMKMT $S L S R E D S V Y L A K L A E Q A E R Y E E M V E N M K A V A S S G Q E$ MDRGTMI FLARLAEEAERYDEMAEHMKAVANFEDE MDRSS LI FLAARLAEEAERYDEMAGHMKAVATNFDE
 NATLKLDRPSLVALAKLSEQTERYDDMAAAMNLVTEQTEDE

SRED LIARAK LSEQAQRYDEMAAAMK VVVEMGSE REQLTVMARI AE QCERYDEILVCMKRVVKLNPV
 DKDELVQRAKLAE QAERYDDMAQAMKLVTECTEA MAPSMKAVTEPNGP K DELVQRAK LDAEQAERYDDMAQSMKKVTELGAE MDKDELVRAGRTTCGGRRTDDMAAAMKQGRQKPEE ATS GDE AGEDRD

DRQQLVFMAKLAEQSERYDEMKEGMMQVVELGPQ AVAP T A REENVYMAKLAEPAEMYQEMVEFMEKVSNSSEE
 RDALVTNARWAE QAERYDDMTDFMKFVAECDGS
S RAE YLLLLAKVAEEAERYEDLVGQDKGLTYTYGA
SLSREEDANKAKFAEQAGRYDDMATCMKAMTKXQ DRE DMVY RAKGAGQAERYKMY MSKPELI QKAKLAE QAQRYEDMATCMKAATEQGAE MAAKSREECVYYAKVVAESADRYPEMLEYVKGIVKFNAR K DHNSLVAIAKLAEQAERFEDMAVAMRTIAEMGNE

$A D P E N L G R D Q Y V Y L A K L A E Q A E R Y E E M V E F M H K L V V G W A E$ MDKS DLVQKAKLAEQAERYDDMAAAMKAVTEGGVE DKEAAL QKAKL WE QAERWHDMALCMKEVVEMGHA DRASLVLRARIAE QAERYDDMAASMKTLTESDVD MNKFSREEFLFDAK AQQTERFNDMIEFDKHFLDQ

DKYELVQUKAKLVEQA EKY DDMAACCMK S DTE QGA E A QL AEQAERYEDMAAFL
MEKTELIQKAKLAEQAERYD MATCMKAVTEQGAE
 K S DMILLMARIAEKAERFNEMKEYMYTVASTPDP
$K D V D Q L V T F A K \square A E Q G E R Y D D M A R A M R K V T E L E G K$ $G Y V L S L E A P Q L V E L V R V A E T A E R Y E D M C K F V K A L V E T K Q G$ DLVFMAKLTEGTERYDEDVQCMRKL KMNSE
ERGKLIV L A TLA Y LAAKRYDDMTKSMRKVCEYE DE
Y I F CAKMAERAERYDEMAKSMKEADKLTQE ST TE K $\square E M I$ QKAK LIAE Q DKHYDD TCMKAVTKQGAK MASKQYEEALQQKANLS DMAERYDDMAKEMKQAVEDK H T

MEKTELI QKAK LAREVKLYDDVATCMKVVME
ERTNKVADAKL WE QAERWQDMALCMKEVVEMGG® SAMASSERETALVVAKLAEQAERYRD\|AEEMKKVARMGVE TSERENKTFLARLCEQAERYDEMVTYMKEVANDGGE

EKARLVESARLAEQAERYDDMVENMKKVVKKELK MNCEDYNE ILLFKAHLSDMSERYDDMANEMKLVAEKKTF REEYVFHAKLA QQAERYEEMVSFMQK VVVGYT E MAMCMKEVAKLGEE S NERDVVALFMAQDYD QTDRHQDMVDTMKKVDELSACD S DKRDEHTYMARLAE QTERWEDMVENMKKVAEITKD

SREENVYMAKLAEEAERYDDMLT Y $\square$ NK VLDA Q Q P E ERENLI Y LAAKLAC L A GRY DDMMKSMRKVCEHD

E M V V S M K K V A G M D $\mathrm{V} E$ ERTCLVHKAR】AEQGERYDDMSKAMKAATEKNAN MVEAMKKVASMDVE
D QLILLRAS LSERAERYEDMDKDMKRVIENK $\square E$ MEDMDDPDLVDMAKLAEHAERFEDMAKYMKSKVQKDSN

S RADCLLF $\square A K L A E Q A E R W D D V I S Q L K S \square I A Y S D Q$

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| UniRef90_G0QNG2 |  |
| UniRef90_F7H176 |  |
| UniRef90_V9TN05 |  |
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| UniRef90 C3Z521 |  |
| UniRef90_C3ZTH4 |  |
| UniRef90_W4YFQ8 |  |
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| UniRef90 F8NMT1 |  |
| UniRef90_UPI0002740981 |  |
| UniRef90_K1P9N7 |  |
| UniRef90_C3Z520 |  |
| UniRef90_L5MD91 |  |
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| UniRef90_U6I5B5 |  |
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| UniRef90_A0D7E8 |  |
| UniRef90 D8LVF6 |  |


| L | T | V | E | E | $R$ | $N$ |
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| L |  |  |  |  |  |  |
| S | I | E | E | R | N | L |

50
60
70
80

L S N E E
L T V



LS S DEGNLI AVVFKNEMGTRRSAWRVLRNI QMKTQDT

LTVEERNLLSVAYKNAVGARRASWRIISSVEQKEANRNHM



L S N E E R N L L L S V A Y K NVVVGARRRSSWWRVI S S I E QK T E K G S E

$L T V E E R N L L$

| $V$ | $A$ |
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| $V$ | $A$ |
| I | $A$ |
|  | $A$ |
|  | $A$ |

LT L E E R E ML
LTVEERNLLSAYKNVIGARRASWRI

| $L$ | $T$ | $K$ | $D$ | $E$ | $R$ | $S$ | $L$ | $L$ | $S$ | $V$ | $A$ | $Y$ | $K$ | $N$ | $V$ | $V$ | $S$ | $C$ | $R$ | $R$ | $G$ | $S$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |



L S N N E E C C N L L L
L T V $\operatorname{V}$ E E R R N L L L S V

L N N N E E R N

LTVVE E R NLL L SV A Y K NV I G S L R A A WR I V S S I E QKE E GRKN E
LSNEERNLLSVAY
L S P E E R N L L S V A Y K N V V V G S R R S A WR I V T S A E Q K A A D G S E T LLE N E R N L L S I A Y K N M I G T R R N A WRVVIS T DEE EA E T K D T N R

 SADVEK GR L L S MA Y K NVVGGGQRAA WRV L S S ME QK GQEE G S E

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LT QE K R N L L S VA Y K NVVGARRSSNRDICMDEQRAEN K G G D
L DVEERNL L SVA Y K NVVGGSRASWRTL S GGFD DADE
L D TEA R NL L SMA Y K NVI G S R R NA WRII T S IIE S R E S A K EK S

IG P E TRNLFSVAYKNMAGARRASWRILSAERQKPENSSDE


$L$
N D K E R N

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


LT A EERNLLSVGGYNVIGPRRASWR\|LAALEEKEEGKESE
L S T E E R GLL L SLLA Y N N I FEA A R R D , CB968C


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140 150

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A T V V F Y Y K $\square \mathrm{D}$
GLFGQLA HVMMG G $\square$ S F SVVLT NLL K A
K I I I DILLE YAS GQTHD QAAN GAL DA YQKAS $N K V F Y$ LKMKGDYYRYLAEVAAGDDKKGTVDQSQEAYQKAF
 STVFFYKMKGDYYRYLAEFKFGDEKKEAAANSMKAYETAT AKVFY LKMKG DYHRYLAEFKTGAERKDAADATQLAAYQAA Q
 SEVVFYRKMKGDYFRYGA EI SEGEEREGMVTKAKESYEKAQ
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 TK K Y Y L K M K G D Y H R Y Y A E I ETM T E E QK D K A LEA Y T Q A M SKI F Y NKMAGDYYRYLAEYLT GPELEGCAKKAEDAYAAAA
 SKMF HL K MK R D Y Y RY L A A V A S GEKR N SVI I EASEAA YK A A F SKVVFY YKMK GDYHMYLA EFA T GNDRKEAAENSLMAY KAAS S K V F Y $L$ LKMK G D Y Y R Y L A A EVA S G D S R S CK V

 S K V F F Y H K M K G D Y H R Y L A E F A I G D R R K D S A D K S L E A Y K A A T
 SKVF Y LKMKG DYHRYLAEFKTGAERKEAAESTQTAYKAA Q D QV F Y L K M VGGD Y Y R Y L A E F Q T GE DLLENSKMNADKAY Q DA M

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## S

STVVYYK K MKGDYHRYYA
SKVVFYYKMK GDY H R Y LAA E F GSDA ER Q GA A DNS L EA YK DA M
 Y Y I F F LKM M G DYYRYKA EVVIS GSEHGEVVSKNS Q GA Y Q EA A F
 S K V F Y L K R K G D Y F R Y L A A

SKV F
SKVFYYKMKGD Y Y
SKVFYFKMKGDYYRYYAEFKSSNERKDAAENSLLAYKAAS

 $\square R V V Y Y Q M K G D Y Q R Y M A E F K \square G D D K K S A V V D \| I L S Y K A A Q$ SKI L Y Y KMK GDYCRY LA EFA SDEKRKAAATTANEAYKTAT SRRVFYQKLKA DYYRYI CESRSDDEKTEPAQKAKECYEAAM ARVVFYHKMK GDY N RY I A E Y S Q Q K A QE KA DQQAQQA Y Q T A L SKVLY LKMMKGDYHRYLAEEFKTGAERKEAAESTQLAYKSAQ S IVYFYKMKGDYYRYMAEYKTVVERKEATDQSLGAYQAAT
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S K V F Y L K MK G DYY RYL A E
A R V $V$ F Y $\operatorname{F}$ L K M M K G D D Y H R
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180 190

200
STANAELIPSTHPIIRLGLALINFSVIFYYEIIMNSPERACHLAK DTANKDLNTTHPIRLGLALNFSVFYYEVMNDPSKACNLAK EISKKEMQPTHPIRLGLALNFSVFYYELLNSTEKACSLAK DISKSAMQPTHPIRLGLALNFSVFYYEIMSSPDKACQLAK TAAEADLPPTHPIRLGLALNFSVFYYEI MNSPERFVRYYM D A AKELSPTHPIRLGLALNFSVFYYLLNSPDRACTLAK GIAMTELPPMHPIRLGLA NFSVFYYEILNSPDHACRLAK EKA AQLPNTNPVRLGLALNFSVFHYEURNNPDEACRLAK EKATAALPTTDPVRLGLALNFSVFHYENRNDPTEACKLAK EQSQTNMAPTHPLRLGLALNFSVFYYEDLQPNDACDLAK SLMTTELPPTHPLRLGLALNFSVFYSDIMNSPDRADRLAK DLMSAELPPTHPLRLSLALNFSVFYVEI LNAPDRGALMAK EปSKKEMQPTHPIRLGLALNFSVFYYEILNSPE EHAKEHLFTTHP:RLGLALNYSVFYYEMRESDLACKLAK NDEAERMSPDNP:KLGLALNYSVFGYEDKNGEKADRDAQ READANLPPTHPMRLGVALNHSVFHYDVRKDATRACDVAK D $\mathrm{S}_{\mathrm{SKTDL}} \mathrm{L}$ QPTHPRLGLALNFSVFYYEILNAPDKACHLAK EISKEHMQPTRPIRLGLALNFSVFYCEI QNAPEQPCLLAK NI AMTEDPSTHPIHLGLALNFSVFYYEI D:AKEKMQPTHP:RLGLALNFSVFYYE: VIANDTLTSTHPIRLGLALNESEYYE EVAQTELPPTHPIRLGLALNFSVFYYE EVAOTELPPTHPIRLGLALNFSVEYYE
 EI A EKLSPTNPTRLGLALNYTVLQFEVLKQTEEACKLAK DlATTELAQTHPIRLGLALNFSVFYYEILNSPDRACNLAK KRGQENLSPTDPVLLGLALNYSVFYYEVENPDRKACELAK ETSTDSLCPTHPVRLGLALNYSVFHYEISNAQHKACSLAQ KHALLATLDPMHPTRLGLALNFAVYYHDVLKSPERACHLGK DISKKEMQATNPTCLGLALNYSVFYYELLNNPGLAWMLAK KNANDSMAPTHPIRLGLALNYSVFHYEI MNKPDEACKLAK EKA AELQPTNPIRLGVALNFSVFHYEVRNDPTEASRLAQ D SKKELQPTHPIRLGLARDFSIFHYELLNTSELACALAK KLALGSLEATHPTRGLALNAVYYRDVLNSPERACHLAK TLAEQELSVTHPTRLGLALNFSVEYYEIKNDPEKACCLAK KAA SKLAPTNLVRLSLALNFSVLLYDI MKFPEKAFFHAK D AAMTELPPTHP:RLGLALNFSVFYYE:LNSPDRACRDSN DISKKDMQPTHPIRLGLALNFSVFYYEI LNSPENACQLAK EVAADAMPATHPIRLGVALYSVFHYE TQNDKKARQLAK E AGKTLPPTNHIQLGLVLNLSVFHYEL VLAKSNLSTTSPDRLGLHLNQSVFYYE:LQNAAEADRLAN DI KKEMPPTNPDLLGLALTF VFHYE ANSTEEADSPAQ LMAKKEMQPTHP LLGLPLNFSSLTICLAWRPRQLWARVR LMAQTKLSPTLPLYLRLMLNTSVFDCD LSDVEGARELAK DIAMTD日QPTHPIRLGLALNFSVEYYE EGAQKACDLAK EHAKKNMPSTHPNRLGLALNYSVFYYEILNSPDKACNLAK D A ODH:PETHPTRLGLALNFSVCYYELLKQPEKACELAK EVANTSLAPTHPVHLGLALNYSVIFYYEIMLEHERGIUQLAR DTAAADLPSTHPIRLGLALNFSVFYYEILNQSDKACAMAK EIAVT LIPPTSPVKLGLALNYSVFYYE DTSKKEMQPTHPICLGLALNF
 Q A EQLNPTDP: RLGLALNY DISKKQMQSAPPIRLRLAVNF VEYSEMNDSEACELAR KKAAEELKPTHPIRLGVALNFSVFHYEVTKNTEEACRLTK ESAEAELPPTNSVRLGVALNFSVFLYEI RNSSERACSIAK DVAQTDLTPHSPHPLG SCLELLRVLLRDPELSRSCLP DIASVDLPPTHPDRLGLALNFSVFYYEILNSPERACHLAK
 EKA EPLASTNPIKLGLSLNYSVFYYE ETASGKLHPTHPTRLGLALNYSVFHYE DIA A A D R S SHPRRGLALNFSVFYYE QISNAEIJAQYRPTSLGLILNYSVFLYE ELIDDKDKFPKNLLRLGVVGLNYSVFCYE: STAMTELPPTHVIRLGLALNFSVFYYE EMAENSLAPTNMVRLALALSNFSVENYEEDLCDHRACKLAK EISKEHMQPTHPVRLGLAFSFSVFCYETQKAPEEPCLLAK E|AEKDPPPTDPLRLGLALNFSVFYYEDVEDSKQACDLAK K A
 EI A N E LA PVNSLRRLGLCLNYSVVYYEI EKMPDKACMLAK $E L A B E L P S T N P T S L G L A L N Y S V F F Y E I K N D G A K A C S I A K$ K H A L A T L E P WH P T R L G L A L N F A V F F R DV R A S P E R A C H L A K


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ASEHERALFKCRMAENAERFDDMVSFTRKACESSTE TSRSQYLLIAKVAEEAERWED\VIQUKG\DQTFGS KEREKVV RLA K LAE QAERYDDMVEFMKTLARMDVD E EClVYRAKLSEKAERFK QMVECMKAAVKYASS MASSERELKYFMARVADQAERHTDVVTGIKSIIGDGGP MDKSELVQKAKLAEQAERYDDMAACMKSVTEQGAE

ESMKNA $\square \mathrm{N} \square \mathrm{NT}$ Q
MSVPDKDEVVQRAKLAEQAERYDDMASAMKSVTETGVE EREKVVCLAKLAEQAERYDDMVEFMKKLARMDVD

AADNEE
MS K Y T REELIVY L K $\square$ S E Q TERFK D MLE Y M K QVVNF E QE
 AFSSNDRDNFVVVAKLSEQAERYDEMVDAMKKVAKMDVE $M L S V E K N G V M A R L A E Q A E R Y E E M C A H M K E V A D E M E P$

TSERESSKTAGAARLCEQAERYDEMVTYMK EVVASLGGE
 E EKI F MARVAEQAERFDDMVDFLQPILRDKGD


EREAWVYKAKLAE NAERYDDMVAAVKEVAASGEG E E MVVESMK K V A GMDVVE
MERA $\quad$ L C K A K T A E NLE KY D DVVSSMKEF DE DG ME DDE YND DLLFKA Y LSS D DAE R Y D DMAS E MK QA

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DKESLL QKAKLLCAE ERWQDMADCMKEVVVEMGEE MDKTELIQKAKLAE QAERYDDMATCMKAVTEQGAE SSDRELKFFMARVADQAERHEDVIQY $\operatorname{LGKEI} \square D \square D P K$
 NF QRDDYLLLA QLAQQTERFNEMVEFVGKF $\quad$ VQQNGQ ELLQNTKLAEQAAXYDGMAACRKSETEQGIE
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DKDE $\square V Q R A K L A E Q A E R Y D D M A A S M K S V A S A D Q E$ A E Q A ERYEEMVEFMEK VAKSVDE
$T L S R L D C L F L A K V A D Q A E R Y Q D V I A Q L K R V V T A S D Q$ KMELI QKAKLAE QAERYDDMATCIKAVNELGAE

ESMKTVAGMHVE
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MPAMEKEKCLTWKAKLAQEANRFEDMARYMKQVAGECGEEP TLSRLDRLYLAKVADQAERYQDVIDQLKDVDNANDQ $M V E P M K K L A G M D V E$
QDSRNELVQLAKLAEQTERFEDVILYMKKAIEDNPS MAREDSLYMARLAEETERYEDLVFFMKKVVEAGQE EQAERYEEMVNYMKDVAKLGVD EQHDFMARVAEQSERFRDMVDFLKPVIEKGAA MSNKDRS $\square A \square L A E K V E R Y E D M V K A V R N M A E S N V D$ MDKNELVQKAKLAE QAERYDDMAACMKSVTEQGAE SREDCVYLCSAAEEASRFEDMVEYMRRVT T FEQE

E MVEAMKLVAS LDVE A LSREDLVYKAK $\square$ AE QAERYEEMMDCMSEVTSGEEE

SEAREN $\square Y \square Q A K \square A E A T E R Y G D M A E L M K E M V Q L W G E \square$ MS DMSKDELVQRAKLAEQAERYDDMAQSMKKVTEDGAE $R K Q L V Q Q A Q L A E Q C G R Y K D M A A A M R Q V A E G G E P$ EMVESMKKVAGMDVE

MVQSMKETAHFEGL
RNQLVQAA QLAEQCGRYKDMVSAMKQLVEEKKT
SRVDVLF LIAKVFDQAERYEEDAQLLKE\VQSDVE
 TA $A G A G G E$
$V A M L G V E$ MERESLVVKAK $\square$ AEQCERYDDMAE $\square$ MKEVTERGDD EQAERYEEMVEAMKQVAHLNVE


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#### Abstract

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LSPEERSAFSXAYKKADEPLRSSWGDLQQGKSNEEDNGAK LTAEERNLLALAYNNMVGSRRAALRTIASAEQKAADGSE LSNEERNLLSVAYKNVVGGRRSAWRVI SSDEQKTDT SD LSUDERNLLSVAYKALTGNRRTALRSVNAFLEDPSIUGAK SUVERNELSVAYKNVIGARRASWRIISSIEQKEESKGNE LTQEERAVVAAYKNLVGNKRADLRVLTAGEQKESRKQQS LSEEKNLXSVVYTNVVGAHRXSWRVISSIEQKREERGEK LSPEERNLLCVGYKNVVDARRLSWRALSSEELKEEAQGNK DTVEERNLLSVAYKNVIGARRASWRIVTSUEQKEESKGNE LTNEERNLLSVAYKNVVGARRSSWRVISSIETKTES SE पS VEERNLLSVAYKNVIGARRASWR DSS DEQKEESKGNE KEQAKSTD LT DDERNLLSTAYKNTTAAFRASWRT爵DTDQRAQQAHSTPR LSKEECNLLLVAYKNVV AFFCHSGCRVCAYSKTSD $\square T V G E R N L L S \square A C K N \nabla I G A \square K A S W R \square S S C \square E Q E E E N G G G E$


पt VeerntLs Vayknvigarraswrits n Teqkeenkgad LSVEERNLLSVAFKNVIGARRASWR!VSSUETKEEAKHDS
DTVEERNLLVAYKNVIGALRAAWRIVSSTEQKEEGRQND PTEEERNLLLVSFKNLVAKKRFAWRVLNTIGDNCKHDKDN LSNEERNLLSVAYKNVVGSKRSSWRVLNSIGERTASRDGE LTQEEKTLLSKAYTFVIQELCCSSWRRLK KENSVEQGVG LTVEERNLLSVAYXNVIGARRASWR $\frac{1}{M} V$ SS S IVEQKEENKGGE $P T$ Q R E R N L L S V A Y K C L V A Q K R C S WR N L

LSPDERSLLSVAYKNMMGSKRNAWRITSSLQपKYE NT

 LTVEERNLGSRAYKHQI TSTRESWERIVECEKKEKRSRSD L L E ERNLLSVAYKNVVGARRSAWRVLSSGALK N NDGNS



REQQLLDAMRAR $\square R G E L I A D C E E A L L T \square Q E N L L P R S V H A E$ EVLD GHII P K K A S T A E
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 D K L L K M I R E Y R Q M V E T E
 K Q K E Q A QlV Y R D S ll S Q S E M I K N Y R $\quad$ K $\quad$ R R N E RR LMQRQKERIEHDIVVDVCKDVVELLERFLI PAAAPGE GHAAAARGYRGRVEAELSNIDAGILRRLLDERLVPAAAAVD

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\begin{array}{l|llllll}
\mathrm{V} & \mathrm{~F} & Y & W & K & L & S \\
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\end{array}
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S & K & M \\
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S K V F Y K K M K G D Y WR Y L A E F K G G A ER K E A A E E T L L A Y K S A E

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 D TTRKEMQPTH
 Di ALVDLP
D ATKELASTHPTRLGLA
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E SNAELPPTHPURLGLALNFSVFYYELINDAKACQLAK KHALSTLDSAHPTRLGLALNFAVYYHDLLQSPERACYLAK DTSKKQMHPTYLTHLELALNLSVFYYEIFNNPELTCTLAK EUSKEHMQPTHPLRLGLALNFSVFYYEUQNAPEQACLLAK D $\square$ AVADLSPTHPDRLGLALNFSVFYYE LNSSEKACSMAK KHALVTLDPTHPTRLGLALNFAVYYHD CHSPERACFLAK AEAAKSLKSTNPVKLGLALNYSVYLYEUSKDMKKALDVAK
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E TSERHLEPTHPLALAVALNHSVLHYEVLNNAEKATKLAK KPTVLDEASEFS FLVDVKLDLLC CAYRLAK ETAETELKSTHPDRLGLADNFSVEFYEVLNKPHEACEMAK LVAAENLPPRHPIRLGLSLNYSVFQYEILQNESTACETAK EITQWHMEPTHPLALAVALNFAILYYEVLNNPQQATKLAK DVSKKEMDPTHPVRLGLALNFSVFFYELENSEKACSLAK SMAENFLPVTHPVRLGLILNFSVFCTE:MKDYELGRQMAE D AMMKELPPTHPDRLGLALNFSVEYYELDSPDRACSLAK DiALLELPPAHPIRLSLALNFSLFQYY LKKSEKACTLAK ETRCKVGWSRAVIVFYISVYGHV
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#### Abstract

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EAFDAATAELDNLKEDSYKDSTLIMQLLRDNLTLWT SAFDSAVAELDSI SEDSYKDSTLIMQLLRDNLTLWT QALYKPDADNDMISEK Q 1 C

EAFDNAVAELDS LKEDSYKDSTLIMQLLRDNLT LTWT QV QAFNDAFADTEHDEEDQYRVATSDMQLLRDNDT\WT QAFDEATSELDTLSEESYKDSTLI MQLLRDNLTLWT HAFDEA IGAASTMPEQALEDSLTILQLLRDDMILWS QA $\square \mathrm{DDA} \square \mathrm{AE} \square \mathrm{DSLDAASYRDSTL} \mathrm{\square MQR} \mathrm{\square RDNLVLW}$ SAFDDAVLSPQATDPET $\square R D A D Q L Q L L K D D L I L W S$ TALQEAMNKIDDVDEETFRDAKSI I ELLKENLTLW  QAVDEANNHLNRTGQED RDARLVMQLLEDNDTLW ATFDDADAELDMLSEERYMDSMLTMQLFRDNLTPWT QAFDDAI A GMFNARYDYFK KAFDDGI DELDTLSSTSYKDSTLILQLLRDNLNLWT TAFNNAI ENLEGLSENHYRDSTLI MQLLRDNLTLWN TAF A EA I A E L D T L N E D S Y K D S T L I M QL L R D N L T L WT RTVBAAVGEIEMLNKEVYEDSMTILDLIKDNLARW KAFEDSTADPGGLNENSYKDSTLIVMQQLRDNATDWN


K S F K E A VGLID K LEEDEYSEATLILQLLKDNVQLWT
EAYQNATANTDK TK DEHYKDTALIMQLLQDNTT LTWS TAFDDVIAEHDTLSKKSFKNSTQRMLLLRHNLTLXT DAFDAKI AFDEKLSSEQYVKCLSLLMQURD
TAFDAAI SELDTLSEDYYKDSTLIMMQLLRDNLTLWT QAFDEAI AELDSLGEESYKDSTLI MQLLRDNLTLWT QAFDDALAELDTLSEESYKDSTLIMQLLRDNLTLWT

## QAFDEA $\square$ AELDSLGEDSYKDSTLIMQLLRDNLTLWT

QAFDDS TAKLDDVPEANYKDSTLTMQLLRDNLTLWT HAFDEAVASVTTFTGQ\LEDSLMLLHLLKDDLTLWS TAFDEAI VEPDTLNED
QAFDDAI AELDTLNEDSYKDSTLIMQLLRDNLTLWT

 DAFDHAAIA GLDDESSEEHYKDSTLI MQLLARDNMTLWN QAFDEAT SEELDSLGEESYKDSTLI MQLLRDNLTTLWT


QAYAAALPEMDSLSEEVYRDSNLIMHLLNDNTTIW KSFDAAIEKLDTLNDASYKDSTLIMQLLRDNLTLWT AA $\square D A S S A V V H T L G E D Q A K D T L A M M Q L L Q D N L E L W T$

KALQDALDKLDDCDEETFRDAQS I ELLRENLALW HAFDDAKAELDVLIKEPEDDS LLMQLLCDNLTLW
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$N G E E S V S M K \quad R S D S T L I M Q L L R D N L T D W T$ AAFDDA $\square$ AE LDDTLSEESYKDSTLIMQLLRDNLTLWT QVC
Q GLDD DAVEELNNHNENVFNDSELIMQLLQDNLSLWT KAFDNAIAAMDTLQEESYKDSTLIMQLLRDNLALWN
A A F DKADAGLETWSLEFYKESTVIMQRWRDNVVQWT A AFDDAI A ELDTLSEESYKDSTLI MQLLRDNLTLDT RAFDEAI TEEFDSVSEDSYKDSTLI MQLLRDNLTTLW
 SA F D DA RAFHEAVSELETLSEEFYYETVTVLQLLR
HAFDEAI A S DPS SPTQNVEDALMLLQLLKDDLILWS
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A A A MKNVTELNEP

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MHEAKLSK Q AEXYVDMAACVKSVTEQEAK Y $\square$ A M L A E Q C S R Y K E M VQ F LE D MVK Q R D D

LVQKAKLAK QAERYVDMASCLXSATEQGAE $R E V N V F M A K V A Q E C G K Y E D C \square R Y M R D V I N Q G R P$

E Y E $\square$ A $\square$ K R A H Y S E $V$ A ERYE D MCE D A DEAEKYDDMVEFLDKVAKNVDE E MVV S MK KV A GMDVIE
EQSTHVHFASLSSSSERYEEDKKAMKKSVQLKAE MADNK RE E Y I Y MAKLS E Q T E RF DEMVEYTK K LVGGLSRE MS REENVYMAKLAE QAERYEEMVEYMEKVAKTTDE MEMT DRE ILLFR R $\ K L V E Q A G L Y D D M V S A V K T L V E R G E E$

QK MQM $\square$ T A Q $\square$ A F D A D R CD D MADCMK A T V $\square$ A G G H
$R Q D L I Q L A K L S D R A E K Y N E M D T Y M L L A S K F N Q D$ NDERKQCVIMATAMSQAERYGEMLSYMKRAVEDNPDV
 MA QIA ETAERYEDMSQFVSKAFAKRRE ATPAGE MEGATVIQKAKLAEQA RADNMAAFMKSAMEKGRS ER D QC\T MA QI LGQ T S KAKEMVNYMKRAVELNP I MAECMKERVETNPV $D D V M L L A R \square A E Q S E Q Y D D M \square E \square L K P F F E K T T D$ DKSKLVQKTKLTEQAERCDDMAATMKAVGTEGHE

TELDNEP
EPSUFMARVAEQGERYDDMFEF LIKEFMQSKP H MEGATVIXKAKPAE QAKXYGDMAVFMKRAMXKGAE


$C L R S L S R A S L V V L A E L T E$ Q A E R Y D D M V H $\square$ M R T LVT T H P P E ENVEMMKRVIDQANQ
MDKNELVQKAKLAEQA
DLVVFMAK L T E EA E R Y DEMVQCMRK LVVKMNSE S SEREKCIAMARLSDLPNKALDMVKYVKRAIELNPI L A R I Y E A L E M Y S D MVVDEVK K V V E L R D Q

GCPQKRSRDEA LLICR DAEAADRFEDMLNY VR $\square F T A G D G D$ ADDRDTIVKRAKLAEQAERYDDMSNFMKTCVKDHSH

EAMKK VAK L N VE
DREELVYQAKLAEQAERYD

MEKTELIQKAKLAEQAERYDDMATCMKAVTEQGAE S R D A L V F QA RLLA QQCGRD DDMLSAMKVLVASQDE $M E P R D I V Y L A Q T E N S I D R S G E A I M K L M Q L A E V K P N$ LA QVAMKAGQPNDAlLYIKQALKTKTD A A A A GTREEMVYMAKLAEQAERYEEMGTCSQ

REENVYMAKRAE QAERYE EMVVQYMEKFASTDEE MDRNEQIQKAKLAEQAERYDDMASSMKAVTECGGE $H E P$
MDKNELMQKGK LDEQAESYDD VVACMKSVTEQGTE


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UniRef90 G3WHC2 UniRef90_H2ZFT1 UniRef90_S9VQZ0
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LS DE E R S LI S VA Y K NVVGA H R S S QR V V S IE Q K T E
EHEEERYMLSVAAYKNMVGSRRSALRRI I A SVEQKEAD GSET MILK E T S L S V A Y R SVV GTRRRS S WRI S S E QVEENK E GVV I S S T D R H L FA A A Y R H LVVVPRRAASWRIL A SAEQKAP S QPAK


## X N L L S VA YENVX GAHRSSWRVVSSTEKMMEGS

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

$\square T \square N E R N M F S S A F K N V L S K L R N S W R \square L N G E K E K H S N D$
LTPE ERNLLSTAYKNLIAAGRRAPLKRTRSDEKKETKKGNT L T V E E R N L L S V A Y K N V I G A R R A S WR I I S S I E Q K E E N K G G E

 LS R E E R DL L S V A F K N A TA V RRRLS WRV I A A S E Q GEK DA RMK

LS VE ERT LFS TAFK NA VGA R RQAWRALTMLEHRERGEAGR L S N E E R N L L L S VA Y K N R V L G H T I L L P A V I I S T K Q K T S V N G N E
 LD T S ERTLLSVVGYKNLITSRRQGDRHLMQQEDEMEGLTVP LSAE ERDLLSEAYKNAVGSRRSAWRTLTPVEQSEA
 LKAEERNLLSTAYKNALLPRRRAWDEITVAVQNAEKS GSS


 LS TPE E $\square \mathrm{N}$ LL L T TA Y K H V I
 LD T E E R N L L S M A Y K N V I E S R R R N A WR IIT S I ERRRESAAKEK S

 $L$ SVEERNLLSVAYKNVVGARRSSWRVISSIEQKGDTD

## 

 LSMDERNRLSVAYKHNTGRTLRTAWRATPE LLSNAR N K L N VEERNLLSSVAYKNVIGSLLRAAWRIVSSIVEKEEGRKNE
 FD Q N E R QL L V L I Y K T A I D P I R E T I R T L S M Y R D S S K E S G Q S LTKEE DDFFAHTYKKA $\square$ NSPRNALVAMDNQLQLQQSPDV SHRRQRWQRQRQRER
$I V S S T E Q K E E S R G N Q$
 PT I E ERS LLLVVAYKNVLYDYSKAFRSVVNVQSRHENKGED
 FSNEERNLLLSVAYKN RVVSSSDQQTEDAETR

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GHLDQ R NYC VQ DE GE LEADCTDVLDVLDNHLIKSAQNAE S DDSSIAD LIK GKI EKEI EQLCQEVQTVI SEHLLRDSSSVD R R LVTKYRTRIQDELVAI CNELLMVVDKHLLPSSSETE P NLNQLLEFKQQMFKELEAI CNDLVQLVDDSLIPAATTSE ANVTKVKEYAKKDDKELHDI TEDVLSVLNNNLI PNAQSDE QELQLI KDYREKVESKLRSUCTTVLELLDKYLI ANATNPK ARALDLAKYRAQI AAELQSTCEAFLSLLRDRLLPEAPTVD
 HLALLQRQKNKIEKELAAKCKDLLENVLEKLVPAAGKGE

KTETQLRD DCNDLLSLLEKCLIPSASQKE RQAA KWDREKVETEMKEMCDEVLELLDKFLI PSVHNAD

 QKVKIIK EKQEMVKDEFFNVCNDILELI DAHLIPSTTNVE
 FQRE AKKYQKTIK KELMESCNEVLTLLNRYLNPKARTSE
 KVEGELQKDCDTILGLLLDTKLIPAASNGE XMAXEYREKIESDLRDIENDLLSLLEKFFIPSDSQTQ TFLPYITEYKKQVEDELTKLCQGVLKTTDEQLLKKAEDDE $K K L Q L I K D Y$ EFMESD GESGGLLELLDKYLIAKATNPE


KQ I NEK DDKVAKDIDYQTNKALNII KEYMMVD DTNDN
 DKLKMIREYRQMVETELKLICCDDILDVLDKHALIPAANTADE



 DASKM YRHQUE $\qquad$ $C Q L V V G L L$ PASNDSN
 QT QAEVKS $\square$ KKQ\| 1 TELVSLCEEFI DLI NSKLLPVNTDPD KS $\quad$ KGYRAVIEEEL RE:CHDVLNLLDVYLIPKASNPE NIS DEMSKLRITIEKORSVMEAISDCDOKIVMAYQ
 CKERDQKDKEELDNELVGFCTELINLVDEVILPKVEDPE ATWLRERVETEI KEDCGDVLTLVDKLLGSETLEYE DYQNESSAYRKKLEEEVVNMCKDMIKLAKTLCTKKDGNTE KKQQMSKEYREKIKAELVQUCNDVLELEDKCLVPSAARPE E Y Q Y F LK Y Y ETI EAEI RLMVRKLLAYI DSCLLKVEQEPD LVEYRKTI E E ELRTI CEEVI NLLTK VI ENIDEAAE KK LDEKVKAYREKI EKEELETVCNDVLSLLDKFLIKNCNDYE QSAI NAYKAAI EERLHTNCQNIVDLLRNYVI PTSQAYE EKGPEVQESWEKVETX EKVCDTVVGLLDTXLI KDTGHAK PY LDD Y I KEYKAKVQKEDEDLCNKI NRTIDDNLLPKATTDE
 DHVSIIK KYRGKIETELSKDCDGLLNLLEAHLDPAASLAK
 RVQRLDEFREKLVSEIDEHCEDLLCKLLDSRLIPSASSGB

 NAIPY Y QKTRAQUADELLKNYCTDLISLVVDEKLLPSCSDEK

## RTKGF $\square$ AKVEAElLALGNEVLGLLEKGFLPRASNDE

 RKKEMAGTYKKKI DAELTKI CQDVLELLDEFLITKDPGKE MAKEYRVKVEKELREICYYDI IGLLEDKHLI PKASNPE T IAAGLVRRVRTQLKDEILSHCQEVIQLLEKQTVTRDEDG DHVVLVKEYRSKVESELSDVCASVLQRLKDSNLIPSATASE RQVTLI RRQRTKI ERELADVCRDIVQLVDRKLLPAADSGE
 EQAQMIDDVCQSSI HDLDELCAQGLDLVDKVLLPACQDPA $G G G G A A R G Y R A L L V E A E L S N$ C C G G L L R L L D EREVVPAVAVD DHGSVIDKEYRSKI EAELTEEVCGGGLKLLDDQKLVPAATALD WQVGLCERFVKEI QEKTEHYCYEVNEV I DQVLKVESGSUV D HV SLVKDYRSTVESELSEVCANILKLI ESHLIPSASSSE KKKKMAQEYREKL MAA QYKKELE LE LTKSVCNEVTDLINNTVEVKCEDLE MLN LL DK SLI PAADNDE


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UniRef90-P68253 UniRef90-R9QPM9 UniRef90-K3W6D4 UniRef90_A2G036 UniRef90-R9QQ85 UniRef90-T0Q3R3 UniRef90-G0QMN5 UniRef90-UPIO00440E941 UniRef90-UPI0002B498F0 UniRef90-M3WVC7 UniRef90-C3ZEH5 UniRef90-M3Z176 UniRef90_C3YRQ0 UniRef90-F2UFG7 UniRef90-ROIBL8 UniRef90-A0A059EPJ8 UniRef90-B3G4K3 UniRef90-M1CR89 UniRef90-UPI0003EC3696 UniRef90 E8Z6C4 UniRef90_UPI000441F82F UniRef90-Q9SEC9 UniRef90-Q9XYW8 UniRef90-F7IRL2 UniRef90_UPI0003ACAAF4 UniRef90_A2FEZO UniRef90-J9P069 UniRef90-B7XJ58
UniRef90 M4EY76 UniRef90-F6WA09 UniRef90_Q7G888
UniRef90_Q232M6 UniRef90-UPI00042ACACC UniRef90 K7V2S2 UniRef90-C1L7S6 UniRef90-V9LJA0 UniRef90-H3AQHO UniRef90-Q22WU6 UniRef90-A2FQW3 UniRef90 V9LJI4 UniRef90-C5K760 UniRef90_UPI00044012F6 UniRef90-D8M6N4 UniRef90_Q9AT78 UniRef90_M3X0Y7 UniRef90_A2F1A4 UniRef90 C3ZWQ8 UniRef90-J91HS8 UniRef90_UPIO00333FCB5 UniRef90_U6HWQ1 UniRef90_Q38KZ9 UniRef90-A2IDB2 UniRef90-J9IYU4 UniRef90 UPI0001DEB07D UniRef90-Q9XYW7 UniRef90-I3SHC7 UniRef90_Q22B37 UniRef90_C0Z2P5 UniRef90-T0QZY9 UniRef90-I1K9W0 UniRef90 A2F806 UniRef90-UPI000328F25D UniRef90-F9WVQ3 UniRef90_A2DJ03 UniRef90_U6IQZ3 UniRef90-A2EH41 UniRef90-T1KCZ1 UniRef90 UPIOOO4415111 UniRef90_F6S1U8 UniRef90-G6CL94 UniRef90-R9QQE7 UniRef90 UPI0003C100AE UniRef90-U6FUQ5 UniRef90_Q9XEW6 UniRef90-E2LMJO UniRef90_UPI00029D9C71 UniRef90-Q013W8 UniRef90_A2ECB8 UniRef90 A2ERZ3 UniRef90-M8AR33 UniRef90_UPI0003D76F24 UniRef90_G5E090 UniRef90-D2VI47 UniRef90-F6GZ60 UniRef90-G3WHC2 UniRef90 H2ZFT1 UniRef90-S9VQZ0 UniRef90_Q940R5
 EISKEHMQPTHPIRLGLALNYSVFYYE K SAEEALPPTHP\|RLGLA
KEAENQVSDVNPTLLGGLYLNYSVFLYEDTRQSEEARAMAT TLADAELPSTHPDRLDLALNFAVFYFEILNSTDRASSLAD E IA K N DIPPYKPSYLGLLLNYSVFLYEILDKKEEADELSQ STAETKLPTTHPDRLGLA
NISKKEMQPTHPIRLRLALNFSVLYYEILNNPELACTLAK NI A $\square V E L T P T S P T R L G L A L N F A V Y L H D I G N A R D A A L A F A R$ E I A RMNLASTDPDRLALILNMSVYFFEVLDKDHDACIRDAN K HA LD T L E A WHPTRLGLALNFAVYFRDVKSDPERACHLAK

 D 1 A M I E L GPKPLI HSTLALNFSVEYYEILNSPDHAKAVCD WVAAKPLKATNPLKLKLALNFSLLHYEILKRTDSACTLAR TLAHECWGPADPNYLGLVLNYAVFEKEILGNTGLACRMTE EMAENSLEPTNLVRLGLALNFSVFTYAILNSTER NQAlL LIPPTSPVRLGLALNFSVFHYEILKKTDDACNMAR E IDAKTHTRVTNPMRLSLALSGSVFYFEILNKKHIACCLAK
 A I A L N DLLCS S

WY QQFQLYMTLNWTSVF
$\square N$ S P E S A Y QLA K Q LLQKNARKDDA $\square R L G \square A L N Y S V L Y Y E \square K D D \square V K A C E I A R$ E ISKKQ
$E \prod S K E H M Q P T H P \prod R L G L A L N Y S V F Y Y E D Q N A P E Q A C H L A$


 DISKSQMQPTHPDRLGLALNFSVFYYEILNSPDKACLLAK

 DVAVADLAPTHPI RLG
 EVSKQNLQSYSPTSLGLILNYTVFLFENAKKQTDAVRIAQ AA AKPLRATNPVKLELALNVSVFHYE LLNQVDSACTMAK ELA EQLSPADPTRLSLLLNYSVFCYETVGQKDQADEDAN
$E \square A S G N \square A P T S P L R L G T A L N F A V F Y F D \| V H A D D K A A Y K L L$ EAA KGMATTHPIRLGLALNFSVFYYEIMNKPEEACKLAK E
EICRKGLRPFNSVVLGLADNFSVFYYEVMSDPAKACEDAK DISSKEMLPPAPS AWAWRSFSVAFYEIVNSPAEACSLAN EA AKNIDYKNPVK $\square G L A L N L S V F Y Y E V V G N K D E C K L A E$
 D I A L A DLAPTHP S S D
A LAAKTCMTTTHAFR $\square G \square A D N Y S \square F V Y E V L Q E P Q V A Y D L A K$

## A $\square$ S NSELSQASTTALGLT LNYSVF LYEMMDRHQEA DDLAA

 EISTKEMQPMHPTRLGLXXSVFYYDGLNSSEKSCSLAK$S V S K Q N L Q S F T P T S L G L I L N Y T V F L F E D A D K K Q E A \square N L A Q$ SVASEVLSATNPVRLGLALNHSVELYEIADDHKAACEMAB


E $\square$ SKAKMQPTHP $\square R \square G L A L N F S \square F Y Y E \square L N S P D K A C Q L A K$ EIANS
Di A MTELPPTHPDRLGLALNFSVFYYEDLNSPDRACRYVQ TLAKDVLTPANSVRLGLSLNHSVFLFE\|VGDRTAACLLAR
RHA LSTLEP $\square$ HPTR $\square G \square A L N F A V F Y H D V R K S P D R A C H L A K$
 QTATEKLPSSNPTRLGVTLNYAVFKFEHAEETGAAREMLV

D
 VVFASVM VAK W THYIILGLTLNFSVFCYEILSRKQ
LVAAENDPPRHPIRLGLSLNYSVFQYEILQNESTACETAK


UniRef90 UPIO00265979A UniRef90-P68253 UniRef90-R9QPM9 UniRef90_D8LWQ6 UniRef90 K3W6D4 UniRef90-A2G036 UniRef90-R9QQ85 UniRef90 G3ICC6 UniRef90 ${ }^{-10 Q 3 R 3}$ UniRef90-GOQMN5 UniRef90_UPIOOO440E941 UniRef90 UPI0002B498FC UniRef90-M3WVC7 UniRef90-C3ZEH5 UniRef90 M3Z176 UniRef90-C3YRQ0 UniRef90-F2UFG7 UniRef90-ROIBL8 UniRe990 A0A059EPJ8 UniRef90-B3G4K3 UniRet90-M1CR89 UniRef90-UPI0003EC3696 UniRef90 E8Z6C4 UniRef90_UPI000441F82F UniRef90-Q9SEC9 UniRef90- Q9XYW8 UniRef90 F7IRL2 UniRef90-UPIO003ACAAF4 UniRef90_A2FEZZ UniRef90- J9P069 UniRef90-B7XJ58 UniRef90-M4EY76 UniRef90-F6WA09 UniRef90-Q7G888 UniRef90-Q232M6 UniRef90-UPIO0042ACACC UniRef90 K7V2S2 UniRef90-C1L7S6
UniRef90-V9LJAO UniRef90-НЗАОНО UniRef90-Q22WU6 UniRef90-A2FQW3 UniRef90 V9LJI4 UniRef90 C5K760 UniRef90-UPIO0044012F6 UniRef90 D8M6N4 UniRef90 ${ }^{-}$Q9AT78 UniRef90-M3X0Y7 UniRef90 A2F1A4 UniRef90 C3ZWQ8 UniRef90- - $91 / \mathrm{HS} 8$ UniRef90_UPI000333FCB5 UniRet90_U6HWQ1 UniRef90 O38KZ9 UniRef90-A2IDB2 UniRef90_-J9IYU4 UniRef90 UPI0001DEB07D UniRef90-Q9XYW7 UniRef90-I3SHC7 UniRef90 Q22B37 UniRef90 Coz2P5 UniRef90-ToQZY9 UniRef90_11K9W0 UniRef90 A2F806 UniRef90 UPIOOO328F25D UniRef90-F9WVQ3 UniRef90_A2DJ03 UniRef90 U61OZ3 UniRef90-A2EH41 UniRef90-T1KCZ1 UniRef90 UP10004415111 UniRef90-F6S1U8 UniRef90-G6CL94 UniRef90-R9QQE7 UniRef90 UPI0003C100AE UniRef90-U6FUQ5 UniRef90-O9XEW6 UniRef90-E2LMJO UniRef90 UPIO0029D9C71 UniRef90-Q013W8 UniRet90_A2ECB8 UniRef90 A2ERZ3 UniRef90-M8AR33 UniRef90_UPI0003D76F24 UniRef90_G5E090 UniRef90-D2V147 UniRef90-F6GZ60 UniRef90-G3WHC2 UniRef90 H2ZFT1 UniRef90-S9VQzo UniRef90Q990R5
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KAFENAMKMLENTPEKDYQDSVSTLQLTRDNTRTW
 RTYNESSPLVEENSESSFNNATMLLNLISENLALUN
TTFDEA TAELDTLNEDSYKDS LTMQLLRDNT SVFSDALDDLDSVSDNAYQFATMI MQALLRGNIETWT NAFEEAI QNIDNVNEENYKDSTLI MQLLRDNUQLWT FAFDEAVAGMGALSEKTFRDCVVILSLLKDDMLLW QAFDEAIAELDTLSEESYKDSTLIMQLLRDNLTLWT
 DVVT EMDVLSEVSSRDSTLMMQLLHDNLTLWT EAFDTAVTELDG|PDPERKYSTDIMHQLRDNLTLW EAFESALEALDGLRNADHRDVSALMQLLRDNLIMW
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TTFDEAMADLHTLSEDSYKDSTLTMQLLRDNTTLWT TAFEDATAELDNVQEDSYKDSTLIMQLLRDNLTLWT TAFDEAIAELDMLSKESHKDSMLTMQXLRGSLTLXT QAFEEAIAELDTLGEESYKDSTLTMQLLRDNLTLWT AAVEKADKELPNIDEDANRDTVSI YNLLKENLDMW
 RAYQEAGSGI NQLSQESKEEATHTLELLNENIHLWS TAFDEATAELDTLSEESYKDSTLIMQLLRDNLTLWT


QAFDDA KAFQEALNDLEDLEEERYKDSTTUMQLIRDNLTVW

KADTEAEQEYDSTADDTDDEALSTLKLLKDNFTTWN KAFDDA KLINLALDHAELNGCESCNNFTATLFPLVDNKYWT ETVSLVSP IVVQNSASSSPEAKTILQLLNNNUSLW TAFDDAI AELDTLNEDSYKDSTLIIM
AAFDDAI AAMDNLDDN
TA LDDDTUTELXTLSQDSYGDSTLTMQPLCNNLLLXT KAYDDAFNMM KGSEELCTEAYHVLPLLKDNLALW

ST DDEAVVDДH LTKDSYKDSTFMQWLQDK T ETYQTYAPIIEQNSEKSREEAAQI TKLLDENIKLW EAFDAALA DESPDCNYGDSQAIMIQLRGNLTLW

QAAYDDADAETDNTSEPYKESATVMKLLKENMRLW KAFDEA QQLE EA पEQDDE
NPFDEAMADLHTDT T TMQWGQNNपRGGT DTLSKSKEALN
EAFQGA $\square$ NN $\square E S E N E E N$ RDCTLIMQLLRDN $\square$ TYN DA $\square \mathrm{DGAHMDFDETSPDASSD}$
KSVQETDDLLDTLSDKTYNEAK\| DYLLKDNVKNW TAFDEATAELDTLSEESYKDNMLIMQLLRDNLTLWT
ETYQNCAPLTEQNTENSRAEASDTIRLLDENTKMW TTLQQAVANLSETKKEGQPEVCIILQLLRDNLSHWS
 QAFDDAGAELDTLNEDSYKDSTLIMQLLRDNLTLWT
QVIMTVVEDSQKAYQEAFD $\square$ AKAKMQ
C C A SAFDDAVLSPQATDPETDRDALQ\|QLLKDDLILWS
ACLDQTVEASPRLDDDGVDETEAリIELLANNLALW SAIQNFSEDSNQLSESSHKEAQNVINVMQKNLVSWS TAFNEA $\square R F L E E L P E D Q Y N E A A \square M L Q L M R D L S L W$ Q T

PEFDGAMTHDEELLEKQERDAVLILQLLKDNGFLWS
LLMKA VEDDTRNEYKDSLLMQSQR NTTWT KAFDNAI DELNNLHGKDYDDSVLIVQLLRDNLTLWS QAFEEALSDPEVLNEEQHKEAALIMQLLRDNLALWT

1020
E S L VF SAAKLSQQCGRDEDMLGSMRTDAATCDE $M L N E E N K A A F Q L I G K L H N S G R P K D T V F F D Q K M A T A K K E$
 D E N I T M M K R I I E L N P Q MAKLSEQTERFDEMLDYMKK L LDMSK E
MADTARNDLRGFA V VAQEA LRWADMAEAMRTVVVETAA A NLLF E Y A RNC LMMLCENDNE MQKNQLAEQAERYDDMAACVKSGTEQGAE E E ILLEGVK L L N R L G R D D D S $\square \mathrm{K} M \mathrm{MD}$ T F L E E K Q D

ATEGAPVIQKAMLAEQAK YGDMSAFVKGAMEKGRS
D K E E L L N R CK L N D L I E N Y GEMFE Y LK E LS H
$M$ VDFMKKLARMD V D
F LIARVYHTAGLT T K A A DEVS K L A L L R D A
EDVVAE $\square$ KTVVAFNAQ
STSREDSVYLAKLAEQAERYEEMVENMKTVASSGQE KEELI Y YI KI LINHLGSYDETVT LIGK SVNVENYN K E E Fil Y Y L K I L L N H I G Y Y D E M V S M I S A A N V E N Y N


RFDDMADYM $\square$ S CTTGHRP
VD R E QLVQRAGLAK QASRALQQYGCNQ E L $L$ E E P

AS A MKEATSLLNEP M D A Q DLE YMCNVF VNTKRLEDALQADKE LIE DP L | $M$ | $V$ | $D$ | $Y$ | $M$ | $E$ | $W$ | $I$ | $K$ | $S$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $M$ | $H$ | $P$ | $T$ |  |  |  |  |  |  |
| $I$ | $S$ | $F$ | $I$ | $N$ | $Q$ | $I$ | $I$ | $E$ | $K$ |
| $G$ | $Q$ | $P$ |  |  |  |  |  |  |  |

 NEYTFMARVSE QCERYNDMFN FLDDLEVQRKKA


YKAKLSDS $\square$ GNYEDVCFFAK QLVESKVS
I T D Q A F R S S D T C T L I E D Y L K T L D D
D M R Q I M K E LVVT I D E
RKECLENAKAA QATQNFDELTQAVRAMANMNVE $R E E N L G V A L L S E M V D R F D D I A D Y M D S C T T G H R P$

I A N Y GKE QIADTFGD
REENVYMEKLAEQAE EVENLMALLKILQSCECEKDDFDLAVKDAPMQPV LQ L $\begin{aligned} & S \\ & L\end{aligned}$
$D H L L A L V R I S K S L K Q Y D K M R G Y M Q E D D Q T Q D L$
 RKNLLSKAKAAMESECYDQMVHFMKEAVESDKN $M N N L S Q G Q L V Q L S V N Y E K M N C V Y E E F N L M K Q V I Q F Q Q D$

R D QL $\square$ N L IKE Y H S N N R Y S D S $\square R \square F Y$ QLNETFGD
MF LS RADFEAGQVT DASK VKK LDAEANYP
EEFVYMAKLVEQVKHYEEMVEFMEKVSTESEE RDYYLSMAKLADVAERYSDMVEYMTMCCEHGVV EYMEKVAREGEE
$M V L L L D R L T N A E V E$
MS T LERQK Q $\square$ YRAQVYE WGGMYDKMMEA
LLF LAA LMAEACRRFDEVIQLLVRKASRDEE
SNNLIKANTSMALGQYNSAVKYFKAYMDESPD
QLSREELAYALKLSSRLERYDEVLE IVKGLSMHNEQ
$\mathrm{M} V \mathrm{Y}$ F M K K V VR $\square \mathrm{T}$ E
c c c c c c c c c c c c c c
 UniRef90_A2FSF9 UniRef90 A2DQL3 UniRef90-A2DN94 UniRef90-G0R3S3 UniRef90- D2VEK1 UniRef90 L8HE45 UniRef90-A2DLD9 UniRef90 F1S9F0 UniRef90 A2E4R6 UniRef90-A8QKK3 UniRef90-M3YJA7 UniRef90 X6LGT8 UniRef90 Q9XZV0 UniRef90-MOVBT1 UniRef90-D2VVB2 UniRef90 A2DNU8 UniRef90-A5YWV3 UniRef90-A8NXD8 UniRef90 E7Q391 UniRef90 COH5KO UniRef90-B3L700 UniRef90-E1G1L4 UniRef90 A2DFA7 UniRef90-A8QKK2 UniRef90-W1PDB3 UniRet90_11FXRO UniRet90-MORDL6 UniRef90-D8QNY6 UniRef90-F1N7F1 UniRef90-A2EJB7 UniRef90-G7Y3U1 UniRef90-J9JBD4 UniRef90_D3B7W6 UniRef90 J918W3 UniRef90-V7PN62 UniRef90-U61G13 UniRef90_X6LVU5 UniRef90 B6A161 UniRef90-B9ZYV0 UniRef90-K7KN89 UniRef90 K8F3N6 UniRef90-L8H393 UniRet90 W N NJ20 UniRef90-W1NIW7 UniRef90-J9BDK7 UniRef90-F4PYX9 UniRef90_V4VEB6 UniRef90-A2FB70 UniRef90_-Q54LJ4 UniRef90 FoVLI4 UniRef90_X6P913 UniRef90-Q5CMF3 UniRef90-A2F4K6 UniRef90-W1P266 UniRef90_-7LVM0 UniRef90-D2VZ67 UniRef90-FoZTJ5 UniRet90_W1NJP9 UniRef90-A2DKA1 UniRef90-K7MMZ1 UniRef90_W1NHK3 UniRef90_MOSFK4
UniRef90_W7AJY8 UniRef90 W7A317 UniRef90 B6AFS7 UniRet90-V4Z7W0 UniRef90-BBLAFO UniRef9o WINRB2 UniRef90-V4ZFU3 UniRef90-J9LYS3 UniRef90-Q23GC1 UniRef90-W1NQT6 UniRef90-A0A024V1F6 UniRef90_U6KGE5


LTPEERSLLSVAYKNLTNNLRNSWRTDDCLESAAASDGSS LSVEERNLLSVAYKNVIGARRASWRIVSSIEQKEESKEKS FNYTESLSVGFAFKNALNVKRKEKTVLENIITNEKSSERE LTKEERNLFAVFYKSLVNKFRREYDMYMDLQ REDPRKEE VAYKNVISTRRSSRSSMEASVHEFKDNAAS पNTMERNLLVLAFKSLVRPRRASWRK】KD DERVEDEPHC
$\square S N E E R N L L S$ Y Y Y K VVGACPSSSED $\square C R W Q R E E A R D G S$


AFQSLVQPRRASCREVKNTERVEDEHC पTNEERNFFAVFYKSLLDKFRKEYNMFMDLQ REDPRKEI
 WNLLSVAYKNVI GARRASWCIVSSTEQKDESHGNQ DTYESARLLTFALKEQI NRKRQAYKTLKSIIEQKKSLKKD FSMKELNLLSDTANNLISKRVDKLSHNDDSTTTTTTTPTT LSMEEKQTLNDMYKNMIIDPKRKSWRTLCAPFFDPAFKNDQ RDNSLLLLAGSLRNRVTSMRNSLKSIKSQEEKGRKEKNN LNKKQTTFFNDVVQTVVNPVRAATKQLRESEAFAQEKSNE LDHNERSLLAYASDTILRQKIVTLDQLKELE KQSEFSN■ YSHDELS LLSNT $\square$ SELISEKVTS $\square T$ S $\square$ N $\square$ SAPTTPTKP $\square S$ FTNEDKT UVD $\square Y E A \square V V P R T A V M N D N G \square E P D S S$ LTVDERNLL LNPEELEMLWMAYKNFTNC QWSSLCATIVSQASESKE HTVEEHNLLSVAYKNVITAACRASCRIV SDEQKE GRGNH DTPGERDDGEVFYKNYTLSLKGRKCEETNEFSNSSTNNSS EKSEERQLLSSCUKHKVNSTRNSFRKIIEEKLIQSKAKNE
■NEEERRLLCTSYMMSVYERLISWQNEMS RPHGE QNA
TTEEERACVQRAFNRRDQRSKHSHKQVALERAFDARNRT LPKEVFNLLSKAYNHLSYDKRNCIRELEAYLE S SQDSDG LCEEEYKLEDKALSFYFCSKDQPUKKMEQDYY


## UniRef90_A4S116

## UniRef90-A2FSF9

 UniRef90-A2DQL3 UniRef90-A2DN94 UniRef90-G0R3S3 UniRef90-D2VEK1 UniRef90-L8HE45 UniRef90-A2DLD9 UniRef90-F1S9FO UniRef90-A2E4R6 UniRef90-A8QKK3 UniRef90-M3YJA7 UniRef90- ${ }^{-1}$ LGT8 UniRef90-Q9XZVO UniRef90-MOVBT1 UniRef90-D2VVB2 UniRef90-A2DNU8 UniRef90-A5YWV3 UniRef90-A8NXD8 UniRef90-E7Q391 UniRef90_COH5KO UniRef90-B3L700 UniRefefo ElG14 UniRef90-A8QKK2 UniRef90-W1PDB3 UniRef90-11FXR0 UniRef90_MORDL6 6 UniRef90-D8QNY6 UniRef90-A2EJB7 UniRef90-G7Y3U1 UniRef90-J9JBD4 UniRef90_D3B7W6 UniRef90_- 998 W 3 UniRef90-V7PN62UniRef90-U6IG13 UniRef90-U6IG13
UniRef90 X 6 LV L 5 UniRef90-B6A161 UniReffo-BgZYV0 UniRef90_K7KN89
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UniRef90_W1NIW7 UniRef90-J9BDK7 UniRef90-F4PYX9 UniRef90-V4VEB6 UniRef90_A2FB70
UniRef90_O54LJ4 UniRef90-FOVLI4 UniRet90-X6P913 UniRef90-O5CMF3
UniRef90 A2F4K6 UniRef90-W1P266 UniRef90_17LVM0 UniRef90-D2VZ67 UniRef90-FOZTJ5 UniRef90-WiRJP9 UniRef90-K7MMZ1 UniRef90-W1NHK3 UniRef90MOSFK4
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UniRef90 B3LAF0 UniRef90-W1NRB2 UniRef90-K7L182
UniRef90_V4ZFU3 UniRef90-J9LYS3 UniRef90-Q23GC1 UniRef90-W1NQT6 UniRef90-A0A024V1F6 UniRef90_U6KGE5


GKANKLQYYKELVGTK\|DQAQKAПD\IDS\|LIPHAEGPA FKKQVEQELETUSQEVIKLLEDVLI PFTLK TETES D ALIEKYKG\|VETEWEKVCDGAVGPLDDHZIEEGTGDAK
 QAGQMI SVYRKRVEDELRMVCNEDLSHDANHCLPLANTGE HRRQLIDDYLFKIAKE: DDDSTEMI GLI DELLKRDLLDDE
 RELGGMRQQKRKIEKELVVTCNDVEELLDRYLLDAAKPGE
 LK QRILRDNMYRARYEVVTGCKEVIDLID HGIVDTKNUEE


LATDTDYLSRUESEIVSUCERVQQLLDSYLITYEDSAE
$\square \mathrm{DGE}$
DREGVGGCEPGRAEPAGQLINCSETQH
KKLKK RAKTNKELETVCNAMLAFFLDKFLMSNSSDGE ELVRADENKMESVTHQLISICKEGIETMETVLIPAAESPE PYSGLFQTFAQQVGDEIRTIATRALRNVDMDMSKEHKCEE KLLPLC
LALSRAKRNKQKALDELKYQSHGLLRLVEASLSTCVREE
QYKKSLDDYQLKLTNGMYEKCMNVIDQI LKKCLP LCTDHE EEKKCAELLKLKINKDIRTIERDAYFGIKAKCIPKTVDEK KGLSVMDKYKQMLENETKLTCNEVLMFSNLFAFFDAESVL
 EYQEKLEDELKEVCKETIDDLVEGVLLPRASKEHSPRYKSD AKLAQHKKLRTQLEKDLGQVAQEALDTVEKHVLPHATTDH
 DKHR RLRDNMYRARYEVV
PAKNKLKEKQKADDELN DHVSVIK ESCGGLLKLLDQKLVPTAAAAD
 YKDAELAACKDRLRDDIVRHCYGI WATTHLDMPTPGSPA PDPQLLSVYTQWIADELASDCDELLIDLVINHSMHGQKMDE SLATLIHNETVKQFEKLKFTCHDVLS I DQQUIPGNTDTE NKKKYFDSYKQTVIDELFKGFKE DQEVLDHLLSKENLKIS SANSKQQRLKKKLKDETIYEGKGLLRLLESSYNSMSNNQE PC $\square A \square M D Y L S R I E S E V S G C E D V H H L L D S Y L I P S E D S A E$ DHLVVIRNY RSK KVELSNDYDK LKLLDTHLVPSLTSGD HRPTIRDYRYRLESELSNNSVLVLNSHLIPSFVNYW DHVSHIRSHRAR:ESELNSIYGTILRLLDABLIPVANAVD KRKTICSSIRATIKDKFLLNCEAMINMVNCILSTINEEK MQ $\square$ SCCDDY KRKNLCRSHRTMIKENFLLNCEALDNVVNCLICCTINEEK EQLEETHKKKISTVESEVVSICSEFFVLIDKHFILTDNSVE YRAKEVAAYKERLKDDIVRHCYAVVWAVTH HLIMPSPASAA



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## UniRef90_A4S116

 UniRef90-A2FSF9 UniRef90-A2DQL3 UniRef90-A2DN94 UniRef90-G0R3S3 UniRef90-D2VEK1 UniRef90_L8HE45 UniRef90-A2DLD9 UniRef90-F1S9F0 UniRef90-A2E4R6 UniRef90-A8QKK3 UniRef90-M3YJA7 UniRef90- ${ }^{-1}$ LGT8 UniRef90-Q9XZVO UniRef90-MOVBT1 UniRef90-D2VVB2 UniRef90-A2DNU8 UniRef90-A5YWV3 UniRef90-A8NXD8 UniRef90-E7Q391 UniRef90-COH5KO UniRef90-B3L700 UniRef90-E1G1L4 UniRef90-A2DFA7 UniRef90-A8QKK2 UniRef90-W1PDB3 UniRef90-11FXR0 UniRef90-MORDL6 6 UniRef90 D8QNY6UniRef90 F1N7F1 UniRef90-A2EJB7 UniRef90-G7Y3U1 UniRef90-J9JBD4 UniRef90-D3B7W6 UniRef90_- 918 W 3 UniRef90-V7PN62
UniRef90-U6IG13 UniRef90-U6IG13
UniRef90 X 6 LV L 5 UniRef90-B6A161 UniReffo-BgZYV0 UniRef90-K7KN89
UniRef90-K8F3N6 UniRef90-L8H393 UniRet90 W W NJ20 UniRef90-J9JA52 UniRef90-W1NIW7
UniRef90-J9BDK7 UniRef90-F4PYX9 UniRef90-V4VEB6 UniRef90-A2FB70 UniRef90_O54LJ4 UniRef90-FOVLI4 UniRef90_X6P913 UniRef90-Q5CMF3 UniRef90-A2F4K6 UniRef90-W1P266 UniRef90--7LVMM
UniRef90 - D2VZ67 UniRef90- FOZTJ5 UniRef90-WiNJP9 UniRef90-A2DKA1
UniRef9O-K7MMZ1 UniRef90-W1NHK3 UniRef90-MOSFK4 UniRef90-W7AJY8 UniRet90_W7A317 UniRet90_B6AFS7 UniRef90-V4Z7W0
UniRef90 ${ }^{\text {B3LAF }}$ UniRef90-W1NRB2 UniRef90-K7L182
UniRef90 UniRef90-J9LYS3 UniRef90-Q23GC1 UniRef90_W1NQT6 UniRef90-A0A024V1F6 UniRef90_U6KGE5


lupas_21 | lupas_14 |
| :--- |
| lupas_28 |
| jnet |

cont
sol25
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## UniRef90_A4S116

## UniRef90-A2FSF9

 UniRef90-A2DQL3 UniRef90-A2DN94 UniRef90-G0R3S3 UniRef90-D2VEK1 UniRef90_L8HE45 UniRef90-A2DLD9 UniRef90-F1S9FO UniRef90 A2E4R6 UniRef90-A8QKK3 UniRef90-M3YJA7 UniRef90- ${ }^{-1}$ LGT8 UniRef90- Q9XZV0 UniRef90-MOVBT1 UniRef90-D2VVB2 UniRef90-A2DNU8 UniRef90-A5YWV3 UniRef90-A8NXD8 UniRef90-E7Q391 UniRef90 COH5KO UniRef90-B3L700 UniRefefo ElG14 UniRef90-A2DFA7 UniRef90-A8QKK2 UniRef90-W1PDB3 UniRef90-11FXR0 UniRef90-MORDL6 6 UniRef90-D8QNY6 UniRef90-F1N7F1UniRef90 A2EJB7 UniRef90-G7Y3U1 UniRef90-J9JBD4 UniRef90_D3B7W6 UniRef90_- 918 W3 UniRef90_V7PN62 UniRef90-U6IG13 UniRef90-X6LVU5 UniRef90_B6Al61
UniRef90_B9ZYV UniRet90-K7KN89 UniRef90_K8F3N6 UniRef90-L8H393
UniRef90
W1NJ20 UniRef90-J9JA52 UniRef90-W1NIW7
 UniRef90-V4VEB6 UniRet90-A2FB70 UniRef90_O54LJ4 UniRef90-FOVLI4 UniRe90-X6P913
UniRef90_O5CMF3 UniRef90-A2F4K6 UniRef90-W1P266 UniRef90-I7LVMO
UniRef90
D2VZ6 UniRef90- FOZTJ5 UniRef90-WiNJP9 UniRef90-A2DKA1 1
UniRef90 K7MMZ1 UniRef90-W1NHK3 UniRef90-MOSFK4 UniRef90-W7AJY8 UniRet90_W7A317 UniRet90_B6AFS7 UniRef90-V4Z7W0
UniRef90 $\quad$ B3LAFO UniRef90-W1NRB2 UniRef90-K7L182
UniRef90 UniRef90-J9LYS3 UniRef90-Q23GC1 UniRef90-W1NQT6 UniRef90-A0A024V1F6 UniRef90_U6KGE5

$\square K$ TCKYNSTE T A Y LTT F Y L N Y S VF L H D T M R N T E E S $\square \mathrm{K}$ V S K
D S L E K VS P L N VI G L R T S LAA S VF Y Y EVM N D QEKA VE TA K E A A RQSLGPAHPL RTG I ALLNFSVFYYEI RANREAAIAAI A K T A A EA K L P P THP I R L G L A L N F S V FYYYEIMNAPERACHLAK $K$ R A L $N$ N $L$

 E LAA D K K L K R Y H P L R L A L M L N M S I H Y Y A I P C E R I K A L Q L S M

 R I A K A E L R R A N P TAR L V TA L N F TV ELAKD LTNPSHPIRLGLALNFSVFYYEDAKEVNKACELAK ETSKE PMQP THPIGLGRLVLNYI FYYE\|QSTPEQARRLAK EHAFA E LDP P THSFRLLGL AL NLSAF CFEHLDNSDRACFVA Q A I S Q E HLQQP THP HP AR P GL S F L M
DI CASNLSKNHPYYLSSILNASVFQYEQRKNLAAAQEMCN

 DVT H G DVNVCNPINLGLSLNKSVFYYEIMQDRQKACIISE





$D A \square R E N L F S T H P L R \square A T A L N Y S V F \square N D N L R Q M P K A \square E L A K$


 QRSENSLLSPTN PI L L QL S L L S A NYYK EN G DFEKS I Q $\square$ S K HFAKT D M GPCDK L RI E T LI S WA N F L F Y N L E K K D E A L A S A R

 T TIA NE PGTDDSTRRWLDKNFSILDTEFF




 KLSQDFSDPSDALVLSVVLNFAVELAERCNDDARAKNIAK
 N I A TAA GPI ISSTSMWLANNFSLLTAKFFNTKD KRSFADLPPTHPDRLGLALNFLVFYYE\|LP
 S ICQWNFKPTDPYLLQDA
NVAKAGTNDSESTDRTDATNFSKLKTEF DEPEAA SR

lupas_21
lupas_14
lupas_28
jnet
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jhmm
jpssm
 UniRef90_A2FSF9 UniRef90 A2DQL3 UniRef90-A2DN94 UniRef90-G0R3S3 UniRef90-D2VEK UniRef90 L8HE45 UniRef90-A2DLD9 UniRef90 F1S9F0 UniRef90 A2E4R6 UniRef90-A8QKK3 UniRef90-M3YJA7 UniRef90 X6LGT8 UniRef90 Q9XZV0 UniRef90-MOVBT1 UniRef90-D2VVB2 UniRef90 A2DNU8 UniRef90-A5YWV3 UniRef90-A8NXD8 UniRef90-E7Q391 UniRef90 COH5KO UniRef90-B3L700 UniRef90-E1G1L4 UniRef90 A2DFA7 UniRef90-A8QKK2 UniRef90-W1PDB3 UniRef90_11FXR0 UniRef90-MORDL6 UniRef90-D8QNY6 UniRef90-F1N7F1 UniRef90 A2EJB7 UniRef90 G7Y3U UniRef90-J9JBD4 UniRef90_D3B7W6 UniRef90 J918W3 UniRef90-V7PN62 UniRef90-U61G13 UniRef90 X6LVU5 UniRef90 B6A161 UniRef90-B9ZYV0 UniRef90-K7KN89 UniRef90 K8F3N6 UniRef90-L8H393 UniR Ref90-W1 NJ20 UniRef90-J9JA52 UniRef90 W1 NIW7 UniRef90-J9BDK7 UniRef90_F4PYX9 UniRef90 V4VEB6 UniRef90- A2FB70 UniRef90-O54LJ4 UniRef90 FOVLI4 UniRef90 X6P913 UniRef90-Q5CMF3 UniRef90-A2F4K6 UniRef90 W1P266 UniRef90 17LVM0 UniRef90-D2VZ67 UniRef90_FOZTJ5 UniRef90 W1NJP9 UniRef90-A2DKA1 UniRef90-K7MMZ1 UniRet90 W1NHK3 UniRef90- MOSFK4 UniRef90-W7AJY8 UniRef90 W7A317 UniRef90 B6AFS7 UniRef90-V4Z7W0 UniRef90-B3LAF0 UniRet90 W1NRB2 UniRef90-K7L182 UniRef90-V4ZFU3 UniRef90_J9LYS3 UniRef90 Q23GC1 UniRef90_W1NQT6 UniRef90-A0A024V1F6 UniRef90_U6KGE5


SAFNAAVPLFDELDEEVTSE LLMLLQMLRDNLTLWT SAHDEGASAAKIVLQQEDKDDAMEVINLIAQNLKSWT QAFDEA $\square$ SE

EAFRNATQNMHLLNDDECSKT\R\LGTLRDNTNKWC QAFRDALQNMHLLLENDDECTKTIILGVLRDNI NKWC QAVTEGKEHDRDDP D D NA $\square$ NQASEC EEQFKDSEI CVVRLLQENLE $\square$ WS TAFDDA $\square$ S K $\square D E \square D E A S Y K D S T L I M$

EAFENADSDMEGSDSSDYRDSSLILQLLRDNLSLWT TAFYDA ${ }^{\text {A }}$ AL
QA DDEA QAKVEASGKEPRRETSRDMELLRQNDAVWT SAlDQFDQNATDIDQNQLDESRQLVDLMSKNLIFSW TALEFAKTDLDQVSRVNAKETTHLVKVL
QAYENAFANMDSLDEDNYRESTYVMQSLRDEDND TSFDDATSELDCLSEDSYQEGTLIMQLIRDNLTEMT MCLSQALDKLDELSDDQFREAKQI IEMMKENLSSW QAFRDAIQNMHLLSDEECSKT IAULGULRDNINKWC TADRDVDAEI
EAFDAADGEIETLND QES LLLMQLLRDNTSLWT RALLAVKESNETLSPQSEQ DAFAQAHVDME DEDMDNDSANILQLIKDNMDLW

T A L D E G LIE D L D A LT D N A Y K D A A L I L K L I K D N $\square$ S M W
 QAVTEGKEH TKNDPDDRAVVDLLRDNDDAW K SFDDADSELDTLSEDSYSESTLI LQTIRDDLTDWT

KT LDEDSKM $\quad$ RPDKTDDYQDCMRDQQLLKDN $\square N Q W T$ NTFDKADSELDTLSEDSYKDTTLLLQLI RDSTT ETLQESMTKLDSVPQAQFADVVEALQLLMKSTWRWS TEFDKC\|LHFQSLTDVYYNECVHYLNI I KHYIVLW


QTEEDM1 N
SEFDKAI PEVDYLSDEWYREA LLLLQULKDN I IMWS QAFDNGISELDCLEESSYKDSTLELQKLRDYLN E V L W
QLRKDTSSSFEKYSDD $\quad$ KPK $\square$ NE $\square I D \square M D E N \square S \square W$

DVFDKSSNLLDK $\operatorname{DEDDKQADCAR\square LSKMRYNTKRWS~}$ AVFDRTTDQLTNMQDEGEADRCLILSRMRYNI KRWS LAFDETDKKFDKLGDKSDSEATLTLETLKEHINTW


## 

KALRDS $\square$ AELNKVEREGHKDCDRRMDVLEENFKKW D IV F K S SN LLDEI EDKDHAHKCLILSKMRHHDKRWS A QFREAVENVVHUSDEESRRVVMVMSLLRGNVEAWC

[^1]


[^0]:    lupas_21
    lupas_14
    lupas_28
    jnet
    cont
    sol25
    sol5
    sol0
    jhmm
    jpssm

[^1]:    lupas_21
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    lupas_28
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    jpssm

