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GS05 UniRef90-M3B762 UniRef90-K1X442 UniRef90-V5FFZ3 UniRef90-C7ZPNO UniRef90-F8NVW3 UniRef90-10YTZ6 UniRef90_UPIO002880BC5 UniRef90_A7T593 UniRef90-10YY17
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UniRef90
B9XQK 7 UniRef90-J4GPU7 UniRef90-K8EB19 UniRef90_S2KBS8
D

DPFAGDPPRHPGLRVNSQKPFNAEPPAELLAERFLTPNE ${ }^{30}$ DPYANDPTRHPVLRVNSQKPFNAEPPGMLLADKYITPSEL DPYAHEPERHPALKINTGKPFNAEPPGALLVDSFVTPNAL DPYAKDPDRHSALKPANMKPFNAEDSPALLCESFITPNEL DPYATDPRRHPALKPASVKPFNAEPPLTLLADNYKTPNELK
PWAYEPKRHPLLKPTSERPFNAEPPTNLLAESFYTPNDF DPYANEPKRHPALVVRSQQPFNAETPVDVLGTSRWTPNEL
PWAQEPVRHALLKPASKRPFNAEPPIGLLAEKFYTPNEM DPYSTDPPRHPALVINSSKPFNGEPPPALLTDNYMTPSAL DAYANDPSRHKTLTINNQKPFCAEPPPPGLVDSFLTPNEL DHYAHEPKRHPALKVNSQKPFNAETPLQLLVESFYTPNEL PYSKDPTRHPALKVNSSMPFNAEPPSELLMQSFDTPNDL
 YNNEPKRRPDFTVNQQQPFNAEPPCDALIRNYVTPNDY
 DPFSTDPARDQRLIKHTAKPCNAEPPPEELGKEFITPPEL PYANDPERNPLFKVNASQPFNAEPPAELLTESFIVTPND D YSEEPPRHPSLMVNS
D P F
YSGEPQRDERLGVITQK
DAFSNDPERHPALTVRNAKPFNAEPARSDLUSYITVDL
DPFESDPVRDARMTVHTAKPCNAEPPNDQLEAEFGTPNEL
DPFENDPERDERLVTHTAKPRNAETPSDLVGADFKTDENV YDNEPPRNPLLKVNAKVPFNAETPRSALIDAYVTSVDM YAEEPPRHPALKINSKEPFNAEPHRSELVASYI TPVDF
D Q YSKEPPRHPSLYINSKEPFNAEPPRSALFRSYV

QRNPSGRLTGKHPFNSEPPLQLMHHGF
VPRNASMRLTGKYPFNAEAPLPLMHHGF
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QRKDRLIVHGKAPYNAEPPLDRLRAAFL
DQFTPDNPRSPHLRLTGKHPLNGEPELALEKAGMI AHVSRDPNI RLTGKHPLNAETPIPL LMDHF
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DQFSPDPRSDNLIRLT NHVPRDARLRL GHVPRDPRLRL NYVKRDPRLRL

KRRTLRV
VPR
DPYSRDPKRHP
AYTI
FRLP
PRSPALLD
RL1
VPRDPRLRL
FSREPAHSDQLQVRKAHPWNAEPDVATLVEHPLTPEHL
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| QUERY <br> UniRef90_V9KND5 |  |  |
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| UniRef90-I2CP30 |  |  |
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F Y V $V$ R N H M W V


FFVRNHLPVPQIK T EDHRLTIEGKT DDLSVVDELKKKYKSY

F YVVRHHMWV PVVDDAPEEKHPDGETRGYTLKELKERFRRH

HFVRNHGSVPHLRWQTHRLEVENGKLVLTMEELKDEFDA
F Y KR N H GP I P MV D D DE Y SVLI S GKPK KL S VK DI R MLP K Y

 H Y V R N H G A V P K R E WA T H T L A V D GLL V A T F S M D DLL A A L PA R F Y V R N H M WV P K V DP K Q H T L T I D GTTTK DYTVE DL K T K F KP V F F V R N H L P V P T A D LVGYTLKI S GLGLDFTLDELKTQFKHK HFVRNHGAVPKASWDDWTVEVTGLVKELTMDQLVNEFQSR F Y V R N H F WV P A VK GEDHEI NI DGTERTYTVKELKERFPR H

 F Y K R N H GP I PVVVDD DE Y NVVII G GK P L E I S M F E I R R R L P K Y H Y V R N H G S V P R R L W E F H K L D V E G N T I S L L S M D D L K H N Y E P F Y V R R S H G D I P D D L D A D G Y R L T


 F Y V R N H GAV P QV Q D P D WE I S I E G L V E T I T F K Q L L E E F E Q Y H Y I R N H G A V P R R L L W E F H E L D V E N G K L K L S M D D L K E K Y E H I

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F Y V R S H G D $\square P D$ D E A D S Y R LTTVGGTPR DLS L S DLI A Q FP P R F Y I R S H GPTPQQLSEDHRIVI DGMVDRFSVAELQAELPVR FFVRNHGAVPVI D I LDNWELSI EGLLVENLTLR QIIDSDF QQV VY C R N H S P V F E L D E D D WTVVTID G K P M E F N L K E L K E N F T Y A
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## QUERY

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EVTATLQCAGNRRSEMSRVRPVKGLPWD\GADSTARWGGA TVTATLQCAGNRRSEMNEVKQVKGLNWGSAAISNATWGGA TVVATMQCAGNRRTLIHEVKHVKGGLSWTGFA 1 HVTATVQCSGNRRNEMSQVKPVKGLEWDQGA GTAVWGGV
 TITSVVQCAGNRRSELNKVKKVKGLEWGPCAI GNATWSGA EVVATLQCAGNRRTEMNRVRQVKGLEWGDAAI GTARWGGV SVTAA MCGGNRRSEMTEVKAVKGLSWNAGAVGNARWS GV TVTATLQCTGNRRDQFNDVKKVKGLEWGDGAI GTAEFSGA NIVSTI QCAGNRRSDMNRVKKVKGLDWSEGAI STAEWGGA TVTAAIMCGGNRRSEMTHIKAVKGLSWGAGAVGNAKWSGA TVTATLQCAGNRRSDMNKVKQVKGLNWGVAAISNATWSGA AI TAAVMCGGNRRSEMAKVKKLRGLSWNVGAVGNAKWAGV


 EVTVTLQCAGNRRSEMSQVKEVKGLEWR $\square$ GAI STARWAGA SVNATLQCAGNRRSEMNAI KKVQGLNWKGTAI GNAKWTGA QVMATLMCAGNRRDEDNKIKTVKGVTWGPAAISNGIWGGV TVTAHLQCAGNRRTMMSDYKKVKGVGWGDAS SNGVWAGC
 $T I V T A L Q C A G N R R A E M S A V K P V K G L S W D T T A V S T A T W T G V$ KVTAALQCSGNRRRHMNEGRKTNGLPWTTGA SNACWEGV TVVAVTLQCA GNRRSDMTRNRKTNGLQWNVGA SCAEVEGV
 NVTATLQCAGNRRTEMSKSRKVRGVGWDVCALGNATWGGA TI GSVI QCAGNRRADMNQYKKVQGLMWEGTAI SNAEWTGV RITAALQCSGNRRNDMTRHAHTNGLQWGVGAI SNAEWEGV TVTVTLQCAGNRRGHMNENGKTSGLPWDVGAI GTADFTGV KVTATLQCSGNRRNDMTRHAKTNGLQWGVGAI SNAEWEGV TVVAT L Q CAGNRRTAMSKKRTVKGVGWDIGALGNAVWGGA
 EVTATLQCAGNRRTAMSKARKVRGVGWDVSADGNAVWGGA


 KI AATLQCSGNRRKDMTTHRDTNGDQWNVGAISNAVWEGVI
 K $\square T T T L Q C A G N R R K S M T D A A T T K G L Q W K A G A G S T A E W E G V$ EFPATLVCSGNRRKELNDMKPTSGSSNTAGSASTSVWRGI STAAVVVCAGNRRKEQNMVKKSKGFNWGSAGVSTSVWRGV $N V V A T L Q C A G N R R T E M S K A R T V K G V G W D V S A G G N A D W G G A$ NI PVLLACDGNRRKEFNMDRKTKGFNWGAGAVSCAYWKGP NAMACDGNRGELNMVKRSKGFNWGPAAVGCAYWKGP TVTTAVMQCAGNRRADMLAVAPVSGDPWAPGAVGNAEWTGV ELLPATLVCAGNRRKEQNMVQQTVGFNWGAAGVSTSVWRGA TI PVTICCAGNRRKEQNMIIKPSTGFSWGPGGIGGAYYTGV N P A A MACDGNRRKELNMIRRSKGFDWGAGGVSCAFWKGA TVPVTMVCAGNRRKEQNMVRKTKGFSWGAAGVSTALWTGP NI PVSLACDGNRRKELNMVKRSKGFSWGAGATGCVYWKGP
 NIPAVMACDGTRRKELDNLIKRSKGFNWGPAAVGCAYWKGV TYPVTLVCAGNRRKEQNMVRNTKGFSWGAAGLSTALWTGV| EVVAALQCAGNRRAQMATQRDVKGLKWNEGAVSNVKWGGV DVLCTLTCAGNRRKEQNMVAKT GGFNWGPAGTSTGMWTGV1 RII SAMQCAGNRRADLQSVVRKNGDPWDVGADGNVDWTGVI $T V A T L Q C A G N R C N E M A A V N R E D F V D V G G G T V S T A Q W G G V$ $T$ PVTLVCAGNRRKEQNDVKKSVGFNWGPTAVSTTYWTGV TVPL QIVAVLQCAGNRRKGGLVKPVHGVAWRDGVTANAEWTGV TVTATMQCAGNRRADMRAVAPVSGDPWDGGAIGTADWTGV EVVAAMHCAGNRRRDMQKDKPVEGVLWGQALI ANDRWGGV TYPVTLVCAGNRRKEQNVVRKTKGFSWGAAGVSTALWTGV
 E $\operatorname{li} P V T L V C A G N R R K E Q N M V H Q T D G F N W G P A A V S T T V W R G V$ SVTATMQCAGNRRADLHRHRPVSGDPWAPGAI GNARWDGV
 EAVAALQCAGNRRKEMGAIKPVKGDTWDNGVIANCRWGGI KVMAVMQCAGNRRADMVDVGYVEGDLWGPGA GNAEWTGV TYPDTLVCAGNRRKEQNMVRKSKGFSWGAAGLSTADWTGV EVVAALQCAGNRRKEMDQVKKVHGVLWDDGVI CNARWAGV
 NIPIFIACDGNRRKELNMIRKTKGFNYTAAASGCAYWKGlV SVMMVMQCNGNRRDGLHKVKHTK GVIWGPGAGGNA $\mathbb{V}$ V G C EITVTLQCAGNRRSEMTRFKEVRGLEWNTGAISTARWAGA EIVAVNQCSGNSRGFF QPRVPGGQLGNGAMGNARWKGV TLPVTLVCAGNRRKEQNLLRKSLGFDWGSAGVSTALWTDV


## QUERY

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130
140
150
$R L R D V L L H A G F P E E L Q G E W H V C F E G L D A D P G G A P Y G A S \square P$ L L S DVLAS A GVTETTAAAKHVQFEGLDHDMVSTHYGASIP
 RL R D L L K QVVGV T E D E E ILLK HV HF E GL D LDDVTA T Q Y A A S I P $R L D D V L H H L G M D T D D P R I E H V V F D G L D L D D P T M N P Y$ GA S V P LL R DVLLY A GVKEDQP QNGHVQFEGLDKDVTGSAYAASVP L L R DVLIA M GVK S DES $\bar{R} L S D V L A Y A G L D D D \square D E \square E H I$ QF

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





 P RDV
 L S DVLRD A GFEND Q GMNGTSEEVKHVQRNGMEAYGAS I P LL S EV L A Y I GVVS E EQ S T I E H CHELE GLDDK DVT GQ S Y GA S I P



RLMDVLKDAGLKHDLTAVRPQSDDEGDVDPTGTPYGASi
RLRDVLLDSGYD VTAACDSCPDDPEADRH円DAYGASI
RLRDVLKDAGVPVQPSSSPSSNSDGGDDVPSQKDYGASS| P
KLSDVLELVGIPKGGKHVEFVSVDKCKEEKGGPYTASS|
KLADVLELVGIPSSKSGGKHVEFDSVDKCENGGPYKASI P
PLRTVLKRCGUANRKSGALYVCFEGAEELPGGGGYGTSUL
SLRHVLRHCGGLSHAKGAHYVNFEGAEDLPGGGGYGTSSVT
KLSDVLADAGFPLAEARAGDTDARHV QFAGLESYGASSI P
LLADVLK SLGG SEDNEVIK HVHLEALDTDPADGHYGASII
PLCDVLKRCGILFGKHGSLNVCFEGAEDLPGGSKYGTS:| T

TLNDVLLASGIDDDKCSHDHI
KLADVLELLGGISPGGKHVEFVSDDKCKEENNGPYKASTS LL R DIL L S A GVPPNTDGVRYWVNFAGDDELQEGRYETCIIP RLADVLCAAGIDADD GRHVAFESHDRADTDTRFGASIP


 LL R DILLAA GVRESKEGKLRWVNFQGADEPSEGKYETCDP





 $R \mathrm{M}$



 $P L V E V L A R A K P L \quad R G A R Y V C F E G A D A L P \quad N G H Y G T S V R$

 G L G DV L R A A GVVD E S A A HVVA F E CHEDEDD Q D G E R F R F GA S I E SLA DVVLAA A GVVSKGATFVATTGADEVDVDGEKA QFGASIIS MMHNILSRAKP M M M KAKYMCMEGADALPN GNYGTSIR $R$ R R DV L L H A G V D E S M A M D D D V H V WH V S T C Q D D S Y Y G G S I P $S$ L A DV L SA A GVVE D G S G HVVA F S A H D E V VM K D D R F D Y G V S I P
 $R L R D V L Q D V G V D V Q A L N G W H V C F T S H V T P C D D D D Y G A S B I P$ P L R E V L F K L G V $\operatorname{V}$ K E P K E G
 R L R DI L A T V GVVT T K I K K N L L H VA F E SVVE Q C E E D K C Y G S S IP
 R L K DV L E K C G V S E GA K Q VT F NGM D K P L L P N T P D F V K A L D $Y L A D I L L A F V Q P L R G R A K H V I F E G A D S L P N \quad G P Y G T S Q R$ $P$ L R V L L N K A G V Y K A G P GA R F V $C$ C L N G P Q Q D G G P G S Y G T S I D

## QUERY <br> UniRef90_V9KND5 UniRef90-12CP30 UniRef90 A8JEP4 UniRef90 U4U212 UniRef90-V5GWV3 UniReffo-S4RHN5 UniRef90_D3TPZ1 UniRef90-10YYK3 UniRef90 ATRTU7 UniRef90-B4HB80 UniRef90-W5L431 UniRef90-E2B6H6 UniRef90 U6PEF2 UniRef90-T1ETS6

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YATACDACDVMLAYKQNGRTLAPDHGFPIRMIIPGHIGG ASTALDPSCDV WEKAIREDEDVLIAYEMNDEPLSPDHGAPLRVVVPGYLGA LAKAVADET ALLAFAMNGAPLLPEHGFPVRAVVPGFAGV LSWADRQRGMLLAHGMNGEVLHPDHGKPGRVVIPGQIGG LAKVLDEEGDVLVAYEMNGRPLSPDHGYPFRVVVPGYTGA LAYAMNSHNDVLLAYEMNGVNLPPDHGYPVRLVVPGFVGG REVAMDPSRDVMLAYMQNGELLTPDHGFPVRVIIPGFVGG LKKALDAAETLLATHMNGERLAAEHGKPLRVVVPGFAGV LVKATSPA DVLLA WAMNGEPLLPEHGAPLRLVVPGYAGV SAMDAMGVAMMNGPMSPDHGYPRAVIGHGG LEKAMTP GDVLLAWAMNGEPLMAEHGFPLRVVVPGYAGT LNWCMDPNKGILVAHKMNGEKLHPDHGKPVRIIVPGQTGG LTKAM EEDVLLAYDMNNQPLSPDHGWPLRVIVPGYLGA LHKALDPSQDVMIAYMQNGEKLKPDHGFPVRLIMPGYIGG LEYVIEPVNDVILAYQMNDHPIPPDHGYPLRLMVPGWVGA LSKALDEFGDVLLAYEMNHSTLTRDHGFPIRVVVPGYIGG LARAMDPEAEVLLAYEMNGQPLPRDHGFPVRVVVPGVVGA VEQALDG EVMLAYEMNDEDLPWLNGYPLRLVVPGHYGT LS WAASRDRGMLIA WAMNGRALEPDHGFPVRLIIPGQDGG

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RSVKKWLGRIVASPSESSSHWQQRDYKAFCPSVDWDSVVWG
RNVK WL GKIVVSEKESTSHWQQNDYKGFSPSIDYDNVDFS


R CVVKLSRI I AS KEES


| $R$ | $N$ | $V$ | $K$ | $W$ | $L$ | $T$ | $R$ | $I$ | $M$ | $V$ | $A$ | $D$ | $H$ | $E$ | $S$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $R$ | $S$ | $V$ | $K$ | $W$ | $L$ | $G$ | $K$ | $V$ | $V$ | $V$ | $S$ | $E$ | $E$ | $E$ | $S$ | $Q$ |

RNVKWVNKITVSKEESPSHWQQNDYKGF
R Q V K W W L K T V R L


R QVVK Y L S A I VL S E E E S K S H WQ K R D Y R G L P P F V G P D H Q N F E
R S V K W L K S I V V $\operatorname{L}$ Q K E E S T N Y F Q R R D Y K L F L P Q




R S V K WL D RI DI I E E E S Q GF F M Q K D Y K M F P P SVD WD N V V WS



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R MV K WL K R I V V S N Q Q S Q S H Y H Y K D N K L FP S HV DA E E E D W
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$R M V K W L R R I V V T P A E S D N Y Y H F R D N R V L P S H V D A E$
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R S V K WL K RLVV T A A P S D N WY HI Y D N RVL P T M I S P E R


R S V K WL K RI IVTTSEPSDNWYHIFDNRVLPTMITPE

RMVKWI E EI TVVTEAESDNFYHFHDNRVLPSHVTE
R S A K WL T RI EL RDEPS DAPDQAK D Y KL FPP DEDGS DVDWR R S VK WL GRVSLSKQKS QSMWQQTAYKGVPPCANQKTVD
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RMVK WLAR HVSDRESSSNHHHIMD R R R




RCVVK WL R RI WI T ERENSSHYH DWDNRVVPAFVRSADEDDP
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R S P K WLLA SI TVVQDAPS DN PMQA D D Y K L LFP P H L D Q E TAA A A
 RWVK WL GRI NI AR GESPNFYQQRDYKVLPPNAEQAAPWWD R S P K WL A S I MV Q D E EA DTP $\square Q R K E Y R L F P P T T T K E T A D$

RWVK WV D T I SL S P DESPNFY QQRDYKVLPAEVD
R MI K WL L S K I T T T Y K E S D N FYYH FRRDNRRI LPP H V D E K L A D
R S AK WL T R I EVVK DTPSEAPD DQA H D Y K L LFPA DVVT S E TA D WT
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Y WV K H L N E I T VIDDEPFNGFWMNPAYRD PDNSCACVEPG R S V K WL K DI EI SEKES SHYLHYFDNRVLPTQLSPEQARAE


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60
70 F F V $\mid$ R N H GAVPII N A DE WT|L|K|L|HG|L|CTT|L|S|L|AD|RTMFRVV





FF V V R Y H L A P L D

A
F Y V R N H G P V P
HFVRNHGHVPV


A Y D R N H GP I P H I S A S T H L L H I D G S V S N P L D DP I L H T L P Q H






AYNRNHSAI PEIDDAATHVVSVGGNPLQQLSEQLRHDFPGH






 F Y V R WH WA P T E V D A G T F R L K V H G K E L S L S L D A I A G L P R F
 F Y V R N H GS V P EVV D IP D WQL S V E GLLP L VL N L A QI LTE E E Q I F VRNNGIP P S S V DLE QWRLVI D GESVVESSIA DLKRKF QHH F I

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 GYDRNHGPI

## N

 MF RNNGLPET $L F V R N N G K P V N$

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 $\mathrm{V} F \mathrm{~V}$ R Y H L A G H P I D P A A H T L T I D GK P LT L L L L S E L Q R F P R F
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90
TVVPTVVCAGNRRKEQNVVQK
KS $\square$ GF S WGP ${ }^{110}$ G $\square$ S T A $\square \mathrm{F}$ T G|V ${ }^{120}$ EYVAVNQCSGNSRGFSEPR VPGGQLANGAMGNARWKGV EVISALQCAGNRRDTMSTQKEVQGQNWQDGAMMNCRWKGP ELVAVHQCSGNSRGFFEPR VGGGQAGNGLMGNARWKGV TLPVTLVCAGNRRKEQNVVRKSLGFNWGSGGVSTALDTGV $T$ MGTLQCTGSRRDEMALHA IPNEDPWGAEPISNARWRGV EFVAVHQCSGNSRGFF QPRVGGGQAGNGLMGNARWKGV QTIAVTQCSGNSRGF SMPRVAGGQSGNGAMGNARWTGV EVVCAMQCAGNRRHTMTRLKEVHGVDWTDGADMNCKWKGP QITAVHQCSGNSRGFFEPR INGGQLGHGAMGNAKWKGV TVPITLVCAGNRRREQNVVRRSLGFNWGAAGLSTALFTGV TYPVTLVCAGNRREEQNVVRKTKGFAWGPAVLSTALWTGV NDPVFLACDGSRRKEDNMIKRTRAFNFTGASASCSYWKGV ELVALCQCSGNRRGLF KPHVAGVEWGYGAMGNAKWKGV TVLAALQCAGNRRHTMTKEKEVWGIDWHNGAVMNASWTGV ELTAVCQCSGNSRGLFEPR VAGGQWANGAMGNAHWKGV TVTATMQCAGNRREGFDEVRDVPGEPWGPGATSTARWTGV TVVAALQCAGNRRHTMTKEKEVWGDDWRNGAVMNAEWSGV NIP PGLACDGSRRKELNMDKRTRGFNFTTAAVGCSYWKGV EVTAVNQCSGNSRGFFEPR VAGGQLANGAMGCARWRGVV SI TAALQCAGNRRHEMERVAEVQGDDWGDGAVMNAEWGGV EVVAVNQCSGNSRGFVAPR VAGGQLANGAMGNARWAGV EVEAALQCAGNRRKEMSS IKRVVGLLWDDGVIANCKWGGA TVVCALQCAGNRRHTMTKLKEVHGIDDCDGAVMNCKWRGP TVPITLVCAGNRRKEQNTVRKSQGFSWGPGGVSTALFTGP EI AAVCQCAGNRRGMV RPHVHGПQWGYGAMGNARWKGV EVVA AL NCAGNRRAKMATQRDPEGLMWSEATVSNVRWAGLL EVLAALQCAGNRRHTMTKLKEVVGLDWMDGAVMNCTWRGP GATVTLQCAGNRRAGLMTVRDIPGTPWGPGAASTAQFHGV ETPVTFGCDGNRRKELNMIKKTSAFNYTAAAVSTSLLWRGV E VAVNQCSGNGRGFFEPR VGGGQLGNGAMGNARWRGV EIVAVNQCSGNSRGFFEPRM EVVAVNQCSGNSRGFSSPR VAGQLV DVVAVNQCSGNSRGFSSEPRVFGAQLANGAMGNARWTGV E IVAI NQCAGNGRGLSEPR VTGTQWGNGAMGCAKWTGV SYYAVLQCSGNGRSFFEKQQTALGDQWKHGAMGNALWMGV EVVAVNQCSGNSRAFAAQPRFGAQLGNGSMGNARWVGV TYQLTLECGGNGRAEFD PPPAKGNQWTVGAVHCASWTGV EIAAVNQCSGNSRADFSPR VPGAQWGDGAI GNATWSGV KMALTIECGGNGRAFFN PPAKGNQWTYGAVACSEWTGV
 SYAAVNQCSGNSRGLFDPR VPGAQWGHGAMGNARWEGV RVIATMQCAGNGRAGLMAVRAMPGHPWQRGATATATWTGA TAPDTVVCAGNRRKEQNQVRKSKGFSWGAAGVSTALFTGP $\begin{array}{llll}T Y Q L V & C G G N G R S E F N & P P V G G N Q W T T G A V G C P E W T G V \\ T Y Q L I V C G G N G R S E F N & P P A K G N Q W T V G A V S C A S W T G V\end{array}$
 $D V V A V N Q C S G N S R G Y S S P R \quad V F G A Q L S N G A M G N A R W T G I$ S HVVTLQCAGTRRLEQIAMYPGDGAPWAEGAI GNARWTGV STVVTLQCSGTRRIEQIHDYPGDGAPWGEGAIGTARYVGV EAAVNQCSGNSRGLFNPR VAGGQWANGAMGCAKWTGV TLQLTLECGGNGRSAFDPPPAKGNQWTHGAVACSEWTGV EI TAVAQCAGNSRGLFNPR VPGAQWAHGAMGNARWTGV TLAVLQCSGNGRAH HRPKVPGVQWERGAVGNAQWTGV NYQLLECGGNGRSEFN NQQLECGGNGRAYFE P PARGNQWTVGAVGCSEWTGV $E V T I T L Q C A G T R R R E Q D E Q Y P G D G A P W G E G A M G T A R V Y K G V$ SNIVTLQCSGTRRDEQUREYPGDGAPWGEGAISTARWTGV ELVALCLCSGNRRGFFE PHVPGVEWSYGAMGNARWKGV EVAAVNQCAGNSRGFFKPR VAGGEWGNGAMGNARWTGV TYPVTLVCAGNRRKEQNVVRKSKGFSWGAAGLSTALDTGV TVICALQCAGNRRHTMTKLKEVHGDDWFDGAVMNCKWKGP EVVAVLQCAGNRRHTMTQLREVKGVDWLDGAAMCCVWRGP
 TYQLVLECGGNGRSGF
 EVTAVLQCGGNSRSAF EI SMALECSGNKRARF K AAVNQCSGNSRGFDEPR VAPGAQWAHGAMYNAMWTGV

PPAKGNQWTVGAVHCAKWT GV PAASGNQWTTGAVVGCPSWTGV K P ПA G G $\square$ QWGS GAMGCATWK GV KPKVYGUQWEEGADSQGVWKGV
 TYQLTLECGGNGRAEFS PAATGNQWTTGAVGCPKWTGV KQTVVMQCAGNGRGLF QPRVQGAQLGNGSMACVEMAGA ELPMTDACTGNRRGEVNADKRSAGYSWGASAVSTSLWRGA SVAAVNQCSGNSRSRF QPRVAGGQWGNGAMGNALWTGV HLVCALLQCAGNRRDDFNKRRVLNGAAVRSAMPSGQVWDNC
 TYRMVLECGGNGRSFF QPPARGNQWTNGGAGCAEWTGV NRDAFLECAANSGMEWKGAQLNGCQFTHGMDHCVMYTGV SVVHTMECSGNGRTYFE PDAEGDQWSFGAVGNAVWTGT KI KVVLECAGNKRSLF QPKVFGEQWEKGGMSHGYWKGV EIAAVNQCSGNSRGLFAP ERLVTlQCSGTRRILQUGL ПAANTLECSGNSRSLLIA
$R$ VPGAQWGNGAMGNARWTGV QPPGKGSQWTYGGVGFPEWTGV


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UniRef90-V2XIP2 UniRef90-D6TU29 UniRef90_UPIO0045EA896 UniRef90_UPI000473A50B UniRef90-E4UUR0 UniRef90-I3UE79 UniRef90-W4K674 UniRef90_G3JS44 UniRef90-F2S6W9 UniRef90-D3DHG4 UniRef90-G1X2C5
UniRef90-A4BV39 UniRef90_UPI0003108D6C UniRef90-W7HHP7 UniRef90-B8N2T7 UniRef90-B8IWEO UniRef90-W9WTP6
UniRef90 B8IVR3 UniRef90-J4GIK5 UniRef90-E5AEL4 UniRef90-U4LIP8 UniRef90_UPIO0045EAB48 UniRef90-F8NVWO UniRef90-C0NT74 UniRef90-UPI0004639337 UniRef90-UPIO004410CC5 UniRef90-W1KR84
UniRef90-19CJ64 UniRef90-Q1Q123 UniRef90-UPI0003601534 UniRef90_UPI0002EB9D22 UniRef90_C1DTC7 UniRef90-A1VQR6 UniRef90_UPIO0037120B9 UniRef90_UPI000370C942 UniRef90-UPI0004718C97 UniRef90-A3KJG7
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Y|L|ADVLID ${ }^{130}$
YLA DVLDFVQPARQAKHVVFEGSD
150
160 DLPNGPYGTSQL
 GLSEILARAKPTKKGGGARYVCFEGADQLPN GTYGTSVK PLKAVLDKAGVQAGAVQVSFGGDDGPVV_PDTPDFAKALD YLADVLEYVG ADRRQAKHVI FEGGDSLPN GPYGTSQR ALRDVLQAAGTAPEARYVSFSGLDEVWEEGKAVGFGSSIV PLKAVLEKAGIASGAVEVAFSGLDRPAMPQTPAFAKSLKK

 YLADIL RYVGITKGKRGARHVVFEGGDTLPN GPYGTSQR PI RELLAQAKP VVDARFVCFEGADKLPN DHYGTSVK

 RLADVLARAVGVQDSAGHVEFEAPDVSEDADPPQHYGGSVP $L L S T V L A Q A Q P T L C P V E G A H V A F S C Y Q T P T Q D G Y Y G G S I V$ PLKTVLDRAGVQASATQVMFEGLDGP VLPATPDFAKALD
 RLRDVLSTVLSPSTITYVRFNSHVTPCQD DTYYGASI S


 RLADVLAHVGVAPEAVHDAFHAPDVSPSADPPQPYDVSVP $M V R D L I D A S G L Q D Q P D D E R W Y L H F E G A D A P S E G P Y A T S M P$ PLRALLDRAGVRAGARQVTFNGLDNPQADGDPDFVKALD $P L K S V L D R A G V K A G A V Q V T F D G M D G P$ VLPETPDFVKALG PLKAVLDQAGVQRGAKQVVFDGMDGPVSD KTPDFAKALD PLRKVLEHAGVKAGARVVTFNGMDTPVVLPSTPDFRKSLDD
 RLADVLNYAGVKWDTLEVAFKGLDKA PYPQTPDVERSLP PLRAVLEKAGVLAGARQVAFNGLDAP VLAATPDFVKALN RLRDVLEDAGIK KNAVYI GYHALDHDSMDPNKEPDSRGCP R R RLRDVLNAAGVQKTAAHVAHEGADMHSGKEGKLPLSRGVVP RLKDVLERAGVKAGAVQVRFSGLDEPVVDDDADFKKSLD ALRALLDAAGVGPGAKSVGFGGLDRPLDEVDPFEKSLA RLADVLTAAGLDTTRGHVAFEAPD DAVDACPPQRFGASIP LMS SILQRAKLLP GAKYVCMEGADKDPN GCYGTSIIK RLRDVLEAAGI EDDAVY!GYYGKDHHSGDPSRNPDSRGVP RLKDILDDVGI K DSAVYI GYHAADSHSRDPNKEPISRGVP
 YLKDVIDHCGGDPETTHIEFSGADTYFKKGKVQNYLVSVVP SLKKVLRYCGIKPEGKHVEFFGADTYFKKGQVYNYAVSVP RLKDILDKAGVRSGAAQVRFKGLDRGTDPATPDFLKSLD RLKDVLEKAGVQSNVVYTAHYGADHGSGNPDKDPISRGLP RLKDLLDYAGVRSNAVQVRFKGLDTG VIPQTPQLMKSLD RLRDVLQQA GVKPQGVHVQFQGADRPALATVPLFTRSIP
 RLA DLLKA AGLKDSAVYTAHYGADQHSGDPSKRPISRGVP $P$ KKKVLK IA GVLDPECQUIEFIGGADTYFKKGDVFNYAVSVP SLKKVIKYCGGLVDDKGADFYGADTYFKKGGVHNYVVSVP RLKDVLAKAGVKHEADEVSLNGADKGADDKTPDFIKSLP RLKDLLERAGVKAGAVQVRFNGLDAG VLPATPDYUKALD PI GALLRMAKPK RAAKYVCFEGADKLPN GYYGTSVK LL K DVLEK A GVK IEE E S HVAFSCFQTPCQD DK F Y GA S L P
 RLKDVLADVGIKGDAVYI GYHGKDQHSKDPKKEAISRGVP RLKDVLQAVGI KDDAVYI GYHAADHLSGNPEKEPISRGVP RLKDVL NAVVGI KDDAVVYI GYYGEDHLSRTPGKAAISRGVVP RLKDILHLAGLERDAKWI GFNGSERA AYYETPEFVRELE PLRDLLNYAGLKPTAREVVFAGRDCGTRMAGTYPYARSLP PLRHLLARAGVKAGATHVAFRSDEQGGGYPADVRFEKADP
RLKDVLAKAGLKPNAAWIKFNGLEK K VYSKTDRFVRALE RLKDVLTSVGVKDSAVYI GYYGDDQHSRTPGKAA SRGV P RLADVLAAAGVTDGARQUACRGTDQP ALEVTPAFVRSLD LVRDIL LA CGLKLELNYHGRRLYDHFEGADTEGKYATSIP $R L M D L L Q E A G V K P G T V Q L Q F Q G L E R G P G P E G K G S N A F I K S$ FSHCSI GE EDARRLGIRHVHFEGHDCDPTHTHYAASIP PLRAVLERAGLQAGARGADRGCLHEPARTPGDDAYERSVP $R L A R D L E R A G V A P G A V Q V Q F A G L D R P P G D A P W$ F FA K S L L T PLAEVLKVAKVKPSAKYTAHSGVDHLSGDPKKQSLSRGMP
 PMSAVLDDEYG GATD DGLWWLSAMGGEAPPDKDVFCRS I P SLLTLLQQMTG GKKKEVKEVIFESHDMGTQPSTDQPYSRSLP RLRDLLDRAGVAP GVVQVK LS GLDQAPGEAPHFASLA SLKKVIKACGLVDGGKHLELVGAETYFKQNQVMNYAVSVP WLRDLLAQAGLTPDARHVAFEGFDKPLGKAQLK FIDRIP RLADVLREVGVTDKAVYI GYEGDDHLSGDSSRPVI SRGCP R L R D L L K

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180
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200

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UniRef90-D6TU29 UniRef90_UPIO0045EA896 UniRef90_UPIO00473A50B UniRef90-E4UURO UniRef90-I3UE79 UniRef90_W4K674 UniRet90-G3JS44 Uninefoc - 2 S6W 9 UniRef90-D3DHG4 UniRef90-G1X2C5
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UniRef90-B1LX97
UniRet90_J3ALC2
UniRef90-W5WEX5
UniRef90-FOUMG9 UniRef90-UPI0003B60510 UniRef90-FORCT7 UniRef90-UPIOOO3677956 UniRef90-Q47UF5 UniRef90-F9X6E2 UniRef90-M2UL52 UniRef90-UPIO002EC5EC5 UniRef90-15BWB8 UniRef90-UPIO0031330DC UniRef90-D8PJI2 UniRef90-UPIOOO3FAB6DC UniRet90_LOGY30 UniRef90_D3SL25 UniRef90-B2AKQ2 UniRef90-E6PMK1 UniRef90-UPIO0031EE46E UniRef90-P43100 UniRef90-E3RMG9 UniRef90-R1GWHS UniRef90-UPI000406AFC8 UniRet90-UPI000255AFFF UniRef90-F5Z6J4 UniRef90-12K7N2 UniRef90-UPIOOO2FC6787 UniRef90-ASFZZZ
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UniRef90
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UniRef90_FoM8G3

TSWARDKRKGMMLIAWAMNGLPLIEPDHGFPLRLLVVPSQTGG LDHALDG EVMLAYAMNGADLPMLNGYPVRLIVPGHYGT LERCMSVEDEVILALEMNDVPLTPNHGYPVRVVIPGVAGA LAWAMDPNKGIMVAHKMNGENLHPDHGRPVRVVVPGQDGG


LDHALDG EVMLA
IDHGMDGEEVMLAWSMNDEDLPLLNGYPLRLVVPGYFGT L DWARERSKGMMIAWRMNGLPLEPDHGYPVRLVVPGQIGG L NWCLNTDKGVMLAHRMNGQALHPDHGKPVRVIIPGQIAG LEYVMDPDNDVMLAYEMNDHPIPPDHGYPLRLILPGWVGA VWKALDENTII AYEMNGEPLPHWNGFPARLIVPGWTAT LSRALDKNMEVLIALKMNGEDLTPERGYPVRMIVPGVAGA LDMARS EDVLIAYAMNGAPLPLLNGYPLRVVVPGWYAT LSRALDPEMEVLLALRMNGKPLTPERGYPVRVVVPGVAGA LSYVLDPTNDVLLAYEMNDHPIPPDHGYPLRLMLPGWVGA LDHARDG EVLLAYAMNGEDLPWLNGYPLRRVVPGYYGT LDHARDG EVLLAYAMNGAELPWLNGYPLRLVVPGYYGA LEKALSD DVLLGYEMNDEPLSPDRGGPLRLVVPGFLGA LSRVMDKNGGI MLALQMNDKPLTPKHGAPVRVVTPGIAGA LSWAMTRERG!MLAHKMNGLPLTPDHGRPIRVVIPCQDGG AKALDENT LI AFEMNGEPLPHWNGFPVRLVVPGWTAT LAKAMDEKGDVILAYEMNGESLTPEHGFPLRVVVPGFSGA LWRAMAVDREVI ADLEMNNKPLQPAYGYPVRVVVPGVAGA RERATEP DVLLAWAMNGAPLPDVHGAPLRVVVPGWIGA VMHAMNPANDVMLVFGQNGRVLHPDHGYPLRIIIPGWVGG
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VDHARDG
D
DHARDG
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IAHAMNG
MDMAMRD EVMVAWAMNGADLPFLNGYPLRLVVPGHYGT
QVMLAWAMNGEDLPWLNGFPLRLVVPGFYGT




DHAMDG
AKAMSDD E
N WAMD
LNWAMDPNK
$M S K A L L D E T$
MSKALNG
I EHARSP
WRKV KFE
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TRKV
VDHARDG
DDKAMTDN
DOHRG
DHARDG E
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AKALE
LSKALNPYN

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 LSRLDDKRSIMLALEMNDKPLPPNHGAPVRVVTPGIAGA LARAMRPEDEVVVAVEMNGAPLKARHGAPVRLVVPGCAGA MSKALEDET I AWQLNGKDIPEFHGYPLRLVIGGWPAS AKAL ODETLLAFKMNGKDLPLAHGFPLRLVCGGWPAS
 LSAANDG EVMI AFQMNGANLPLLNGYPVRLIVPGWYST LAKALEDETDLVAWAMNGQDIPLVHGYPLRLVIGGWPAS I NKAMEDES LLI AWAMNDEPLPLMNGYPLRLVFGGWPAS LADALRP EAMIAWEMNGQPLPVLNGYP RLVPGFYAA LLHVLDPHHDVMLAFGQNGRVLHPDHGFPLRCI IPGFAGG LDWNDPVLQECLVAYQMNGEPLPMDNGFPVRLVVPGKFST LHRALLGQRDVLLVYEMNGRDLPPDHGAPVRVLVPGTVGA
DHARAD
VAKAMDEHN
I KKAFD
EKVF
AKVR
LNKAIHP

$\square$ EVIVAYGMNGTQLPLLNGFPLRLIVPGWFST ALLVFAMNGEPLPNVHGGPLRLVVPGWPGS LDHARTD DTILAYEYNNEPDPYKHGFPLRRIVPNWYGM LEKAM KIVDEVMLA WEMNGEVLPSIHGAPVRAVVMGYDGA AKAMEDET LAYEMNGEPLROVHGFPLRAVAGGWTGA


UniRef90 Q9UVH6 UniRef90-UPIo004756ECE UniRef90-B8MBE3 UniRef90-P08619 UniRef90-A7BIP2
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UniRef90-S7PYY9
UniRef90-E6PMK1
UniRef90-UPIO0031EE46E
UniRef90_P43100
UniRet90-E3RMG9
UniRef90-R1GWHS
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UniRef90 UPI000255AFFF
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UniRef90-12K7N2
UniRet90_UPIO002FC6787
UniRef90-A5FZZ7
UniRef90-D2QVQ2
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YWMKHIVSINVVSKPFDGFWMKSAYRI
RAVKWLDRITVQKQESSNAYQQKDYKI LPPEVTKEQAAWH YWVKMLDEI EVLNHADQSFWTAKAYRVPA
RSVKWVTRVTVRAEPSENYFQATAYRVLEPEADPDAAGPG RAVKWLDRITVQRQESSNAYQQRDYKILPPQVESKEQAWH RSIKWLTKVWVTEFENDSYYHDYDNRQLPSFVTDSESE YWVKHLNRITVLDTRLQNFWMKAAYRILPDNTCACTKPG RSVKWLDSITISAEQSRNHYQQQDYKILS YWVKHLNRITVLDQPFESFWMKSAYRIPAACTEPGQAPTA RWVKWVDQI EVCSEESPNFYQAKDYKILPENVTREQAAWP RSVKWLDRI SVQMTESESYYQQHDYKILPPEAD
RSVKWLKRLVITDKPSGNWYHKYDNRVLPTT円TPEMSKKD YWVKHLTSI DADAKPFEGYWDKTAYR
RWVKTVDSLT SHDESPCFYQRRDYKVLPDNVTQDMADWS RWVKWLDTISVVPNESPNFYQQHDYKILPPEATWEDAEWP RSVKWLTRVTARTTPSDGWFQTTAYRLPPAEAGAE RQVKWLKKLWVAKKPNRSHYHDWDNRLDPSMDDSRDHPFG YWIKHLHEINVVDAAYDGYWMKTAYRI PDNDCACV Y WV K HL NAI TVRDTPFDGFFMKSAYRI YWVKHLNEITVTDSVYDNFWMKTAYRI PDNACACVEPG YWI KHLHEDEVLDHPHDAFFMTKGYRV PDNDCQCVAPG
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 CSQKWLTRIYLRDIVHDGPKMTKAYRTPNRPVEPGE
RSVKWLTRVTVRSTPSDNYFQAVAYRLPPADPEPGTA
YWVKMLSDI EVLDKPDDQYWMKTAYRVPGANTKPGQTGFK YWVKALNHIDLMSGPDENYWMAKAYQLPGADVPPGTSTFP RSVKWVDRVTVREHPS LNYFQDVAYR
R
T S G K WLS KIVIRNKIHD G
TSGKWLNGI SVRNKEHDGAKMKAAYRVPNPVVPGEKV
Y WVKMLNDIEVIDSPDQNFWMAKAY
Y WV K H L S E I T V T D T EFT GYFMNTAY
RSCKWLTRINVI ENPSLDAPVQMKEYLYYTPQKGKQNVQYS

YWDK TLA D V
SCMK WLTE I TVRVDETPGYYMQQAYRI
ASGKWLQRi SVVRKIHDGEKMTSSYKVVAPGTTVKEEDMR
CSQKWLQRI QI RDQVHDGAKMTKSYRVVAPGEEVPEDDFV

RSVK WLYKVRAI HRPSMAPVQRKEYLYYAPQDGKQNARYS
Y WVKMI DEI QVVSKPWS GFWMNPAYRV
YWVKMLNDI EVIDRRDDNFWMATAYRI
RSVKWLKKI TITTSEPSDNWYHDYDNRVLPTTDSPD
RSVKWLDQI SVQMTESDSYYQQHDYKILPPEADCKE
RSVKWVDTIVVQPYESTNHYQQRDYKVLPPE

TSGKWLTEI SVRNIVHDGAKMTTAYRV
TSGKWLSKIVIRDRVHDGAKMGGNAYRVPCK
SWVKMLSNITVTNEYKKLGFMDVAYRVPDNETESETPEK
A S V K WL R S TVVLDARFTGPFQVVDY VYEPSTDSD

SW WK MLSNITVTDTKPPGHFMDHAYRIPDNNCECETPDH
T S G K W WLK K I VVVRD R VVM D G
RCIK WVDKMWI SDKQSTNYYHDWDNRLIPSRVT
Y WMK HLT WDRALTQPDDNFWMATAYRI
RSVKWLKKITLSPRECGSHWQQQDYKDYG
A SVVK WLTEI HVTQTPFQGFFQTDDYSY
Y WVK A L DRI TVVSAPDTGYWMDKAYR DPATSVVPGAKDFP LSHKWLTKITLRDREHDGQGMT GHSYRLPEK
M WVK WL RRIKVGDEPWHTREETSKYTALMPDGQARRFTW
NSVKWVEEI RVMDGMVEGEWTDRD
ASI K WLKHIKLADKEFGGHFQTKDY VFYPHVNNDNDSFP

NCVKWLNKITVMKEPVTGFFMDEVYRIFNEGQDPKT
VTGKWLKRIAVRDKVHDGTKMGHDYRVANP $\square A P G E Q S D$
V SGK WL EALSIRDRVHDGEKMA

| UniRef90_Q9UVH6 |  |
| :---: | :---: |
| UniRef90-UPI0004756ECB |  |
| UniRef90_B8MBE3 | K V P P L |
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| UniRef90_V2XIP2 |  |
| UniRef90-D6TU29 | Q G |
| UniRef90-UPI00045EA896 |  |
| UniRef90-UPI000473A50B | T T S T |
| UniRef90_E4UUR0 | TVP S $\square$ Q |
| UniRef90_I3UE79 | E A P |
| UniRef90-W4K674 |  |
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| UniRef90-F2S6W9 |  |
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| UniRef90-B8IWE0 | E S P A |
| UniRef90-W9WTP6 |  |
| UniRef90_B8IVR3 | T VP |
| UniRef90-J4GIK5 | K Y P S M |
| UniRef90-E5AEL4 |  |
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| UniRef90-UPI00045EAB48 |  |
| UniRef90_F8NVW0 | R V P A M Q |
| UniRef90-C0NT74 | KVPAMQ |
| UniRef90-UPI0004639337 |  |
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| UniRef90-UPI0002EB9D22 | T VP |
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| UniRef90-A1VQR6 |  |
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| UniRef90_UPI000370C942 | T VP |
| UniRef90_UPI0004718C97 |  |
| UniRef90-A3KJG7 |  |
| UniRef90_B1LX97 | T V P |
| UniRef90-J3ALC2 | K T P |
| UniRef90-W5WEX5 |  |
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| UniRef90-Q47UF5 |  |
| UniRef90-F9X6E2 | N G F S I Q |
| UniRef90-M2UL52 | N G F S IQ |
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| UniRef90-D3SL25 | SAPNM |
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| UniRef90-W2S1Q5 | D G $\square \mathrm{Q} \square \mathrm{Q}$ |
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| UniRef90-UPI00036FE658 |  |
| UniRef90-G0IXW1 |  |
| UniRef90_F0M8G3 |  |

UniRef90 w9wnt3
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UniRef90-J7J343
UniRef90-A1RB45
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UniRef90_UPI000474840F
$P G K G E M D L Q R T R P P L L E T P W S V F D K G V F T P V D Q$
 PGKVDGFIY L N DRPI NGELPPHLLHDE VTPFPN KK DLI YHGEKPLTAETE $\square Y$ AL D S DF T T K P E N R R A A L Q M $\square$ N P A P Y N A E A P P E A L KAHLIAK SLLP E NQETP DH F L E E K I T P P R S L L
 PSPEEPGRAS GLIPRDSSLPNLEFPGRDLNSRVTT TAS F K P GLLVP C Q V L P E
YESNLIRRPGLTRVSAASVAFTPLQGLFGT PYEKDI, R WI AANQDMPGNGVSWSPL HEQGT

GF F Y L N D R P $\square$ N GELPP HLLLHD E V T P F P
P LT H


F E K E VVVRNLAA R N L K Q Y T S A S S R A P R Q


Y S DEPPRHPALKTNSKEPFN


## AMTDLGQRPLVLE

QYEA HVVRRPWLTADP $\quad$ TSSVVN PQLIPTNAGLRTYATMPE
P L P D D A F TVRGT
PQLQENIVP
NHG $\square P$ P A A L R Y E L
YERNLVRRPGLTRVSGSSVAFTPLQGLFG SADAIIRRPAPKSKVTIPS GAELDVKGISPDITPS GLL
FESGGVIRRHPTPAS RLKVPAGA E

| $L$ | $D$ | $V$ | $P$ | $G$ | $I$ | $S$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $T$ | $R$ | $S$ | $P$ | $L$ | $Q$ | $E$ |

P F E GYPSRFEAKVVRTVSAPNARTPL HRDNGA

NDRPKAP
$S G K P L D F S K P A V I P N G L$
$\square \mathrm{T}$ L P K P V K A A
EK D A K D L P A L N $\square$ A S K S P L S T T E E D L T P TPESVV
RS P TFFVHNDLPWALETRRS QFGFGPMITPASH
 ND RPKAPGAPLDFTRPAQYQAKLDLTPEDKVTGYNN HGTNAEMRWEAMRDVYHVPNDR NAEMRWPSMGQGYVVPDDR DDKPGVPE I ILLKDTKPEKYQSDLVLTPEDKVTGYNN
 $D L L R \square P A P A V R D P V P A G A D L G V A D V E P W L T P A D D F$ ADALASGLTTYATRTADF $P$ GK D P R L I VH S $\square K$ T G E I E T P $\square$ ALL R E HA IT P K S I
 DLLFSSDEPSDHRQNLAGVSSPLSTSDLSLTPESKILEYNN RLPAARTAPAVPA GADLKLLDDLLAPYVVTMNADF
SRDAVRLPAPSSPAQPDPAGAQPRVRGISPFTTPNDK YEK D II R WIS A NPNVPGNGDTP LEEL Q GTIT PN GL $R \square A G L D V V R R A P P G A D F A A E L G T T P F V T A N S D$



F E K K A $\square$ R N P G L
K E P M S A T S P $\quad$ LQ E L D G T NAEMRWEAMS QGY H T

A R D A L R LP A P VA A P P VPA GA ELGG DA D LA PVVTPNGSF

## UniRef90 w9wnt3 UniRef90-M1 W502 UniRef90-A0K206 UniRef90_UPI000377BE3E UniRef90_W4LTH6 UniRef90-W3RII6

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UniRef90 D1CAN8 UniRef90-D1CAN8
UniRef90_A2YXE6 UniRef90_UPIO002FF3044 UniRef90-M9X4V4 UniRef90_UPI00035CA5D9 UniRef90_UPIO00363A524 UniRef90-AOAC11 UniRef90-SMQYV4 UniRef90-W4LZ76 UniRef90-E2PX83 UniRef90-UPI00037E9C1A UniRef90-UPIO00427233C UniRef90_UPIO0036D31EB UniRef90_V8QTH9 UniRef90_UPIO003686CC9 UniRef90_UPIO0047C3A4A UniRef90_A1R532 UniRef90-D7BIL8
UniRef90_D8MXP9
UniRef90_UPI00047E7147
UniRef90-I9X1A2
UniRef90-13CF91
UniRef90_UPIO002379B9D
UniRef90-A0Z1D9
UniRef90-T5K6M5
UniRef90-I1B0R0
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UniRef90_UPIO0032AAFDF
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UniRef90-A6WEI5
UniRef90-D2QXY2
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UniRef90_KOF6S4
UniRef90-GOPPF2
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UniRef90-G4HTIO
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UniRef90_UPI000474840F

[^0]H
V
 HFVRNHGGI PRIDKKHYRFSLDGLVARFTLDDLMSRFARM HFVRNHGGARADAKKHYRFSLDGLVARFTLDDLMSRFARM

FIVRNGLI
CFERH SGGV
FFVRYH
FFVRYHLDP
P
 AFERHHSGADDLKKEDYRLMINGLVDTPLVYEDLERFPRE MFIRNNGVPPSIDPTQWTLTVNGEEVTYSIDDLKNKFENV FFVRNNGLPPSLEHKGWTLEI DGEKKSYTI EDLKKKFKTY HYVRSNFVVPEHDGVVEVGGAVERPDTVTVDDLRAMPKV


 F Y Y R THLSSYPTMLLQSWTLSVGGEVVRRFSFKQLKEMPQV





| $Y$ | $R$ | $V$ | $D$ | $A$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $F$ | $F$ | $V$ | $R$ | $N$ |  |

FFVRNHTSTPVIDERDWKLTLWGRPVDFGYGQLRS LPP SV
 FFERHHAGVPALDPARHFLVIHGLTDTFTLDELR QFPAV

 CFERHHGGDAEVDPAQHRLMINGLVHRPLVFTMQDRFPRE HYVRVHYDTPATNAATWQLTLDGCPLSFGLTELRASMGRQ HFERHHQGWHDVDPSKHRLMI NGTAKVYTMDDVM RLPSV YRVDTALTVPNVDPSTWRLVIDGMRVELSFQDLVDMGLD

VTGYNNYYEF
FYERHHGGGIPEVND
FYEDPARNAHTLT

YRIDTALIVPQAAGDNWSFEVQGCKQSLTVGDLKARMPIR







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## UniRef90 w9wnt3 <br> UniRef90-M1W502 UniRef90_AOK206 <br> UniRef90-UPI000377BE3E <br> UniRet90_W4LTH6 <br> UniRef90-W3RII6

UniRef90_UPIO00467E84E UniRef90-UPI0003B63990 UniRef90- D5X154 UniRef90_UPIooo255734B UniRef90-AзW516

SUTCALQCAGNRRHEMQERGEVSGDDWGDGAAMNAEWTGGV 120 ERTVTLQCSGTRRTEQVLKYAGQGAPWAEGAVGTASYVGV TVRVTMECAGNGRARLLPRPVSQ PWLVEAVGTAEWTGV TMQLTLECAGNGRAAF YPKASGNQWTYGAI GCPMWTGV NRICFLECAANSGMEW RGAQLNGCQFTHGMVHNVMYTGV TVVAVNQCTGNSRSRFAPR VPGTQWGNEGMGNARWTGV EIVAVNQCSGNSRGFFKPR VAGGQLGNGAMGNARWKGV ELAAVNQCSGNSRGYF QPRVPGGEWSNGAMGNARWVGV TYQLVVECGGNGRSEF VPAASGNQWSVGAVACPTFTGV NHIYFCECAANTGMEWAGAQLNGAQFTHGMI HNMEYTGV ELQ WI ECGGNGRAAFEPSPR GNQWDLGAIGCPTWTGV TYALTVECGGNGRSEVI $P$ PTKGTQWGYGAVACGRWTGV
QRVVTLECAGNGRLAMRPDP QRVVTLECAGNGRLAMRPDP TGEPWGDYAVSTARWGGV TDTALLECSGNKRAHFE PKVFGDQWKEGALSQGNWKGV SRTAFVECAGNRSFFAQGQEVSGTAWTLGAVGAARWRGV
SNVVSLQCSGTRRDEQ1HEYPGDGAPWGEGAIGTARWTGGV TLTATMECAGNGRTFQSPRPR GGVPWELGAVGTACWTGV DRSTVECSGNKRAMFEPPPVPGEQWGIGAVGNVKWTGV TLRRTMECAGNGRARLTPRPVSQGPWLVEAVGTAEWTGV
 <br> H <br> \section*{ <br> \section*{ <br> <br> } <br> <br> }  SRIAFIQCAGNRRSAMSPWGKTAREVG SRIHFI ECSGNPSFLDP P WGKTAAEV ELEMVLQCSGNGRSFFSRYARASGAQWERGLVSACAEWDGVV
 TRTAYVECAGNGRSHYTTQQSVTGTAWGNGAISNGSWTGV NR】YFLECAANTGMEWAGAQLNGCQYTHGMIGNVMYTGV $R F Q A T F E C C G N S P V P E Y R \square S S V M E Q \square K G H G M M G N A E W A G V$

E Y A 1 I
S G GVTLTTCVSN


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

TRTYFIECAGNGQGYRNPPDPNLTATVSR QR $\mathrm{D}_{\mathrm{Y}} \mathrm{R}$ MRC V E
 ARTIT T CV S
 ESDVTLACVSN

A WSMVVPW!GF


E R $\|$ Y R M R C VE

E R IVVTLLACVSN



ERIVYRMRCVE A WSMNIIPWLGF


_UPI000474840F

## UniRef90_w9wnt3 <br> UniRef90-M1W502 UniRef90_AOK206 <br> UniRef90_UPI000377BE3E <br> UniRet90_W4LTH6 <br> UniRef90-W3R116

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 RLRDVLEDAGYDRDKVYTGYEAGDHLSGRPDLDALSRGCP PLKDLLALIGLKSTSLEVVFEAYDYGKRKDLAGHFTRSLP
 PLKVLLEEAGVKPEGKWI DAEGADG RLHDLLARAGLKREATWI QFEGLDRGVGDKPSAMSRS। P RLKTVLEEAGLKPDARWVVAEGADA SKARGMKSLP PIRDILRMAGPQSGADMVLSKSVD GYTASTP RLRDVLELAGVSPSAVSVMPRGLDDPFAGVDLGRVRRPLP PLRGLLEEAGLDTRAVDIVFTGLDWGVQGGMVQAYQRSLS KLSDVLELVGI PKLSSGGKHVEFVSVDRCEKGGPYKASIP PLKTLLHAAGLKP GAKWVVAEGADG AAMTRSLP KLSSLLEAVGIKAEARFLTAEGADQP ANPNAPDDERSDP PI REVLAEAGVREDAEQVFSTSVD RLADVLRAAGLKDSAKHVAGYGADHLSGDPDRVVISRATP RLADVLRRAGLSPRAVDVQPRGLDYVSGGESLGRVRRPRP PLRLLLEEAGLKGSATWILAEGADA SLKDVLEQAGVKSTADEVMFHGPDEVVGDPAEVTYERSLP $R L R D V L Y R A G L A G S A V D V M P R G D D D E F T G V S V G R V R R P L P ~$
 PRV保
PVRDILALARPRRGADMVLSRSVD
LLKTVLKEAGLKPE AKWlIAEGADG
PLSTILNEVGVKSGAKWLLVEGGDS RLSLLDEAGIDPKAKWILAEGADA PVRELLAMAGPKAGADMVLSTSND

## PLALLLKEAGLRPEARWLIPEGVDAV

ELRKLLKAAEPTSNARYVAFQTIYAPDEMPDDYYTRSLP P RELGOAGVODGADMV SRSVD EMPUDYPYVEGLR RLATVLREAGLKDEARWVVAEGADA SLNALLKRAEPTGNAKFVEFETLLARPEMQGAMTRSLP PVRDLEAGVRPGAQQLFTSVDREEMQGQWPYKEGLR SVADIFEHFGGVAGDQAAF LTASGGEEDPEGDDKNRSVP PVRELLARAGVDRDADMVLSTSADGGEGFTASTP AVRTLLREAGHDGATKG KWDYEGADASSNGRSTP PLHKLLALVEPTSNAKYVAFKTLYAPDUMPGQYPYVEALR PLATVLERAGRTPDAVDVMPRGLDYVTGGVDYGRVRRPIP PLRDLLLSAEPNSKAKYVAFETVYAPEQMPGQYPYLEGLR KLSDVLELVGDKFGGKHVEFVSIDQCKEENGGPYKASIP
 pLaELLERAGVRAGADMLYATSTD KLADVLA HLGVKLSSE VRFVAAEGKEGPEGKPDFEHS B B
 QLSDLLKLVEPTSEAKYVAFQTLYDPKEMPGQAPYVEGLR PVRALLERAKPQVGADMVLSRSDDDKEMPGQAP PVRALLERAKPQVGADMVLSRSDD

GW PLKLLLNECGVQPRAK WAПAEAADGAADNVGP PLRDLTTLGVQAGADQLFCTSSDADAEAADGAGWTCGTP ELATLLDEVGVKP GAAWLLAEGADA

A GMTRS $\square P$ PVRELLARAGVSSDADMVLSRSID
plrevibraglramarevmlegldac
YIKDILKDLGLKPE AQWMLAEGDDNS GFTASTP RVRDLLARAGVHADADMVLSKSID
PLKTLLEHAGLKKEAKWIVAEGADG
 PLRHLLKETGVRPDAVDVLPSGLDAPFEDD YGKMGRS: P AIRDVLKTAAPR RGARYVCFEGADRLPNGHYGTS P KLSDVLELTGDPKGGRHVEFVS $\square$ DKCKEENGGPYKASII PLSLLLERAGFDLKRATVL RLSTLLEMAGVSDNAAWILAEGADA PLAPLLREAGLAADAVDVVFTGADHGVERGVEQ PVRDLLAMAGVQEGADMVLSRSDD
PLAALLREAGVRPPSEGGRADQLVSRSHDGM
RVADLLRASGIHPDADMVLSTSID
Sid




| UniRef90_W9WNT3 | $\mathrm{HV}$ |
| :---: | :---: |
| UniRef90_M1W502 | $D \mathrm{G} \square \mathrm{Q} \square \mathrm{Q}$ |
| UniRef90-A0K206 |  |
| UniRef90_UPI000377BE3E | $\square$ A P |
| UniRef90-W4LTH6 |  |
| UniRef90-W3RII6 |  |
| UniRef90-UPI000467E84E | VT P A |
| UniRef90-UPI0003B63990 | T S P |
| UniRef90-D5X154 |  |
| UniRef90_UPI000255734B |  |
| UniRef90-A3W516 |  |
| UniRef90-UPIO003741850 |  |
| UniRef90-A1VX83 |  |
| UniRef90-UPI0003B79207 | $R$ V R A |
| UniRef90-K6BUZ0 |  |
| UniRef90-G2NB85 |  |
| UniRef90-G2XK31 | N G F S $\square$ Q |
| UniRef90_UPI00036B2305 |  |
| UniRef90-14D3S7 |  |
| UniRef90-UPI00035FF7EA | $\square E P$ |
| UniRef90-M1SNH3 | Q Y A S $\square$ Q |
| UniRef90-C0N3J8 |  |
| UniRef90-LODRC7 |  |
| UniRef90_J7J343 |  |
| UniRef90-A1RB45 |  |
| UniRef90-UPI0002E5E77C |  |
| UniRef90-UPI0002557C79 |  |
| UniRef90-UPI0003A69531 |  |
| UniRef90-B8IWF2 |  |
| UniRef90-U2YV18 | R |
| UniRef90-I2MTF3 |  |
| UniRef90_D1CAN8 | M R P |
| UniRef90-A2YXE6 |  |
| UniRef90_UPI0002FF3044 |  |
| UniRef90 M9X4V4 |  |
| UniRef90-UPI00035CA5D9 | S G F A |
| UniRef90-UPI000363A524 |  |
| UniRef90-A0AC11 |  |
| UniRef90-S9QYV4 |  |
| UniRef90-W4LZ76 |  |
| UniRef90-E2PX83 |  |
| UniRef90-UPI00037E9C1A |  |
| UniRef90-UPI000427233C | Q Y T S V Q |
| UniRef90_UPI000363099E | KSGS |
| UniRef90-UPI00036D31EB | R V |
| UniRef90-V8QTH9 |  |
| UniRef90-UPI0003686CC9 |  |
| UniRef90_UPI00047C3A4A |  |
| UniRef90-A1R532 | R G R S V Q |
| UniRef90-D7BIL8 |  |
| UniRef90-D8MXP9 | Q A |
| UniRef90-UPI00047E7147 |  |
| UniRef90-19X1A2 |  |
| UniRef90-13CF91 | Q A |
| UniRef90-UPI0002379B9D | R A G A V |
| UniRef90-A0Z1D9 | Q H P S |
| UniRef90-T5K6M5 |  |
| UniRef90-I1B0R0 |  |
| UniRef90-A7MNQ9 | Q A |
| UniRef90-D2AYP3 |  |
| UniRef90-D9SY72 |  |
| UniRef90 ${ }^{-}$W1AJD3 | Q A |
| UniRef90-UPI00032AAFDF |  |
| UniRef90_UPI000369A5B2 |  |
| UniRef90-A6WEI5 | R S F A |
| UniRef90-D2QXY2 |  |
| UniRef90-D5V1N8 |  |
| UniRef90-W2U4P9 |  |
| UniRef90-DOZ2C0 |  |
| UniRef90-UPI00036B000B | R L S A |
| UniRef90-K0F6S4 | R PRS |
| UniRef90-G0PPF2 | K P F |
| UniRef90-F5T2B1 |  |
| UniRef90-F4CZS4 | T V P A G Q |
| UniRef90-UPI0003743E1D |  |
| UniRef90-S0DGG4 | R |
| UniRef90-Q1ATJ9 |  |
| UniRef90-12K413 |  |
| UniRef90-UPI00037C55CA | R A G S |
| UniRef90-I3UGE4 |  |
| UniRef90-E0URX4 |  |
| UniRef90-UPI000360A0A5 |  |
| UniRef90 R4JAL4 |  |
| UniRef90-I1N790 | T |
| UniRef90-B8KX43 |  |
| UniRef90 UPI0003B521EB |  |
| UniRef90-IOKYC9 |  |
| UniRef90-UPI000474ABC8 | Q |
| UniRef90-UPI000348E735 | R |
| UniRef90-G4HTIO | R |
| UniRef90-Q080E5 | S ERS $\square$ |
| UniRef90_UPI000474840F |  |

UniRef90 Q93IL8 UniRef90-A6AKV7 UniRef90-A6E236 UniRef90_UPI00037FECEC UniRef90_UPI000374F331 UniRef90_UPI0003B76FCF UniRef90-W0RE26 UniRef90 K5BCH8 UniRef90-LOMLX1 UniRef90_UPI00037D9159 UniRef90 UPI000377D744 UniRef90 UPI00036B6F38 UniRef90_UPI0003B6C7E3 UniRef90-A1W3Y2 UniRef90_C4UIM3 UniRef90-A0KDR1 UniRef90_UPI0004099C75 UniRef90-K7AJL3 UniRef90 A6Q6A0 UniRef90-A0A017HPN8 UniRef90_H5TWW9 UniRef90_K8RAC4 UniRef90_UPI00037A44B4 UniRef90_UPI000376E9BC UniRef90-I0G2M9 UniRef90_A3VC85 UniRef90_B9NLF3 UniRef90-G4SXU7 UniRef90_E6S693 UniRef90- DOIV59 UniRef90_UPI000380FEDF UniRef90-UPI000475D56D UniRef90 D5BQ61 UniRef90_G2J0G8 UniRef90-E6WZX3 UniRef90-UPI0003A7E631 UniRef90 W7W8D6 UniRef90_UPI00047CB3B6 UniRef90-Z5X8Y6 UniRef90 UPI00037972EA UniRef90_AOK0G2 UniRef90-MOMNJ8 UniRef90_UPI00036F4CFA UniRef90 UPI000379E297 UniRef90-K6YMY4 UniRef90-UPIO001FFDF47 UniRef90_N1UUM1 UniRef90- G2E2F4 UniRef90_UPI00045EC389 UniRef90-NOBC32 UniRef90-14BGZ9 UniRef90-KOHXS9 UniRef90-D5P758 UniRef90_F4GQA3 UniRef90 U2Z657 UniRef90-F5RC97 UniRef90_C8X5Y6 UniRef90 S7W398 UniRef90_D9XKZ4 UniRef90-R1GYJ88 UniRef90 C1D414 UniRef90 UPI00047CE75B UniRef90-UPI000462C52D UniRef90_UPI00036B5AD8 UniRef90_B8CQR5 UniRef90-UPI0003941C71 UniRef90_E4U748 UniRef90_UPI00047A261F UniRef90_A2SCV9 UniRef90-R9PM80
UniRef90_UPI000255E3ED UniRef90_DOL788 UniRef90-UPIO00369127D UniRef90-H5X489 UniRef90_B2UEI1 UniRef90 Q5LNE0 UniRef90_Q62G98 UniRef90-B2IT18 UniRef90-H2FYC5 UniRef90 Q1LI76 UniRef90_UPI00037211D3 UniRef90_B416Y1 UniRef90 C7QI84 UniRef90_UPI00037559D7 UniRef90_C4ZPC6 UniRef90_W7W2T0 UniRef90 ${ }^{-}$M4R8B5 UniRef90-F1CFW1 UniRef90-UPI0004781443 UniRef90 UPIO00477CFF6 UniRef90-E3BEB5
UniRef90 R4JJ03

|  |  |
| :---: | :---: |
| UniRef |  |
|  | $1{ }^{\text {D G }}$ |
|  |  |
| Ref | D GK |
| UniRef90_UPIO003876FCF | YRUDTALIRVPRVDAAGWTLRVTGLEVEDTYADLLAEAEHV |
| UniRef90 W | HFQRHHAGVAII DPARWELLVHGLVDRPTMFTLLKRLPSV |
| UniRef90 | ALAVPQLSRDDWRLRIHGLEITYRFDDLDA FTTV |
| UniRef90-LOMLX1 | AANAGGLKTEGWKVRID |
| UniRef90-UPI00037 | Y $\$ RNHWKDSPEI D\NTFELKIDGETVTLSFEDLK K LPQK  \hline Ref90-UP100037 & HFNRSHQGWYDIDPSQHRLMVM  \hline & FYEFPA NAKLFKP P P WT  \hline UniRef90-UP10003B6C7E3 &   \hline UniRef90_A1W3Y2 UniRef90 C4UIM3 & FYEYNARYEFGLKTAPWQ  \hline UniRet90-AOKDR1 & VYERHHAGVPDIDAQRHRVVVHG  \hline UniRef90-UPIO0040 & FYEDPAEFSQQFKVDPWSLTI DGKPDT  \hline & NLPAPNANRDDW  \hline &   \hline UniRef90 A0A017H & THLEWPKVDAATWTLQVDGL  \hline  &   \hline iRef90-UP10003 & ALS ${ }^{\text {LPPRVDA S WSLRVHGL }}$ |
| UniRef90-UP1000376E9BC | MK |
|  | HYERSHSGVPDIDPAQHRLLVHGMPLVFSVDDLK RMPSI |
| UniRef90 A3VC | YYEDPAKNAHMLTVDPWSIVEGGLVDTYSMADIMDGMTVE |
| UniRet90 B90 |  |
| UniRef90 G4SXU7 |  |
| UniRef90-E6S693 |  |
| Ref9 | YYEDPARNAHTLVTSPWRVEIDGLVKKPNLEDLTKLSAQE |
| UniRef90-UP1000475D56D | FYEDPSENAGSLKTRPWTVAVEGEPKTYDIDALLKLAPLE |
|  |  |
| Ref90-G2JOG8 |  |
| UniRef90 E6WZX3 | HYVRCAGGVVDIN |
| Ref90-W7W8D6 | HFERHHNGVPDIDPAQHRLLI HGRVL |
| UiRef90-UPIOOO47CB3B | HHNGVPQI DPHRH |
|  |  |
| AOKO | YRIDTALSVPEDNAEEWELRVHGL |
|  |  |
| UniRefe | Wr |
| UniRef90 UPIO00379E297 | YRVDTALVVPEIDATRWR |
|  |  |
| UP100 | S |
| UniRef90 G2E2F |  |
| UniRef90-UP100045 | YRDDTADTVPRVDPATWRLRVH |
| UniRef90-Nol | HNGVPDIDPKQ |
| niRef90-14BGZ9 | D |
|  |  |
|  | GD W |
| F4GQ | DW |
|  |  |
| UniRef90-F5RC97 UniRef90 C8X5 UK |  |
|  | DTALIVPNIDPDRWRLRVT |
|  | AL®VPEV |
|  | FYEDPVENSQNFVVNPWTLEVDGKPMKLSYDDLLKKFP |
| C1D |  |
| UniRef90 UPI00047CE758 |  |
|  | YRIDTALR ${ }^{\text {a }}$ |
| UniRef9 | AF促W |
|  | GYGKNDPADPFP |
|  | Y QVISKNVNPR |
|  |  |
|  | NPWSFTI D |
| UniRef90-UPIOOO2 | ALQVPSVDAASHVLRI T GMPLEL |
| UniRef90-DoL788 | FYUDTALQVPTLTTGDWSLRI HGMEVRL |
|  | A |
| UniRef90 H5 UniRef90 B2 | ALVVPQVRAQDW |
| Ref90 ${ }^{\text {Q5 }}$ | YEFDPAAYAHLLKTVPWSIKIDGMVERYDFQDILSEMT ${ }^{\text {L }}$ |
| iRef90-C62G98 | R |
| UniRef90_B2ITI8 |  |
|  |  |
|  |  |
| 7211D3 | HFERHHAGVPVIDPTKHELLI HGKPLVFTVADLK RFPSV |
| UniRef | NHL |
| UniF | YRVDTA |
|  |  |
| UniRef90-W7W2T0 | D PVT WRLRIH |
|  |  |



## UniRef90_Q93IL8 UniRef90-A6AKV7 UniRef90 A6E236 UniRef90-UPIO0037FECEC UniRet90_UP1000374F331 UniRef90-UPIo003B76FCF UniRef90-W0RE26 UniRef90-K5BCH8 UniRef90-LOMLX1

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UniRef90-A3VC85 UniRef90_B9NLF3
UniRef90-G4SXU7
UniRef90-E6S693
UniRef90-DoIV59
UniRef90-UPIO00380FEDF UniRef90-UP1000475D56D UniRef90-D5BQ61 UniRet90-G2JOG8 UniRef90-E6WZX3 UniRef90-UPIO003A7E631 UniRef90_W7W8D6 UniRef90-UPIO0047CB3B6 UniRef90-Z5X8Y6 UniRef90-UPI00037972EA UniRef90-AOKOG2 UniRef90-MOMNJ8 UniRef90-UP100036F4CFA UniRef90-UPIO00379E297 UniRef90-K6YMY4
UniRef90-UPIO001FFDF47 UniRet90-N1UUM1 UniRef90-G2E2F4 UniRef90-UPIO0045EC389 UniRef90_NoBC32 UniRef90-l4BGZ9 UniRet90-KOHXS9 UniRef90-D5P758 UniRef90-F4GQA3 UniRef90_U2Z657 UniRef90-F5RC97
UniRet90
C8X5Y6 UniRef90-S7W398 UniRef90 D9XKZ4
UniRef90-R1GYJ8
UniRef90-C1D414
UniRef90-UP100047CE75B UniRef90-UP1000462C52D UniRef90_UPI00036B5AD8 UniRef90-B8CQR5 UniRef90-UPI0003941C71 UniRef90-E4U748 UniRef90_UPI00047A261F UniRet90 A2SCV9 UniRef90_R9PM80
UniRet90 UPIO00255E3ED UniRef90-D0L788 UniRef90_UPIO00369127D UniRef90-H5X489 UniRet90-B2UEIT UniRef90-Q5LNEO UniRef90-Q62G98
UniRef90- $821 T 18$ UniRef90-H2FYC5 UniRef90-01L176 UniRef90-UPIO0037211D3 UniRef90-B416Y1 UniRef90-C70184 UniRef90-UPIOOO37559D7 UniRef90-C4ZPC6 UniRef90-W7W2T0 UniRef90 M4R8B5 UniRef90-F1CFW1
UniRef90 UPIO004781443 UniRef90-UPIO00477CFF6 UniRef90_E3BEB5
UniRefor R4JBo3
RLLKHILLEEAGVKAAGSWVLIA 130 GADA 150 SAMTRS ${ }^{160}$
PLADI KMADPKSSAKYVAFETLYDPKQFPAQGPYVEGLR ELADLLDLAGVQSEAKYVAFETVLRPDEMPGDWPYVEGLR PLADLLKRVEPQGSAKYVAFETLVRPDEMPGQWPYLEGLR PVRELLARAGVQPEADMVLSRSTDPBMGWTAGTP PASVLLREVGVQ RGASWVLAEGGDA RVRDLLAPCGVRPEADMVLSTSVD ELGKLLKLAEPNGNARFVAFQTLYDPEQMPGOYPYVGTP SLKDVLELAGVKDSAVEVMFEGADHVVSDPAEVTYERSLP PLIKLLEDCG ANLKGVRFVLAEGADG SHETRTIP PLAQLI KWAEPNTNAKYIEFVSLADTQQMPGDWPYTEGLR PVRDLLAKAKPHADADMVLSRSQD SLAELIKRVEPQGSARYVEFVTLADKATMPYDWPYTEGLR ELGKLLKLVEPTSNARFAAFQTLYDPDQMPGQYPYVEGLR RLSTLLDETGVDADARWLLAEGADG TLASLLKKAGUKSNAKFVRFETVYDPEQMRGQSPYVEALT RVGDVIDKFGGSADNK LF LTATGAESGPEGVDPNRSVP RLKTILDEПGLKPEAKWMLAEGSDGSE

MSRTLP PLAPILKEAGVLAEGDEVVFWGNDKGTDEDHDANFARSMS PMKTLLDRAGVRPGADMLFSTSSDGWTAGTPVS RLSTLEAAGGLAANDG HAPRWILAEGADAAAMTRSDP PLATLLEEAGVSPPADGGPADQLVSRSEDGM WPTIGTP PLSALLKQVEPLGSAKYVEFTTLADAKTMPGDWPYVEGLR PLKFLIDLVSKDKG SNWMLAEGGDGAGVDRSIP ELNQLLEKVGVQSGAKYVAFETAYRPDEMPVEWPYVEGLR ELADLLNMAGVQEGGKYVAFETAYRPDQMPGEWPYREGLR PLSVVLQEAGlKGRAKWI TAEGGDA 0

 SLAELI RRVEPLGSAKYVEFHTLADPKTMPFDWPYVEGLR PLKELI RRAAPTGNARYVEFVTLNDPEQMPGSWPYLEGLR
 PLASLLKQVEPTGKAKYVAFETLQRPAEMPGQWPYREGLR $\bar{E} L$ A DLL L A E GVVRP G A E QLF C T S V D PLSVLLDEAGI EPRTTWAVAEGADAF AMNVSLP

 PLREVLKMARPKD GADMVLSTSSD GFSASTP P V R S V L R A S G LDDT DAAA TGGS GA D D DG D D S TEEEETAAAR S IP TLA S L I K S V S PK S S A K Y V R F E T L VY D P K QMP GQAP Y VE G L R
 S L A A L I K K A K P L S S A K Y V VF E T L Y D P D QM P $\square D Y P Y$ V ELLAPLL R E A GVVEP GAD QIVVS S R D G WTA GTP
 PLGDLL R RFKPTSKARYVAFETVLDPEQMPGQWPYREGLR
 $P$ L SVLLDDEA GVDPS A $R V R D L L A G A G V H P D A D M V L S M S V D G W T A G T P V Q A L T$


 ELKDI LDRAGVQSSARYVAFETAVQPDNMPGVRPYVEGLR $P$ L S VL L D EA GVVEPD AR A W I A E GA DA GAMNM


S L A A L L K E A DPMGSAKY VAF ETLLHDP K QMPGQRPY VE G L R PL R PL L E E A G LLDDAVEVLFTGWDTGVDLGVEHAFERSLP $P V R E L L A M A G P Q A G A D M V L Q T S I D D G T A S T P$

GWTA GTP $P$ L SVL L D EVVGIAPEARWI LAE GA D G

A A M S R S IP
 PL S TLLLKRFEPTSKAKYVAFTTVVERPEQMPDDWPYVEGLR
 $P$ L G ALL R E H GVVRSGS DQLV CRSTDGMT $\square G A P T R S A L E$ SLAELI KRVEPTGNAKFI EFVT LIADPKQMPFEWPYVEGLR S $L$

P LAASLI KWA EPT SNAKYVVE DSANDRLTMPGDWPYTEGLR
 ELADLLAMAGVQEGAKYVAFETLYRPEEMPGTWPYREGLR PLAELI KRVEPTANAKYVQFVTLADPSQMPGDWPYSEGGLR S L R E P L A S I I K A AN P T S K A K Y V A F E T L Y D P E QM GI D Y P Y V E GL R

$R L C D V L R E R G V Q P D D T$

G M T $\square$ G T P $P M K V V T D A C G G$ V $\operatorname{T}$ V S D AVVMTSAGVDHEPTGLDPKKAKVE $P$ L A A L L K E V E P L L G S A K Y V PI RELLDEADPE DGADQVVGRAVDGWTCGTPTS
ELARLVERAKPTTKAKYVVFHTLYDPKQMPGQYPYVEALR H L S E L I S R A R P
$P$ L A D L L R E A GVVR S GAD Q I L S TSS S D G WT C GTP



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UniRef90-A6E236 UniRef90_UPI00037FECEC UniRef90_UPI000374F331 UniRef90_UPI0003B76FCF UniRef90-WORE26 UniRef90_K5BCH8 UniRef90_LOMLX1 UniRef90_UPI00037D9159 UniRef90_UPI000377D744 UniRef90_UPI00036B6F38 UniRef90_UPI0003B6C7E3 UniRef90_A1W3Y2
UniRef90_C4UIM3 UniRef90_AOKDR1 UniRef90_UPI0004099C75 UniRef90_K7AJL3 UniRef90-A6Q6A0 UniRef90-A0A017HPN8 UniRef90_H5TWW9 UniRef90-K8RAC4 UniRef90_UPI00037A44B4 UniRef90-UPI000376E9BC UniRef90_I0G2M9
UniRef90_A3VC85 UniRef90_B9NLF3
UniRef90_G4SXU7
UniRef90_E6S693
UniRef90-D0IV59
UniRef90_UPI000380FEDF UniRef90_UPI000475D56D UniRef90_D5BQ61 UniRef90_G2J0G8 UniRef90_E6WZX3 UniRef90_UPIO003A7E631 UniRef90-W7W8D6 UniRef90-UPI00047CB3B6 UniRef90_Z5X8Y6 UniRef90_UPI00037972EA UniRef90_A0K0G2 UniRef90_M0MNJ8 UniRef90_UPI00036F4CFA UniRef90_UPI000379E297 UniRef90_K6YMY4
UniRef90_UPI0001FFDF47 UniRef90_N1UUM1 UniRef90_G2E2F4 UniRef90_UPIO0045EC389 UniRef90_N0BC32 UniRef90_I4BGZ9 UniRef90-KOHXS9
UniRef90 D5P758
UniRef90_F4GQA3 UniRef90_U2Z657 UniRef90_F5RC97 UniRef90_C8X5Y6 UniRef90_S7W398 UniRef90_D9XKZ4 UniRef90_R1GYJ8

## UniRef90 C1D414

 UniRef90_UPI00047CE75B UniRef90_UPI000462C52D UniRef90_UPI00036B5AD8 UniRef90_B8CQR5UniRef90_UPI0003941C71 UniRef90_E4U748 UniRef90_UPI00047A261F UniRef90_A2SCV9 UniRef90_R9PM80 UniRef90_UPI000255E3ED UniRef90-D0L788 UniRef90_UPI000369127D UniRef90_H5X489 UniRef90_B2UEI1 UniRef90_Q5LNE0 UniRef90_Q62G98
UniRef90 B2ITI8 UniRef90-B2ITI8
UniRef90-H2FYC5 UniRef90_Q1LI76 UniRef90_UPI00037211D3 UniRef90_B4I6Y1 UniRef90_C7Ql84 UniRef90_UPI00037559D7 UniRef90_C4ZPC6 UniRef90_W7W2T0 UniRef90-M4R8B5 UniRef90-F1CFW1 UniRef90_UPI0004781443 UniRef90_UPI000477CFF6 UniRef90_E3BEB5
MEKA|L|D DCM|V|AFAMNGEA|L|RPEQGYP||RLVV|PGWEGN LDEAMNPL ALI SVGLYGKTLAPQNGAPLRLVVPWKYGF
 LDEAMHPLLT I LAATGMYGETLPNQNGAPLRLVVPWKYGF


 $M$ S L V L S G E V LV A Y G Q N G E M L R P E N GY P L R L V V P GV $M D E A M N P L T$ MAVGLYGEKLPNQNGAPMRLVVPWKYGF




 | $V$ | $E$ | $K$ | $G$ | $L$ |
| :--- | :--- | :--- | :--- | :--- |
| $V$ | $E$ | $K$ | $V$ | $L$ | DVI I A Y A QN G E A L R D E Q GYP

 L
L
L
$L D E A M H P L T$

 LGALTDERNALLAVRMNGEPLPFEHGFPVRLVVPGLYGY




 VA A AMD HGRGAML AIGMNGEPLPVEHGFPARMVVPGLYGY $V A K L M D D A D V A Y Q N G E R L R P E H G Y P L R L I V P G W E G V$ $\checkmark$ AKLMD

|  | V | E | $K$ | $A$ |
| :--- | :--- | :--- | :--- | :--- |
| $L$ | $D$ | $D$ |  |  |
| L | $A$ | $K$ | $A$ | $L$ |
| $A$ | $A$ | $D$ |  |  |

L A | $V$ | $A$ | $D$ | $V$ | $L$ | $D$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $R$ | $R$ |  |  |  |  |
| $Q$ | $D$ | $D$ | $R$ |  |  |  | L S K AL D



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## 

 $\square D$$T G$
$L$
MDEAMHP ${ }^{G} L^{G}$
A LT D GR D A L
曰

EVVI

 L S ALTVDDRNALLADRMNGEPLPFEHGFPVRVVVPGLYGY
 I E A A M NEN A AMI A WGMNGEDDPYMHGYPLR V V F G G R P G S




 LDEAMHPL ALLLTFGLYGQVLPNQNGAPVRVIVPWKYGF

 D EAMNPLS LLVVGMYGKTVPNQNGAPVRLVVPWKYGF
 VESVLDGRTG LLAVAMNGEALP DAHGFPCRMLVPGFFGY RSVVKK VYK DAMLA WEMNGVP L P NAHGGP LRMVTP GYFG LD EA A L H P L L

[^1]| $L$ | $D$ | $E$ | $A$ | $N$ | $S$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $N$ | $W$ | $M$ | $D$ | $P$ | $N$ |
| $L$ | $R$ |  |  |  |  |  |
| $T$ | $E V V$ | $M$ | $D$ | $G$ | $R$ |  |


 L N WAKD P L K G F ML

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 K K VSAK WVTELKKVRFDADGYWTPRGWSARGPGKTASRDDVP
 KGMKSLVH:RLTRNQPPTTWEYGFYANVNPQVDHPR WS NSVKWLVGI HVLDHEFKGFYMTERY
SNIKYLRRIKLGTEPFAAKDEVLGYVDLMPD
KGAKSIVKIRFTEKMPDTTWMKAGYANVNPQVEHPRWTQS VSAKWLVELEETRDRVTAYWTDRGWGEKGPVKLESRWDVP
 TN: KWLRRLKLVRAPEMTREETSKYTNLLPD
KSIKSIVKI TLTDKAPVNTWQALGFANVNPRVDHPR WS NNVKWVKRIALTVEESGASDQRSGYR
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ANVKWLKRIEVRDRRFVNQFMGRDY
VSTK WVTDWELTRSDAQAYWTTRGWSALGPDKLASRDDRP
 KSAKSIVRIRFTDKEPVSSWEYGFYSNVNPEVDHPR WS
 KNVKWLRRLHLAAKPVMARNETAKYTELLPSGKARQFSF VSCKWVTELKVTTADDVGYWTPRGWSADGPDKTSSRDDVP KSAKSLVRIRFTDKEPGTAWEYGFYSNVNPEVDHPRGDWS KSAKSIVRIRFVEKPPGTTWEYGFYSNVNPEVDHPR WS ASVK WL NK I QTK WL RRLKFDDKAWWVREETTKYTELLPDGHAKMFNW




 VS AK SVVR RLTDKKPQTTWEYGFYANVNPQVDHPR WT VSAKWVVDLEVTAAERTVYWRDRGWAERAP:KTQCRDDAP KSIKSIVRI RFTEREPQATWEYGFYANVNPAVDHPRWSQK
 VSAK WVVDLELTEFDKEAYWTRQGWAPRAP VKTESRDDVP
 KHVKWLQRLEEVAQPVMSRNETAKYANLLDPSGKARQFTF
 KSTK ASVKWLRAITVLNQPFKGVEQAKVYRYQKSATDP VSAKWVTELKVTTYAADAYWTPRGWSATGP KKTASRTDVP VSAKWVTELKVTRADDVGYWTPRGWSERGPUKTASRGDVP VSQKCAVGMGVRDRVHDGKKMA
KSTKSTVKTELTEKQPPTTWEYGFYANVNPQVDHPR WS KNVKWLTR| ELAAGEDYRGYWQKRGWSDRAVVRTMSR KSAKSLVKI RFVEQQPKTAWEYGFYSNVNPKVDHPR WS KSTK SIVRURFTDVEPPTTWEYGFYANVNPKVDHPR WWS



 K SKSLVKI RFVDKQPPTSWEYGFYSNVNPDVDHPR WS
TSVKLRRUEGGAPWHRETSKY

VSAKWLVDLELT TAGYDSYWVQRGYSQTAPVKTASR\|DVP NNVKHLGQVAFTKTESTVKYMKSSYRISP
KSAKSIVTIRLTEKEPATAWEYGFYSNVNPEVRHPR WS VSCKWITELELTSADFDAYWVPRGWSAQGPIKTQSRTDTP KSTKSI VKI TFSETRPTTTWEYGFYANVNPEVDHPR WS
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SERA $\square$
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R PRS
Q A

FSPKT $\square$ APTYAFSMDTPFPF PSALSTTDEAKTAYQSVTTYNN

PGETPPPPEAGGKAGPAEPPADEAPGPYDTDEAQTPYDD AGEVPKPKRPRGPYDTDETPTPYEDATTYNNFFEFGA
$P \square M R G T V A Q A A D D D L K \square T P Y K D \square T A Y N N$ EPFRSQTLDV KKNENFTVERQVTDE VVAATYNN





THPGPYSGGLAPTPEEFVTGYNN
 AEQPER $\quad \begin{aligned} & L I R R A E A L S S S S R T P G A D V M G T M\end{aligned}$


PASMITTRPFP
FSTDEKLTTYQD円TTYN AKPLPAGVGPGFVTANKD P LAA AAKSAFSTDEGQTPYKD

VR D P प P A L

PMTPEKDVTSYNN


PGK LAALASVPSQVVGANTMDRVTAYADVSQYNN


FRTDEVLTRFEDDTSYNN
FNPNADAEYYQRESRTRPFPF
ETRRDATGSGVVTPSDH
ERHALVDVNPRGFYDRHPPKPHULNDSITPDDL
P LSADTTGSPS ASNTTGLRDEGGDPANSFEQQTNYNN
ERP
AEPYDTPNET

TPNGL


DM $\square$ VHSANT $\square \quad E T Q R G A V G S G V V T A S D K$
FSTDEPRTPYEDIT TYNN

G $\square$ F RTGTSPAPAT $\square G A G E L P G D \square T P V K D F$
D P VA Q VRRPRPLGPYDTKEAVTPYRSVTTYNNFYEFGLD PTDDFA RPAASVPAGTEVTVPGATPF $\frac{\square}{F} T$ S PAEF PPGQTLTEK FP PPDPHKLKSF!THDDE PRQAWAAAEQRKK DT GFTKTAYGADEKLT PYDD $P \square A G V T P R P D L A A A D P L T P W D A V T T Y N N F Y E F G T A K$



EKPAPY GN IITHNNF


NAFYD $\quad$ DDVPEVDAASYR DQVSGLKRVWTLDEDRA LPQE FYEDPARNAGRMAVRPWTVSVEGKPRTFDDDDLDKLAPGE HFVCHRND DPAADADSWTVSLTGDAESLTMADL GGDYPTV VTSYNNFYEFGLDTRPWAVVVDGEPQTVDDDQLDAWFPPE FYVDTALVVPRLDANDWKLRI HGKPVELS FEDLLRR E I I AKGDPAENAHTLKPRPWTVVI DGEVAKPDDDTMQAWFP LE FYEDPAENAGSLKTKPWFVAVEGHCERYTLEDFLAPHPSE



 HYLLIHFDVPAIDPETWSLRVHGRPLDLRDDDLRAR EQR

F YEDPFENAQQFKVEPWTLTLDGKPMTLDFDDLTQLFPDE FYEDPAKLSGNFKPRPWTVKVDGMPGTFDIDALIKEFPPE
 FYEFGMEKDDNFHPLPWTLELSGMVKRLDVGALLKSSDIE LYY $\operatorname{CRNNPAADVANPEDWQVEFKGEPKTLTVAELKTAMGLA}$



YEEDNNFYEFGTD
FYEDPEVYGHRLVTDPWSLEVGGLVAKPRALEDVMSEDPME YRVDTKLAVPIVDQNSWSLTI DGRELTFSYDDLRER ENV YEGDPVENAGSMTIDPWSVRIDGLVDRPGFDQIMEDMTVE HYERHHGGVPAMDPSKYELVIHGMPMVFTLADLKRFPSV FYIDTALLVPTLTTVEWRLRIHGEEVTLAWDDLLABMEM FYEDPAANSGSFKPSPWTVKVDGKPREFGLDELLA FPDE YELDTARNAHRLKTRPWTIVVDGECDEI GIEDVLSGFTQE

AKNFTTKNWEVVSVEGEPDKLSMEDFLA FPD DE
FYEDPAKNAHTLKTRPWTVKI EGLPQTLDLDALLKLAPQE

 NAFYGEEDDPDIVGDDYRLEVRGLTRSWRLAELY QLTQH
 $\frac{L}{F} H T D H M G A A V V D P V K W T L V V T G L V K K P L S P D Q L K R L P H K$ FYEFTARRAANFVTHPWTVVEVTGMVRNFADEDVLTQGDQE FYI DTA LDRVPTPDPAGWSLTVTGLDPFTLTWDELLA LPDVV IVNSFKGIPQDDDDKYRLVIEGEPLNLSFKEIQA LPST
 C VV C H L DPARNAGTLRPRPWQVSVEGLVKKYDLDELMKLAALE LYVRNNLPAPDADRDAWKITFEGSPQSLTLGDLK KIGVE
 YR DDTAFTVPQLRAEDWELRIHGLE!RLDYRKLRERFAI EDPAREAVLFKPTPWTI RIEGQAKTISIIEQLMKLAPLE
 Y Y VS K NLEAFDVDEAKWRLKVSGLVKSFSLQELRGQFEAR DPAKRAENFKPDPWNITVEGEADTFALED DKEHQLE $D K G D P A R N A G S D R T R P W T V T V$
$A$
$A$
$Y$ YRIDTALRVPRLRTADWSLRI HGMEVTLTWDDLGAAFEPV LF LHE GEVPHYDMSEWTLRVFGEERTFTYEDI LA LPTV VT TYNNYYEFGFKPTPWSVA I EGEPRTVNLEDI LK K I AP L E EDPARRAKGFVTEPWTVTVDGDVARYDLGRLLMGIGLE DFADYQLVVDGLVETYSLDQLRN MPSR
 FDPKANAGSLDTRPWSVAVEGMPATWAFDD MPDNPQYDWMSEQFSTWRLDVGGLVENPTQDSLLKAMPSR YYEDPYRNSQEFDTKPWSVTI EGEPVT $\square$ SAEEII SLLFPSE DPARNAGALKTRPWTVSVEGEPRTFDMDELLKLAPME
 DWRLRVTGLPLSLSLSDLQRFPSR


## UniRef90 R4JAZo

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## UniRef90_Q12LQ1

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UniRef90 U1TEA1 UniRef90_UPI0003B61EB1 UniRef90_M9LLV8

$T \mathrm{~S}$ K
 $P$ L A A LL K EVVDPDGSAKYVEFLTHYDREDMTRRWPY GE GLLR $P \vee R S V L R E Y G D D A P D \quad G R W L T A V G G D P S D A E D V F A R S I D$ PLGELI KRVEPTSRAKYVAFTTVLKDPEQMPGQWPYVEGLR
 $P L A G L L R R V E P T S K A K Y V A F T T L K D P T Q M P G Q W P Y V E G L R$ $P L A A L L D T V E P L G S A K Y V A F E T V V R P E E M P G Q W P Y V E G L R$ PLSTIL PRFQPTASAKYVEFTTGLDPAQMPGQWPYVEGLR
 R P R D L L K L A N P L E Y A K F I T F H S Y D PLAALLKKAGVKAGATHVAFETGYDPAQMP $\quad$ KHYPYM RI S DLLALLAGPAEDADMVLSTSAD GWTAGTP $P V R D L L E R A G V Q G D A D A V Q T T S A D \quad G M T D S T P$ $P L S G V L A E A G L E P G A D E V V F T G A D R G F Q G G V E Q A Y A R S D P$
 $P L S A L L D K V G Y L L G S A K F V A F E T V V R P S E M P G Q W P Y V E G G L R$ SLA ELL R QMEPTSSKAKYVEFTTMVDPKQMPGQWPYVVEGLGR S L A S V L K R F E P T S K A K K Y V Y F E T L L F D P E Q M P G Q WP Y R E G L R



 $P L A R I L E A V Q P Q S A A K Y V A F E T Q F D P V R M P G Q W P Y V E G L R$
 PLAPLLQRAG\|LDDGVEVVFFGADKGEVIKMQQNFARSMS $P L S H L L R Q V E P T G N A R F V E F T T L A D R S Q M P G D W P Y V E G L R$
 $P$ L A A V L K A A QP NTN A K F V E FT T L $P L A P L L R E L G V E P G A D Q V V A R S A E \quad G M T I G T P$ QLSALLKRFQPTSKAKYVRFETLRDPKQMPGQWPYVEGLR
 $P L K E L L E E A G V G R N A D Q I L D S$ E L A D L L D L A GVVQS G A K YV A F E T Y L N R D E MP GT WP Y V E G L R

P I A DL LA E A GPDP GADMLLSTSVD
$P M Q M V L D L A G V R P G A D M L L S T S V D \quad G W T C G T P$ $P L A A L L D D V G E P L G S A K Y V A F E T V V R P D E M P G Q W P Y R E G G Q R$
 $P L G A L L K R F K P K S R A K Y V A F E T L Y D P T Q M P G Q W P Y V E G L R$ ELRHLI DKVKPTSEAKFIKFTTLFDKSRFPDQYPYVVGLR



 PLADVLKKREPTSNAKYVAFTTLADRKQMPDDWPYREGLRR R FA D F L R LI G A Q T Q A K Y V S F R C A D
RLSEFLKRIGADSRAKYVWFRCAE
 PLSYI L S LAASPLLP QACYVWSDGLDHGFAGVSADRYQKDL P $P$ L R K L L A A V E P TA QA Q Y V R F E T L Y D P D QMP F P WP Y V E G L R $R F S D F L K E L R \square K P D A K Y V M D H A D H \quad D Y E T N V M$ $P$ V R E L L VRA R PQQGADMV LSR S VD
$R L R D L I A L A Q P K A N V K F A Y F V S A D T$
P F S Q F L KL V GA DLSSAKY VS F K CA D

RLDDVLQRVEPDPEAAFVWSIVADAGEGGADCGHYTKDLP SLKKTLLDRAGVKPEAKWLVWEAAD GYRES L A

 $P$ L REVVVAKLGVVPGMNYITSTGGETGPEDPNTDMVERSVP $P$ L G K L L D R V Q P T S F A K Y V A F T T L E D P E Q L P G Q WP YVVE GL R PLADLLREAG $\quad$ RRPGADQLVSRSPDGMS $\square G T$
PLKALI D WA QPTGNAKYI EF $\quad$ KSYNDPRHMPGDWPYNE GLR P L A A V L E RAA LLLPA A R FVVF HCAD MYEALD GTGQYY E S I D $T V S D L L R R V G V Q G G A K Y I V W R A A D$
SLGDVLKKFKPNSKAKYVYFETDYDPS QFPDKWPYRE GLR PLAALI RRADPTGAARYVKFTALHDPEQMPGQWPYVEGLR
 RMS DL L A R A GVR P D A D ML LS T S VD LFR D FLLA GLK I K P DAKYVMFHADD P DYDTNVP
 P L A QL I K WAEPTANAKFVGFVGTLDDS LARMPGDWPYTE GL R PLAEVVKRVEPTADAKYVRFETLNDPKRMPGQWPYVEGLR PLLATVLDEVRPTAGARYCVFHCFDNYGGGLSASPYYESVVD
 P L A P I L K E A GVVLD S GIVEVVFWGADRADDVVKFTQNFA R SMS PLADVLRKLEPLPSAKYVEFTTLFDPKQMPGQWPYVEALR PL GALL Q SVG LIKPEARYIVFHCADEYETLDGTGWYYE S L D SLL S R L L S K V S S I K N T A K F V EFFESVVY DP E QM N GQ WP Y R E G L R
 SLS ALLKKQASPMGSARFVRFETAAEPETMPGDWPYVVALR



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L D E A V H P LT

## L


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FNPEKLAPEFP ${ }^{30}$ VSE【IEP E A
P LTAKPSDYKVDDK LTPKKDVTTYNN WQAVTPGNEAVTPFQTHYNN
SDDPSAH LYPVARNTA WQAEGGRPLTPEK $\square$ AT TYNN PQVTPELVAVPEPEVQATMDRDVTPEEFTSKYNN

FKSHQPVPEFSKM M V T R P F F E F K QPK

GKSMPQFAVPDQQTSFKDDTSYNN PRAQAAAAPS LEVAPRVPGLTEFVTPNDRF

 $P G E P L T P Q K D V T S Y N N$ A D LR $R$ VPGVGPFLTPARDF
$\square$ T N Y N N
D P L S N F
TTNPDFADAGRSVTNQLFASRYN

EDDPTGLSGLLPNPGGF DPTSGS $\square$ RSK $\square R$ RAARRVG $\square$ SGDPPAAPEDRRLPPGQGH SFTTDEPITPD HRDVTVVGE T G Y Y
AADVARYPDVEPGKAPSWFAEK LPS $\square$ QWGAVTTHYNN LI $\mathrm{l}_{\mathrm{G}} \mathrm{LI}$ I PVGN F


RNPRFS $\square \quad D R P D T E E Y V A A T Y N N F Y E F S G G K$ $P$ T G L E QKVPG $\square$ SPFRTPTADF
$\square P G L S P F R T A N A D F$
$P P G Q Y$ LVG
R
AENDPTGVTGLLPNGGGF
 FNPDRLAPTYTEADITPFPF I TPNDG $\square L A K \square P E G \square E K K \square R G \square T P F R T K N S D F$

 D QPVLA LPEPVSAGPAGTDMK LPELTSFVTPN DT | $\square$ |
| :--- |

 T L Q THPGPYSAALQPTPKPNVTGYNN $P D Q Q T Q P F P F$
$P E A V T P L G E H$ ERVGAPLERSVSPPSGDPDFDWMPEAVTPPGEH

PEAPTPKQKAlTYNNF TKNPAFSQVDRPVTQEMLAGKYNN

GQVTSSEFATQYNN
PNT $\square E T K R S A F G D G \|$ T T P TRQ
PEYPESA TVPPPF RKPENRITPR RSARGGTSMITPAER

YTTPNDD
$L P N G G G F$
PTYPASMDTKPFPF


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UniRef90 Z9JQ33 UniRef90_J3DIF6 UniRet90_E3HUW3 UniRef90-UPIO003052BB0 UniRef90_K9YVK5 UniRef90-UPIO0037328EE UniRef90-M2Z947

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UniRefon -HOIYN2 UniRef90-C7PVM0 UniRef90-K9H1N3 UniRef90-BoCAU6 UniRet90 UPIOOO3B6493B UniRef90 A9HLO7 UniRef90_UPIO004632718 UniRef90_L8DDR3 UniRef90-V4NN35 UniRef90-U9VL00 UniRef90_UPI000302AOC1 UniRef90-UPIOOO34A7EE9 UniRef90-R7XSW5 UniRef90-Q1J005 UniRef90_UPIo0035FC98E UniRef90_L1M203 UniRef90-UPIOOO35E4CC4 UniRef90-K9ZDL1 UniRef90-M7NZM9 UniRef90-Q98LU0
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${ }^{50}$ KII D P TKFRLV $\frac{60}{V} v$
80


NS F NFT
VIDGK L S L
70
$\square E \| Q \quad Q M P L^{80}$

| $Q M P$ |
| :--- | :--- | :--- |
| $G K Q$ |

 FYEDPARNAGQLQIEPWTVRIEGEPGTYSIEDLVKPHGLE F Y E F GS H A A Q AL K K I R P W S V L I D G E V V Q

 Y R V D T A L Q L P ALLTS DE WR L R V H GLVERRPREWDFLRRRNAV F YVRNHAPAPPEDAPAFCVGADGSGVSVRVDALRRGGPVV
 YKVDINPSPPSI DPD GWRLSVTGEELELDYDDVRGYETR F Y EFI WS NA Q DL P T N P WQV EVVTGLDPKTYDLDDLKKA FP L E GKE DPAS YS GNFK T D P WS V V I A G L V D S Y G V E D D A P D S A L

 FYEDPA QYA HTLK TRP

GY R $\quad$ L


 FYEDPSQKSGRFKPRP
F
 RFYSVTQQGAPRKDERSYALTVVGGTARTDSLQDLRAMMPQV




DTV K G L


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

RPWT D D GLPMRL RLTRD Q A MPQR D P Y A N A E Q MVIE P WTVKV

D Y R M T I


Y Y EF $\square W K$ A A QA LP TENWQVEVTGGVKTYDLDD IQKKFPFE R DWR L T I D GLLVETFSLDELKA
 NA YY GEDEAPEVVDGE YRLEL GGLIREWS L PEELYA L P QV



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




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40
R|L RDII INLLAQPKPEAKYVYFKSAD
150
160
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$P$ FAGFLKYIGADLSAKYIAFRCAD PFSAFLKRVGADLNAKYVGFKCAD RLQETVADAQPQKNVKYVYFQSAD GYYTSID PMRELIKAVEPTAKAKFVRFTSRYDSEDMPGPWPYTESLR ELLNRIIAQAEPLGSARYVAFTTLMDPENLPGQWPYREGLR PLAEVLKRFEPNSRAKYVEFTTLHDPERLPGDWPYVEGLR SLSTLLKQVDPTGNAKYVEFVTAAQRETMPGDWPYTEVLR PLAELLAEVGVRPEADMLLSRSVD GRGAGTP PRAALLRRLEPTSRARYVQFTTLLDPERDPGQWPYVEGLR PLKYILNEAGVKEGAVKVISYAAD RMADILEEAGIEDEGEYALLSGAD DYYYSVP PMRLLLVEAVEPTSEAKFVKFTSYYDSEVMPGPWPYTEGLR PLAGVLSKAGVQPSAKFVEFQTVLRPSEMPGQAPY而EGLR PISALLDQVEPLASAKYVAFETVVRPEEMPGDWPYVEGLR RLADLLREAGVRPPSRGGPADQLVARSVDGM WWY TLGTP PLLSELVKQVEPTGNAKFVEFDTLDDPMQMPGQWPYNEGLR RLGPLLDRAGLLKPNARYVVFETAYRPEEMPGQWPYVEGLR PMRKVLEDVEPTSDAKFVRFESFYNTTEGPSTSFSNLPWP PLAQVLK QVEPTSSARYVRFETRKDPQHMPDDWPYREGLR PLADLLNHHGLTSRSKYVEFESLYDPDNLRUDWPYREALR RLSDLLDDAGVAGNGKALRFTCFD GAYSESLT RARDLLEEVRPKPEARAVMLKSHD GYSANVP PLSPFLKQVGVQDKAVEFLLHAADREMPGOYETTLP PLKALLAQVKPTSSKKYVAFETVMRPEEMPGQWPYREGLR SLGDLLREVEPLGSARYVAFESVLRPSEMPGQWPYVEALR PI SALLKQVEPTSKAKYIRFETLQDPKTMPDDWPYVEGLR RLADVLDAVAPTASATAVRFTSFD PLADVIKRAEPTADAKYVAFESLARPKEMRGHWPY VG KI TDLLATVDVDAQAAHVMAHCY GSYTTNLA PLADVLRRFEPTSKAKYVAFTTLADPRQMPDDWPYREGLR PMKALI DLVEPKPQAKFVKMTTFFRPKEVPYPWPYTEGLT RLTDVLDLAGDD NTSADQLLSTTVDGMTD PLAALLRRVEPTGQAKYVKFTALYDPKQFPGQWP PLATLLRETGDRAGADQLLSTATD PLSALLKAVEPTSRAKYI RFETLQDPKHMPDDWPYVEGLR PLASLLKRFEPTMNAKYVAFETVVRPEQMPIDWPYREGLR RLRDIIALAQPQANVKYAFFESAD QLSEVLKKAQPNSRAKFVEFTTLYDPEQMPGQWPYKEGLR PLSLVLDQAVVKPQARYVMFHCLDTDDRSGSGDKYYGTID QAKRVLELARPKPEARYVSVFCD RLATLLDAAGVRPGAGAVRFTCFD RLQEI ALLAQPQSNVRYVYFKSAD PFGAFLARAGADTHAKYVGFKCAD
TLKTLLEQHG GAQPEATHVAFYSVDG PVSDLLERAKPRSGNNQLSTSVD GGYTTNLP GAYSESLT RLKDLI ALAQPKNTARYVYFESGD GYYNSWD PLSKILDRVEPLGSAKYVAFETVVRPEEMPGQWPYLEGLR PLS I LERAKDGSDASYI WTSGLEWGEYAGVEETYQKDLP PLATLLKRAQPTAAGKFVEFVTLERPAQMPGQWPYREGLR PLADVIKQFQPTANAKYVRFETLNDPQHMPGQWPYREGLR PLATHLDEARVKPEARFVVFHCYDSMDGLSGAVRYYESSUD PLRGLLGEARPRAGADQVVGRSAD

GWTAGTP SLADLISRLEPTSNAKYVRFETLARPEQMPGMWPYVEGLR PMRALLEAVEPTAQAKFVRFTSFYDPEDGFGPWPYQEGLR
 QLSDLVNAAEPSADAVDVVTHADD GYSEAUP PIASLLDEVGVAPDSDMLLSTSSDGFTAGTPV SLSELIKACNPLPSAKYVQF LS LDDHKQQPYDWPYSEGLR PMRELIKAVNPKSNAKFVSFSTYYDENVTYGPGFHLGSLP MKALIAAVEPTSAAKFVRFTSFYDADITPGPAITFGSWP YLADLLEYCRPRDVPGRARHVIFEGIDELPK GKYGTSQR PMRLLLEDVEPTSDAKFVRFSSFYDPTTGPGFWAVNYPWP VLGDLLAQVGVRDEARFVVFHCADRYHGPETDPYYESLD PFRSFLERVGADTTAKFVGFKCDD PVRNVVAAL GGLAGGARFMTGTGGEKLPEGDPRSVMVE RVVDLMEHLQLKPGATHVMQHSV RLSRLLDAAGVREGAGAVRFTCFD STSAI KELVEILPEARYVMVHAH PMKDLLDEVGVHPDADMLLSTSVD KNFTTNLS $R L S H L L D L A G V R G T A K A \| S F T C F D \quad G T Y T E S U T$ RMGDVLEDAGVQEDGEYAMVRGVDTMDGGPNGR DYFYSIP PLGEVLTRARLK PNARYVMFHCADTMDGGPNGRPYYES: D PLADLIKKVQPTAKANYIQFETLERRSEMTIDWPYBEGD RLSTLLALAEPLPEACFVWSEGLDHGKFFEYEADYQKDLIP PIKPLLDEADPEGECDCAMLRAEDDYFVQFPV
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UniRefon_B9JWU2
UniRef90_S6B071

180
190
200

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Q A
Q A
Q A
Q A QA
R G

Q A
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Q A $F$ A
QA

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Q A
Q A

Q A
Q A R P $\square$

Q A

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T
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QASEI
$V A P$
QA
QA

R P F A
QA
QA

SA
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QA
Q A

SHPSV

A A $\square \mathrm{A}$
D D G R $\square \mathrm{Q}$
$\qquad$
$\square$

LS RNPAFAKVDRADTDEADATKYNN EPGRPLPPGQFLTPD D TNPAYADPGRPVTVEKTASSYNN PPGQHLVKNWP

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PPGQHLVRRDWP
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PLQPHEMTAAVTATDK

PPGQYVTEKFPVLH
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\text { P P G Q R } \square \text { T T G F P VL } \mathrm{V}
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 F YEDPSRNAGSLRARPWTVTVAGEVKTLDVDALVRMFPPE FYEDPSNAPRTLRTRPWTVAVGGQCARI GI DDLLKGLTSE N $\square$ WR AABSLPDRPWTVTLDGMVEKI A I DDLLAMVKLE YRIDTADSVPLLRAEDWSLRIHGMEVELDYQGLV ELGLV VD DN STDPEVDAN EWTLTVTGEELTYGYEDI TSMEPEH KPVGTAYETHLRAGFDWRLVVDGLPLSLSMAQLRA LDPRR GPED $\square P Q \square D G E H Y A L E V R G L V R R W T L P E L Y R M Q Q V$ Y NGATPEPEY $\quad$ PTWTLTQS GLTLS L NL RTLLKRFA L H
 FYEDPARHASALKVEPWAVVVDGEVGNPGRYSLEDLFPQE
 FPVLSKSGTPDWDPETWEFTVTGEELTWSWE FFR DPVRHAAQFKVEPWTVLIDGFVGKPGRYDMAA DAEPQPSV
 YR DDTA LVVPAIEPSDWLLRIHGMVDRLTYRDLDDR QLT

FPV
NAFYPEASVPE VLTYGSTPQVDLMNT FPVLSKSGTPQWDMNTWEFR


WSFE LT YGPTPREDPH

 FYEFIADAAESLKVRPWTVKIDGKPQEIADDDLLKRMPLE VLHHGNPYYRDLEEWTLTI DGEKDTYTYQQLL DMPQT NAFYSQYNVPAVEVADYRLAVSGRVADWTLDRLRA LPQQ
DVWR
RYYSVTGA YVDQFITRPWQISVTGLPKVFDVDELVRTMPQE
 AAPKVDLDTFELKI CGTEVSLS LSDLKTQFKQH FYEMTYGRTPQMDTFVWRFNVWGLAREFTWEEFMA LPKA $V L D L G Q Q P L I S T E T W R L E V R G L V E T L T W A A F Q A$ RIYNVAPSVPHRDATDYRLTVSGLTATHTLADLRA MPQT LFVRNNALPPPAREGQWPVAFDGQPDAYTLAELQA MPTR FYEDPARYAGKLEVEPWTVLVDGEVAKPGLERLVQPHRLE $N \square W R \quad R A Q K L V T D P W M V T I D G M V D T L D A A D L I A K M P Q Q E$ FPILHEGEVPRYDMKQWNLRVFGEERTFTYDDLLA LPRT

 FPVLHQVPRYRDDLSDWSFRVFGRPVTLTWDQFR RLPAR


 WP VLD LGGYQPNDT LDR RWRLGYVDGEPVVVGWEDFMA LPQT

 GSKSIWEAAQNLPTDNWRVEVSGLPRTYDDDDLHQKFPDQQ LI MLYGNVPYYKTLDDWDLKI F GLVEKILRYKDLMA LDPQT



 VLDLGQQPAIRRESWRLDVKGNPQSFSWTEFLA LPQS $V L D L G M Q P R V P L E R W R L D I D G N A V S W D W D T F K A Q K Q T$



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UniRef90 G8QLB1 $P L A D L V R R L E P T S R A K Y V A F Q T L L D R D Q L P G Q R R P V L P W P$ $P L G S V L R R F E P T S K A K F V A F T T L A D R K Q M P G D W P Y R E G L R$ $P M R R L V E \square A R P L S G A K Y V R M E T F K D P S \square A P G Q K Q S W Y P W P$ $P$ I A DVLALAKPAAGADAVLSRSYDGWNAGTPL PI MDLVEPA GLPEGCCVMFRAADGFYEEFP $P L K D L L D M A G L L R T S A R Y L I R H C A D R Y A Q Q \quad G D Y Y E S D D$
 RFAD LI QA FP P VS Q A K WAR DE S SVVNDDANGNSDP Y Y
 LFT DFLK AVGVELK S K Y $V$ MLUG D N PLA LI R RLQPRSAARF RFETAYRPEEMRIDWPYVEGLR PL S A L L K QV Q P T S K A K Y I R F E T L V D R K D L P I N WP Y V E G L R
 $P L A D L L S Q A E P T S$ QARYVRFETLVDAERMVIDWPYVEGLR
 $R \square A G L L S A A G V H A G A D A V L Q T S E D \quad G W T C G T P$ KVT DLMNLIEVEPEAAHVMEHCY GDYTTNDA P T RELLARAGLDTDPRD PDLQVLSTSTD ATRDLLAACRPRDEADFVVLHSYD $W V R D V V A L A Q P K P E A K F V M V H C Y D$ PLHYFLGLVGADTRAKYVAFRCAD P L S A $F$ L Q H V GAD MTAK Y V GFKCA D
 Pr P L A EAGVEDAVHVMFHAMD

PAEEI AKLAKVKPEAKYVLLHAEQQGWTANMP AVPDLMQHIQLKPGATHVLIHSY GGYTTNLA S L S E FVVNLCQPLDPSAKY I QFFT LVDRK QMPYDWPYSEGGLR $R V S D L I K D A G P D P R A N T V D F H A T D \quad G Y T T S F P$ $P L S A L L D K V E P L G D A K Y V A F E T V V R P E E M P G Q S G Y F Q S Q P$

 $P$ LK T F L E RVGADMRAA FVAFRCAD R Y Y S S L D


GTYTESLS SLADLLA ESDPDPAADQLVSRSAD GWTA GTP
 A RVEPLGSAKFVAFETLVRPSEMPGQWPYREGL R STRDLLDHAMPKPEALLCVMLLTSYD
R L S H L L D LA G VQQ DGAGAVRFTC F D
PLTTVIHELGGGVVPGSRFLTATGADSLPDVAVYS ESTLT PLAALLRRVQPTGEARYVKFTADNDPQHLPGQWPYVEGLR PLAELLKRAEPTGNARYVRFESRLAPEQMADDWPYVEGLR PMA R L V M M A Q P K P EA K Y I R L E T F M D P D DAP GQRQ S WY P WP $P L Q A L L A K V R P K A T A R F V R F T G T L R P E E M V N Q W P Y \square E G L R$ $R F R D L F R L L K V K P D A K Y V M V H A D$

P D Y E T NVP ATRALLDACQPREQARYVVLHCYD GYTTNLS
 PAARVLEEAGVKPEARFVLVHAD PDYTTNLD $P$ LA E L L K R VEPT GNAK YV E FVS LIH DPAQMP GQWPYRE GL R $P \bigvee R V V A E A L G G G V V P G A G Y L T G T G G E K L P E G D P L S I I V V$ KTKEI A K RVVMPLE EAR FVI L H A E E ALPALLRRAGVRAGADQLVGRSED
$\mathrm{G} \mathrm{WT} T \mathrm{NV} \mathrm{P}$ P L A P L L K E A G I Q E D G DE V I F F G H DV G E E ER M R QN FA R S M S PLSKLLERFD PKAE GKYVEFKTLYRRSEMRDDWPYREGLR RLLDI A ALVQP KETAT HLMCYGYDT YT T NVN
 LF K DV MRLVVKVKP EARFVMVHAEE GWTTNVP PMKLLVKDVEPKSNAKFVRFTSFYDPKDTPYPWPYTESLR
 P MK LL MA DV E P K S NAKFVRFTSFYDPFSQFYPWPYTEGLR $P$ LK TFLE YI GADTTARFVGFKCAD R Y Y S S L D SLDTLLADVETTGEFVLARS $P L A D L V K$ LAQPKA GAKYLRMETFEDREMAHGQRS GYTS $\mathrm{S}_{\mathrm{L}}^{\mathrm{L}} \mathrm{L}_{\mathrm{P}}^{\mathrm{D}}$ $S T H$ T $N$ LA HLLDDKVQVK DSARYLVFHCADTLRAGP YYESSID
 S MLDLAALVQPHEDATHILCHGYDT DVMPLLEQAGAPDECCVMLRAADDFYEEFPREA SLLKEI I ENSGPKREARWVMFWSAD PFAGFLRRIGADTTAKYVGFRCAD
 ATRDLLDRVMPRSEASFVMLTSYD GYTTNLP ATRDLLDDVVMPKMEATHVMLHSYD GYTTNLA PMRLLLMADVEPTSAAKFVRFTSFYDPTKGPGFWATNYPWP STQELARLTYPKESAKYVILDHEE NWT TNLP $R$ L G D L R EA GVQS GATHLWSDGADS GFGGTHVPYFR K D L P $P V$ S T L L NEAGVQQE GATTVVIFYSAD

 A MK A LV D Y A R P L G S A K Y V T M Q T F M D P K Q S WY P WP Y VE G L T

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


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| $\begin{aligned} & \mathrm{L} \mid \mathrm{A} \\ & \mathrm{Y} \mathrm{~V} \\ & \mathrm{I} \mathrm{D} \\ & \mathrm{Y} \mathrm{~V} \end{aligned}$ |
| :---: |
|  |  |
|  |  |

170
180
190
200
LAELLLIRPDS|LLATHYAGEPLITPVHGWP|L|R|LIAGRYFW YVEALRDDEDALLAVGLYGRVLPGQNGAPLRGVVPWKYGF


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LS ALTR
$L I D A F H P$
$M A T A L H P$
$M E T A Q H P Q S$

8 2 E7B08 MDEAMHPDT VK DLLRD MDEAMHPLT $\begin{array}{llllll}L & D & E & A & M & N\end{array}$

$\qquad$
 $A 1 L A V G M Y G R V L$
$V L L A T S W E G Q P$
$V$
$V L F A W A F D G E A$ 1 EDFAR AFMAVGMYGRTLPADHGGPLRVVTPHKYAY ADAAMLAVAMNGRPLPDDHGFPVRTIVPGLYGY
 RDAFFAFQLFGEPLPAEHGGPLRLVVPHLYAW MASALHP
$M P T A M H P$
$M E D F V R E E N$
 MATALHPQTE L

 FLWGNQ
LFAYKHNG GK E
 YVEGLT LA EDAFLVT GAYGKPLPKSMGAPLRLATPWKYGF IQDFLHEKT
MATALHP
LAEATNEL


AS MVF F G AATAMDRDA
FEDFVR
FEDFWR
LS D F A AEDA L A VGLYGETLPNQNGAPLRLVVPWKYGF LEQARRD DVLVATSWEGLDPLTRDHGGPMREVVPNLYFW

 YDEAMH LDEALHPLT L E D D L M G D
 HVLLAFNYNDAPLTDKHGWPLRLLVPHLYFW DILVATHMQGEPIDNDHGGPVRVYVAPMYFY
 RSVPAAAMADALLAWEMNGVPI SLAHGGPLRLIVPGYTGV







 YVEGLTMAELAFIAT GDYGKPLPRQHGAPDRLVVPWKYGF

 L E E ALK 는
-
MATALD B
ATTALDREVQTLLTFTYDGERLPPKYGYPMKLRMPTKLGY



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 LEALLD D IM EATNDL MPSAMHP
LDDF DRDS
EDFARPEN

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240

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KNPKHVLSI EVTNRFPGGYWEDQGYNWF G
KNVKAI TGGI TFLADQPMDYWRVRGYSRY
K SI K Si K H I RFVEDEPPTLWEYGFYSNVNPDVDHPRWSQR K SVKWLRGFEAI DENHPGFWEQNGFHLRG
K SIK Si VRIS FVRDQPATTWEYGFYANVNPKVSHPR WS K SIIK SIVRI GLVEKQPKTTWEYGFYANVNPNVYHPR WS K SAK WVKRI ELLA GDRKGYWEVRGYNNHADPWLEER KGAKWVDGI EFLTEPQRGYWERRGYSQTANPWEEQR K S I K S I VRI SLVRDEPVNTWEYGFYANVNPQVDHPR WS
 KSAKWI NGLEFLKKEELGFWERNGYHHRGEPWAEER VGAKWLTRMTVTRYDAASYWTDRDWATDGRVRTQARDDTP K SAKWLKAIEFLDKDAPGYWEDRGYHNRGDPWAEQR KSAKWVSALEFMAEDKPGYWEERGYHMRADVWAEER KNPKHLTGI TVTDSFTSGYWEDHGYNWFA
K NPKHIVEVFVANDYPGGYWEDQGYNWF S
K SAKWI NGLEFLEKEDLGFWERNGYHQRGEPFAEERYSY KGAKWVSGVEFLTEPERGYWEKRGYSNTANPWNEER K NPKHVQVI ETTNHFPGGYWEDQGYNWF G
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K SAK WVRGI EFLEQDKPGFWEKNGYHMYGDPWKSQRFAWD
KSAKWI SGLEFLDHDQPGFWERNGYHMRGPFKDERYSD
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K GI K SI VKi T LTD K QP P STWEYGFYANVNPEVDHPR WS K SAKYVESIELVEHDTPGFWEFRGYHMRGDPWDER K S DK S I T R I SL V A ERPKTFWEQLGWANVNPMVPHPR WS K SAK WLRRI EFVAEEQDGFWEKNGYHHYGDPWKEERYSWS KNAKHIVSI SVTNDYPGGYWEDQGYNWFS
K S DK SIV VII SFTDRQPSTFWEYGFWANVNPDVDHPRWSQK K SLK K W S Gi Elt E EVVP G Y WE E R GY SV
VSAK WL V DLE L T T F DYDPYWDERDWALPAPVHTASRDDTP RNVKFV HRIIVM
K SAKWI NGLEFLPEEKLGFWELNGYHRRGEPWSEER
KS S IK SIVRVSLVERQPPTSWEYGFYSNVNPAVDHPR
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$K$ S I K S V Virl Tht A SQPQTTWEYGEYANVNPAVPHPR WS

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K SAK WVRGLEISDVDEPGFWETYGYHSYGDPWDEQR $K$ S $\square K$ SIVRFTFTDERPVSFWEQGFWANVNPEVSHPR WS KSAKWLNRIEFLGKDQAGFWEKNGYHMRGDPWSEER KHAKYVRRI EAVADYRGGYWEDAGYEWYA
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G H
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#   <br> $R P D V D P S R \square P P G Q H H E R G F P G G F$ <br> PPGQY $\square$ TADFP TED <br> PPGQYPTESFP <br> PPGQYLT T DFPILSAG NRETEQPELPPGQRLQRG <br> PPGQYLEQGFP <br> T K K <br> QPESREEEPPALPPGQR $\square Q R G$ <br> TEK <br> RRDDLRHREQAPMGAHAPVPELTPLITAAGEK  

REPTPQQYASSYNNYYEF

D F
P D A G L P P G QY D A G D D ERFPSHYDQNRDV
GARKTLLRPLNRQNYPQRMDSKEHRVNGK
H G T G D
PADDRLPPGQYDVGNS
$R \square A G L V E D F Q G S A D R \square P P G Q S V V K Q G$

VPRRGLLRRDDSR QDYPARMDSAQHRDNGKP

S P GFRGRAHPLSDRLPPGQYPTESFP
DQRTSSNGF
RFTGSRPL PPGEGNDAFPVTS W
MANDG $\square R T \square D F V P G S R Q S A P F T T D E P M T P F E A V T G Y N N$ $\square$ SPYFWHNGKY

D F

VT A A R R
$P$ LT A S P SA Y K VD E K LTT P K E A VT T Y N N LN RLAPQQKYSEQYFWPNGK HWRDE

T H T
D पS D DEDAFVA पNHP

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



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Alvithaglis ${ }^{130}$ GGAFVSVw ${ }^{140}$
150
CDGGYTTNLLIP
SLADVLRHVGVLDRARFVRF
SLDTLFESVDTDAEFALVVF GSYGGYTTNTP LLRDL VRAGAATEADHVRDHSVD SFDDLLSAAGIDAPTPFLLAEGYD SVDELKKDVDPRSEWVTVRWVLFYSADG DLEKFLLSKGWDPKEKPVWVLFY PVDAFLE GVDPDGTYVLV
SVDTLLD I AGVGADAAFALARSH TFDDLLKAVGLEEPPEAYVMAHCD PARTVLELLAPAPDATHVMVWAEY LVDDILADAGVEPPTGFTLAHAFD PFRELMKLVNLKPNVRYVRIYGYLNGD RTQTILDLAPPAPDVTHVMVWAEY $R V G D L L A A A D V R D G A F V R F V S V$ ALRELLQLVNIKEDVKYIKIYGYYNGDRFG PLTTLLEHAVPESGATRLVTRAVD PAAELVALAPPAPEATHVMVWAEY SVDVLLEGVDTSASHVMA KVTDFMKLI AVDPQAADVVQYSY YVHFTSYYDPAVTPGPSLGFARD伿 RVRDLLLLAKPDNNAKYVIFKS PLASLLKLVEPKASAKFVAFETFNKPQQAPWPWP PLAALLFEAGLQ AKFASHVEMHAADG PAKKPSADAKYVRLQTFFDKGMAPGQRQFFASVP
HMSELDEKVKPKPEAKYVAFSSADSYYVSYTHTGELLRDRV PLASLAEHVRPLPQAKYICFLTMQDNGRDE PLRHLLEQARPYGAYALVW
SLDTLFEQVDTSSKFTMAHS
SFQSIINYLKPDPDWKFLIDQTGDD
a DDTLLRDVPTTASHVLA
PARAVVDLAPPAPEARWLFASAAY
SADDLVTLAPPSPEATHVMVWGEY
STSTLLALAPPAPEVTHVM
STQELAARLT DGP GVTHLLVHSADG
PLDAFLAEAGPRSTATHAVAYSH
SLNTLIKDTKPFYSAKYINFYCYGN
PLGALDVRPPARYICFMTMQDNSTDEPSAYTESIP PLGALVDLVRPLPQARYICFMTMQDNSTDEPSAHFYEVFD
 P ПEAFLENVD
 LLEDVIEACGGLKDGMVTVQRSTADGFMNGDY RLGDLLDSAGVEEAARWVTIRSV RLRDVVALAPPEDGAVHALLAAR PLSDLLARFEPKSEGRYVEFKThHRRGEMRDD SMQTLLELVRPKPDAKWVVFYSLGDGSDG RTENLLACKPDPDAKYVFHTLDEKWEKPEGGRYYAHP RIATLAGLARPLPEARYVVFHAGRTRSRPGGLGYYYEVID PVTDLLAAAGADEDAAYAVDHAVDGYWNTVTREADERS RMADLLALVQPDPEARWVVFYSFADG AEPGHGRYYDCHR KLRDVLELLGPRPENNYVMIESHGLAQVMYDNRPFYAVIP
 SWSGVSLDT LLAEVDTAADFALVDSY
PGKALLEHAGMMPKARWVNFYSYD VLADLISAVGGSPESD VRMTSEPPGPYSRTTAD RLRDLAALAGDP HPASASVTSLERGPFAQATLN PMRHLLDLVKPTADARYAVFYS LADGGDGGRYYDVHS RMPDVMRIVRPMSSARWVVFRSMADGSE PGGGRYYDCHK PLADLDKHADPETGATRLVTKAVD

RLIADLARLAGVPAPRSARVS SVERAGAF $R F A D F Y E Q V V V P A P D D G A E F V V F R G Q D G$ RLRDLLELLGPRPE GANYVLTDSYGLAQKMYDNCSSLP LLADVMEYLDTDPNKYTGHFLKGLSFGTDKGQYDSTLS Lich ADLLDMAGPLPGATDVVYTSFQNMDAGYEGGTYYTSTP VLADLVATVGGSPDDD
 RALDVIALAPPAPEVASVLVEAEYAYRVMEMGGGYA LLREVLALLAPPHPD MLSDI EACGGLDEGVTGVRVTGWDDWECANDAWPASNYD SMRT LDVVKPRPEAKWVIFYSFGEGSDGGI YYDAQP RVVDLLERSGAPADAR VRVVSLQLRGGYRVSELG QLAELARLAGVPAPDSARVS SLERSGAFAGATLQ $R L R D L A V L A G C P A D S P P G V F V E S L Q R G G$
$R L R D A A L V G H D P P D$ RLRDLAALVGHDDPPD VFVESRQRRGAFRHAALR VLADLLAAAGAGLDRE LRMVSLEPPGPYSRTVLP PLAELARLAGMPSPR SARVTSLE rLadLarHagap garqVLVESLQ RLRDLAALVGYEADMAPDVLV YRQUVVAEARPLIAQAEFVVLRGED YRQRVEPAVRPGATDTHVVFAGLD RLADLARLAGADPED VVLHVS



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K S AK WVR S $\ E$ LLCDSEKLGF WER $\square G Y H R Y G D P W R E Q R$
ANDK WLASVEVMRSEAIDYAERKGWPRRPSRMAPSRDDVP
K S AK WV K GL R F TAKDEAGFWELRGYHMYGDPWREQR K SAKWVRGFTFTPNEQPGFWEQNGYHRRGDPWREQR K S $\square \mathrm{K} W \mathrm{~W}$ YK $\quad$ D FADQDVLGYWEQRGY
KSAKWVRGITLQAHDDPGFWEQNGYHTHGDPWTEER K S A K WV NGMRLTRTDEAGFWEQLGYHAYGDPWREQRV KSAKWVRGDRRTHEDDPGFWESAGYHNYGDPWREQR $K$ SAK WV SGLLTLLAEDQQGFWERNGYHDHGDPWREQR
KSAKWVRRLRTMAEDDRGFWESRGYHSYGDPWKEQRYD K GPK WVRGI EYMTADRRGFWEERGYHNDGDPWSEQRYSYQ KSAKWLNGLQFTSRDEPGFWELRGYHDYGDPWREQR K GSKWASGI EFMTENNPGYWEVRGYHMNGPFKEERFADRN K GPK WVRGI EYMRADRRGFWEERGYHNLGDPWREQRYSYQ Q WVK WL ERVEVRRRSDPAQW
KGSKWV SGI RFMKDDEEGFWEELGYSMTA
TGAKWI TELELADDTHVDYWWKRGW
K SVK WL RAI EYLT GDRRGFWEERGYHNDADPWSEQRYSYQ K SAK AV SGL RLLDRDEPGFWESVGYHMYG
KSGKWI NGLEFLEHEQPGFWE RGYHNRGEPWSEER
KGAKSIVKI EFVAEQPATYWEYKFEANVEPDVPHPRWSQK ESVKWLREIELTDDYKEG
K S GK Si VKTSPRRLEYRQPEEYGFVANVEPDVPHPRWSQR $\square N V K W I E E L H A T N D P V E G F Y E E R G W N G H A$
K SVK SI NRI TF TAERPKTFWEYGFWANVNPAVPHPR WS K S AK Wi A GLRLLDHDEPGFWEQNGYHARGNPWEEQR KNDKYi TGI EFTDDRKRNYWADFGYSVDGPGDDHP LDFN KMAKWINQI EFIDDYSG
K S VK Y FA AVEVLTEHVPGYWEMRGYSLNADPWRDERFDFG K SAKWVHGLELIPRDVPGFWESNGYHLLHGDPWREER KGCKFLCGLKFSKENEKGFWESRGSHDRG
K SAK WL RRLT LAHHDQPGFWETFGYHDYGDPWREQR KGPKWLMAFEYLASPRRGFWEERGYHFNGDVWREER K S VK WL RMVEYMTADRRGFWEERGYHNRADPWDEQR K GPKWVRGVEYMVADRRGFWEERGYHNDGDPWREQRYSYQ


K MAK WIN QUEFVDDY
K GPKWVRGVEYMTADRRGFWEERGYHNDGDPWREQRYSY K S AK WVRGLDLT THDEPGFWESGGYHNYGDPWREQR VWVK WL A LI DVRAEPDPA
SWTK Y L T Q D F DGEERPDKWNDW YTGFPPE
QWVK WI ET I E VRRRRDPA QW
K GPKWUAEISFHHTPQQGYWESHGYHPRGRQDLEERW
R
K Q VK WDA G I E F VA D F F E
K MAKYVCGVELVEDFSH $\quad$ GKGQGGWRD
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VNVK WI S E I E LTENRQA GYWDER GWD GT GEVE T
K QV K WI EAVEFVVADFRG $\quad$ GWGRGGYN
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K S AK WV H GMRLLLEDEPGFWERDGYHDYGDPWREQR
K S M K Y L E K I VV TEN Y D P G D D G WA WY N
LQTKWLTRI EVV
HCTK WV R S I A FRSAP
K MVK WI A All E FVVHDFAD GYNEDHGYRD
K QVK WI E S I E FVVDS F D G G Y NEDHEY
T GAK WL GELE LLADDS HVDYWWKR GW
R HVVK W L K G I E F V A H Y S E
K L V K Wi K Gil E FVVEHFS E
HNTKWVGAI DFRA
K NVK HI G GI E FWRDRGYRFYPSLMDHPRARV
K HVVKWVRSI RW $\square$ G D Y A D
K GVVKCSELHFTTEFNSGFWETKGY
R S L K WL ER I EVVNRYR G GFFEDT D F
LQ T K WLSS R E V
K MVK W\E R 】E F \IE S E K Q
K GPKWVRGWNYLGAEDTGFWEQRGYHRRGHAWQEQRYDY WQT K WV GRIEVL
K GPKWIVELTYHRHPQQGWWESHGYHPRARVAHEERW
PNCKFI KTIDFTNEE
K M VK WI K GI E FVVEHFSEVGGGQGGYNN
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HNTKWVAAI DFRTAAH
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L NTKWVARMTFGETR
L Q T K WL S R I E V I P
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NHSAL

E E P


E E P

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Q A

DAAPS $\quad \mathrm{DVT}$ TDDSS $\square$ T DHDD A E ALDRPVTPDLTWATGPGLL

PGELPPGQRPGPHEP

VT RKP $\square$ PRGTDRKDLVNVNPAEVDASS LE DTK $\quad$ EE

P N D F
AMEPFRK $\square T \square$ NKFKPRNAQPYTEKD $\square$ S PYHWTNGR
T K K GF S F Q GPADGVHK S W $\square$ T P E D D

lupas_21
lupas_14
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conf
sol25
sol5
sol0
jhmm
jpssm



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 AVPDLLRAAGVPEG RAVRLVSLERGSLWSVS

 $R L R D L A A D A G Y G D G A G P P P A V L V E S L Q V S G \quad P F R S V A L R$



 RLRDLLDAALIPVD

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


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210

HNTKWVGRLT FGNFEETA RQVKHIKSIDFTQDE LQTKWLDRIEVL RWVK WI REIVVV LQTK WVARLEAL MNTKWVARMTFGD
KNVK QVCAlDFLRSYDPG LQTKWVTRVVVS QWVKYVYRIT
 LQTK WV HRVVML
RNTKWVARLTF
NNTKWVRRLTFRA
K MVK Y I R SLE WMA DYST K MIK K L R S A E WUA DYRT



240
230
lupas_21
lupas_14
lupas_28
jnet conf sol25 sol5
sol0
jhmm
jpssm

```
lupas 21
lupas_14
lupas_28
jnet
conf
conf
```

sol5
sol0
j̣hmm
jpssm


[^0]:    

[^1]:    LDEALNSLS

[^2]:    

