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 AAADDTSFTSREI TRGFDYPMRLVWGPDDHL QTE VT P V $\mathrm{E}^{\mathrm{T}} \square$
 VT PVEDE SGASEPFSAHVLIDSGLDAPWDMVWGPDDYL F 1 RTVVATGLQDPYEIVWGPGGQL
KPDENRFTKVVLAEKLNEPLEMAILPDERV S QRNQWQKVTV DE GLEHPWSMVWLPN GEI VNPVEVPVGANETFTSVVLTTGLSNPWEVTWGDNML ALA QETVRSEAGAVKVVEVARGLEDPWSLAFRPDGRM AAPAPVAQTTPQGFRQTKVLEGLENPWSMAWLPDGTM PAFA GQTARPAVKTLQVTEVASGFNHPWADAFLPDRRMM


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K PVDF S K A R P E
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STP

- T VPT T

A P A WA AQTQKSEEGSV GVGV
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T $\square$ T R T K VVL
P A F A A Q CAA T S NVA Y DV $V$ TV V
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A A TAQDFQKVTVLQGLEHPWSMAWLPDGDL


P A F E G Q T R $\begin{aligned} & \text { DA } \\ & \text { A } \\ & \text { S }\end{aligned}$
$N \mathrm{I} T \mathrm{Q} V \mathrm{~V} L$ T E GlL E N P WG M D WL P P G D




E T P K T S $\square$ D Y EMVVD G L E $\square$
VASDGKASDNGSFOVTVLSGLEHPWSMAWLPDGTL PAFPQQTRAPEKTAVQVTTI ASGFKNPWAI AFLPDKRM ADCGASKTSSFEKVTLDSNTNNPMEELDDAP DGRV

PVLAEKVSV EQLQQGLDHPWAMAFLPDNQG
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A A S K T F D T D K VRV
PEENRFTKHVLGEK L D EP TEELVVL DN GKI TEKPDENRFTK ITLDEKKLDEPMEL EVLDEDGRV $P E S V P E L T T V E V T P L V E G L E H P W S L A D W L P N G D L$
VT P V $D$ K $\quad$ P P L A K G W W

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 DIRLHPQFATNNQIFFSYNEPG EDGGSSTAVARATLT DLALAPDFATSRKLYFTYAAMADRQGSGTKAFSATLSKD G| QKDPNYAQNNFVFAYYAPTG DEEDNRLSRFVFKDG D VLHPNYEENGWI YMSY SSSEGDGEGGNTAVMRAKDN GIRLDPNFASNGF YLYYSPNT DGGPRNQISRFTVS DVEVGPDYAQSGLI YWTYYEPRQGGNGGAVANA KLVDGE D AALDPDFSQNNRVY AYAGQG NGGYGTE ARARLS DVVLSPDFAQNRRVYLTWTEADDNGRAGAVGDGSGLLS DI ELDPKFGSNRTLYFTAASVAGDGGSGTAVFRAKLSSD DIVLHPDYANNGWI Y LAYA SGNLGKGGALADMRAKLE D VLHPDFAKNGLVYLSYAESGTGGKGAVVARGKLALNN GITLDPNFEKNQWI YLYY SPPDEGEPILFNLSRFKGS DVRLSPDFASNRRVYLTFAQPGREEKGEPHAALGYGTLT GLNVDPNFKQNKWLYAYYSPLTGNTVADTAQHLSRFVYDD DVVLSPSFATDRTIFWSYAEP REGGNATSVARGRLS DI ALDPQYSSNGYIYYTYVFADGK EKGSNTALLDCKLF GI QKDPNYAKNGHVFVFYS PPDDKEVRLSRFTFKND DVATSPHYATDQLIFFTFSQPGKGGSGTAAARAKLVRDDG DVALSPKFTQDREVYGFAEEGK VEGKAGTAVGYGRDN GLAKDPGFKDNHWIYYYYSPDGEKSINR SRFTLVEDILD DIAVDPQFEQNRWVYFSYAAGTEKAVNRVQVARGKLN D:ALHLRFEENQWIYFTYAHGTQD DANRTRVARAKFD DVVLAPDFAQSRRVWLSYAEADS EGRASTAVGFGRLS DIELHPNFNTNGWIYFSYAESTEGEGKGGNTAIIRAKLS DVVLAPDFAASKRIYYSYAEPGEGPDGSAGTAVASAKLG DVVLHPNFAKNHWI YLSYATKGQGGYGAVISRAKKLDLSN GVAADPDFKNNNWI YFYYGVGGDRHVS QLDTRELKDR DVMVPRTFAKTRRI Y KYA KRVGRGSATAVATGQLA DIKLHPDYEDNGWIYYAYSEP KGENGGNTAIMRARLD DIAVYPDYANNGWI YFTYAASSEGEGEGGNTAMARAKUN
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 D DLQRLEHFRTVFRQMPSTGNHFGGRMVFDAKGALD DALG N N K L V N I E K L Y KA SPNS T R G Q HF G S R I E F DR D G Y L F F S I G D A ALSDVVKVI Y Q Q Q P K L V G P N H F G S R L A F D K N G H I F I T Q G






## QUERY

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R VQ
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DRGN
DRGS
DGGNPP $\square$ S F DGAY $\square R E Q$
E N
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DRGQMQ
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$E R F F L \quad R$ R R A
DGGNPP $\square R F N G E Y \square R$
HFGPRDEAQNLANHLGKIVRI
DDTNPFESGGYSP $\square R E G R D \square F D A Q K N$ N
D G
D R G
ENND
DRG
FDWREEAANTNDLRGKI LR
ARRPTAQDLDKLQGKVVRL
NNTNPREGSSNLDERPGMENADDQRAPGNTNDLRGKI LR I
D RT
ERSDMPM
ERSDRQFRD
D H G
D R
ER
DGFNY
DGGNPPVELEGDLIRKQ
D
ERSDM
DRGEQQ
K QDQA QLTSNHI GVVVRV

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ERGN
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E N
D R G
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DRG ARDEN
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A Q NKGNHLGAI I RI
D N F
D R G
DKGSRPV
QAASA
EQDRA
N A
ER
D R G G
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D N
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## QUERY

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220
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$R P D G S V P E D N P F D D G A A P$ HEDGRIPEDNPFVENAWT NADGSIPSDNPFVNGAKP HADGSVPKDNPFVNGALP RPDGSVPTDNPFVKGAAP APDGAVPKDNPFVNDAKPEVSYGHRNVQGAALHQTGELW NDDGSIPQDNPFVNNADPALWSYGHRNVQALALHPTGRLW
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 $\stackrel{N}{N}$

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$T D G Q P G G K G A F A D N A R P$ TGQGEIPPDNPFVHGARP HDDGRIPKDNPFIDGAKKA NDDGSPADNPFVKDARPE $N D D G S V P A D N P F V G G V A A Q$
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YSYGHRNPQGMAHHTGEI W YTMGHRNPFRDSVDQTGYVY WS LGGRNDQSATLDAQGRLW YSMGHRNPWRDSVDSKTGLY WSYGHRNMQGAAIHPSSTLW $Y A M G F R N P F R F T V D V D G T L Y$
$Y S G G H R N V Q G \| F D A E H R L$ WSKGHRNPQGMDFDSKTGLY WAF GLRNPQGAALNP WNTLW WSYGHRNDQGAALHPTTELW FSYGHRNVQGMALYPSGQI W WSLGHRNVQALTFGPDGKLW YTYGNRNPQGMTLTPDGEIW WSYGHRNVQGAALHPTGELW WSYGHRNSQGAALGPDDELW YSYGHRNLDGLVVDNNDR1 I WSYGHRNDQGLTFDQTNRLW WSLGHRNPQGLAFNPDGSLW YSYGHRNVQGLAFHPTGDLF KFTLGNRNLQGAALHPQSGLW YSYGHRNVQGLALHPTGDLL W W W WSYGHRNDQGLTDDKTGQ। W $Y S Y G H R N V Q S L A F D P T G D L$
$W S Y G H N Q Q G A L N P W S G L$ WSYGHRNDQGAALHPQTQLL WSKGHRNPQG\|AFDKDGKLY
 WSYGHRNTQGLTFDPTGRVW FAMGFRNPFRIGVDKTNTLY YGMGFRNPFRTGVDPKTDLY YSYGHRNDQGLALQPGTGVF WSYGMRNPQGLAFNPWSKMW WSKGHRNPQGITFDRTNRLY WSLGHRNPLGLAFNAKGELW WSKGHRNVQGATFDPTDALV WTFGNRNPQGLAVNPWSGLW WSYGHRNDQGLTFDQTRRI W WSLGHRNVQGVAVQPGTGVW FSYGHRNPQGLVLNPFNGI W
 WSYGHRNPQGLALNPWSGMW YVMGNRNPYRIAVDQTGFLY YVMGNRNPFRLSVDQTGTLY ws YGHRNI QGMVFDYRQKVW YSYGHRNVQGMARDPKSRVY
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TFFTVEDDYQFFDPACGFLQYMCWPTIAPSSLHYYPTGWH
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 $\square G T T V D N G Y D F R D P A C G G R F F I C Y P T V A P S S L S Y Y R G G$
PAYPAAESKKFPDMGTGGRSAMAGPTYYKDDFKNAKGRR GTNTPVSREKSRPGMDDPKTDWTPADAPSGLVFYTSNRF
TYWTVDNDYDFTANCTGWICNPTIUAPSSAYYYAAGES
HK S T Q GP GMEQP VYY WDPVIS PS GMT $\square$ YS GD $\square$ F
KAF $\square$ WYPYAESTEFP $\square V G A G G R S A M A G P V Y H K D Q F G G A K R$ Y D G D
PAFDWYPYVESAEFPQVGTGGRNAMAGPVYYSDMYPNGGG GDTEQPDMQQPQHQWTPSDAPAGDTFYNGAAF $Y G G G V I G K K Q Q A G L E Q P L H Y W V P S$ I APSGMVFY GAE

Y D S D
DK S
G $\square$ KHKPGMADP LHHWTPS $\quad$ AP S GMTFYTGDAF IWYPYDASPEFP LVGAGGRNAMAGPVFYSDDFK NAPGA QKEGLGEQPVYYWDPVIAPSGMADYDAADF
$E K F P A V G S G S R S A T G G P V Y H R T D F K A P K R ~$ PSF $\square Y Y P Y G V S E K F P A V G S G S R S A T G G P V Y H R T D F K A P K R$
VHY WVP S
KDGMEQPVKYWVPS I APSGMAFYTGNLF

E WYGYGESEKFP DLETGGAAPMGGPVYRYDPDL DSE $\square K$ $R \bar{V} P Y T E L D G L G S P L L H W T P S V A P S S L T L Y R S T G E$

KDGMEQP LHKWTPS $\square$ APSGMAFY $\square S D A \square$

PAMDYYPYGTSDVFPQLQGSGRSATGGPVFRKADFKDAPF EMDGMLQPLTYWVPS I APS GMAFYTGNEF

E Y Y GPR $\square G E G T S A P G M E D P \square Y Q W T P V \square A P S G M \square F Y G G D A F$

NREVTH

## VLQWTPSTAPSGLAFYTGDAY WVP SIA TS GLA Y LISSER

S
HKA GMEQP $\square H$ Y WVPS $\square$ AP S GMTF $\square$ T S ER Y

QK E

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A $\square$ Q Q K E G $\square E$ QP VYY WD PVVS P S GMT F Y S S D R $\square$
GTEQPHHVWGKSPGVSGMAFYDGER QQGMEQP LHYWVPS $\square A P S G M A F Y T G D \square F$

PAF $\square W Y P Y A A S P E F P S \square G T G G R N A M A G P V Y Y S D M Y P A E T R$ MEDPLHYWLDPSIAPSGMAFVSTNKY EYFGPEDSAERSRPGMEDPKHYWLPS S I APSGMAFVSTNKY PATVDYDYGGNPLFPE $\square G G G G A P M G G P V Y R Y N A S \square N S S R K$
PATVDYDYSGNPRFPE $\square G G G G A P M G G P V Y R Y D A D N P S K T K$ MEQPLIHWSPS DAPSGMAFYDGDLF

ME QP VT Y WVP S $\square$ A T G G LDE LVT S D K Y GYEQP LFYWDPS $\square A P S G L I S Y Q \quad G E$ PP! PWYPYS LSPEFPELDLGGRSAMAGQFYTYNKNSGSNK YNVQ S KAF $\square$ YYPPEFGP $\square$ MGKGGRNAMAGPVYYYDDYP ESPVK

K MQGMEQP $\square H Y$ YVVP S $\square$ AP S GMAF $\square T$ T NK Y PAF $\square$ WYPYGASEEFPQLGTGGRNAMAGPVYYTDMFPKETR

GTHVDGTEQPAYYWEKSPGDSGMAFYD AT KAFDYYPYADSPEFGPGKGGRNAMAGQVYYYDDYEDSPVK


$\underset{S}{G} S P$ W
WT PVISPAGFVIYS GK PAF $\square W Y G K G P S K K W P L V E K G G A S A M A G P V Y Y S D L Y P N A P Y$ QPEHYWDPS $\square A P S N L L V Y S$ GK


QUERY
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 KFPQWKNSLFIGALAGESLITLTLDGEKVTHEEERLLSD
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LWPE WK GDLFIGGLSSQSLVRVDLNGTAAAKGNQ S

 | $E$ | $R$ | $R$ | $T$ | $D$ |
| :--- | :--- | :--- | :--- | :--- |
| $R$ | $V$ | $P$ | $S$ | $Y$ |



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| QUERY | PGSLIK F T |
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| UniRef90-A8ADN3 | P G S I I VF |
| UniRef90-G4RCM9 | PGSILMFT |
| UniRef90-R4LN03 | $P G S \\| L A F$ |
| UniRef90-D2QPJ1 | A G N |
| UniRef90-141H31 |  |
| UniRef90-E3F5W6 | $P G A \square L V F S$ |
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PAGCARA

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 DIELDPNFKDNGWIYFSY SGYEGDEEGYNTSIMRARLK DIA DPDYQNNGWVYISY SSDDGDDKGGNTAMMRAKLN DVHPHPDFGSNRMIYLTY SKPQGGQESTTTLTRGRLE DVMVPRDFATTRELYFSYQERSGFRAGAGTAVAKAVLDEG DVIVDRDFATNRTVHFCYSEPALVGNSTAMASAARLSDD DVVLHPKFAENHLVYFSFSEPRGGGKGLALARGLRLVDGA DVLADSGFDKNRTLYFCFSEPAAGGGSGNGTALASTQLS DIMLDPDFSTNQTIYLSFAHGNGAAANGTRIVKGTLN DVELHPDYQNNGWIYVTYAASNEGEEDGGNTAIARGKLE DVALAPDFAQSRKVWLSFAEAG DDGKAGTAVGYGRLS DVAVDPDFSKNRMIYFTFSQDVPP DGGAGTAVGKGKLS DVALSPGFAEDRLVYLTYAEAG ADGRAGTTAGRGRLS DIVLHPDYAKNGWIYYTY ASTEGEGEGGNTKLIRAKLE GFAI DPNFNENHWVYFYYAPVNYSPD VNRLSRFTFK DVIVHPDFAQNNVVYLSYAEAGDGDTRGAALARATLDCAQ DVELATDFTSSHRVYLAYAEPG PDGTAGTAAGYGVLD DITLHPDFENNGRI YMSFDETEGEDSGSVVEYATLALNDA DVAAHPNHAENGWIYDAY AKPFPDNKGALT DMRFKLDD VTVDPNFATNHFLYLYY SPMTDKNPVNYHLSRFVVN GVGIDPDFKNNRAIYLYYAPPGDTPAGDAPETRLSRFTLN DVAVGPNYATDGWMYMTYSAR EGGDVGGTVLARAKLD GVAVDPNFATTGWVYTYYTAFTKSNDVIA RIARFDVKN DI ALDPDFNTNRMIFWTYSEPV AGGNHTAVAKGKLS Gi Ald DPAFDSNGFLYLYYSPAG TEAFDRVSRFKLTGD DVVLDPKFAQNRLIYLSY AEPRPEGAATAVARGRLAED DVVVSPNFRQDRRVYLSYAEVG RAEGLAGTTVGFGTGS GLALSPDFVQSKRLYLAFAEKGPFRKSGNTAVASATLS GMALDPNFASNGYVYLYHSPAS MRGSTDVNRVSRYTLTT DVTLDPDFAKNRMVYWAFSEPQAKGVLLADAKG KLSAS GVVMDPDFDNNKFVYMYYSPESEDAKSL DVSVHPRFSENRFVYLTYAAGS AEANHTRLARARFD DVQLSPDYANNGWLYFSYN KEDDGQGATTLSRAKLQ DVLVDRDFPTTRRIFLSLMHNGPD GSTDRIVSARLE DILLHPEFKKNQTLYLSYNKFKKVDGKTVSTTAIMMAKLS DVALSPFEAS KIYLTYS GVAADPDFASNRFVYYYYAP DVLLAPDFEESNRIFFSFAEPRDDGNGTSVSATLVADEEN DVMVPRDFAQSQEIFLTFAKRQGRGAGTALAVARLTPD DVAWYQ GQVYFSYAEPGPR GVVLDPKFDENHWI Y LFYS

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 A DETRLDEVRVIVQATPAGPNHNGSRLLFDPQGYQ FASFG

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 GN S L T N S E V L Y K A S P N S T K G Q H F G S R ND
 GK RIK DLS LI F E IA S GSS G GRHFGSRRLLEAQD G T L F L T V G




 E D M Q Q L E D F TVVVFRQQP S VG N H F G GRMMVFD G K G Y $L$ A D K R R L E N F Q V I F R QL $\operatorname{P}$ S S G H H F G S R R V NES LVQQDESLYKCEGNTTKKGQHFGSRRIVFDNE GYLYYFSAG DNFLDLTTSEKILLIPDVFRGCCHTGGSI EFDANGLLY LSTG $P L E C S L D G L Q V I W R Q D P K G R G H Y G H R L A F G P D G K L W I T S S G$


 A N G T L N T A S E K K V I DVVA A S C C H V G G D Did F D A D G N L Y
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 GNQLS N LT T I F S Q T P K LA G GRHY G GR L LTTM K H L Y I A L G

 GNSLDLESEKIEWPTQRERCCHWGGGMVFDKKGNLLIAA G GRVLGPLLEVLFAVVPQLKS GTQHFGSRMLWLP DGTLLLAA G
 D K A L E D T K VI F E S R P A DK A T D Q $\quad$ GG G R L A F G P D G M L Y L
 ENGTLDDGSEVTVVLEVPGQCCHVGGDIDFDAEGNLYYSTG G GALEDVVEVI FQQMPSYDGDKHFGSRLEDDADNALII AVG
 GDVLDVASEKVHFRTDRKVANHAGGDLNFDKHGNLYASTG GSEMRDVQVIFRQMPT LDSAQHYGGRLVFPKD GTMI DT L G



 GAAPALGNVQVIFRRATPEGNGHYSGRMAFAPDGHLDFTNG







 P S GER RLGAPDTVVK G DPK GRDHNGGR\|AFGPD GMLYA GTG E GRLLQDTE DILI T DA WESP L G T Y G GRMVFGP DGMLY DG VG







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 F E D G TVIMP P D N P F V V T GVVQPA ERDGSIPPDNPF IEDARP
LADGKPHPDNPFTKQARP
$M P$ D

## ,

 NDDGTPAADNPAAKGFAP AKDGSAPKDNPAVGGALP NKDGSVP HDDGSI PDSNPFAEGAKQA NRDGSVPADNPYAQGAGATKEGKPVANADGSVPS DNPGAD GVTTA Q    Y VMGNRNPYR S S V D DK T G L
    WS Y GHRNPQGLA I NPNGEL W
    
WS Y GHRNVVQGA D
WS T GHRNPQ G $\square T$ FD P D GK L L
WA Y G $\square R N P$ Q GMAMNP WEALLW
Y S Y GHRNQQGAVIHQTGELW
Y SYGHRNPQGMAMHPQTGI W

WS LGHRNALGIAFDAR GKL W
WSFGHRNAQGMAF G LDGRLL W

WS Y GHRNLLGLAFDPAGNLW
WS Y GHR R G Q GA AVLG P D G R L W


DGTYTIPDGNDFPKGTRPEIYTMGDRNPYRIAVNPRSS Y


$V W T$ Y GHRN P Q G L V Y D A A S DVV
WS Y G $\quad$ R N P Q G MA L N P W S K L W W
WS Y GHRNQQGAALNPWTGLW

Y VMGNRNPFR I SLDHNGNLL
WSLGGHRNPLGIAAFA GD GTLLW

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


KPGGAPAPGNPRFS GARP
K G Y A $\quad$ P K GNLFS HAGRP

AP D GS I PAGNMFAPGTRP

Y A MGTRNAFTLTYDKTGDVV

WS Y GHRNVQAAA I E P GTGLW


HEDGKI PTDNPFVKNAKPAVWSYGHRNPQGMWFDQTTTTLW
$\begin{array}{llllllll} & \text { A M G R N P F R F S }\end{array}$

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



DGSY DVPA GNDLFAPGTRPE
TLE GEPFEGNPF DDGAQPE


| $A$ | $P$ | $D$ | $G$ | $S$ |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $D$ | $V$ | $P$ | $K$ | $D$ | $N$ | $P$ |



D G S Y D $\square P$ D GNLFAPGTRPE
$\begin{array}{ll}A P T G G A A P G N P G R A G A A L P E \\ T & D\end{array}$

| $T$ | $D$ | $Q G Q D P$ |
| :--- | :--- | :--- |
| $T$ | $D$ | $D$ |

HDDGT DP A DNP F V D DARPE


TPE GEPAHGNPBEAD SV
DGTYTSPA GNLFPA GTRPDVVYDYGHRNVQGLA WDGDKRRLW






TPDGEPAPGNPF A



| $E$ | $Y$ |
| :---: | :--- |
| $P$ | $Y$ |
| $V$ | $Y$ |

$\begin{array}{llll} & \text { Y G G L R N P D G A A }\end{array}$

WS L G H R N
$\begin{array}{llll}W & L \\ W & \text { Y G H R N P Q G }\end{array}$








WS Y G NRNVQ GA ALD AK GRL W
WS Y GHRNPQGMFYDRNQRLW W

YAMGFRNP FRRLSVDP T GTVVY
WS WGHRNPQGAA WGP DGRL W

WT LGHR S E E G LAA F A P D G R L W
WA Y G V R N S Q GMVVMDPET GLLW










$N L D G T P A A G N P L A D K G F H P$


WS LGHRNVVQGAA IMPTGELWW



ND GSVPA DNPFA G GVAS Q\| WS LIGHRNVLLG\| AF DA Q GR|L|W


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UniRef90－E8RNX7
UniRef90 UPI00035D7D00 UniRef90 UPI000368354E
UniRef90－N6WV72
UniRef90－IOK6G1
UniRef90 UPI0003FBA818 UniRef90＿D7EA84
UniRef90－K4R1F3
UniRef90－S4ANL1
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UniRef90 G2IQ02
UniRef90－UPI00036D5046 UniRef90＿UPI000380C23E UniRef90－F3LKX3 UniRef90＿N0E357 UniRef90＿Q2G795

STRPEFKAPA A ${ }^{290}$ DT P VISS PSSLI I

K T
TSREGMEQPDWYWVPSTAPSGMAF $\square$ NSDKYP
THAEGMEQPVVHWTPAIAPSGMAYYDSPAFPG
$\begin{array}{ll}\text { DYSTGK } & \text { SGDNFDPEHAVNASRNNTGLTMLPPAQ } \\ \text { DFASGT } & \text { SGEAFDCSAPVNDSPHNTGLTELDPAQ }\end{array}$
KGGEGE
TKTEKP
EQPAHQWTPS $\square A V S G M A F \quad \square T S D R Y P G W K G Q M V V G A L K$

AK GKTVPGTEPPDYVWPVSPGVSGMAFYSAPTF
T S
YS GTP TT DQTQKEG
GSGSAIHEGTRREG
${ }_{T}^{\mathrm{D}}$ ■PDHSTRPEFAA
T A

$$
\text { N Y G G G R } \square \text { G D G } \square \text { T }
$$

$\begin{array}{llll}\square & T & & \\ D & T & R & P \\ D & D \\ ~ & T & A & R \\ K & S & A & P\end{array}$
Y GENYNGTSFTD $\square$
TEYEGMESPDMHWTPS $\square A P A G \square A \square Y$ Y $\square$ GELIFPHW
TSAPGTEQPLFYWKDSPAVSGMAFY
S LT QK P GLE QPVYYWDPVVSPS G S $\square F Y T$ G D LIPPEW
RGKTVEGSE APHHVWEKSPA $\square$ S GMAF
T QKPGIT
DFEKQESLLFQ
FDPAAPVNTSPNNTG■QN【PPAQ
DTRPEFNAPETWWDPVISPAGFVIYSGDAY
TKGTDVPGME SPYHVWLKSPGLSGMAFYTGHP
DTRPDFKAPADSWVPSVSPSSDVIYDGDLFKG
TEKEGMEQPVTYYVPSIATCGMTMVTSDRY
DFATNVA GPTFDPKAPVNSSVNNTGLKNLPQAT DFATKE SGEKFDCAAPKNTSPYNTGLTNLPPAQ RP $\square G Q T E A P G V V Q P V V F W D P S A P A S G M A F Y T G D K F ~$ QTAA PGLEQPVYYWDPVI APSGMVFYEGAMFP
DFVAKRST GEVFDPQHLINYSPNNTGAKKVPAAQ TQKAGTEQPVYYW DPS ISMSGMDFYKGNDAEW DFATGT SGAAFNCNAPVNNSPNNTGITQL PAA TAKEGMEQP LFYWDPS $\square$ AP S GAAFYTGPGWRGQLFVGA $\square A$ QG AEVVGTATPDYYWKVSPADSGMAFYNNGR GVNYGTGSQ\｜GIGTELVG
TDKPGMQAPVSQWTPSDAPSDMLMVKGNKY
DTGV VGAKFNCNAPVNNSPNNTGLTSLRPIV TSKPGMEQPVFYWDPS $\quad$ APS GMTFLSGGLWDGDALVGSLJK
DTLK $\quad$ VNNSQYNTGLVELPS
SREYTGPAI
NPVPS
T T A P G
TAKEG
DFGNGS SGGTYDCGAPVNNSPHNTGLTELPPAQ TQMDGMEQPVYYWDPSPAPSGMDYYEGEEFP

DFGSK QSGELFDAQHPVNSSPHNTGAKELPPAQ
ASQAPE
EPGEGFTEPTYYWDPVIAPGDMTFYRGTAFEG
DFGSGA SGDAFDCGAPVNNSPHNTGLTELPPAQ KGVAGTEQPDFYWKKSPAVSGMAVYNS GENYGGGK】GEGT
LTEK
IT E K E
T AKEGLEQP LYY WVPSMAPGNMVFYNGPQWQGKVFDAS LK DPVEQWKTADASPSGDAYAKGS\｜WMAS
YTASDPNKGDNDPVGAKFDCGGPANSSRDNTGLAKDPPAK EG DNYGSN』TPHDQ
PTMAGVENPVYTWTPS TGPCGLTFVNG
TEREGMVSPI DHWSPA I APCGLLIVKGDRYPG
HSGSQTWAPSGAAY
NFATNTTGPKYDC ADGPTNNSPNNTGLAK LDPPAK APVAQWKTSEASPSGVAYAQGSVWMAG
$D T G E \square$ GAKFDCDNLTNPSPNNTGLTELPPVQ
T
$\square A$ Q WH T DEASPSG $\square$ ASVDGVIWMAG
P
$\mathrm{K} \square \mathrm{G} \square \mathrm{G}$ T A A P
TEAEG
SEDDGFVK PRLYWNPSLAPASMAYY
RRKAGMTDPLWVWVPSIAPSGML FYRGNAF
DFATGE SGAEFDCAAPRNESPNNTGRTELDPAQ
VA G D GFAA
KTRPD LAA A A $\square$ S WNPVIAPGDM■ F Y T GKAFP
$D \square P D H \bar{A} T G P Q \overline{F A} A$

PAF I WYPYAASPDFPQVGSGGRNAMAGPVYYTDMFPRETR PAWIPYDGGSVPEFGTGGESPMGGPVYHFDPGL DSATK GTEQPDHYWKVSPADS GMAFYSADTF

A QR LLER $\square T \square$ GMEQPLYQWTPS $\square G P S G \square A F V T G N K Y$
A Q RLLERTSE L L
ED A VK E GMEQPFYYWVPS $\square$ A TAGATFYNGDAF


NAS
Y D A T
$D P \square Y Y W V P S \square A T C G M T F V T G D R Y$ PAMDYYPYNESEEFPMDGSGGRNAMAGPVYYREDFDKTEV

GSPW

SAMDWYPYAASKEFPE LGQGGRSAMAGAFYTYDRNSTSRS A A WIP YDDSSVPEFGSGSESPMAGPVYRYDPGL DSKVK

A PLIWYPYGNSEQFPEVGSGGRTALVADVYRADQFPAATR
】PAALWMGKSTTGVPE $\square$ GGSGAPMTSGAYQFDPDSDSDRK G Q A

ME QPDHYWVPS $\square$ APS GMEMDS GQQF
A WY GYGTSPTFPELGSGGSAPMGGPVYRYD AANPSATK F DY $\square$ SR $\square \mathrm{S}$ GD

G $\square$ QQKE GMEQPVYYWNPVLSPGS $\square$ AF Y NS S A WYDRNPAEAFP IPGSGSLSAVGGP FYRKADFKGAERP

SARRTAPGLEDPRRVWTPATAPSGLAVASGRRV WAP $\square Q V G E G T K R K G M E Q P V Q M Y D P S$ I APS SQI QYQ GT MVDSVHHWVPSVATASLVAYS GNV
 A A W DPYDGNSVPEFGNGSESPMGGPVYNYD AGLDSAVK

F D Y $\square S R \square S G$
PWYPYTPTSRFPQDGMTDPDHVWVPSDAPSGMAFYTGDKF MEQPQYYWDPV ${ }^{\prime}$ GPS GMIF HS GK WNP LP VGEGTEKEGMEQPVKFYVPSIAPGSLIAYS GK
A A W $\square P Y D G D S V P E F G N G S E S P M G G P V F R Q E E V D D G S A D A$ AKA GMEQP LD Y WVPS $\square A P S$ GMAF LT S DRY

PGTEQARYYWDPVIAPSGLAFYSGNLF GMVSPLHHWTPSIAPSGMAlLRDPAF PDHRAGDGFEPPKVWWNPA ISPGGLMUYS GK
F K Y
AS W $\square$ K Y DGGSMPELGSGSESPMGGPVYHFDPANP KPTK LE GMRGP $\square$ NHWTPS $\square A P S$ GMTVYDGEAF

PS W $\square$ RYGGDAGSPPEFGGGGEAPMAGPVYRYDAGNPSTTK K P D $\square \mathrm{WY}$ GYGPSEAFPEMGEGGSGPMGGPVYNYDADNPSET KKEGMEEP LHYWDPS $\square$ APS GMAF $\square$ NS DK Y

WYREGMDNPLFFWNPPFNPENMFFYTGDK
GYEQPLYYWDPSTAPS GLVSYR GK MEQPVEYWVPSIAPS GLLAR RVEGP

PAW $\square$ PYDGGSVPEFGDGGESPMGGPVYDFDPAD DSVTK VWVP SIA PS GMAFVT S DRY PAVWWNPSISPAGLMIYDGTAF

| UniRef90 UPI00046455B5 |  |
| :---: | :---: |
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 WQGSLFI GSLVDQHLRRVQLDGNEVTVDQEVLLHR

 A GDKVVRV
PEWKGDFFVAALKSSLVARLDLYEGRMMHEEREDFEDA NGDLLI A ALKYQLLTRLDRDET GTVTAEERLEDG
PQWQHKLFI GALKETSLIVLAVDG NQVREE PQWQGSLIVGSLKFELLARLVMQGNKVTK $K Y P Q W Q G H V L V G A M K F A H L V L V E L D G N K V T G H S K$

PDWKGSLLVGSLKFQYL ERLELKNNKVVYREK $\square M P D E$
$P A W Q G S I F V G G L R G E Q L A R V V I K D G V S D L E E$


 DGDLLVAALAARHLRLVEMEDGKP RAQQE LLAD



PDWQDTGLI GGLSSQAIVQVSLDGANS NDSVVLGALADRCLIRLQLDGDR IVREEVARYD
WNGNAVI STLSGTALVRVSMDGEDATEEAQYYTP KFPYYDGGLFIGDWMRNWVVVARFDQNENYLRTEPFMATN FPEAYDGDFFAGEFGRRWIKRIEQNGDGSVAKDNDFPW
 LPDYYDGKLFIVEFMRNWVKVVTFDENNGVRKDEPFAPQIC WPQYFDGKAVFADWNDSRLFSVQLNDDRSKVADVSRMLQG

```
FPAWRHSLEDGALAGTSLIRLSLEGDRVVS EERLLSE H HWQGDILLGSLKFGLLVRL DMENGKVIEEERLLDN
P E L K GK MLLA S MKY AFV SVL E LDA D S KVVK Q H K FPPYYDGVHFFYEWSRNYIKEVHFDSATAVTRTNPFLPGG
```

VIP E WK GNLIVVGGLSGSHTSRLVIKD NKVVGEERLLAG YPA YYDGKWFVTDYVRGWIMAI EVVEDGNYKSMEEFMSEG PGWRGQLFAGGLVSGDVRRLSLDAQGRVLAEEA TTI




PQWRGDLFDGSDKFMQLVRDELDGTQVVGEERMLMVP LDPKEYDEELFI FDWERSLI NIVRFDKPGNLQKLEPFLPAM GAPEFKGNI FVGGLRVQSLVRLVMDGDKVVGGEQRLLTD AFPDWKGNLFAGALKLTHLNRVEIDNTGSADTEE RLLVG WQGDLLVGSMKPGGLVRLTLEEGRVAGEER LLLG FPAEYEGNFFAGEFGRKWI KRIEQGDDGTVSA $\square$ NDFPW GTA WKGSLFVGSLKFARLHRLELQGAQVVR DEYLLDG
 PQWHDSVFVGGLRAGFLDRLTLTTNDKVRRDEEPLLAD


FPAYYDNQFFAYEFGRRWFKNTS LDADGSPLADDPFSAGL
PELKGDLLVSGLAGQGVFRLNMEEGELVS DQRLFHE MFKA WS GNLLAGGLALTYLSRLELDGNTVVREEKLL

## WQGDALLGSLVARHLRYLKLNAQGKIQSQER LLD

FPQS $L$ SEHFFAGEFARGWDKAVHVTSGGGVGE $\square$ STFKPSD KFPEYDGVSFLYEWTRNYVKEVRFDANEEVLK DNDF LSSA $G D W N G N L L V G S L K F Q Y L D M C T L K N N K V I L E E R \quad L L D$

FPR LKGS LMMVAGAGSKK\AQMS $\square R G D F \quad \square K Q G D T M L N E$




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UniRef90-G7UUQ2


MKQR|RG|LUQAQDGS|LWVIUEDGPQAKLLKLSAS MGARVRDVEQGPEGNVYVLTDQQNGKVIRLS

EIGRVRDVRTSPEGY YLLTDAANGRLYR
KVNSLDDMEVGPDGRLYLLEYGSGWFSKNPDAGLARTNFN
QLRRPMNDEFGPEGS LYVVDYGSGYFGGPDSAVYRUDYT
RKKRTRDVRVGPDGYLYVLTDESDGELLKTS
NTGRVRDVRMAPDG YLYI AVESPGIIVKLT
LGQRVRDVRQGPDGWLYVLTDRSNGQLLR
EFGRIRDVIVAPDGAL MVTDEEDGEVLRVSKAPTQ
RGKRIRDVRVGPDGYLYVLTDESNGELLRLS
GAGRVRSI ATHPNGDIYLGIDGM
GRI RDVRQAPDG FIYVSVEGKG
GDGRVRDVRQGPDGYYLALDDRGG DPSAVVREPV MGERIREI EQGPDGAI WLLEDGSNGKLLKLTPKA



 GEGRVRNKQGPDG FLYLGDEGKGIV
 QQHRFRDVVQGSDGALYALTDGEKGRLYRI LGVRTRDVRQGPDGYLYLLTDQKDGQLLR
 MGQRIRELEQGPDGLVYVLEDERDGSG GRLDKLTPK RKARIRDVRVAADGAVYVLTDDENGELLRIVD D TGRVRQVSESPDG YLYAlTEGTGLLVK GFRRPIDLAFSKDGVMYMLEYGSVYGADNDDARLVK TEYN TGTQMDMEFGPDGALYVLDYGVSWFQGDEHSALYRDEN EGGR1RDVATGPDGYLYLLEDAENGALYR
 QNDRIRDVLSARDGNLYAVSD SGGKDHRDSKK
QGERTRDVRVGPDGY LYVLTDQDNGKLLKV
QYGRI RDVVESPDGDIFLLTDSSNGELLRLT
GVGRURSLAQGPDGTHYGLDGQGEVVRLDPK
RFNKPMDMEFGKDGSLYLLEWGTNFGGGNSDSGLYR $\square D Y$
KGERFRDLVE KDGAFYAVTD NGNDYKTAKK
TFTGVNDMDFAPNGD MYVLQYGSYASYAKDAKLYRTKYN GARVRDVREGPEG FLYVLTDEA PDVGRDRLEP LSSRIRNVIEAPHGALILGTD SGNVYRVTPAI KIGRIRDVAVSPDGF YL NIGRVRDVRTSPDG YLYMTVENPGIIYK
LGERIRDIEVSPKGD YFSTD SGNIYK
SGTQVMDMAFGPDGALYVLDYGTGFGSGDDSSADYRDEH
DARIRDVRVGPDGAVYAVTEDRDGG
ПGQRПRDVVQGPDGY LYLVTDHSNGRILRП
KFKRPICIKLGPEG ALYVIDEWGSNWYNNKDAQLVRVEF RKERIRDVIEGPAGEMYLLTDAVDGKLLKVT

SGTQVMDMDFGPDGMALYVLDYGTGYFGGDENSADYRDEN

R RVRDVRVH DGAI WVLTDHNPGELLR
MDARリREVEEGPDGAUWLLEDGGDSQ
GRLLK LT P A
NDTQ DDAEFGPDGS DYTLDYGTGFFNGDENSAYRVDYV
$L G K R V R D V V V G K E G E L Y L L$
NVNQVMDVEFGPDG ALYVLDYGTGGNFNENSRLLRYDY
KFNKPMDMTFGPDGS YVLEWGSAFGGGNSDSGLYRDDYS GSGRVRSVEQGPDGY $\square Y$
$\square D V R F R D T R Q G P D G Y Y V L T E G R \square R G P R D T D G M L L R \square E P$

MGMRLRNVRVGPDGALWLLQDGPNGKMLKLTPK
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MGQRMRDLRQGPDGWLYVLTDGRDGELWR
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GRLL L K L T P


[^0]m

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VD PA
Q L C L

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P QPEPDVKE DP $\quad$ S E F T I R T L T T K L D S P WG L A P L P D G N L
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VA S GP $\square$ A S P K S Y A WQAE KI T D GLV DP WGL A YI N D D S M
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S D P F A I A VL P D G S A APTSTPGATNTEPPEDAPAVVAENLDTPWALVFLPD QSI

NYE $\square Q V$ V A E NLYY P WA I D DSDE GK $\square$ VAPA $\square A Q Q D P A P R Q R \square E P E L M A K G F D V P W S I G F L P G G A M$ D A P D T

TASSAPK ${ }^{\top}$ $T V A N R Y Q K V A L D S A P D Q P M A L D V A D D$
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Unipopgop

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$G V V L D P D F S T N R W V Y F W S P Q D V G D G P H N R V S R F D Y D A D$ GI ALSPDFASDHMIYAYFTSASDNRDVRMLYTER K G| TLDPDFESNRLVYDAYS KGDDAANATAVIKGRDS G| AVSPKFAQDRTVFVYYTAEQDN G|ALDPNFSQNHFLYVMSSYSE $\quad$ GGNKDYNRVIKLV GLTLDPNFASNQYVYVYYTVPG DGGAGNAVARARLA GIALSPDFASDHMIYAYFTSGSDNRD VRMLYDAKK GMTVDPDYSENNYI Y LYYTYNED D DTKNKLVRYQ DVA DPDYDKNGWVYLAYSHSEYDGNRPPAMTRYVRGKME DVSVDPDYAKNGWVYLSYSHSDAEGERKPAMTRIVRGKLQ DVLTQTTNTGTRVYLSYA KGKPEANGTAVYAADLV

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210
220
230
wDAQGRLL ${ }^{24}$ NLDGSTPSDNPMAKGVPAQTWTTGHRNPYGLDAFAPDGKLW NADGSVPPDNPFQDKGAKTFWSLGHRNLLGMAFDKQGQLW TPDGAPAPGDPFP DSPVYSLGHRNVQGLAWDAKQRLF KDDGSDPADNPFGNA TTDGQPAPGNPTFSGADPELYSYGHRNVQG|AWDSENRLW NPDGTVPRDNP LGGPDNPVYSYGHRNPEGLAFDPTGRLF FKDGSIPTDNPFYDNGRDPI WTYGHRNHQGLAFHPTTDLW NSDGSIPNDNPFVKGVQTEIWSYGNRNPQGVVFHFTNQLF DGTYS:PDGNGFPKGGRPEVYVMGCRNPYR1/SDDKTGWLY NLDGTIPSDNPF GASSPVYTRGHRNPQGLAWQPTNRLF
 TKDGQPAPGNPFGEAGLPELYTDGHRNPQGLAI HPTGDLW TATGGVPDDNPFVDDTLDEIYTMGNRNDQGMTVLSNGQAW TQDGTVPADNPFVKGMRPEUWSYGMRNPQGMALNPWHTVW NQDGSVPKDNPFYDNGENQDWT LGHRNPLGDDFDANGKLW DGSYDIPDGNPGTPGTRPEIYAMGFRNPYRMSVDKQTGVY DVNYR PSDNPFDNDARPEDYAYGGRNMWRCSFDRGDRLF NLDGSVPKDNPFYNNARAEI WSYGHRNPQGLFFDRTQTLW DVDGRIPPDNPFCSDALPEVYAYGVRNMWRCSVDRGDR1F NRDGGTPSNNP K LGGKPQIYSYGHRNVQGLAYDRTGNLW RADGSPHPDNPWYGGARAALHSLGHRNIQGLARDPSGRVW
 TPDGEPAPGNPFPSS SVYSYGHRNVQGLAWDREQRLF NADGSTPADNPFADGGKPSVYSYGHRNVQGLYYDPTDTLY
TPEGKPAPGNPYPGDSPVWSLGHRNVQGUAWDGDRMY EDDGSIPSDNPF SNSPIYSGGHRNPQGLAWNSNNMLY HKDGRVPADNPFVKGALPEI WSLGHRNMQGAALRPGQQFW NADGSUPTDNPFPTGSRQR1WAYGLRNPYTMADQPTGK1F NSDGTAPGNFNS YKDGSIPADNPKNSAVKVYSMGHRNPQGIDWDKSGNLV YKDGS:PADNPFVHGAVKSLFSLGNRNIGGMAVHQTGELV NLDGSLPDDNPFRGELSERUWTYGHRNPQGLAADDSGALY HPDGTVPSDNPYANNNDTQFWSTGHRNVLGMAFDESGRLW NADGSIPANNPFKNKALPEDWSKGHRNPQGITFDSDGKLY SDTGKAVDDNPFYDKEANFVFSLGHRNPQALLVSNSGVII NSDGTDPTDNPFYNTANRAL WALGLRNPYSFAFQPTSQMF NPDGSVPSDNPFIDNVLNE EADGTVPTDNPFVPGARET
TLDGKAPGNPMAGGVRGE ADSGDPASGNPFGNA
NGTYSTPAGNLFAPGTRPE NLDGSVPQDNPFTSEARPE ELDGSIPEDNPDSNSA ARDGSVPPDNPFVEGADPE SDDGGVPQDNPFVKDARPE DGTYTVPQGN
TPDGKPASG NVDGSVPSNPFDGDS TVGYTVPSGNPFVDGARNE: WSYGHRNPQGLVWDTNQRLW RPDGAIPAGNPFVGDARPEIYAMGLRNPFRFSVDQKTGHL NKDGSIPEDNPFVDGARGEIYAYGFRNPYRFTFDEETGI Y TTEGEPAPGNPVMAGGLPGLWSWGHRNPQGAADHPDTGLW NLDGSIPNDNPFINPNAHAVFSLGHRNAQGLVYDYDKRIV
 DGSYTIPDDNDFTEAARPEI YGMGFRNPFTAAIDPETDEW TPTGKVPSSNPTKGSYVYSKGHRNVQGLAFDGAGRLF ATDGTAPDDNPFVGGGIDSIWSYGHRNIQGAADRPTGELW NLDGTTPDDNPFAGNAQAQWSFGHRNPQGLFYDPTKTLW NGDGPAPDPDP A NEDGSAFEGNPFPGNLD tPDGAPAPGNPRPGS
 KEGQTTWSTGHRNPYGLAFAPDGRLW
 NLDGSDPDANPFVDNAKD TPDGKAAADNPFHKNADPA
TADGDPAPGNPDEGS
NADGTTPTDNPLYGGIVAAQWSTGHRNVQGLAFDESGQLW TANGKTPKNNPF DDHTAHAVYSYGHRNLQGLVYDYDTQQ1 TPDGEPVHGNP SADSVVYSWGHRNVQGLAWDERKRLW LPDGTPAPGNPWADKPANQ WSYGHRNILGLAFDAQGRLW QLNGDAAQDNPFHEGKLDEIWSYGHRNPQGLFFDSKQKLW KDDGSDPQDNPFVENARP TPDGDPAPGNPF
NPDGSTPSDNPFGNA
GDNPVYSLGHRDQGLAWDSEGRLW
VWSUGHRNPQGLDFDSKGRLW


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UniRef90-D7CCG3
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UniRef90-W3AH37
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UniRef90_S2YJN2
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UniRef90_F3L501
UniRef90 UPI00046E65FD
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UniRef90-J1EIZ7
UniRef90 G4QFP9
UniRef90-L0D875
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UniRef90_U4ZWD6
UniRef90_U1PN88
UniRef90_UPI00026CCFF7
UniRef90 K2AV09
UniRef90-D9T8K5
UniRef90-A7K1V5
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UniRef90-U5BSR8
UniRef90_U1M728
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UniRef90 R4V584

AHSTRPEFAP
PR
TRPEFNAPE I Y WVPTVAPSGLI I YDGAMFPKWQN DP $\square$ A QWHTDQASPSG $\ A Y A E G S \rrbracket W L A G$ NSGAS DTWAPSGMVFYEG PMGAAI
TPPLRSYDPI $\square$ APAGAAFYRGPV RAWDGS LFFGT LG SVPD D MPPVAVFNPTVATSDMVFYTGSAF
DTQPQYEKPDYYWHPAISPSGLD FYTGKLF
$N Y V T G E V S D \quad F F D P E H P K N T S P N N T G V E D D P P A R$ SAAPD VAKDKWEPY I IPASVPQTRETDFSAPNLTDALM PLI H S GNARWAPSGl TFVSD GP WK G
 QS GQAFDCANPVNDSPN
SGQKVGDGIDQKEGLD
DS LP GMVNPVYVFEGRFAPAGLAEVTSDAFD
$K G G Q V Q N M \quad$ T
TEKSGMQAPVLHWTPSTAPS GMAYVNSDKY
E E IIP IYYYSPIADWVPA ISPAGFIIYKGADWTGNGFDGSDS DFATGA SGQAFNCSAPVNDSPNNTGLTTLPPAQ

$K \square C Q N S S \square D D \square L P F A Y G H S V G K S V T G G Y V Y R G C E S P N D N$ D PVE QWK PKDASPSGDAYAKGSIWVAG
KTYEGMTGPVHDWVPS TTSHEYWGPADSNVHQRADVTAPLLE
DSEHEA
DFATGQSGAAYDCAGGAV
NDSPNNTGDDQLPPAV
NPVAQWSTEDASPSG【AYAEGSVWMAG
TEAEGMAQPMTYWVPS $\square A P S G L V M D T S D V Y P G$
QWPTDEA
KPLVQSQEDTWAPSG】AFVNQGPWKD
QSAPG
YPHGAGDGSGCA $\square$ TGGTFFNPPTTNYPTS $\square A Q W H T D D A S P S G \square A Y A E G S \square W M A G$

GWPD\|IGDEKKENLLNPILH
THKPGMEQPNLYWRPS ADVCGL
RERQGMRQPTLYWKPS $\ddagger$ AVSGUHFVNSSS
TYGVNYSGARVSPY TEYSG
DPPKVSWTPVISPSSLS $\quad$ YTS GS QNDFPA WQGKA $\square M S G \square S$ YGWP IITYGRDYSGAK IGEGTAKE
T T K A G
TEYKGMQQPNFDWTPS $\square A P S G M \square L Y E S$
AYQHD $\square$ PGTA $\square T G G T F Y N P A T P Q F P A N A V G D Y F F T D \square S$ DFATGE

## GS GDP $\square \mathrm{G}$ VS HADRADVTGPVVS WP

PSRPD LEAPK LDWNPS $\square$ SPGGMAYYSGA
HSGNDTWAPAGA
DFAAGTAGPKFNCTGG PTNNSFRNTGLATLPAAK
DVGEAKS $\square P N M E D P K L V Y \square P S \square A P S N M V V Y R G D K Y$
KPLIHSGQDTWAPSGIAFATQGPDQG
THKEGMEQPEFYWDPS $H A P S G H S G Q G A P E W R G D F F V G S L K$
 $T A G T A$
$L V T W A T K D A S P S G M K F D C A A P K$
$\square S G T T A Y$

A $\square$ GE GTHKEGME
DFATGT SGAAFDCAAPRNDSRHNTGRTELPPTR E QPVYYWDPVIAPSGLAFYNASLF PAWKGSLFVGGLK

$\square E P \square Y S W T P V I A P S G L T Y Y Q G P \square A A W N H S$
TQYKDMKQPSINWTPSIAPSGMAYYGTRFN
RAKPGLQQPE WYWDPS $I A P S G M L I Y S G P E W R G D \square F V G S \square K$ PAAGSNQGWPVITYGQQYGGGQ
ETGESGE DFDPENP $\square$ NDSVNNTGDEEDPAAQGTS $\square M S P Y N$ VA Q WR T DKASPSGIAIVQGTVFMAG
EASAGMEQPVYYWDPVIAPGGMTFYQADLFDG
SEEAD
S PGRSRRRRRRAWHGSTAACGW
TSGDDST WAPSGMDYD
GEVAPGVKP
D PVAVWRPEDASPSGLAYADGALWMASLHGQRLWRDQ
EQPAYYWDPA
PARPEFTEPALYWAPVDAPAGL TFYQGDLF
IT QAE
GTEAPGVTA
SHNDREDIIAPAYSWPCGSGGFPPSGMSFYPAQAADNP
P ПPDHATRPEFAAPA IS
DPLVTWSTEEASAPAGLAFANGSDWM
S GlLK LIPQHDTQP
RDYPGMQKPSVDWTPSIAPSGMAYYGSKH
D PVA QWK T SEASPSGIAYAQGS IWMAG
$S T R P D L A Q P A \square S W N P V \frac{1}{1} A P G D F I F Y S G D L F P G$
EY TPA $\quad$ APAAGAAF $\quad T G D L F P G W R H$
V WP STATASPSGMADVNDVAY $\square G A L R G Q R \square W E V P L L D$
TWPVSSASPS
$D P \square V T W T T D E A S P S G \square A Y A S G S \square W A A A \square R G Q R \square W Q \square P V D D$

QRQEG LDEPVYYWDPVISPSG $\square$ T FYKGNR $\square$


A A DVWYNYAGNP LIFPE $\square$ GGGGAPMGGPVYDYDPEDDSDVK QPVYYWDPVVSPSGMTFYGGDRV

Y N S D
AQA LVRVNFFTND
PA WI PYDGGSVPEFGSGTESPMAGPVYRYEPDL DSAVK GMYIIFGDFMSGRLMALLKEKKETG DYPFARVTPFHRLEGYQDAVLEWTPSDAPAGLAVYDGAELF WSFSAVGEGTQKKGMEDAKKVF $\square P S$ SIAPSDLLLI Y H GR G $\square \mathrm{Y} \square \mathrm{F}$ GDFMNGRLMA
 EAEVWYGYGTNPDFPEGGGGGAPMGGPVYTYDPELESDTK MTPPRW $\square W V P S \square A P S G M T F Y Q \quad G E$
 SGG KDTWAPSGAEF YNSN

T Q Q P $\square \mathrm{H}$ H WT PS $\square \mathrm{GPS}$ GFA $\square \mathrm{YRGD}$ SKALIVVDMDAAGNASERYRYDMGARI


GRWDHQ
PPDFHYGYGPSEQWPEGEGPAAPMAGPVYHYDPGDESPTK
QQEGMEQPVYFWDPVLSPSGMTFYSGNA


PS W $\square$ RYAGDAGSPPEFGGGSESPMGGPVYRYDAANPSTTK

GER VVRDRFSGQ
AA TVWYDHASTRFPELGSGGGAPMGGPFYHYDAASTSERK Q P K K F Y $\square \mathrm{PS}$ S $\square$ A P S S $\square \mathrm{MQ}$ Y N G N A QA W $\square$ PYDGNSVPEFGTGSESPMGGPVYRYDPDNP SPVK G Y

AFYPYGHKDPWGSGGRTSNVGPVYDP WDTSDGSPWAGGQKSS $\square$ GPSGMAFFTGSS

TRQTGMAQPDHYWTPS $\square$ APSGLAWDSS DRY WGGYLDYPSEWEEYVMDEVPFPEDTGGAAMVGTVYRHNTA G $\square E S P R K \square Y \square P S \square A P S G L L L Y R \quad G K$ P V H VWEDTLAPSGLT F Y T GDEF

GRH

$P \square A V G E S T E K E G \square S S P K K V Y \square P S \square A P S S L I L Y R G D K$
GRAGQPVSHFQDDYG
T GTVGRP $\square$ AHYEGRYGR $\square R A V V R A P D G S \square W V T$ T SNHDGRR $\bar{N} K P G T \square Q P \square H H W T P S \square A P S G M A F H$

UniRef90 R8BP07
UniRef90 H0S521
UniRef90-COQE20 UniRef90 D6K1U8 UniRef90 K1ZRF5 UniRef90-UPI0004275751 UniRef90-E6SIH6 UniRef90 A7NFR8 UniRef90 UPI00047DF439 UniRef90-UPI00036A387C UniRef90 UPI0003B4DE70 UniRef90 UPI000248E048 UniRef90-S9SS58 UniRef90_U2APQ2 UniRef90 C7PHS4 UniRef90-G4F7A2 UniRef90_UPI00036ACAAL UniRef90-A4C9B7
UniRef90 H5T7LO UniRef90-UPI00037DE824 UniRef90-F6Z059 UniRef90-H0F128
UniRef90 F2K1D0
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UniRef90-D7CCG3 UniRef90 UPI00040A0321 UniRef90 W0E6T6 UniRef90-W3AH37 UniRef90-UPI000364AFC5 UniRef90- M3DIZ5 UniRef90-A0A059EB57 UniRef90-F4F9E8 UniRef90 T0CW25 UniRef90-A0A023RM84 UniRef90_UPI000376B68A UniRef90_S2YJN2 UniRef90 K0BC57 UniRef90-X5DG79 UniRef90_UPI000379CDE4 UniRef90 F3L501 UniRef90 UPI00046E65FD UniRef90-J1T2Q2 UniRef90_J1EIZ7 UniRef90 G4QFP9 UniRef90-LOD875 UniRef90-UPI000349A2D2 UniRef90_M7MYS9 UniRef90_U4ZWD6 UniRef90_U1PN88 UniRef90_UPI00026CCFF7 UniRef90 K2AV09 UniRef90-D9T8K5 UniRef90-A7K1V5 UniRef90_V8FS66 UniRef90-UPI0004793924 UniRef90-S7TJV4



PEWENNLFVGADSGTHTARLVIDSNNKVVGEERLLVG FQPDSPGRHLHRVRLDPSGTRVVEEEVLFKG PEWSGDLFFVTLKTGRLYRLKI DNR TUVEQEILDDG
K DWYGNALLGSFNSEALVVLNIVSNNVSEEERDWL
FPKYYDNKVFHYDWDRGWVHAI TLDENGNYSKQEPFLPSF $G \square P G W K T S L L V T S L K Y G A V Y R V P V M P S G A S T R G E A L K \| L P$

WPEYWDGKATFGEWNQGKMYSFQLDGENNR\|LPKHFDPAA PEWKNNLFIGALSGQHTVRLVIEN NKVVGEERLLGG EWKGNLLAGGLGSEKLLRLRLENGN VAEEELILNG


FPQDFDGDFFAMEWGRRW $\square$ K D $\square$ GVNADGSRGG $\square G G \square P W$ CMGTGQTCDFPGLINNYYQY I SFAED
 LIF S D WNDDIISTALALDRHNRLRLNENDDEAQQEQRYLRN

NGDALIGGLVSKDLRR\|DDENGASLGETSLLSD YFPA WRGDLFSGALKFGEVRRIDLENGVVMGEERDTI

PEWENNLFIGGLVSSYIARVII EGD TIVGGEERLDTD WPAYWDGKALFGEWNQGRMYSFQLAGEQNRVLPGVFDPSV

WK GDLFTGGMNGPAGLELTRDDMENGEVVGRESLFD

LF KEWRGDLLVGALRGQALLR LHLDGDK\|VSAERR LTD $L S T G L D G N L Y Y L S L S D N A L Y R I I Y$

K $\square$ P Q WE GKYFFAALRGSHLHMDEFD LQNNSVISHEKLFQD
 MFPEWQGNLFVGALVNREVRRLTLKNGRIDSEQAAFPEIR MFPEWNGNFIVAALKFQLLSRMQRDASGAFTAEE RMFEG GAAWRGSLFVGSLKFGTLHRF EVANGKLQREEKLLEG

FPASMDGKPMFYEWGRYYLKEVALDGEGDVLD $\square$ GSFLPET PEWQNNLFDGGLNSHHIARLVLENRRVVG EERLLAD
 FPQSFDGQFFATEFGRGWDKP $\square H V G A D G S P G T \square D S F P W$


FPAYYDKTPFFYEWSRNTVKEFR $\square D A E G G L L K \square S P L V A Q \square$ FPEWQGDLFAGALKLRHINRIELDNEGNADAEE RLMED FPEAYDGDFFAGEFGRRWIRRVEHSPDGSAGTDNTFPW

FPATHHGKLLFYDFVRGWMKLVDTDENGE\|】AVEDFПD PAHWRGSLFVGAREGTGLWRIQFDGTREVG RERLLAD

GKVWQGS LFTGS $\square K K F G Y L A R D T L Q G Q R V V A E E K D A V S$ F GKSMDGKIF $\square$ ME YGSGWIKY
 PGWQGN $\square \mathrm{F} \square \mathrm{GA} \square \mathrm{Y}$ AER $\square \mathrm{H} R \mathrm{VVLDGE} \mathrm{\quad T} \mathrm{\square AHEE} \mathrm{\square LLEN}$ PDWRDSALIGALAGEGTVRVAFDRAEGARQLDRWSFET A KGDVYI A SLNPGGLVRLRLKEGRVATEERLFP TEWQNSLFVGSLKLEQLHRLVLDGDNVTH EE\|LLSD
 $R \square P Q W T G K A L I G G \square S S E S \square I V V D \square Q H Q P \quad \square K E \square E R V E$

WK GQAl $\square$ T GLVATGLVRVSDDGTKATEEAR YP YPELSGKLLAGALKLTHINILTVKDGE\| GGETR\|LEE

A G G P ME G


UniRef90 R8BP07 UniRef90 H0S521 UniRef90-COQE20 UniRef90 D6K1U8 UniRef90 K1ZRF5 UniRef90-UPI0004275751 UniRef90-E6SIH6 UniRef90 A7NFR8 UniRef90 UPI00047DF43s UniRef90_UPI00036A3870 UniRef90 UPI0003B4DE70 UniRef90 UPI000248E048 UniRef90_S9SS58 UniRef90_U2APQ2 UniRef90 C7PHS4 UniRef90 ${ }^{-G 4 F 7 A 2}$ UniRef90_UPI00036ACAAD UniRef90_A4C9B7 UniRef90 H5T7L UniRef90 UPIO0037DE824 UniRef90-F6Z059 UniRef90 H0F128 UniRef90 F2K1D0 UniRef90-R4GDF8
UniRef90-D7CCG3 UniRef90 UPI00040A0321 UniRef90 W0E6T6 UniRef90-W3AH37 UniRef90_UPI000364AFC5 UniRef90 M3DIZ5 UniRef90-A0A059EB57 UniRef90-F4F9E8 UniRef90 T0CW25 UniRef90-A0A023RM84 UniRef90_UPI000376B68A UniRef90_S2YJN2 UniRef90 K0BC57 UniRef90-X5DG79 UniRef90_UPI000379CDE4 UniRef90 F3L501 UniRef90 UPI00046E65FD UniRef90-J1T2Q2 UniRef90-J1EIZ7 UniRef90 G4QFP9 UniRef90-LOD875 UniRef90_UPIO00349A2D2 UniRef90 M7MYS9 UniRef90 U4ZWD6 UniRef90_U1PN88 UniRef90_UPI00026CCFF7 UniRef90 K2AV09 UniRef90-D9T8K5 UniRef90-A7K1V5 UniRef90_V8FS66 UniRef90 UPI0004793924 UniRef90-S7TJV4 UniRef90_UPIO004658030 UniRef90 U5W8P4 UniRef90-UPI000366D80C UniRef90-E2PY22 UniRef90 B0SUS8 UniRef90 E6TT63 UniRef90_14MMG7 UniRef90-U5BSR8 UniRef90 U1M728 UniRef90- R0FI86 UniRef90-UPI00035E15B0 UniRef90_MODXX7 UniRef90 UPI00036D0425 UniRef90-Q2CKC7 UniRef90-S7IA12 UniRef90_HOJVR4 UniRef90- UPI00026287B9 UniRef90_UPI0002882BB0 UniRef90-UPI000362B324 UniRef90 B1ZCNo UniRef90-UPI00036113F2 UniRef90-A0A058ZNI9 UniRef90_UPI00047832AF UniRef90 U1PSX4 UniRef90-U2YIY8 UniRef90-R7XW13 UniRef90 V2UKQ4 UniRef90-A0Y119 UniRef90_G2NFN7 UniRef90_A0A031K489 UniRef90 F9T0X7 UniRef90-S7T1W1 UniRef90_UPI00047C99AD UniRef90 UPI00035DF7C7 UniRef90-D1ABR9

MGERTRDVAVAPDGAVWI I EDDSPGRLRRLT


ENQRFRD ITQGDD NALYA $\square T \mathrm{D}$ A GR $\square Y K \square D$
QYGRDRAVQVGPDGCDYFGTSDGRGEPVPGDDRDLR
TYGRLRDVTVGPDGFLY I STDETSAQLLRIRPTIER
HRRIRDVIQAPDGSVYLLTDYKEGELIRLS
EFNNMIDUKLH EGSFYFIEYGTNWFAQNENARLGVIDYA T DNRYRDTAVSSDGRT $\square Y$ VIT DSAGQMLGQQNTRVTEMAN

GFYRAMDFDFGPDGS $\quad$ YYVIDWGQGFGGNNTSGDYKVNYV
EGQRFRDVTQGVDGALYAVTD QGRLYRLDKA
D I G R 1 RDVRQGPDDAI YLLTDAPQGGLYR
$R K Q R I R N V K V G P D G Y L Y V L T D A P D G Q L L K V S P A V$
GVGRVRSLLQGHDG YLYVGLDGQG
S GTQPMDAAFGPDGADYVLDYGTGWYAGDENSALYRDEN TGG VPDATSPSGVVYKIVDTSR
LNERMRDLKVAPDGS Y I LTV G
LDERFRSITQAPDSSLI VTTDS GKVLRLT

LGERVRDVRTDQSGA ILVLTDDENGKLLRVTPK


GEYA $\square$ R DVVQGPDGH $\quad$ Y $V$ ATKDFDG $\square$ FRVD
$\square G E R \square R T V K E G P D G A L Y L L T D S G Q G R L L K L T$


D R I R D I RVSPEGALYVVTDGENGR\|IKVT
D Y GRDRDVIVAPDGALLMVTDENDGELLRVSRAADR KKERIRDVRQGPDGFLYLVTDSPQGRLLRLT

EFDYPMDMEYGPDGS $\square Y L L E W G A G F G T G G D A G L Y R \square D Y T$ QQQRFRAVVEGTDGALYAITD GGRLYRD LGERDRDIEDSPAGDIFFSTD NGNLYR RDWRLRDATTAPDGSLLVAVDDDPAP VVR
MGARIRDVAQAPDGA 1 WLLQDDG
TGKQVMDSAFGPDGAYYVLDYGTGYFNGDNSALYRFDYL $\square G E R V R D \square T \square S P D G Y V Y F S T D T G K \square F R$

APHAA $\square$ DMKFGPDG AMY $\square$ AE WGNGFGSNTD DG $\square Y R \square D Y$ V $\square$
LNERTRALLESPEGW\YFSTDSGNDYVIKP
TGTQVMDMAFGPDG ALYVLDYGTAWFGGDHNSALYRDEN
GLLLPMDVD $\square$ GPDGS $\square Y$ Y $\square$ AEFGS S WWEVNDQS G $\square$ TK $\square$
$R N E R I V D V R M G P D G H \quad L Y V L T L P S G G V L R V G G$

DGQRVRDVRQGPDGLLYYLTDAPQGRLLR $D W G S P F D M N V G P D G A L Y F I \quad D Y G G S I V K \square T G G$
$G \square G R V R D V D V A P D G A D L V L I D A P A \quad P D G G \square K R \square A P$ $M G E R \| R D \square R R S P D \quad D W \amalg Y F S T D S \quad G N \square Y R$
$E L G R \square \square R D V R Q P D G M L Y V L T D E S D G G L Y R \square E$
$R$ RR DVETAPDGSVWA TEDGSPGRVWRLT
GYRIRDVEQAPDG ALIVLVDGTGEVWRVTPK
$T L G R i \quad R D V R Q G P D G M L Y I V T D E E D G G V Y R$
RGWRI RAVATAPDTGEMYITTDS DNAELIRI
$F G K R L R A L A E A P D G A L W V A E D G K \quad D A R L L R L T P R$
MGQR $\square R G L L Q T P Q G D L W V I E D G E N A A L L K$

MDNRTREDRQAPDGATWLLEDGEG PESGHLLRLTPA LGERIRDIEALPNGELIFSTD SGKDYR

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A G N
PGA $\square$ LAFT

Q G

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PASPTPDSPPPGSAVALHDLVTGLSNPVAMIHANDGTH AVQPTGEVSVVAEGLDAPWSVLVLPGGGT

LCLQEVANGLRNPVAMIHANDGRF
AAEGDCTATRTGSFQRTALATDLADPFELAVAPDRRV NTSQAEEAVPHADASTHVVETVAAGLDHPWSVALLPDGRR DGSTSADPTASAGAPDDEPETVVEGLAAPWSIAFAGD VA

PETPQGGDESGAPSRPAEVIATGLDAPWSAFHH GTP PQAPGGTAGATAPALTVQTVAAGLTHGWDVGFLPDGKV AATAAEGHMALTPAALEPEVVFEYED LWGFNWLPDGTM APLATSGTAGGGDPGYDRDVV KLDLPWGVAFLPDGSA
 GPLPAQADAPFAVRR1GAGFDRPWAVAFLPDGRL

## VVLT TRACATDGG $\square$

GYERATVVSGLNSPWDFRFLPDGR
ASPGRSPGRSPSAGS
$A \square S T P T S K \square A S A P$
T L S E E पK $\square$



> APGRPTGTATV,

D DQTPSKPN $\qquad$ QLC VVAENLD
$\square$ DAFEGQTDAPEGATFDEEVI TGALSRPWGLAVLPDGAG DASTNEDSSSTSNPANAETEVI ADNLDVPWAI EKNNDTII ASFQDESSDPPQDVAATVLAKGLEVPWGIAKLPDGSA
 PP $\square A T S T A A S S P A G L A P E E I A R G L D V P W G L A F L P D G T A$ DVKADPQGCDQ SDEWAADSDSLRKEQVVQGDNDPMEMVFINDQEA EMPQKFPETFVPEPKGVEVEVWAENFNDPWSLLFLPNGDA
 NVAATTGRANDADTAPCVLVEVANRLRNPVAMVHANDGRF


QLCLEEVANGLRNPVAMVHAGDGT
TPTPRVTSAAPE STRNVTTGLDAPWSIVTFYGEGTA VF $\square$ QCTQHSQTGPAVIGLQSFGTGFSSPVEITHCGDSR


PGDCTATKTGAFQRTPLATDLADPFELAVAPDRRV VEEVVT GLDAPWSI A FLLPDGSA DYAVETVAEGFENPWGLAFALPDGRL PEGKGEPKRESGKEETVATGLRVPWSLVVTEQ HF PAAYAEDYPEGVSVETVAENLNIPWSVDWISDKTM


GTVQSDSEGLCLEEVANGITRPVVDLQNSGDGRLD - $\square^{\circ}$ I I A EDLD DPWA WEKSENT T
 A ATTEQAVPTGPTIGLERLVGGFQVPTDMALLPGDDQ ASALPEGVQQSQTGTVGLQTFATGFASPVAWENCGDSRG $V N L Q L I S D Q L S Y P T A F A A P N D G N L$

ADSSESSDEDKEDEVETVATELDVPWGD DYLPDGSA
ATPDKDEKTQQFSVDKEVIATKLNVPWSUTKSGDTF ASESLASTEKPAFITKKI AT FDEPWAMTALPEPPK AQEGDCSATQTGNFQVALVDEGLADPFELAVAPDRRV PNRSATVPPGGVSVETVASGLNVPWALAFLDGGRL


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UniRef90_UPIO00369588A








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







VSQRDRGDIVEVLPD


## -







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





 LVAQRK GEI MRVPKGSHDQESFFEVSDDM AVGGDA

## 

## 



 |  | $Q$ | $V$ | $G$ | $T$ | $V$ | $P$ | $N$ | $S$ | $V$ | $T$ | $T$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | $K$ | $P$ | $F$ | $L$ | $N$ | $I$ | $S$ | $E$ | $A$ | $V$ | $L$ | $T$ |
| $G$ | $N$ | $V$ | $S$ | $G$ | $V$ | $P$ | $A$ | $V$ | $A$ |  | $S$ |  | DGE

$\mathrm{G} D \mathrm{E}$
SGGQ
 SGKT VGTVPNSVT
GRLVGNVGNPSAEAV V D S
 $F F V Q R T G K V K V I D Q S T D K V T T A D D F E Y T P E M A R G Q G G L L$ LVTQRDEGTIVLVD DTGSVTPVGPVPGV DGEGEGGLL LISERSGQLIHLDLSSTERTAIGNVPSVAGAVGSGGGLL YISERGGAIVEVARPRGKLIRQKLKLNKRVHHEGEGGLL LFTER NGHLRLIEDGQLLKEPLLS LISERDS GLI RERLPQGGLRDVRTVPGVVHA






 | $L$ | $F$ | $T$ | $R$ |
| :--- | :--- | :--- | :--- |
| $F$ | $V$ | $C$ | $E$ |






 |LVTQRDDATVVRVSPRGEVRTVGEFGDAA
$L V S T K K \quad G K L W L V K \quad K D G A K F L I D G V P D D T Y$
UniRef90_K7RHJ8

## UniRef90_D3CW69

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UniRef90-V4YC48
UniRef90-U5E7K3 UniRef90-I3JBR1 UniRef90_Q1LVK0 UniRef90-A6VYA6 UniRef90-MODC66 UniRef90-U5BYS8 UniRef90-K6D9L7 UniRef90-UPI00037DAF21 UniRef90_G3WWLO UniRef90_UPIOOO381F405 UniRef90-UP1000225BE63 UniRef90-U3DW30
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GLAVAADHAENPWVYAYHTAAEDN CI ALHPRFTTVRKAYVYYSVSVKKEER RRTSEFTVSV HD CIALHPQFAKVKKVYVYYSVSVKRQEKURISEFTVSESDM DVAKSPQFKEQGWLYFTYS K KPTDDGAKTTLARAKDA GMALHPDFENQPFDYLMYTYAGENN ETBTSKVARGKHE GFVLDPDFAQNQQAFAYYTYEDSSGGGQFNRVVVLRY GVAFSPTWGSDQQVFFMHTASEGN GI VFHPQFKDTGKVYVYYSV EDSYEEMDRDSEFKISPDD DUADAPDFATSRLIYLSYAEPRPN GGSSLADMRARDD AARDGHLYWYATRSD GTTFHPSFKHNRKLYVYYSVGDRAEEWDRTSEFRVSEDD
 GLAFHPNYASNGYFYVNY REPRVSDGATVIARYSVSSG
 GLALDPDFGENNWLYMLNSDKTEKQLNVSRFTVVTGNTID DVQVTTDGDTLWVYL A ASGVHDDQTTGTELWRARGA DVAVHPDYPDDARVYLTYSASAADSPAGDTHVGAGRLALD
DVVLHPNFTENKLVYUSYINSD NAGKTRYATIIRGTLER GII AAHPDFDNNGLLYAYHTYRDEG NRRNRVILLK G|AVDPNYDENKYIYGYYTYNEFNRTLSTTNKLVRYQLS GLAVPAGSEPARLYAYETTADDNRVVRLPLTGV G|VASPDFADDRTVYAS
 GLAFHPNYETNGYFYVNYTAPSP GLAFHPKFHRNRKFYAYYSCLGKKKVEKDRGSEMKVSRAD
 GLAFHPDYASNGFFYVNYTNLSGNTVIARYSVN VRGRS GLAFHPQYAKNGKFYVYFSKRVPKTPGDDHQSIIREYKEN GFVLHPEKKNYAFLYYTYKDENGQFN RVVEIR
 GMELHPDFQENGLAFAYYTY GTEEAVKNRIVMLN DVVLAPDFATANHVYMSYVEAGNDTDNNKFGAKVIKATLD DVVPHPNYSENYYVYFSYDTSDDGGQTRYAVVDRADLRDS GIVAMPGDESAVFFYYTTAADN D LPHPNFRQNSLLYGSFVTSENNGGTRGAKVILAKLQ

## UniRef90 D3CW69

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UniRef90-U1Q9E5
UniRef90-W9H7A3 UniRef90-K9AQG5 UniRef90-UPIO00462DF31 UniRef90_UPIOOO333E010 UniRef90_UPI0004783E56 UniRef90-UPI00037BB1A0 UniRef90-D2BCZ7 UniRef90-UPIO0036A2F02 UniRef90_V6KEW0 UniRef90-W8X1T0 UniRef90-UPIO00378825A UniRef90-A1T3U8 UniRef90 L L7EVP8 UniRef90-R9TV85 UniRef90-M6HVD3 UniRef90-UP IOOO3788AB3 UniRef90-F3LJH5 UniRef90-E8VY09 UniRet90-D8HNU9 UniRef90-UPIIO00333BF63 UniRef90-UPIooo366F289 UniRef90-K2AMG3 UniRef90-F6PE18 UniRef90-Q28RX6 UniRef90-R2SXNO UniRef90-R4LMB2 UniRef90-UPIOOO2464481 UniRef90-V4YC48 UniRef90-U5E7K3 UniRef90-li3JBR1 UniRef90_Q1LVK0 UniRef90-A6VYA6 UniRef90-M0DC66 UniRef90-U5BYS8 UniRef90_UPIo0037DAF21 UniRef90_G3WWLO UniRef90_UPIOOO381F405 UniRef90-UP1000225BE63 UniRef90-UPIO0047CDD1C UniRef90_U3DW30
UniRef90-R4SPA8
UniRef90-L7VXJO UniRef90-V6SBA6 UniRef90_UPI00037B9409 UniRef90-B5H411

 QNGLSASPDRVIVDNIPVAQFHNGGRIRFGPDGMLYIGTG ADGSWGGETVLVGSMLANRGHNGCAVEMDRFRKLWVGMG ADT LV HPLTILEYPAWKGHFGARVADAPDGKLIIATG GDGLDLSTEQVTLQVQRGQCCHVGGDVGWDADGNLYLATG
 $Y R G G R L G Q P H L I L T G D P H G V H H N G G R I A F G P D G M L Y A G T G$
$D G D S S S E E V I L E V E A T R G M C H V G G D G F D P D G N L L L S T G$ PTTDVLTFQRLIKDGDEANVIHNGSRLLISNNGKLYMTTG MNSVDHGSERIILETEEPASNHNGGELLFGDDGYLY
 RGSLSLGAPEELTGGPKAGNHNGRLAFGPDGLLYATTG DNQVDSSERTILEVAEPASNHNGGQLLFGHDGYLYIVIGG ADQLTDVEVLHVARPFIDDTGHYGGRVEFGPDGLVYMTVG EDRLEDILILFDSTPKASDGNNGGRVAFGRDHTLILTLG PGSFALGSPEVLLDGDPKAGNHNGGRIAFGPDGKLYATAG PGALALGDAETVLDGIPAAVNHNGRIAFGPDGMLCATTG PNRAELKSERVILETDEPASNHNGGQLLFGDDGYLYTFTG RSATKVKDLLTGLPISQQGR HSGCRPTIGPDGALLVGTG ADNTNLENVETLYEAGPKTPVHYGSRLVWGPDGHLYFTDG NG Qi GAREPLVTGDAKNKFHNGGRIKFGPDGFLYTTGG DDATALSDFKDI FRQDPSGENHFGSRLAFAPDGKLF ITGG PVGQQLGAPDT LRGDPKGNDHNGGRIAFGPDKMLYAGTG GGRARLSELTTLWRQRPASRGGQPGGIAFSPDGHLFLTVG GNTAT FDTDLLVSTLAAAPNHHGGALGFGPDGALYWGVG YDGTKLGDYRGLLQGIKKNRYHNGGRLASGPDGYLYVSTG hDRTTWTETEEL LADLPGGVIUNGGRMADGPDQKLYITTG LEKSKLTSERIIMEVVQPYPNHNAGQLAFGPDHYLYVAWG DNRLDSVETLFADPKTKGGRHFGGRLLLHNRDYLYLSLG NKELSDWQELFVADAVSTTGRHFGSRIAFDDSNHLYVS IUG GGVLSGTPQVLLTGIPRNKYHNGGRLRFGPDGKLYISTG GNTVDHSSERVLLEGEEPAANHNGGQLLFGDDGHLYYFTG PAGRQLGTPRVLVTGDPHNVHHDGGRLAFGPDGYLYATTG MNVVDHTSERGILEIDDPASNHNGGQLLFADDGYLYIFTG LDGNQWEETEVLLDEDPSGANHHGGRMKIGPDDKLYVTTG LAAKGKPRPLLTGPHSAHDNGGQLAFGPDGYLYVSTG ADGTLDTASEKEVANDRGQCCHVGGDIDFDAAGNLYLTTG RDSGRLEDFEPVYTARPESGGHYGSRVVIDAEGFLYVSVG EPA
DNQLDHSSERTLLEVVEPAS
NMLDHSSERTLLEVDEPAS DNKLTEWHDLLVTDSATSETKHNGGQLLFGDDGYLYDFIG PASREVLWRNEI HTGSDDACCHYGGRIAFDGQQHVFFSVG GN TAKDDRVILDNIPAFATHLGGRIAFGPDKMLY GTG NGGAWTEERILLDRIPSAAYHHGGRLKDGQDGKLYI TTG FNGTADSGYAGVESGMRKSRYHNGRIRFGPDGFLY:A AG MNTVDHRSERIILEDEEPASNHNGGQLLFGDDGYLYIFTG


## - <br>  <br> \section*{}

- AGKADPKSERVVLEDKEPAANHNGGQLLFGLDGYLYMGTGG EDGTRPDSERVLGEVHEPRKVHNGGAVAFGPDGYLYASYG DGRWTDEEPVFAAPRSSYTDRSVNFGSRIVFEGYMFFTVG EENNEWFEQKVLLDRIPSGNFHHGGRIKDGPDKKLYITGG DGKLS TTSTPILTA:EKNRYHNGGRLRFGPDGKLYATAG YDGSAWKETGVLLEDI DGADFHNGGRVKIGPDDKLYVTVG TAKPRLQDLTPIIWEQIPKGQGHYSHRLLFSPDGKYLY RATEARLMETPTFRGEGRANSHMAGSITFDAEGNLEVATG FPNLENIERDWKQFPAVKGKGHFSHRIAFGPKGKI FITSG





## UniRef90 D3CW69

## UniRef90－K9ZD76

UniRef90－UPIO003B7BB93 UniRef90－F4C3K8
UniRef90 UPIO00371C0A7 UniRef90－A4WIDO UniRef90＿UPI000365EC79 UniRef90＿S9S9L9 UniRef90－UPIO00476DDFA UniRef90－UPIo004775AD8 UniRef90－J2K2FO UniRef90－UPIO003683DC4 UniRef90－UPIO00441C2EE UniRef90＿UPI00047CC687 UniRef90－UPIO003B4C8C0 UniRef90－G3P081 UniRef90＿NoD2N3
UniRef90－U1Q9E5
UniRef90－W9H7A3 UniRef90－K9AQG5 UniRef90＿UPIO00462DF31 UniRef90＿UPIOOO333E010 UniRef90＿UPI0004783E56 UniRef90－UPI00037BB1A0 UniRef90－D2BCZ7 UniRef90－UPIO0036A2F02 UniRef90－V6KEW0 UniRef90－W8X1T0 UniRef90－UPI000378825A UniRet90＿A1T3U8 UniRef90－L7EVP8 UniRef90－R9TV85 UniRef90 ${ }^{-}$M6HVD3 UniRef90－UPIo003788AB3 UniRef90－F3LJH5 UniRef90－E8VY09 UniRef90－D8HNU9 UniRef90＿UPIO00333BF63 UniRef90＿UPIOOO366F289 UniRef90－K2AMG3 UniRef90－F6PEI8 UniRef90－O28RX66 UniRef90－R2SXNO UniRef90－UPIOOO4164481
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UniRef90－L7VXJJo
UniRef90－V6SBA6
UniRef90＿UPI00037B9409 UniRef90－B5H411
UniRef90－UPIO0047A15A2 UniRef90－UPIOOO262C9D9 UniRef90－MOD8P5 UniRef90－Q0FFJ7 UniRef90－F5SKH0 UniRef90＿l3DOG0 UniRef90＿U2RAQ3 UniRef90－H1Q5B9 UniRef90＿14BFS4 UniRef90－10AJ33
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UniRet90 W6TSG1 UniRef90－W6TSG1
UniRef90－AOAO23CM99 UniRef90－W7SUW5 UniRef90－UPIO00420BD63 UniRef90－UPIO001E8A03C niiRet90－X0S821
UniRef90－UPIOOO465A735 UniRef90＿UPIOOO35C916F UniRef90＿J9SPR1 UniRef90 UPIOOO369588A

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TADGGVPADNPDPSSS TPDGQVPPDNPF AKNPVYITGHRNTQGFDWRDQSTLW NTDGSVPSDNPVIGGTRNIVYSMGHRNPQGITATRSTDHVF NDDGSIPSDNPFPNNA DGTYTVPAGNDFAPGTRPEIFVMGVRNPFRMDVDPDAGTP DDDGKPSPDNPFPNS PD WSYGHRNPQGDDWHPDSGVM YPDGSIPKDNPFVNGALPAIIFTYGNRNVEGIAQHPTGDIW NLDGSVPEDNPFVEDAMDAII WSYGHRNVQGAAMREDGTLL TPSGKPAPGNPFGT DVYTYGHRNVEGLAFDPHGRLW DGGYGDPEGNLFPPQTRPEIFAMGLRNPFRFSVDGGDGAA NLDGSVPEDNPIPGS LVYSWGHRNSQGIVFGKNG1LY SVEYQUPPDNPFDNKARPEVYAYGARNMWRCSFDRGDRLF TPEGRPAPGNPFGS PVWTWGHRNVQGLAWDDANRLY DPEGEPAPGNPFGNFA WSTGHRNPQGLAWDASGGMW DVPYSLPSDNPFLNEARPETYAYGVRNMWRCSTDRGDRMF DGTYTVPDGNDFAPGTRAEIYAMGMRNPFRDTTDPDARAA RPDGSVPDDNPFVDNAEDTIYSYGHRNASGMTVHPTNADW DREGNPPSDNPFVPDAAPEI LSGGHRNVQGVTVDPDGSLL DPDGSVPEDNPFPGS PVVSFGHRNPQGIAWDETGRMF TPDGQVPDDNPFP ASFVYT LGHRNPQGLAWDADGVLY DVNYQVPKDNPFLPGAHPA DHTGKPLPDNPFPGS AAGKPLPDNPFGS PVYNYGHRNVQGVAVRSNGQVL AADGSTPADNPFVKNAKEAGYSFGHRNPQSLTVHPETGUW TPTGAGAPGNPFPSAPRDVGUGHRNPGLAWDSQGRLW
 NVDGSIPEDNPFVEGVLEDIYSYGHRNMQGLVITSSGDIY NTDGSVPVDNPVINGARTHIYAYGGRNPFRLTFTPTGQLL
 DVNYKIPEDNPFVNDSCCETFAYGFRNPWRYSFDPKGRLI TPDGKPAPGNPDP DSVVWSYGHRNVQGLAWDDADQLW HDDGRVPVDNPFVGGARPEIFTYGHRNSQGLAVHHTNSII W TLDGKIPNDNPF DDNVKKEIWSFGHRNPQGLFFDKTQRLW NPDGSIPSDNPFGT PVWSYGHRNPQGLAFDAQGHLW DVPYSIPQDNPFAHDARPEVYALGVRNMWRCSFDRGDRLF TTAGRPAPGNPFGT GVWSYGHRNVQG\｜AWDAAGRLW KDDGGSPSDNDF DVDYRIPADNPFVHKARPEVYAYGVRNMWRCSVDRGDRIIF FLPDGSPTANDALRDVLPGUVSYGHRNSQGAALQPGTDLL NLDGSDPNDNP TPDGKPAPGNP VKDSPVWSSGHRNVQGLAWDSGKRLY DGGYTVPAGNDFAPGTRPEIYAMGFRNPFRMSVDPTGTVY HDDGSIPDSNPFVPNASSAMFTYGNRNPQGMTVHPDTG1W TPDGAPAPGNPVPG DVPYSTPSDNPFLKEARPEVYAYGVRNMWRCSTDRGDRMF DVPYSIPPDNPFVGEARPEIYAYGVRNMWRCSVDRGDRMF NLDGSVPRDNPFVTHARNEI WSYGHRNPQGLFYDTDHTLW NPDGSTPEDNPFAGDGDPD TPEGETPKDNPFPNS PIY NVDGTVPPDNPFPNS YVY俍 DLDGKAWPGNPMVGDARPEVYAYGVRNMWRCSFDRGDRLF NLDGSIPEDNPFENSARAMTWSSGHRNPYGLVVAPDGRLW EPDGSLPADNPDPGS PVYTHGHRNPQGLUAWSDDGALF DVPYGIPPDNPFDGDARPEVYALGVRNMWRCSFDRGDRLF NPDGSAPSDNPFFSGNARYVWSYGHRNPQGLAWDSRGQLW EPDGSVPSDNPF ADSLVFSYGHRNPQGIAWSADGRMF DVNYGIPPGNPYAGAAADE！WA $\square G \square R N P W K F S F D R Q N D W$


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 NLAGEVPPDNPFPGS PAVWSYGHRNDEGLTFDDDGQLW NEDGTIPTDNPFQDKGDKT NSDDSVPEDNPFRS NSDGTNPKDNPWKES ATDGSVPRDNP GDSp DVNYGIPPTNPFADSTRKE DVDYRIPPNNPFDHGARPEIYAYGLRNMWRCSFDRGDRLF NLDGSIPDDNPFPNS YVYSYGHRNPQGLTWSSNGTMY DRRYRVPDDNPFEPGAHPTIYAYGVRNMWRCAVDRGDRMF NDDGSVPADNPFVTGSYQTUYALGFRNPFSLALDPSGQLL DTPYGIPPTNPYVVTGADETWADGLRNPWKFSFDRTGDLW WHDGRVPPDNPFVHGAYPSIWSYGHRNPQGLARNPDGGLW DVPYAI PKDNPFMENTKPEIYAYGFRNPWRISFDKNGRLF NLDGTIPDDNPY SNSLVYSYGHRNPQGLAWDETGQLY
 SASRQSFCRNSNDTAAQFW STGHRNVLGMAFDEKGRLW DGTYTVPEGNLFEPGTRPEDYVMGLRNPFRIAVDPDARQP NDDGSVPLDNPFKNKGAKTFWSTGHRNALGLAFDSKNNLW DRDGRPWPGNPFGN $H D D G R D P N D N P F K E M G A N T$
$T P E G A P A P G N P F Q R G A R P E$

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UniRef90＿UPI00036A2F02 UniRef90＿V6KEW0 UniRef90＿W8X1T0 UniRef90＿UPI000378825A UniRef90＿A1T3U8 UniRef90＿L7EVP8
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UniRef90＿F6PEI8
UniRef90＿Q28RX6
UniRef90＿R2SXN0
UniRef90＿R4LMB2
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250


280 VTD H GPRGHDELSLAKAGDNLGWPTIYRCESKK GMVTP


VT THGPVVGHDEVVNVIVKGGNYGWP LAAVGKADRGEFDDP I ATEHGPRGGGDELNILVKKGANYGWPVVTYGDDYSGKVVSEK T L E H GPA G G D E I N I PQPGAN Y G WP V VA Y G T R Y G G GP I G S G A SEFGDHTADELLNLDRAGHNYGWPATQGKTSNPKYTSP

| A S E F G D H T A D E L N L |
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 ETEHGPRGGDEI NI VEAKNYGWPVISYGDNYNGTQFTQL QSEFGDATLDELNLI QPGKNYGWPNCEGRCSNSAYVNP TAEMGPMGGDELNIPGAGKNYGWP ASEFGQNTWDELNLTEPGKNYGWPEAEGTAGKKGFV
EHEMGPRGGDELNRIRPGGNYGWPEVSNGDQYSGWPIPRH EHEHGPRGGDEMNLI EPSGNYGWPAITYGDDYSGAVISPF VA DVGAASFEEVNLV

AVGQDLLWEEV
ASEFGQNTWDEL
CGEFGNSGMDET
ASEFGQNKFEEVDLVVRRGRNYGWRAREGGCSEMGEAPKH

WTE GQNKYE EVVIVEKGRNYGWRAKEG F S CY DK
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 \begin{tabular}{lll}
$R$ \& $I$ \& $R$ <br>
$L$ \& $V$ <br>
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\hline$L$ \& $K$ <br>
\hline$K$ \& $I$ \& $E$ <br>
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\hline$R$ \& $Q$
\end{tabular}




| $V$ | $E$ | $K$ |
| :--- | :--- | :--- |
| I R N Y G WR A K E G |  |  |
| I | E G G Y G WP M V S |  | | $N$ | $I$ | $I$ | $E$ |
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| $N$ | $V$ | $I$ | $E$ |
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## w <br> GGKEYWG

WG YSDPTF HLGEKGANYGWPDCEGVCEDSAYSDP NRI AAGGNYGWPVIQGKEKKAGMKDPUF NLI QPGKNYGWPTCEGTCSTAGMTNPKR

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| NGMVYPGI | QKGSNYGWPTIQGDETESGMVTP AGANYGWPVVEGAAGDRRFV

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$V$GTNYGWPDIIGD
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NVLRAGADYGWPESEGTRGSAGEE
NLVTAGGNYGWPGAEGYCDGCTS $\square \mathrm{DPDY}$
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UniRef90_U1Q9E5
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Q VTWSTDEASPSGTAT SIVWREALPPGGAA!YTGNSL
GSSPTVWREALPASGGAA Y S T W
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DPP LHAWTPT $\square A P A G L A Y Y A S A E \prod P E W K N$
SRPYNEWNFETATPGEMFDCNALVNNSRWNTGLAETGASE ESGGDTWAPSGAVHGDAFPELRSWLLIACLRGSMLL
TAQKGMEQPIVQW
EPPAYYWDPVIAPGDMTFYEGEMF PEWEGDLLIGGLV VA QWGTSVDSPS G $\square A Y A N G A \square W M$
 WPNVEGFCDKAQEKQFCL $K \square C T N S S \square D D V L P Y A Y P H K M G K S V T G G Y V Y R G C E S P N L N$ T WPTSEASPSGLAFAKGSLWAAALRGTRLWQDPLKN $D P V Q Q W A T G E A S P S G L A A \square G D T L F L A A L R G E R L W T I A P A T$

DFAAKK $\quad$ SGPKFDCAAPVNDSPNNTGLRELPPAQ
QR LDGYESPVLEWTPSDAPAGLAIYYGPEWRGDLLVPALK

KLCHNAS LDDILPYAYSHTVGKSVTGGCVYRGCESP NDN
KYDETVPMTDLTRFPDAVPAKWS
NSKDGMEQPLHYWVPS IAPSGMAF DTGDKYPG
VQQWDVA A A S P S GLEEIVNDWIYM
D P VEE WRTKDASPSG円AFAKGSDWM
ATRPEFDAPSLYWTPVIAPAGLAFYRGTA
TEKEGMEQPLLHWTPS\|APSDMDFYEKDYYP
S GAA $\square T \mathrm{~S} V A V \mathrm{Y}$
ATWNVSDASPSG $\square$ A $\square$
HSGEETWAPS
EGLADDPDYEYGREEGQSIT GGYVYSNS LISDDN ARVWPTSEASPSGLLAFAGGSLWM
VQP H YMWD P S $\square$ A P S GLA AF YN H QWLVGS
DT $\square P G \square E A P K$ WVY $\square P S \square A P S S L M L Y R G E R Y$
K LCAAS LDDT $\square P \square F A Y P H K M G K S V T G G Y V Y R G C E Y P N \quad \square N$ VAE WGPP EDSPSG $\square A \square A R G S V W M$
NSGAS
$K L C A N S S \square D D V L P Y A Y P H K M G K S V T G G Y V Y R G C E N P \quad N G N$
GSGEQAHAPDFIEPRYFWDPS DAPSDMVFYDGDMF
TSGSNQT WAPSGMGY
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$P$ S GAKYDCGGPANNSFRNTGQSTLPAVQ
TFPSG
YGWECGTGGFPPSGTTFYNGDAF
SHADRTDVVGPVYGWECGTGG
DPLLTWSTAEASPSGLAISSGD
KLCQNSSLDDVLPFAYPHKLGKSVTGGYDYRGCQMP NLN

SY L HGETPGGANDDPSGDGYGAAVVVGPVYGAEMFP
SWN WAPSGMAAAAAFPPAGMVFYKGDLFVTSLG
ESGMAET WAPSGMAAAGG
T WSVSSASPSGDAYANG
K LCANS SLD DVLPYAYPHKMGKSVTGGYDYRGCESP NLN
EIPDHPSRPEFQAPVLWWNPVISPGGMDAYTGA $\square F$
HSGNDTWAPS
$D P V Q Q W R P A E A S P S G M A F A G D A L W$
S LCTN AS LND DLPFAYPHTDGKSVT GGYVYRGCEYPN $\square N$ KT WPTSSGGPSGMEVVNDWIY
D P V Q Q WP TSDASPSG\|A IVNG
SSMKMPLVVTNHTSGA CS $\square$ TGGYVYRGPSYP NFQ
 EWR PTSEASPSGLDAY
E QPLIY WN PS DAAPSGMTFYSGKQFPQWKNN

QS GGQTWAPS


EYAHN

K LCANSSLDDVLPYAYPHKMG
TSGSEET
WAPSGMDYYDG
S L G
EAPNNYTEPLYT YKHDTDCADAGLTQYNPAQFRFP
PKNCPSRTPPDVRGGEPLRRDPVI EYPHARNGETDGDSVI

TAKEGMEQPVKYWT
$K N W I N P D A T K G G N Y$
HS GDHTWAPS
QTWSTSSGGPSA
HSGEETWAPS
HSGTDTWAPS
TPPK PS WTPVISPSSMS $\square$ YNAGKYNDFPAWQGNA LIS G LS
DFATGE SGEKFDCGAPVNDSPNNSGLTELLPPAQ
DTRPEFTAPVAYWVPTLAPSGLTFYNGNEWQGQALLGGLK AATWTTREASPAGLAIVGNRAYM
STNKKFTPPVRFWVPTIAPAFMP $\square E E R K K W S G N A F \square S G \square K$

S Q H LQRVVF N
G G T
GAD $\square Y Y$ Y DNDTDQPWPE $\square$ T AF GAS GGQGPMGGP $\square Y$ HFDEA $T P S \square A V C P A E F C T \quad S P$
APG\|VR LA WDGDR
PAA $\square$ WYGYDESEEFPHGTGGGAPMGGPAYHFDPD $\quad$ ES D TK
 GLY $D F$ GDFMSGRDMSLKEN HETGEWQYNEI GKVSTP $\square \mathrm{S} Y$
GAGD $\square A$ STA WFVGEFGR $\square R D V A A A P D G G L W F \square G N N T D G R G$ GLY FGDFMS GRLM
PATVWYAYSASAEFPELGTGGGGPMGGPVYDYDPDNTYRT
PCGMDFYTGSA

G $\square \mathrm{Y} \square \mathrm{F}$ G D F M S GR $\square \mathrm{MA}$
SGTPTEATCGDTFL AGK

GKY $\square$ FADFVSGR $\square$ WA $\square D \square P D E F T Q P A K K V Y S \square G K W P L I S S$

G $\square Y \square \mathrm{Y} \square \mathrm{F}$ G F MS GR $\square \mathrm{MS} \square \mathrm{QENPGTGQWSYSE} \mathrm{\square CMGHGQTCAF}$
G $\square \mathrm{Y} \square \mathrm{F}$ G D F M S GR $\square \mathrm{M}$

PA W $\square$ RYAGDAGSPPEFGSGSESPMAGPVYHYDAD $\square$ DSAVK

GLYMF GDFMSGRLMSLRENVEWQYNEDCMGRDQTCRFPKL GLY IF GDFMSGRLMSLKENPETGKWSIICMGNDKTCSFPKL G Q A $\square \mathrm{M}$ R

G $\square \mathrm{Y} \square \mathrm{F}$ G D F MS GR $\square \mathrm{MS} \square \mathrm{LE}$
NQATRQWQYSE!

G $\square \mathrm{Y} \square \mathrm{F}$ GDFMTGR $\square \mathrm{MS} \square \mathrm{HENPE}$ WQYNE $\square \mathrm{CM}$ GHGQTCDFPSL
GKYFFSD YC $\square$ AK $\square G M V D S S G N V T F S Q T F S G N R F V T F G E D$ PAVWYAYSASAEFPELGTGGGGPMGGPVYDHDPAVTYQGK

FPPSGAVFYDGDA
SKALVRTDFN

G G A P V
GKVF $\square$ A DEVQGWDKVLT CSADFSSCGNAQDFDPQAGSSVV GKYI YGDYGSRKVW
GMY IF GDFMSGRLM

GGY $\square Y$ YGS $\square D A \square D Y V F G D Y S K E G D P R G S \square F A A T P T E N G \square W$ GKYFFSD YCKAQDGMSDASGNVTFSATFSGNNFVTFGED GT $\square \mathrm{WT} \square \mathrm{T} D \square \mathrm{NKELWKMER} \mathrm{\square S} \square \mathrm{SREPGHWQ}$

SKALIVVDFDENSRATERYRYDMGERD
PA WV WYPYSASAEFPELGTGGGGPMGGPVYDFDPDNERVT
GK SLVR
$S K S \square F R$

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 NPEHWDGKAFFGEFSQDY $\square$ AAFTGDNNGSVTA $\square E N F L P N A$ $\square F P K W R N N \square M G A L A F E E L R R L V I V N K K V T K Q E \quad M \square M K$ WPEYYDG $\square P L L Y E W S R Q W \square K Q V H \square D D D G G V L D \square T E T V P D \square$

PEWNNS LLLGSLKGRS LDRVKLNPEGSRDEKEGDFFQL CMGTGQTCMFPGLINNYYQYIISFAED EAGELYFM

S PRDGDDRLF
KFPQYEGKAFQYELT RRWFKTFSFQEEDQTFTDPRFEPDM $F S D W D G D L F V G G L A S Q Y V V Q F A V D G R E$ V SEKQRLLPD

QWGE WDGALATVALKGAKLIVLTLDEQANVVSKAPAEVNG WEGDLVVGSLKFMRLQHVQLDDSNNVVGEQ KLDN

FPAWQGSALDGGLRAEGLVRVAFGKDGVPRQADRWSL

FGKDASGKVY LDSDFGSGK $\square Y R$ I DDRS


PDWQGD $\square L L G A L A G Q A L V R L D \square D G T S V I G E E R F R$ T

FPAS DDDRFFATEYGRKWDKP DEVKADGSPGTDDTFPW
PDWRGDLFVAGLAKQSLAHFRVDGRDVTAVEP LLAD
IN S Y Y K Y I I S F A E DEAGELY FLA T GVP S A T A R G GVI
I NSYYKY I SFGEDEAGELYFLATGAASATARAGVV
 EEYDNVLFYSDYNDRLIKYLVLNDDGTEVVAGPYNFDD

CMGRGQTCMFPGMTNNYYQY\|ISF
$P Q Y R G S L F D A G L S S K S G V V V V N G A Q A R V A E Q$
$\square$ NHYYPH $\square$ I S F GEDEAGELYFMSTGEPSAT

M NGELYAGSTNNGVIYKLIDSSLSVVKSTK QWKGHLF $\quad$ GTLREQAL $\quad$ RLELDGTRVVR EERLLTQ FPEAFEGKWFNYELTRKWFKTFSVQQQDQTFTDPRFQPDM



LR Q A P D G S $\square \mathrm{Y}$ Q LT Y S P G Q LVR $\square \mathrm{SGAP}$

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A WGR $\square R$ ASA $\square G P G G Q \square Y A T T S N G T \quad N D R V D R \square R P V$ E WD N P M D LEF GPDGS $\square Y$ VLE Y GDGFFRNPDAGLYR $\square \mathrm{D}$ Y A GFGRVRD $\square$ KFGPDGA $L Y$ VLL
$D L A N P M D M E F G P D G S \square Y V L E Y G S G W F G G S A D S A \square S R \square D Y$
$E \square G R \square R D V M V S P D G D \square Y \square C T S N D D W$
$S T G \square P S A T A P N G V V Y K I V D T S R$

EWNQPFDADFGPDG A $\square Y V \square D G T G R G G S N E G A G \square Y R \square D Y$ RGWRFRDVAVGPDDAVYLA D

KFGRLRAARTGPDGADYVTTSTGSN_DKLLRDAPT NMGRVRDVRMGPDG YLYASVEGEGUV

DRR $\square$ R DVAVAADGAVWLIEDGSGAGLLRLTAK


GEGRVRDVEDDADGA LILIDDDPGALIRLTPAA

TGTQVMDSAFGPDG A
A L Y R VE Y L RGTRIRDVTVSPTGHLYAAVDDAPAP $\square Y R \square$

LDERLRS DAQDSAG VLY $\square$ GTDS GKLLK $\square T$ QAGALVSTKVGPDG ALYGSQLGRGQIVR

MGER $\square R D V A Q A P D G A \square W \square I Q D G G K G A$
$\square R E R \square R D V R Q G P D G W L Y\|L T D N N D G Q\| L R$
$A W N Q P F D A D F G P D G A L Y V \square D G T G R G G S N E G S G \square Y R \square D Y V$
RE WRMRAVAVEPSGH

EFGRLRDVRTGPDGF LYYLTSDGRGSPDTNDDR\|LR\|VP
$R P \square A \square A T S P D G Y \square Y Y V A R G G \square G G G S Q V D N T A T$
G
$N \square G R \square R D \square A T G P A G E \square Y \square S \square E \quad \square P R V P G R \square V R L L P$

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

DGSPASKDESFQ TVVTDGKPWDTEY DQER VERVAGPFDFPWSIAFDPEGGM QNTKLDVALAIPPDGTR
$P A G V E \square P V R P V G E D V V I A A G L D A P W S V L R \prod P A G G T$ ATPGGTARPPAQSPTDTEVATGLSAPWS TFH GTTA VNAGEQKPEASLPFTMTTVASGEELPWRLAFLPDGRM SVHENDFVETLAKNLDKPRSIADSDDRB TGAGAP V T TV S S GWS $\square P W$ W TA WL P D G S A
QLVDATTPTFSLEKVNDSLYAPLALEENAHDGRA
DVIARPSDAWPKAPNGFKVDLFASGLNSPRKIVTAPNGDF
P T TNELTVVAS DLDAPWSIQKAGE RF PYEASVLVDGLNVPWELVSVPDGRM
AQTVTSQHHNFQQEKI DDTDVDWGLDFYDNETV
N【IGWPAGETPAEQAD PATTSSGAPLVRDVVQVEEKLDGLQLPWSVVFLPDGTA $K P E V M A E G L K V T W G M A Y L P N G E V$
$D V A E V A T G A A P W G L A A L A D G T L$
PAVEHPVVDTDLDVELLAENLDAPWSAAFVGETP
QGQTAVAQNVQVTQ\|ANGFEEPWA GFLPGGDA
PPDPSPTVVDGLLVETVIGGLENPWSMVAGGDGRL PMTDSGDGTANERAVGLETVASGLRSPLAVAFAPDSDR
P पF TGADANRKQVT $\square S \square Q E V V K V K E P T D \Pi Q F P P D S P F$ STAQANSDLKQAYTTTVVSDDLGVIWGMDWVDEQQL PAQLAVRTLATGQAVPWDDGFLPDGSG PTRTTAVDITTDLDAPWSMAALPDGTV
SQPATAVADP GF REQ V FSG VEVEPVVENL
SASVAADQDVKLVRVAAGFERPTVVTHAGDGRLL dARTTSGQASSTDAGGGSVHTDATGLYVPWGAFLRHGTA
$F G L A S A Q S T N L V P \prod A N N L N R P L F L A M P G S D R$
$P G T T A P D \square S E S Q V V T E H A S S N N E G W A M S F L P G T H Y$
AESLTSEQQELKLDKI APDAFDRPSSMAILNGELY APARSVTEAPAAVRVVDAYPKLDAPVEFTHANDGRV

APPSEDEGLKLTPLVTGLASPILVKSAPDPTR PLLQSQSKPEEEPRLTRTVFLSGLSDPWDLAFTPDGAL
 DAKLPPEEHSSPRDS GDQEATQSSQAQEGVVFKELNAPWN VR

SAETPESTPLETVA ADCKATIDENYTAERLATGFDAPVAVEFTTDGER VVQRPEEAKP ILPPGFSAELIASGIVNPRVVRVAPNGDL ATDEEAAAFFDPGAEVRTLAEGMTAPTDMAVADEQER

WGFDF贝DQHSG
AEGETTAKPETFK
EVATNDQVP VVARPAGALPQALPGFVVNLYASDLKTPRALKRAPNGDV WPQATMPTVPAGFLVTQYAADLESPRNMYVLPNGDV PSPPSGMCLEKIGNGSYDNMVPHPDGRV AEPGDCTASRTGAFQRTPVTEDLADPFELAVAPDRRV

## $\square$ S

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 GLAFHPDFSKNRRFYYNAVSKESGKDQTLILEFLWEPQKI DVAVDPEYPEQPWIYLTYSAED GEGTTSTHVGRGQFD
GFK LLP GFKDHHRAVAYHTY DVMVTRDFARSGTVYLAHV RGEEPANTVILSRARLQ GLAFHPDYAKNRKFYIYYSLQDPKHTRVSEMQT FADD GLAFHPRFRRARTLYVYYSVGTRSREWUR DSEF RVSEDD FLADPAAPGGTGWVYAYFTASDDN RDERMPLAGT DI $\square$ ASPKDKN VFYFTYA KPDGKGGTPTLAKARLN GLAVRQDA LYAYFTAADDN R VRYSLTGT GVFVSPHYATDQSIY LTYLEPGD YGGGLVLARAKLHDS GI ALHPDFSNNHLMYVFFTY EENGKLWNKILQIT GVAASPAW NGKTDKDVFFMETTATDNRVVRMS GVALSPTFDDDGLVFFYRTAEDGNEVLSGAL
$G V A V D P Q W S A N R A V Y F D H T S S D G N \quad R V A R M T$ GFAFHPDYKNNGRFFVHYSAPSKKGFDNTSVLAEFKVSAN GITSDPAFATNGYVYVYYTTTV GGTHNKVSRFKMT GLAFYPVGKNPKWLYV
GFVLAPDFEDSQEAYAYYTYQGDD GNTNSVVRFPYQN

DVKVKEDFQQKGYY Y

 LRQVYLQDLNQPF GMLVLNDYFYVANTDALYRFPYK GFVLAPD AT FTTTYDAYAYYTYEEESAQFNRVVTLT $S P G F A T D R W L Y A Y F T S S S D N R \square A R M Q L T \quad R \quad R D G$ GVAVVPGAGSSGLVDVVVYLTS GI AVSPDYKDDGEI FI YYTAADGNRDASL
GVAVGPEDAAPGEVFVHRTAPGGNEVLRGTDT
GIVVGRNQ $V$ G YVYQTT DVMVPRDFAATRRIWLSYAAPVAGGAGTAAGFGR GLAFHPKFHHNRKFYYYSCLDKKKEK $\square R \square$ SEM KVSRAD DVLPDRDFARNQRVYLSYAEAD PEDPSRNGVAVMAARDD GI ALHPEFTQNRRLFVRYSSPPREGTPSNYSHTFVRVADD GI AFYPVGPDPKYVYVGNTDSVVRFPYQNGDTKAR
 GVAFAPGFPKQPKLYTNYVKAVGNKDVTVVSEWVVENPTN
 GLAVNNGCGTSGTDGCLF LYA YFTSAADNRDVRMPVAGG GMTLAPNFPADPYVYVLYTYDAPPGQTAPVWNDVSRLRAA GLALHPDFPTAPWVYVLYTYDGANGGRCVVTARLSRLQAD $G L T V H P D Y P A V P V V Y A V Y T Y D V$
$G L A F D P K F K Q S G R F Y I N Y O D G P R N R L V C F D V T$
$A$

 GI AMAPGDESVVFAYYTTDTDN S V F HPDFERNRYLYVCY DQA GLAFHPNFRQNNLFFINYTNRSGN GMAFDPAFSTNGFLYLSFTEDTGN NTGMTVIARYRAN DLDPGPTFDTDGTVYLSWA R RPHAQGMTSFVVARFESA DIAF EKENNVQRVY LDCDSKVIPGNKSSTAIHSYNLK EIVSSPAFPDTGWLYLTYASGD DDSTAATLGRARLA GLAFHPKFSENGYFYVNYTKDNPRETVVS RFQAPKG GLAFHPEYSENGYFFVVYTADGPRRTVIGRYNVNME GVAVDPDFVRNRFVYVYGSPATNRVIRGTVDRGYSKVSNR GITLHPNYATNGYI YVNYTRKGDRSAVYARFTRSTANPDQ DVALDPAYRDNGWVYLSFSTSSGERDGRAVGNTRGRIAGD GLAVVH DDYLYAYFTTRGDNRDERYP GMVLDPDFKDNQTAYVYHTYAKQGQA TNRVIADK GMALHPNFTSNQRLFVYYS DRGETREK $\square$ R $\square$ SEFTVVYENP GLALHPDFAENRRLYVRYSAPRRSGTPSNYSHTFVRATDD GI ELDPDFMTNGWVYLHYTPHSK $\square$ NRDTRMQRQVSRFTDD GI AFYPPGDDPQWVYV ANSDSIVRFAYRN | $G$ | GFHPDFAENGRFFVRYSAPPNEETPDRWSHVAVLVTDD |
| :--- | :--- |
| $G L A F H P N F T S N S R L F V Y Y S T L S S S G S E I I V R I S E F Q T M S N D$ |  | GLAFSPDFQTDSKFFVNVIVK SSGSGGKDYSK LLEFEWK

DLKVVEDK GKTFLYYTYS KEVKDLWTTAMGRALYK GFILKPTFAETKTAFAYYNY DEGEGPFNR\|VTLK SLAFDPAYAANGRFYVYYTDTAGDDTDARYQVSAA GMAFYPPGDDPKWLYVVSNM GLAFHPNYLQNGRFFASFNCDKVRWPECSYHSIIAEFTAN $G L A L D P G F A T N H R L Y L L H S D R T E K R L N L S R F T A V T G N T V D$ SLVFHPDFKNNGFFFVNYTRS BDGATVIARYKVAAE


## UniRef90_UPIOOO382B276

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UniRef90 UYUM UniRef90-U1YUM7
UniRef90_D5UK13 UniRef90-D3Q868 UniRef90-UPIO00464C44C UniRet90-UPIOOO3B3D785 UniRef90-UPI0003B4014F UniRef90-F7IRM8 UniRef90-UPI0003B47E1D UniRef90-G2MGT8 UniRet90-LODQA8 UniRef90-Q4PK43 UniRef90-R9A483 UniRef90-UPI000474C4C0 UniRef90-K0JQX1 UniRef90-UPIOO047EF54D UniRef90_U5VZK6 UniRef90-아A48 UniRef90-MOGTI9 UniRef90-K9ZZV3 UniRef90-UPIO0038207B5 UniRef90-M0QD59 UniRef90-UPIO0029A896E UniRef90-D3PN69 UniRef90-R8B042 UniRef90-UPIIO00381279A UniRef90_UPIO00368D227 UniRef90-W7QDD7 UniRef90-I2GLV2
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UniRef90 $\mathrm{O} 023 F 3$ UniRef90-UPIOOO37521C0 UniRef9O-UP10002C342B6 UniRef90-E2PZ72 UniRef90-UPIO0035F130E UniRef90-l2N9H4 UniRef90-UPIOOO40B1A7C
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LS WK D RKRVLLRVDQPYSNHNAGQLAFGDDGKLYIGFG GDLKARSKAEKIVASLPHDGGHSTRDIVFTPDNKMLVSVG

RNSEQWEETSVLLED TPGAQFHNGGRTE $\square G P D D Q T Y$ VTG GDELIDREEITFVAEPMADGDEFGGRLAEGADGHVFLSLG PNKADISTERVLLETPQPFWNHNSGNILFGPDAYLYIA G ENSVDHSSERLILEGEEASNHNGGQLEFGDDGFLYGTG EGGYTDGEPEQVLAGIPKAGNHNGGRLAFGPDGMLYATAG GSTDESWQDLFSSNVVVTSGRHFGSRLAFDDEGYIYMTMG DTSARLNNFEVLWRQMPKGKGGQAGQ:AFSPDGYLFATVG FDGKALSGYTPVLTGGVRDTQHNGGKIAFGPDGYLYVTTG DGTVLGELTPILSGUPAGSTHNGGRLAFGPDDQLYVTTG NPDRADPQGKVILEVDQPQSNHNGGNIVFDKKGYLYI GDVIDPSSETTDLDALSTASNHNGGALHFGMDGKLYIACG GDLDASGKAETMVPDIPSGGGHWTRDLAFSLDGKLFVAVG GGRAT I DNKAEEFTEKEVVNANS AGQGKALEGAEDLVVGETVHGAGGSRILFGPGGALYVSVG LIDNKWQETDLLIDRTQSGTYHHGGRLKANADGKIYVSVG SGDLRRGPAEVVFSGGPKASTHNGGRIRFGPDGLLYYGVG

 $P N$ A L G F R AVMEPVGRAGGRHFGARLVEALDGTVFLTTG



 GGA PEPDVVTDPKNRFHNGGGLEF GPDGHLWATTG $P G S Y S L G T P E E D L T G A K A G N H N G G R M A F G P D G N L Y A T S G$ GNTMTGSEQVLLHDWCQQFPSHSIGDITFGADGMLYVAAG GSVMTGAE QPL LHDWCQQYPSHSIGDLRFGPDGMLYVSSG A D DPAKTEETVVLDGDPGANVHNGSRLAFGPANYLWMTTG GDRANPSSAAVLL T DE QP Y A NHNGGQLAF GPD GY L Y I $N G Q D S D D T Q D L A V T P T K D T P V H F G G R L A V L D D G T W L V S T G$
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 N N R LT N E K V I Fill N K DS S S GR H F G C R L A I A ATVVDPATEVVLFKFRQPYSNHNGGKVLFGPDGYLVV
 P DVANPTPVATYLE QAQPARNHNGGSLEFSPDGFLYLGLG RDIVTDDPFKNSFNRWGGAGAHSGGRIRFGPDGFLYVTTG A DSSTEFVVLVVVPYPNPQGAARSGCLGFGPDGYLYY T TG GS GGLR WED Q QL V H D D GP Q GVHFGSRFAFD GD GHVVFVAG $A G A V G L G V P E T V L A G D P V A S N H N G G R D G F G P D G M L Y A T V G$





 DGKLSAHEDLFVADVVSDTSRHFGSRMAF KDQFVVVVI G LE GNVWQETVIHLDGIS T GNVHHGGRLEDGPDNLLYATIG
 G GQTS DTAK GQKI LDLPGYNNHWTRNDVASPDGKDYVSVG GT A S Q P S EVRRRDFTMGLPFTSHHAGQILFGPDGYLYBMMG PASEKR L LT T P TWRGEGRANSHMAGSLAFDRAGRLHVATG GNRADPASARVLLVIEQPFANHNGGQLAFGPDGYLYI STTRRRDDKVLLEWPVQQHSCCHSGGGMAWDSKGNLYY A T G HATAT $\square R K D L L S W D T Q \square H S C C H A G G G M A F D D D G N L Y V A T G$

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UniRef90 F6FSR8

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REDSQNSKNHSGAII K
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DGGNSNDSGPG
DNHNGLLP
ERGRNELSS L
DAGNP
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SWPG $\square R$ GSVGDPDRVS


RSAQS
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DNNSSQFSEGYSGNNPQPNYKDARRTAGNTNNLNGKILRI SNSNVGEEGMAKEPEGGLDAWVPLGAAWGMEDGRADVLAF DGG GANDDMLGHVDDWYDGNDGGNGQDVDNLLGSVLRL D G G R
D G G GANDPYKN
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DGGSIGDPYNFSNKKSDGKGMKEEVRRANIIED DGGS GDPYNFSQNKKSLLGKUMRLNDDNPSALSDSDL GL DNNSSRFSDGYSGMGDGGSGGDPLNHGQNLGSLLGKILRI VNNSSRSDGYSGNNPQPNYKDARRTSGNTNNLNGKILRI | $V V G E N E L$ |
| :--- |
| $D S N S S G$ |

RPTAQSDGASHHGKVLIRI
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AQDRKNGSVRL
A QDPTSKNGKILRL

UniRef90_UPIOOO382B276 UniRef90-I3EBSO
UniRef90_F6FSR8 UniRef90 ${ }^{-}$EOMJZ 5 UniRef90 A0A023D058 UniRef90_UPIOO035C519B UniRef90-A9A5X9 UniRef90-UPI000379DF81 UniRef90- V4Y2B1 UniRef90-A0Аог3Хом6 UniRef90-17A417 UniRef90-H5XR69 UniRef90-H6R2W7 UniRef90-V6HBQ3 UniRef90 Q89RQ3 UniRef90-UPI00034A270A UniRef90-l3D1N8 UniRef90-IOJSN2 UniRef90-V4RS83 UniRef90-UPIO0037AF4E9 UniRef90-UPIO0035129C2 UniRef90-UPI0003B54727 UniRef90-A6CXHO UniRef90-UP10003B5C3D8 UniRef90-UPIooo35D7021 UniRef90-F3KN15 UniRef90-S5UM72 UniRef90-D1BCFO UniRef90-E2PY08 UniRef90_UPIO0037E8739 UniRef90-UPI00037B7B16 UniRef90-UPIO00369ACDF UniRef90-UPIO003B6B788 UniRef90_UPIO003FC4615 UniRef90-TORR09 UniRef90-F3WZ61 UniRef90_UPI0003FE25B5 UniRef90-B1HVF7 UniRef90-U1YUM7 UniRef90-D5UK13 UniRef90-D3Q868 UniRef90-UPIO00464C44C UniRef90-UPIOOO3B3D785 UniRef90-UPI0003B4014F UniRef90-F7IRM8
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UniRef90_UPIO0047EF54D UniRef90_U5VZK6 UniRef90-10HA48 UniRef90-MOGTI9 UniRef90-K9ZZV3

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 TESENKLKDNAQTLFDK DPDGEAPFDNPFAHGARREI WSFGHRNPQGLAFHPTGELW NRPYGLPSDNPFKPGHHPEIFALGLRNPWGLTFHPTNQLW DPPYRVPPDNPFVGDARPEVWALGVRNMWRCSFDRGDRLF NQDGSVPKDNPGGDNKF TPDGEVPDDNPFPGSKRF TLDGKPAPGNPNFGKTPAETWASGHRNPQGLAWAPDGTLF
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ERDGSIPSDNPE WQYGLRNPFTFDVQPTGKLF YVYSYGHRNPQGLTWLSDGTFY GLDGSIPEDNPWPNS APVYSMGHRNAQGLAWNPNKGLY TADGRVPPDNPFVKGSRPEIYTYGHRDPDGLALDPRSGSI N $N D D G S \prod P N D N P F P G R S Y$
$T P E G R A P G N P F P G S$ TADGAPAPDNPDPSS EPDGDVPDDNPFE TQDGDIPDDNPFEGS FADGAPLTAPEFAGDVFPGVYSYGHRNPQGLAWTEDETMY DVNGRVPLDNPFVPGAHPALYAYGDRNMWRCAVDRGDRIF LPDGRIPADNPFQWQGRPWHWSGGHRNPQGAALHPTGELW DVDGRDPADNPLVGQALDEQFAWGFRNPWQLSVDQG ALY NQDGSTPEDNPFFENANEREYASGGRNPVGLATHPKTGQL SKPYSIPSDNPFVGKAAPETFAYGDRNPWRMSFSPDGRLL NIDGSIPKDNPFIGNALDELWSYGHRNPQGLVYDHHRKLW TPEGRDPADNPFPGS PRVYSGGHRNPQGLAWDGAGRAW DPTGAAAAGNPNGGAADRRVANGLRNPYR\TMRPTSEAW DPTGEAASGNPGAGSADRRVIATGMRNPYRFALRPTGELW
EPDGTAPSDNPFGPDSDSRLYTIGHRNPQGLTWLPDGTTL DVSGDKPKDNPFVNGARGEVWAYGLRNPWRESFDRENNLF DRTGRPWPGNPFGN
DRNYRIPADNPFVPGARGE DRNYR|PADNPFVPGARGEIUAYGLRNPWRMSFDRTGDLW NPDGSPASN GLAGALPELAYGWRNPWRYSFDRTGDW TLDGEPAEGNPWYDGVAAEFYSMGHRNDLGUAEGPGGSVW LKNGNKY NNKAFTNSLPETYSLGHRNPQGLSFDDEKNLW DPQGLAPEDNPRFEGFLPELYSWGHRDDQGLAVHPDTDAW DVNYGIPADNPFKDNKDGFEYAYGLRNPWRISFDDEGRLW DHPYRIDPEGNMGEGVLPEI WDYGLRNPYRFSFDCTGDLY DRNGAAAPGNKTPSGGDPRIFTYGHRNVQGDAFHPTGRPY DEDGSVPADQPFADDAVRGLWTLGHRNPQALLFQPGSRLYY TSEGKDPDPFEGNQKGYVYSLGGHRNPQGLVFDDEGTMY DVEGRDPEDNPLVQDGLDEHYAWGFRNPWRFSFDEDS D

 DQPYA $\square P P D N P F A A Q A R G E$ TPDGKFVR
N
WGNYPDGTGER WGNYSVPADNPFSEDKEP
$D G S Y T I P E G N D F P P G T R P ~$ DRPYAI PPSNPFVQGVRPE DGTYTVPAGNDFTGDTRGE E LNGDMPSDNPFE

WALGLRNPWRCSFDLERYFLL YAMGMRNPFRITTDPDARAA
WSYGWRNPWRFSFDRTGDMW WSYGWRNPWRFSFDRTGDMW
$Y V M G V R N P S R T F V D R K T D L D Y ~$


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T Y P H T A P P A 290
QSGEDTWAPS
DPVA WWPTSQASPSGRTTPRPCGC
DTRPEFNAPEAFWVPS $\square$ APA GLVIYDGDDWKGDAF $\square G G L V$
DPVQQWAPAEASPSGMTFYNG

YDPS $\square E P G G \| L Y Y T G D K F D F E F P F \square M$
TWEPAEASPSGA
KAPELYWVPTVAPSGLAFVAG SEFPQWTGHALIGGLR
TFNPDNASPSGA
T S GLTMPVVWEYGHNEEGGWS DTGGYVYRGKDAAGEDE DYETNEPLGDFYDCENGPDNDSPHNTGLERTPPYYPRSWT DPLVT WSTDEASPSGDAIAAN
PGLLDPDFEYDHQVGQSITGGYVYRG
DLKDRVTIPDVLIQPHSASLGM TFYEGTQFPSDYQ
DPFEREDVEAPVVHWECGSDGFPPAGMAFYEGEEF
SNSPVYSLGFRNPQGMTWDDDYVAEFGPEKNDEDNLDQAG ETGRNTWAPS
PVVTHGDNYDGTPVG\GVQA

 AQEKD
D P V ${ }^{2}$ Q Q WT P D QAS PSG $\square$ A $\square$ T G D
S TIEPSG\|LYYY
VWK P
DP LV S WP TADASPSGLAV
T WAVAEASPS
 TYDHGSGVNGCAI TGGCFFNPTSTNYPSKYYGKYFFMDYC ELKDKVIVPDVLLQPHNASDGL TFYEGTQFPKEYQ IVHSGSSETWAPSGLATD

P VA PGT
DLVKKA $\square$ APDVPVGAHTGTLGLA FYDQKTFPQKYH
TSGPSKT WAPSGlTV LGLA
YGNNYNGVP $\square P K P$
$V W P$ STGEASPSGLEVVDVAYTG
DPVATWATSDASPSGLAVV
D PI AT WT PAEASPAGMAIA
$D P V T$ T WATSDASPSGLDVT $\quad$ REAAY $\square A G L R$
QWTPAEASPSA
TAKDGMEQPLF YWDPS $\square A P S G \square M V Y D G P D W R G Q V F T G S L N$ RKCHNAS LDDVLPYAYGHAVGKSVTGGYVCRGCEFPN L N SRQAGWLPRSI APSGLAFNTG GRYPGWEGQLFSGALAA TLETVRGGEPLRDPVVEYP HSDRPVSGDSVIIGNVYRGT ELKNKADVPDVLLQSHSASDDL TFYNGEQFPEAYR
 EDPVKVY I P S IAAPSSAVIYQGNAFPE
S WPTSSAGPS
$D P V L V W P T A D A S P S G \square A V V G N T \square Y M$
$P I C E A L Y T Q P S G T H T A P F V A W N H S S K \square V A G E$
TLCENL
ALYTQPS GTHTAPFVAWNHSSKLVAGE
A PVVNTGSKTWAPPGCAFYTG
SNCTRERKLVDPILQYGRSEGVSVTGGYVYRGKA VPELV TPPDHNWTPSVAPSGMDHYT
T WT TE EASP
 $N G L V \quad M P V L T Y T H D Q G R S I T G G Y R Y R G S A M P$ AFR DSPSGPF $\square \mathrm{DP}$ DAAYGHN EGVSVTGGYVYRGNNMPAMQ
$K \square G \square G T S \square P$
VASSRLFTDDDATPAHEFPEPDAPSGMALVTGE
NTPADY $\quad A P V W Q Y S$ HSNGDVSVTGGMVYRGQQNP S $\square K$


TF KM M M
HAEAGETEPVFTWTPSDAPCGAAFYDFPGWRGDLFVTSLV DPVQQWRPADASPS GMV DSAGS $\square \mathrm{W}$

 TKPLGWYNCDAPPNNDGLVNIPPITG NT IWYSPQGGAPDY $D L A G K A T V P D V L M Q A H S A P L N I V V$
$P E D C P D S A P D E A P Y D G Q E L Q D P I V E Y P H V Y D G K S F P P D Y P ~$
D NFDCNDSAPDEAP

| D | C |  |  |
| :--- | :--- | :--- | :--- |
| $\mathrm{T} T \mathrm{~T}$ | T | N | S |

TTTQEGTVV
EQPVVHWSPS $\quad$ S PS GMVFYRGDKV WAPSGMVTF
GFVLKP PLLEYGHDAAGGCAVVGGYVYRGSAMP A LDR G LKDKVIVPDVLLLQP DAAGGCAVVGGYVYRGSAMPAALR ELVKTAIVPDVPLGAHTASLGLA FYTADKFPERYR NTSTSSINPIFPVMGYNHSDVNKAEGSASDTGGYFYRSMT

AAPKNESPNNDGLVNLPPVTPNTIWYAPQGGGPDFPRDAN LA H S GDK T WA PS GVGFSEG

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S Q A L I R VD $\square$ A A D GSASEAERYSWRKR $\square$

SQALIRDAFAHGKAYEAERFGW
GKY $\square Y$ ADFVS GN $\square W$
GWPQTWE GWPGRD $\square$ NP $\square$ PEPFMGSGAGGPMSGPVYRYDEN

GDAFAAEHGSWNR
KNYGWPEQQCSGDKKFENA LLCYDPS $\square E P G G \square L F Y S G D T \square$
PGMADPLHVWTPS $\square$ APS G L A $\square$
GTY $\$ YGDFVHGNDWA
GLYIF GDFMS GRLM
GEVDDWFVHSF
G $\square \mathrm{E}$ S P K K VY $\square$ P S $\square$ A P G S $\square H \square Y$ Q G E K
DTRPDLTKPVIYWAPVIAPGNLMFYT GTQ

GKY $\|$ F GD W
GNWMDVMDPS
GNDFAAEHGSWNRDPRAGYE L $\square$ R VP $\square$ ENGKATGVYEDF

SRH
QGPAMDWMPG $\square$ APNG $\square$ AF Y TADR $\square$
NGAFVGQHGSWNRSKFAGYRVAFVPNGKPSGPPEDFLTGF

GQTDWRVPFASADGGASADAF
S
G $\square Y$ Y GDFMS G
GQALWR
AVPELQGSFVFADYRAQGRLFDADPGEGQWPTAVLP\|VSG NDAFASEHGSWNRSHRTGYKVIRVPMNDGKATGEYEDFLV
GMYVFGDF $\square$ QGK $\square$ WA $\square P$ VPKP

ACPTGSSSSTGVAFYPADGG
A Y Q HSAQVVSGETCPTGG
SSTS GMAFYPSSGGD GKYVYGDFGSGTVWVGERDGNDGF

E $\square$ Y GTH $\square$ YS S Y DTGRFWGFRYENGKVVDHRELDATTHRVV GAYFYADYVSGRIWAATPQGSGW
${ }_{G}^{G D Y L D S D F G S G T L W A L T E Q P}$


GKYVY A DYAS GRVW
$S L Y G H Y \square Y G D Y C T G R \square W A \square Q Y D G G F S P S N E L L L D T P H H \square S$ GSYLDGDYCS

RPS WN N N G I S E GMS PCVF LS GA GWYVYGDYQRGTYWTLKRNNDGTFQQDTQLNLPTVMPVS KQELHR

GMY $\square$ YGDFMDGR $\square$ WS LVENEGNWTNS $\square$ MCEEDTC $L D S G G L$ PRDANGVPSYKAEEATFLLPWLKGGGQATMNGPLYRYDAD GDAFVALHGSWNR
GGHVYE
GKYi F GDYVSGRDFELNENTATWNSREFCLGDNTVCTGSM
 SRHL

GRYLYSDLCS G W
GDDFAAQHGSWNRSVRTGYEVIRVQLKNSKANGTYEDFDT NGAF $\square$ GQHGSWNRSEFSGYKVVFVPFRNGKPAG DPCMYGRY IYADLYAGRDWAGTETP
PWYTYSASARFPELGTGGGGPMSGPVYDYDPANGYR TK GAY $\square Y G D Y C S G R I W V A T E Q G G K W V V S$
GVPSYK LDE EKLLMPWLKGGAQATMTGPVYRYDAASGSAV

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LSVGPDGNLYQLD\YPGAFYR\APSGGNRAPVARAAASPD

FPEAYDGRWF LLDYHRGHVKTAE $\square$ DENETVTA $\square$ DDFMPGE

SKRTGYKVIRDRMKDGKPTGEYEDFVDTE $P A W D G D L L V A G L G Q Q Y L A R F S V D G T G$ VEEAEELDTD DFESP FIGASMRAANLYQLDFAEGLSSQK DAEGTFWAGA $\square$ AGMT LVR LEPDGEG GFAETRMLEG

FPR $L$ N G $\square L L I G A \square K \square T H M N V L D V N E A G Q V L E E R R Y Y E E$
TFPQWNGSGF $\square$ SGLETKS $\square$ NR $\square V F D G H G G A K P A E R \quad W D$

## VT GFVKDGQ

 $\square \mathrm{ADPQKG}$

GAPQALLTDRGRLRAVLVDPATPL

DAGK【QQVLSMGRDADGE $\square Y$ VL

E E D $\square$ FT $\stackrel{\text { D }}{\text { E }}$

SYPAYNGAVFFADYSRRCTWALPSTPGGLPNAAEVRTFVS YPAAYAGALFFADYTRDCIWAMRPAAAGGVPAANRLTFVA VTLVPSGDDLPGADSGTVFDASWMDAEYDAVAH VRLEN


LFPGWQGSALLGGLSGQTLVRVPDAGEDTGTPES
 SFG $\square D E N D E L Y \square C S F D G S T Y R F N Y P P Q N D Y V V T T \square N T P \prod A$ GRI WTLTYEGGVASAPVDRTDDLG K WKA WE GRLAVGF LR GQRID DLKLNQAGVTTGILKMPDIP F GQAPN GELYVLSFAEGKLYRVVERT@ASVKTG
$V L \operatorname{R}$

TSSYQRN $\square$ LSFGEDQDGE $\square Y M \square T$ T DYASTTAQQGKVFQLV WPS Y WD GK WF VGDFYDQTQPRHAVNPVHAES LKK $\square \square P V G E$ GVRTGYKVVRLKFRDGKPTGEYEDFMDEA

LGS FPKNULSFGEDEAGEMYLLSTSEAKTTVQGKVFK\|VD FGQD $\square$ S GEVYFTDFGSGNTFRI
MFPDWKGNALIGGLGGKHLVRLVLQDGRVVG
E E R LLT G

GF VLENG
QPEDF $\square$ T GF $\square$ ANAEKNE
FPESFEGRWLAFELTRKWFKSFS $\square Q R N D Q S F S D P R F P P D M$ KWPYWDGKWF VGDFYDGDQPRHAVLTDPKTVGRGG $\square$ V VHN


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VWGRPVGVAVAKDGALL TSEDGNGT\WRVS
$E G L R V R D V A V G P H D G A V Y V A F D D E G A P L$


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

VWGRPVGVAVGQDGS LIVTDDGSKSVWRVSY

LHQRFKDVRQGPDGLLYALTDEPDSVLLRTS
$V Y G R P \square G V A V L P D G S L L V A D D S S N I L W R V T A Q$

GDDGSALYVLTDGRGDPRDGDDRLLRVTVT

VWGRPVGVAVAKDGADMVTDDGSGTVWRVAY $L N F R \square R N L \frac{A}{I} E S P G N L I L L T D G S$

DAASPVDLEVGPGGELYYA D LGGTIRRV GAANPVDLA GPGGELYYA DAGGTIRRI EVGRIRDVTQAPDGSLLISTSNRDGRTRSDDDR\|LRVVP

AGARTREVEVAPDGAVWILEDGADGRLR K IGRI RDI E E IS DGSLII I NDEYDGGVYR $E V G G i S D V R Q G P D G Y Y Y V L S E T N G A L Y R$
 SF RFK LASFGQDGGEVYVTDFGGGAVYRID S ER $\square R T L V L G P E Q A L F V S T D$ DGEIVRITASP
$G \square G R \square R D V A T G P D G A D W \square A A E K P G R \square F R V$

D P R R
$S G \square R \square M D W K F A P D G S \quad L Y V L D Y G R G F F T S D K S A D W R V T Y K$ VWGRPVGVAVAKDGALI VTEDGNGT■WRVTYSAGR
PRKR $\quad$ R DVDVGP
LGERTRDVAVGPDGAVWVVTDEENGKLVR
LKERIR HVANGKDGH LYIS TD S GKII KV

VWGRPVGVAAASDGS VL VSDDGSGSПWRVS
$V Y G R P V G V T V L P T G A M L \quad V A D D A A G K!W R \| A A Q$
K WNQPFEAEFGPEG A $\square Y V I D$
$G \square R N \square M D W K F A P D G S \quad \square Y V L D Y G R F F T S D A S A L W Q \square T Y K$
E D L R WMDAEFGPDG A LTY LLDYAGGFF LHSNQK LVRVTYH

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EGAKPABQGQ VFTQS $N V I G W P E G K T P T A P A G F T V G E F A R D L V N P R W M Y V A P N G D V$ GDCQAGDAANYKVERLTDQUGEPHGLTIAPDGKV $P E \square S Q S E V L T G L E N P W D M A F D P D G T M$ $E V V P \square P Q N P V L R V P A G F T V N V F A E G L D A P R W L A L T P S G D V$ $D V T T T G G S S C S P S Q G V C G A T Q V G T D D D V V W G L V T R P D G T / L$

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WPDGKMPTAPEGFTVSKFADKLDNPRWTYVAPNGD $\square$ AAAGDGPALTRTLLLSGLEKPWDLLAFTPDGAL WPEGQMPTAPEGFTVTKLADGFQNPRWTYFGPNGDM ADEPDTPVQPDTVTLTDVAEA

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$P G Q P G V S A Q S L P T G F L N A K V Q D G Y T T P M G T V F T S D G K R$
A GETP TPAPGLAVKAFAA GLEHPRWLYVLPNGDV
 PADARPTE D DVVATTVVVADLEDPWDLTTAADDDAA VKLNNSTENSSPPS GICVEKIGNGGSYLNMVAHPD GRV $V$ I GWPE GK TP PAPA GFNVTKYAGSLTNPRWDYDAPN GDV $V P L T S A S A A P V L P P G F V L R D Q Q S G Q Q A P T D F A Y L P D G S M$
 AKGWPEGGKPQAAAGFSVQAFATGLEHPRWLHVLPNGDV

GAVQADPE GLCLQEVAN GLRNPVAMVHAND GR F PSPRIVFNLPEGFTVNVYAEGLNNPRWLALTPEGHV STFAQTP E $\square G \square D T E T V I T G L T A A M Q L V H A D D N R I I$ | $A \square G W P Q$ |
| ---: | :--- |

$P T G D P V Q D A T V T K T P W E D A V A P G G G S$
GEQPESPAGFNVTAFAS GLEHPRWLATLPNGDV VQADCKATITGNYKAERLT DQI GEPHGLVTAPDGRV $V P L P D D K P T L R V P L G F V V N V F A D G L E A P R W L A L T P N G E V$

P P C VVSLLVAE GLVAPLMLTDAGDGTR
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NV DGPGVPTEDTLPA $L T V T T P V L D G L D H P W D A V Q A P D G A V$ $N V I G W K D G A T P K A P E G F K V N K Y A D G F Q N P R W M Y V T P N G D V$
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FVAD 50
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AQGET
GNGSGEE
$V D G T G E G$
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FQNNAAANSLTEVLNT
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 FVADSRANQIVRITYRLTEGSAKPAEEETTTVAKGLLNRPY FYIGKGCGTIHLDWDATKKPKLLTTLPVMGNRGSGEEGLL FVIEQHQAKVWSFPNDKETSQKQLAFLQLAAPDSDNEEGLL
 LVTETGQNRIRLLRDSNSDGVADVRE TFASGDNGLN FLSDQAGKIYSVSIPPEGSGEILKIDETNLVHFDAELGLL LYNQRDAHAIVHLNPKTGAKKTIGTVPNVGSTDGEGGLT FVCESG
FVAESGTGKLIKDTNDDGTKASKDQTTVFRD
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 LVA QTNGQVRLVQNGVI QSPVVLDGGPLLFDLDF NGI F VYVVDKEGAI YAFPNKESVVPAEVRDIKATVLNNNESGML

 ATKKSADRI LFTEKCRGLSARRADGSVKRLFGTKGSALVADCSGQSGMN FVCEANTGKITLLRDKNNDGT TIELRETFLSELKQPLGML WLAERAGTVRVLDREGLDSPVLDISDQ STMTDGERGLL YVSLGLTHNKVVMLPKEG VQEENTLCLVADGLNGPQ YVSRREGDVVMLKDTNDDGKPDHQQTVVTKE LFVWDKAGRVWVSNWNGTQYDRQTNPVLDLSDEVGDFGLL LVAESDSPGTDIQTDKNRDASFVMRKVGAGTKSPNKDM1L
 FLSNQPGKUWLATVPGEGSGEELVI LTTGKQGNVA WVSTTGQTKS FVVE SNTKGSADRDTITATLPVRSGDLGLV

## FVAESRAGR】SVLAGG

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






$F$ F S N Q M G K VF LA T LP DE G S G G T LIF VDDLT D QVVY F D T Q F G M M

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GMAF
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UniRef90_UPIOOO36CCOFA UniRef90-E8U669 UniRef90 ${ }^{-}$M5RJQ4 UniRef90-UPI00047A0590 UniRef90-R4WLZ3 UniRef90 UPIOOO36106D8
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 DGRHGDPTSERVIIGAPPASIHNSGNVVFGPDDYLYVSTG LINTNKLDKVLLKWPVQVHSCCHAGGGMAWDSKGNLYIATG PGGK KISNPQQLIGDLPDGGQHPNRTLAFGPDGALYVSVG
$G D L K A R G Q E K L A D A P G G G H T R D V F S A D G K R F A V G$ GDGKARGQPEKLADLAPGG HSTRDVVFSADGKRFVAVG EDFKSVSDRTDIDTDLQGPGAHNGARLRFDKTGALWVTGG
THARPSGTANTVTGTLNPPDTVNTVTGTLSPPDTVNAATG GTSSQPSEVRRIFTMGLPFTAHHGGQILFGPDGYLYFMMG GDGKAADEPESGVADIPSSANHWTRDVVFSPDGKTYLSVG TGQTSLSGTGTKLKELPGYNNHWTRNLLGSPDGKOYVSVG ATAQSLDQATRKWDVQDHSCCHAGGGMAFDKDGNLYVGSG SEFTEVSDRTDVVEDDPDAGAHNGGRI RFSPDGYLYVTTG AVQKDEHAKKDLLRLEQPYSNHNGGQLAFGPDRKLYIGFG QGQNKITGKGEKIADLPGYNNHWTRNVVVSPDNKLYVSVG
 IIDDVPYKPKATDHPFGGPGAHNGGRVRFGPDGFIYQTTG
 ADWSRMVRERTVLTGAPSGGRHAGCGVTAASDGTLWIGTG A SLASAQLIFTVPYPAAGHRSGRITFGPDGYLYDSTG PANPTSAGSKVELLRIPPGEDHKGGMMQFHPEGYLYVGMG LSSGRPGTERRLIEVPEPQSNHNGGAVTFGPDGYLYVSFG ADRVDVDSEKVLI SIDQPYFNHNGGSLAFGPDGYLHIAVG TGETKITSKGAKIVDLPGYNNHWTRNLLANADGKIYYSVG
RDIVSDTPKKHRNRWGGPGTHSGGRIRFSPDRFLYVTTG

 DKACPATRMETVVSGLPGGGRHPMKTLKVGPDGLLYVTAG EDGT GELEKIIGNLPDGGQHPNRTIGFGPDGMLYISDG AGGTDLVA VPASRK DLDGYESHAGGTLLFGRDGSLLVSTG EGETHIAESGVKVADLPSGYNHHWTKNLDSPDGSLFVTDG GTASNPSEVRRIFTMGLPYRGGHAGQILFGPDGFLYLMMG

## G

EGSVRPQEV - QEEMTSAGKKI LDLDAGGYNNHWTRASSNNSKIYVSVG EGPQGLTEEKVLI EGAANTDIHGDTGVVAAPDGTVWVSTG GDRSARAGAELVVEGLPNRGSHWTRDIAANAEGKIYVSVGG PGATQDTQPGVKVADLPAGNHHWTKDLIASRDGRRYATVG PNLADDESEFVIIIENQPFSNHNGGQIVFGPDGYLYI NMLDHSSERSLILWMVKQPSTRVGGEQSLRMQAFLFVAEG QGQLQLEGEGKQIATLPGGNQHWTRNVVVSPEDKLYVSTG NAVNPNTRLEVLKIPHPTNANHNGGEMHFGQDGFLYLSV NGETADKSQPIKVVDDPGGNHHWTKNVIASKDGKLYVTVG PHQADPKSEVVLMEIDQPFQNHNGGSIEFGPDGYLYIGLG ATGGKLEVLGKVFGGDDSDGNHDGGRMVFGPDKDLYVTTG PGATQ TTPGEKFMDLPAGNHHWTKNDIASRDGKKYVSVG LATNRLDKVLDKWPVQVHSCCHAGGGLAWDSKGNDYIATG KGQQQLTGTGQKDANLPGGNQHWTRNVVASPDGKKYVSVG PDLANSGSGSILFTVDQPFSNHNGGMMVFDTGGYLLVG PDQVNATSEKILMEIDKPQSTHNGGSIAFGPDGYLYVPDG DDFSGVSDRTDLVTDIPGPGAHNGGRIRFSPDGFLYVTTG TGDTKIETAGEKIVDLPAGNHHWTKDLDASPDGRLYATVG PNKADPASEKVLMTIKQPFWNHNGGTIKFGPDGYLYD
TGEAT
EGDTRTTAPGTVTPDPGGNHHWTKSLVASPDGKLYAGVG DSSANPLEVRRI FTMGLPYMAHHGGQLLFGPDGYLYLMMG DGRNGAVGTQVLTNDLDPAGQHPNRTI AFGPDGMLYISVG KDATSITTTGEKI AAFPAGNQHWTRNI IANKDTKFYVAVG AGWTALTRGDALLTGPDVEGHGGCRILVAADGTLFVGG AGQTKISTVGEKVVDLPAGNRHWTRNLIANEDNKIYIAVG NVADPNSKAILITIPHPTFSNHNGGELHFDKAGFLYLST QGADRDTASGEKVIDLPAGNHHWTKNVVARPDGSRYVTSG DPDUADAGSETVRLRFDLPAGHDGGDLAFGPDDHMYMSTGG


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UniRet90-M5RJQ4 UniRef90_UPI00047A0590 UniRef90-R4WLZ3 UniRef90_UPIO0036106D8 UniRef90_UPI0002E06EC3 UniRef90-M6DDB3 UniRet90_A3CY92 UniRef90_A4EK98 UniRef90-A1K7G0 UniRef90-A3ZMC0 UniRet90-R4SQ20 UniRef90-W1JW43 UniRef90-MOT1E7 UniRef90-C7PPT6 UniRef90-C1AY25 UniRef90-UPIO003F548F0 UniRet90_F4KVV0 UniRef90-LOGQR6 UniRef90-MOTGWG
UniRet90 M5RAI8 UniRef90-LOSXE4 UniRef90-A3XR44 UniRef90_I1KCN2

200
D G G S A
DPGNRAQSLDSLLGKILRL
DTATPSVP
DGGSAD
DPFDNGQNLNTVLGSILRL
A Q DLK SLLGKVLRI

GSNN
D A G
AVGTNPQDPSSPAGKVLRA
DGSEGYSGNNWTEDYEGVSFQDARRTSGNTNDLNGKILRI
D A GRPGL
A QEHASLAGKILRM
SAGNVGEA LGEPDGGAAWDKANPPGAAWGAETERAGVLAF DVGKVDQS
DGGNKG

SRTNEGHAQPSAQQVAADERANGVGASDGPELFRADVLAF
DNHDGP $\square$ P
SGDGGSGGDPQQN

DGGK P
WAREGDFSQDLDSLGGKILRM
YTDQPDDWYENAPGGTAQ\|TDNLFGGVLRII
DNNSSQFSDGYSGNNPEPNYKDARRTAGNTHNLNGKILRI
SSCNACDESNEE
SRSNVDDPDTTPE
D R
 DGGS $\square G D P Y N F S Q N K K S L L G K D M R L D I D N D P S G Q K$ TD L
S GSNVAEG $\square$ GKEPEGEPWLKS QP $\square G A V W G Y E Q G R A D V L A F$
SGSNVG
ENGMEHEVKRAAI WEI
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GSNGYSGNNWGVSFQ
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DGGGANDPYKN
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A V R
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SSCNVCVEEDPRQGG\|LRFYPDGRPAGADDDP
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DNASYSSTD $\square G S A S E T Y Y Q Q A \square N D G R A Q M \square T S L C G K V L R \square$ SNSNVGDNGMEVEEGRAR
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SASNAGEHGMEEE $\square R R A C$
SASNVGAGMGTKNARA】ADWERRHGRGAAWGEEA
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$\square H Q P T R P Q D P G N L N G K$
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D N N S SGFSNNPQ
PNFKGVSFADARRTAGNTHNLNGKILRI
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HTPE $\square$ GNAQDLTK
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DNHNGEVP
SNSN
VAEHGMEMEEGRAAVVEIV GLGDGGSGGDPTGNGQNLSTLLGSLLRI

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STCNACD
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VAENGMQAEENRAALLEV
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UniRef90 W90G16 UniRef90 ${ }^{\text {R9GLW6 }}$ UniRef90_R4THX4 UniRef90-U5BKS7 UniRee90-UPI00037FB7EA UniRef90_UPIOOO4748E93 UniRef90_UPIIO0035C1B36 UniRef90-W5NB87
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UniRef90-UP10003F548F0 UniRef90-F4KVV0 UniRef90-LOGQR6 UniRef90-MOTGW6 UniRef90-M5RA18 UniRef90-LOSXE4 UniRef90_A3XR44
UniRef90_IIKCN2

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GRAEVRAFDPDGKNGRTVATGLLRNCSMTVQPATGALL DVPYRDPPDNPFVRQGRDEVWAYGLRNPWRDSFDRTGDLW NADGSPAAGNPVNAGSPVYTLGHRNVQGLVQPTGRVY DVDGK PKDNPFVEDAQPEIFAYGFRNLWRLSFDRTGDLW DTDGEPAPDNPDWGDGDPRTYTGGHRNPQGDDFTPQGAPL N MPDGSVPEDNPHE PD G
E G D ${ }^{T}$ AATGKVSVYSLGHRNVQGMDWAEDGTMF GSYTVPEGNDFPEDTQPEIYVMGVRNPARLHYDPVNDWI
 PDGKNRSLLFATGDRNCVGLADQPGSGTP DINYAIPMKNPFAQDSQPEVWAAGFRNSQGLTLGKNGHLY D

 QLDGSTPEDNPF $D D P Y G \mid P A D N P F$
$D G T Y T L P E G N L F$ FTGKTR
QPDGSK
PDGSE

## N N N N D N D

 DTNGKAHPDNKPPKGFDKRVYAGGHRNPVGLADDPKSGELV

PDGKNRRSFATGLRNCSGMTVQPATGAL NGTYTTPPGNLFPDGSGERMYAEGLRNPVGMAWYPGSQTL DVDYGIPSDNPAFAHWAPEVYCDGLRNVWKFSFDRENGLW DRDGEAAEGNEPPDGFDPRUYTYGHRNVQGDTFHPTGQPI
SPNYKVPDDNPFRPGFLPEIVGSGLRNPWRFSFDTTGELY N LD G
WGNYS IP K DNPFSQDKNP
NPD GS IPA DNPFHNA D
N
N NTNGTPARGNPFP G C T

D DTPYADPPDNPFTDGGPDELYALGLRNPWRWSFDKTGDLW

 DVDYGUPADNPFQGNDKSETYADGLRNPWRDSFDRDHALF
DRDGRAAPGNAT
PAKGGE

## DLINGE

DPNGEDPAGNPFDPDARD
ETFAS
Y

> 낟 Y
 E GVYATGLRNAEGFAWHPETGALYATNNGSDNRAATAG NADG
$D P$ T GNGLSSNPFYDG

##  <br>  N <br> TSDGAGVPDNPYY DGSGERVYASGGRNPVGMAWNPTSKVL

 N
## GRAAVLVAD

| $P$ | $D$ |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| $P$ | $S$ |  |  |  |
| $P$ | $E$ | $V V$ | $F$ | $T$ |

PATGSTRLFASGLRNPNGLSWQPQSGAL
 DFEGN
$D V N Y A V P T S N P Y G N A$
$\mathrm{D} V \mathrm{~V}$ Y A V V T S N P Y G N A
D
NQETFAFGLRNPVGLDFHPTKKLV VY A L G L R N P Y R WS F D R T G D A W
 DKNYA $\quad$ PA DNPF VNGALDEDYAYGLRNPWRIAFDPS GRLW TGDLTAPADNPFASGGAKYVWS DGHRHPQGLAFDAA GRLLW $D \square$ DGTYTLPA GNLFT $N$ LD G D I D N Y P P GNRPAAGL

 D DKNYA PAADNPFVKDAQPEIYAYGLRNDWRFSFDHKT GL W $D V N Y C V P A G N P F A G G A R P E I W A Y G L L R N P W R F S F D P D G S L C W$ E
WGNYS $\square$ P K D N P Y S S GRWRVFASGLRNPNGLSFEPQTGAL RPD GSDRTIYAQGLRNTIPFGWHPQTKQF NADGTPAAGNPDP N
P P P Y Y S $\square$ P S GNPF

DVDGTNPADNPF VSNVREEIV ALGFRNPYRFS DDDGPRDF
D
P D G S G E I Y A S GL R N PV G M D WN PVT G DL

UniRef90_LoKG25 UniRef90-Q67MU9 Uniinefoc C1A338 | UniRef90-FOSGC6 |
| :--- |
| UniRef90- $\mathrm{B} 8 \mathrm{GHL5}$ | UniRef90-LOAEP6 UniRef90-A5FMV9 UniRef90-UPI000306EAFO UniRef90-UPIO0047B248F UniRef90_UPIO004634E47 UniRef90-G7H5R1 UniRef90-A5EFE1 UniRef90-M7XYQ6 UniRef90-M7YT88 UniRef90-UPI0001D2F518 UniRet90-D8VN88 UniRef90-SOFWG7 UniRef90-UPI00046AF46E UniRef90-M0CP23 UniRef90-UPIO00476E9B3 UniRef90-Kgu4W1 UniRef90 UPI000375E02B UniRet90-B6BTG2 UniRefofo W4LM15 UniRef90-B9IJR5 UniRef90-G6YHY6 UniRef90_UPI000374F17E UniRef90-UPIooo37789B2 UniRef90-LODFS1 UniRef90-G4FCQ3 UniRef90-N1WPI4 UniRef90-B2IVQ5 UniRef90_V4NKYO UniRef90-GoG826 UniRef90-W4LVV1 UniRef90_UPI000372E33B UniRef90 UPIOOO42492AB UniRef90-HORST5 UniRef90-M7Y8V1 UniRef90_10KGM0 UniRef90-1316W2

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UniRef90 R9GLW6 UniRef90-R4THX4 UniRef90-U5BKS7 UniRef90-UPI00037FB7EA UniRef90-UPIOOO4748E93 UniRef90 UPIOOO35C1B36 UniRef90-W5NB87 UniRef90-UPIO00344F778 UniRef90 UPIOOO41B1E17 UniRef90-UPIOOO36C30FA UniRef90-E8U669 UniRef90-M5RJQ4 UniRef90-UPIOOO47A0590 UniRef90-R4WLZ3 UniRef90-UPI00036106D8 UniRef90-UPIOOO2E06EC3 UniRef90-M6DDB3 UniRef90-A3CY92 UniRef90_A4EK98 UniRef90-A1K7GO UniRef90 A3ZMC0 UniRef90 W1JW43 UniRef90-MOT1E7 UniRef90-K9XJP7 UniRef90-C7PPT6 UniRef90-C1AY25
UniRef90-UP10003F548F0 UniRef90-F4KVVo UniRef90-LOGQR6 UniRet90-MOTGW6 UniRef90-M5RA18 UniRef90_LOSXE4 UniRef90_A3XR44

250
260 ${ }^{260}$ Y G WP WY Y G D ${ }^{270}$

280 WCVVNERDGEYATSVVREGAFYGWPWYYGDNEDPRHKGERS TADVGQDAVEEVNLQPAGSNYGWRVWEGSRRYGQGEAPGA SVEQGTSVDDEVNLLTPGGNYGYPDREPGTYDESVPMTDP VGDVGQNLWEEVDIVEAGKNYGWNRWEGTH HAEHGPVARDEVAMLRPGSNYGWDVTRGGPNDPDYENYEE ATEFGANTWDELNVIEPGANYGWPEVEGDAARDEFVDPVQ SVEHGPDRDDEVNLLRAGANYGWNPVGSGTYDESVPMTDP TTAWGPAKYETATVITEAGNHGWPYCMGNGQPYRDRNPKN
 ASDHGPDNDDEINLIVKGGNYGWPNVAGFCDTSEESEYCT CADVGQDAYEEVDLISKGGNYGWRAYEGPYVYHPEWTPGG WCAVAERDMDYVTHVREGGFYGWPWRYGDNVDPRHAGERP VGDVGQGAWEEVNLVTRGGNYGWGDMEGDFCYSERANC ASEHGPGHDDEVTPLAPGGNGGWDPAPGKGVSCPADYCGY SSEHGEAGNDEINDIEAGNNYGWPEDEGEQEQDNMEAPLV VADVGESNYESVNRVEKGGNYGWNVKEGTHCFDSESSDDE AGWVGPDKYDTFAVITKASNRGWPYCMGNQPYRDRNLPDP WGWRGNDQPEELNLIQAGQHYGWPFCWGDRQPDVYLSADP WTSDNERDMDY THVQEGGFYGWPWWYGANQDPRHAGKHP TAEHGPWHNDEITLLVKGKNAGWDPAQGGRGECPDAYCGY TAENGPDGNDKLSLALPGENLGWPLIWGYAG
 WCVVNERDFEYATTVVKDGGFYGWPWYYGNNEDPRHQGERP
 TAGWGPAKYETATII TEAGNHGWPYCMGNRQPYRTGWYDC A G DVGQ N LYYEMVHLIMN GGNYGWS
 ATVNERD GPDYLTRVKQGAFYGWPYAYTPNNILDPRQKTDG C A DVGE DNYEEVVDMITKGGGNYGWHYYE GPLPFKPSKLSNS EQEFGNS DMDETNLIVKGGNFGWPSCEGT
VA EHGP WHSDEDTV L K N G GN G G W

$$
\text { DPRPN } \mathrm{A} \text { A G R }
$$ WT AVNERDPDYITSVKDGGFYGWPYYYGQDEDPRMKGQGK WTAVNERDPDYY TSVVQKDGFYGWPYAYFGQHPDPRDDPKP

 MA DI GQD GWE ELT VTPAAANYGWPCYEGTHPY ATS GCSL $E T E$
$I G D V Q D T Y E$
$G Q A R E$ $\vee$ A DV G Q D RY
 WT AVVNERDPDYYITSVQEGGFYGWPYAYGKNEDPRRK GERPD WTAVNERDPD YV T SVVKEGGFYGWPYAYGSDPDPRLLKGEAP
 GPPRRDDLPPE E I NLVVKE GA H Y GWWY Y CWGDRPDPN F SAP E S FGMDS GIDD WE ELN RI T E GA DY GWP Y


 WT AVNERDP D Y I T GVVKDGGFYGWPFYF GQHEDPRRAAENP VG DV GWGT WE E I N F V Q K G A N L G WP CF E G NQPA A GFA MP Q C WTAVN ERRD DYITSVVKRNAFYGWPYYYGQDPDPRMEGRGM CAVNERDGPDFATRVVDGAFYGWPWFYGAHPDPRAA GARA WVAVNERDPDYMTSVKEGGFYGWPYYYGRHVDDRVKPQRP


 ATNNGRDQPEGFYKLKAGGNYGWPYCYTLNGQQVFBDKD A GDVGQESWE EVDVITTKGGNYGWSSREGTHPFGSQPVPES ETEHGPTGRDELNLVVKGGNYGWPLVSGPMTGADLSPART WTVVNERDPDYGTSVVDGAFYGWPYSYYGQHVDDRVKPQR A GWVVGPDKYDTRAVIT QASNRGWPYCMGNDPSQP L GWYDC
 $V G D A G Q N L F E E V S L V V N G G N Y G W R L R E G T H C F D P E N P P P A$ WMEHGPWHSDE』TVLVNGGNGGW DPRP WVAVNERDPDYMTSVTVGAFYGWPYYYGQHVDTRAKPPRP C GEVGGQD $\square G D V G Q G R F E E V D H L A K G A N F G W S C K E G P V V F D E T X C E D$ WTVV NERDPDYMTSVKDGGFYGWPYYWGQHVDPRAKPERP
 VAVNERDKPDYY T GVVKE GAFY GWPYY F GQHP DPRVVPAAPA AV DQ GTS R D D EVVNLLVA G GNYGYPDRDPGDYDETVPMTDP
 $\square G D V G Q D S F E E \| N F A L N G T N Y G W R C Y E G N V T Y N T S G C A A A$ WT TVVERDPDYMTSVRDGGFYGWPYYFGQHVDTRVKPQRP C A DVVGQE T Y E E V D D I S K G G N Y G WR V Y E GP DL Y H S P WA P G G VGDV GEKAFE EVVNLVVSGGNYGWRIREGT WVVVNERDPD YLT SVVREGGFYGWPYYYGQHVDERVQPQNA WT AV NERDP D Y A T S V K K G G WY G WP Y S Y Y G QIN D P R WE D D P

UniRef90 LoKG25 UniRef90_Q67MU9 UniRef90_C1A338 UniRef90-FOSGC6 UniRef90-B8GHL5 UniRef90_LOAEP6 UniRef90_A5FMV9 UniRef90_UPI000306EAF0 UniRef90_UPI00047B248F UniRef90_UPI0004634E47 UniRef90-G7H5R1 UniRef90-A5EFE1 UniRef90-M7XYQ6 UniRef90-M7YT88 UniRef90_UPI0001D2F518 UniRef90-D8VN88
UniRef90-S0FWG7 UniRef90_SOFWG7
UniRef90_UPI00046AF46E UniRef90- M0CP23 UniRef90-UPIO00476E9B3 UniRef90-K9U4W1 UniRef90_UPI000375E02B UniRef90-B6BTG2 UniRef90-W4LM15
UniRef90 B91JR5 UniRef90-B9IJR5 UniRef90-G6YHY6 UniRef90_UPI000374F17E UniRef90_UPI00037789B2 UniRef90-LODFS1 UniRef90_G4FCQ3 UniRef90_N1WPI4 UniRef90-B2IVQ5 UniRef90_V4NKY0 UniRef90-G0G826 UniRef90-W4LVV1 UniRef90-UPI000372E33B UniRef90_UPIO0042492AB UniRef90_HOR5T5 UniRef90-M7Y8V1 UniRef90-IOKGM0 UniRef90-13I6W2 UniRef90-IOHZT9
UniRef90_MOMC30 UniRef90_UPI0003620A37 UniRef90_UPIO00362A2D3 UniRef90-A1AQH8 UniRef90-T2KLLO UniRef90-V4IH42 UniRef90-D7FJP1 UniRef90-D5B9N8 UniRef90_UPIO0039C6A15 UniRef90_UPI00047EFAB1 UniRef90-M5WDG2 UniRef90-L9W7F1 UniRef90-W9QG16 UniRef90-R9GLW6 UniRef90-R4THX4 UniRef90-U5BKS7 UniRef90_UPI00037FB7EA UniRef90_UPI0004748E93 UniRef90-UPIO0035C1B36 UniRef90_W5NB87 UniRef90-UPI000344F778 UniRef90-UPI00041B1E17 UniRef90_UPIO0036C30FA UniRef90-E8U669 UniRef90-M5RJQ4 UniRef90_UPIO0047A0590 UniRef90_R4WLZ3 UniRef90_UPI00036106D8 UniRef90-UPIO002E06EC3 UniRef90-M6DDB3 UniRef90-A3CY92 UniRef90_A4EK98 UniRef90-A1K7G0 UniRef90-A3ZMC0 UniRef90-R4SQ20 UniRef90-W1JW43 UniRef90-M0T1E7 UniRef90-K9XJP7
UniRef90 C7PPT6 UniRef90-C1AY25 UniRef90_UPIO003F548F0 UniRef90-F4KVV0 UniRef90-L0GQR6 UniRef90-MOTGW6 UniRef90-M5RAI8 UniRef90-LOSXE4 UniRef90_A3XR44
UniRef90_I1KCN2
 VFPVAEYT $V$ HRSGEGGCSDTGGYVYRGQA VTGLV $V R V P G A 1 A A V W R S G S S T L A T A S A A F T G G A A W G A$ SVAADAVMPIWE YDHGVGKSDTSGYVYRG TVPTVGSRGES LTDP $\square G H D L G L V V V G G Y V Y R G \quad T A \square P G L T$ HTAVTPPLVNTGPETTWAPSGLTFYDEDA
 QWETGEASPS

TSPRNTGLEDLPPVKDNMDWYSPQGGGPVYPEREDGSGLP $D P L D T W P T D E A S P S G \square A V V G G$ $D L K G Q V T D P D V L L Q A H S A S L G L \quad$ TFYDAADFPPEYR

 STANKIKPVLSISHNT GVCSVIGGYVYRGAQYPAAYG MSNNSEGTPTSMTDLDRFPDALK
HSGNETWAPS

NCPDET PASVRNGEPLLDPVIEYPHWHDDVQLGSG【IG TKPLGWYDCDHPPNNDGLVNLPPVTGNNDWYSPQGGAPDY | EGTTKKECAKTEPPVLTYTAHSAPLAMVFYTASQFPAEYR |
| :--- |
| $E L K D K V I V P D V L I Q P H S A S L G L$ |



A WY ERPMA WL LGQRYRAPDW NTSVSSTNPDFPVMGYNHSEVNNEEGSASITGGYFYRSMT DERTGSVEVIDPVYEYPHSEGQSVTGGVVFRGPG VDALQ DLAGKVTVPDVLMQAHSAPLNDA FYDGKSFPAEYQ



 STK K $\square \mathrm{ENP}$ P $\square \mathrm{F}$ PVMW YNHSE $\square \mathrm{NQKERSAS} \mathrm{\square TGGYFYRS}$

GDC
D DV
VARATIPDVPVGPHTASLG1DA
ELVAKA IVPEVALGAHTASLGGLA
SVMTDPIRVPGAVGAVWRSGSP TLIT
ERVASAIIMPDYSLSSHVAPLGM
E RVASA MMPDY

| T | V | F | A | P | L | L |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| K | N | C | L |  |  |  |


DSCPTETPGDV
PTETPEACPEKDVRGQLFT
$D \square V A K T \ V P D V P V G S H T A S L G L A$
YCGYVSNRADGRPTPMTDLDRFPAADPPYYDKTKFPARYR DLVAKTVVPDVRSVGMTALDRFPAALPPSWNNGGRSQGMS HVVP GECSGLDRADYAFPGDRTVTGLSVDGGHVYRGAKYDD L L G DFCQGTEPPALT LSAHAAPLGM TFYTGDQFPAEYR MTWKEYAQKATEPEMLDTAHSAPMNDKFYRGKMFPSEYK TLANKDEPNPTNTCNVPFQATNPAQGTTQADNPCSDQPYP DLVATADAPDYAVGPHTASLGLTFPSBCDALLPPAWR TTSATSINPDFPVMGYSHSDIDKNVGSASDTGGYFYRSMT YDEATPPVINTGPQTTWAPSGDAFYDDETI EAWTNHVFVA NTSSSS ASAVNTPPMLAIRRGQGQDNGNSDTAGIVYNGESYPEEYR

 K LCHNASLDDILPFAYPHKLGKSVTGGYVYRGCEMPNLN
 $D T G G P Y V A P A Y V Y V N G E R G G Q S V I G G V V Y R G S L Y P Q M Y ~$
$D L V A K A L A P D Y A V G P H T A S L G L$ GRKDASACTNATPAFATVTAHSAPDGLAFYTGTAFPAAYR VSEP DEPVWEYDHA IGKSIT GGRVYRSDRNTGKYDYADYV DLLPPKAVPAWAPGGLDAVGAD
$D D L V Q A A L P$ D DHPKNESPNNDGLVNLPPVTGNNDWYSPQGGAPDYPRDAS DLVGRTRTPDVLFQAHSAALGLQQGYDGRTFPEKYR

 DLVARARVPDYADGAHTASLGL $D K M D E P D W E \quad Y N H D V G K S D T G G L V Y G Y T A V P E L V$
 NTSLLGS $V N P \square L P V M G Y S R S D G N T T M G S A S G T G G Y V Y R S G T$ EGKSKAECATTEPPVLTYTAHSAPLAMVFYTASQFPQEYR GLIESAVVPDFP $D$ NAHTASLGLAAGYTGNAFPEKYK VRVPGAVAAAWSSGSSTLATGS GAFVTGAGW $P$ I PPNVVKLK EAVVPDVDLGSHTASLGLVFYTANAFPKKYK STYVF PAHA YVSQNPAASITGGVVYRGTEYPA A


EMVASATKPDYALGPHTASLGL
D L V D Q A L DP DVP L GP H T A SL GF

UniRef90 LOKG25 UniRef90 Q67MU9 UniRef90_C1A338 UniRef90 FOSGC6 UniRef90 B8GHL5 UniRef90-LOAEP6 UniRef90_A5FMV9 UniRef90 UPI000306EAFO UniRef90 UPI00047B248F UniRef90_UPI0004634E47 UniRef90_G7H5R1 UniRef90 A5EFE1 UniRef90-M7XYQ6 UniRef90-M7YT88 UniRef90 UPI0001D2F518 UniRef90-D8VN88 UniRef90-SOFWG7 UniRef90_UPIO0046AF46E UniRef90 M0CP23 UniRef90-UPIO00476E9B3 UniRef90-K9U4W1 UniRef90-UPI000375E02B UniRef90 B6BTG2 UniRef90-W4LM15 UniRef90-B9IJR5 UniRef90 A4B9T0 UniRef90-G6YHY6 UniRef90_UPI000374F17E UniRef90-UPI00037789B2 UniRef90 LODFS1 UniRef90-G4FCQ3 UniRef90-N1WPI4 UniRef90 B2IVQ5 UniRef90-V4NKY0 UniRef90_G0G826 UniRef90-W4LVV1 UniRef90 UPIO00372E33B UniRef90_UPI00042492AB UniRef90-H0R5T5 UniRef90-M7Y8V UniRef90-IOKGM0 UniRef90-1316W2 UniRef90-IOHZT9 UniRef90 MOMC30 UniRef90-UPI0003620A37 UniRef90_UPI000362A2D3 UniRef90 A1AQH8 UniRef90_T2KLLO UniRef90-V4IH42 UniRef90-D7FJP1 UniRef90 D5C1Y8 UniRef90-D5B9N8 UniRef90_UPIO0039C6A15 UniRef90-UPI00047EFAB1 UniRef90 M5WDG2 UniRef90-L9W7F1 UniRef90-W9QG16 UniRef90 R9GLW6 UniRef90-R4THX4 UniRef90-U5BKS7 UniRef90-UPI00037FB7EA UniRef90 UPIO004748E93 UniRef90-UPI00035C1B36 UniRef90-W5NB87 UniRef90 UPI000344F778 UniRef90 UPI00041B1E17 UniRef90_UPI00036C30FA UniRef90-E8U669 UniRef90 M5RJQ4 UniRef90-UPIO0047A0590 UniRef90-R4WLZ3 UniRef90 UPI00036106D8 UniRef90 UPI0002E06EC3 UniRef90-M6DDB3 UniRef90-A3CY92 UniRef90 A4EK98 UniRef90-A1K7G0 UniRef90-A3ZMC0 UniRef90 ${ }^{-}$R4SQ20 UniRef90-W1JW43 UniRef90-M0T1E7 UniRef90_K9XJP7 UniRef90 C7PPT6 UniRef90-C1AY25 UniRef90_UPI0003F548F0 UniRef90-F4KVV0 UniRef90-LOGQR6 UniRef90-MOTGW6 UniRef90-M5RAI8 UniRef90 LOSXE4 UniRef90-A3XR44 UniRef90_I1KCN2

GDAFVADHGSWNR
GTY LYGDYCTGY $\square W G \square R R Q D G E W$

GKY $\square$ F GD WSESFT $\square G N G T L L L G T P P A D N G T G T Q N G M W$ PWENRVFVCGLVSETLYGVTGRTGNE NGVFVGQHGSWNRSK $\square$ S GYKVLFVPFKDGKPS

TYELGDETFTQPYLKGGGQAVMDGPTYH RSQVDTGSGVA GDAFAAEHGSWNRSKRTGYKVIRVRLKDGVPTGEYEDFVT
TDPCLYGRYMYADLY ASAMWTGSETPPSSGNYT
GDAFVALHGSWNR
K Y F F
P S WN N R G V S E GMS P C VF LIK G S
GYVYRGDAMSDLDGAYLFGDWSADPHGDPLGSVF
PRDANGVPSYKKEEAKYLLPWDKGGGQAAMDGPVYRYDAK NDAFVTMRGSWNRNPPVGY
GD $\square F A A E H G S W N K A A R A G Y E V I R V P R H G T A R A S G E Y Q D F D$ ESFEQRPVPT YPTWNNMGLSQGTGSAAFLAGKQWGKVQDRR
DPCMYG
GWYLFGDFVSGRMWA
GDAFVADHGSWNRD
NGAFIGQHGSWNRAEFSGYKVVFVPFSNGKPSGNPEDFDT TSYNAADATYTQPY LRGGSQAIMSGPTYHRSLVNPNSGVA GVYVYGDFDTGR】WG
DGLSSQG $\begin{aligned} & \text { GS S S } \\ & \text { G } \\ & \text { V }\end{aligned}$
AEFLVGEQWGDWDGR
NGAFAAFRGSWNRDRGTGYK IVFVPFDAKGRSLGYYEDFL

T D $\square K T Y$ P DAMKPAWNNNG $\square S Q G T S S A T F L T G D H W G A W N G R$ NGAFVGQHGSWNRSVLSGYKVLFVP
NGAFVGQHGSWNRSEFSGYKVIFVP FENGKAK WGEWS
GGAFVGEHGS WDRDPLNGYKVVY $\square$ PFAEGKPSGKAQD
GWY VYGDWS QGTLWTLRRP
GRYFFADFVQGR $\square W S \square Q R A G S G W$
VK A F RNDPDA Y G $\square$ S $\square T G G Y V Y R G E S \square D A L V G K Y \square F A D W S R$
NGAF I GQHGSWNRSQLSGYKVVFVP
PCVFLSGP
NGVFVGQHGSWNRSVLSGYRVVF $\square$ PFENGKPTA
GQYVFSDYCDG
GHYIFADHSVGS $\square H H L A P A A G G G W T A G$
HDAFVALHGSWNRNQ
NTALV
G LQRRYFHSRPA $\square D W K H G Q D \square A R V P S F C S \square G G A F Y$ A GMV SGA $\square$ VGQHGSWNRRPKSGYRVIYVPFTDGKPSGPPRDVLT D P C M H
$G L A S N A D Y A V A L T P G V A E G D G$
A S VT D D T G T H
DPCLYGGY LYADLYGAGDWAGTESP
NGAFIGQHGSWNRSTLAGYKVAFVP
GAYFFGDYATQK $\square W K Y D T Q G R V V R P Q E T P P K F T G \square G G P V K$
NGAFVGQHGSWNRAALSGYK ILFVPFENGKPSG
GSAFVADHGSWNR
 GLY IFGDFMSGRLM
HGAFVAFRGSWNRNEGTGYKLVF DPFDEQGNPKGYYEDFL GWY GGTDYFSGD DH QGAFIVGQGSWNRKPHSGYKVI
$N Q M F V A L H G S W N R S Q K S G Y K V V$
TGSVWALSYD
NGAF $\square$ GQHGSWNRKPRSGYKVVFVPFDNGKPAGPPED DLT G $\square P S Y R D Q A T Y R \square P W \square K G G G Q A A M N G P V Y R Y D A A G T S A A K$ NGAFVAFRGSWNRDRGTGYKVVFVP FDAKGRSQGY GRYFYGDF IA GR】WS ILWDGTKVNGH DEHTFEMGFFSNVS GRY $\square F G Y W S T G F G V G N A T L L V A T P P A G W$
TDFETYPDAMPP DWTNNGWSQGTSSGTF $\square T$ GDQWGDWDGN GGAFVGQHGS WNRKPRSGYKVVFVP
GKY Y Y A DYVTGKVWA
GTY Y A TDFCQGTAWA
GGAFVGEHGSWNRQA LNGYKVVFVPFADGKPSGPARDVVT DPCMYGRY LYAD $\quad$ YYGGAMWAGIEVP
NDAFVTMRGSWNRNPPVGY
NGAFVTQHGSWNRKPVSGYKVLFVPVFKNGKP
NGAFVVQHGSWNRDMLSGYRVVFVP



GNRTGYKVVRLLFKDGKPTGEYEDFMNGE WD GA LVMGGLKSKELDF LR LSADGRSVDAQTFGLVN

NEGGENEDDADAVYDGPWL DDRFTATVSTMFEG

$G A Y D G L L V I G L L K A Q G V L A L R D D E D G A L R Q Q F R L P E L D$ WPE YWNGKWFLGDQSNAN NRVAVTVDPGTVDEAGAPAFG $G F V V N D R$ E

A K R T GYK lVR L R F ENGSATGEYEDFVTGA $\square$ WK GWENR L A VGF L R GKR $\square E L L E M D A E G M T V G T A V V A G \square P$

WP S Y WD GK WF VG DF YDSDQPRNAVLT DPATHGDGS $\square P \square H D$ $K \mathrm{~V} V R$ L R Y EN G K P VA F E D F $T G F V L D N$ GD $L V V G V M G \square A F G D T P A G A R D D V I D L T A D G T S V H G V I T M P G B$ YGPAMAGRVLMSLFSEGRIVQFALDSDTRSTAVGMGVFLE
$\square R T G Y K V V R L K F K D G K P T G E Y E D F M D D A$ GF $\square A N D$

DEANSQNRVAVTVDPAGVPTHQPPVFAE L I VG F M G $\square$ G F G G T P VG Q R $\square \mathrm{NLIDD}$ DE D G L S V N D VT E M P VP M $T G F L L N \quad P S Q P T$
 FKDGKPSGK PQDFLTGFIANEKDAK GK P QDF LT GF A N P S T S EVY
$G A A V I S A Q K G K R L V F V K L S A D G N R V V R T S E V L H E$ $V \vee T G F$ VTEDRQ



SYAGYK VIRRHFEDGKPVRATDFDTGWG TFRGSWNRRPASGHKIMKVTFENGKPVKAEDFVKGFS FPAAYRNSYFFADYGENWIRRATLNADGSFNTVQAFLPGG GFLSNDQ

T LIFEG
Y D D D WLD DRFEATAH
$F K D G K P A G K \ L E D F L T G F \| V E K G G N D$ $F \square A A A N G D \square V Y A D \square Y S G L L R R L S Y$

QPEDF LS GF IA DREKSE
GRPTGYKVVRLVLRD GNDTGVVYEDFMMDA F SF G VDQNDE $\square Y \square$ CSFD GK $\square Y$ KF $V$ QSP $\square$ S $\square T V$
TGFLID
$R T \square P S$
GF $\square$ NDE GKAM
VMVDPQSGRVQDF $\square$ T GF $\square$ NGQD

GF LSS D GHAR
WPAYWDGKWFVGDFYDADQPRNAVVMDPRTQGSGGLPVHD YEDF LT GFLI NPTEA SF GEDANGEVY L VD Y G GK $\square F R \square$
 FAD GQPS GLPE DVLTGFVNDREEAL

GF L N S D N Q A R
$K \vee V R \square R Y Q N G K P T R \square E D F D T G F T$
T GPQEDF LTGFVKDSVKGVVR
GPWD GALVMMGGLKSQQLI F LRLSAD GQTVTAQTFGLQN A GKPEDFLTGFVVDPNKDEVR
F GE TED GEVFVVSNTRNSVSRLTSTG
R D G M P D G Q
A E D VLT GF VNEAGE

| $G F D D A E G$ |  |
| :--- | :--- |
| $F$ | $L$ |

K
$F \square P D E N G N$

UniRef90 LOKG25 UniRef90 Q67MU9 UniRef90_C1A338 UniRef90 FOSGC6 UniRef90 B8GHL5 UniRef90-LOAEP6 UniRef90_A5FMV9 UniRef90 UPI000306EAFO UniRef90-UPI00047B248F UniRef90-UPI0004634E47 UniRef90 G7H5R1 UniRef90 A5EFE1 UniRef90-M7XYQ6 UniRef90-M7YT88 UniRef90 UPI0001D2F518 UniRef90-D8VN88 UniRef90-S0FWG7 UniRef90_UPI00046AF46E UniRef90 M0CP23 UniRef90 UPIO00476E9B3 UniRef90-K9U4W1 UniRef90_UPI000375E02B UniRef90 B6BTG2 UniRef90-W4LM15 UniRef90-B9IJR5 UniRef90 A4B9T0 UniRef90 G6YHY6 UniRef90_UPI000374F17E UniRef90-UPI00037789B2 UniRef90 LODFS1 UniRef90-G4FCQ3 UniRef90-N1WPI4 UniRef90 B2IVQ5 UniRef90-V4NKY0 UniRef90_G0G826 UniRef90-W4LVV1 UniRef90 UPI000372E33B UniRef90-UPI00042492AB UniRef90-H0R5T5 UniRef90-M7Y8V1 UniRef90 IOKGM0 UniRef90-1316W2
UniRef90-IOHZT9
UniRef90 MOMC30 UniRef90-UPI0003620A37 UniRef90_UPIO00362A2D3 UniRef90 A1AQH8 UniRef90-T2KLLO UniRef90-V4IH42 UniRef90-D7FJP1 UniRef90 D5C1Y8 UniRef90-D5B9N8 UniRef90_UPI00039C6A15 UniRef90_UPI00047EFAB1 UniRef90 M5WDG2 UniRef90-L9W7F1 UniRef90-W9QG16 UniRef90 R9GLW6 UniRef90-R4THX4 UniRef90_U5BKS7 UniRef90-UPI00037FB7EA UniRef90 UPI0004748E93 UniRef90-UPI00035C1B36 UniRef90_W5NB87 UniRef90 UPI000344F778 UniRef90 UPI00041B1E17 UniRef90_UPI00036C30FA UniRef90-E8U669 UniRef90 M5RJQ4 UniRef90-UPI00047A0590 UniRef90-R4WLZ3 UniRef90 UPI00036106D8 UniRef90 UPI0002E06EC3 UniRef90-M6DDB3 UniRef90-A3CY92 UniRef90 A4EK98 UniRef90_A1K7G0 UniRef90-A3ZMC0 UniRef90-R4SQ20 UniRef90_W1JW43 UniRef90-M0T1E7 UniRef90-K9XJP7 UniRef90 C7PPT6 UniRef90 C1AY25 UniRef90_UPI0003F548F0 UniRef90_F4KVV0 UniRef90 LOGQR6 UniRef90_MOTGW6 UniRef90-M5RAI8 UniRef90 LOSXE4 UniRef90-A3XR44 UniRef90_I1KCN2

VWGRPVGVAAAGDGS[LIVIVEDGNGT\WRVTVGGDR
QF GR LRSVTPTPDGSLLVTTDNGAG
DK VLR VT P T

TYGRLRHAAPGPDGS LYVLTSNRDGRPDERDDR\|VRDE VYGRPVAVTVMNDGSLLGVNDSSNTIWKVTAK

GHGR $\square R T A Q Q G S D G A L Y V T T D N G N G A \quad D Q L L R V T P$ EDLRWMDAEFGPDG ALYLLDYAGGFFS $\square D D N K L I R V T Y D$

VWGRPVGVA VARDGSLL $\square$ SEDGNGT $\square$ WRVS
VWGRPVAVAVARDGALLF GEDANGTDWRVS
T ER $\square R S L V L G P K G A \square Y V A \square D \quad A G E \square W R \square E N A A$

G $\square K N L M D W K F G P D G A L Y V L D Y G R G F F T S D S S A L W K V T Y T$ QFGRPVGDATAPDGSLLF TDDTNGVIYRVSY
VWGRPVGVAVASDGSLL VTDDGSGSI WRVSYA
$I S E R F R G V T M G P D G A L Y A A V D E \quad G N I Y R I T A$
GYPT IVDLQFGPDGYLYVLT

VWGRPVGПAVARDGSLI VTEDGNGTIWRVTY
$V Y G R P V G V T T L P D G S V L V A D D A G N R I W R V A A Q$
TFRQ】MDAKFGPDG ALYVLDYGNGFFSLDANKLLK $\square S Y T$
GAARFRSVVLGPEGDLYTAVDE GS $\square Y R \square T$
T WGRPVGLLVLPDGSLL LTEEANNR $\square Y R \square Q Y$

AAGRFRSVVQGPDGSLYASVDE GTTYKLT AYGRPVDVTIMNDGSLL VNDDAGNTLWKVTA



VAFGEDKGELYVLTNASNGLMNRKGK】YK V V
$V Y G R P V G V T V M E D G S L L V V D D S G N T V W R V T A K$ V $V$ GRPVCVAVTPTGDLL VNDDSGNCIWKVSY

A WGRPVDVIQGPEGALYTSDDRGGMDYRVRYR RFARLAGLVELPDGSLL VSDDTNGVIYRVSY VGNGUVDVEF NPDGALYYVNDNTGEVMKISYG GSHDGALLVADDVGGMVWRVTGK

EFGRLRH $\square E P G P D G S L Y L L T S N R D G R P L E D D D R \square V R L D P$
VYGRPVA VA VT PDGALL VADDAGNTDWRVAAK
$V Y G R P V G V T V P D G S L V N D D S N T D W R V K S S$ LWGRPVGVTMGKDG ALYVSEDANGTVWRV ARGRPVGVAVDRTGALL VADDVGNTIWRVT

T WGRPVGVLVLPDGSLLF TEEANGVVYRVQYSEDRKT
$G R P V G V V I D Q Q G G L L V A D D V G N K V W R V S A A$
VRGRPVDLAVTPDGALL LTDDGNGALYRIAAG

GRPVGVAVDRTGALL VADDVGNAVWRV
$G \square K N L M D W K F G P D G A L Y V L D Y G R G F F T S D K S A L W K V T Y R$ TWGRPVGLLVLPDGSLL LTEEANNRDYR $\square Q Y$

PSARFRS LVQGPDGALYAAVD SGEDYR GRPVGVAVDKAGALL VADDVGNVVWRVTAA

GRPVGVA $\square$ DKSGALL VADDSGNTVWRVSA
QF GRPVG $\operatorname{li} G T P D G S L L F T D D T N G V I Y R V T Y A G T$ QYGR LRSVTPTADGSLLVTTDNGSNRMWRISARVRVTP $G R P V G A V I L P D G S M L \smile \square T D D T T H H \square W R V A Y$
A LGGRPGGVVDRTGALL VADDVGNVIWRV
$A Q G R P V G V A V D K P G A L L V A D D V G N V I W R V T P K A$ VYGRPVATTVAPDGSLL VNDDDGGVIWRVSA

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UniRef90-S4XNV8 UniRef90-FOS713 UniRef90-U1GUA8 UniRef90-A0A016QKA9 UniRef90-B9XPK1 UniRef90-UPI0003B561CB UniRef90-UPIO00237E654 UniRef90_-14VU67 UniRef90-E8YQ03 UniRef90 ${ }^{-}$A0A022 $\mathrm{G}_{623}$ UniRef90-UP10003FFED26 UniRef90-UPIOOO3616332 UniRef90-D81744 UniRef90-B9IEIO UniRef90_N9RVT9 UniRef90- ${ }^{-}$M0X8B9 UniRef90-UPI0004719309 UniRef90_W7QlJ9 UniRef90-A9WA50 UniRef90-F3YVV0 UniRef90 O1LLQE3 UniRef90-E9CBC8 UniRef90 B2JM80 UniRef90_l9BZN3 UniRef90-UPI000373C9B9 UniRef90-UPI00036981FB UniRef90-F4L1Z2 UniRef90_UPIO00471A1E5 UniRef90-G8AGAO UniRef90 A9UPD6 UniRef90-UP10003FFBD79 UniRef90-UP100047AD8F7 UniRef90-UPI00037AB5DA UniRef90_A6VWS3 UniRef90-FOJ5L6 UniRef90-UPIo0041C41B6 UniRef90-N1MRQ5 UniRet90-U2U8G9 UniRef90-L8M4L7 UniRef90-LONES7 UniRef90-UPIOOO37EA08A UniRef90-D9QFE4 UniRef90_UPIO004726845 UniRef90-J31X86 UniRef90_-J3MJ73
 SPVTAQNAPAVKFVPYASGLKSVTTITPAGDGSR PSLRTETVADGLTPLDLAMPPGGRF PTGWDGGKPRAPAGFTVTALATDLKVPRQMLVLPNGDL SDYKLQKLDVSFEHPWGITSLNNEEM A $\square G W P A G T T P K P A A G L T V K A F A T G D D H P R W L H V L P N G D V$
 PTSMTFLPDNRM VGTGFSDPLFREGIPGTDR
$A A \| P S G F Q E Q V F A G L S Q P T N$ EFAADGRV PPGPHNVTNSDDGCACVETVAAGLSNPLGLVNAQDGRL P V E A S L PPLQLETEFAGDIPNVRSMSLGDDGTI


T पP P
ATPAAKLPKVPDGFKTEVYASGLANAREMTQAPDGTL VPTGFTI AKFADGLGKPRQLAVSESGNV DVVGWPAGQTPKVPAGFRI QPFAKGLDHPRWLLALPNGDV

PEGFSIELYAKNIEGARSMAMGSNGTL TPAGWKVSVAASGLGKPRMLYLMPDGNM LPAEWGDRLPTVPDGYEIAAIADDLRDPRQLVVLPNGDV PPQGICVEKIGTG SYLNMVAHPDGRA DVKVWGEGEAPQAAKGLAVARFADGDDPRSMLVLPNGDV AKGWPEGAMPSASAEVALVEVATKLAQPVAMTTARDGSR PKGFHISVYANQVSAARSMVVSDSGVVI ACSTGATAQSDPGPNDTVTTVLDGLAKPWDVVVAPDGTV APAWPAGVTPQAAEGTRVAAFARGLDHPRWLLVDPNGDVV VP WPDGMTPKAPAGFTVSRFADSLEHPRWTYLAPNGDY APAQPWQAKPLAAPGFAVSAYARKLDHPRWLYVLPNGDV AKGWPEGGKPQAAPGLEVAAFADDLKHPRWUHVLPNGDV STEAPSPPKGLCLEKDGNG SYMDMAAHPDGRA
A VGWS GSDMPKAPAGFKVTALADDLDHPRWDYLLPNGDV PAGALPKVPAGFTVNEFAAGFENARVVQVAPNGDV.

DGQVPTAAAGLKVNAFAAGLKHPRWIEVLPNGDV NAPSKS $\square$ STQQVDVEKFAQQVVTEDLDFPKAI ATV DDTHI $P A G F \square P T V P G G F S V Q Q A G G G L S P R W L Y T L P N G D V$
 VPA GFNVEVYAA GMANARSLADGDKGTV DAQTAGTPQVKFTPFVSGMPQDTTLTHAGDGSG
AKGWPEGRTPRAAPSLKVSAFASGLDHPRWLLVLPNGDV


PATPSAPPGFTVSAFASGLEHPRWLYALPNGDL AKGWADGAKPLAADGLSAVAFADKLDHPRWLYVLPNGDV APPDPTPAARLPPDGFKVEVWAAGVANARSMAVGDKGTVI A $\square G W P A G G K P T A A P G \square A V R A F A D G L D H P R W D Y V L P N G D V$

TPSDPHGLCLEKI GNG SY SSMVAHPDGRA
APAWPKGMMPRPAEGLKVQAYAQGLDHPRWLYVLPNGDV ATHPSASPKGVCLERIDNGSYAYLNMVPHPDGRV TPRALAQPTGFVEEQVGEDWDAAVGMAFSDDGDR
PEDDAGTRLQVAMDYAVRLYANGLNRPRLMADGPDGSLL
$P P$ GFKVEVLSDDVPGARAMTLSSPKGTL
 LQPDATGLAAP DYAINPPGRL
PKGFQI EVYSDKVPGARAMTLSPSGTL

 PASWGDRKPTVPEGFTVTADATDLGDPRQTLVLPNGDi
 WPE GQMPEAPDGFKVEKFAGDLEEHPRWTYVAPNNDD VEARPNGSLPVVPAGFKVEVVWTDGVPEARSLALGDKGTV A $\square G W P A D K T P V T V K G T Q V N L F A K G L D H P R W L Y V L P N G D V$

AVGWPKGAKPVAASGLNVAAFASDLHHPRWLYLLDNGDV SPAVAAAPSGFVEAPFTSNLTQATGMAWAPDGSR PTAAPGLKVNAFARGLTHPRNMHVLPNGDV EAVGWRGGTLPKAAKGLKVNAFATGLDHPRWLHVLPNGDV WPEGVMP TPAQGFRVQAFASGLDHPRWLYRLPNGDI

EVGGWAEGEMPTPAPGFTVTEYAADLDHPRWMVPHPDGR|V


LVAETDAPPKPD DTKGGKDAK MVVMQCAGASFPSANRDRLD0 $L V V T L Q A G Q V R V D D R G K L R P E P F L D V S R D L T S A G G E R G L L$


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

 LSTGK NGTVA WVSPS GRARTVAT $\quad$ L

 $F V G S R K E G K V Y A L I D N D G D \quad Y K A D K V I D I A S K L G M P S$
$F V G T R T V G K V Y A V L P K A D A D G G K R E V T M A S G L H R P N$ YVTNREAGTVTRLDDTNADGVVDEKQVVATIIKS LVAETNGPRDGEKPKGGFFEGLLMKKAGAGVPSADRDTLL FVVGTRNEGKVYALKDTDGD YKVDKTYTIASDLEQPN YV T R R D A G DVLLL K DPNGDGKFDEVKTVVAEFKG LVAE GRGGRAPKL TP K DVIAAGDIKARGNTQVESGNRDTLL FFSNQPGKDWDPDQDSGEAMELDESTPFVDDTDQQFGMM







 FVADSSADKVVVLARVDKDGKAESRTTFSEDLLKPF
 LAAEA LSEPGGDKSAFDYAMFTTMKRAAAVGASPNRDSLL



 LI LE HKK GR DWLEKNGTTETKTDFADLHEE DRPGEAT GLL $L \vee A E T N A P K$ R P D DSTGDRGWVMEKVMGKAGAGDRDSLL

 $L V A E T N A P \quad P K P D D G K G L V R G W V M K Q V M K R A G A G D R D T L L$ $F V G T R Q L G N V Y A V T D S G G K R T$ LVAETNAPPKPEDDAGGWVAK QDMKKAGAGVASANRDTLL
 FFSSQQQGKI WI P E Q GS GETLGFDESSPP DDLDDTE FGMM


 YVAERGANRIVVRLPDLDGDGK ADQVDAVATNLPGVVHSLE $F V T E R \quad A G R V R I V L A G Q V L A E P F L D I A G R V S T G G E R G L L$
 WL A E K G G R I R Y WP T D P S NP G LVV
FVIF Q NGLLRVIQNGTMDIQSRVSPPDVRTNANDERGFL PV R VVA $~ L \square N M P A$ FVGGSRAEGKVYALRPG
 LVAESNPNEEAVT TPKQVIAGLIESKSGKKAKGANRITLL $\bar{F} V G T R D K G D V Y A I Q D T D G D \quad F V A D K M F T I A T G L N M P N$

 LAAKRD GN LIVVDWSTKPAQTASYL VLPVDSYGERGCM FVVE SNDAKKSANKITMFRDKDQDGVPD
FVGNRNLSDVYAVREANGKRE
FLA ATSKGEIVVLRSKNGQAAETAE VFASGLARPY LVAFTNAPAKPDGNKGGWVMGLVMKRVGAAVPSANRDT L LI A E R P P S S DF DYAMDS TMKRAAAMGPTARLRDAAGDGVAE
 $L F I \quad D R K S G E V R V V S L T K D G Q P E T Q P G N T T L V T R T N S E C G L I$


 $L V A E T N A P$ PKPEDGKG $\quad$ R G GWVMGKAMAAVPSPNRDTLL

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GVAYH
D G A $\square Y \mathrm{Y}$ VA $\quad \square S K \square W R Y D D \square A N H \square D G A$
$\mathrm{V} H \mathrm{G} \square \mathrm{T} \square \mathrm{D}$ S GTMYY
VA K EVVFSAPI
RDADHDGVAETKVPFLTHLHSPFGMALVGDTLYVAAFPYV $G V A F$ K D GALYV VH G DT MK DGMLYLC RDADGDGTYESRSIFADGDDAPYGDAYGNNNELRRYKIN GMAFHPKFAENGRFFASFNCDKVKSPGCRYSUYVARFDYT SKTVLLEGLNSP YGMVLIGETDYVANTDAVMAYPFT S $\square A F H P D F A R N R A F F V N Y T N Q S G H T V I A R F E V S$ M RDADGDGKAETRNVFLQDLNSPFGMVYVANADAVVRFPYE GVTLL GIELATDFETSRTLYTCQGTGSAGGGGSDNHVAVVSWTVD RDNQGRGVADERHAFLTGLNAPFGMVLLGQHLYVARFPYT VIDD HFYVANTDGLYKYPYKEGM RDIDANGAAK $\square$ RTVFLQGLNSPFGMALDGNDLYVMHFPYQ QRSVF LEGLNSP FGMALVDDQLYVANTDALLRFPYRE G\ALHPNFAENGRLFASFNCDKSKWPGCAYQTVIAEYSAN LHEGKAYVATPTQVFAAALLAD
DVIPAPSFADDGAVYDS WAREGDTVHGVAARAT WD RDADGDGHAETRTVFMSGDTSPFGMALVGDELFVVKVPYT GIAFYP SGSDAPTHVYIANTDSVVRFPYKA GI AFHPEFDQNGRFYVRYSAPEREGLGYNHTDVLAEFQVD PLAFYPS LANPNR NABAGRPWSRRDSGLAVKE DAEG D DLDGS G V RDANNTGVARTQTVVFLGGDHSPF GMALIGNELYVARFDYV
 EQNDF LIENLNQPF GMLLIGNTFYVANTDGLIRYSYS $G V A F G K D G T Q A E L S Q V K \square D \quad K \square E$ GLAFDPGYRQNRRLYVHYTDRNGDTVLARYT AAPD GLAFHPGFRHNRKYYLQHQDQENGRISSVVIERQADASFK RDTDGDGVAETKSALLTGLHSPFGMALVGDKLFVAFPYKA RDTRGDGSVATRTVFLDHLYSPFGMALVGNDLYVARFPYH GVAFH $L L R G A G G T A Q S R S V F I S G L H S P F G M A A V G D S L Y V A R F P Y H$ RDTDGDGVADARSVFLKDLHSPFGMVLVGNDFYVARFPYQ
 RDSDGDGVADQRSVFLQGLQSPFGMARVGDTLYVASFPYE GMAFHPNFAQNGRFFASFNCDKVKWPGCTYQTVIAEYTAN KNTDFDENLNSPF GMMTVVGDTLYVANTDTLMRFPYH
GMAFHPDFATNGRFFASYNCDRTKSPSCSGRCCNSDVGCD GMAFHPDFATNGRFFASYNCDRTKSPSCSGRCCNSDVGCD GFALDPNFKSNRY $\square Y$ S S Y N N S NEYNNAT $\square G R V T R Y Q V R E$

 GVAFH DGALYAS STSRDVRLDNDE SIVHHPAWPAQPYLYVLYSADNDYDVLCEGSAVLARLKFD RDTNGDGDADEQYAFI EDLHSPFGMALDGNHLYVARFEYD GLAFHPNPASPGYRTLYTYNSEQ $\square P A A T M P T Y P V K D S S T N$ $G V A F \quad R D G A L Y A S$ S SRKVFYEGKDDDAALGDAVLGNKVIVSTSPNIWV FTDE RKSANGSGEWERHVFI DNLHSPFGMQLVGDTLYVAKFPYK $G \vee A$

 S I LDDPDFANNYFYVYYS SUPGGGFRVSRFEHS ERYNF LKNLNQPF G GMLVLGDYFYVANVDALLRFPYK G L A F $K D G V L$
$D P Q Y$
$Y$ RDSTGDGVAD DQTVFL
 $A N \prod N T \| V R \prod P Y R N$ $N L N S P F G \square A L V G N T L Y V A D F P Y H$
$G M A L V G D T F Y V G N T D G V M A F P Y T$ VHSVFDRGLHSPF GlAFDPNYVVNRYVYFF $G L N Q P F G M A Q L G D T D Y V V V A F P Y$ GIAFDPNYVVNRYVYFFVTVS GNDLYATAQQIVRYTYA GLAVHPNFPEQPYVY LAFSYDNPDREGVGRVTRRLVRYTAD RDADGDGVAEENHAYLENVRQPFGDALI GDTLYVGAYPYE RDTNGDGVADLRRTFLGGMTLSNGRLYVANTDALVAFPYT
 KRSVFLQGLHSPF RDADHDGVAEMRSTF IEGLNSPFGMVLVGKDFYVARFHYE G LAFHPGFAKNGRFFVSYSCDDNGAQPCQFQSVIAEYTAN
 UniRef90- G2INU7 UniRef90_B6BU48 UniRef90_V4PPN6 UniRef90_-14VKJ2 UniRef90_T1X4R7 UniRef90_A3W1Y3 UniRef90_Q0BXK5 UniRef90_UPI00036BF7DC UniRef90 E9CFR5 UniRef90_UPI00036728F3 UniRef90_UPI0003B77C3B UniRef90_A9ETM5 UniRef90_G7WLH7 UniRef90_U3QE09 UniRef90_B1KFR8 UniRef90-UPI00024882A5 UniRef90_M7Z7V6
UniRef90_IOK6D9
UniRef90_R0E5B5
UniRef90_G2PLB9
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UniRef90_E9CBC8 UniRef90-B2JM80 UniRef90_B9XFR5 UniRef90-I9BZN3 UniRef90_UPI000373C9B9 UniRef90_UPI00036981FB UniRef90_F4L1Z2 UniRef90_UPIO00471A1E5 UniRef90_G8AGA0 UniRef90_A9UPD6 UniRef90_UPI0003FFBD79 UniRef90_UPI00047AD8F7 UniRef90_UPI00037AB5DA UniRef90_A6VWS3 UniRef90_F0J5L6 UniRef90_UPIO0041C41B6 UniRef90_N1MRQ5 UniRef90_U2U8G9 UniRef90_L8M4L7 UniRef90_LONES7 UniRef90_UPI00037EA08A UniRef90_D9QFE4 UniRef90_UPI0004726845 UniRef90_J3IX86 UniRef90_J3MJ73

130
140

150


 ANEDT DFQNLLIAAAPKLKENRHYGSRIVD KDDNLYAGFG



 GNVMT GSEQVLI QDWCQQYPSHS DGDLGF GPDGKLYVTS G
 GSEPT GLTN ETELLRRLPGDANHGDTGGIAPD DD GTVLWVSVG


 A S L P S VP T P ELVV G K LP N K S H H G WK F I A F G P D G K L Y I P V V G
 EGQTRIDAPGRKIADLPGGNHHWTKNIIASPDGKAYATVG SQLLESPQEPELI YDDYPTEFHHGWKYIJAGPDDKLYVPVG

 GTSSSPSTRR $\square F$ TMGLPYSSSHGGQ ILFGPDGYLYLMTG P GQVK DT A K GRK LDDLPS Q N NHWTRN L L A N A D G K L $P N V A S P A S E R L V L T V P Q P Y A N H N G G Q L Q F G P D G F L Y I$ PGQTR】TAA GTKLVDLPGGNHHWTKNLDASADGKLYVTVG K R Y A QKPSYEVLKVSLPNDKWHGEKVI KA GPDGKLYI PVG
 PGQTQUSAPGELVAKLPAGNHHWTKNLLASADGKLVVVVG TKMTSPGDKIV ELLSASGYNNHWTRNIITNKKDKIVI SVGG E GQTTISAKGNKVLDDPGGNHHWTKNLVASPDGKFYVVVG
 GSASQPDEVRRDFTMGLPFTAHHAGQILFGPDGYLYFMMG GTWGPHQLFVDRLPDGGQHPNRTLAVGPDRKLYDSVG A A D A E L R D L E I W W QAPAPGA GHFA L R L L V Q G E H L F I T S G

 A G D T S I R A T G R KL A D F E G G G H WT R S L L A S R R D G K
 $P$ D QA DAA QVRELDSSFPVLVGNHNGGMLAFGPD GML Y

 FSRADPASARILETARQPYANHNGGQLAFGPD
$K D \quad S G Q A S R R L I K D P C S T D V H S G G G G I E F G P D G F L Y \square G M G$ G D



 NGQTRDAAAGTKLVDLDAGNHHWTKNLIASRDGRRYVTVG P D GTAVVSEKP LVVTGWCQQQFPSHSDGALAF GPD GAA LYYAGGG

 D GLT T D M G S RKV L LGE SVS T GHGVG SLVF GED GS L LVV S A G


 ASVVDPTSRREVISFGKNAGNHNGGTLAFGPDGYMYLALG

 A GVVT S DS E R GVVELLA DLDPNTVNH H WT K S L L L S R D G K K Y V G V G
 EGQTRAEGPPEKVADDPSY $\square$ NHHWKSLAASPDGRFYVGI G NNNRADQNSEVLI WDDPDGYYHYGGDISFGPDEHDYI S L G A GQNTDEGEPEKVMDDPGGYNHHWTRNIIANNDKI YI T V I M G
 T GDK Q IT APGNKLVDLPAGNHHWTKNILASADGKVYVSVG NGAERMAAPGRRLLTRFNPG GHWTRSLLPSPD GKLLYVGVG APGDTRDSAA GRRLAEFKGGGHWTRSLLASPDGKLVVGVGO
 $N G V G A A R T V V V N R L P T R G G Q N H D G G A L G F G P D G K L Y W A L G$ ANSDYPNSELVLLLETPPVQNFHAAGAIIRFGNEGELIFSHG PGATRDS QPGRKL MD LIPG GHWTRNLIASKDKKLVVAVG SGRTRITARPEKIVDLPAGNHHWTKDVIASADGKLVVTVG





| UniRef90 S3YN52 | SNSN 170180 AAENGLD 190 QEVGRAQTVEE ${ }^{200}$ |
| :---: | :---: |
| UniRef90＿UPI00036E343F | Y LGLGDGGSGGDPQNNGQNLSSPLGKLLRF |
| UniRef90－M0LUS7 | NGGGALKS EKQVDDWYAPNRGGNGQDVGHLLGS\｜LR |
| UniRef90－G2INU7 | SNSNVGERGMAVEEERAVIWEDDRETG |
| UniRef90－B6BU48 | ERGGEM $\square$ AQDPNTHPGS\IRT |
| UniRef90－V4PPN6 | SNSNVAES GMAVEANRAAVLEI |
| UniRef90－14VKJ2 | SNSNITERGMTAEVDRAR |
| UniRef90－T1X4R7 | SNSNIGEN |
| UniRef90－A3W1Y3 |  |
| UniRef90－Q0BXK5 | DGG ${ }^{\text {GNDPNADQNGQDTGTLLGKIL }}$ |
| UniRef90＿UPIO0036BF7DC | DGASFSATDYGQLGSPPNPCADPANEAADATQLSGTVLRL |
| UniRef90－E9CFR5 | DGGAGG DPHGNGQNFNSLLGSVVRL |
| UniRef90－UPI00036728F3 | DVASYTEVDA RALDRAQDEAKAQGKILHL |
| UniRef90－UP10003B77C3B |  |
| UniRef90－A9ETM5 | DGGGSTSD P P P N GQNDEVKYAKILRV |
| UniRef90－G7WLH7 | APCNVC DPGDPYASITRM |
| UniRef90－U3QE09 | APCNVCAPD ENRYANI MKM |
| UniRef90－B1KFR8 | APCNVCESELPP FATILKLL |
| UniRef90－UPI00024882A5 | DRGN RPNGQNLETHAGSILRL |
| UniRef90－M7Z7V6 | APGN\LMP PDTHAQ I RRI |
| UniRef90－I0K6D9 | STCNACAEPNP |
| UniRef90－R0E5B5 | SNSNVGENGLAA ETDRAA |
| UniRef90＿G2PLB9 | APCNICDSAT VDKRYASITRM |
| UniRef90＿C6X133 | TLCNDC KEMDREAASIVQV |
| UniRef90＿UPI000464 |  |
| UniRef90－M4DOV7 | DGGGVS DTHNFAQNKKSLLGK\LRD |
| UniRef90＿UPI00037D7726 | SATN $\square$ AEKGLDVEKGRARII EY |
| UniRef90＿W6LTS2 | GS S DPQNRAQNPHELLGKLLR】 |
| UniRef90＿J0U139 | SNSNVGENGMQAE |
| UniRef90＿UPIO004778367 | APCNVCDVE D D R A KIVRM |
| UniRef90＿L8DEL6 | D T ASPSVP ${ }^{\text {P }}$ |
| UniRef90＿UPI00036CE4F4 | SNSNVAENGMAAE |
| UniRef90＿UPI00047AE4ED | SASNVG EQGMEKEERRAN\｜LELV |
| UniRef90＿W0UX63 | S NSNVGENG\｜VAE |
| UniRef90－K5YMF4 | SNSN VAENGMQAEENRAAILEV |
| UniRef90＿A0A059CYS4 | DGGSPNNSG DPYNFSQNKKSLLGKIMRL |
| UniRef90＿Q09DV7 | SSCNACA ETNPEHATMLRV |
| UniRef90－S5THU0 | DR QQEDPAQERDTNLGAVVRL |
| UniRef90＿U7DIW3 | S N S NVGENGLEAE |
| UniRef90－A0A017T7A8 | SQSNVDDD ${ }^{\text {D }}$ DEKRRANILAY |
| UniRef90－M0A6Q6 | DGGNVH D $\quad$ G $\square$ GHVEDWYPENEGGNGQDTENLLGG\｜HR |
| UniRef90＿F1PC15 | DGG M M G P F GKFGNAQNKSALLGKVLRI |
| UniRef90＿UPI00035EEED5 | SLSN【GERGMAAEE |
| UniRef90－K0CX95 | D G F D Y EQAQVMSSQLGKVLGF |
| UniRef90＿Q13RP0 | SNSNAG ENGVDAEEGRARILEF |
| UniRef90＿S4XNV8 | VGVGDGGGDTSNPDPDNNGQN］EVKYAKILRV |
| UniRef90＿FOS713 | SGSNVG ENGMDNEVRRANILEI |
| UniRef90－U1GUA8 | QPGNNVLHDAD ${ }_{\text {G }}$ |
| UniRef90－A0A016QKA9 |  |
| UniRef90＿UPI0003B561CB |  |
| UniRef90－UPI000237E654 | S N S NVA D N G M EVEE D R A R |
| UniRef90－14VU67 | APCNI＿C DPAPDHGKLIRM |
| UniRef90＿E8YQ03 | SNSNAGENGVEAEEG RALILEF |
| UniRef90＿A0A022G623 | SNSNIG ENG口DKEEGRAAI WEVV |
| UniRef90－UPI0003FFED26 | APCNI CEPPET HAQIRRI |
| UniRef90－UPI0003616332 | S NSNVAENGVE |
| UniRef90－D81744 | D GASFNFADYGQVGNPCADPPAPRRAAGQPVLLNGALLR |
| UniRef90－B91EIO | DGGGVGGDPHNFSQNKKSLLGK\MRDDVDNIPSAAEIDKL |
| UniRef90－N9RVT9 | SNSNVAENGIEQEQGRAQILEF |
| UniRef90＿M0X8B9 |  |
| UniRef90－UPI0004719309 | D GATANGQDTGWKEGVPTDNF VEQARAQQVNSLNGK\｜MRII |
| UniRef90＿W7QIJ9 |  |
| UniRef90－A9WA50 | SKCN】TVGCSEGDPR |
| UniRef90－F3YVV0 | GT GDGGGAGDPNGNAQNQDSLLGKLLRLL |
| UniRef90＿Q1LQE3 | APCN】CAPD |
| UniRef90－E9CBC8 |  |
| UniRef90＿B2JM80 | SNSN A AENGVEAEADRARILEF |
| UniRef90＿B9XFR5 | DGGDANDVGLS ${ }^{\text {d }}$（IVPGGNAQNLSTPLGKFLRF |
| UniRef90＿19BZN3 | APCNVCERD |
| UniRef90＿UPI000373C9B9 | NAGEQVLDKDGKPIVDD |
| UniRef90－UPI00036981FB | SNSNVGENGLEVEYR RADVLEV |
| UniRef90－F4L1Z2 | APCNICESEKDI FASITRL |
| UniRef90－UPI000471A1E5 | APCNI CKSEKPI YASITRM |
| UniRef90＿G8AGA0 | SNSNITERGMPA EADRAMVWEl |
| UniRef90－A9UPD6 | DKYYAQL A ADMSYTAGKV $\quad$ RVV |
| UniRef90＿UPI0003FFBD79 | SSSNVG EHGMEKEERRANI I EII |
| UniRef90＿UPI00047AD8F7 | S PQNITM |
| UniRef90－UPI00037AB5DA |  |
| UniRef90＿A6VWS3 | SNSNVGENGMEAEAKRA |
| UniRef90－F0J5L6 | SLTNI A EAGMAVEE |
| UniRef90－UPI00041C41B6 | SLSNI AEHGMAAE |
| UniRef90－N1MRQ5 | SNSNVGENGMAVEE |
| UniRef90－U2U8G9 | DLGNGTGVNA DLTSMASKVSRA |
| UniRef90＿L8M4L7 |  |
| UniRef90－LONES7 |  |
| UniRef90＿UPI00037EA08A | SNSNVGENGMAA EKSRAAVLEV |
| UniRef90－D9QFE4 |  |
| UniRef90＿UPIOO04726845 | SNSNI GENGMEDE |
| UniRef90－J3IX86 | SNSNVG ENGMDQEQGRAATWEV |
| UniRef90＿J3MJ73 | DGGNVG D PWNFAQNKKSLLGK\｜ |
| UniRef90＿M2T5W7 | S V S N｜V｜G D E G M A V E |

UniRefigo s3yn52 UniRefi90-UPIooo36E343F Unirete90-Molus7 UniRergo Geqinu UniRef90-V4PPN6
UniRei90-I4VKJ2
UniRefi90 $-1 \times 4 \times 27$ UniRef90-A3W1Y3 UniRefóo -oosXK UniRef90-UP100036BF7DC UniRefo ${ }^{\circ}$ - E9CFR 5 UniRef90-UP100036728F3 UniRefi9-UP10оозв UniRet90-A9ETM5 UniRef90-G7WLH7 Uniret90-U30E09 UniRe $90-$ - 11 KFR8 UniRef90 - Upio0024882A5 UniReti90 M M 777 V 6
Unirefi90-70K6099
UniRe 990 -ROE5B5
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UniRete90-66x133
UniRefi90-UPIo ou4644DFB
UniRef90 M4DOV7
UniRefi9-UP100037D7726
Uniret90-W6LTS2
UniRef90_J0U139
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UniRef90_W0UX63
UniRe90-K5YMF4 UniRef90-A0A059CYS4 Uniref90 OO99DV7 UniRe90-S5THU0 Uniref90-U7DIW3 UniRei9- A0A017TTA8 UniRetio-MOA 606 UniRete Unirefio-UPIO0035EEED5 UniRef90-Koč99 Unirete90-O138po UniRe90-FOS713 Unirefolo UlGUA8 UniRefi90-B9XPK1 UniRei90-UPIOOOO3B561CB UniRefi90-UP1000237E654 UniRefi9- $-14 \cup 467$ Uniret90-E8Y003 UniRete 90 -AOA 022 GG 62 UniRe e90-UPIOOOO3FFED26 UniRef90-UPIO003616332 UniRef90-D81744 UniRei90-B9EIO Unizetio-N9RVT9 UniRefi90-UPI0004719309 Uniret90-W70119 Unirete90-A9WA50 UniRef90_F3YVV0 UniRefo-O1LOE3 UniRetio--E9CBC8 UniRef90_B2JM80 UniRef90_I9BZN3 UniReifo-UPIoooz73c9в9 UniRefi90-UPIoоo36981FB UniRefi90-F4L172 UniRefi9-UPIIOO4771A1E5 UniRet90_G8AGAO Unirefio Agupd UniRete90-UP10003FFBD79 Unizetio-Upiooontad8F7 UniRef90_A6VWS3 UniRef90_F0J5L6 UniRefi9-UPIOOO41C41B6 UniRe90 NiMRO5 Unirefo- L2U8G99 UniRef90_LONES7 UniRef90_UPIO0037EA08A Uniref90-D90FE4 UniRe ei90-UP10004726845 UniRef90_J3IX86 UniRef90_J3MJ73
 DVSGDRAKGNPFVNGANPNDWAYGLRNPWRFSFDRTTDLV DVDYGDPDDNPLVDDALDEHYAWGFRNPWRMGFSGGRLM K T DGSVPSDNPHFTSHPDWIYS GGVRNPQGITLTPENDIL D LVTGATRLFASGLRNPNGLAWEPHSGAL

GRAADWEVDLGSGEARVFASGLRNPNGMALE
DPDGDGLPGNPFASSTDRRVDAYGSRNQFRFGFR
 DINYSTPKDNPFSDGLAPEDWALGVRNPWRCSFDLE DPTGNGLPSNPFYNSANPRVWELGLRNPFRFTDDNPGBY $\square M Y Y D 1 P N D N P F V N N V R D E$ WSYGHRNPWRWAFDTPYTGW
 KPDGSDLR VVARGVRNTVGFDWHPATHEDWFTDNGRDW DPMGAAWPQNPARNMADPRUAA $\square G \square R N G F R A T D D K S N D D W$ D $\square$ ASGTMRPFATGLRNPNGMAWQPESGVL DPQYR $\square P A N N P F Q P G Q L K E D Y A Y G M R N P Y R F S F D H T G D L I$

A $\square W Q V D I N S G A S R V F A S G L V N P N G M A W E P T V N E R$


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UniRef90 UPIOOO37D7726
UniRef90-W6LTS2
UniRef90-JoU139
UniRef90-UPI0004778367
UniRef90-L8DEL6
UniRef90_UPIOO036CE4F4 UniRef90-UPI00047AE4ED UniRef90-W0UX63 UniRef90-K5YMF4 UniRef90-A0A059CYS4 UniRef90-Q09DV7 UniRef90-S5THUO UniRef90_U7DIW3 UniRef90_A0A017T7A8 UniRef90_M0A6Q6 UniRef90-F1PC15 UniRef90-UP100035EEED5 UniRef90-K0CX95 UniRef90-Q13RP0
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UniRef90_N9RVT9 UniRef90--M0X8B9 UniRef90-UPIOOO4719309 UniRef90_W7QII9 UniRef90-A9WA50 UniRef90-F3YVV0 UniRef90-Q1LQE3 UniRef90-E9CBC8 UniRef90-B2JM80 UniRef90-B9XFR5 UniRef90-19BZN3 UniRef90-UPIO00373C9B9 UniRef90_UPIooo36981FB UniRef90-F4L1Z2 UniRef90-UPIO00471A1E5 UniRef90_G8AGA0 UniRef90-A9UPD6 UniRef90-UP10003FFBD79 UniRef90-UP1000047AD8F7 UniRef90-UPIo0037AB5DA UniRef90-A6VWS3 UniRef90-FOJ5L6 UniRef90-UPIO0041C41B6 UniRef90-N1MRQ5 UniRef90-U2U8G99 UniRef90-LONES7 UniRef90-UP100037EA08A UniRef90_D9QFE4 UniRef90_UPIOOO4726845 UniRef90-J31X86
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 TVVNERDEPDYLNSVRDGGFYGWPYYFGQHLDERVQPQAP WTAVNERDPDYMTSVKKGGWYGWPYSYYGAIKDPRW WTSVNERDPDYMTSVKDGGFYGWPYYYGKHVDTRMKPQRP
WTTVNERDPDYMTSVQEGGFYGWPYYYGQHVDKRVEPPRP CGDVGQDTYEEVDLITKDGNYGWHAYEGPYRYA SEG WGDHGSDHPEEFNKL LPGKDYGWPYAYGARQEDPVIDKPK VSEMGPQGGDELNLLTEAGNYGWPDASMGVHYDGSPIPD
 VADAGQHFDESVYDVEEGGNYSWNVKEGSLCFSTETPLDP WTVVNERDGDYLTSVRDGGFYGWPYCYWGQIVDRREPBQD LHEHGPDGGDEVNLLQQGANYGWP VVTLGKDYSGARDSPF

LSETVPE AWD GDV解 WTAVNERDPDYMTSVVDGGFYGWPYYYGNGVFERVKPQKP WVAVNERDPDYITSVKEGAFYGWPYYYGQHVDTRVSPQRP
 WTSVNERDPDYTTSVSDGAFYGWPFYYGQHVDERVKPQRP FTDNGRDWMDELNHLTQPGHFGYPFCHQG WTVVNERDPDYLTSVRDGGFYGWPYYYGQHVDARDQPQKP AGDVGWNTWEEINRVPNAGNFGWPCFEGTGRQAGYDGANL CADVGQDTYEEVNVITKGGNYGWRVYEGPNPFSPQQSPGG WTVVNERDPDYMTSVKEGAFYGWPYYYGQHVDTRVKPQQP CADTGQDQYEEVDLISKAGNYGWRMYEGPLVYHPPWTPGG TGDVGWQNWEEINVATEGGNFGWPLYEGLEKQTNYYDGTP ETEDGQQGFEEVNIDQAGNNYGWPICEGNDHRGSDGGDAN ATHNGSDGEEVI DEVEPGRHYGWPYCY TAEIGAVPAGA ADVGQNS LGDDQPD DELNRLTEGEHFGFPYCHAG

屠 WGDVGWADWE EVNVIRAGTNGGWPCYEGSNVQPSYQALRG HSDVGQNNVEETDRIVMGGNYGWPTKEGDFLFNRTNGPAG FTDNGRDPDCELNRLTPGQHFGFPYCHAG
QSDNDDDGGVR NYVMEYGNYGYPKRHWHLNDPGVVPNLL WA DANERDPDYLTSVKENAFYGWPYYYGQHVDPRAQPQRP FTDNGRDGDDELNHAKDGQHFGYPYCHAGDV FTDNGRDPPDELNRATKGQHFGYPYCHAG EDADP WAVVNERDPDYLTSVREGGFYGWPYSYWGQNDPRAQPQKP IUEVGGNNQEDI HLGAARKNFGWPLCEGACDSPDFAYTCN WTAVNERDPDYVTSVKEDGWYGWPYYFGDTKDPRWASNPH LGNEGPQ DULGKVSKGEHHGFPFCHQGD DALGDNLDPDYLTRVKQGGFYGWPWYYGDHEDPRLQGQRP WTVVNERDPDYLTSVDDGGFYGWPYYYGQHDDTRIQPQRP WTVVNERDGDYUTTVREGGFYGWPYCYWGQTVDDRVKQDP
WTVVNERDGDYLTSVRDGGFYGWPYCYWDRTVDDRVPQDP WTAVNERDPDYVTSVRDGGFYGWPYYYGQHVDTRVKPPRP VNSVGTGYEQVFVVNARSHAGYSDYENNQPASNFITPVV LGDVGWTNWEENNTGKGNNFGWPDYEGGNGVSEVPDFQE WVAVNERDPDYMTSVRDGGFYGWPYSYYGRNDARVKPQRP WVA VNERDPDYMTSVTPGAFYGWPYYYGQRVDARVKPQRP WTAVNERDPDY TSVQDGGFYGWPYYYGQHVDVRVQPQKP
WTAVNERDPDYVTSVKDGGFYGWPYYYGQHVDERVKPQDP CADVGQSSYEEVDLVIKGGNYGWRVFEGTTAYLPLSSPGG
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UniRef90 L8M4L7 UniRef90-LONES7 UniRef90-UP100037EA08A UniRef90_D9QFE4 UniRef90_UPIOO04726845 UniRef90_J31X86 UniRef90_- 3 M M
UniRef90_M2T5W7

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WGGSEYTG

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DLVARAVVPDYALGSHVAALGLAFST_PAMGARFA ENVSEISNLTFPILGYNHSEVNKHEGSASIIGGYFYRSN】

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PAECPDEVGEDA
 TTYPDMTDP IVNWTPS $\quad$ TAPSSMLYYTDSQYP
 TSPM 1 $D L V A K A V P D V N D G S H T A S L G L A$ $E L G W G K N C K D Y T P P V G L M G P H T A S D G M R F Y T G S M F P K T Y K$
$Q G L T E P V L V$
$G$

## ELVAKARAPDYALGAHTASLGLAASTGKSGVGSAF

 D VAQADAPDYALGPHTASLGIAFSQ DFGKGRSCKDYVPPVLKLGAHVASLGMRFYDGNQFPASYK DKVASALTPDYALGNHTASLLGLASGMRFYTGRSFPQHYW EMVAKA MPPDYAVGPHTASLGLASSQGNSDTAA EFGWGKSCEETTAPAALLGPH1AALGMEFYTGSMFPEAYR $A \operatorname{LVAQALVPDYALGPHTASLGLA} G A R G N R D P P A Y A$ DLCESL TPDFP G Y Y H S D NTSLKKVNVDPP IMGYSHSDVNKD DGSAS $\square M G G G Y V Y R G S$ $L L T P N D A N P L Y$
$F S R D C T N D L T G P V G G Y D H N T G S V S \| I G G F V Y R G S Q L P G L T$
 DRYAPPVAVYGRDLGQSVTGGYMHRGMYVF
EFGKQRPCSAFTPPVAKLGPHVAADGMRFYTGTQFPPEYR QLCT EMVARAVVPDYA $\square G N H T A S L G L A A F Y D G K L F P N R Y R$ AA GT\GAPPGNRSPGSPAGLIDP\SG
QFNKGRACSAFVAP $\ A K L G P H V A P L G M R F Y T G K Q F P A D Y R$ QTGAGSPTGMVIYE GRLLPEVFWDQMDHSDAGPNVVRSYP DLVAKA DAPDFADGSHVAPLGLM QMDFYTGNNLDAQYR EFKGDRPCSDFTAPVQKLGTHVAPLGVEFYTGKMFPASYK EFGKQRDCSEFVAPVQKLNPHAASLGMKFYTGSMFPQEYK EMVAAADKPDYSLGSHVAALGVAF CNDYDDP IVHYTHTDSNAPTGSALVGGFVNWGSHLPQEYY EYGKGRSCSEFTPPVLKLGAHVAPLGMRFYTGSMFPSEYR DLVATAI APDYALGSHVAPLGL
 ALVASAI TPDFALGGHTASLGLCWLPAGTLPG DLVARAIVPDYALGPHTASLGIAFSYEAHLPPQW
 AKVASALQPDYALGGHTASGGLCWLPE
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TGAF $\mathcal{G} E H G S W N R K P K S G Y K V V F V P F \square G G K$
STS■TGGEVYRGD M
NHYVFADFESSNVW
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GG|F:AEHGSWNRA


DA】FVARHGSWNRTTK■GGDVVMAKPG
PA $\quad D Y Q N D$ GGVFVGQHGSWNRNPQAGYKVIFVPFEAGKPAGKDEDFVT KHAFLAEHGSWNRSSKVGYRVTLV EGVFVGQHGSWNRDPPVGYKVSFVPFRDGRPAGEADDFAT DPCSYGTYLYADLYANAMWAAIESP
NGAFVADHGSWNRKPAAGYKVVFVPFGA
GRYVYGDFGSGRVWAAQDRQGAWV
SGAFVGEHGSWNRKPRSGYKVVFVPFADGQPAGL
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QGMFTGQHGSWNRRPHSGYQVIFVP
NGAFIGQHGSWNRANFAGYKVVFVP FTNGKP GGAFVGQHGSWNRSQRSGYKVIFVPFANGQPSGPPQDFLA KGAFVGQHGSWNRKPLSGYKVVFVPFRDGKPAGPADDVLT DPCMYGRYLYADLYAGALDWAVETP
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GGAFDGQHGSWNRKPRSGYKVVFVPFVDGKPAGAPEDF GKYLYGDFASDRVWMFTWRDGVATPSSPTDDGTQLSQDLN GGAFVGQHGSWNRSEFVGYKVVYVPFSNGKPSG
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GRF TYGDYVSKKMW
DG DVLIAYHGSWNADETPRDCRVQR\RVSDGTPVSSEPF
SYKHNDRNFAGVPTDPTLGSSVTGVA VNRGSK GGAFDGQHGSWNRKPYAGYKVIFVPFKKGEPAGGPEDFLT

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NQLLAEHGSWNRSKKNGYR NDIFVAEHGSWNRSQKDGYRVMLATTDGSGNVTGYKPFA DGVFVGEHGSWNRSVPSGYKV1FVPFRDGAPSGDPDEVVT GAYFFADYSRGWMKYLKKEADGKTVASENMFDNYMTSVIN NGAFVGQHGSWNRAEFAGYKVLFDP FDENGNP NTIFVAQHGSWNREVKQGYN
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TLAGVGDQPSLPDAASGGGTATTQR■GGS $\square T G G T F Y D S T \square$ KALFFADFYG
MAIGQHGSWNRSKLSGYKLAFVAFENGRPVGMPRE\|LTGF NGAFVGQHGSWNRSVHSGYKVIYVPFRNGEPDGPPRDVLT HGAFVGQHGSWNREPKSGYKVIFVPFSNGVPAGAPMDFLT NGMFVGQHGSWNRKPVSGYKVLFVPFAAGKPAGNPVDVLT QGA IIGQHGSWNRKPHSGYKVIFVP

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GFLSDKGQ

GF $\square$ DEDGNAR
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PSGEP DDFVTGFRTEDGK PSGPPIDVLTGF LTADEK
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D GRATDYE $\square$ F A E GWLG GRV
A LD GSGKAVR
QEVFAQGWDRGGK $R I V R V V L E G D R V V N S E V F A S G W E$ FPKWKGDLFSGALK DRHINRIKLDQEGNADAEERDMED

GF NDKG WNRTKPSGYNVVRVKFENGKPVRUDDFVTGFS
YEPF IDGWL $\quad$ GKPVGFKVQRVRFANGKPVGAEDFEESQE G I A WH GS WNRSKPVGFKVQRVRFANGKPVGAEDFLTGFT GFLGEDGKAR

D GRPAVTRDVEGK VTGGLPVDVLS GF LAK DGS
$\square D G F \square R G P \square D V L A G F V S P D G D$
$N G A A V V S S Q Q G E K L L F L K L S E D G T E Y V D E A D A L V G$ $E D G T E Y V D E A D A L V G$
$P P L A V L T G F L D G E G G$ EDFLTGF $\square$ AEGEESE
$\begin{array}{llll}Q \\ G F & L & R & R \\ G & D & G \\ N\end{array}$ E
D
E

KLVRVHFEGGQPVGFSDLVSGFL $\square F E E W R G D A F L G G \square S G Q R L V R V E D E G E A A E A G Q E$ WD GFLNADG $G F V N K D G$

ERAS Y
GF LTTDGHAV
SVST $\square E G \square A S F G E D A A G E L Y \square V S Y G G R \square F R \square D P E$ KPEDFLTGF $\square$ A DAQKSE V VR L N K D G TVK S VE P F M T G F L E FGEDEAGE $\square Y$ VAEYGSGQVLRL
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 GF $\square$ S DKGEAF

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G S
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AFENGKPVSA PKDVVTGFTSADQKQ YKPFAEGWLNQESQ D EGWLLQGEE
FEPA LDGSFFYST $\square$ N Q $\square R H \square T$ YSSGNQYPV $\square Y$ SAWADPAT QQPEDF LTGF GADDDSSQVY $V \mathrm{~V} R \mathrm{~V}$ TVDAQGNAKSEPFDEGFP D P $\square \mathrm{DVV} \mathrm{V}$ G F $\square$ S E D G D
ER
GF L S PDER
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D $\square$ GR IRDFE
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QAASVVD $\square A \square G P G S E L Y Y V \quad D L G G T V R R$
PDTR
$S F G R P V D \square L Q L P D G S L L \quad V S D D Q R G V I Y R \square Y Y Q$
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PWGRPADVLVAPDGSLL V S DDDAGAI YR I RYTP
SWGRPVSVLTLPDGSLL VSDDAADAIVR』SY
L NERIRALLQSSEGWI YFSTDSGKDYVIKP
$Y V G R P V D V L V A K D G S L L V S D D Y N G A I Y R V S Y G$
QFGRPVGI ATLPDGSLIFTDDNNGVIYRVSYR
A QGRPVGVIVDKSGALL VADDVGDTVWRVS
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RFGRPAGVAISANGAVVYISDDANGVLYRIS
$G R P V G V A V D P R G A L L V A D D L S N T V W R I A P T G A R T T G V$
AKGRPADVT DDSKGALL VTDDVAG■IWRV
AYGRPVGVAMDARGGLL VADDVGNAVWRV $V V G R P V D V A T D P D G S M L V S D D Y G G R V Y R V T Y$
AYGRLRSLTFGDDGAFLLTTDNGS
AYGRPVGVATDRQGALL VADDVGNVVWRVSAS
VYGRPVGVTVAKDGALL VNDDDAGIIWRV
AQGRPVGVAVDKNGALL VADDVGNAVWRIT
$A Q G R P V G V A V D R R G A L L V A D D V G N R V W R V T P T L$
LD GRLS GVT QAADGSLL, LGDDTGGA $\operatorname{LIYRVAYRP~}$
AGERIRAVTEGQDGALWVLEDGAGGRLL
$A Q G R P V G V A L D Q G G A L L V A D D V G N K V W R V$
VWGRPVGVAVARDGALL VITDDQSNTVWRVAY
GRPVGVSLGPDGSLL VADDVGDVIWRVTGAA
$G R P V G \square A \square D A H G A L L \quad V A D D V G N T V W R \square T P R$
VYGRPVGVTFLQNGNLL VADDAAGIIWHV
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GRPVGLTIDRSGALL VADDVGGVIWRVSGNA
A WGRPADVQPLADGSVL VSDDLA GAVYRVTYKP
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A QGRPVGVAIDKRGALL VADDVGNVVWRV
Y L GRPVDVETDPDGSLL VADDHNGAIYRVSYG
$A \underset{Y}{ } G R P V G V A L D A R G A L L$ VADDVGNT$I W R V$
GVNTPVQVLTGPGGDLFYVA LGSGELRRVSYA
GRPVGVADDFSGALL VADDVGDVIWRVSPVAQTTYET

A WGRPAGVTVAANGT $\square$ F VISDDRNGN $\square Y R \square$
 SASGVCDLVFGPDGALYWIS DFG GYIKRVSFSDARLTAS GRPVGVALDARGALLVADDVGNVVWRV
PWGRPADVLVMPDGALL VSDDMAGVIYR $\quad$ VSYRP
LYGAPVGVAQDRDGGLL VWGRPVDLEFDPDGSML

I S D D Y A DVVYRVSYA
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TYGRPVGVTVDPKGALLI VADDLSNTVWRV
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AYGRPVGVTIDKTGALL VADDVGNT\WRVS
$S Y G R P V G V A L G P D G G L L V A D D V G D V I W R V T G A$
SYGRPVGVTI GPDGSLL VADDVGDVI WRVTGAP AQGRPVGVILDSAGALL VADDVGNVVWRVTGG
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$S Y G R P V G V A L A S D G A V L$ GRPVGVVIDKTGSLL
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V A D DVVGNVI WRV SPAA
$V A A D D V G N T V W R V T A A$

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$\bar{F} V G S R R A G K V Y A V T D V N G E$ $\qquad$ NHA

LVASDSELGFM LVVESVVMGWIE SMATS GG GTEGSNR\TLLRDSNGDGVPD $L V A E T N A P A M A Q A M K R A G A A T K S A N R I T L L R D T D G D G V A D$ LI A EATADAGPPRSVFHYAMQATMRRAAALGVSANRDTLL
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 IV GN R T G G SVSMVT E GK $L \vee A E T N A P Q \quad R P D D G W G \square K G W L M K Q V L N N A G N R I S L L$ $I \quad C T R Q R V G T M V I G D V S Q T P M P R A T Y M S D P N V D S G Y E R G L L$





 $\bar{Y} L T R R Q Q G D \square W$
FLMEQRGVVYSFSSELSGQKLFVNLTS VVY $F V A E S Q Q$ $F L G S Q P G K \square W L A T V P D Q G S G G \square L Q F D E T D Q V H F D S Q F G L M$ $F V I E R N S A N Q I T L L R D T D K D G E A D Y Q N V F V S G L N Q P F G M L$ $F I V E K$ CGADKI LDDGVVLETPFDDDGFNAKDPEHRRGLL

 $Y L T R R Q Q G D V W$ VNSRPK $L V V E A N G P P K P N S R P K Q L D M G V V Q K A S G K G G A G G N R D T L L$ LV A E S DAPDMKK\MARA GSGNPSANRDTLLDRDSD GD GVPE


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$K$ \& $A D A K$ <br>
\hline$L$ \& $N D$ <br>
\hline

 

$A D A K F I L$ <br>
$D$ \& $C$ \& $C$ <br>
\hline
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 $Y T G S R K P G K V H A M D D K D N D \quad F K D D E V V L V A D G D Y M P S$ YV N T WS GRYYKS D K K P P GGFLVAL QDKTGNGKAD L F IA Q K N GVVRVA R N GVLQQ T P AVVDVMSAVNSPR DRGLL
 $L T V G K N G T V S W L$ $L V A E G S G G N A P Q L K P K D$ LVAETNSP $\frac{1}{P R P K D F \prod A G Y I K S Q G T T T V E ~}$
 I AVLSRPGKLVRLVDRDGDGR S DASSSVLASGFERPF $L$ VAESNKPQ K DQD DS G $\square$ K D W $\square$ A GK $\square$ MAK A GA G FVGSRKAGQVWALRDSDGDGKADQRW
$M$ YI ID Q $\square G G I W S I L E L T T G N K V V V A D L S S L L V D D G D E R G L L$

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130
140 150

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AGPMPTDDEKSAVNILEWSDGHNGAAVCFGTDGMMYVTSG PRLSNPPEPEVVFDRYPEDVHHGWKYLRVGPDGKLYVPVG
 DGLRMESMAAVIEGDPSVLGHQDHAVTIGLDGKLYVNVG THDNDPSKPVVVIDTLPAETHHGWKFTAFGPDGKLYVPQG AGARQ TTEPGRKIVDLPAGNHHWTKNLDASADGKLYVTTG SGRVDVSREKLIMVIQQHNVTRNGGQLLFGNDGSLYIFVG EAKVSGKGEKILSLPAGGYNNHWTRNLLMKPDSKIYVSVGG
DVGCDPSKVGTDNGAQPCQYQVVVSEYSAKGSSANISEVTM PAGGYNNHWTRNLITNADQKIYISVG
 PSETAHGWRF AFGPDGKLYVPVG KTRKTQGEYEQVVTGDPGGSNHWTRTLRFGPDGLMYVSVG GSLSVP RVFADGFPDAGOHPARSIHWGPDGFLYATFG SGQTRITAPGRELADLPGGDNHHWTKALLSPDGKLYVGVG EGMTRUAAEGEKVVDLPAGNHHWTKNVIASPDGHLYVTSG DGALDPDSRRTVLTQEQPYSNHNGGQI SFGPDGMLYI GKVMADTQPEPIVVGLTLQRQHASKSLAVSPDGKLFVNFG ASATRTDDPLVGGLPLNPSGRHSGCRPTFGPDGAL WI GTG GEVMNPDQPEKIITGLDSKGQHSSKSTTGDDAGNIYVNDG ARGSAAANRRIFAMGLPYTSGHGGQVLFGPADGYLYLMLG NKLIPEGNPEVILVDRYPDRWHNAKSLAFDKKGSMYVTFS KNYNKKPEPEVVFDQLPDESHHGWKYIKFGPDGHLYIPIG KGVVPAGKPEIVVEGLPDTGDHPMHPFVIDRTGNLFVDLG DGTLNVYGAETLIKDLPDGGQHPNRTMDFGPDGMLYISVG EGQTALRTPGEEVTELPGGNHHWTKALLASPDGKLYVGVGG EGQTEASGPPEELTKLPAEDNHHWTKMTASADGEFYVGIG PGDLKISVAGRKVLNLPAQNMHWTRSLAAGPDGLLYVGVG GEPLAGFEPLTTPGA GPASGHWTRNLADHPDGKMVVAIG QGQTEDTAAGTELIKLPGGNHHWTKNLIANKDGKLYASIG GHLAAPPAPQVRYADFPTDTHHGWKYLDFLPNGELYVPVG SRLGNPPDPVIVNDKLPTETHHGWKFI AFGPDGKLYVPVG EGQTTITAPGEVVTELPGGNHHWTKSLLASPDGKLYVGVG G
DGRT TLSVPRVFADNFPDAGQHPARQLGWGPDGYLYASFG DGRDAPADKKKVIFEGGGGQANDHGGAMFVFGPDGRGYVGLG PENPNAVNTKVLMY DDKPYQNHNGGQLAFSPDGYLY
PGETRMSDPGTELGDDPSTVNHHWTKALLSPDGKRYVGSG
 NGDDVPDKKEVFLTGFGGFHDHSLHSVIAGPDGKWYFNTG LAKKNLDFKNGFQAEPPDESGYHFGSRLABKDNYGFASAG

S A
GMTQARA GK P QVLTKKLPSE $\square$ NHHWTKMTASAD GRFYVVGI G R


 GEKKILPAAGSNSQPWCFYYTHSDGGLVFAADNKTYVSAG D GADRID AP GRELVKLPAGNHHWTKNVIASPDGTLYATVG AK A Y ELDP K S ERTV DE WES D GHNGAAV CF GP D GMMYVT S G PASLTTATNANNVVVQANSRRSHSGVALVFGADGTLLVTTG GETKILDPAAGSSNETWCFYYTHS GGDLAFGTDNKTYVSAG DGQTQAAAAPTTVAPDPSAVNHHWTKALVDAEGRFYVGDG

 NNPNHATQLPTTDYSSPTKLSHMGGTLVFGTDNSLIISTG


| UniRef90＿L8B | SNSNITT $170 \quad 180 \quad$ ENGDD ${ }^{190}{ }^{190}$ YRRATVLEVV 200 |
| :---: | :---: |
| UniRef90 ${ }^{-}$M5WQE4 | DGGGTGDPYNFSQNKKSLLGK\MRLDDVDNLS |
| UniRef90－F7Y6Z1 | SNSNITENGDQAEKDRAAIWEVDRATG |
| UniRef90－N1QXZ1 | DGGNVG DPWNFAQNKGTLLGK\｜\｜ |
| UniRef90－G8R103 | SASNVG EHGMEVEKRRAGILEI |
| UniRef90－V6J6X7 | SNSNI TERGLDEVEDDRAMVWEV |
| UniRef90－UPI000368E7C9 | APCNICKSDPP |
| UniRef90＿UPI00042B5504 | D G G GI GDPYNF S SNKRSLLGK\｜LRL |
| UniRef90－UPI00047D8ABF | SNSNITENGDQAEKDRAA $\square$ WEVVDRTT G |
| UniRef90－UPI00047764B6 | SNSNVGENGMAA EKDRAAVLE $\square$ |
| UniRef90＿Q89FY2 | SLSSNI A EMGMEVE |
| UniRef90－I1YH21 | APCNICDVNGYEA T T 1 RM |
| UniRef90－W0RDG7 | SNSN VAENGDDKETDRAAVWET |
| UniRef90－E6J611 | DAFTGPAP ${ }^{\text {P }}$ |
| UniRef90－UPI0003FB6B03 |  |
| UniRef90－UPI0004758A8E | S NSNVGENG |
| UniRef90－S7V7J4 |  |
| UniRef90－W5WWE9 | VNCNIC DPGKDYARIFKV |
| UniRef90－UPIO003728FC3 | SNSNVG ENGMQQESERAAIWEVV |
| UniRef90＿A9UP82 | DKYNEYLV GMG |
| UniRef90＿UPIO0034B5 | Q NP G S L L G K L L R |
| UniRef90－UPI0002DB4C3B | DGTSDSDTD EKGQSTDTLLSKTMR11 |
| UniRef90＿UPI000426DC58 | APCNVCDSEKD ${ }^{\text {L }}$ ， |
| UniRef90－UP10002C356FB | HHGGQEDGYLYFMMGDGGGTGDPYNFSQNKNSLLGKIMRL |
| UniRef90－UPI00037AAE9A | DGG MKRSEVAQDDKDLRGKVLRM |
| UniRef90＿14WPU7 | S NSNIT E NG【DQEYRRAVVLEV |
| UniRef90－B2T608 | APCNV |
| UniRef90－I7ZA74 |  |
| UniRef90－FOF | STNNDAPTQNPEE ATILRV |
| UniRef90－K1RK62 | DGG L R S A N M S L L KVLRI |
| UniRef90－F4C9W4 | SGSNVG |
| UniRef90－A3CJV0 |  |
| UniRef90－W8W078 | SGSNVG ENGMEYEKRRATULEL |
| UniRef90－D0LH88 UniRef90 B1Y5N2 | LLGGMLRL |
| UniRef90＿B1Y5N2 |  |
| UniRef90＿M4WQ34 <br> UniRef90－UPI00035E7778 | A PCNI CRPDREKYANDQRLNTD <br> SSCNVCEEKNPK RAAMDRY |
| UniRef90－UPI000376668B | STNN DAPTPNPEEATMLRपSPNGQ |
| UniRef90－UPI0003789BDA | S S S $\$ ITENGDEAEYR  \hline UniRef90－W9TDQ8 & SNSN VAENGMEAEENRAAILEV  \hline UniRef90－UPI00039EFBA7 & D Y GQNLLGTLLGKM  \hline UniRef90＿I0KFB2 & APSNACQEKDRQPGSKGQMPCP LLDNYAGI WVF  \hline UniRef90－UPI0004190858 & APCNDCEKENP酎 YASITRL  \hline UniRef90＿UPI0004783D88 & DTARAT $\square \mathrm{P}$（ QDRTALGGKVLRV |
| UniRef90－UPI0004796543 | AYSNSCQEQDRTKGSKGMMPCP L L EAAGG】WQFSADKL |
| UniRef90－B4G154 | DGGKG DPFNFAQNKKSLLGKIVRL |
| UniRef90＿UPI00036057A5 | APTNACEDQNSKTNNSNSIVRGEYPCSQLT\｜LGGlWKFDE |
| UniRef90＿C7RA18 | VPCNDCN EKDERFGTI GRL |
| UniRef90－B2IHN5 | SATNACQTENRMPNVVGADPCVELET |
| UniRef90＿UPI00036BD246 | DGASYNAVDP |
| UniRef90－UPI00029A432D | SLCNDCKESD |
| UniRef90－M1JV04 | SNSN】TENG】GAEYR RAAVLEV |
| UniRef90－UPI00036799E7 | DSADTGYS P ${ }^{\text {P }}$ |
| UniRef90－G4F5Y9 | S NSNTTERGMAAEVNRAEVWEDDTETGM |
| UniRef90－A0A013WW88 | SNSNIG |
| UniRef90＿A0A009EYE4 | S N S NVAENG $\square$ A Q E E GRALIMMELDLLS T G Q |
| UniRef90－A8TXG7 | SRGNLGEEPPPRATIQE |
| UniRef90－Q15UW1 | SNSNI AENGFEAEDG RAA |
| UniRef90－LOWCS5 | APCNICDPALP |
| UniRef90－UPIO003612066 | DGGGADDMDGQ】F $\square$ D Q A MVGHGEMGNGQNKDN\｜LGTVIR |
| UniRef90－R0CP54 | APCHICRPD ENRYANLMRM |
| UniRef90－V5AXD4 | SNSNITENG $\mathrm{S}^{\text {GAEYR }}$（ RAAVLEV |
| UniRef90－Q9RYV3 | ATNNDAPTQNPEE ATILRI |
| UniRef90－H0E8A9 | DGGS AFDPRDNGQNDKTQLGKLLRY |
| UniRef90－UPI00036A76E8 | NEGGQLLDGKGNP VAGKDGKPIDFKK |
| UniRef90－17JAK5 | DGGKANDVGNGHTPS凹GN AQDLTKIYGKILR |
| UniRef90－T1WAL0 | SNSN1T ENEMEVEYRRAAVLEV |
| UniRef90－I1IIC8 |  |
| UniRef90－A4ANJ3 | NAGPHMVT DKS GWQLR S GSVYTGGTPYNDANTPAQVSDDG |
| UniRef90－V5SFA8 | S $\square$ SN $\quad \square$ AEQGMDVEQGRAMIHAD |
| UniRef90－W9DXS9 | ERGGGM $\square$ AQDPTNHAGS $\square$ I $\downarrow$ |
| UniRef90－H2QZT5 | DGG MAGDPFGTFGNAQN |
| UniRef90＿Q1YJ96 |  |
| UniRef90－D3PST3 | SETNFGP ERDPRRAAILRF |
| UniRef90－E6WVZ8 | SNSNTTERGMTA EQDRAVVWEI |
| UniRef90＿W1RYV1 | SNSNI GENGLES ERNRAAV IEV |
| UniRef90－A4CL67 | APCNI CDSTSVDERFA TITRM |
| UniRef90－UPI000350AFFB | DGGQVG NLLGKSGNAQNKSSLLVKVLR\｜ |
| UniRef90－F2UAQ4 | DETKREWVQSNSNENGDP RHNGCIIRV |
| UniRef90＿S3UL96 | DGGGSGDPNNY AQNLESALGK\｜LRL |
| UniRef90＿UPI00047C14B7 |  |
| UniRef90＿B2JWK4 | DGANFEQVDYGTACGDGTNLLPQGAFRSQGVSPYNDG\｜LRV |
| UniRef90－U2EIQ6 | SNSN $\square$ GENG |
| UniRef90－UPI00016C3CD6 | DGTADSDANDT GQRTDLLLAKVLRI |
| UniRef90－IOKE33 | DGGNPGYGSAYWQQGLQS G I T FKENSQY |
| UniRef90＿UPI0004728B06 | DGASFDQVDYGKACGDGTNLPQGAFRSQGVSPYSDGILRII |
| UniRef90－A0A024IH71 | SNSNIGERGMAVEENRA |
| UniRef90－U1K738 | VPCNI |
| UniRef90－M2TNK2 | SNSNVGERGLAVEANRAMDWQ\DAES |
| UniRef90－F8EHF1 | DGAYYSNDDDGSHPGTAYQECIGANRSQFLNS |
| UniRef90＿B3T505 | D QEQRTTFQN |
|  |  |


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| :---: | :---: |
|  |  |
| UniRet90-F7Y6Z1 | FSEDPRYER WA |
| UniRef90-N1QXZ1 | DVNNMPPKDNPFSVDFAPEVFALGF |
| UniRet90_G8R103 | DGTGEKV |
| UniRef90-V6J6X | QTGAHRP |
| UniRef90-UP1000368E7C9 | DTNYS ${ }_{\text {dek }}$ |
| UniRef90-UP100042B5504 |  |
| UniRef90 UPI00047D8ABF <br>  | RSRMFASGLRNPNGLSWEPQSG |
| Ref90 | DLAAGTHRIFGAGLRNPVGL |
| IYH2 | YAEGVRNSVGMDFQPETGAL |
| UniRet90-W0RL | PRTGAHRVLASGLRNPVGLAWDPD |
| UniRef90-E6J611 | TRTGAPAHDTMD DSRVLTYGHRNVQGL |
| UniRef90-UP10003FB6B03 | QK G GVKFATGLRSVVALD WNFADNNLYAL |
| UPI0004758A8E | TGRAALWQLELI |
| et90-S7V7J4 | TGLKVLGH |
| UniRef90_W5W | KKQEIAAGVRNTVGFDFHPTKELW |
| UniRef90-UPI0003728FC3 | D ${ }^{\text {PQHGSYLVYASGLRNPNGLA }}$ |
| iRef90_A9UP82 | QTAGMYVYVG RNGYRAFFDPTERFF |
| UniRef90_UP100034351E | DFPYATPASNPFPSQSRDEVWASGLRNPWRFSFDRTGDL |
| UniRef90 UP1000426DC58 | DKDGSNFED YARGVRNTVGFDWHPETKELWMNDNGRDW |
| UniRet90-UPIOOO2 | VSEDPRPE |
| UniRef90 UPIOOO37AAE9A | SDNPDPES PVFAKGLRSPFGATWRKDSSLY |
| UniRef90-B2T6 | DRNRFGLIGRMDPDGSHYEVVARGIRNSVGFAWHPTHDLW |
| UniR |  |
| UniRet90-FORJF9 | RPDGQWRE VYASGLRHT GFDFQPGTGQLYGFDQGADW |
| UniRef90 F4C9W4 | N |
| UniRef90-A3CJVO | TDDSDPEVWADGLRNPWRCSFDRPSYFY |
| UniRef90-W8W078 | NVDGGTPSDNPFADGSGEIEYATGLRNPVGMDWNPVTGELL |
| UniRef90- B1Y5N2 | AD |
| UniRef90 M4WQ34 | GSAREVVAHGIRNTVGFTWHQTRQLW |
| UniRef90-UP100035E7778 | NPDGGQ DELFATGLRNTVGFDWHPDTHELFGVDNGRDF |
|  |  |
| Uni | D TASGASRIFASGLRNPTGLQWEPQSGKL |
| UniRef90-W9TDQ8 |  |
| UniRef90_10KFB2 | DANKTNQR DQS GRRYATGl RNAVALDWNTTNTLY |
| UniRet90-UP10004190858 | DVSKPGSKPEVYAHGVRNTVGFDWRPGTSELWFTDNGRDM |
| UniRet90_UP10004783588 |  |
| UniRef90-UP100047965 | R V V |
| UniRef90-B4G1 | DVNYSITPKDNPYADDSEPEVVALGLLRNPWRCSFDSERYFY |
| UniRef90 C7RA | NIETKEFE LIATGVRNSVGFDWHPETKELWFTDNGRDW |
| UniRef90-B21HN5 | HADKRGQKFSP |
| UniRef90-UP100036BD246 | NRSKVWQL |
| UniRef90_UP100029 |  |
| UniRef90-UP100036799E7 | SATGAGVPGNPYYDPARSRVYASGFRSPFRMSKDPD |
| UniRef90-G4F5Y9 | N PKDGSYRDFASGLRNPVGLEEP |
| UniRet90-A0A013WW88 UniRef90 - 0 A009EYE4 | N ARPFKDGSYR】FASGLRNPVGLA |
| UniRef90 A8 | DGSG ARPF GrmVASGLRNPV |
| UniRef90-Q15UW1 | RVFASGLRNPVGMTW VDDT ${ }^{\text {V/W }}$ |
| Ref90_Low | VRS |
| UniRef90-UP | GNNPASNPFVDQALDEI FSYGLRNPYRLSFDQQTG |
| UniRet90-ROCF | SRLELVARG\| RNTVGFDWHPT |
| UniRet90- Q9RYV3 |  |
| UniRef90-H0E8A9 | DDDADRP |
| UniRef90-UPIo0036A76 | NDEVLGNNFRNNFEVAVDSYGTMW |
| UniRef90-17JAK5 | $\bar{Y} \mathrm{G}$ |
| UniRef90-T1WAL | A ATGASR |
|  | SDDSRPE1 |
| UniRef90-A4ANJ3 | KNDGNGLEVVGHNFRNAYELDLDSF |
| UniRef90-V5SFA8 | PATGRVTAFATGLR |
| UniRef90-W9DXS9 UniRef90 H2OZT5 | KDNPKFEGKSNWUYQ】GVR |
| UniRet90 H2QZT5 | ASKVFASGLRNPNGLSAGQPRTGEL |
| UniRef90-D3F | NPDGSLPEDNPFAGDPRRVIWAEGLKNSVDFTWTPRGELW |
| iRef90-E6WVZ8 | G |
| UniRef90-W1RYV1 | N PKNGYKR FASGLR |
| UniRef90-A4CL67 | DGSNREVARGVRNTVGFTWHPTEELW |
| UniRet90-UP1000350 | DEWYQVPEDNPFLPGLAPTIYAYGVRNMXRCAVDGGDRLF |
| UniRef90-F2UAQ4 | HKDGQUPADNFGHARGVPGCAYGLRNGFRSSWDPTGR |
| UniRef90-UP100047C14B7 | KEGVRYATGLRNVMGLDWNPNN |
|  | ATTQSVAVVTAGLRNPFRFAPGMTDELY |
| UniRef90-U2E | WEDDPDSGDQGUYATGLRNPNGAFGGQYRLW |
| UniRee99-UP100016C3CD6 |  |
| UniRef90-UPIO004728B06 | GTTTQSTAMVANGLRNPFRFAVPST |
| iRef90-A0A | T T GAV |
| UniRet90_U1K738 |  |
| Uni | RSA |
| UniRef90 B3T505 |  |
| UniRef90-B2IUV6 |  |

UniRef90 L8BJ91 UniRef90_M5WQE4 UniRef90-F7Y6Z UniRef90-N1QXZ1 UniRef90_G8R103 UniRef90_V6J6X7 UniRef90-UPIO00368E7C9 UniRef90-UPIO0042B5504 UniRef90-UPI00047D8ABF UniRef90-UPIOOO47764B6 UniRef90-Q89FY2 UniRef90 - 11 YH21 UniRef90-worDG7 UniRef90-E6J611 UniRef90-UPI0003FB6B03 UniRef90 UPI0004758A8E UniRef90-s7V7J4 UniRef90-W5WWE9 UniRef90-UPIO003728FC3 UniRef90-A9UP82 UniRef90-UPIO0034B51ED UniRef90-UPI0002DB4C3B UniRef90-UPI000426DC58 UniRef90-UPIO002C356FB UniRef90-UPIO0037AAE9A UniRef90_14WPU7 UniRef90-B2T608 UniRef90-17ZA74 UniRef90-FORJF9 UniRef90-K1RK62 UniRef90-F4C9W4 UniRef90-A3CJVV UniRef90-W8W078 UniRef90-DOLH88

UniRef90 B 1 Y 5 N 2 | UniRef90 B1Y5N2 |
| :--- |
| UniRef90 | UniRef90_UPIO0035E7778 UniRef90-UPIOOO376668B

UniRef90-UPIO003789BDA UniRef90_W9TDQ8 UniRef90-UPIO0039EFBA7 UniRef90-IOKFB2 UniRef90_UPI0004190858 UniRef90-UPIIOOO4783D88 UniRef90 UPIOOO4796543 UniRef90-B4G154 UniRef90_UPI00036057A5 UniRef90 C7RA18 UniRef90-B21HN5 UniRef90-UPIO0036BD246 UniRef90-UPIo0029A432D UniRef90_M1JV04
UniRef90-UPIOOO36799E7
UniRef90-G4F5Y9 UniRef90-AOAO13WW88 UniRef90-AOAOO9EYE4 UniRef90-A8TXG7 UniRef90-Q15UW1 UniRef90-LOWCS5 UniRef90_UPIOOO3612066 UniRef90-RoCP54 UniRef90-V5AXD4 UniRef90-Q9RYV3 UniRef90-HOE8A9 UniRef90-UPIO0036A76E8 UniRef90-ITJAK5 UniRef90-11IIC8 UniRef90-A4ANJ3 UniRef90-V5SFA8
UniRef90 W9DXS9 UniRef90-H2QZT5 UniRef90-Q1YJ96 UniRef90-D3PST3 UniRef90-E6WVZ8 UniRef90-W1RYV1 UniRef90-UP1000350AFFB UniRef90-F2UAQ4 UniRef90_S3UL96 UniRef90-UP100047C14B7 UniRet90-B2JWK4 UniRet90_U2EIQ6 UniRef90-UPIOOO16C3CD6 UniRef90-10KE33 UniRef90_UPIOOO4728B06 UniRef90 AOAO241H71 UniRef90 U1K738
UniRef90
M2TNK UniRef90-M2TNK2
UniRef90 F8EHF1 UniRef90-B3T505
UniRef90_B2IUV6

250
260
260
270

280 WADANERDPDYVSVQDGGFYGWPWYFGQHVDRRVQPDRG CADVGQDLHEEVDVITKGGNYGWSFYEGPYVFTPPKSLGG CADVGQSDYEEVSLVVKGGNYGWRVFEGDQSYPALSTPGG WTAVNERDPDYITSVQEDGFYGWPYYFGNHIDPPRWDDMP WTVVNERDPDYLSVRDGGFYGWPYSYWGQNDDRVRPQNP FTDNGRDPDDELNHVKQAQHFGFPYVHNDN CADVGQDQYEEVDIVTKGGNYGWRFYEGPFDYNSSNSSVA WAVVNERDPDYMTSVRDGGFYGWPYYYGQHVDPRVMPQRP WVTVNERDPDYMTSLREGGFYGWPYSYFGQNVDVRAKPRP
$W T V V N E R D G D Y L T S R D G G F Y G W P Y C Y W G K T V D D R V P Q D P ~$ MGDDNPPG ELNAASQGQHFGFPYYAGGDARH WAAVNERDPDYMTAVKDGGFYGWPYYWGQHVDTRVRRPR SAEHGPDVDDEVNLVLPGSGYGWAPDSGGRYDQSVPMTDP PQLLFSPWQSEEFLRIKEGTHAGWPYCYWDQMQGKKPEYGG WTAVNERDPDYMTSVQEGGFYGWPYYFGQHVDRRVAPQKP QNDNDDDGGVRVSWLMEGGNMGY FNPDGSRKWQADR FTDNGRDWPDELNRVTKGQHFGFPFCHGKN WTVVNERDPDYLTSVPPGSFFGWPYYYGQHDDQRVQPQRP VSEVGSNDWEDVHIIQANKNYGWPMCEGACDNPDFAQSCD IGDVGQGAVEEDNFSTGGENYGWRTFEGSHDSRFADDPV LGDDRP PDELNHVKPGLHFGFPYCHGKN IA D P CADDGQDDYEEVDVITKGGNYGWNVYEGPYPFNDPNSTSK WAIVNERDPDYLTSVQPGGFYGWPYYYGQHVDSRVMPQRP FTDNGRDPDDKLNRARAGMDFGFPYCHGGDADARTPPDP
WTVNERDPDYMTSVKGAFYGWPYYYGDHADARDPDDN HGDNIP PEELNRIERGQNYGWPFCYGDRNPDPYTNSSQ CGDLGEGAQDEVNLIQKGHNYGWDDKEGADCNNRGPCND CADVGQDQYEEVDLISKGGNYGWRAYEGPLVFNPPSAPGG WTAVNERDPDYATSVKKGGWYGWPYSYYGDIKDPRWSED WGDVGQRDWEEVNVLAAGSNFGWNTFEGTHCYPPEVDDCD FTDNGRDPD

DDELRVRA LGDDFP HGDNIP WAVVNERDPDYMTSVQDGAFYGWPYYYGQNVDTRVKPAGP WTAVNERDPDYMTSVQAGGFYGWPYYYGQHVDVRVKPQRP TGDVGQNKVEEDDHAPAGSNYGWGRMEGSQVFDGEEPANH ALDHGRDNSEEFLMVKDGADFGWPYCYNDHYQNKKMDAPE MGDDIPD CEENRATKGQHFGYPYWHAGTVKDPEFGDKG SVEHGPDVDDEVNVVVPGGNYGWDPARGGETPGGYDEGVP LHD LFPELYDDMYALKKGDNAGWPY円YYDQHKKDMAPEYG CGDVGQDAYEEVDLISKGGNYGWRALEGPQVYHPQWAPGG LᄂH HAPNYF MGDDLPPD IGDVGWTKWE GI DNGGDTPENTGGPGAFGWVAYEGGNGTSNRTGGYQ WAIVNERDPDYMTSVQEKGFYGWPYYFGNHVDKRAEPQRP VGDVGWNGWEE DYYQPGQSYSWPCWEGKTPTPGFAMAQC WAVVNERDPDYLTTVQEGSFYGWPYYWGQHVDPRVRPQAP WGVVNERDMDYLTRVEFGGFYGWPWYWGGYEDRRVQPQRP WTVVNERDPDYMTSVKDGAFYGWPYSYYGQHVDTRVKPQK
WTVVNERDGDYLARVVEGGFYGWPYAYGGLPQPELAGRRP TAVNERDEPDYMTSVQENGFYGWPYSYYGQNDTRVEQREP LGDSHPA DELNRVKAGDHFGYPYDHGGDNEDGYTPD A ADVGNDDEEINDIDSGANYGWNVREGNGNEDGYVYQQLD WAVVNERDPDYMTSVQDKGFYGWPYYFGQHVDERVQPPRP HGDNIP PEELNVIKRGKNYGWPFCYGAKNPDPFVNVAN DGDVGEQT EEEDRVAPPVNFGWSAFEGTRRQPGKDLDE QSDNDDDGGVRINYVMQYGNYGY
WADAGQNLFEEVDVLGGGNYGWNTREGTHCFDPNATTAP WADANERDPDYLTSVREKGFYGWPYYWGQHVDHRVKPQRP QNDNDQVETCRTTWLMEGGNAGYFSPDGSRTWQADRRPGQ WTVVNERDGDYLTSVQEGGFYGWPWAYWGRADHRFKSEEI ASNHGAKGGDWFGEVKKGENYGWK LWGGTNYSGSKIGPF WAVINERDPDYMTSVKEDAFYGWPYSYYGDHVDERIYPRP ATHNGTDHEEVIVAVQPGGFHGWPYCYGLNLKAERSEVPD WGVVNERDMDYLTVEFGAFYGWPWYWGGYEDRRVQPQRP FTDNGRDMMCELNRVTEGQHFGYPFCHGGGXGEGFTDPDP CGDMGQDRIEEVDLITK A ADVGQAGYEELDIELSGKNYGWRVTEGNHCY QFPCNP
 TVVNERDEPDYMTSVEDGGFYGWPYYFGDNVDARVAPQKP VGQNGQDLWEQAYLVKKGENYGWSVTEGSHPFYPNRKAGP IADVGWSRFEELHLKHGGNFGWPYFEGLSFTDGRSEFYT VGNVGWNTWESIDHVVAGQNFGWPCYEGW WTVVNERDPDYLTSVREGAFYGWPYYWGPNVDPRDQPGDD
 WAVVNERDPDYLTSVREGAFYGWPYSYWGQNVDKRVRPQD DTENGDDKFDETNLVKPGFNSGWDSDMG

UniRef90 L8BJ91 UniRef90-M5WQE4 UniRef90-F7Y6Z1 UniRef90-N1QXZ1 UniRef90_G88103 UniRef90-V6J6X7 UniRef90_UPI000368E7C9 UniRef90-UPIO0042B5504 UniRef90_UPI00047D8ABF UniRef90-UPIOO047764B6 UniRef90-Q89FY2 UniRef90-|1YH21 UniRef90-WORDG UniRef90-E6J611 UniRef90-UP10003FB6B03 UniRef90 UPI0004758A8E UniRef90-S7V7J4 UniRef90-W5WWE9 UniRef90-UPI0003728FC3 UniRef90-A9UP82 UniRef90-UPIO0034B51ED UniRef90-UPI0002DB4C3B UniRef90_UPI000426DC58 UniRef90-UPIO002C356FB UniRef90-UP100037AAE9A UniRef90-14WPU7 UniRef90-B2T608 UniRef90-17ZA74 UniRef90-FORJF9 UniRef90-K1RK62 UniRet90-A3CJVO UniRef90-W8W078 UniRef90-DOLH88
UniRef90 $\mathrm{B1Y5N}$ UniRef90-M4WQ34 UniRef90_UPIO0035E7778 UniRef90_UPIOOO376668B
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UniRef90_UPI00036799E7
UniRef90-G4F5Y9 UniRef90_AOAO13WW888 UniRef90-A0AOO9EYE4 UniRef90-A8TXG7 UniRef90-Q15UW1 UniRef90-LOWCS5 UniRef90-UPIOOO3612066 UniRef90-RoCP54 UniRef90-V5AXD4 UniRef90-Q9RYV3 UniRef90-H0E8A9 UniRef90-UPI00036A76E8 UniRef90-17JAK5 UniRef90-TTWALO UniRef90-11IIC8 UniRef90-A4ANJ3 UniRef90-V5SFA8
UniRef90 W9DXS9 UniRef90-H2QZT5 UniRef90_Q1YJ96 UniRef90-D3PST3
UniRef90 E6WVZ8 UniRef90 W W1RYV1 UniRef90_A4CL67 UniRef90-UPI000350AFFB niRef90_-2UAQ4 UniRef90_S3UL96 UniRef90-UPIO0047C14B7 UniRef90_B2JWK4 UniRef90-U2EIQ6 UniRef9-UP100016C3CD6 UniRef90-IOKE33 UniRef90_UPI0004728B06 UniRef90-AOA0241H71 UniRef90-U1K738 UniRef90-M2TNK2 UniRef90-F8EHF1 UniRef90_B3T505 UniRef90_B2IUV6
 Q
DLVAATRDPEVL FRAHSAPDDMAFYDRSAFPAHYR ELVARA 1 KPD PALGAHTASLGLMYS RGGALDNVS EFGKGKSPADYRKPALLIPAHHAPLGMTFYTGNQFPAAYR EFGAGHPCSDYTPPAARLGAHVAALGMRFYTGSSFPPEYR DLVKQADKPDYA GPGKTTKAEYCAPSTLNYTAHAAADADKFYTGTQFPAEFR
$S G P L A W P \square A S Y T H A N G C S V T G G V V V R R P R G G S A A P R A L L$

UniRef90_L8BJ91
UniRef90_M5WQE4
UniRef90_F7Y6Z1
UniRef90_N1QXZ1
UniRef90_G8R103
UniRef90_V6J6X7
UniRef90_UPI000368E7C9
UniRef90_UPI00042B5504
UniRef90_UPI00047D8ABF
UniRef90_UPI00047764B6
UniRef90_Q89FY2
UniRef90_ITYH21
UniRef90_W0RDG7

G GVF $\square$ S E H G S WD R S P L N G Y K V
 NPCLNGRY $\square Y$ ADLYAQSMWS GIEDP
NGVF IGQHGSWNRTTLNGYCVLFVPNGEPSGKPEY
EHGSWNRPNPVGYKVI FVPFSNGKPAGEPDDFATGFRGE
DNIFDAEHGSWNRSSKVGY
DPCLYGRY LYADLYADA $\square W A G T E S P$
GGAFVGEHGSWNRKSDNGYKVVFVP GGAFVGQHGSWNRRVHSGYKVIFVP
DGMVI GQHGSWNRSKLSGYKLVFI PFENGKPSGPGRD\|LS GDAl AQHGSWNRTEPVGYA
GGMFVGQHGSWNRKP LAGYRVIFVRFADGMP
NGSF $\square$ AFHGSTNRAPYPQSSYF $\square$ GFVPFKNGQPSGD GGVFIGQHGSWNRKPHSGYKVVFVP
MGEKYQGTLLASEAGRNVILAY
NGDFDAEHGSWNRSTPQGYR
NGMFIGQHGSWNREPRSGYRVIFVP
GAY

GR $\square F V A Q H G S W N R S A$
$P \mathrm{P}$ VGYR P VTVEFRGGKP
DPCMYGRYVYGDDYAGA $\square$ WA GSEDP
VK LDEDDRDGSGDRSYDEFVAYTGEGDGMPVGMAFGRDGMY HGAFVGEHGSWDRSPLSGYAVVHVAFVDGKPTGVPEPLVT NS $\square \mathrm{FI}$ I E H GS WNRSKKVGYRVVHVTTDPDGSNARQE
EGMFIGQHGSWNRRPRSGYKVIFVPFANGKPNGMPVDVLA
GDAFAAMRGSWNRSEPSGYE
L Y YCDP GVVCPCH
GQHGSWNRSKLVGYKVLF $\square P F E N G T P T G E Y K D F L T$
DPCLVGRYGYADLYA SAMWTGTEAPESSGNYSSSLI
NGAF I GQHGSWNRKP LS GYKVVF $\square$ P
F DAAGK
GWYFYADYNS
D GMVIGQHGSWNRSTLSGYKVVFVPFVDGRPAGPPRD■LS DNLFI AEHGSWNRTQK $\square G Y R V A R V E$
NSALVA A HGSWNRTEKTGYKVVSLHFGPKGTDTERDFDS NDAFVAYRGSWNRTEPSGYE $S W Y Q V V W V A F E N G K P V G E P K P V V T G F L S D D E K S V R G L P V G$

NGAFVCFHGSWNRAPDKQGGYFVAFDPFGKDGRPSGKYEV NSAIIAKHGSWNRSKKAGYEVVVVAKVSSGKVTGQET $V L A V T A Q K G E K L L I M R P G T G A$
NGAFIAFHGSWNRAPDPQAGYFVVFVPFENGKPTGK
ADPCLYGRYLYADLY ASAMWTGAEAPESSGNYT
DGAFIAFHGSTNRSPYPQAGYII
NTPLVTLHGSWNRSTKVGYKVVNMPLEA
$\underset{G}{G G A F I A} \operatorname{FHGSWNRAPAPQAGYNVVFQPDKDGRVSGR}$
GGAFVSEHGSWNRSPLLNGYQVVWVK GAYFFGDYVGQR DWAYDGFGALTEQPETPPFGGGDGGPVK EGVFIGEHGSWNDADPVGYKVVFVPFSDGS
DGAFVG■HGSWNRKPAAGYKVVFVG
GGAFVALHGSWNAAEPRGYTVVHVPFRSGEPSGGY EGMFI GQHGSWNREPKAGYKVIFVP FKNQQPAGK GDDFIAEHGSWNRSERAGYRVTRVRLSPDGEVTDYQ GNYVFGDY
NNVLIAE HGSWNRSSKVGY
S WNRKP LNGYWVKFENGKPVGQPQPVVS GFLTDDEK QVRG NDAFVTFRGSWNRNEPSGYEVARV
DRYVFGDYCSGRTW SVPADGRRHPMRREPARVPHQSA N IDEDSDPYRHWHLNDPGVPNLLQTGSGSPTGMVVYEGKLL GRY $\square F G Y W S D G R T V G N G T L L A A T P P T G W A E G$
SWDRSPDSGYQVVWVPFQNGMPNGPAQPVVTGFHYGAPVG GRYDFADMYS SAMWTGTVNTDGSGKYTSASI GALMSADAGRN VIFAYQPSMDESGF
SWNRREPSGY CVIYVPFTNGKPSGMPVDVLTGFLDAN DKSM
G $\square Y \square F G D F M S G R \square M S \square Q E N P G T G Q W Q Y S E \square C M G H G Q T C E F$ NGAFIGEHGSWNRSKFNGYKVVYVPFTDG
DSLYVAYHG
EGVFVGMHGSWNRSEPVGYKVVFVPFRNGRPAGDPDDFAT LGSRYSDGAFVGLHGSWNRKPAAGYKVVFVGFDDGEAGKA
GHLLIAEHGSWNRSEKSGYRLTLV
K $\square$ K D GESVG
GS FVFGD Y
GRYFYADF $\square A G K V W S L V F S G N V Q D \square L E H T G E \square G G S \square N D S$ HGAFVAFHGSWNRAPLKQEGFFVAFVVFKNGKPTGDWEVF NGMFVGQHGSWNRKPRSGYRVIFVPFDNG GAYVYGDYSTGHDWA
TGGETFF LDE GHHAEAVPD DHDPYQNVTSGGRCIIGGGWTR A Y VT LEDRKGKSCGGKPSGGGPDQNGSVLSA IGFTDDTST EGAFIGDHGSWNRKQPVGYKVIFVPFSGG
HQLIVAEHGSWNRSKKVGYRVMMPR EGAFVGEHGSWNRSKPVGYKVVFVPFSNGR

UniRef90 L8BJ91 UniRef90-M5WQE4 UniRef90-F7Y6Z1 UniRef90 N1QXZ1 UniRef90 G8R103 UniRef90-V6J6X7 UniRef90-UPI000368E7C9 UniRef90 UPI00042B5504 UniRef90 UPI00047D8ABF UniRef90_UPI00047764B6 UniRef90 Q89FY2
UniRef90 I1YH21 UniRef90-WORDG7
UniRef90-E6J611 UniRef90 UPI0003FB6B03 UniRef90- UPI0004758A8E UniRef90-S7V7J4 UniRef90_W5WWE9 UniRef90 UPI0003728FC3 UniRef90-A9UP82 UniRef90_UPI00034B51ED UniRef90 UPI0002DB4C3E UniRef90 UPIO00426DC58 UniRef90-UPI0002C356FB UniRef90_UPI00037AAE9A UniRef90 I4WPU7 UniRef90-B2T608 UniRef90-17ZA74 UniRef90_FORJF9 UniRef90 K1RK62 UniRef90-F4C9W4 UniRef90-A3CJV0 UniRef90 W8W078 UniRef90-D0LH88 UniRef90_B1Y5N2 UniRef90-M4WQ34 UniRef90 UPI00035E7778 UniRef90-UPI000376668B UniRef90_UPI0003789BDA UniRef90 W9TDQ8

370 F D GKPV 380 P S VIT GFVV R DE 400
K E
K E
S LPALGY DFSFGEDNRKDIF ILLASSGVYRVVRPSRCNYTC VTGFLDNDNKAH

F LT G F $\square$ S D $\square$ K D E K $R \square V R V I L E N S K V V D S Q V F A S$ GGWS

KDGRPDGK $\quad$ P QDVVTGFLDNDDQ $F R D G K P A G G P K D \rrbracket L T G F \square G A D K A M$
GF LSPDEK

## LVRVTFDDNHNVTGQETFMDGE AGDPVE $\square$ L $G F V G A D$

 YE $\square F A D G F A G V D P \| V N V S D$PSGPPQDF LIFGYLDNAGK
KPEPTGAGFAMNRHNLITS LKEEDVEDAKSRATDEDKT ■EFVQLQGSKVVGR EVFADGWDKGDS FQAGKPSG EPDDULTGFVSENDE
FFADYAQGWMKYDTFDPPTSTNVKEVVLFNS

A DEVFAEGWDRPNGE
FTD $\square$ HGEGSVYGAEPQGN $\square$ FVVRPE
GFYSDD
E S E
GFVNAKG
E
IIEPFVTGFVF EEGGTWK
GF $\square$ A N D A E
A E
SFSCSKSSP $\square$ ACDTAAGS
D
GF L A P D
$\square N E D G S \square K R Q S \square F A E G W L D A N G Q V R$
E S Q
GFEFQG
D
$\square$ TPFVTGFVF
EEGGEWK
PAQDKQGALLIADDAGNAVWRV

FAENFAGVAEQGVPGQNA WEVFADGFSGVATVNAA
VAF $\square$ PFKNGKP $\square$ NTWEVFADGFTGTDTVKDMSD NRVLSEDDFVTGW LKGDE YVVFADGFAGPHKEPGRADH YDNNDFDTDDSKGTVDALVFDANGVVVGQRRFASGV GLVA WH GS WNADKPVGFKVQRIHFENGIVAVKAEDFLLTGFS $P \vee G M P Q P V V T G F L T D D Q K Q V R$
FAPARNGDLVYADILSGNLRRDSYAAGNAAPVAKASSSTD PSGDPDDFVSGF LTED GQ FADGEAGKAKPVDVLTGFLDADGNAR

EAFMTGFW $\square$ D GTRSAE
$P \square D \| L T G F \square N Q E D E A R$
P F V]S G WL
ES LLGGK
$R$ VVRVVLDAAGNVTKQEPFQGER
LPMDKQGGVLIDADAGNTI WRV
VFDAQNKPEKI
EPFVTGFVYQEGGEWK
$Y \square Q D A S G R V L V G T T G G Q V L$
PKEFW GQM』HCEPGHNVVRSYPVEKAGAGYTAK\|VN\|VD
MAQDATGALLIADDVGNVVWRVTRAG
PLSCSEKTPFPCDGSTNSLLGRILSFGEDNKQDGFFLASQ KLKRQDLITSMQESTEGY IWNEVDGDKR N N A M

KPDGMAQDVVTGFLDGEQ ERFVIQNGLPVRSETFATGWR $\square P G Q M C R$ GFRDDDG
K $\quad P \square D V L T G F \square D K A G A$
YEPF $\square \mathrm{DG}$ G $\square \mathrm{N}$ HENQTR

S F GEDANGE $\square$ Y VVD Y G G K $\square$ F R $\square$
A N G F
A GTPEVMSSSQ
PSEFRNALYF GDLLRKC $\square$ WTMQPPNNTPQTFAR APAGAPRVVLDGFDQNDE
TPEAYQNKYFFGDYNRNWTAYAEFDTDDHPMAVE PFGY TYPQFKNALYFGDLLRKCIWTMQPPDNTPQTFAKSLQ

YEPFLTGFM
KPNGAPVDFVAGFQADGK
PAGPPVDVVTGFRSEDGM
TYPTEYKNTYFVADVEGTTFNTKLDADYNVHYVNRFGYNL YNF QLNSDRTGFVYNOKLSDVDNED YNF QLNSDRTGFVFYNQKLSDLVLDDNDEV
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UniRef90 L8BJ91 UniRef90－M5WQE4 UniRef90－F7Y6Z1 UniRef90＿N1QXZ1 UniRef90 G8R103 UniRef90－V6J6X7 UniRef90＿UPI000368E7C9 UniRef90 UPI00042B5504 UniRef90 UPI00047D8ABF UniRef90＿UPI00047764B6 UniRef90 Q89FY2
UniRef90 I1YH21 UniRef90－W0RDG7
UniRef90－E6J611 UniRef90 UPI0003FB6B03 UniRef90－UPI0004758A8E UniRef90－S7V7J4 UniRef90＿W5WWE9 UniRef90 UPIO003728FC3 UniRef90 A9UP82 UniRef90＿UPIO0034B51ED UniRef90 UPI0002DB4C3B UniRef90 UPI000426DC58 UniRef90－UPI0002C356FB UniRef90＿UPI00037AAE9A UniRef90 I4WPU7 UniRef90－B2T608 UniRef90＿17ZA74 UniRef90 FORJF9 UniRef90 K1RK62 UniRef90－F4C9W4 UniRef90－A3CJV0 UniRef90 W8W078 UniRef90－D0LH88 UniRef90＿B1Y5N2 UniRef90＿M4WQ34 UniRef90 UPI00035E7778 UniRef90－UPI000376668B UniRef90＿UPI0003789BDA UniRef90 W9TDQ8
UniRef90 UPI00039EFBA7 UniRef90－IOKFB2 UniRef90＿UPI0004190858 UniRef90 UPI0004783D88 UniRef90－UPI0004796543 UniRef90－B4G154 UniRef90 UPI00036057A5 UniRef90 C7RA18 UniRef90－B2IHN5 UniRef90＿UPIO0036BD246 UniRef90 UPI00029A432 UniRef90－M1JV04 UniRef90－UPI00036799E7 UniRef90 G4F5Y9 UniRef90－A0A013WW88 UniRef90＿A0A009EYE4 UniRef90＿A8TXG7 UniRef90 Q15UW1 UniRef90－LOWCS5 UniRef90＿UPIO003612066 UniRef90－R0CP54 UniRef90 V5AXD4 UniRef90－Q9RYV3 UniRef90－H0E8A9 UniRef90 UPI00036A76E8 UniRef90－17JAK5 UniRef90－T1WAL0 UniRef90＿11IIC8 UniRef90 A4ANJ3 UniRef90－V5SFA8 UniRef90－W9DXS9 UniRef90 H2QZT5 UniRef90 Q1YJ96 UniRef90－D3PST3 UniRef90－E6WVZ8 UniRef90 W1RYV1 UniRef90－A4CL67 UniRef90－UPIO00350AFFB UniRef90－F2UAQ4 UniRef90 S3UL96 UniRef90＿UPI00047C14B7 UniRef90＿B2JWK4 UniRef90 UPI00016C3CD6 UniRef90－UPIO00
UniRef90－IOKE33 UniRef90 UPI0004728B06 UniRef90 A0A024IH71 UniRef90＿U1K738 UniRef90－M2TNK2 UniRef90 F8EHF1 UniRef90＿B3T505 UniRef90＿B2IUV6

SKENVTAVVATGPNGS $\quad$ GRPVGVAVDKAGALL $\quad \square A D D V G N T V W R V T S A$
VYGRPVGVFILKDSSMLVTDDGGNVIWRVTA TRGRPVGVTVDPRGALI I ADDLANTVWRVT SWGRPAAVLTMPDGSLL VSDDAADVIVRISYR

ARGRPVGLAVDKSGGLL $\quad 1$ A DDVGNTVWRVTSA GRPVGVTFDKTGALL VADDVGNVI WRVT SYGRPVGVVIGPDKKSLLMADDVGNVI WRVTGA A WGRPTDVLQLPDGSLL $\square V$ S DDYNGVI YRISYG GKARGRPVGVA $\operatorname{V}$ G GGALLVADDVGNTVWRVTGA
 AHGRPVGVALDQQGALL VADDVGNlIWRVAPSAT KWFRPSDVLVGTDG AIYVADWYDGMVGGGYGRDYRDTPK A WGRPVDI EVLIKDGSLLVSDDKAGVIVKIYYK AYGRPVGVVIDKRGALL VADDVGNII WRVSA
DTGTVIDIVEAPDGSFYYAT

## VLGRPVDLLEMPDGALL VSDDKAGA】YR\｜VYQP

LYGAPVGLAQDKDGALL TADDVGDAVWRVTAA



VYGRPVGDAFAKQGYML VADDAGNT $\square \mathrm{V}$
VYGRPVGVTVHKDGSLL VNDDDSGLWRVSA
$S Y G R P V G V V I G P D A A S L L V A D D V G N V I W R V T S A$ GRPVDVLVAPDGALL $\quad$ VVSDDQNGAI YRI RYG VIARPVDVAEGPDGAI YVSDDFTGSIYRVS
QFGRVAGVAQYTDGSLLF TDDQSGVIYY RVRYT

AKHRPMG LAQGPDGS $\square Y$ T DSVKGTVWRVLAK
 A QHRPCGLAQGPDGS LYVTDD LKGT $\square Y R \square \square Y R$
 VLGRPNDIDMLTDGS IL VSDDGFSKVYRVSYQ

## $F G \quad \square A Q I T T G S D G N L Y Y A S \quad D G S G E I G R$

RFGRPAGI TVTKEGTI Y IISDDAAGNI YA I
$G[\operatorname{LPGVTQDKSGALL} \backslash A D D A G N A \| W R V S A A$
PSTR
TRGRPVGVT DDPEGALI TADDLTNAVWRVTY GRPVDVTADAKGALL VSDDVGGVVWRV
VWGRPAGVAVAPDGALL VSDDLGGTDWRV $G R P V G V E F D K S G N L L V A D D V G N D I W R V S P S D S N V T H N$ YWGRPADVMVSADGSLL ISDDSANAIYRV
A WGRPADVLVAPDGSLL VSDDLDAAVYRD
QF GRVAGLAVYTDGSLLF TDDQSGVIYRVQY
GWFRPSDVCVAPDGSLL VSDWYDPGVGGHQAG DQG

GVYRIV
KLFRPSDVAVGTDGADYワADWYDPVVGGGYGRワYRDTPK GRPVGVEIAGDGALL VADDVGKVIWRVAPAVAR

ARGRPVGV G DDGGALLVADDAGNTVWRVAAA
A WGRPVGLVIGADGAMYVSDAQGGRIYRI
TRGRPVGVTVDPRGAAVIADDLANIVWRVS
AHGRPVDVTADAKGALL $\quad$ VVDDVGGIVWRVTKA
WGRPVDLMF LIEDGSLL VSDDFGNAIVRI

AKYRPCGLAQGPDGS $\quad$ VYVEDKKGT $\square F R \square$
LQ G GPVDLKSGPA GDLFYV
AKGRPVGVVIDTAGDLLVADDVGNTVWRVS
GFDGLVSLMVNPNDNNLY
$G G P V D L K A G Q N G D L F Y$ D $L$ VITSTVRRITHK
TMGRPVGVTLDPKGAVI VADDLSNTVWRVT
TYGRPAA A EDDDGSLL VADDYANAIYRISY
TRGRPVGVTVDPRGGLI I CDDLSNTVWR
PS $I V$ V VA I HPEGNIVYLEYSPSG
GFQGVTDKFH
GF Q GVTDI K F H D G AMYVVVIGDGS $\quad Y K \square S P K$

UniRef90 L8BJ91
UniRef90 ${ }^{-}$M5WQE4
UniRef90-F7Y6Z1
UniRef90 ${ }^{-}$N1QXZ1
UniRef90 G8R103
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UniRef90 Q02B70
UniRef90-K6Z499
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UniRef90-F1RS40 UniRef90_W4MAS8 UniRef90-B4DB11 UniRef90-UPI0003B3F068
UniRef90 Q7NGA4 UniRef90-H5XMJ4 UniRef90_G0A3B2 UniRef90- S2KIZO UniRef90_A4WTF0 UniRef90_IOKC35 UniRef90 U5W0Z UniRef90_UPI0003673DDE UniRef90_UPI0003944201 UniRef90-A8H813
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 PPGFSIETYAENVTGARQMALSPNGTL VPEGFEVSLYAVVVPDARSMAVAPQGTV A G $\square T L A E G D E A K\|F A S E I T N P T N \square D\| D H K G R V$ L VPVLTF GQLPQGFTQKKLTQDI NEATCMAHAADGRI

EGEVPEAAEGLQVTRFAEGLDHPR\|LYRLPNGD\| AAPQLSVTTVASGLS $\square P$ WDVEVAPDGTA
 APPPGFKMDLFAAQLLNPVAFTDDEQGRV ATPENLAK LK KAGFHDAKFAEGLESPRVIVISRAGND TVHEELVATDFASEITNPTNIDDDHRGRV PEGAE $\square$ HMPKGFV $\quad$ EEFATGFTRPRFMALGPGGEV TPEETVKTVAEGLQVELFAAEVVNPTSMDVDHLGRV

TVNAFAGNLDHPRWLYVLPNGDV VPAGFTVTVMASELGNARMLYVMPDGGV PPGFKISLYAL VPDARMUAVGPQGVV PDGFKMEVWASGVLAARQMAWGDKGTL A WKE GETPKVADGLKDEKIPASLMHPRQLYVLPNGDV TTPDGLCAAVLADGFKFPRGUQPLSNGEL

TRQAPNGVCTEKDGNG
VA DA A GLGVAD KLFSAF VAAAKT VGPSLI
 VVPSGFKVDVFAEGLNAPDSFLFTETDEM
 ATPADELPTPPPGFKVETFASDVLDARMLREGPRGTV WAANEAPKP
 PPGFKI ELYAVVVPEARHADEPSTGV PQGFSLSI FAKDLNDPRVLTTDPSNVL A A P P VIER $\square K \square P P$ GF R VPAFPDPTAPDKPPGFKVETWASGVLDARELRQGAKGND AFSASAHAAVRLQKV GDFPNAVHVAGAPDGRL

VA E GCDDVQLFA S E LI N P TNNLHVDERGRVV EVIGWQEGQTPTVAEGGTVSAYATDLVNPRTVHTLPNGDV DQTPFVTDSNYTIGKFATGLEFPVSIDFVGD DM $P A G F G A L K V V E T G A R T R H V V V T P Q G V I$
$P K D L Q Q T I F A E V P K A R H M A Y D D Q G V L$ WAEGEVPEAAEGLAVNRFAEGLDHPRTVYALPNGDI

$P \square D P S D \square A \quad \square P E G Y S A E A V A S G L T F P T S V A F D E Q G R \square$ PDGFK $\$ SLYA $\square$ VPDAREMAVGPTTGV APEGFDI RLVAANLANPVAFGIDEQGRF
 APAKPAATVAAVPEGLEVTVWATTLHNPTNIDDDKDGRV VTA QLSPQRVTARATVVRRRVAVGFDRPVGLVRDPGGRT PPNFD $\operatorname{SNYARGSKPRFLARAPNGDL}$ APRGPSQSETPVPPDYDKAVDATCLDTVSAVA PLPDGTA


$P A G C V Q \quad L C L A E V A S G L R K P V L F V P G P D G G R$ A A EPVMDTVSKGFGLTLYASALGDAKQLAVGDNGTL TVTKGFGIT QYASELEDAKQLAVGDNGT DVSRWSADEKPVPAQGLVVERFADGLDHPRNLYTLPNGDI SLPPGFKI DYFAEDVVSARQMALSDKGIV
 PEGFEAEVVATGFNAPVHCCFDEQGNC $P P G F R D E V F A D G L G D P R M M$ LL $K D G M /$ VPEGFAIMVYADVEDARCLLALPGDLV LTPSYTSPVVAPGWKAALVAKGLTKPRGIIFDRKGRL

WAEGEKP AAGGK
WA EGEKP I AAKGLSVSRFADKLDHPRTMITLPNGDV VPSAPPTSRTPVPPDFDKAVIATCLDTVSAVAALPDGSV

EPDS LTLPKGFHATVVAEGLGAARHDTVRDNGDL TVSKGFGLSLYASDLGDAKQUAMGSNGTL

S LVIGPDGK L
PATEASGQAGVKDHPQAELVAEGLSFPTSLTFGDDGTA PSSPQTSDPPPQTDYDQSVIATCCLDTVSALAAALPDTSA

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UniRef90－M4Z042
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UniRef90－A5P9M5
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UniRef90－B1KHW7
UniRef90－12ERT2
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UniR Refo FoSRB3
UniRef90－W4MAS8
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| UniRef90－GOA3B2 |
| :--- |
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UniRef90－S2KIZO
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LVTPRDVGGTFTMKTपMGRAGAGEPSPDKLVLLRDTDGDG L MTQRAGGFVAVRPGGAVVRPRADFSRLFVVK EAGLM LVTEDHRWR』LIGSSEDRLAMYEKHYDKVLEDTNGDGGFN $\llcorner\mathrm{A} V \mathrm{Q}$ SVAPPEASVKRPKDLDADGDGVAE YIAETFRYRKSVLDDKWQTLTNESERDQLLEDRDGDGRAD MLVAQKDGVVRVVDNGTLRSTPLINLSSEVNDVS DRGLL YVSSRDAGTLTMLSPDGATKKQVVALEDVHGMVDHDGTMY WVCEAFN YRPADTGNETRPAGDRIVILEDTNGDGKAD LLSDTPNGSVWVLSGKQQKK FVGGREGGVI SAVIDKDHDGK ADEVLIIAKDLTMPS
 LFIADLLQGLLYRMQDKTLQTDLREQFPEFISKPGLGTGFG YLSRRQQNDIWYMK

DVNKDGRFD TFVSTRKTKIYSLTDRGGAAEDVREFAPTDEFNNPNGD FVGSFGLGNVYAISDKGGKRE VKTVLKGLNMPT VVAEANGVKNPVTAPKELIMSLVQKSSGKGGPGGNRITLL FDWNQNDRDMTVEKDHMYRLEDTDGDGLAD
 WVCE VVNYRHFRNPNNPVRTEGDRILVLEDTDGDGAAD YYTERSEVNSWLKDNGDGSHDWVEKEQVFRVDDTDQDGYA LVADAGV AQGEAE VADAGK LVSQPTKGTपK【LNPA LTAETNAPAGDHGGGGLTGLVAGFSTAGQA FVSSLFVANALVKTPAGGRAVHVF VLAGEPSDNGSG IVSVGTRKPKVENAGGGIMDTVKGWIADSLLTKAGATGVLL
 YIGS GDGHVYALELQGARVAARH FVSSLFVANKVYAlPENGE HKAKVIIDNMPLAT YVVQQDGVVSVVRGGVARTFVDDR ATIQSGGEQGLL
 $\frac{L V L E K H S G K V I R I S D D G G V L Y D E P I L D V S V R F N Y Y S G L L}{M}$ FLSQTKAGKVVALPDADGNGKADRAVPTM KKGGNGH LVSLTRSPNQGGGGLMGWDANKLMTKAGANGPSANQVVLL WVAEAV
YVVEAGYGEVF $\quad$ APKLLRTEPDGSYTTDATGQ VFVGTRKAKVWAVTDRDKDR VADEVKVFAPSDNFKDPN YVCERRQCIIKHHKEDDARYTREQDRIRLGTDTDGD GLI FI LEK EGYVKILTPEGEПFKEPYLDIHKLVQSGDERGLL FIVDQTGLILILTPGNQVLPTPFLNITVLASTFDERGLL WVAEGVDYRSKSNRQPGGDK LVVGQSTGTARWLDGTGPAAGPPFLDLRGAVVKVGEEQGLIM LAGERRSGRVFLV GTDGEQQEFATLDVEATGDGGLT FVGTQDG GTDGEQQEHATVALQDKDGDGIAE TFVGTRKDKVWSVTDRNKDRVADEVKDFAPS


LAVPDLNGPLYUVDETGEATEWDEFPDFVRPSQGTLY LIAVPDLNGPLYLVDEETGEATEWDEFPDFVVRPSLGTGLG FVGSYRDGSITALVDDNNDGR VDKRYVIAKGLDYPE F ANDQRGDLYRVVPGAAASDLAAQPG\｜DLRTSSGEQGFQ FVGSGKGGTITALVDSNNDGR A VDRRYVVGKGLDNPE LVAERENGGIKHLMGKAGADTTSANRDTLLRDSNGDGTVD YVGSMNAGNVYALQDKDNDGKAEKRW LI AKGDKRPS FVAERGGQUILKDTDNNGQADQKDLLLNDTFSTGLSLF WVTEGLNYRLYRNEKGE\VRQHGADRUKILEDTDLDGRAD YVSEAGH KVGKPRVLKVNTQTGEYE MVS隹 LVSQPMEGTITLLKPG LNSSVEVSEFATGLQEPN $L V V Q Q G V G V T R L D L V D H G D T C D W M S T S T I L S D S Q G Q D Q F G$
$T F V G T R K T K V W A V T D R D K D R V A D E V K D F A P S V A$ LVAETNAPAGNKPGGDTGAVMTWMMDPDKIVLLRDEDGDG YAGERRSGTVFRV

GANADQEEVARLDVEATGDGGLT
$Y$ VSMRRVKGV QAG\｜VGDRGSDGKAVQTEHFGAVD FVGSNKSGIVHALVDSNQDGR VRKRYVIAKGLESPD YATSTDGNTRRWT TGWHDLTMLSEQDHRLEDVDGDGTAD GGDGTLSNLITGGLAGRS GDADEL
 LTDTNNDGFD
DWRDLTMVKERVHLIEDTDGDGVAD

## UniRef90 W8IF07 <br> UniRef90_Q0W8G0 UniRef90 ${ }^{\text {Q11HZ2 }}$ UniRef90 U5C3L6 UniRef90_C6VW30 UniRef90_M6GX81 UniRef90_UPI000225DE50 UniRef90_UPI0004783A98 UniRef90_A6DRY7

 UniRef90_UPIOO04096C83 UniRef90-B9XC51
 G $\square \mathrm{T}$ LHPDFAA NGKCY L F Y
DAD $\square K R V L R E D G L D S P S G M A Y R D G T \square Y \square A N H D A L L A F D Y E$ GLAFDPGFTANHRVYTCQAESRGPFPSTGQVVNVVAWRMS DILDDGPIIERDGKVYYTNDPHLWMMEDTNG
$V K E T F L E H L N S P F \quad G V A L V D N D L Y V A D T D A V V R Y P Y Q$ YSTNFADVVDGLGAGVLARKGNVYFTDIPNDWLLQDTNHT GIAVNPFFAGSPYVYLLYTYDPPETAGGNRPSRLVRVTVD $\mathrm{Y} V \mathrm{~T} \mathrm{I} \mathrm{KE}$
 ENLDRP GIAI KDGDLYV AQVSQIVKYSEDE

 AGERRQVASNDPLVHGMDVKGGKDYAVGEKMDWVMDDARD
 $G L A F \quad Q D G N L Y V \quad \square A V D K L I K Y E N A E$ RNVNGKWEQHRFIENLNAPFGMQNTDYVANADSLVKFPYQ $G \| V L G P$ DGLLYL GLVGR IVRFDPKNPEATL $K F Q L V F E E L H D E V T D V A G A V M K F G D D A A P D M W R V K E D P K T$ GMEFHPNFVSNGRFFVSYHCDKLRHSGCQYQUVVAEFTAN
 $D Q Y Q M I V E D F N D E V T A V M K G E D A L F V G V G P D M W R M M D T N G$
$G I T L L G E D$ G $\square$ NRHEGN $\square Y$ V HRGF $\square$ T $\|$ I KPD G
DMF $\square Y N D G Q G N S Y L Y V$ V KASQRFVMENPALDSPFGMVWREGRDYVANHNGVVSWPFQ VAGGALYVATPRKI

LRFDA $\square$ E RDADGNGTAETRKVIASGLAWADGTLYVGNHNAVVAFPYA
 $K V P N G V C F S P D G V L Y Y V$
$G I V V Q C A Q E N D C K L Y V E N V L A F P A A Q F F G E G G P D$
$V$ GVAWH NGALYVS AVVRULRLDS AD VI PH GLCFDEDGTLEVVEQNRVSSFASAEKDWRRLAWK Gl A F H
 KSTVFYQGTDVNAAKGYYTATRGHAGVAANVVAELRAPSGD RDTDRDGUVDERYDLLTGLNS P F GVVWIDDDTVYVASY TNG G DATL L S DRIFLYYTESESGSDVREGSSELDSVDAK
 RDADGDGTAETRRVLVSGLAWGDDTLYIANHDEVLAFQYE SKAVTFYQGEELYVLPYADGKGQKVFVCQSPDVLVFEDKD A $\square A F Y$ NG

## GVC F

KNGPWTGVTYHNGNFYVGEGGELEGGRILRDS
SKDGFLFV AEQNRVLLFPAAEFFYEGPD
DKSTVFADGFNDVVDGTGVLADDGDVYYTCDPKDWKFRDD
SLAFHPNYKKNGKLYVSYTTNQERWAMGPHDHULVVVEYN ALAFHPQYAQNGKLYVQYSAPGCPLQYTRRDSEFTVSPDD

 Q

Y V A
TAPNGPTTHADMRADYR
$T \perp P N G P C F S R D G F \square Y \square A E Q N R V L L F P A A E F F Y E S G D$ TYDAPPGQTAPVWNDMAHGNDVYVAVAPDLWRLRDKNGD保 GRLLQAA FVAFHPGFADNGRFYTVHTEAGQTPTHEPPGDTRVHGVVT KRGFHPKQKDKGEFY CYSHMVKKRVRKSRDNELKVLASD SFAFHPEFATAGAAGFGRFYTVHSDDDRSPTPDFVPNSGN A $\square A F H K E F A T A G A L Y V A L D E K$ G LRSTF $L K G G N S P F$ G
 $K$ VTVFPMGDAVEERYDDHGRYLGCRVYVGNSPNDMVFEDT TFFDLPEERWLKTGAFTGACWHQGRFYFMNTDTFSRLGED GLDYY A SEEDRLIRVKDAD

 KADQRFDFRTADMHSPSGMAYGNGKLYVANHDAVLEFSES
GLADSPGYGEDGLVFAY ITTDTDN

GGTGDRMYKGALY
 KI ADGFQTE $\square \mathrm{TG}$ GAA GVLWHDGDVFAT $\square A P D V W R L R D T H G$ GLAFDPR NSKVLWLANDAPDYIQPAPDFSGK』TKLILN QIVAEDFNDEVTDVAGAVMMGEDALYVGVGPDMWRLVVQN LGDLRPPV NGLTFHEGNLY DAEGGSPGEPGRLSRLSPD GLDALSPTFAEDQLVFAYVTTATDNGRVVRFT $D$ MTRVADFPG $V H G \square T A K D D F M Y L C N N N K V L R Y A D N$ QSQVFFNKENNGAAA GVMPFADHVYYTVYPDDWRLEDTDG

## UniRef90 W8IF07 UniRef90-QoW8G0 UniRef90-Q11HZ2 UniRef90-C6VW30 UniRef90-M6GX81

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UniRef90-Q02B70
UniRef90-K6Z499
UniRef90_UPIOOO3032576
UniRef90-UPI00035D91FD UniRef90-G4SWJ3 UniRef90-UPIO00362BEC4 UniRef90_UPIOOO479C597 UniRef90 M4Z042 UniRef90 U1U8Q0 UniRef90-UP100047C3BB9 UniRef90-STVJQ2
UniRef90-M1C9K9 UniRef90-M5SV72
UniRef90-UPIO0045EBA2C UniRef90-UPIO00464B97B UniRef90'UPIO0042021BE UniRef90-T1IYJ7
UniRef90-UPIO003B4CEOA
UniRef90-UPIO00366D8B1 UniRef90-UPIOOO2D550F8 UniRef90_UPI0002F481F4
UniRef90-G8MJM7
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UniRef90 FOSRB3 UniRet90_F1RS40 UniRef90 W4MAS8 UniRef90-B4DB11 UniRef90 O7NGA4 UniRef90-H5XMJ4 UniRef90-GOABB2 UniRef90-S2KIZO
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UniRef90-UPIO003B46FA4 niRet90_O12QT8 UniRef90-K6G4R9 UniRef90-LoA810 UniRef90-LOKVQ5 UniRef90-GOSA61 UniRef90-UPIO00464AC72 UniRef90-F61FB9 UniRef90-H5WYF1 UniRef90-EARTL8
UniRef90_I $3 Z K 23$ UniRef90-A0KT50 UniReffo-A3ZN63 UniRef90_U5QGP4 UniRef90_UPIO0040DAFA4 UniRef90-LOA791 UniRef90-UPIO002626DA8 UniRet90_A5FGJ2 UniRef90 UPIOOO37A684A
UniRefgo- F4CF82
 GRLDNVPAPVVVISGFPETPEHAWKHIRFGPDGLLYIPVG
 PANTVNSVTRVMQFDSILNGNHNGGALLFKDGYDYTA $\square G$ QPYPNHNAGQLAFGPDHYLYIAWG
 $D D W S A A T R E R T V V T G I P V T A S G R H V G C G L A V S G S T W I G T G$
$G L S D K R T S L Q D G G G R M Y S G H D M H G L S W G P D G K L Y W S T G$ PGQTRDTNDGTVLSELPGGPHHWTKSLVASDDGRLYVGVG GHAETRTSDSYGYGVHFSLIGHDDHGPRFGPDGRLYFSMG QADGTLGTSKLLIVDLPDAGQHVDRTLAVGPDNKDYVSVG GDDVADKKE LLFGGDDGQHDHGMHAFVFGPDGKFYFNFG AKTMTAGAGQEVVMNGMGAGHVTRTVLFNRKGKLYLAVG GDGKADGPPTKFLTGGGGFHDHGVHGMNGGPDGKLYFT:G SATVFRGKPRELMRVDVVSPDHGMQETAFNPFGCLYDGIG EGATRTTQPGTKVLDLPAGNHHWTKNLDASEDGRLYVTVG GAVSLGTPRVFAEGFPDAGQHPARNLKWGPDGYLYASFG VAVSEVVKQGALIPASEESFNHSARVCRVGPDNKLYDTDG TGETEI RTPPEEVTSLPGGNHHWTKALLASPDGKLYVGVG DDVIGGKSGVAPLPGRGRHLLTNMRFDARGDLYVNVG GLTKEKVSISHGYGVHIGFGGHGMSGLEMGPDGRVYWGIG GTATTPFEVRRDFTMGLPHRGVYGGQLLFGPDGFLYVMTG GDLVADRKEVMFTGDGGVEHDHGDHAFVPGPDGKLYFNFG DGIMDEKESISHGYADHIGFGHGMSGLEMGPDGRVYWGTG GDGW GAPQPFTRNLPSG GHSLKTLKTSPDGYLFDNVG KGDTR QKEDILAGLPSWGDHHNNRVIFGPDGKMYFGQG
 DRIDDRPGEPRVVYDAFPAEAPNSWKAVKVGPDGKLYVTVG LGADAVSGPGRKIMDLAPGGGHWMRNLKLSPDGKRYVAVG VAAFNVVKQGELIPTEEESYNHTARVCRVGPDGKLYIAL G AAALTATNKRVLI ASLPSGGGHSTRRTLLPYKNNLLVSLG TRLNAPPQPAVVTDTLPSETHHGAKFIAFGPDGKLYVPQG DARSLAPQGGLDPVAEQSANHTTRVCRGGPDGKLYVSLG AADPGSLRPVLSIPHPADTTNHNGGQLQFGPGGLLYLAPG DDKADTKDTLFTGLGGEQS DHADHSFIQGPDGKLYFNFG NRVYQYDWNGEKLFIAQLSNNHHGGAMTKGLDNETYFVIG GEVTNPEKPEKJITGLINRRQHESKSVVLDNSGNIYVNVG AKPFTFGEPEVIVTGPPTGGGHSTRTIKFQDGKLYLSVG LGSDSVASKPRRVTDLAGGGGHWMRNLELHPDGDLYVAVG GDLKADGAPKKFLTGFGGFHDHGVHGINVGPDGKLYFTVG DGIFDKKTSTSHGYGVHGFSGHGMSGVTEGPDGRI YWNIG VAGFNVVKQGDLIPPGEFSFNHTARVCRIGPDGN YGGLG
 PHQVDLRTARVFLEVAELHRKHDGGQLLFGPDGFLYILLG ANQVDAGSERIVFKIQWPGRKHNGGGLAFGPDGLLYI GLG KGDHVFDTSVDKREVLLSGHDHSLHSVTAGPDGLFYFNQG AGRVDPLSARPVLTVAQPYANHNGGAVVLGPDGRVYGGG NGDTTAQSRQVIVTNLPGAYGHELKNI ALDTNNKLYVSЏA

QGQAPKPVLTGUPKGTNNRAALLAGAGTLLVATG DHDDNPPKPTVVFDKLPSDKHHGWKYLKFGPDGKLYSAVG GAETLSSDDFEVVAELPGGDGHNSRTLTVGPDGRIYLSLG VAAFNLVKQGELIPVEEESFNHTARVCDIGPDGMI Y YAAL G GNVMTGPEQVLVQDWCQQFSSHSDGDLHFGGDGMLYASAG EWTADDPGADVFSGDRREVLRDGYSRFLHGMQQUGFDPTT SRLRRPGRPKEIYDRLPGNSKKSRRAMQFGPDGLLY DADG AFHSVLLDEWRELMRIRQPFGNHNAGQLISFNPEGRTYMATA EGATEDTEKGRSDYALKAPNNHWTRNLAVSPDQKIYIAVG DDHLDQPKSEVFFSDLPHDSHHGWKFLRFAPNGELIIPVG S GSTEDLDREVTGLGGDSDHGVAGMVVALDGKLYFMHG NNF\|AEKET DEVLIDNDPTGGH ATRTVKVHNGSLYMSMG KKDMR $G K A Q V L V A D L P D G Y S H M K N I A V G K D T L Y V S D G$ VLDRNMTSAGHVRSLLLTRNQPPPSNPG PDVAAFKVMETLVPEAEVSYNHTARVCRVGPDGKLYTSLG AGATRLEGTPKKLMDLPPAGNHWMRNLLLSEDGHLYVAVG EPA GYYDKKTSTSHGWHVHVGFGGHGMSGLVEGPDGKIYWGDG GNALVPKEPQVIVEGIPPGGHKAGLAFDGAGRMYVSLG DGQADHRETMATGFGFHAYAGHDMHGMTVGPDGKVYWSVG SSSFSGTVQDYDVGMPRSTKDHATNSLAFGPDGKLYWTOG GD RGQQPKALLTGPKGATGNRGALMTDGKGALLVATGG ADGTLGKAADTLIKDLPSGGQHANRTMDFGPDGKLYISVG DGVSDRNTSMFRFGVHAAYDGHDDHGLTVGPDGKIYFSVG

## UniRef90 W8IF07

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UniRef90_F0SRB3 UniRef90_F1RS40 UniRef90 W4MAS8 UniRef90_B4DB1 UniRef90_UPI0003B3F068 UniRef90 Q7NGA4 UniRef90_H5XMJ4 UniRef90_G0A3B2
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UniRef90 U5W0Z UniRef90_UPI0003673DDE UniRef90_UPIO003944201 UniRef90_A8H8I3 UniRef90 IOIH61 UniRef90-A1SA38 UniRef90_UPI0003B46FA4 UniRef90 Q12QT8 UniRef90_K6G4R9 UniRef90_E8R649 UniRef90_L0A8I0 UniRef90 LOKVQ5 UniRef90_T1IYJ6 UniRef90_G0SA61 UniRef90-UPI000464AC72 UniRef90 F6IFB9 UniRef90_H5WYF1 UniRef90_E4RTL8 UniRef90 I3ZK23 UniRef90_A0KT50
UniRef90_A3ZN63

SNSNVGENG IIAA
K N R A A V L E V N P M Y S S I M R M


VFRC
D S
D G G
WKDDPKKNGQNPK TLLGSMLRI
SASN $\square$ AENGMEAED GRAMDWEY TLDEDG
DTATPSVP
D R GFSF
T T K E GKKF HGPNE GA
Q S R Q S $L G G K \underset{V}{V} \begin{aligned} & \square \\ & V\end{aligned}$

D R G
A VHF GPD GY LY $\quad$ LT VGD GTSYNF A D P R A
A NVKTKEGKVLAY STCNTCEEHNKANATMQRFNLD
NS G GQlK DRNGE\ IKDQS GNP DT TA H
SSANVVTGDPE MRAAlSRY
APCNICQTN GGDKFDNPEFAS LLKYNLKSKERV
$\begin{array}{lr}D Q G V T G G Q S S D G K G R K W K & S G T P D C Q A G T V W K C \\ D G G A T E N G Y Y G G C D & N T R K \square W S K L G R \square\end{array}$
SNSNDA ES G $\square E$ QE

PPFNI G $\square P$ P T S V
SNSNITENGDGAE
SATDHCEGENGAAPTAG QPCAEAEGPQALGVIRK
$D \square G F N G K D Q A G N T Y$ K Y
S GTHRGDPYNF A QNKRSLLGK\|LR\|
NEGHQDANGKR】IDDQSGHEVRDHGNPYQ Q G MVFRC
D $\square$ GFNGK GP D G
MRATEWKY


S G S N
$S P C N V C R P D D A$
SVSNI GENGMTLE
QPFNVPPPPEKSVLLYREQG $\square G G \square I R L G Q D$
QPWNVPPKDKLAELDKNG
SSCNVCNENDPN

APCNVVCLK
QPYNV T P R DK L E L F E R $\square \mathrm{GM}$ G
$\mathrm{G} \square \mathrm{D} / \mathrm{M}$ APCNICDPGEFA
D G G R T

SNSNVVENG IEAEKGRAS $\quad$ IWWVVDRATG
DE GQS G $\square F E N R$ VE N P CY K V S F V N DE C S T E P VVY T G S $\square F K \square$ A Y S N SCQVVKDRQK GS LGQPNCPILDSAGG■WQFR
S SCNVCDEEHPW
SDTNIGDKGMAAE
D S GVTGLQSAD
A PCNVCEA
D $\square G$
GK G K K WVSNTTDVQKGTVWRC E DPFGS I DA
 QPFNVFAPEKLDLYKKVGM
DRGNLLTADGRTLKRPGTGA
$S G \left\lvert\, \begin{array}{llll}V & V & R & M \\ V & F & R & C\end{array}\right.$
D GMITLDDMEEMDGLSDFTGSVLRLDVDTDMCQV

$D G G S$ AYDPRQQAQDLDSKLGKVLR

DAGNAKAT
APCNVCDPE
QPFNVAPKENLET
$\square L D N C T D Q F \square G E G Y A F A D R$
QPFNVPAP


D $\square$ G F S GK G P D G
NTKWGGYA S L L F R L L

KGOK K K K H
D GASFNVADYGQLGTP $\quad$ N PCADPPGGTMDPAGLDGT I LR L


A AKDPF GKF GNTQNKSTLLGKVLIRI
APCNVCES
TAGDADF GK LYY $L$ G $L G D G G S G G D P Q D L A Q D R$
$S P C N V C E$
SNSNVGEN GLETEKG
APCNI CEAPTDKHARLLFSLDNMA

D GCCSVVQP DK S
TATNLLAVVG D D DFHDRP GA
QKTQNFDVVDH
Y A S I L R L



D D GEEMPPRTY LLVSRGSSA NVDTLLAGDATSGISQURAF
QP F NVPP P EK K ELYERREG $\quad$ GGG I I R V GQD
SATNIADNGMEEE
NAGDSRA
$D P G M N V 1 D D Q G K Q H F$
ANANLCA
APCNVCEASAP
DKG G HVVVSQEGRE

|  |  |
| :---: | :---: |
| D P K VP K G T K P VG L K P C P L L D T R A G V |  |
|  |  |

 D I GF N GK GPD G K EWKY AMTNTG I DDAYE $\square$ G WLKR L $L$ P HARD DP GYDVT LAGVNVETE DAGNPSA SVCNDCKESDKET
D N G T S
VM T LE G K R L H Y
SYSDACADETKDGKSCPLLDSVAGDWRFDADKLNQEYSDG

## UniRef90 W8IF07

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| UniRef90-GOA3B2 |
| :--- |
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UniRef90_101H61
UniReffo-A1SA38
UniRef90-UPI0003B46FA4
UniRet90_Q12QT8
UniRef90-K6G4R9
UniRef90-E8R649
UniRef90-LoA810
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UniRef90-F4CF82

| ${ }_{N}^{\text {D Da R R }}$ |
| :---: |

220
230
240

DLARR

D
DDNGEPAPGNPYYDFNEVGQNRNNYBAVDSYGTW LDNGEPAPGNPYYNQPRRSTWAVGFRNPWRMSLDPVSKKL DVNYK $\square$ PEDNPF $\square$ N
SDGGPAS
D
PDTGSILRCNPD
DPTGEGAAGNPFYQ
YKEGLVFRSNPDF GSGKEVFAGGLRNTVGFAFQPATGALL N PDGSGHEIVASGLRNPVGLAYPGTDQTW WV

AKGVRNSVGFDWHPQTKQMWFSDNGRDM
DIDGKNDE
NPLGRNPADNPYAKDSGGEYYCRGFRNPNRFSWLPDGKLL
VGRAA $\square W E$ VDPRNGNYRIYASGDRNPNGLA WEPGGGAL RPDGQWRE VYARGLRHTVGFGWHPVTGVMYGADQGADW DRDG SNREVFAHGDRNSVGMDFAADKTDW
YGRAAVWEVDAATGASRIYASGI RNPTGLQWEPQSGKL YKLLW PMAMVKDWENYASGLRNSMALAVHPSGDLW PNRGVIARSNPDNGSDFEDFAMGVRNTHEFVFDDYGNLI
DVNYSIPRGNPYNNDKAPEWWAGGRNPWRCSFDSERYFM DLDG SNDETLAWNFRNNWEVCVDSFGTMW PNRGVIARANPD GSDFE YAMGLRNTHEFVFDEHTNLI TADGRPAGALLTVRHAQSAI WARGLRNSQGFAWQPQSGMF DDKSYTGAYSPFPDGSQLELVAWGLRNPFRDKFDCHHRLF EGMAFAPGTED LWVVTNQR
DFDKH
RVRQFA
NDDG TGVRQFAGGMRNPNGMDFNPYTGELD
EGRALIWEYDFASRRQRQFAAGLRNPNGLDFSPWSGEL

## DQDGK

GTGREVYTYGIRNSVG1DFNPNGELW
DQDGK GTGKTETFARGLRNAVGMDFNPDKAL
DRDRYGLIGRMDPDGSHYEVVARGVRNSVGFAWHPTRELW
NRDG SGREVFARGIRNSVGMDFDPDGTLW NLDG QGMVFRCDPD GSN RNNARVFASGLRNPNGLIFNPDTGEL
D T E
ADK■NQTYGD
DVDGK
EGRALIWEVNDET
DTDG
DTDGG SSEQDAS
PNSGITASSNPDASGIRNVTGFDWSPQDQSLWFADLGRDW
RVPCSGAVMRDSPEGEGLELVAWGFRNPFGLAFSPDGQLY DRDG
ERDGSNDEE PYSIPRS
DEPYGIPPDNPFVGD
W■GGFTARMNPD GSNVE!IGNNYRNSYEQAVNSLGDTY
WDPKARRPRIEIVAFGLRNPWRMTFDRTGALW AEGLRNAEGLAFLPGTTSLWAVVNNRDNDAYPFDDSTGNY DPSGKPAKGNP KADSAVYASGLHAPGGMCGTADGSRL NADGSGF QVLAHGDRNTVGFDWEPGTHHDIFFNDNGRDH NTDG TGREVYTYGVRNSVGQDFHPTGDLW
DENGDSPQWQPY
DKWGTGGIIRMKTDGSGREVFARGIRNSVGMDIHPETGEV PNSGVIVRANPD GSDFEVFAYGVRNTHEFVFDEYGNLI DPTGAAAAGNPADGSADRRIVASGLRNPYRFAMRPTNEVW DPEGDDPAGNPFVDDALGEVYGLGMRNPHRFTWDPDGRMF
DVDGHDPPDNPFMSDACPGVYAYGVSNXWCCAMDRGDRDF DVETGN SEQIVSGVRKVLAFDWAVEDNTLWFADLGGDW DPLGTNPADNPFVGEADDELIFAYGLRNPQRFSFDVTGNAF $\stackrel{\text { D }}{\mathrm{D}}$

DQLANTLRVN $V D T G A S E Q U A T G V R T V R G M D W D Q D G K L W$
$A T G K G 1 P Y A V G M R N P V G L A F Y P G S N T L$ TK GITPYAVGMRNPVGLIAFYPGSNTL KDSQIEFVAKGVRNSVGFDFHPSNKLF TVKCNGSVLRCDPDGSNLELVAWGFRNPYGVAFDPDGGMF DLNGN

NCTVFSSGMRNAVGMAFHPTGKLY RNAEGLAFAPGTKDLWIVNNQRDPYVDDTGNYGQU1
DVAE
AGRAA TWEDDTDTG
TPTGQPAQDNPDP
PNEGVIVRCNPD GSDF
WSFDDAKPGQKFVEG
NVDTG ASEQUALGVRDATGFDWSPQDGKLWFADQGRDW
PNQGGVMRCNPD GSDFEVFAHGLRNVQELAFDTYGNLF
TDPYSGPFYDPFAKNAPVKIYAAGVRNAYDLVWHSNGNLY
PNRGVIIARANPD GSDFEIFAMGVRNTHEFVFDAHTNLI


AAMLQUDPQTWKRTLYASGLRNTDGFDWQQTKEMW
$P N T G G V L R M N P D G S D L E F F A T G L R N V Q E D A F D D F G N D F$

## UniRef90 W8IF07 UniRet90-Q0W8GO UniRef90-Q11HZ2 UniRef90-C6VW30 UniRef90-M6GX81

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| :--- |
| UniRef90 A3W4 | UniRef90- S2KIZO

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UniRefgo F4CF82

WVVVINERDPDYMTSDRQGGFYGWPFSYFGQNUDRAKPPRS ${ }^{260}$ FTENGHNPMDEVNAPAAGMHFGYPYVHGANPDGFVDPVY FTDNQVDGMGELNRTEAGQHFGFPWVNGALEDRVDPEY FLIDVGEHFEEINDITAPADYGWNCKY
VADVGQDLWE EVNVERGKNYGWNTKEASHCFEPKRNCKQ WTTVNERDMDYLTNVPDGANYGWPWLYYKNTRDRRVEAPM A IIEQGTDRDDELNLLRAGGNYGYRPDRAPLIYD TADNDSDKGDRINYLVEGGDSGWHAGHQNAFASKLNFRSY WTVVNERDPDYMTSVKDGGFYGWPYSYFGQNVDPRVMPRP SGDNNCDNGDRLVYIVEGGDSGWRTGYQVSETTPAGLWNS VGDVGWDSWEEI NTGPAGSNFGWPYLEG
YGWDDGVDWEELNKLEMGKDYGWPY LGDGERNLYDTPPH QSDNDDDGGVRINFVMEYGNYGYRDEMTGAG ATVEERDGPDYFTHIRQGGFYGWPYSYGSNDDPRDTEEHK MGDDDP PCE\|NRVDEGAHYGYPYFHAG T TIADP MSDNDDDGNQRICFVMPGGNYGYPQSHWHEEQPGDVHKT
 HGDNIP PEELNVIVRGRAYGWPFCYGDKNPDPYTNTSQ FTDNQVDGMGELNATPGENFGFPWYGGGHTRTA EYKDQ WFTENARDWDKLNMISKGEHFGYPYCHQGD WADANERDPDYLTSVQDKGFYGWPYYFGQHVDERAQPQRP
 CGDNGGDMYEEVDMITKGGNYGWPVYEGYLFKPANAREGS QSDNDDDGGTRINYVMQYGNFGYR GELDQSTWRVPR ATNNGADNPEHLNKIEAGQHYGWPYCWSDPAQPGQLMQDP ATNHGMDSPDEFQRIQYGAWYGWPDFTGGYP
ADYANKNPPEEFTKVKEGENYGWPYCSYTMDDLDYVPDNN WAVVNERDMDY TTNVPLGAQYGWP WVYWYIDDWRVNEPMPE FTDNQRDGSDELNHVTRGQDFGFPYCHSGL WRNDPDP WTTVNERDMDYLTNVPVGAQYGWPWVYYRTNRDRRVDAPM FTDNQVDGMGELNRQTAGQHFGFPWYGGGSVRTNEYKDS FTDNQVDGMGELDHATKGENFGFPWYGGGKVRTVEYKDQ ATEMGRDPPDEINTIKQGGNYGWPПCYGKNSHDTEFDKNT

 LGDVGQSTTEEINVVAAADFGWDVCEG QSDNDDDGGVR NYVMEYGNYGYPKRHWHLNDPGVVPNLL WCVVNERDPDYMTSVQDGAFYGWPWYYGDHVDPRVYPPRP DTENGENYFDEDNLVKPRFNSGWNSVIGPADRENPDTHPC VMQHGRDQAECLYALKKGDNAGWPYMYGQQHKKMMAPEYG
 LSDNDDDGNQRICFVMPGGNYGYGPRHWHEEQPGUVHKTL SSDNDGDHPERLVHVVEGSDAGWRSNWQYGKYTDPKNNKF ITSENSYDTADYLWHVKPGTWYGWPDYAGGMRLDGERFEAP FTDNQVDGMGELNRTKPGQNFGFPYFGGGSVRTGVEYKDQ

QSDNDDPPACRVTPLLYGNAGFASADGKRAWGADKRPGQ VADAGRDQTEEVDRVPAARNFGWAAFEGARDQTNRRLTPG GAYVDNHPPEEFTRV LDGGNYGWPFC GARDQTNRR WVTDQAKEHDVVYRIEEGEDLSVPAWTWKDKPGVSGCADW LGDDVP PDELNQWTSMQHYGFPYCHAG WTDNQVDGMGELNHTEAGQHFGHPWYGGGSVRTN EYKGE ATNNGPDHWEVLVRAEEGSFHGMPWYQWVAGEYRRDDCVN WNQVDGMGDDELNRATPGQNFGFPWYGGGSVRT VEYKDE SEDNDGDHPERLVYIVDGSDTGWR
IGdVGWNTWEEINRLTAGANFGWPCFEGTGRQGGYDGANL VGMVGEQSDDSVYELRPGDDFGWNEREGGFRFDRSDPSNV MGDNLP ITADIGQAVEEI NLLRAGGNYGWNEREG NRIDKGGHYGFPYVEG HASDVIEPAY FADVGRDWMDEDNR DKGMHYGFPYVGYGYASVVEPAY

 ATEHNDDEREDL
 ADYVDENPAEEFTKVEEGKNYGWPYCNPVPSDSMDDVPDV FTDNQVDGMGELNRQTAGEHFGFPWFGGGSIRTN EYKSE WATVQERDMDYFTNVRVGVQYGWPWIVYWKNVYDDRVSWPM SSDNDGDHPERLVHLVEGSDSGWRDNWQFGKY GGMHGRDGPDEIFRIAKSTDMGWPYTYWDGARKLRLTAPE MGDNLP PDELNRVVIGSHYGFP YLHASSVVEPAY GVDNDSDQKERFVYUAKGDDAGWRCNYQ YRGDGYNPW LPTNGSA

ATDQGADDPELLIVVRPGAWYGWPDYDGN EPDTDPKF ITDRGSSA DALYAITPGASLAVPTWTWPEKPALAGCAD GVDNGGDTPEELNK DMGGNYGFPFAYGKKEVDQSREDPV SVDNDGDERERFVYITEGSDSGWRLNWOFRTK

UniRef90 W81F07 UniRef90-Qow8G0 UniRef90-Q11HZ2 UniRef90 U5C3L6
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DLVIAKAlIKPDYALGSHTASILGLTFDEDS S $\quad$ LIPSPYR GGEYNLSL VTPPELDLPPHVAPLGLRFYTGTMFPAEYQ GNVPRPEGVEFVPPAVEMDAHAADLGMSFYRGNSFPAEKYH
EGLTDPDYEYGREEGQSTTGGYVYSNS
EGLIDPDYEYGREEGQSITGGYVYSNS
ESVPMTDPVRVPGADGAVWSSGSPTLATTALQFLPAT DYAEKKSLNSSWMTERLFYANDENQ FYNARAVMPTV

$\qquad$ GVTLDQWDAKSTRPVLTWAAHASGMQLIFLSGTGDPADYN DLVARA IVPDVILQPHTAVLDFL WRANYTGKQFPAEYR EFSUVKNPEDYVAPAFNLGAHVAPLGTHFYHGDMFPESAQ RTGFGSPTGDCFYEGTLLPEKYRGQLLHCDAGPRERRCAH DLVAEARVPDYALGSHTASEGNAYSGGYYGKTIPL L R IPNLTTKQDYCAGSVLTYTAHAAAIGGMFYTGNSFPAEYR TPPADVVFPVVEEAAHAADLGMMD GTGKMFPKEYQ KFAMGHKCSEFTPPVLNLGAHVAPLGMKFYTGDQFPAEYK DLVAKA $\mathbb{D} P \mathrm{P}$ YA S SHVAPGGLLFYGMPQYRGGAFDSEHG DCSA DEEMYKPRAPARLLPAHAAPLGMTFYTGDRLPALYR TSNSSSNSLIFPVMGYNHPETYKT $\square G S A S \square I G G Y F Y R S Q T$ TGMHAEDPDR
NFVGETACQQAQAPVLT VT LPQFKPKGKPQPTFLLEEHPMQPPGPVAVFPPH ENETAVNCSSFRKVDKGDQAHSAPLGQTFWTGDKVDKKYR YLMEYVRKPEYGLGAHVAPDGLAFARGGNTMGDRFA AFGARRSCAEFTAPEALLGPHAAPLGMRFYRGTAFPEKYR PLMEYVRKPEYALGPHVAALGLVFSKEGDRMGPGFASGAR


FYNGKMFPQKYQ YFRNPCMEPFETPSYПDTQAHSAPLGपAF EFGAGHPCNAFTPPVVKLGAHVAALGMRFYSGSMFPPDYR
TPPEGVVFPQVEEAPHAADLGM EFGWGKSCDDYAKPAALLGPHAGSLGMTFYNGKMFPAKYQ
QTGSGSPCGMAVYEGEMDPKDFWNQPLHAEAGHNVVRAYP DMVERADPADYALSSHVAPLGMVFS NGSAMPDQFA AGG』LGNESDCPVEYRGFQP 1 PPTFENFVYSDPEFSFHET GDGKKEATGNFDEPAAAFPAHMAPNALLFYTGTMFPERYR DFGDRYDCRLTEPPAHTFTAHMAPDGLLEFYK
QY $\square$ SY VRRPEYA $\backslash G P H V A A L G G V F S K E G A A M G E G F A F \square A R$ RTGFGSPTGITFYEGDLFAKKYRGSLLHCDAGPREVRWFH A YEKPKNLK TG L P NYELPAHVAPMGLHFYRGEQFPPRYH NVWMDEKLFKPRWDGQAAYIIPPDMNYHNGPTGMVYNPGT GKKAPQPLLAQHPNQPPKPVADLGVHSSSNGLDFSRSSSF APPADAVKPEVEMPAHAADLGM

TFYTGSQFPQKYR WNRERMWYPYR
$D \square P T A E W D P G T M P S G D V Y G G G A P T G V A F Y E N G$
S PLAA WPVASYTQRDGCAATGG
DTTNGYYNMPFDRDYELNASGSVDCGGMNRDDRGD
TYGAKMKCGQFQGPVWRYKAH DAP $\square G M R F Y T G Q Q F P E H F Y$ $D V P$ VEVVMPAVETVAHAADLGM TFYTGKMFPAKYK S EPPHPTDAIPAPVA ILPARSAPL GLAFLPEDS EPPADAVMPVDEMDAHAADLGMM FYTGSMFPEEYR
DMCEN LYSAGGQTAPFYTYQHTEKVVQYGKYRDPLN
Y MCE N LYSAGGQTAPFYTYQHTEKVVSGETCPT
 $D K P K N$ L K V VPPTYELPAHVGAKGLHFYRGTQFPERFH

EKPENLKVVVS PVYELPAHVSPMGMLFYRGEQFPAEYH EKRQYERRPDYSLGPHVAP LGMLFADRTRR LGAP F D NFSEGKKSTDYVQPALKLGAHVAPDGDHFY LGKHFPAAYQ EFGP L N S GYTFVVDPDYELGAHVAPTGID FYDGEMFPETMK
 NTY $\quad$ R N P CEDSTPSLIDDLQAHSAP LGGLNFYYGNSFPAEYF DNNENETVVNCSTEDKGIQAHSAPDLGLTEWTGANVDEKYR
 QYGMGTRKPEYAMGAHTAVLGMVVFANGGNDMGPDFANSWN TDVLAVATSEAA
TDPKNNSYKVWMDEGMYLPRH DKQAAYF LDP P $\quad$ DR YGGDGKTPAAASYAAPVAAFFQPRRAGAFYGGKRFPKMYR EKPKN LK $\quad$ TTVPVYELPAHVAPTGGLAYYRGKQFPEDYH MA E E L WQ T RRAA QPAY LTTPPLAAYSLD GPA G
P T QNDY LFKVVA QS G GYFGHPNPTRGQYVMNGGNPTSGVS
T NWQF GKYRDPDN
HPTRGPAPQFVLANHHEFPPPEAPLLHFPTHTSAVKFDVA
GNTKEGWVKPTQAS LLDFPAHSA


## UniRef90 W8IF07

 UniRef90-QoW8G0 UniRef90-Q11HZ2 UniRef90_U5C3L6 UniRet90_C6VW30 UniRef90-M6GX81 UniRef90_UPIO00225DE50 UniRef90_UPI0004783A98 UniRef90 A6DRY7 UniRef90-UPIO004096C83 UniRef90_B9XC51 UniRef90 UPI00037C9283 UniRef90-I3ZM18UniRef90-R7ZL61
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UniRef90-K6Z499
UniRef90-UPIOOO3032576
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UniRef90 G4SWJ3
UniRef90-UPI000362BEC4
UniRef90-UPIOOO479C597
UniRef90 M4Z042
UniRef90 U1U8Q0
UniRef90-UPI00047C3BB9
UniRef90-S7VJO2
UniRef90 ${ }^{-1}$ M1 C9K9
UniRef90 ${ }^{-}$M5SV72
UniRef90-UPIO0045EBA2C UniRef90 UPI000464B97B UniRef90 UPIO0042021BE UniRef90-T1IYJ7
UniRef90-UPIOOO3B4CEOA
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UniRef90-A5P9M5
UniRef90 UPIO0016C4477
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UniRef90 Q7NGA4
UniRef90-H5ХMJ4
UniRef90-GOA3B2
UniRef90 S2KIZO
UniRef90-A4WTFO
UniRef90-10KC35
UniRef90 U5W0Z1
UniRef90-UPI0003673DDE
UniRef90_UPIooo3944201
UniRef90_A8H813
UniRef90 101 H 61
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UniRef90-K6G4R9
UniRef90-E8R649 UniRef90-L0A810 UniRef90-LOKVQ5 UniRef90-T1IYJ6 UniRef90-GosA61 UniRef90-UPI000464AC72 UniRef90- F61FB9 UniRef90-H5WYF1 UniRef90_E4RTL8 UniRef90-13ZK23 UniRef90_AOKT50

GGAFVGQHGSWNRSVHSGYKV ${ }^{340}$
NQLLIAEHGS
SWNRTVPVGARVMFT A DDEEGNATST亩
Lle D Q

GKY YFADFVSGR VWADD DPDESTQPAKKVYS LGKWP LIS S GAFVARHGSWNRKPPSG
GWGEFGGGLAVSTLKGERLVFM
G Q IQ


GGAFVGEHGSWNRHEFNGYKV
GFPDRWQDHFFDCDYKGSSVNSGDHSFAL
IISFYNNGNRNNTSDPPAVFPILTQSHGAPDGAHVITAGDF GDA LATMHGSWGANPPSGYEV $\begin{array}{ll}H W H L N D P G V V & P N L L Q T G A G S P T G M T V Y E ~ G E L C \\ N G A F L A N H G S & S G R A Q R L G Y S I T F V P F K N K P A G P\end{array}$ NNDFVAEHGSWNRSKKSGYKVM
KKPKGAGYELEKENLVTSTDNWFRLSDVCVAPDGSVMMAD NKYVFGDVANG
NGVFIGQHGSWNRKPRSGYQVIF\|PFRVGK
NDAFIAYRGSWNRSEPSGYE I ARVNFDANNKPTE GA IFSAQHGSWNRTVPVGARVMVTK I DAEGKA
NNI LIDAEHGSWNRHKYQGARIMRVIVGPDGKDAKQEVFAS SWNRTPLNGYKVIWVKFENGKPVGQPQTVVSGFLTDDQKQ NSLI DGYHG YRAHGHRLVA LLPNSKGAPLGKSVEGIGGW N $D P C L Y G R Y L Y \square D L Y P D G \square W S S T E N P$ HWHLRDPGVV PNVVQTGAGSPTG I RYE GEA NRYKVWMDERFFTPRWEKQAAFDTPPDANYTGMVYNPGAG QDA IVALDGSWNRK QPSGYALLRVQFR SAAMGFDFNYNPDFGPTGDVF VAEFGSGAPGTTGGK
$G G A$ LVMMHGSNRWSSDRG
$G G A F I A R H G S W N R R P I A G G D V V F V R F D S H G N$
GGAFIARHGSWNRRPLAGYDVVFVRFDSHGN
HGSWNRKPASGYDVVFVDFDDRGNPVGKPKP
GGIFLAQHGSWNRTEPVGARVMFAPVNPDGSAGTAEVFAE $G G \| F D A E H G S W N R T K P V G A R I M Y \square P I K E D G T A G E P E V F A Q$ NDLLVAYHGSWNRSV PTGYK IVRHQFN DNI FIAEHGSWNR

A QVDGAGYKAEVVNLVKSKDQWFRPSDVCVAPDGSVF DSD HGAFVGEHGSWNRTDFNGYKVIVYPFENG
VG PA P $\square$ AFPDDSFGYSDMDFVSDHNHAA $\square$
NGAF $\square A F H G S W N R A P E P Q A G Y Y V V F Q P F K N G K P S G E S E V F$ EGALPARYNHS
HGSWNRKPPSGYDVVYVAFDERGNPTGKP円P
RKPKGAGYELEKE LLLTSSDNWFRPSDVCVAPDGS IVAD NQMF VAE
AL
$G F Q G Q A F V A Q F G D M A P E \quad V G K V L A P V G F K V V R V N V A$


## A LGKK WPGLLLACEAGRNVVFGYFPKPQGAGF

QAHSAPLGLTFLQSTNFTSLYRSGAVLGLHGSWNRTQRTG
$K Q L F V A Q H G S W N R \quad S V P Q G Y Q V A L V K F R G G E P$ NAIFSAQHGSWNRTEPVGARVMVT VIDGEGNATMEPFAE GLALDA $\square$ VAI HGSSATQPDGRVTGDPATR
 NTYKVWMDENMFKPKFEGQAAYITPTIANYAGMKYNPGTA PYPA $\square E G R Y \square F G D \square V S G E \square R F A D T$
NQMFVAE
NQLLVAE
NGAFVARHGS WNREPLSGYDVIFDP
QQLFVAEHGSWNRSKKSGY
N NLIFIALHGSWNR
RMGATYRTTSGETLLRGDDP WFRPVDVT LDHDGSALVAD
FGFY GDAF $\triangle A L F G D \square A P V T A R S P S P R G$
GNMFVCFHGSWNRQ
DGALVAMHGSWNRESS $\square$ S G
DKFDPKNNGSRVFDSFHGSWNRDVPVGYKDSYVNFSAKT GGDFSAQHGSWNRTTPVGARVMFTAVNEDGSAGETEVFAE RRPAVGYDVVF DPFDANGNPKDVKPVRVLTGFLDKEGSTH
$N$ NHNGPTGMQFNPGTA $\square G K S$ DGAFVALHGAADEGGENGQAGYNVVF 1 PFKG NKAGA NQLFVAE

FTFNPGTA
$G V Y \square G Y P V G V L P D V N Y R G F A Y N F G L N R S P D G A D E Y K S S S F$ NTYKVWMDEEYFKPRWDKQAAF $\square T P P \square I N Y T G M L Y N P G T A$


UniRef90 W8IF07 UniRef90＿Q0W8G0 UniRef90－Q11HZ2 UniRef90＿U5C3L6 UniRef90 C6VW30 UniRef90－M6GX81 UniRef90＿UPI000225DE50 UniRef90＿UPI0004783A98 UniRef90 A6DRY7 UniRef90＿UPI0004096C83 UniRef90＿B9XC51 UniRef90 UPI00037C9283 UniRef90－I3ZM18
UniRef90－R7ZL61
UniRef90 Q02B70
UniRef90－K6Z499
UniRef90－UPI0003032576 UniRef90＿UPI00035D91FD UniRef90 G4SWJ3 UniRef90＿UPI000362BEC4 UniRef90－UPI000479C597 UniRef90＿M4Z042
UniRef90 U1U8Q0
UniRef90＿UPI00047C3BB9
UniRef90＿S7VJQ2
UniRef90 M1C9K9
UniRef90 ${ }^{-}$M5SV72
UniRef90＿UPIO0045EBA2O UniRef90＿UPI000464B97B UniRef90 UPIO0042021BE UniRef90－T1IYJ7
UniRef90－UPI0003B4CE0A UniRef90 UPI000366D8B UniRef90－UPI0002D550F8 UniRef90＿UPI0002F481F4 UniRef90－G8MJM7 UniRef90＿K1X1T2 UniRef90－KODU49 UniRef90－UPIO004666705 UniRef90 UPI000478AB9s UniRef90 D3F9Q1 UniRef90－F4L7J3 UniRef90－A0A017HUX7 UniRef90 B3V5W6 UniRef90＿UPI0003B6DFC8 UniRef90－M1YGF7 UniRef90－A5P9M5 UniRef90 UPI00016C4477 UniRef90－B1KHW7 UniRef90＿I2ERT2 UniRef90 UPIO0040A210B UniRef90－D7A4T2
UniRef90－FOSRB3 UniRef90 F1RS40 UniRef90＿W4MAS8 UniRef90－B4DB11 UniRef90＿UPI0003B3F068 UniRef90 Q7NGA4 UniRef90－H5XMJ4 UniRef90＿G0A3B2 UniRef90 S2KIZ0 UniRef90＿A4WTFO UniRef90＿IOKC35 UniRef90 U5W0Z1 UniRef90－UPI0003673DDE UniRef90＿UPI0003944201 UniRef90－A8H813 UniRef90 IOIH61 UniRef90－A1SA38 UniRef90＿UPI0003B46FA4 UniRef90 Q12QT8 UniRef90＿K6G4R9 UniRef90＿E8R649 UniRef90－LOA810 UniRef90 LOKVQ5 UniRef90＿T1IYJ6 UniRef90－G0SA61 UniRef90－UPI000464AC72 UniRef90－F6IFB9 UniRef90－H5WYF1 UniRef90＿E4RTL8 UniRef90 I3ZK23 UniRef90－AOKT50 UniRef90＿A3ZN63 UniRef90 UPIO0040DAFA4 UniRef90－LOA791 UniRef90＿UPI0002626DA8 UniRef90 A5FGJ2 UniRef90＿UPIO0037A684A UniRef90＿F4CF82



WY DPGVGGHQVGDLNRGR\FRI

FGKDATGKVYLSDFGSGK $\square Y R \square D R S$
GNPLGKPVSVLGSFLDNG
$R$ DSDDGQSVVSTVEA DGE
DNKFFVND FRGGVPRTNDSMFDVEEAGAGFKMEANLEDEA VVFLFKDGRPSGNPQDVVTGFE RPAGAGYEMVDHTNFIWRILA
Y N QNTMFFDDVYNGTIFA ATLNASRQVASVQLVDNNA MTPFVEGFLMPVKGGSGW $\square P E V F H G Q M I H T D A G P N V V R A V Q K D G A G Y R A E \square V N \square M V G D$ ARDFATGWMLAPDKA

RAVLKDNEIVDYQPF $\square E G W L Q A D E$
T


PFGEP $\square E \mathrm{~V}$ पT GFVSEAGE PDGSKPFAEG WENGQWK
】T P F VT GF VF
GF $\square_{E G D Q G Y L}$
VRGDNQGGVLIADDAGNA $\square$ WR $\square$
HSKPGQGM
WKETFFVAGFSGNPARSG $\square$ HAFK $\square A P K G A G F E M T E T K K \square M$
LP P K Y R G QLIHCDPGPNSVYE LHDDGAGYVGHQVE LLS GD LGPRWKDHFFVVEFVGNAIHAFTLEPKGATFELKSTERDA NQQPVASVPFISGWLQGK $P \square P Q V G H R V S R \square E L K T G \quad R \square K N F A \square N R T G Y A A T H T G G G$ FFPWVNGRP ARKQADVVAVLPRPPAPVLTGFLTKDNK $V L T G F L T A E G K$
GWLAESGEYL
GWLTDSGEY
ANGTYEGTDF $\square$ TGW $\square$ DGEQKT L
SKKAGYRVVRVVTDPDGSHARQEVFAEGT
GWNDGDPQY
ARPDGKGGAKLETFMTGFVK
WYDPAVGGHKFGDTGRGR $\square \mathrm{FR} \mathrm{V}$
EPAGQPVD\｜VTGF\｜EGDQ YNFPLNSDRTGFSFSSPDLKDLVADGRWDRQPPELIFAYN ADNFAGSPEKAATGR $\square F$ VSFHGSWNRSVPAGYQVRRGQLDAEGNVQSDEVFDDGS WY DRGVGGHGMGDPTDGR TYR TTPKGHTGYKVPEVKLDAK NGSWNRSSKDGYQVVMLEDENNKVIK RSPVVSFLD WKNKFFLVEFVGTPTGSHI WSFGLKPKGASFVLDGEKDVV DGTVADFAANRGKIVA

PASKLKTG | GWLT PNGEYL |
| :--- |
| LPERYDGHF |

## K LD R F DF $\square$ T S NKEKKFAGSDF $\square G G T S S V T S E L P T L F$

YK $\square$ A HFA WDSSTQRPGAQVDLVTGWVDSATQE
FSEQ
A F $\square$ S G W $\square$ T A S G T
G W $\square D E N G E Y$ L
REPR【VGVTID EHGQGK】SDLLSGFQNEQ GE GW\DENGEYLLGGSPTNSG\HAFKDKPKGAGFELGETKK\｜V YPAAYQGAVFFSDYTRDCIWAMRPSPGGVPVAANRDTFAA AEMVQGGERAPFYEVALVDEAGQPTDMRE

N G S WNRSSKVGY QVVMLE $\square$ E N G QVAKRSTVVS F LD NGS WNRSSK $\square$ GYQ $\| V V L T \square D K G E V K R R E T L I S F L D$

KVGMVT LTNGSTVVKYEPF DTGFM SEKVGYKIVRVDLDTSGNVIGSHNFIDDK WY DGGVGGHAFQDQTTGRUYRVAPKGWQPSRPSHDFGTPD
 $N K V S F F P W V G G R \quad P G N E V D L V T G W V I G R E$ GQP 1 PAADSVDSLVD $\square$ MTAADVTKCGLTRCF
GWLDENGEYL
GRPTWVTWDKTGDDTAGVIWRVMAPGAKPSEG口KRDE
WLNKFF LVEFTGTPTGAH DWAFDLKPKGASFDFNSE！DMV PMVFADGFAGPTMDDKNAKRAIY

NGSWNRS S KVGYQVVMLK LIENEQVVSRETVVSFLD
$L S P E Y K D Y F F L T G A P G G V Q V A L Q A E T D G A S F T M T N Q H K I G G$
$A G V L K N Q L L V V E Y S A G D D I L T L T P G S D G N I D T M V T Q L S S ~$



H GS WNRQNPSGYKVERDKFDSKGNPTGSEDFLGSE


## UniRef90 W8IF07

 UniRef90-QoW8G0 UniRef90-Q11HZ2 UniRef90 ${ }^{-} 66 \mathrm{VW} 30$ UniRef90-M6GX81 UniRef90-UPIO00225DE50 UniRef90-UPI0004783A98 UniRef90 A6DRY7 UniRef90-UPIO004096C83 UniRef90-B9XC51 UniRef90-UPI00037C9283 UniRef90-I3ZM18UniRef90-R7ZL61
UniRef90 Q02B70
UniRef90-K6Z499
UniRef90_UPIOOO3032576 UniRef90-UPI00035D91FD UniRef90 G4SWJ3 UniRef90-UPIO00362BEC4 UniRef90-UPIO00479C597 UniRef90 M4Z042 UniRef90 U1U8Q0 UniRef90-UPI00047C3BB9 UniRef90-S7VJQ2
UniRef90 ${ }^{-1}$ M1 C9K9
UniRef90- M5SV72
UniRef90-UPI00045EBA2C UniRef90 UPIOOO464B97B UniRef90 UPIo0042021BE UniRef90-T1IYJ7
UniRef90-UPIO003B4CEOA
UniRef90_UPIO00366D8B1 UniRef90-UPI0002D550F8 UniRef90-UPIOOO2F481F4 UniRef90-G8MJM7
UniRef90 K1X1T2 UniRef90-KoDU49 UniRef90-UPIOOO4666705 UniRef90-UPI000478AB99 UniRef90 D3F9Q1 UniRef90-F4L7J3 UniRef90-A0A017HUX7 UniRef90 B3V5W6 UniRef90-UPI0003B6DFC8 UniRef90-M1YGF7 UniRef90-A5P9M5 UniRef90-UPI00016C4477 UniRef90-B1KHW7 UniRef90-I2ERT2 UniRef90 UPI00040A210B UniRef90-D7A4T2 UniRef90-FOSRB3 UniRef90 F1RS40 UniRet90 W4MAS8 UniRef90-B4DB11 UniRef90-UPI0003B3F068 UniRef90 Q7NGA4 UniRef90-H5XMJ4 UniRef90-GOA3B2 UniRef90 S2KIZO UniRef90-A4WTFO UniRef90-IOKC35
UniRef90-U5W0Z1
UniRee90-UPI0003673DDE UniRef90_UPIOOO3944201 UniRe990_A8H813
UniRef90 101 H 61
UniRef90-A1SA38
UniRef90_UPI0003B46FA4
UniRef90 Q12QT8
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UniRef90-E8R649
UniRef90-L0A810
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UniRef90-T1IYJ6
UniRef90-G0SA61
UniRef90-UPIo00464AC72 UniRef90 F6IFB9 UniRef90-H5WYF1 UniRef90_E4RTL8
UniRef90 $13 Z K 23$ UniRef90-A0KT50
UniReffo-A3ZN63

GRPVG|VTFDKTGALL VIADDVGNVI|WR ${ }^{430}$
AWGRPVDLLVMPDGSLL VSDDRAGVIYRITY
HGRPMD $\triangle$ AFLPDGSML VSDDFAGA WRUAYNPAR

TRGRPTWVEFTEDGGLLVSDDTAG\|IWHV
 THGNMVDMDFGPDGKMYVSEFNNGGY NRDEGNLFT THGRPVGDAVDKAGGLLIDADDVGNTDWRVTAAPYR PG VVDLKGPDG WLYGADIFDGTIRR
RFARPFGLAQMQDGS L LGDEQNGLYRVTHG KDQRPSDVCVAPDGSLMVADWYDPGVGGHQVGDD N VWGRPVGLLEMPDGSLL LSDDGGKKVWRISYRA SWGRPVALLTMPDGSLL VSDDFANVIYRVTYQ E
ayGRPVGVADDKQ SALLVVDDVGNTTWRV
QFGRVAGVAVYTDGSLLFTDDQSGVYRV

GAPVDVKQGPDGNTYYVEDRTGRVVR
GGILPTGMDFGPDG ALYFADWDDGWGTNDDGRПWKMEVT
QWFRPVDVCVAPDGSLLDADWYDPGVGGHRMGDTER
SGVLPTGMDFGPDG ALYFADWПDGWGTKNYGR $\square W K$ LIEDE A WGRPVDVIVGADG WLYVISDDLTGWDYRI GLERPIDVVFGPSGD LFVLDD MGUTSKEEGFDPQ RWGRPVDVAVLEDGSVL I SDD
AHGRPTWVAFAKDGALL VSDDVGGVIWRVTA
YVGRPVDVQPLSDGSLL VSDDHNGAVYRVSY
THGRPTWVTWGGDGALL VSDDTAGII WRV
GRPVDVAQLRDGSIL VSDDLVGALYRISYG
GRPVDVQVLQDGSLL VSDDYAGAIYRUSYSGAK
VWGRPADVLPHPDGSLL SDDYAGAIYRVSY YQGRPVDVAELPDGSLL

AHGRPVGV G $\square D G G A L L V A D D A G N T V W R V A A A D G S \square T P E$ FPGGDSDITFH NGVMYVAADMDGTVYKI ADHKPCGLAQGPDGS LYVSDDKAGTVYRITGK
 E
GEARPYSVLTAPDG AMY DSDDLKGNDYRDYYK RGILPTGI QFGPDG ALYAADWINGWDTKNYGRVWK DD GLERPLGVKFSPDGESLYIVDFG

GRPAAVAQLNDGSLL VADDTSADYRDSYG WQTLVTDVDFGYDGQ LYFTDWVNSWEGVGKGRDYRSVPQ

RPADVCVGPDG A $\square Y$ Y $V$ AD WFDARVGGMSGT $\square$ YR $\square$ APK
YWGRPVDTAVDAQGNLL $\square S D D S S G A \square Y K \square T P K P$
A LGRPVDVLQTPDGSLL VSDDKDGVYKVEY
RWARPVGIVLAPDGALYFTSDRGESGLYRVT
GRPVDVAQLRDGSULVSDDLVGADYRI
GGVLATGIDFGPDGSLYVADWINGWDTKNYGRDWKMDVQ SAANPVDLA IGPGGDLYYV DAGGTIRRVRY LAGRSRDLRFGQDAGGLYVLSKANGRVWRLTAA
GEARPYALVTAPDG AMYПSDDLKGNVYR
GEARPYGMA $\square G A D G S \quad \square F \square S D D \square K N V Y R$
KDGRPAALMELGDGSLL VADDFANVTYRVTYG
VIGRPSAPLVLNDGSML ISDDKANVI LRVTYS
G
GLERPSHCQFGPDG ALY VVDGQ VIGRPVDVIVSDDGS LFVSDDNEGRIYR YYYA RWGRPVDVAVLEDGSVL I SDDTYGAIYK

NGVLATGTRFGTDG ALYAADWVNGWGTKNYGRVWK DDVN RPVG\| AVAPDGT LYVADSNKGRTWRDTYA GEARPYALLSGEDG AMYLSDDLKGNLYR
NGVPLVG NFGPDGG LYGVDWGGGYPLNEKGAVWKTD
GFTDPVDLTEGRNGN YVAELIDGGQSGGRIVLLRVNPN SGLLPTGMDFGPDGALYFADWINGWDTKNYGRI WKLTD SRPDDVRFHPSGDALYVLDFGGVNALAGSGKLWRVPDT
RFGRPAG $\square A V G S D \quad V V Y \prod S D A N G \square \square Y$
QGLMASALNGGDDAAYUADWDGMWQPNDKGADYKVDD $S Q H K P C G L A Q G P D G \quad A L Y V S D D L Q G T \square Y K \square T Y N A$

UniRef90 W8IF07
UniRef90-Q0W8G0
UniRef90_Q11HZ2
UniRef90 U5C3L6
UniRef90 C6VW30
UniRef90-M6GX81
UniRef90-UPI000225DE50
UniRef90 UPI0004783A98
UniRef90- A6DRY7
UniRef90_UPI0004096C83
UniRef90 B9XC51
UniRef90 ${ }^{-}$UPI00037C9283
UniRef90-I3ZM18
UniRef90-R7ZL61
UniRef90_Q02B70
UniRef90-K6Z499
UniRef90-UPI0003032576
UniRef90-UPI00035D91FD
UniRef90 G4SWJ3
UniRef90_UPI000362BEC4
UniRef90_UPIO00479C597
UniRef90_M4Z042
UniRef90 U1U8Q0
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UniRef90-S7VJQ2
UniRef90 M1C9K9
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UniRef90_UPI000464B97B
UniRef90 UPIO0042021BE
UniRef90-T1IYJ7
UniRef90-UPI0003B4CE0A
UniRef90 UPI000366D8B1
UniRef90-UPI0002D550F8
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UniRef90_T1IYJ6
UniRef90-G0SA61
UniRef90 UPI000464AC72
UniRef90- F6IFB9
UniRef90-H5WYF1
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UniRef90 UPIO0040DAFA4
UniRef90-LOA791
UniRef90-UPI0002626DA8
UniRef90 A5FGJ2
UniRef90-UPIO0037A684A
UniRef90 F4CF82

P G E
$R G R \square F R L$

S G E
GRVFR R ${ }^{\top}$
SAENWEL
T G V V WR $\square$ T

DETLLK

G
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G G A



$\qquad$
4
TGA L WR V

UniRef90 A6CK85 UniRef90－UPIO0017446DO UniRef90－G2PN29 UniRef90＿A6CAJ9 UniRef90 A0A059DSK7 UniRef90－M5UGV9 UniRef90－F2MVP5 UniRef90 A3HZ53 UniRef90－C6W6D0 UniRef90－R7ZTD7 UniRef90－UPIO0046F7F08 UniRef90 FoSMM5 UniRef90＿UPIOO0374F2A9 UniRef90－F3YUF1 UniRef90 Q1YK16 UniRef90－D8HNEO UniRef90＿UPIO00364F662 UniRef90－UPI000380FC9E UniRef90－UPI0004681015 UniRef90＿W4LP82 UniRef90－J3k952 UniRef90＿UPI0003B6171E UniRef90－Hot9z8 UniRef90－UPI0001746431 UniRef90－B1ZRL2 UniRef90－UPI0002DC806F UniRef90－UPI000403A9E5 UniRef90－D9R5N5 UniRef90－Q8RMDO UniRef90 UPIO0036221BC UniRef90－B4CWDO UniRef90－A1T1E7 UniRef90＿UPI0003782A6E UniRef90－D2ROK4 UniRef90－UPIO0036B29ED UniRef90＿T1J8X3 UniRef90 UPIO003B56983 UniRef90－N8YST7 UniRef90－A0A011A8H6 UniRef90 UPI00047E572C UniRef90－A6C6N9 UniRef90－A3ZZ05 UniRef90－K5BA29 UniRef90 M5T2U9 UniRef90＿N9DM73 UniRef90－MOE2Y8 UniRef90 UPI0002E680B1 UniRef90 V9DK53 UniRef90－UЗАН98 UniRef90－OOG1GO UniRef90 FOSKK7 UniRef90－D8NI42 UniRef90－M2XNYO UniRef90 UPI00037690E6 UniRef90＿B9X928 UniRef90－G0JON8 UniRef90－A3HYW6 UniRef90 UPI0003AD7642 UniRef90－W9YTE8 UniRef90－V5X4G3 UniRef90－${ }^{-} 77 \mathrm{VH} 11$ UniRef90－LODEX7 UniRef90－A6G7HO UniRef90 S7WL53 UniRee90－UPI000345ED35 UniRef90－B4D134 UniRef90＿UPI00047EC504 UniRef90 A4ATK0 UniRef90－А6СЗВ2 UniRef90－N8TK79 UniRef90＿W5TMLO UniRef90 GOJ6N4 UniRef90－D2ROP6 UniRet90＿W7S765 UniRef90＿J2WCS3 UniRef90＿M5CBG6 UniRef90－R7RRA1 UniRef90－UPI000362CDCB UniRef90 F9Ul38 UniRef90－A3ZWK1 UniRef90＿G2QRS3 UniRet90 A6CAH4 UniRet90－E1Z2N9 UniRef90－J3NDX6 UniRef90－UPI0003711519 UniRet90－UPIOOO35C7A66 UniRef90＿UPIOOO29A6167 UniRef90＿UPI0002EBA844 UniRef90－UPI00035F242A UniRefol＿Loinx
$T$ TQDGYK ${ }^{20} E K V \operatorname{ASGLLT} Y P{ }^{30} C \| T$ FDEDGS $\|^{40}$ PGTATDPKDAVLPGFKVNLLYTDQGSWVSMTTDPQGRM

| F DPTD <br> $A$ G VQ A |  |
| :---: | :---: |
|  |  |
|  |  |
|  |  |

PSGFRAQ ${ }^{2} M A K D G G T T R H M A D E L G D \square$ PTSPEAAADTVPEGFEVSTFAAEVAQPVALEFDDRGRV S DPSGFGDSVYAR VPKARSSAAGKAGTV ARPGQSAAPVPPDFDPSVIATCLDTVAAVAGLPDGSA

VQPVPPSELTपTNFADVTPSPAC口AVAPTGEV ASSTPVAADGYNVNVVAQGLRRPRSLQFDSQGNL EAPGAFPRपR $\square D M K A G F C A G L V A D G L K F P R G U V Q U P G K P L$ VPDDLEVTVWASSLFNPTNMDTDKEGRI AVPPGYVIEAVATDLTFPTGVTFDDTGAA


PASTPGEELTVPPGFKAELLASKDEGSWCMA GPDGKL DLAGAPAPREAMVPQGWTLSVWAR TPRPRLAAWTPDGDL PPDLQLTNFTGDLTSPACLAVAPTGEV
TPVEAMKPDP GFEVELVYSGEQGSWSMASKPDGT
PGTPTTTSKAPPTGPC｜DVVVSCLDTYGGVVVLPDGSA
PANFEDIPAAEGLKRVRFFTKAPDGRM TGYQIEVFDK SLNSPIGLVVFNEGEL QPGFEAEHLAENDKGSWAMTFDDKGR ATATPADQTKLL KDFKVELVPTEVQGSWSMA DDPKGR VAAAPGEATPVENDGFKVVRLYSQEGSWSMTADPQGRL

QFSFN【PSNYD पPAAEGDKRVRFFAQAPDGRM MQMDVDPQGRV【PPEEAAKAVPKGFSVKLFAGDVHQP信ACTDDRGRL PAPSGSUQPSLASGYRMQVVATGLSKPRGMELVKAGNV PNGFKIELYAVVPDARHDANGPQGVA SPEETMKT $\square P E G Y D V N L F A S E L Q N P C Q A F D A K G R L$ TAPG CVVGVAENLGFARGIVATIGNDTY QAGFQAEHLTSEMGSWVSMTFDDKGR पAAEETVSAVPNGFKVEDFLNNDEKPRGTTSDQDGND P LHPKVEKLKLPPGFVAEHDYSDQGSWVAMTFDDKGRM PSPSGS $\square R P S$ RASGFMQVVATG【SKPRG\｜LLDQAGNL VPA GWTLSVWAR TDKPRLMT WAPDDALL APTPVPPPQGKDFDKAVITATCLDTVAAVAATPDGSA


TLPEGYEATVFAKPPGYPTSVABAPDGSML AQEAVDAMTIKPGYKVNVWAAEMTQPMAFCWDDRGRL PANFELEELYRPSEHWVAMAKGPNNTL
 NAPQTPPSTGQRPPGDPDPSVVVSCLDTTGGLTVLPDGQA PQTPDKAVETVKPGYKVNVFASEITQPMAFCWDDKGRL $P Q A P A S \square P K V L R P G W K L Q L D A A D V V T P T A L A L D P T G E V$ AGFCAGLVADQLKFPRSIVQVPGRDL AFPPK【VNGLGAHVIYNNLTEPRGIRIDGQDNL QEGYK\KKQIEGLNEPTAFAVDSTGNLU VLASPVNAQKCLLPNFEDKLLAEEIEHPSVVTCDDQGNLL LDPSYSPPVVSPGWKAQLIATGLSRPRGLKFDSKGGL

पSNTRKDSASPSGMCLEKTSDGPYS SMVAHPDGSA
PGVKIEVFAQGLVQPRQMAMGKN VLL
PLTPDEQRAK LPPGFE $\square Q Q V A S D \prod Q K P M N L A F D A K G R L$ VPEGFEVTLYAADLAKPTQMNFDPQGRL


UniRef90 A6CK85 UniRef90-UPI00017446DO UniRef90-G2PN29 UniRef90-A6CAJ9 UniRef90-A0A059DSK7 UniRef90-M5UGV9 UniRef90-F2MVP5 UniRef90-A3HZ53 UniRef90_C6W6D0 UniRef90-R7ZTD7 UniRef90_UPI00046F7F08 UniRef90-FOSMM5 UniRef90-UPI000374F2A9 UniRef90-F3YUF1
UniRef90-Q1YK16 UniRef90-D8HNE0 UniRef90-UPIO00364F662 UniRef90-UPIO00380FC9E UniRef90_UPIOO04681015 UniRef90_W4LP82 UniRef90-J3K952 UniRef90-UPI0003B6171E UniRef90 HoT9Z8 UniRef90_UPIOOO1746431 UniRef90-B1ZRL2 UniRef90-UPI0002DC806F UniRef90-UPIO00403A9E5 UniRef90-D9R5N5 UniRef90-O8RMD0 UniRef90_UPIOOO36221BC UniRef90-B4CWDO UniRef90-A1T1E7 UniRef90-UPI0003782A6E UniRef90-D2ROK4 UniRef90-UP100036B29ED UniRef90-T1J8X3 UniRef90_UPI0003B56983 UniRef90-N8YST7 UniRef90-A0A011 A8H6 UniRef90-UPI00047E572C UniRef90-A6C6N9 UniRef90-A3ZZ05 UniRef90-K5BA29 UniRet90-M5T2U9 UniRef90-N9DM73 UniRef90-MOE2Y8 UniRef90-UPIo002E680B1 UniRet90_V9DK53 UniRef90-U3AH98 UniRef90-FOSKK7 UniRef90-D8N142 UniRef90-M2XNYO UniRef90_UPI00037690E6 UniRef90-B9X928 UniRef90-GOJON8
UniRef90 A3HY6 UniRef90-UPI0003AD7642 UniRef90-W9YTE8 UniRef90-V5X4G3 UniRef90-R4TDH5 UniRef90_SVVH11
UniRef90 LODEX7 UniRef90-LODEX7
UniRef90-A6G7H0 UniRef90-S7WL53 UniRef90-UPIO00345ED35 UniRef90-B4D134 UniRef90-UPIO0047EC504 UniRef90_A4ATKO UniRef90-А АССЗВ2 UniRef90_N8TK79 UniRef90 - W5TMLO UniRef90-GOJ6N4 UniRef90-D2ROP6 UniRef90_W7S765 UniRef90-J2WCS3 UniRef90-M5CBG6 UniRef90-R7RRA1 UniRef90-UPIOOO362CDCB UniRef90-F9UI38 UniRef90-A3ZWK1 UniRef90-G2QRS3 UniRef90-A6CAH4 UniRef90-E1Z2N9 UniRef90-J3NDX6 UniRef90_K9NEM7 UniRef90_UPIO003711519 UniRef90_UPIO0035C7A66 UniRef90_UPIO0029A6167 UniRef90-UPI0002EBA844 UniRef90_UPIo0035F242A UniRef90_LOINX4


YIIAES GYA ${ }^{50}$ YGSPPGEGR ${ }^{\frac{60}{T}} \mathrm{~L}$ IKVPPEGKGNVFAKGFKGP ${ }^{80}$ LVGDQ YGGDYRVTDPPVESNAQAKVETLDLK $\mathbb{V} G G A H G L L$
YVVESHT HFRPENYQGPK TDRDRFLQDTTGDGHAD LYVTRLGEFGY配RQNSLHRDQGDHVPMGLEELTQSELFQ WVCE VVNYRHFRNPYNRVRKDGDRILVLEDTDGNGRAD VFVGTRKTDLWAVTDRTKNRTADEVKRFAPADSFTQPG FVGVDMMGSLGKEPGKGS\|VKLIDKDNDGVYETHTEFAKA WACEAFNYRPAV NGKSELGQGDRVVIMEDKDGDGKA LTVSDGRGKMYELRGGKPADDMEKEMPRFINKPGLATGGGG FV WV VE RLSKLKDGHGMY LKKDRNQDGITEDQQLLG RKAVPDNGKDYVVEDGAQPRTYLDFAPQFFSGQGLGQGFG FVGTREDAVYAVSDHDGD

 MAFHPDFNRPDMPGYGKLY LVVQSSAGMFFRLRDNGGTCLEVEDEVDLIDHPVKSRLNH LMVPDMNGMLYLVDKESGDYVPYHFIDNFHNHAGLGTGLG FVVADMGG WGHDDGRLLILDPA
WVAEGVNYRKKKNRRPEGDR
VVVESGYGEVF AEPRLVRVDSSG LVSNPGAGTVTLLRPGDKGT保

YADT DDG $\square$ KRFT $\square N P D G T \square G T P Q L T Y S L Q D A S G Q R L S D$ YISPQGKP PGAGLKKEDTWGGLWRATLDAQGHDA LVSVPSAGRVLRFEPRG FVGVDMQGII KLIDKDNDGTMDAHTTFAKVNNPRGIIAGG LVVCDQGGSLYSVTPGKTAETTKVEKDDVPI GQAQGL
 RLADPDMNEMLYMVDKETLNVRDQFVDNFHNHAGGGTGFG FVTD
LVAD LITSDQYGDLYRDTPAKGSKTNDTQVEKLKVDMGMAHGALD LCSDQYGGLFRVTPGADAETTK DEKLDVAIGDAQGLLCAF FVTQQEDRLRRLVDRDGDGKA DDESTIFADGFSALE FVTDMRD WVVTRGSAEVAWVDPDSGEHELALEDPVAFHGGHRELGGQ WVVEAYAYPKRLLPFDGPLLPRKKGDKILTFEDTDGDGKFD
 FVGTRKQNVWVVTDRDKNRVADEVKEFAPSTNFTDPNGV WVCTMPTYPMYLP
VV DMGGWMNNRGRLLRGEDGDKL LTTGRLGSVQLV RRGGQPVQ ASLP VHTTGSLGLT LTTSDQYGTLYRMEDPEDGAKDLKPTDEKLKIQTETPVAD Fi Gs
YVGVDATGSLGKTPGKGRVVKLIDHDNDGKADSHTVFAEV YTADQYGGLYRLTIPADGSDSLAPKVEKLVVGNETGGKLG YVGPDLNGNLYLLDKKTRTPRVYTFAPDFFSQAGLGQGFG LVVEQGRGVVSAHTVNEDNGCVSVGTSSDVTSALNLNHGD LAGERKSGRILLAAAE KDPAAWATVPVDGSGDGGLT FVLESHT HVPPKDYKGPDGDLDKVLSDSNGDGELD LVVEAD GA DWQARPEHPSDADVPPTPRVAAPSPGDDRKAR LLTTGDRGTVLRLEPRADKARGRAPAVHALASGLDDPQ WIAENKDYESR GDGFSNSGDSRILILEDTDGDGAAD Y SCDQYGKIYHFTPEDGKTDKEEDVHPL NLEDGEAHGLL WVCTMASYPMY RPNKKGKEVDDKILILEDTNGDGRAD FVTDMHD LTDNKKGIVYILDEWNSETGKFGKD LATERTTGR LLKVTAVGPSDTPPPPVTRVDVDAAGDGGLG WIAENKDYESRQH GFSNNGNSRILILEDTDGDGTAD LVVESH THFPPKDYAGPKADRDWLFADFDAATGKPATR LVSVPENGTVVRLVPDG TGKATESVLLKGMNQPHGLT FVVADMDGRLLLLDPHAPQGGRFKELLTGVEYPFGLVIGP IVVERSKG VVALTKRNDATCAGWEKRTVITQADLEHGDE YVAEKI GKDEVI

MMVQDSNGDGKAD YVGSRDGVIESFNNVPEAVTKDPFMDLRDRVAVVWDGGF FVG

MSQVWALVDTDGDGRSD FFSSQDGKTWLAATPEQGKGDILQTDPFLDLMPEGYLGFV YVGSS AIPSYVYGGKDGDMYADPGIHVIASGLEEPH

WVTHSVEYPFAAADSEKSRDG $\square T \| L D G G K D G$ WVASSEVY WV Le LI SVPSSGQUVRYESG

UniRef90 A6CK85 UniRef90-UPI00017446D0 UniRef90_-G2PN29 UniRef90-A6CAJ9 UniRef90_A0A059DSK7 UniRef90-M5UGV9 UniRef90-F2MVP5 UniRef90-A3HZ53 UniRef90-C6W6D0 UniRef90-R7ZTD7 UniRef90_UPI00046F7F08 UniRef90-FOSMM5 UniRef90_UPIO00374F2A9 UniRef90-F3YUF1
UniRef90-Q1YK16 UniRef90-D8HNE0 UniRef90_UPI000364F662 UniRef90_UPI000380FC9E UniRef90_UPI0004681015 UniRef90-W4LP82 UniRef90-J3K952
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UniRef90_A3ZZ05
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UniRef90_LOINX4

T G $\square$ T WA D G Y A F D S

Y L Y A A E GA DA G Y P GA G C GR\ I RVVS P D $L Y V M V N E K G A P Q N Q G R E S G L Y R L K D L G$
$R \square Q T F Y E G S T E T M N \square A A H P E G W \square Y V A T R S S \square F R L R D Q D D$ D P IF QPA G GNLY DLYYVSHHRYRNGCFEVVVSHTQLAKDDA


 $D V T K V F Y Q G P E L N A P L G D W V M G N K A D V S Q S P Y V W L F T D T N$ S FA F HP EF SKN GL L Y T S H D F S Y G D S I R S T L Q WVV V L E WQ T D D Y P G T G I V I G G GYLY T S S N S AVFRYKLG K G RRTVF WNQGNRTTSVLPGS QGCWDLNAGTGSWLPDAD GD YA AFHPDFARNGI F Y TVVHTEDLTPQPNTGYHGII TE WTAD $G \bigvee A Y$ | $R$ | $D$ | $A$ | $L$ |
| :--- | :--- | :--- | :--- |
| $D$ | $V$ | $V$ |  | $A E D G R V L R Y D D D E$

$V L P A A E F F Y E S P D$


MWFNGD S F IVEYKA S S D N G GVYYDNSTDSVY LTVAPNAWRASDSTGD VDNPRGI I VQGS QVFVLHTTFSKETKQATGMNLVVFEDKD TSFLE QRPDNPSDFFYLGGRSGGRDVESDSVLVEWT FDHD
 DGKKLY A SDR GTVVYA WDYDA EARRVV



## D V F H VLG E GAFYVAA





N

## WA

$D \square A L S P H Y$ DE D K L L 1 Y A YVVT T G S D N
D MVLHADGRGDRYLYVS
FVEHHPEYAENGIFYTVHTEAGSALTEDEQATRVTRHEYV $P Y M T G L K N P N S D Q F Y T D D T G Q D W L Y L A E T D Q L D T R R K F T G Q G$ SVIQ M GY A Q GL L LY A F NS Y Y VMMV NH R GN E E F E K T S G L

DA
Y A F D S LYA A VVN G G K E R P S K G L S G R L L K R D T T G
$L Y V S V N G N A A Q G S G L Y R V T$
G G DELLY $L$ A A ESDQQIDVYTYRDGAATNRRTLVAGL EGT GA GVLA H G GHVYY T C $\square P K L W R M T D A N D$

 E IS Q D GKTLYYASSSESVYSWTYDQSAMTVS

$K$ K T VF V
C $\begin{array}{ll}D & D G F \\ D & L \\ L & Y \\ P & G F E L G\end{array}$ AEQNRVLVLPAAEFFYESPD
 SVI QM GYA Q GLLDWAFNSYVMVNHK GDENFEK GS GLLYRLE D

 E L S FAADRDY $\square A E S N R V S S Y A Y R E G A A A E P R G E G A A A E P R A V V$ S LAADS PGFTE D QLVVA Y I T T P T DNRVVR




 $D V A L S P$ T Y GED GLI YA Y ITT TA SD N RVV R $\square$
$R K K V F M E G L A F P A A L A V G F D G V F V G B P P N L L F D P D K N Q$


 S SHVF VQ DKE LV SP L G V S VFGN K L L VA QPPNLIVYT DVD G $G M V F H P D F G K P G H F Y S S H C P Y D A T Q A G V D L S N C F N N X C R D$
$T V F C E G L A A$ $\mathrm{K} \square \mathrm{T}$ $L$ S E D GRT L Y VVS STENVVY SY SYMPDAATVVS KIT T T FA E G L


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

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G S
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PDAKSPD

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UniRef90－D8HNEO
UniRef90＿UPIOOO364F662
UniRef90－UPI000380FC9E UniRef90－UPIOOO4681015 UniRef90＿W4LP82 UniRef90－J3K952 UniRef90＇UPI0003B6171E UniRef90 HoT9Z8 UniRef90－UPIOOO1746431 UniRef90－B1ZRL2
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TATNSGVVGTDNKRWLKMHPTFHETPSRNYTपNGRNFTEK NHTQLPVNMEFSRAARAWGEDH\｜LPRMWDANGHARG\｜LA D $\square G A N V T D K E G N R P$
E NEGADAELVGDFGNVYFTLGQNYGDDALLVGKGNVR NGDTLLLSLGAHQFDGVDGPYQV GQDNKNDLSKTIEI NEG HQLKDANGNVVVDKFGREVRDHGEPYQQGM GVFRC QPHNVPPKDKLELYERHGDG RSGKKMTMLGGGUVRM NAGRQLVD GQDRPLLDKYERPDD DGGSLGAGYDFVSDGATQAWGSTFRD DPRGSNSK SYNDNCRQEGSGTGMAPCT LDSAG IQATSLVGAPDAPPSERTQLNC DGGTGVRNSEP
APCNVCERPDP
QPYNVPPEEKSD $\square$ YKREGDG
DAGNPAA
DGG
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$D S G S P A A$ STDDANPTDDQTDPKRGADYGYQLTGERRRLITAGLRNVG FNPTVSPGDPDYGMSGDGGNGVGNDNPQDLATPHGKIFRI SSCNACV $T V T N S G V V G N D N E W V$ VVSP LLCDYAGDYTMLYGQNFAT NHTSLPEPEKSLVPRNWHRLWDARGHAAGKLAPGGWDCRT AGNHTD⿴囗十⺝⿱⿰㇒一日夊 STGNTSAED
DRGFH VATPDGRVLSNPAEGA
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VFRC
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AGNHTDDPEMD SQHNAK ПPPKKEA】
DFGFHGAVD
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SASNSDGSDRRDHPDRAVIRQVRLDGSDDTLLATGVRNG D Y FATPSKDR KPKGEEARKLYYHKDPFPEDLDEKDG GNHTSVPEQLKKGSRLPTNWGEDNLFTPYLDARGHANDVK T FHHSQVETPYGPQRVKNA
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DAGDP
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$N$ CGAQFTDKDGKFRSYSGGKKGEWAYDPMTIAGKKSKV EQRRQDTAQDDENNDQGGVMWDCPVGSHDAPRFLQSVTGN DKG
RGSSANDDPDAAQQSSGDSQDRAFNDSSSATAARRGPYNY MNNSFRRGLDGWLYANHGFNNQTRVSGSDVEMQSGNTYRM MPCDVCVPPTY LPYASNQAGQLLFQPSEEYDFVPTGNWQDKKSLLGKILKL I PCNLCMIPADKRYG AMTNLG\｜VDAYELGWLRRDPHAHDVGDDVTLAGDNAETR SNSNVAD
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NQS $\boldsymbol{T}$ YHSHLETPHG
VFTHSKVKDPEHPERPEVIMNA
STGNDTADDRSA

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

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RFLLAQHPGEPPQPKARFAVHSSADGFDFSRAEAFGYVGQ NSNPDKGVDHMPYDRDVQF RRVLQSGPYKSLCTANALYKAPHSLMPPHG APRGGVQPSLLFKNQPNVPPRPYVTFPPNTSTRGFEFNYN DLVAQALVPDYALGPHTASLGLAWSGGGATLPAPF TSYP $\square G T L P D A N W R G F A F D F H$
TPGRELGWPYCNNVDGPADपPFVRDVQTNPDGALLDCAAL KHFTDEIIPALVVDVGGSGTGSLFLDEPTWPAKYNQVPMM SLGAVVNIGMGSPTGVAFGTGAKFPEKYQRALFDNDWTYG
VPDYDFNRDEKAVVDAA TRPHSKPMGLTFWSGEKПKKDFK DAEQFDFTYPVAAYDHNRDPGQTGDAGVALNGGFV SGCKNVLTPYAYFPAHSSALGFDYFDHPNTDDSGKNSFLV
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 SLPAVVNПGQGSPTG\|IFGTG
DIGLGSPTGDEMGLGAKFPAKYQNAYDNDWTYGVIYAVHM QTNPDNSRLDCAPIEQSLGAHAAPLGMSFVTGGVLPEPYA LWEPHRNDQPAHLVPPDANLTDGPSGFAFYPGTGFGTRLK KFKRASGCKNVPAPYAYFPSHSSALGFDYFDHPDTDDS K DGTENWT GEVGQPFWPDNDRNQSVNNTGDENV PNV TVGSTITAKHHYVGATPHSGNGRSDE
ETPASQFADDASPDAHAADGNNENRTDAYCAEQLDASLV E $\square P A D V V N P E A Y T A H A A D \square G M A$ EYKGEEIPADVVIPQAEMTAHAADLGDDFYNGTSFPQKYR QF LTKQWRPTCG
D CSKKTPPTRLLPPHAAPLGMLYYHGALPGQD RHLI CANVANSAP LISEATQGATDTLVGGVPYTGTSYPEVYR N $\square G Q G S P T G V L Y G Q N A A F P A$
PKNTK FSPSTYEDPAHVAPGGDHFYKGNNFPKEYD KNFTEE TIPALIDVGGGSGTGALYLQDERWPAHYDNNPLM NLPAALNUGQGSPTNVMFGTNSNFPDKYKKALYT PLPADDDKYDYEYPLAAYDHDPP LSVGSQYAVDAS GPANLP
Elp
TWK GS VD YKHQKAAYCGDHFFDSDAYPAQFRERDYM ALTLGPHADYGFDDFEPTDSHCELRGGLVYAG
QTGAGSPTGMVVYEGRALPEVFWDQMDHTDAGPNVVRAYP PDSRGKPDLLDLGYVDDPTNNPDGKSLDCSTV
KTTANHSHRSAHGGARVYQSDAFPE EEKGR $\square$ FMAN $\square$ H NLEQGSPTAVLSGTKLNFPS
HF LKKKWRPTA
GCEFVSSRQ
KFKRPSGCKNVLPPYAYFPAHSSADGFDYFDHLNTDDT $\square K$
KTDTDHS
ELP GTLPMDAGTGEAPCAVLSPVSDAWQPAQQTLLVTS DLSNVGFNTDVETNADGHQLDCAKLPKVEQSGGAHSAPLG
QP VFD पPTGAQFSRRP四TQPDDAWCQNPNNNKPPR
PACRNTYMLEFGNAGFSSADGKYSWESDRRPGQSTPVAQ


DHLHG STADAGVEDISAEQFPEEYQGDFFSGNVMTSRTN DHGVGTPLPDPTLNARQRAVKCKSSKVTTFSGUQQALGP
LINPGVIDQPRLVPGATVSDKSLEQTNPADYVPAAFESGTN RGPQPAFLLADHESLPAPEQPLFTFAPHAAATKFAVVPPD DLVAQADAPDYALGPHTASGQGTFSQPAAATKAADPDAPR GFAP DTTSDDHGSTG $\square A V A Y A S N H F P A Q Y A G S M F V G N V V$ EIVNGRHDPD PSIVDHKHYRAAYCGTSTYQGNQYPQSYQGRGNGHENAVN

UniRef90 A6CK85 UniRef90_UPI00017446DO UniRef90-G2PN29 UniRef90_A6CAJ9 UniRe990 A0A059DSK7 UniRef90-M5UGV9 UniRef90-F2MVP5 UniRef90-A3HZ53 UniRef90_C6W6D0 UniRef90-R7ZTD7 UniRef90-UPI00046F7F08 UniRef90 FoSMM5 UniRef90_UPIOO0374F2A9 UniRef90-F3YUF1 UniRef90- Q1YK16 UniRef90-D8HNEO UniRef90_UPIOOO364F662 UniRef90-UPI000380FC9E UniRef90-UPI0004681015 UniRef90_W4LP82 UniRef90-J3K952 UniRef90-UPI0003B6171E UniRef90-H0T9Z8 UniRef90-UPIOOO1746431 UniRef90-B1ZRL2 UniRef90 UPI0002DC806F UniRef90-UPI000403A9E5 UniRef90_D9R5N5 UniRef90 O8RMD0 UniRef90-UPI00036221BC UniRef90-B4CWDO UniRef90-A1T1E7
UniRef90-UPI0003782A6E UniRef90-D2ROK4 UniRef90-UPIO0036B29ED UniRef90-T1J8X3 UniRef90 UPIO003B56983 UniRef90-N8YST7 UniRef90-A0A011A8H6 UniRef90-UPI00047E572C UniRef90_A6C6N9 UniRef90-A3ZZO5 UniRef90-K5BA29 UniRef90 M5T2U9 UniRef90_N9DM73 UniRef90-M0E2Y8 UniRef90-UPI0002E680B1 UniRet90-V9DK53 UniRef90-UЗАН98 UniRef90-Q0G1G0 UniRef90 FOSKK7 UniRef90-D8N142 UniRef90-M2XNYO UniRef90-UPI00037690E6 UniRef90-B9X928 UniRef90-G0JON8 UniRef90-A3HYW6 UniRee90-UPI0003AD7642 UniRef90-W9YTE8 UniRef90-V5X4G3 UniRef90-R4TDH5 UniRef90_S7VHI1 UniRef90-LODEX7 UniRef90-A6G7H0 UniRef90-S7WL53 UniRee90-UPI000345ED35 UniRef90-B4D134 UniRef90_UPI00047EC504 UniRef90 A4ATK0 UniRef90-A6СЗВ2 UniRef90_N8TK79 UniRef90-W5TMLO UniRef90-G0J6N4 UniRef90-D2ROP6 UniRef90-W7S765 UniRef90_J2WCS3 UniRef90-M5CBG6 UniRef90-R7RRA1 UniRef90-UPI000362CDCB UniRef90_F9U138 UniRef90-A3ZWK1 UniRef90-G2QRS3 UniRef90 A6CAH4 UniRef90-E1Z2N9 UniRef90-J3NDX6 UniRef90-K9NEM7 UniRef90 UPIOOO3711519 UniRef90-UPIO0035C7A66 UniRef90_UPIOOO29A6167 UniRef90 UPI0002EBA844 UniRef90_UPIo0035F242A UniRef90_LOINX4

TPKGGTYESVKEEFVSGKPGPLTDVLIHPQDGAMY
A LGSD WVDKFFL
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 $G G L F S A Q R G S W N R T V P A G A R V M F T P F A A D G S G P S G E T V P F$
$S D W G K S L G I M R V T M D G G F T Q E D E N F Q D T D V V D G S G R M$ NLEDEDPRRHWHQNDPGVPDLLETGSGFPMGMTIYEGDLL QVSGLAGKYFFGD VRGRLFYUET
NGAFIAFHNQSPELKKGYMVAFVPFVKGKPGQWETFADNF HYHWDHSASWTDSRDSMGAHGELGGGHSHCGGMIYLGDN ADWNCTSDDGRAVSGGFVYRGDELGKKLRGTYVFGDLV GQVFMAEHGSWNRTEPVGYRVMFT S $\square$ GNEDGTAKDTE
DWWAMERDKNGQWQMQEMDDTQVRPTGAGEDEDGT $Y$ Y M S GYHKSRFAEQSALILPPDKPFYGGPTGM VYNPGA ADWGRSMLY IHRVTADGPTFTQKDEEFQDTDDDVDGSGRLD

 $G K L L V G L H G Y R P T G S R Y E V D A H G F P K V S P A A P V R Y H V S C A$ $A F V A L$ RQEDPGTLPPGDIYGRGAPTGUAYYENGAA DRATKGDEPHSAPLGLSFLQDSGLPAPYRNALATALHGCW $M L Y Y R G T K F P E L E G K L L V G L H G Y R P T G S R \| L I V E V D D R G F$
$A D F G P Y G D V Y V A E Y G S T I H T H I G D S V S Y A S A G H R V S R I D M$ HGMFVGQHGSWNRDPRSGYKVIFVPFTGNRADGQARDVLT

PPVEQSMGAHSAPLGLSFVDGELPAPFQRGALVGVHGSWN QLYIGRVTPDKASFTQKEEEFIKLPQDTDVDVDGSGRM KLYAVHLIAPVGTYTATFEVFVEGRPMPLTDVVIHTDGQM
SNVIAVVALNDNAYWGNRVIYYNWRNGKPELTP
YRGEIE ELQGRYLFTDLVRGWVLATEEDEMVRNDGDPE
 PKFGPYGDVY

QPQGATYTATFEKFDTGRPDPVTDDCVNPKDGA $\square$
SGALVGVHGSWNREPPREPQVAFFP
DRFLICD
NSFLVADHGS
TPALIWHPQSFDDYENA $\square D \square H P W \square D Q P R P$
VGGGHAHSGLLCYQGGL FQAHMAPपD【KFNNSGTEAWVTFHGSWDRTDPVGYKMSVV GGMFSAQHGSWNR GG』FSAQHGSWNRTDPVGARDMFTP CELVYSENFPAVAQGDYLLTNC $\square G F Q G T L Q Y R F K D$ TGYHGY
GLHFVAN
NK\F TAEHGSWNRSSPVGYK $\quad$ STLDDDPKTRTAKNYKSF ADWGRSQVFEGPSYTQEQDPFFK PQVTDLDDD GSGRM FDWSFGIIYATTGTPEGGYYDAKAEEFISGSPLPGTDGEF FQAHMAPLDIKFNNSGQEAWVAFHGSWDRTDPVGYKVSVV LSFTTGQLPRPYDSGALIGVHGSWNRQNPQPPEVSYFAWR

GN $\square$ HAPDF $\square$ SANDAWFMPVSQKTGPDGC $\square Y \square D W Y D R Y H C$ VQNDGAGYKATDENDMEGGKDQWFPSDVCVAPDGS■MVAD SRTMVGLPAHSAPDGFVFTHGSALPAAFGEGALITTHGSW EHGVLSD LIISKGSGFEGKHGDEFMMANNAQWVGFSME $\square G$ FPDELQGNYLLNNC DGFHGVLQYKMKE NSFLVAGHGYKIVIMRKGQKDQTFMDGFLVGKNVYGRPCD

WGDHRDEAYDDMPRGTMKPMVVGDDQFRPVGMAEAADGST LSFVDGGLPGDYAHGALVGVHGSWNAQPPRA

PEVS
पQAHSAPपDLVFYDNSKCSPRDNTVGDSR
KWDGD
WRQENPGTQPAGDVYGSGSPTGVAFYENGAL GRYDAGDYVTDTDWAVDLPPGSTTATKEVLTTFTPKQLAT ATFKSQMEDFLVADDSGEPFRPQD DCFSPNGKHMY
RNSPVYHGSTIIAQEEPDFLISTDPWFRPVDПRQGPDGA HVAPLGMRFYSWRAARSAFPRAYDGSLLVAEHGSGGLNAT
TAPLGVKFWSG YPATERTQRLLVAVHGAGST NGQPSRLTGRLVVTLFGDETPMTAPHGHP
HGLFVAQHGSWNRRPKSGYKVIYVPFADGKPSGTPVDVLT TNIVHRDKPQWRGSS PW RFKLSEDGTSYTSREMTEVIKSNHPAFRPDDVKMGPDGAl MDRLEPDGSSFKAHADDNFVESTDGWFRAVSEQDGPDGTV $S G A L V G V H G S W N R Q P P Y P P E V T F \| P$

UniRef90 A6CK85 UniRef90 UPI00017446DO UniRef90－G2PN29 UniRef90 A6CAJ9 UniRef90 A0A059DSK7 UniRef90－M5UGV9 UniRef90－F2MVP5 UniRef90 A3HZ53 UniRef90－C6W6D0 UniRef90－R7ZTD7 UniRef90－UPIO0046F7F08 UniRef90 FOSMM5 UniRef90－UPIO00374F2A9 UniRef90－F3YUF1 UniRef90－Q1YK16 UniRef90－D8HNEO UniRef90－UPIOOO364F662 UniRef90 UPIO00380FC9E UniRef90－UPI0004681015 UniRef90－W4LP82 UniRef90－J3K952 UniRef90＇UPI0003B6171E UniRef90－H0T9Z8 UniRef90－UPI0001746431 UniRef90－B1ZRL2 UniRef90 UPI0002DC806F UniRef90－UPI000403A9E5 UniRef90－D9R5N5 UniRef90－Q8RMDO UniRef90 UPI00036221BC UniRef90－B4CWDO UniRef90－A1T1E7
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KTGQLRDFFVNHKGEKSEKGP
FAVGGRRTQSALYRVTYVGKESTAKVGPLAPTQ
VEFVGDPALSSHVSFDLKPKGASFELNSEVDML
YVGDWAD
EFPEWDEHLLVASLAGNTLYALKTEGDDITYAE
保 AEGWLD
YLAA WDGAGYRGSPDKGYVVKVLPNDF
PRRYWD QILLADAGQGYVSAFPVQTDGAGYKSTG
GKLAFGKTVPGFEWRVRLDGEGKTLVE GLP LIC AGVD La MPDGP
WPAKYRDRDFMCNTHGRRDNEVRHESGYVLKHGKDFLFAN DGRVFASRTGEMDRDAAEMATLHQLRGFAATGERVTARD AKLNGNDVVDYaVFASGWLEA

VFAEGWLSDSGE
ATSNYGGPVDPYDNEPGALWRLVEKSKVKEGAETVPL
LNETWQDYFFTGSPGNSGI NAFTLEPDGAGFKLGEDKTFL YLSAWDGAGYSGSPDKGYIVRAVPNNWTYKAFPDVKKL LAA ATOLDAMDANMVHQLRLSLDHDNNPNTRPRGFDDFLE MAPRTD

## VD

ALAETSRLRVFADGEETTFAELV
AEPTRAFQTASGPASAAAFEEIISGWHRVNGVRPQ
PAKYQGMLVSAESRGQTLYGYYPKAEGAGKKMERFDFLV
 PKPKPAPVRYHVSCAADPTRSFQTDGGEVAAAPFEELISG GFLDADGQARGRPVGSGRGWARRPVGGRRRRQRDSLSNGGA

RQPPRAPEVSFYPWQDGTL GGQQT LVGGFQTDDGT Y LAA WNGAGYTGNPNKGYVVRVVPQNW
YFTD GGRGTQSGLYRVKYVGSEST
NDLVSGWMRTRNTDS
D
DYRVDENSFYFSDDKGGVIYYVRR
T $\square$ SYANAGHR $\square$ SK KDMKSRTISTFADNRTGFPSSLSNGG GRRDDSDDYRVFYAGDEKNDPTETUADEQ

WRDG
NSGTRSFE EGGDAQT LVGGFQYADGS

WPKEYHGK LFMGNTHGHR\NVDVITPKGSGYEADRNPDFD AF NATGEPVDELQSRTAARDLFANQDNSRCPGDCF
ASP RSGPRAGPENGEYL
PEPFAEGWLTDS GE
EGSGFHADPVEPLLQSSD
RRQGHR\｜VSTLDGA YRPRGEPRTLVWGWDAVPGRN
$\square \mathrm{L}_{\mathrm{G}} \square \mathrm{K}$
PNNS
FMAAWDGAGYSGNESKGYVVRI
GPDGSMYFLTGGRRLESDLYRVYYDGDEAAGTVSKQTLTE MKHDATG AF DRNGDPVDNDQSTTAARDVFANEDNSGCPDNCF
DGELGDQQTLVGGF
YQDARRDPEG $\square$ DR GK GR $\square Y R$ VRYENHPRAPRFD $\square A Q E T D$ WYDPGVGGHQAGD【NRGR\FRVSSPGEAYKV
NREPPRPPSVSYSAWDVDARTLGQPRT乌VEGFQDA DGS
PDGG $\square Y A \square D W H D A D \square C G K E V L N E E T G R \square F R \square M P E K T \square A Q N$ DGSGFAADP

VEPLVKSTD
$\square Y R$ VDENSFYFSDDKGGVIYYVRQ
F $\square$ SDWVDRSYQ $\square H G K G R \square W R L V P D K \square A P V K P R V Q A P P V A$ FFPWANG DLGKQQTLVGGFQATDGS AFASFHGSWNRQPPTGYSVIR $\square$ PWAGNSVNGYEH VYAPD GKKFEGMYLACDAGRRDTMSYFPKPDGANFTMDRGTFПK FGEDNDGEIYLGDVGTGPLQRLARSGAPVTGVFENLPNSQ VADWNYNGWVNK QVKGRLFRVTYTGDQPAVANEP
YVADFYNKITGHYEVRGRTWRП
DRLGYRVVRVVLSKAGDRVVR HERFDSGWLQKEGTPDSS
ARPGMD $\square Q M \square T \square Q D G T R V N Q T P L I N G F V Q D P E R F D \square D S$ QVGRSLLLLDSADWSALRFDTEPELS
GFDTADEAHVH
FHP
 WIADWYDKYPCYQNANGRUWRVAYVGDQ

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UniRef90 S7VHI1 UniRef90＿LODEX7 UniRef90－A6G7H0 UniRef90 S7WL53 UniRef90 UPIO00345ED35 UniRef90－B4D134 UniRef90－UP100047EC50 UniRef90 A4ATKO UniRef90－А6СЗВ2 UniRef90－N8TK79 UniRef90 W5TMLO UniRef90－G0J6N4 UniRef90－D2ROP6 UniRef90－W7S765 UniRef90 J2WCS3 UniRef90＿M5CBG6 UniRef90－R7RRA1 UniRef90－UPI000362CDCB UniRef90－F9Ul38 UniRef90－A3ZWK1 UniRef90＿G2QRS3 UniRef90 A6CAH4 UniRef90－E1Z2N9 UniRef90－J3NDX6 UniRef90 K9NEM7 UniRef90－UPIO003711519 UniRef90－UPIOOO35C7A66 UniRef90－UPIO0029A6167 UniRef90 UPIO002EBA844 UniRef90－UPIoo035F242A UniRefol＿Loinx
$R P \square Q A K F$ GRDGRHLYV VDF GRMDQKDPK P K
 WQ TR
पGERMRD【IS पSDGRVATTTDSGWLIFTRNGDK

K WF RPTDVCVAPDGSLT $T$ S DWYDPVGRSRGRDFRVAPT GTNRV DLRFGRDTGELYVFTKPDGKVYKVVGS VQHRPCGLAQGPDGGLYVSDDDNGTIFKISYK LIAGDTRD RFGQDAAELYLLAKANGKVWKVTG

$R G \square Q A T G \square D V G P D G A \square Y A A D W V D G W K V N T G R \square W K \square D$
LLGDTRDDRFGQ GAAMY円SSKRNGT YVTNTV
GCFRPVGMAFDETGRLFFVS DSTGEIY
GDSRV DLRFGS DAGELYLIAKANGKIWRVTGA
GAPVGMTVADDGALWLVEDKNQAVIRIDRSA
GEERPSDVMVGADGALYVAD WFDLKVGGHGTQDDSL

 GFERPNQLIFGPDGAMY $V$ VD $T G$ ASGALM

RWGRPVAAVVGPDGAV YПTDDAADA $\square$ YR

RWGQPVDTAVLDEES TLSDNFAGATYK
GDSRVDLRFGSDAGELYLVSKADGRVWEVTGAREDVVSS
 T D G

RWGRPVAAVAGPDGATY T D DYADA $\square$ YR
$V L A T D L A F G P G G E L I V S D W V D G W E G L G K G R \square Y R \square T D$
RYSLIVGLQPAPDGNVYMDDWYDKQTCHRPEPEDW DRT RPVGMA TDSQGRI FVSSDASGETY GRPVDVAIMKDGSLL V S S D DFAGAIYRDSYS
$Y \square G R P V D V A V M K D G S L L V S D D L A G A L Y R I S Y$
$R N C R P V D V K F G P D G A L Y V L D W F N P L V G H M Q H S V R N R D T N$ $P M G A P V G L A Q L G D G S L L V V E E D R N G T L L K \square$

KFGRPVD【ITYYDGS【LF SDDFGNK $\square$ YRVYY
E H N
ER VD\RYGSDAGEPYLLAKANGKTWKlVG
RPVGLAFDPQGRI YVSSDASGEIYLI SKA RWGRPVAAVTGPDGSV YITDDYADA IVRLT

D
RWGRSVDAVPGPDGS $\square Y$ VTDDTAGLVYRLT
FPGRYTDपNKMTDAQLVALQTNPSDWHARRARG！LH
TNFRPVD QQFGPDG A $\square Y \square \square$ DFNP LVGHMQHS $\square$ RDPN

L L G DP
RWGRPVGAVIGPD HAVYDTDDQAGAVYR
पTKRPVGLAFGKQGQ पYणTSDETGEVFVIENK
ANERPSDVEVGADG A $\square Y$ YVADFDPRVGGMSGT $\square$ YR $\square$ APK N $\square G G P A D L Q P A P$

## 【VGRPVDLLQ

CTGRPVEFDEDADGSLL TSDDVAGVIYRVRYDAT
RPIDAFAPGSGELFVLDFGQ FEMSDDGVQAKAG GRPVGLTVDRSGALLVVADDVGGVIWRVSGNA

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| UniRef90-A6CAJ9 |  |
| UniRet90-A0A059DSK7 |  |
|  |  |
| UniRef90-F2MVP5 |  |
| UniRef90-A3HZ53 |  |
| UniRef90-C6W6D0 | G T P Y K $\square$ |
| UniRef90_R7ZTD7 |  |
| UniRef90-UPI00046F7F08 |  |
| UniRef90-F0SMM5 | S G R $\square \mathrm{Y}$ K V ${ }^{\text {T }}$ |
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| UniRef90-W9YTE8 |  |
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| UniRef90-R4TDH5 |  |
| UniRef90-S7VHI1 |  |
| UniRef90-LODEX7 |  |
| UniRef90-A6G7H0 |  |
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| UniRef90_UPI00047EC504 |  |
| UniRef90_A4ATK0 |  |
| UniRef90_A6C3B2 | R G R $\square \mathrm{W} \mathrm{R} \mathrm{V}$ T |
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| UniRef90-G0J6N4 |  |
| UniRef90-D2R0P6 |  |
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| UniRef90-UPI00035F242A |  |
| UniRef90_LOINX4 |  |

 QSMLTAESGYRLSVFAE V SNARTIAVAPENGA $\square P G S K A A E V M T V P E G F S V S L V A A D V Q Q P V A M T D D D R G R L D$

SAAKGFKVELLYSDQGSWVNLCTDDKGRL

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PGFQVERTFTTLGSWVSTTVDNKGRL APVPASYPAPVVRDGYEARLVATGLKRPRGVIVDSKGRLC


$$
\begin{aligned}
& \text { VS } \square R P\|V S K \square N \square P T V L A\| L P G D S \square \\
& \text { VRLQP\VSKTNLPTVLTILPGESI }
\end{aligned}
$$



| WVVS S TVY <br> LVIESHT <br> FVGTRGP <br> WVAESYAY <br> $1 T S D Q F G S$ $L V S D Q Y G G L$ |
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LF $\square A T Q Q G E \square F Y \square G N G V \square R T F \square D \square R P R \square I R G G F S G E R G L L$ IT CDQYGGLYR TIPPVGSDT NTAKVQVQKLDDQVAG LF F A T Q $\square G E \square F Y \square G D G E D \square R S R \square I K \square G K S E Q G G Y D E R G L L$ $\begin{array}{ll}\text { WVVEC FEYPNRTPKGKAPRDRIVILLEDTDGDGVCD } \\ \text { WVAS } & \text { WNTYPKWEPGKEMNDSLMI LEDTDNDGKA D }\end{array}$ FI LDEK EGYVK ILTPEGEDFKEPY LDDIHKLVQSGQKRNAV

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$G L A F H P E F Y Y N G L F Y \square H Y S V A G T Q G P G A D P S S E V S R Q W D N$ DTAKMKDGFAHGLDYAFNSLYVMVNDEGDTTLERRYRLQD GLAFHPQFYYNGLVYYHYFKPNPCDPKTLNLRWDNRETQY K RTVFAEGKDGLGAFDLCTGDEVGHGGVFVGAAPY LYF DE VRKIFABVHN


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| UniRef90_A6C286 |  |
|  | UniRef90-I3XCN3 |
| UniRef90-D9R957 |  |
|  | UniRef90_UPI0003B7 |
| UniRef90_UPI0001746 |  |
| UniRef90-A0A024FK90 |  |
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|  | UniRef90-U5C5Y |
| UniRef90-IOK2.J7 |  |
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| UniRef90-F2AXS5 |  |
|  | UniRef90-G3UM80 |



GDGRADKSRDVIVMDTNGTYPHNGLSGLFDSNGNMYIGGLG FDGESLGRPRILFTNLDPDERHHGWRYAALSPDGRLFVAVG GDDKPDAEPQLLLDGWHYEDTHTLNSFIWGPDGWLYGCHG SNGDDQLDQVELLQEVESHSDHGVHALMPTPDGEFYLVTG GPGGALSGRRDVRRDLPNSGAHSFRYIAVGPDSRGYVSFG QGDFPNSNVTFRSDNLFFGDGTATNSGVVGDDNKWVINHG
 EDGDCDRRTILFGP LGGEKDTHGMDSSLLGDDGWVYATHG $\begin{array}{ll}P D T M T V N S R T T V L K N R M Y G T T H Y G G G L D F G D D G F L Y G T T G \\ P D A R S P & D\end{array}$ $T D G D D Q Y D K V T M L R E L Q G E G E H G P H S I I L S P D K K S L Y V T$
$V T N M S N N D L V T R T L L L S Q K E$
$V G O M$ GDGKAD DREVVITGWGKSDTHAGPSNDKYGDDNKI WGVLG FNADKPTGPPQKVLDGWGDTHETLNSLRWGPDGWLYGTHG SGPNLETVQDVLINLDPRSKDHLTNSIAFGPDRALYFTQA TKGTDQFDEVVKLKAFAGGGEHGPHAVRLTPDGKNLLVIG PKTDKPAGPEQIL LDGWGLDDTHENSFRWGPDGWLYGTHG T P P
 $T D G D D Q F D E V V K L A D L P G A G E H G P H G L R L S H D G K D V V V C G$
$G G G H S T R T L L L S R K Q D N G A T D H S S Q I R A F D D S D P N L S T S G$
 NNDDRFDK IDDVIRKLDDSTGGEHGPHGILKSPDGHLLVVMG D H DDTDEEWILHANGQPPFDNHNGVNSLFSPEGKLILTTG $D G D G K A D H R E V L F T G F R E G N Q H R L N G F E L G D D G W V Y G A N G$
$G D G G L D D H A E E L F G T H G G G E H G N H A V I P T E D G D A Y V A A G$ GDG QLLDHAEELFGTHGGGEHGNHAVIPTEDGDAYVAAG REHQYDHDDTVEEWILQSNGQPHKRRTLLNIRRPFLNHNG
 GDDKADVKTYLLHGFDSADSHHSLSAFTWGPGGALYFQEG DHDDTVEEWILQSNGQPPFFNHNGVNSLFSPEGKMVLTTG GDGRADGAAETLE QSRHPEHGTNGVVFGADGWVYVICG
$P$ NGTWRWERIMQTAPYPSSYDHAFNAVCVTPRGSVYVNSG AMTVVFNTVYGANKTTFDHGWNAVGIPDGKYVNG REDQYDHDDTVEEWULQSNGQPQKRRTGLNDRRPFFNHNG
 NKNDKPGKFEVLDKGFGSQDTHTLNTFQWGPDGWLYGLHG


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 ENGHTYMGRDGVK EGAAG】GGG APCNICKVSG VFTHSRVGKPGTPDDQR A GNFTDLDPQMDHYKLPPTWQRDNLFRMILDPDNAGDARY NNT IPPALADSSPVRQVWGEDHLLPSMPDGRGHNRGVLA


 STGNDSAHDARASPPRATVMRVPPSGGPATVYATGVRNG AGNHTDVTAMDAYRLPSNWQEDNLFPLIKDPRGHANNRM SA YSGFKGEDDG KEFSFGQGDYNFEPDGKNFEFLGSTSNNT THSNVGKPGAPDSERTKLNAGVWRYHPTTQKFELFAEGTS

 TAGNPVAKPGTP
VAGNPTA
A ADPASLAGKVLRL

 GGGGKVYDYPSEGWT IG WGGRNSVGVAEEP
THSNVGKPGAPDSERTKLNAGVWRFHPTTQKFEDFSEGTS NQTDYSHSRVPELWGEDQLLKPDEHFMVGSKAPLGHVAQD D G G S

GYDPFNDSQNDME DAGK I I E D DSGGEDRSDKTDNGRDFRFRPDDGRFEAESGQTQYGRHRD
NHTNLPDESII AGSRVPTWNWDANGHARGRLAPGGWITRRF $\left.\begin{array}{ll}N H T N L P D E S U I A\end{array}\right)$

T F H H T Q $\square E$ T P Y GP T RIVKNA G
DGGS $N$ DAN $\square$ ERHVTTSHSP $\square E H P$ K
NDANDFERHVTTSHSPDEHPK
 ARTDHGEVQDN


$T R M N A A V W R Y$
$N D G A S G M Y R F$


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DVVS GKHLPD 290 WQGRMDTN ${ }^{300}$ RANR\|NS F 310 KLLEEQGA G ELLGTLPMVHGTGEGPCEVIHFDSPTFPEYRGRLLVTSWG TVPKEVTFPEFTFNAHNAPLGFTFDGGDALVALHGSWNRT KTDAK NLPALLNDGQGSPTNLMFAYNARFPEKYRNSLLAFDWSFG $N L P G V L D I G P G S P T G M T F G Y G A K F P A K Y Q N \quad A L Y$ PARQIAPVFNFQAHVAALLGBHFRSLG DTIYNQKIELLISNPPNIPPRPDTTFPNGTNLKGFLVN AVPHEVTFPAFTFNAHNAPLGFAFDDGDALVALHGSWNRT EHAHGST

T NADGGA LDCAA LPPVEQT $\square$ GHAAP LGMSFTDGADPAPYT
D N LK $\square G S Q F A \square T E E E N A Q T V S G N K D T D E T C A S D Y V A P R D T$ SYWNRVAFVAEPTGRVLHNAIIEKDGSGFKEKNGFNULAS NSWPQEYRND IFMNNINGAKLNRDHPAPQGSGYVVTHQ NGYPSGTAPDPNYRGYAYDENASPDGS■EYKSNIFNGALK D $\square$ GPGSPVGVEFGYGTKFPA
KT $\square G D H W L G E R G P H A G N F R S A A A G G G H A H A G A M \square Y \square G N S W$ AATTQLLWVAMSTAGHLQS $\square P$ QAPDGSFTGKPTV NPALDEKTIAY
ARCTTTQAPHMRWPAHTAPLH
N $\square$ GPGSPVGVTFGYGTKFPA
PSSSDSSSVPQAKP $\square$ N $\square T A S D T S C S S A N F V P P R \square T F P A H T$ DS WPK EYRND DFMN NINGAKLNNDHPVRAGSGYMVTHK TFGAVVD $\square$ GPGSPTGVSFAGAK YGAKFPAKYQHAFY DPA LDEKT $\square$ SYYDEA $\square$ T
$N \square G P G S P T G V V G G Q G A K F P A$

TAAADPFQVDAYPVGTLPDAN
QF L K K Q WR P T
SRARLVDDGRGSPTGVETYRHTAFPDKYRHGVFSCCWTLG $K L D P A T L S P D Q Q Q K F Y N D P A F P P K P G N L V I T Q P \quad \square R S L G$ DTDPFLSKFAFAWLMKYFHNDPNFPKRPFSPGVQNMGPDA

NVGQGSPTSFFNGETAHFP
T F HKES G WA HA GL $\square$ S $\square$ DAPHMPKRFQNS VIFGS $\square$ HGCS $\square$ K


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 YVS W GSSSYNLNKMGRLWRIRPTRNFKAPGLKEPPYIQ VK H Y VDG S I LIS DDHASAI WRMVPEG WPEKYRNQLFMNNDHGARLNQDQLARKGSGYEGDFAPDFD $\square R P Q D G A M Y F T G R R V Q S G L Y R V T Y V G D E S T E P V E A T L$ $K \square N T \prod S G T T F A M N K S G N S V V R L R F R G G R P V S A T \quad$ T $\quad$ T T T T G VKHYVDGS LI S DDHTGA】WRMMPEG

WRSGTLGTAQTLVGGFQSDGT
QFDPATGPTVSAENGRDALKDIIVNKDNSVCPDKCF EGNAY $\square$ NPLRDAKH GRIYRLVYKG HSPNPD VHDKTMGRIFRISHDNDKWVQVD

MNDS WS Q W $\square$ NFKYDASGSVWA $\square$ D WY DKNQCHSPNPDVHDK

RFDVTKGEPVEASDSTNSVVDVMWNRDVTKCPDQCF HSPNPD VHNKTMGRIFKITNENDKWVQVD LLIHPDGNMYVT $\square G G R G G L Y R \| R Y T G S E S T A P A K A L V G G E$

ADFTGDAFVLSYSAGGGDHVRDQYDPAADNFTAQTTKVVD LGKDLTGDGFVIRYTGGPRNGVANPSPLRKQGRDLLHLEM

H QT A P DQWDYE RGRVYR $\square$ Q $\square$ KGTKTKKAED
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A QQKLKDLLR DGK L
$R$ S S Q $\square L Y \square R Y G P D G Q V Y F \square D W Y D T N K H D R S N G R \square F R D A Y N$


RWGRPVSAVVGPDGAV YVTDDYADAVYR
RPVGLAFDSE ER $\square W M T S D S T G E \square Y$

TMGR

RPVGLAVDDREGR $\square W M T D D D K G D V W$
D

GF $\square A P T D A E \quad R V G N V M Y V I E E G R Q C \square W K D T F R P Y$ AFTR\IDGFTSPTGNTLYIIEYGGKQGGNKSG

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