

40 KKELAEYPAKLQAYKDEQAK KKAAMALAESKKNEDGNLSR

YAAKLLKYQSALAKYQKDLADYPRKLQEDGNLTE QADLDAKYKKELAEYPTKQAK TKAALVEDEKNKDQDGYLSK KNQDGYLSK KDQDGYLSK KDKDGY S

YDTAKTKYDAALVTFDRELQEAEAKKNEEGYYLSK
DKAAYDQAKAQFDKDQAAYEAGLAEAEAKKNEEGYLSQ QELIAYYAAKSKYDQDLIAYEKALKEAQAKRNEDGYLVK ADKAQYDADKAQYDADMIAYNKAMAELDEQKNEDGYMTK QAVADYDKAKTQYAQDQKQYQQDLADYNKKKAYDDYQQQ $\left.\begin{array}{rl}E A K L A Q Y Q A D S G Q Y K K D F A A Y T A A L A\end{array}\right)$

KAAYDTALLAQYNTDKAQYDSDLAQYNTDKNEDGYMTK


QADKKDYDAKLKAWQDYQEQVKNGTAAGRVET
QQA LDE $\square Y Q N L Q K T Y$ ILAAKARYEEEMLEAKGKDGQTGYDTE KA AYDTALAQYNTDKAQYDSDLLAQYNTDKNEDGYMKE DKAQYEQDLTKYYAAKEKYKKDFADYEKNKHKDGYワKQ KRYQAEKAQYHKAYAEAQGNTTKRGYLPE KRYQAEKAQYHKAYAEAQGNTTKRGYLPE KEDDKFNKKVAEFNKEDERVARERAKAEQDRHKDGYLSE Q $\square$ AT T TYNKAMSVYDTEKEKYDKA


QAARDAYNKAKVAYDTAKAKYDQALAEAKANVTREGYSSK A DYKQQVQQLKDTKKAVQKELAKYNKKKNQDGYMNP KKKYDEELAKYNDAKKKYDEEKKTDGYMEE ED QVAAQNRD DEAYNAERARYERELAEDQ RGEEGYDSE RQDKANYESQAKAYQDYEAKYQKDLAAYQANQEEKGNLSR EKKVQQYNVDQKTYNLAKARYDEDYNTALGNTNKTGYLPE KADYDKKVAEMKAKTNQDGYLSQ
EDERVAKEKAQAEQNKTKDGYLSK
KKAYDEAKKKYDEALAKYTDAKKKYDDAMDEDGYLEE E L A K Y N $\square$ AKKKYDDELTAYNKAMEELEKKKNEDGYMSV
KE $\square$ DKFNKEVAEFNKEDERVAKEKAQAEKDKAKDGYLSQ NDAI DTYNKEMERYKRDLAEDS KGEEGYISE K Q N M $\square \mathrm{D} Y \mathrm{NAAMDQYQKDKADYDKRVADLKSKVGKTGYPTK}$ EQNNADYAVADENYNQEQATYEAAVADYEAKDTEDGYLKS KQALSNYEAQMAVYADQKKKWDKAFKEYQKQAAEQGAGAV KQKLADYKTQLDKYYQDVLAYA A WEKSYKEYTGGLTK
 NAA DDAYNKEWDRYKRDLA NDSKGEEGY S S E

ENERLQAEYQKKLADMLAKTKEDGYATQ
KAAYDEKVKAYNDYQAKVKD $\square$ SNPENA
QADKKDYDAKLKA WQDYQEQVKNGTAAGRVET
AEISKGEEGY\|LE DGY L K S
YDTAKAAYDKQVAEANRLTGVDGYLSE QADYERQLAEMQAK $\square K E P G H L S E$
 KE DDVKNKEVAAEFNKEDERVAKEKAEAKANSAKDGYVK D A IDDFNKKVAEHNKADARVAQEKVQAEANKTKKGWLPE QKAQDDYNKKEAQYEKNKAAFDKQEEE NKDKDGHPSE D Y LT AK QRAQQLT GREGSLQQ AAKAAYDEKVKAYNDYQAKVKDLTNPENAE

YEKEVAEYNKHKNENGYVAK
TTKPGYLSK KNKEGYTKD
YESKTNTDGYLSQ KNENGYVAK
YDTEMAEYNQllLADLESKTNQNGYAKE
■AEYPAK $\square$ QAYQDEQAA $\square K A A L E E L E K H K N E D G N L S E$
QQNQAAYSQAKDKQAQWQAQYR
DGQSKTGTEGYTKE
KQNQTAFDKAKQTQAEWQKKYN ELQSKTSTEGFTKE AYKRDLKKAQENVGTDGYLSE YATAQSNTQKPGY
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YDTAKAAYDKQVAEANRRAGMKGYI PE
NEVIDAYNKEMERYQRDLAE $\square$ S KGEEGYISE AYKRDLKKAQENVGNDGHLSE
QNK $\square A V Y Q T A L K Q Y Q E A K A A Y D K Y M D D P V Y R N L K D A$
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PYPQLLTFKSEPNATTLTVSGK
$K \square A Q Q L I F K S E P H A R L S F P G G D K V Y T K D E L K R Y F E N H$

S R Q
AQGLVYQSEPGAVISLEGVKNYITKKGMQEVTSNSDVL
VLA QNLIFRSEPNTTQTFTG
PASQSLTFQSEPNATMSFPNGDQTYT QSEWK
KLAQELVFKNEPNAQLTFPDGDKVYTKEELKSYFYR
VLA Q NLI F K L E P D A T Q T T T G
$V L A Q N L D F K L E P D A U Q T I T G$
$V V T Q G L V F K N E T N A S I T V T G A D S Y T S A K G D K E A F A E A H Q K$ VTAQSLI FKRESNAKATISGQQTFFSWVNGDDGLSVNASK
 PESQPFI FEQEKNATLE I TSGDKVYNA
LLSQY L NLENEPNSVVSISGGQKY
PYGQPLI FK SEPNAKLTLLSGGQKYK KKNTKDEFNNTVKS
PNSQTLLFKAEPNAKPSV
ALAQALNLNSEPQARHS
$V Q A Q Y L I F K S E P N A T V$ VFEGVDKFF APNYPFGTDLAG PIGQSLVFKSEPNATVS $\square S N G T V Y$ SEKQLDSLVRSWG
TAVQNDLI FRSEPNATQTFTGGQGQYAND SVEAS

PNPQTLLFNSEPNARPSVNT
PSSQTLQFKSEPSASMQFLNGGK
AYSQTEWK
AQSLVFRSEPEATMTVEGVSQYDTKEA R R A
ASVQNLIYNSEPNATFEVLTPNSGYQA
ALAQALNLNNEPQAK
YLTQYLNi S S EPNARDK SVE GNVAT DRYS LID SYQKS GGK $P I G Q P L V F E S E P D A V L N V P S G E E F K Q G K F Y N Y A L A$
AAGQSLI FESEPNTVAEVDN VAAQGLVFEQQKDATMTIEGADTYMTKEVSDQLDSKDV
$G L A E N L I Y K T E S D A T M T V E E N G K K F S Q Y E ~ N S A G S$
$P A A Q L L T F K S E P N A N M R F L D G K$
PAA QLLTFKSEPNANMRFLNGKKFSQYE

VVVQNLNLDDELLNSVVSLS G
SK
PVSQNLKFSSEPQAKMSISGSKVYSQSE
TVAKGLIYNNEPNAVVSI DGVSQYVTKEAQAN
A Q GLVYQSEPGAVISLEGVKNYITKKGMQEVTSNSDVL ALAQALNLNNEPQAK
P GQPLIFESESNAVLNTKSGGVEYKKG DFYKHAES AVVQSLI SKSEPNAKIEI DGVTNFDSTGKREEDRLKNPNL VAVQHLVNASEPHAKAHVTTTAQKTQT
AVGQSLI YRSEPNVT ISI DGVTKFVNPEKRKE
IV SK K L V F DNV V N AKLVSVKGAEFI SQKKYWE EVNK K K $P$ GQPLVVESEPDAVLHDGALEEHEQGKFY
TVGQPQLLLQAEDNVKMSSGALEEHEQGKFY

VAK GLVFNNEPNAVVSVDGVKQYVTKEAQ
$P \mathrm{~V} N \mathrm{KT} \mathrm{L} \square \mathrm{FDREKNSKVVSVKAAEY} \mathrm{\square DAKK} \mathrm{\square TD}$
 PI EKHLKFDRTSNGKITKMNGNKFVNGKELDKRNPQSAGG AAGQKLVFESEQNTVAEVDAAATSVSQEEA SAWVENKADI PVNKTLI FDRE
 AISKDLVFDSTKDTKID KITGGKKFIKA

VVLQALSL
VVSQGLKFENEPNGKLSTSGATEFGQK
ATANPEATVESSAS
$\checkmark$ SQGL
VVTQGLKF ENEPNAHLS LTGTTEFGQQDAPRAYSYEE
LL NKY L
NDWTK
ALA QALNLNNEPQAQH
VVSQGLKFESEPNGKDSTS GATEYGQK
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QATYDKAKQTQAEWQKKYDELRAKTSTE

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UniRef90_C7WLS3


#### Abstract

$A K Y V Q K \square{ }^{90} 100$ (SIVASSMGYNF GDKA G W EFANKLFQLDNFKVTDI QNANYQTNKQESFGTVGKYSEY YNKHNLQPDNLNITYYLEQADDVASSVELFGNFGDKAGW YSKKVLQPDNLNVSYLQQADDVASSMELYGNFGDKAGW YGKKNL QLDNLNVTYLEGAAATSTSMELYGNDNDKSDW   NYSNKLLQLDNMSVKDLEQPGATSGSMELFGNFGSKAGW YSKSLLQLDDDMSVKELEAAGGDTNKMELYGNFDDKASW QDGVKVYDKDEDNALVASWNLDGT AMSDW SWG $\square S G D A L D K Y N L L M S W R$


WN L G S EPWRYSYFDALDN
AHQADDILEQFNTDK YTDSEFT
 DGFLDQFNTDKYKDPAT $\square K N K L G S N D P R D G V N D F N A T N D A$
QHLTDD ILEQYNTDK
VAKHHTDGULDQFN
QHYNTD
TDKYQTNGTYNADDFT

TYFDNNDSSQLGS

NTKDKLNSKDPRDGENDFNATND
KVLSDEQLHKAVKHQVGWDDPGTILGS KVLSDEQLHKAVKHQVGWIDPGTILGS
QEYVFNFSYLDDRTIT K K A P G R A A G Q F ELLY Q
GQHVSAGHTVSDPFWADVLAPGGLVGGSGELYK AKAKAGF
 LDYIKA EQNDY LVAQDTLK GMVETSPVISKME
WNLGTEPWRYAYFDMLN
LN EVVRMGYP VGSEDYNDA LKY DRYSNDEGA
AVTRQPDSTIPTGDPML
G G Y

 TNGADKTGNIFYMNSSNYQASDFVSSPVLS
A EKEAAWNTYKNWLVQNGHQPSNLPDSFAS LLSSNGYGA TDWVNAVEQMGY PKGSEIYNDALKYNRYSGDEGA TFFDSNI GSK LG $\square \mathrm{DQT}$ ANKPKD LEQFNTD QATNDFNY

$\square S S G D E \square Y G P Q E K S D A Q G$
TANAA
 ANDUI SNPNYISSGSYY
I SRFDKASLDAMQDASGNKTAYQQNNPHGEA
 QCYNDFSY $\square \mathrm{NR} \mathrm{R}$
GF IVETTEQNVYLLSQNALNGRLDISSTVTKMS IPNKQTW


QHYNT D
HGAATREPDQVIAKGDALL
NYGNDK LT
LGY LLQND DK LDKKELVYKH $\square K$ DFDNAPDKN G

## VSVANRNLVHTVSSYSE

GNVFNVIGTNWDNLVTNDVKEATSTYSGSVLGR F L ELVNNKHGDNHAILRTDLSKLLASKAEGTDANRGVFG RYALA LINY LS GSDSTSKTKRDLAYDHDKNFDDKPNHKG HYYDGKT TSRNQYVREADDSRSYSEWRDGTTTQPNAVITRADTSQPA KHVQDEILQQFNTDK

YSDSDFT
K HKDKK LL ISMLSVDSSGLTTKDSKKAHFYYNNGAGGT EEYVSSGRTFAN

HKDKKLL
DTP $\| V \mathrm{NT}^{-1} \mathrm{DAFYA}$
YNKHNLQPDNDNDTY LEQADDVASSVELFGNFGDKAGW
A R $\square$

GDWTKQLRQNWDSS $\square T S D P S E A R R A G N G Q \square Y G R \square P$
KF $\square$ KATDFNKVNAGDSKDDFTK LRKDMGGKATG GAQVTTKDYDASSNGTSGYTRVLDSTKVLKYKDVGN
 SAQVSVVANTYDDEVQAKKELNY $\square G S G R T F A N N P D A A Y K T$
 GA ITRNPNQIISTDDAMLGGYSRULDSTGFFVYDS
E EYVAGGGTFGSNPVPSL
FQYDSNKLQASD

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

## QUERY

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 ETIINGKEEVKWASVLLKRGQSATATYTNLKNSYYNGKK QTNVSNNGQVKWSTVLLKRGQSVTATYTNLKKTYYNGRKXI TKVVLQKDVPLVATYTNLKNSSYQGKK
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 NAFVKKYGGPDYSNFLWLDKGDQFTVTYDNLKNSNYGDSVL DDNPKYGNKGKKVFLKKDKTLTARYTNLKRSYMNGKKI

| QYTTNADGETEDVWLKM TTAV STGFFVYNHTL S $\qquad$ TPLVAGDS <br> SENPYANNEDAW EENPYSGTEDTW SNILDSTGFFVYN |
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K R VF
AP पNVQGD
KHASDAYK
V
YSNGTTFLLA
RAMGQTAVARYE
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SGGTAVARYEGLD ASYDGKK
GWTTEIDYTGLNGTTEDGKQ SAKLSGGGS RFVIPKIENGQTITATYTNLQNSTYNGKK SASSSKTTSGNFVIPKINKGQTLTATYTNLQNSSYNGTKIV AELSKFTTSTPSKMVQLKPGEQLVATYTNLTASYNDKLV

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## QUERY

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G KDVKVRDTDKLYDANGKEVLPDKFAYALSSLNSSLG DDNQDYMNFSVTDTYYYNNGQEVAFTP $\square$ A $\square$ TYSSLNNNPI DQVDKDVEVEMEVRYYGEDGKEVKGKPFTFSAASMNSYGS GGAADYMNFLVTDTYYYEEGQEVAFTPAALTYSSLNHNPI NKLSRYRVNTRFYDADGNPI QFNPAILAMTSLTKGLK LTAPSKYGVKIRFYDENDNLIQFTPALLALTSLSKGKK LKKDSKMDTTVERFFEDGTKVKDKPFVYSVASLNSNGD GDWRTDMEFRVVAKYF LEDGTQVTFKPGVFTHSSLNHNDD

NELSRFRVNIRFYGEDGNPIQFNPAILAMTSLTKGLK DQAKPVKVAVDVEFYDKDGKMFNLNNAVVALLNSLNHWNG



|  |  |
| :---: | :---: |
| GAKAVVNGRMVEI | N G S TV TV ${ }^{\text {H D D GYA Y A }}$ |
| E FVRLS S G K F $\mathrm{L}^{\text {P }}$ | N G S Y VK Q H G D L L Y S K T NLE D |
| E FVS DFN N A F KY I | N G S Y V K K Q D GK F Y S P E D $\square$ D Y G T G P S |
| WE GAKA $\square \mathrm{NGTHVE}$ | N G S TV T Q NKDYGY VY A E |
| E ES ITT D Y N F R P V K | T G S LVEKQ G D G |
| E E GI A D Y N F K P V K I | T G S YV E K Q S D N RL A |
| E Y V S NLG S R F V G I | NGSYV S NHGGE I Y S A S D 1 D Y G S G T G |
| E Y V S NLG S R F V G | NGSYV SNH G GEly S A S D 1 D Y G S G T G |
| L E Y V K D T S G K F V A | $N \mathrm{G}$ S TVVQVT N |
| S I T D Y N F R PVK | T G S LV D K Q T D G |
| R PR P ITVEAKDV |  |
| DE A V H S L D S K N I Q L | M G S SVKPHKGDFNADA D GEYADSVN |
| WEGAK A I N G T HVEI | N G S TVT Y NK Y G Y VY A E |
|  |  |

## QUERY

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290
300
310
320
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GCKHTMYKNEGGSWTSDAPNWYGAGALRLQGPHNK GCKHTMYKRGEPGSGWDTADAPNSWYGAGVVRLQGKSNYI
GSRFEYNK GSLHTMYTRSEPGSGWDSADAPNSWYGAGAVRMSGPNNY GSRWDYGV
GSRFSQ
WDKADGP $\square S W Y G A \| V G Q A Q A S D \Pi T F$
GSNFTA DWTPTSPKAWYGAIVGRVTSPEISF
GARWDGDDGWDA
TFNGEGDDGWDNT GAKFN
GSKYNA ADTPT

NGDGWDGQNAPYKWYGAIVGQVTSPDIEL
AF NGDGENGWDADNDDGTPRSKSAFYGAGAMTYKGQPFTV FDADGENGWDAINVDGQPRSATAFYGAGAMTYKGKEFTF GSRFN GSKYDVG AANFTSTEQTDVVGEWDDKDNPNAYTGAIVGKSTDRIRF AANFTSTEQIDVVGEWDDKDNPNAYIGAUVGKSTD RIVF GAHFGLPYQ HNA!DHRDSPYFWYLAGAMELKGTAPEY GSKFDRG EWDSTENPNSYYGAGAAKVNSGTKTD GNHFGLNQH NHIDSTTSPYYWYLAGALSLKGTNPEY GHHF GLDGHNI QSRF

GSRYEA
GSRFEVVA

## GSRFSUA WDTPN

GFNGDGEDGWDATSEWDDSTSKPTWYGA VGGKAKGTSVSV GSKFEQ

DDWDTGTSSSRYYGAAVAKFKN
TSAKFYSAGDEKKE GSAYESG EWDSETSKTRYYGSAVGLLFTSPISF GSRFEQ NEWDGTE LSWYGAIVGVVDDGE NF GAKFDGYVNKQTGEGWDDVPSANKYYGAGAMKLTGDYIEF GSRFNSDPTVDTDEGWDAINSKNAYYGAAATIIFGEPMDF GSRFNSDPTVDTDEGWDANNSKNAYYGAAATVFKGEPMDF
 A LNSDGEDGWDKDNTK

LPEEWDTTSSRYAYKGAIVSTMTGNTYTV
GSKYASWQ NLYATDEWDFDNSGLEWYGSAVAKVNDNADHL

GSKFD ${ }^{\top}$ $\qquad$ GTEGDFANDWDGSGL
$\qquad$
NSDWDAVGHKNAYYGSGVGDAEGGRTSF NYNRPQDVGVDWDTSSSPSQYKGATI GYFT

GTVGAWDSSESPRAY DGAGI I S TEGRTKF NSDWDAVGHKNAYFGSGVGLANG RISF DYNREEEVGHDWDTSDSPYQYKGAALGVFK PTHDIKDDYDDPNFYKG\|AGVAESGDTTSF


NTPTSNDKDDYDDPNFYKG $\square$ AGVAESGDTLSF YADFGGVTVNDSADN EYNRQEDVGHDWDTSDSPYQYKGAALGVFK


G $\square$ S Y WF A L N T L P
TFG QGDMPANAG
DMESDNCDNVWFGFDSK $\square$ KP
VVGA
TMTS
TVGA
SFGVETNGQESGlV
SFGVKTAGNASALN
DMESEHCV
SLSAETISQRADSNPTTWWTSSTTMP DIATTNPGQHWPRPDR

DVVMDAGADAKRHEYGKFWFAFSSDV
T F G

$\square F G \quad$ NE $\ V N N P G F D G S S N$ WFAFNTDL SFGSEN NE\|VNNPGYDGNS RSTQWFAFNSS RTDSGANDSNNTTWAYSATT $\square P \mathrm{~V}$ VTLPKKPT


TF DS G Y W $\square$ A $\square$ T S K $\square$ PSPFVLTKPN $\square S$ YKFFS Y
SF GVVKG ES L
$S F G V K G E S L$
VMQRAS QWE
G G Y W $\square$ A $\square$ T S K L
RFF IINKNQDFNYKTVKSGSMAGQPQWTYGSTWTGTT T NT E GTAFTTEFDQWDGPDNPSGQ
S F G M T T K G K S N V V

PVSSAQWFAFSTNL

| QUERY | RAVNVPKVTKEKPTPPV |
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| UniRef90_K0Z817 | RATNLP T I T Lek P T P PV |
| UniRef90-UPI00035F213E | RAVNVPKVTKEK |
| UniRef90-C8NFE4 | RAVNVPRVTKEK |
| UniRef90_Q9RFI7 | RAVNVPKI TK EKP T P P V |
| UniRef90-A8AUS0 | RAVNVPKITKEKPTPPV |
| UniRef90-F2QBN0 | RAVNVPKITKEK |
| UniRef90-G5JRZ2 | RAVNVPKVTKENPEPPV |
| UniRef90_V1D4P3 | RAI GI P EII K A |
| UniRef90-A8SJX4 | RAIIGIPEIIKAKEPNKPV |
| UniRef90-F3SI79 | K A K GVP MK PVAP T |
| UniRef90_Q55307 | R A VNVPKVTKEKPTPPV |
| UniRef90-W1Q185 | A AKGVPPVAPVAPTQPI |
| UniRef90-G5JYH5 | K A V GVPPVAPTAPTEPV |
| UniRef90-C8W9Q6 | KAINV |
| UniRef90-J3AJW3 | AVPENPGEEPKKPSEP |
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| UniRef90-C7MNZ6 | K AKDVP |
| UniRef90_U2XFK5 | K A N GVPP PVKPTKPEEP |
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| UniRef90-G5EI85 | SVPKDPGQAPEK |
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| UniRef90-C7MLU5 | K A |
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| UniRef90_UPI00035CC2B1 | K V S G GL L T P PKA |
| UniRef90-UPI00035CC2B1 | KVSGGLLT P |
| UniRef90-S6BB76 | A ATGVPTR |
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| UniRef90_J3F8Q9 | KAGG\FNETP! |
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| UniRef90-M2NE41 | K A L G V P V |
| UniRef90_X8GS50 |  |
| UniRef90-Q4W7G2 | A VP K D P GEEPVP P T EP |
| UniRef90_U2Y4J6 | AVPKVPTAPRYKESK |
| UniRef90-M3I9W4 | VARTVKPYSPKPHVMP |
| UniRef90-UPI000381EFA1 | VG DVPVT |
| UniRef90_V1CAZ2 | K P K D |
| UniRef90-FOVXL8 | K A Y S VPVETVEEPTLQV |
| UniRef90_F9JJK5 | AVPQDPGNPPAQPVKP |
| UniRef90_F8LHD5 | VPELP E EPNKPV |
| UniRef90-C4GC60 |  |
| UniRef90-G1AUC1 | VAKTVTPYNPKTHVRP |
| UniRef90_UPI000421DB91 | K EVT P K KLIK P VP A T P P |
| UniRef90-F5TD00 | K A K GV |
| UniRef90-G5JTM6 | A $V$ K A P GEAPKEPERP |
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| UniRef90_E6J3Z3 | K S S Gl P Vp A R Y K E S P |
| UniRef90-X6Q0K8 | K A T GV |
| UniRef90-A8SJZ4 |  |
| UniRef90_H1WQW2 | A P $\mathrm{L}^{\text {P P V VK }}$ |
| UniRef90-N0C5D7 | K ANNVVTN |
| UniRef90_M7E4L3 |  |
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| UniRef90_10SBY0 |  |
| UniRef90-R2TMD0 | K S Y S T T P K P EKPA |
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| UniRef90-V7ZJK6 |  |
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| UniRef90_UPI000379C32E |  |
| UniRef90-E6EYB8 | N A K S $\square$ P Y Q K K G N K K P |
| UniRef90-T1ZVH3 | V S |
| UniRef90-N0CD59 | A T T TVTP P |
| UniRef90_UPI00046C7F3A | NA Q S VKP $\square$ NPKEPEK |
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| UniRef90-X8H6G9 |  |
| UniRef90-T1ZVC2 |  |
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| UniRef90_UPI0004216BD1 | K T S ILP K P P PVEPTKP |
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| UniRef90-J4TG22 | P S |
| UniRef90_I0Q132 |  |
| UniRef90_UPI0004695D96 | P H Y S Q A PAKPVK |
| UniRef90-F5VWT6 | VT PVVT TVKPVK TEPV |
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ADKAEYDAKVAQYQADKAQFEKDS $\square \mathrm{DYNTKLLETGLTQT}$

AHKAATEKYKADMAQYEKDYAKYDEEQAQGGPGTT LK QF QDAKEAYDKY INDSNYRDDKE


## QQTND ITNAQIQQYRDK【NEYNSK L <br> HQTADTVDSK

 QDLAK YEVDKAAYEKAKTEHDNKQAEKEAADKTDHNLTE QDLAKYQQDKAKYDSAKSTYDSKLAEYEHWKNKDAYTET QDKAAYDTAKAKYDQDKAAYDTAKAKYDQKKNEEGYLSQ KAAYDKAKSSYDADNEQYAKDYQAKDAYMNDNGFLKD QDLAAKYEVDKAAYENAKTEHDNKQAEKEAADKTDHNLTEYEAEMAVYNTAKAQYDKDLQEYQTKKNESSYVNE KKQTSDYKTA LDAYNKAEADYKKQLDD $\square Q N G \square N T P G S P A V$

A WEKSYKEYTGGLTK
G DVT D
$K D G D V P T$ QYERESKEHEHAFEDFQSYQFEGNDDRQ
DAAN A QKLSDYDQK $\square G D Y A Y N A Q T F N Q K L S D Y D R K L G D Y A Y N A Q$

lupas_21
lupas 14
lupas_14
lupas_28
jnet
conf
cont
sol25
sol5
sol0
jhmm
jpssm


NMAKQEAYNK AYAEYMAQNWPYEQRKKKELRKAEENK
 $D G A Q N L I F G D E P N V V V N G T V T D N R L M D E T G N D \square N Y K H$ A LA QA L NLLN NEPQA
$\mathrm{V} \mathrm{E} V \mathrm{Q}$ DLT F QRE G GA $\square \mathrm{H} T \square \mathrm{NG} \square \mathrm{SA}$ Y LTRDA QARLNT S NV VVS Q G L K F E REPNAK LS $\square$ T GT TEF G Q K

QVVQAMDMNSEPNAKVTLD L N
N V
YDDAKDAKMVKERGGNPEKYKQDLT F LDPEELED
T G T E
TS SKEVSSAEEAEK DTS QAK QK QA DWQKKY DELQSK TGTE $Y D D A K D A K M V A E R G G N P E K Y K Q D L T F L S E E L A D$ A $\square S K N W V F D Q T K D T K 凹 S S D K G G K F \square K A T$ SKTQQEVSSVDEANKUAKKAKQNQAEWQKKYNELQSKTSTE
 TGTE

 E T VQ D LT F QRET N A $\square \mathrm{H} Q \square \mathrm{DG} \square \mathrm{NT}$ Y LT K D A $\quad$ Q A R L L T S NV

D D P QKEDRTTVDVEF Y DKNGQKY DLS QRKA I D D P Q K E I R I TVVDVEFYDKNGQKYDL S QRKA I
 A Y $\square E H L K E L G L W$
$P \square Q Q Y$ L N Y R S E P D A S $\square E S \square T \| T \quad$ G D A Y L T K R T D ETVQDLTTFQRENNATHKIDGISTYLTREA QARLNTSNV LETK QA $\square E K Y N A D A K A K Y E A A L V V Y N K A K Y D Q E Y L E Y Q N K$

SVIQ K LT DQ S E P N A K LTTDSN A N NVI
VE A QA QELVFEREKNATHTIEGDNSYLTPEAQQR DGTSAVNQ K A E Y $\square E E L K K Y G L W$ QA A QE L $\quad$ F E REK DA VH T $\square E G \square N T Y$ Y $\square$ P E A

A M A Q P L IF S RE D N A $\square$ T S LLE P S VK QY T K DE LT D Y $\square$ A


$A \square S K N L V F D Q T K N T K \square S S \square K G G K F \square K A T$ $A$ YD QLV AKKAEE DANVEKVQYENDYDAY QKK LAAEYEVAKK AK GQGLKFRAGQNPKATVESVK FS GS GDG

Q S L S VDDEK N S K $\square$ N $\square$ T $\square$ K D T K A K K $\square$ N N $\square$ T $\square$ T D TQ D K K GLAENLIYKTESNATMTVE QTAKDAYVKKLVEE W AVA QA AKNHASAVYAASKTPQEDTRDAAASNVTNTAGR

$\square D T Q K R N N A E F D Q A S Q K Y Q A Q$
N S LS
A VNQTVIRRGEYGAK T IVTASEYYPAEA N Q GL SVD DEK G S E $\square$ K NIT $\square$ T D K D K K T VY T TFNQKLL SDYDRKLL GDYAYNAQTFNQKLSDYDRK SGNTGSAFA $\square$ DSSTGE IVNDTTQ

[^0]NKEGY $\square S Q V T Q Q Y M N F K N E P E A H \square E S T G G T N \square R K N V$ HAYVLLGSTGGGDKQYSDQTQAPLADTWDPYSPENAKGGA

$P L T \square T P L L E N K S D P R Y D \square N V P G G V S R K \square D$
GETTTLYHQTTGLTTYSRLYGDGKATKMYETKNLQDSDDT
VDSSGLT TKDSKKAHFY GYTKEVVLQAVDLAAANPQARHGSSAAGATVVGTRDDAGY GYTKQVVLQALDLSASNPQATHGSSAAGSQIVGTRDIGST GETTKITHQTTGLTTYSRMYGDGKATKMYETKNLQDSDDT DFNKVNAGDSKD $\square F T K M$ K $\quad$ RKDMGGKAT G GFTKEVVLQA $\square$ S LATANPEATVESSASGAQ VTTKDY $\square$ AS $\mathrm{V} S \mathrm{GY} \mathrm{GRIL}$
GYTKQVVLQA $\square$ SMSSANPQATHGSSASGAQ\｜VATRD■GST
$\begin{array}{ll}K Q Y E S N N L K E G D V & D S T K V L K Y R D V G N \\ N S G Y R V L\end{array}$
KQYESNKLQAGDV
D S T K VLK Y R D VGN

LALNSLNH WTGAAYANGSDNPRELVVEAKDINGN


GP $\square F N K \square R T V I S N Q T W S K \square S T G N A L T E L N K S G \square I Y T E T G A$ AQYDSNKLTSDDI
LLAVYQTALKQYQDAKTAYDKYNDATHKVEGVSNYDTKEAVV QSYDEYVAGGGTFGSTPVAPFT
QKEHLKFNLIDDMGKGYQULIKDWDKPAN
DENDVD DDKVSQDLILDPNESSKVTKGDNVTVEDKDGDVV
QKR】GTSADNQYRSNEDKEGD
HQYDSNE
HQYDSNELTAS D
YRSNE $\square K E G D \square V$
DFNKVNAGDSKDDFTK $\square R K D M G G K A T G$ QYTDAKQAYDKYMTDNAYADLKNVSTHQYDSNKLEASDIV GDVDPSDISQDLVLDKEENTKVDVIISNNHTGIVTKGKGT $A L L K S K V L G D G M T G L S K V T S S D V V S Q P D F Y$
TKDVDT\AVDGKTRD\GEワTKNDDFYGSHITCT SHDTTK GLYKPGDI DPSD ISQSLILGEEKNSKVEVLNKGSVVDEGT VDYDDKTQQSGHSVDELLEQFN NTSRYIPSDFSAANGT LS P DETTQNKQGLLDT NDKNS DTSWAVTGLPSDMTNDYDA
$\square K K Y Q D T \square S T S Q T \square V D Q \square I Q G \square K F Q K N S N A Q M K V$ TSGDD T QDVVQN LD LGQET DANLTVDAKNTVKEEPRVGEDNKADS

VKY 1 N S LDE ELSFKNVQ
YTPA ID GPSHN】ElDGKKDA VITTH TNNKTDK LGDYAYNAQTFN QKLSDYSSNQTIASSQTNNKDGSGETT K SVTETTSVNDATGTDSSDNATSGTNSTGANNDQTGI


UniRef90_F5VFP4 UniRef90 ${ }^{-T 1 Z Z Z J 6}$ UniRef90_UPIO00462D5C6 UniRef90-E3C614 UniRee90 ${ }^{-}$UPI0003A75B1A UniRef90-F8LPR8 UniRef90-DRRXF4 UniRef90- v7HZGo UniRef90-UPIOOO46937E1 UniRef90-K8MLN7 UniRef90-R3LVB7 UniRef90-s9BFEO UniRef90-S9MOJ7 UniRef90-E2YQM9 UniRef90-EOQ332 UniRef90-T1ZP45 UniRef90-UP100036B7214 UniRef90-AOAO24DGRO UniRef90_G5JQK5 UniRef90 Q60626 UniRef90-I1ZPK7 UniRef90-V6DJW0 UniRef90 UPIO003796762 UniRef90-UPIO003796762 UniRef90-H3JSS3 UniRef90-UPI00046A7D14 UniRef90 C2E4H4 UniRef90-H3RSK7 UniRef90-K2NSW2 UniRef90 F3A5L8 UniRef90-F8HCY1 UniRef90-U2ZLA2 UniRef90_-F5VFPO

SDN YGПNPQKGNSH\|LK YTMYAPNGSY

PTFPSOGNYHE VFKDGNSFATYTNVDGDTVDGVAP SRILDSTGYFVYDSFN DGNSTAVTFTNLQNSYYEGRKI ATSPWANNETEF $\quad$ IQ $\square$ KEGDKFVVTYDNLNQSSMDMHP T RVLDSTKVLKYEDVVGTGWKTEVDYTNLKDSTADGKK G
TTNPYADNEDEWAV YNNGAGGTL
$\qquad$ VVIKVGDKFDVTYKGL ARTLDSTGVTKYAN VLHKNQPVTI TGSSGYGSTGVFKYANVDK
 SNGTSGYTRVLDSTKVLKN TGNSGDDSTGVFKYAN GAG STSPYANNEAEW WE TNAKVG STSPWTNRETEYYETALSKGQSTEMTYDNLANSSYNNRK


 GSMLNGLLNNFWQVND GSLLDGKLNDTYKVSGNQ



SESPYGNKDNEWLEV KQGDKF TNPNTQVVLDQFYKINKE
$V V T N S P Y G N K D E W L Q V K$ TGEFL TGEFL KDEFLKLTYDGL
ATSPWENNKTEY TrVV KKGVPLTV SESPYGNKDNEWLEV $\qquad$ T WN K

ED DQPNQGTAGDGRWYSNNGDF $\square R A \square Y T N \square N G A Q Y N D H N$ DYKQDFAKSDEYSAVFSHSGTVATATWDMPDGAYYDGTK TYSDTVYPESGSNEI TATATYTNDSKSSYTDHK VTLKKNLEYNAVFSQKGTVATATWLDMPEGSAYDGTKIV TTANAPEEHSNGQVAVLKQGQPVTVSERGLEGTYDERKQV ETNTMK向NSDNKVIVDFQQGK


4566677753307898648855




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UniRef90 J1GXM2 UniRef90-E2YQM9 UniRef90-E0Q332 UniRef90-T1ZP45 UniRef90_UPIOOO36B7214 UniRef90-A0A024DGR0 UniRef90_G5JQK5 UniRef90_Q60626 UniRef90-I1ZPK7 UniRef90-V6DJW0 UniRef90_UPI0003796762 UniRef90-UPI0003796762 UniRef90-H3JSS3 UniRef90_UPI00046A7D14
UniRef90 C2E4H4 UniRef90-H3RSK7 UniRef90-K2NSW2 UniRef90_F3A5L8 UniRef90-F8HCY1 UniRef90-U2ZLA2 UniRef90 F5VFP0
UniRef90 H7G1M0 UniRef90_UPIO002DC623D UniRef90_E4SME0 UniRef90 F6CBX6 UniRef90-G5JTU0 UniRef90-T0V8A7 UniRef90 B6F241 UniRef90-H3RN49 UniRef90-W1VT57 UniRef90-UPI0004695159 UniRef90_A2RL18 UniRef90_S5NDL0 UniRef90 F2M0F4 UniRef90_Q5FIL0 UniRef90-T0T5L6 UniRef90_UPI000314EC9F UniRef90 F2LZ64 UniRef90-U4QDR2 UniRef90-S5NE64 UniRef90_F5VFN9 UniRef90-H3RSK5 UniRef90-H7G1M1 UniRef90-UPI00046887C4 UniRef90_EOUD11 UniRef90-Q03PB6 UniRef90-UPI0003B37373


K DQTKPVKVAVDTEFYDANGNQFDLTNALVALNSLNHWTG DDENKAVKVSVDVEFYDKNGQKYDLTKAIVALNSLNHWTG VTETDTFYDADGNVINLNTAYIAVVTSNSWTN G K K VKTRLTMKFFDASGKEVKDSPFAYALSSLNSSGG DQDKPVKVAVDVEFYDGDGNKFDLTNAIVALNSLNHWTG VTIELKMYDKNGKLDNLNTAYITVGSLNNHKE $\square F V N Q P K A L Q E S L E F Y D G S N K L M T F K T A Q F M A G S L N Y G Y N$ EI TTDIUFYDEQGRLIDFSNAYLSPMSLNGGGS NNDTQISVKDFYYDDKGNEI KFNPAWIFVTSLNSNRG TNKN VGWDYDF TPVFYDQNGNVIDLTPAFLSFWSLNNEPD KNSKGMTVTGQLYDNQAQPIKIDSAYVSVSSLNSNGG
 SVDETFYFYDDTGKLINFKDAWFGI ASLNHFNS DA EYTFYDENGNTITFKNAWLAVSSLNDGGW

$N N I K Q V S V K D \square Y Y D D K G N P I T F N K A W \square F V T S L N S G K E$ NNKVAI LDDTIT VGTYQGKNVTVTDAFFDEQGNPIIINDGY TVVGS DNGNM 1 D

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| UniRef90 UPI000462D5C6 |
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| UniRef90-UPIC |
| UniRef90-F8L |
| D0 |
| UniRef90 ${ }^{-T 12}$ |
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| UniRee90-K8MLN7 |
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| UniR |
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| UniRef90-C2E4H4 |
| UniRef90-H3RSK7 |
| UniRef90-K2NSW2 |
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| UniRef90-H7G1M0 |
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| UniRef90-G5Jo |
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| UniRef90-TOV8A7 |
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| UniRef90-A2RL18 |
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| UniRef90 |
| UniRet90-F5VFN9 |
| UniRef90-H3RSK5 |
| UniRef90-H7G1M |
| UniRef90 ${ }^{\text {c }} 8 \mathrm{~N}$ |
| UniRef90-UPIOOO468: |
| UniRef90-E01 |
| UniRef90 ${ }^{\text {Q03 }}$ |
|  |


 A
$H \square E S A T \square S N G K A Y T \square A G S S V T V H N G A \square Y A D Q T N N V T Y Q D G$ HAEFVSDFG
SGDKPRALTVEAKDKDGNTVRGTDGSSMSDENNEVKVKTG
 QHESVSFDNGSYFPSSGTSGANATGDSWSSSTNETWSATG
GFEGCQVLSGHAYALAGSSVNLLH NDDDFADS DNQNKDN
 Y $\downarrow$ EKAE $\square F N G S A V T F Q D S F \| R R H D G T Y Y A D Q N \square E V L A V Y P$
HVEYVQAMNGQKAYVADSSVIVDNTGKAYADHNNDPQRMF RTETAQLLSGSAMSI PESSVQVPGNKVFSPSDNEYNKTHN Y IEKAEEVI NGSGVALPESSVTVHNDULYADKNNELLYDDQ
 RTEGVNDGTVSFKTDDSSMVTVHDDGWAFSDVGTDKDQUG PREEVKADSGAKDYTPVGNVTVDKGNNWASYA $\square A R V T N G A$
Y LIE K VKAENAEMKK $\square$ A GSTVT

lupas_21
lupas_14
lupas_28
jnet
conf
sol25
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sol0
jhmm
jpssm

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UniRef90- F8Y353 UniRef90_UPIOO036B7214 UniRef90-A0A024DGRO UniRef90_G5JQK5 UniRef90-Q60626 UniRef90-I1ZPK7 UniRef90-V6DJW0 UniRef90 UPIOO03796762 UniRef90_UPI0003796762 UniRef90-H3JSS3 UniRef90_UPI00046A7D14 UniRef90 C2E4H4 UniRef90-H3RSK7 UniRef90-K2NSW2 UniRef90 F3A5L8 UniRef90-F8HCY1 UniRef90-U2ZLA2 UniRef90-F5VFPO UniRef90 H7G1M0 UniRef90_UPI0002DC623D UniRef90-E4SME0 UniRef90-G5JQK6 UniRef90 F6CBX6 UniRef90-G5JTU0 UniRef90-T0V8A7 UniRef90 B6F241 UniRef90-H3RN49 UniRef90-W1VT57 UniRef90 ${ }^{-}$UPI0004695159 UniRef90-A2RL18 UniRef90-S5NDLO UniRef90 F2M0F4 UniRef90-Q5FIL0 UniRef90-T0T5L6 UniRef90-UPI000314EC9F UniRef90 F2LZ64 UniRef90-U4QDR2 UniRef90_-S5NE64 UniRef90 F5VFN9 UniRef90-H3RSK5 UniRef90-H7G1M1 UniRef90-C8NGQ2 UniRef90 ${ }^{-}$UPI00046887C4 UniRef90-EOUD11
UniRef90-Q03PB6 UniRef90_UPI0003B37373

GSKYDYO
TNGHEVWRNS
EYDFSGSGKEYFAAIAG\|ATGNSVSL


T A D F
DYNRQQDVGHLWDTSDSPYQYKGAA LGVFK
N V TD GIK D D Y D DP NFYK G $\square$ A GVAES G D S $\square$ S F
KFAKDVQHNGDVESGWDWMESPNFYYGSVLYSLKSSTPTL LAGKGDASTADGSRGWDFDNSPYFFYGSVVYKLSGNKVSF VAVKRGYANFGSAQVFNDADNPLK

VGTNG $\square$ S $\square$ S D WEA $V$ QGKE Y $\square G A T V I S$ K P NR $\square K F$
HYNRQEETGVNWDTTDSPYQYKGAAI GVFTQG
NYNRQEETGLNWDTTDSAYQYKGAAIGVFTQGS

D Y NREEEVGHLWDTSSSAYQYKGAALGVFK
PQDVGVEWDTTTSPYQYKGAVI GYFTNGS
NYNRQEETGLNWDTTDSAYQYKGAAIGGVFTQGS
YADFGGKTVTISESN
VGVT WD T S D S P Y Q Y K GAA LG VF K

GADSHYNTNFDKYYGWDTGWNSKAFYGSGLVSLEGSKYTF GAVFNG ESTPTLRGWDDSESPYLYYGGGGVKLTDGHLVF GAVFNG ESTPTLRGWDDSESPYLYYGGGGVKLTDGHLVF PVVKSGYADFGGKNVTDSESNPLKI DG
AI KIWGKDIVDKYLGWDDSDRSKEIFGSGLFKVSGDGПKD A I A I WGEA AVNKYTGWDEVDRKKEIFGSGLFKVNGDGVKi KESFELNPNSVTDSGWDTTDSASRYYGAGLVKLTGTVLDF KSNATISPKYD SSEWDN GNQLGYYGAQLAPQTNTNLSU TANF
YADFGGATVNDSDEN
S PTHD $\square K D N Y D D P N F Y K G \square A G V A E S G D T \prod S F$
RARATDGPDSKPPYKWDTASSPDRYYGAGLI ALNGSDLAV LSRATSGPGEPDQNAWDTANSSDRYYGAGLIALDGSDLTI YADFGGKTVNDSADN
GDVNDKT VRKQTY $\square$ NWDNSDNKKA $\square$ F GAG $\square$ FK $V$ HGKK $\square K \square$ YADFGGKTVII SANN
$\square K$ DA $\square$ A $\square$ WGQDIVDE WDSPTNRKE $\square$ FGS G $\square$ F K VWGDG $\square$ T $\square$
KADF
PS $\square$ DQTTWKSDKDWEES AQYYGSG $\square$ D VHGDSFS $\square$
KADFGTATVSDSADN
A $\square$ S $\square$ WGEEIVNRY V NWDDSDRGKE $\square \mathrm{FGAGLFKDSGNS} \mathrm{\square K} \mathrm{\square}$


GK D Q T $\square$ QE $\square \square$ D K F $\square$ N WD S T DR S KA $\square$ F GAGAFMVYGNK $\square$ K $\square$
ADAVTNPEYGGGDPDWDWLGNKDYALGAVMYQLNGGTNTF KDQINYNYVIKNYSDWDNTGSKK IFGSALYKVEENPIVI A IDD WGKEIVEKYLNWDSTDRSKEIFGAGLFKVWGNGUTI GAVWNLQQNYDPNNGKDKADSPSF
GTVYSGFAVAKDSNGATFRWSKNGYNNAG
Y GKNEG
T LRWDKYGANNSGDHWD ESKKTY $\square$ NA DGTVPF


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B B B
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UniRef90_UPI000462D5C6 UniRef90_E3C6I4 UniRef90-UPI0003A75B1A UniRef90-F8LPR88 UniRef90-D0RXF4 UniRef90_T1ZRS9
UniRef90 ${ }^{-}$V7HZG0
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UniRef90-K8MLN7 UniRef90 R3LVB7 UniRef90-S9BFE0 UniRef90_S9M0J7 UniRef90_J1GXM2 UniRef90 E2YQM9 UniRef90-E0Q332
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UniRef90_UPI0003B37373

TFGATHR SYWASFNSDV


EGTAFTSEF $\square$ QWDGPDNPSGQ TYWFA $\square$ NTKA VMQRTTQ
EFGMHYSTTEGLIANTGKE SKDSSYYGGGAWAAFATLI


TFG NE MVNNPGYDGNS MWFAFNTDL
EAFTTEFVQWDGPADSGGQ $S F T T E F V Q W D G P A D P A G Q \quad T Y W F A I N T R V$

EGTTFKTEF $\square Q W D G P$ ESPNGQTYWFA LNTKT QFQMEFAQWDGPANSGGQ
SFTTEFVQWDGPADPAGQ

EGTAFSTDFTQWDG YAESNGQTYWFALNTKA
AYTASP $\square \mathrm{E} \quad$ SADDGGKKNKTTWFTQSPTL

| $\begin{aligned} & E V G V K Y F T \\ & S A K G G N A D \end{aligned}$ | NMATVIP <br> YEPTTYWFATNSNV |
| :---: | :---: |
| SAKGGNAD | YEPTIY WFAlin S NV |
| K F | SNKLGSAWATFSTTI |
| R F | SNALGSAWSTFSTNI |
| D LY A D N |  |
| N F K T V ${ }^{\text {S }}$ | A WA QVN G Q M |

VMQRTSQ
I IDVKNDDRPNGTPWNAQWANFGTIIPETPN】
KVDVKT DDAP $\square G V \square K N T G Q W F N M G T V I$
RFGSAWATYSTS $\square$ PKMT $\square$ DA VHPGKAPERPT
RF WA T Y S T TVPK LS FEGVHPGKENVSYSSGNMNLAANGS

RFETNF G D N D R N Y N S G $\square$ WY T LD T I I

S NELGSA WATFSTTV
${ }_{T}^{R}$ WGTTDAN

R F
S N G $\square$ G S A WA T Y S T S $\square$
RVGMNYNNATPLFNN
R SYVIRNSSNTDPGYWFTYSTTV RFGSAWATYSTTVPKLGFNMDKPELDPLDVTY

T GAGNDVNAWYQWAMSTDLEKNDNPPTPPT $\square$ HY

LNGTTRYT
AVTATDNAGNATTTADTTNATVDNDSPGTPT


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UniRef90 T1ZZ J6
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UniRef90-E3C6I4
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[^2]KAAGVVENNLNPPSKP Q ITPEQEKEVPTKPV $P T Y D D P \vee P P V K K$
$\square \mathrm{APDVT} \mathrm{T}$ VKPDK TEPV
PTSPGPKAP
PST L LPTVT
KAKSDPYQEKGRPKQP VSPVVQVPA VAPVVETPT

ATDTKTTVKPVKTEPV
VSPVIEPP
VAPVVETPT
AT $\square$ T K T T VK P V K P E P
PAA I IP P NKPTAPTEP

GFPKDPGQRPQEPVKPV GFPKDPGQRPQEPVKPV
PKTTFDAEKPEKPTT
PKITFEAAVPEMP
PVTPTTEI
$N G V G V A P V K P \square E P E A P$

PET\IPPVALEKPTP

D VH GVS GVVE Y E P T

P Q $\square$ A F K GEKPTEP $\square$ K P $P Q N G V P K R K$

PGMAFREEKPKEPTVP

P Q T S F


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

[^1]:    lupas 21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5

[^2]:    lupas 21
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    sol0
    jhmm
    jpssm

