QUERY
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 AALNDEFAALEKQYGGRLGVYALDTGTGRTIAYRADER LADADASLEKRSGGRLGVAVLDTGTGQRFGHRADER DSSSIVQKLARLEAD DGGRLGVSLVDTVHGRQWGYRADER S SLHKQLAELENSTKGRLGVTLINTVNGQEDQYRGDER ERLQQLERDSGGRLGVAVLDTGDGRRFGLREDER

## D R E P S K

$\begin{array}{lllll}S & R & L & A & K \\ \text { L } & \text { L }\end{array}$

K N
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$\qquad$
$R K L$
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D P A S S T GEEFK K L | $H$ |  |  |
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N Q A
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S E K Q RAFAQL DRLRAL
 A QLLA A L
TEAPQPDFAP L E
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D P A E A D S A F T Q
S E G L
A D R F A R
L R A QWA
D T LT Q Q V A R L

EAAATDPL

| $L$ | $F$ | $E$ | $N$ | $L$ |
| :---: | :---: | :---: | :---: | :---: |
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|  | $F$ | $R$ | $S$ | $L$ |

LS QLT A A A QQEEKT DNARR GVYAL DTGTGRSVGYQAD DR
 A ID S DL K KL E K E YEA T L GVVYAIDDTETNKT DNYNGEQR
 D P A PLATVAKA I E S RLLNTRI GVAVFDPAS GLNWNYN GD DR A E V T E R $\quad$ I A DLA D R F A ELERRYDARLGVYVPATGTTAAI EYRADER MDTDTNQTVTYQSDER
D A F G A I E R SVA GRDGVWA Y D LDE T GRSL GHRQDER
S DLA A I E HRLGGGRLGGVA YSAE RALLLRHRADER LT S LL N RYES DSDLLRIGLCAD VNGEARL SHRAE EV LA A TII D R IDE Q E LDDARVVGVVIDRDSGSDWTV SHRAE E R M A E R L R A L E E A Y H G R I G L A A F D T G S GR SV T Y RA H ER QVE Q DVVK A I EVSVLSAR GV SVLDDTQNGEYWDYN GNQR Q E A L R A I E K KVVDARI GV TVLDTA DGSRFSYRGRER
 RAFAS L ERRYDARLGITAVDTGSGRTLVHRAGER
$\qquad$ A V L A DL

GLETYERESGGRIGVYAENLATGAK $\square$ GWRAEAR ERLAALEKRSGGRLGVA LLDTRTGLKATHRADER Q T


## $T \stackrel{\square}{F}$

VEDI SAll
QRDS GR
$T N L V A$
D A L V A
M D S A F A R L LD T A L S G L E S A H GL T L G G V

DARLGGVYALDTAS
$\begin{array}{ccccccc}M & Y & A & V & D & T & A \\ D & T & A & T \\ G & Y & A & L & D & T & G\end{array}$
DARLGGARASTA
A RVE GLLRAALELTHDARLGAFAYDTGTGRTVAYRADER A AEDHFAA LE RKYDARLGVYYMATGTSVA』AYHADDP MNEA LRAALEQSNAVTVGVTARVHGSRHAFRYRGNELD VTEDTIQSTE DH DK GRVGGFTEI DF LLS GKVLSHRREE R
DTIRADLAADEARSGGRLGVALVDQDGRQVAGHRADER

 AL H TVVTS GLVVGVA GVAAQDMT T GA QI FL NGDEP K T D L L R N KI E QI LS DKNAVVGVSII GNNGKDTLSLLHGDRR
 Q N SVLK K QI Q Q I K D K N A TVVAVSV HDFENNKTMHINGNKK S QL K T L L E QAI K G K K A EII GI A V D DD GK DTV T V N N D DQ S PLED KVN

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UniRef90-W9GWJ4
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UniRef90_M7XV87 UniRef90_UPIO00476410A UniRef90_A6DXF2 UniRef90-M3BGD5
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80 FPMCSTFKALAAAAVLAQVDAGKESLDRRITYTKDDLVDY F PMCSTFKKGLLAGAVLKRVDEGRERLDRRMDPVTKADMVPY
FPMCSTFKFLAAAAVLRRVDEGRERLARRIVYRKQDLVPY
FPFCSTFKLI LVAAVLHKSMSQSELLAKHI HYRESDLLSY

FPFCSTFKMVLASAVLAKSVQEPGLMEQRMQYAQSDLVSY
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 FPDNSTFKAFLCAALLEKGEQGEVQPDRRVKDRKEDLVSY
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 F P L T S T F K TI A C A K L L Y D A E Q G K V N P P N S T V E I K K A D L V T Y FPMSSTEKALACGSLLALVDDKQESLQRKVKIMPDDVVTY FAMCSTFKTVAAARVLQMAERGELLSLTDPVVVDPAAIVRH FAFASTVVKVF DA A AVLDGSS DADLLATVVHYDRGDLLE Y FAMCSTFKVYAAAAILRLESQGSLRRLDDTVVPVDPADIV E N F VMCSTFKASLAACVLARVDRGEEQLSAMIPYSKADLLEY FAMCSTFKALAAAAVLARADAGKEDLNRRISYGREKLI FW FAMCSTEKGYAAGRILQQVGRGQLSLDKRVFVDPGAVVAN FPMASTSSKALICSALLAR G GPGAMKTAWLIKEEAVQS Y
 FPMMSTEKTLACAKMLSESTNGNLDPSTSSLIGAEELI PW FALCSTFKALADAFTLARVDRGEEKLDRRVFFGKKDLVMP

 FAYCSTFKALAFGAVLDRTPDDELDDRTVTFSEADLVFH FP M C S L F K T L A AVA R L L R D HA Y D D GF WQRRI S F R K N Q I V R D
 FAFASTFKALLDAGVVLSGNS LEEMERVVTFDESDVLVPH F A MCS TSSKFMAAS A L L K ESEVVKKN L LT QHV ALLKK S DLV N Y FPMASLFKTDAVAAVLRDLDRDGEVLARRVHYTAQYVSGY FAFASTYQTLAAAAVLRQRPLSYV DTVVRYVPEDVNSF
 FALCSTFKLPLAAMVLVEAAEGRWAMGDALPVTDADMVAY YPMMSVFKFHQALAVADACGRRGVSFDTLVYIRPDDDRPY

 L P M Q S V F K F H I A A A A V L



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UniRef90_M7XV87 UniRef90_UPI000476410A UniRef90_A6DXF2 UniRef90-M3BGD5 UniRef90-Q03170 UniRef90_UPI0004699AA8 UniRef90_IORWY1 UniRef90-A0A022LPF9 UniRef90-A0A059MVZ9 UniRef90_J313P1 UniRef90_Q11G68 UniRef90-X5KT70 UniRef90-UPI00041A9709 UniRef90_UPI000475F909 UniRef90_Q6RSM8 UniRef90_Q9RA17 UniRef90_Q0BSY1
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NPTAEKHVNGTMTLAELSAAALQYSDNTAMNKLIAQLGGP SPVTEKHVGTGMTLAELCEAAITYSDNTAANLLLDEIGGP
 SPTTGKHTGGGLSMAQLCEAATVGSDNTAANLLMLASMGGP SPVSERHVGQGMSVAELCEAAI TVSDNGAANLLLASLGGP


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 SPVTEKHVDTGMSLGALCDAAVRYSDNTAANLLEDELGGP

 SPETEK HVGGGEMSVGDLCKAAITGLSDNTAANLILESSLGGP


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A F K
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A
A APDTGKYVDTGMTVAELSAAAVQYSDNAAANLLLKELGGP
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 SPVVEEHLESGMSLLELCDATVRFSDNAAANLLLEELGGP NPITEKHLNEGMTVGELAAAALQYSDNTAMNKLIEHLGGP SPVTREHDETGLTVRELCDAAVRFGDGTAAGLLMRDVGGP SPGTSQHDADGMTVSELCNAAITTSDNTAANLLLSTMGGP APYVEKSPPEPVTVEGAAAAAVSLSDNAAANLLLDRLDGP





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UniRef90_UPI000475A6B6 UniRef90-I3ZLG6 UniRef90-D9WC41 UniRef90-K9B0H7 UniRef90_UPI00037A6602 UniRef90 FOBKK8 UniRef90_UPIO00348E3EA UniRef90-H9BW95 UniRef90-Q0G4Z1 UniRef90_G4HIM8 UniRef90-L1L8R3 UniRef90-UPI00046446FB UniRef90_B6JGD8 UniRef90_K8ENU7 UniRef90_UPI000472A02E UniRef90_B9R2E6 UniRef90-P62593 UniRef90_UPI0004632B1B UniRef90-P0A517 UniRef90-R8E0T4 UniRef90-IOHQQ0 UniRef90-M7XV87 UniRef90_UPI000476410A UniRef90_A6DXF2 UniRef90-M3BGD5 UniRef90-Q03170 UniRef90_UPI0004699AA8 UniRef90-IORWY1 UniRef90_A0A022LPF9 UniRef90-A0A059MVZ9 UniRef90_J313P1 UniRef90_Q11G68 UniRef90-X5KT70 UniRef90-UPI00041A9709 UniRef90_UPI000475F909 UniRef90_Q6RSM8 UniRef90_Q9RA17 UniRef90_Q0BSY1 UniRef90_E7DK52 UniRef90_UPI000378E193 UniRef90-E5XRK8 UniRef90_UPIO00477A9AF UniRef90-B8HGJ3 UniRef90-W7J1S7 UniRef90_R4T4Q4 UniRef90_UPI000477ACD7 UniRef90-D7PIH6 UniRef90_UPIO003C77446 UniRef90_UPI0004648033 UniRef90-UPIO003B77BF3 UniRef90-B1Q1F1 UniRef90_UPIO0047607C8 UniRef90_R5NKQ1 UniRef90-UPIO003FB1EEE UniRef90-F3L4D6 UniRef90_UPIO0028A13C2 UniRef90_Q8VT49 UniRef90_C6X4P0 UniRef90-R6RUE9 UniRef90_N9EC93
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GGVTAFARA130 130
150
160 (TNTATPGDRDTTTPRA A GLLTAFLRS GDDVTRLDRWEPELNEALPGDPRDTTTPAA
 EVVNHFTQGIDDPAFRLDRCEPDLNSAIPGDDRDTTTPAA

 AGLTRFFRSI GDPVSRLDRWEPDLNSARPGDLRDTTTPEA S GVTEFARSLGDSMTRLDRWETELNEADPGDPRDTTTPAA
 Q GLT DYLRGI GDTITRLDRTEPALNEGQAGDSRDTTTPAA RGLQDALRGI GDDVTRCDRYEVALSDATPGDLRDTSTPRAA A ALQGADRGI GDTVDHVDRTEPELNRTSPGDLRDTSTARA
 K GLDATLEKMGDDVDQMERREPELSRWVPGSTRDTSTPRA GELTAFTRGLGDTVTRMDRDEPLITEATPGDPRDTTTPRA $K G F E K A L R Q U G D Q V T H A D R Y E T E L N E A T P G D \square R D T S T P Q A$

 GKVTAFAQKTGDRDFRLDRREPELNSAAPGDPRDTTTPDA RGLQTELRSVGDRVTRCDRYEVELSDAVPGDPRDTSTARA A GVTRFCRSL GDRVTRLDRWETELNDDAPGDPRDTTTPRA AGMTEYARSLGDAMTRLDRDETELNESTPGDPRDTTTPAA QGLAAALA GTGDTTTKVERREPELNQWSPGATQDTTTPRA A AVTAYARSIGDTTFRLDRLETELNSADPGDPRDTTTPEA
 GK TITYAQSLGDTVTRLD KALEREVRRVGDVTRMERDEALNSLAGDPRDTSPDA A ALDERLNDLGDTGTTVSRTEPGLNEAKPGDPRDTTTPRA A GLTA QLRDFGDATSRLDRTEPDLNEAVPGDPRDTTTPDA PGVTAFLRSTGDAKTRSDRYEPEMNGFAPGEPRDTTTPAA PALTAFARGLGDDVTRLDRNETELNEALDPGDRDTTTPRA QQVTQR VRTLDDKVTRRLDRYEPELNQATPGOKRDTTSPHA DGFEAALRQI GDTVIQADRYETELNEAVPGDDRDTSTARA DGLERVLERLGDDVTEMDRYEPDMSDGIPGDDRDTSTPRA QGVNAFLRANGDKTTRLDRVEPALNEARPGDERDTTTPQA
 QQVTRYARTLGDQVTRLDRFEPQLNEADPGDCRDTSTPKA NGVTTYMRSIGDDVTRLDRNEPSLNEGTPGDPRDTTTPVA KELTAFLHNMGDHVTRLDRWEPELNEADPNDERDTTMPAA A GLTAFLRTLGDRVSRSDRWETALNDWRPGEKRDTTAPRP AAFTGYLRSLGDTVSRDDAEEPELNRDPPGDERDTTTPHA SEFKKSLREVGDTVTNPERFEPELNEVPPGDVRDTSTPKA A GLT A WVRTL GDRTTRLDRREPDLNEARPGDERDTTTPQA A GQTAWLRGLGDPVTRLDRTEPTLNEADPGDSRDTTTPEA

 $K$ GV T D F L R Q QAITAFARSI GDERTRLDRWE IALNSAEPGDPRDTSTPEA DAVERWDRGI GDRTTSVDRVEPDLNQATPGDRRDTTTPER TAVTAFARSLGDTATTLDRWEPELNSAEPGDVRDTSTASG PALTAFWRSLDDTISRLDHNEPELNRSPPGAPHDTTTPAA
 AGITAFARSI GDDRTRLDRWET QAVTSFLRT


## QGVTAFLREI GDEESQLDR DEP

 A GLLTAFLRS: GDQTTRVEL C SA 1 PGDARDTSSPRA PAVTSFFRSLGDTVTRRLDRVEPDLNVAAPGDERDTTTPTR E ELLERALRGI GDEVTRVDRVAPEMAEAVPGDVRDTSTPRA
 E GLNAVFRGIGBTTSHADR】EPELNDTFPGDLRDTSTPRA EGFGSALEELGDDVTNPVRWEPDLNEAVPGDERDTSTPEA
 E QLTA Y LR SLGDTVSRI DLYEPELGGVAPGDPRGATTPRA Q A V T T F A R S L G A Q R T R R L E GLTH F L R STGESYT RLDRHEPSLNEAKPGDERDTTTPAA Q GF T A WL R GKGDAVTRLDRREPKLNENAIGDLRDTTS PLAA
 S AVN Q Y L G QL GII D GMRVDRSTA DLLRRDFYGDPDDKSTPRA K TVVE Y I KK S GI ND DQI T F NEEDMQS K WENMFQNWTTPKA
 GTVQK F ID SK DVK D F TI K A DEAQMHRGDEFLYWNVT STNS DSVNRYIQS LGGRDCEITHTENDMHEDLDDCYSNWSTPGA

## QUERY

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## 8

180


200
 $M$ V H S M E R L M L G D A L T P A S R

 $M T G N L Q K I L L L G D A L S A A S R R Q I T A W M L A N K T G B R R V R A G M$ MA H TL L A V A L G N A L P E T Q R D T L Q T W L R G C Q T GA K R I R A A V

 MAALLKTLVLDDALSPASRDQLGQWMVANTTGGTKLRAGL $A V A T L Q K L V L G B A L S P S A R D Q Q T G W L L D N Q V G K A T M E R A G L$ LAT DL RAYAL GPALPAEKRALI T D WL KRNTTGDHTI RAGT $M L K N L Q R V V L G D V L Q T V S R Q K L V D W M V A N K T G D A R L R A G V$ MAESLRKFTTGDVLSPDKRAMLNEMLRTA QLTGDLI RA GV
 MAKSLR SLLTLDNALGETQRAQLVEWMKGNTTGDASI RAGL MAKDLLRAFVLGDVLGDGERAQLTKWLRTNTTGDALI RAGV $F G T D Y Q R I L L G D T L A S N K R D F L R D L L Q R N A T G A D R I R A G L$



 LAT DL R TVVL GNALPPEKRAVLTDWLKRNTTGDNVIARAGT


 MA A D L R A FT L G T A L P P E Q R A L L T D TTMRA N L T G G A L I R A GT LATNLK K I AL D DF L P NDKRELLMDWMKGNATGDKLI RA G L



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220
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 QQ GWKV GDKTGS GDYGTTNTVAI I WPPQRAPLLAS IYLTE PA GWDVGDKTGTGDHGTANDVAVIWPPSRKPIVLABYYT Q P H R WVV GDKTGTGDYASANDVGVAWTTRKTPIVLAVLTSK P TN WRI G DKTG G GEYGTTNDVVAVIWPPPSRKPLIVVSVYTE


 $P$ R D WR V A D K T G T G E R GTY Y N D


PK DWQVGDKTGSGSYGGRNDIAVVWPPDSAPIVVAIMSNR P S GWTI A DKT GT GDYGT LDNDIAVVWPPGKP P IVVMAVMS S K
 PKDWGVGDKT GT GEHGT A NDVAI L WP P GRGPILVAVYLTE PK GWEVADKTGAGSYGTRNDIAAIDWPPNKKP\|VLAILSNH



 PADWQVGDKTGTGDYGTANDVGVVWRPNRAPVVVSIYT TH PA GWAV A DKTGTGEYATRNDIAAVVRPPGRAPIVLVVMSDR PEEWIVGDKSGAASYGTRNDIGIVWPPDREPIII AVMSRH PK GWRAADRTGSNGEHTTNNI AVLWPNGGRPLIVAAYITQ PGGWVV GDKTGSGFYGARNDIAVVWRPDAAPDVMAVLTNR
 TRDWKI GDKTGSNGTDTRNDIAALLWPPGRPPLLLTTY LI LI



 PA GWRVGD K T G S G E R G T T N DV G F L L R P A A S P I I V A A Y L T E PTDDLVGDKSGAASYGTRNDIAVLYPPDRKPIVLVIFSNK

 PA GWFI A DKSGAGERGSRGIIAALGGPDKPSRIVVIMTTG PKSWTVGDKTGTA GYGNANDIA IIAYPKSGAPDIIVITTTTR PADWKVDDKTGTGDYGRANDIAVVWSPTGVPYVVAVMSDR PGGWEVADKTGSGSYGTRNDIAIIIWPPNKKPIVLAILSNH PADWRIGDKTGTGAQGTTNDVAVVWAPGRAPLLLAAYLTE P K D WP V G DK TGSSGDNGSFNDVVAILDRPPGRAPVIAAVYMTG PAGARLADKTGSGSYGTAHDVGAVFRADAPPVILAVLTRT PAGWHVADRSGSGNFN RNDVAMVTPPDREPYFIAAIFLS D PA GWLV GDKT GT GERGAANDIAVVVRPPGRAPDVVAVYTTR PAGWNI ADRS GAGGFGARSDTAVVWSEHQAPIIVSI YLA Q PADWQI GDKTGGGGYGTNNDIAIIIWPPGNAPLIVAVYLTK PA GWT TADKTGSGDYASSNDVGVAYGPRGERLLLALMTAG D P S WRVA DKTGTASYGVRNDIAVVTPPGRAPMVLVVMTS Q PA GWTAADKS GAGRYGTVNDAGVLWSPDGSPLVLVLLSDS PAGWK\|GDKTGNNGKDASGD\|AVAWPKSDAPILIAAYTQG PA G WTVGDKTGTGST VASDDAVA WARSGATVVVSAY LEA PA GWTTA DKTGSGDYGSTNDVVGAYGPDGQRLVLADVTRS $P E S W T V A D R T G A A G Y G T R G V V A V M W P P E R A P D V A A D V Y I T E$


 PADWAVGDKTGTGVYGTANDYAVVWPTGRAP
P T GWRTGDKS GS GAQGQVNNVAI TWPPNGAPWLVAVFTAP PSEWKVADKTGT GARGERHDIAAIVWPTGGKAPLAVALLTR PEDWTVGDKTGACGYGTRHDIGVLWPPEGAPV
$P$ P GAELAD KTGAGSYGVVNDAGVVWPEDGPPLTLAVMTRT PA GWDVADKS GS GAQGEVNNVAVVWPPNRAPWVITVVTSP

 PEDWLLADKTGGGGYGSNNNAGVAWPPGRPPVVLAVQTTR PA GWTVVAGAGLGGYGRACDAAVVRPPGGAPLVLTVLTDR T P P F E L A D K T GLLGGY GVVNDAGIVWRPGEAPVTLABMTRT PAGWM』ADKTGAGDHGSRGDVALLGPGGKPSRIVVLYDTN $P Q G W S A G D K T G S C G N A \quad F N D V A V F T T A K G R R Y A L A V Y L D R$
 $P K N T A I A H K T G T V G G V A N D V G Y I T L P N G R V F A B A V F T R G$ PEGTVVAHKTGSSGTAAVNNIGIVFLPNGEHFIISVFVSE





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ASAPMEKCNEVI
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AKVDDAARD
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TELD DAQRNQTLNQVAKLVLEHF REIPMESRNEALAEIGRAV A
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QRQDAQSNDAADAQTARVALAAL ADADFNTRNGAVIELSKAVMQ
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$N D H D G D R T R P F V A R A A K ~ D A D D A$
$V$
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$V$
$S R P D A V N N N A V V R V G Q L V F G E$
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UniRef90-T1Z0T9 UniRef90 K2A6K2 UniRef90_UPI00035D0AD3 QQKGLEQQVEQVLKDKKATVGVAVLANDT, ITALHNNQDH THPLQEQDQQTTANTDAHVGVALT MDGKDT, ETMN GED VKQLERTAGGRLGVCALDAASGRRVEHRADER RAQLVDIEKRSGRLGVALI DPAGAVLLSHRGEER ND: EKLEKKYGANIGMYALNTQNSEALSFNENKR LKSE:HRIAVLTGGTVGLSALHDESGRCFSLNGMER ESLGRAVRAVADSVRATVGVAVV FEEGDTLVVNNACR GLLAEFDRFAALSDGTVGUAAMDLQTGEVQARNGDTL
$E \square \square P \square K N T V Q T L A A A N P N T P G V F L V D L E T G A Y V D V N G A A S$ KTLRALEKSYDGR $G$ G AVGI DL GDGRTVAYRADER IS QLS SEVRKLMSRYNLDPGMFFLDLETGDYLDDNGEKV EI APLKKKLMDLVPKYPLEARAFFVDMDNGNYVDINAQAP E K KLKT QLEDVAAASPDTPALMFLDLNTGGYVGLREQSK EISELQTPIKALMARYRFTPGIFFMDLQTGDYLNINGGKA AI ENALQEYIKGKDAR $\square$ GVAVI I NGKDTASVNGNRD

 ALEEA A GVVREHPGVAGFYVRDLKSGAGYGVRPDQV ETRLIAQFQRFATLTDGTVGПTVRDLASGESLSLNGDTL APLQNALSDDERASGGRLGAHLFCPQTGLALISWRGEER



L H T K L E QLAA A S C P C R WS V VV T D G D G R NV Y S L R P D L I S SLESACA QLEEETSSRMGVSVWDTQSNEWWDYRGNER



TEPLR QK IEADEARSRPKDAVAMRDLGTGLTFDHAADRW
 D R E T M T VQQ F Q E $\square$ A N R A P G S L

A GLVSADNSGSASFSGKKGDAVRAVDDGWTVEVGGRQR DATKTA】EAKLKAVDGVFAVAFKDLQTGKTLFINEKEN LQDFY S GRVLAANA DER
ASAKAE $\square$ AR $\square$ AAFAE GETG VAALHMETGEA GF GEHGR
SWlLMDANS GEVVEHDADQP $G L V S V V R S L G Q S F N G K D G G D A V R R V G S D W T V A W N G N D L D$ Q $\square$ D A R G Y Y L MDAA S GH VV E H N A E Q R MQTLDNELMAVQREFSGRYAVYAEHLGTGETV $\operatorname{SH} G D Q T A A$ GYLLVDA HTGGKTLAALAAD MVR D LE K S LS A I L Q E A K G A WGVVVVKELAN GAYFAHRPD E L $L S$ QKLQELLTQGFNGETGUVVQNLKTGKDAVYNACDT!

E $\square$ PE E LSARWRT IAA A Q K DLQTSAYVI DADTGKVIA SREEER QLKAK LEETLLKGFNGDAGVYVKNIVSNKFVAMNA D D

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


GYLL DDATNGEVVEQNADQP



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 D S A P I Q A A V E A ALLA GHS GS A YVA Y E S V D G S T T F S L G GE ER
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MQ GLG T SFK GKVG I SVVRNMDE GWMV S FN G GRM
$R A V A E A F R A A G V T G R L H A R D D D T G G V V D V G G D E P$
 $K$ VGI G Y Y D I E T G K G F S I N G D K Y

## S Y $\quad \mathrm{L}$ I D A N S G Y VVA K N S N QR


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 FPAAS T I K FP I L VAL FEDDDS GRVKL NE ILVMRRDLMTGG IPPA A S T I K I F V L V A L L E Q I D A G K V R L D E QL TMMTK D I V T S G
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 F S A A S T I K V V P I L V A F F R A V D A G TVV R L D E E V L T M E E S H V A E G
$\frac{\square}{F}$


| $\mathrm{F} P$ |
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| F |
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100


 S P L R D R YPE GNDPI S ELLLTYTLQLSDNNACDILID YIGGT



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

 UniRef90 ${ }^{-}$X4Z6V6 UniRef90_UPI000475D12D UniRef90_A0AC32
UniRef90 F1Z6N3 UniRef90-K9E3G2
UniRef90-X8MOG5 UniRef90-N6VAW1 UniRef90-R5U789 UniRef90_B8XXQ7
UniRef90 $13 N N U 9$ UniRef90-13NNU9
UniRef90 UPIOOO225DF01 UniRef90-K8DVY7 UniReffo-O2LTC4 UniRef90-V5RLB4 UniRet90-UPIO0028911FFE UniRef90 UPIOOO3A110CF UniRef90-J2L9V4 UniRef90-UPI0002898F93 UniRef90-X4Z6V6 UniRef90-UPIO00475D12D UniRef90-A0AC32 UniRef90-EOUHR7 UniRef90-W6SQG1 UniRef90-K9PN19 UniRef90-R9IDW2
UniRef90_K9RHF0 UniRef90_UPIOOO36C5F98 UniRef90-A6CVT7 UniRef90-UPIO0034DEDC2

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UniRef90-E1VGT1 UniRef90-U9W143 UniRef90-K9V5T9 UniRef90-WORL99 UniRef90-WOEV13 UniRef90-BOT712
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 EKVNSYIKSLGLKDFNLAANEDLMHRDVATQYQNWSTPEA EALTAFMRATGDTVTRSDRYEPELTVNPEGDLRDTTTPDA KALTAFCRSLGDELTHLDRVEPELNHDTPDDQRDTTTAAA EETDKY DRTIGCDQFAVTATEDDMHKNLADCYNNWSTPLS SAVTAYARSUGDDTFRLDRWETELNTALPGDLGDTSTPAA KSINEFAKS|GNASFYLENLEPNLNSDPNNDHDSSTPKD EHVKNRLTDLGDTTTHPSRKEPDLNENAAGDPRDTTSPLA EAVTAFMKTLGDRDGDVSRSTGNMLADWRGDKRDTATPDA EVVNRYI AGLGVGETEI AADEETMHRRTDNQYLNWATPLA EGLTRYI RAHGDTVTRLDRTEPSLNENAAGDERDTTSPAA QAVNDWVAALGVHGLRVDSDTAHPNMDFMLDPRDTATPAA PGVTAYARSLGDAVTRLDRLETALLNATPGDDRDTTSPVA EALNQRFRSWGLTNTVIRNQLPD RGLTAFFRAVGDRSSRLDRPEPRLTEWEPGGVRDTTTPAA
 QVLNQKFRSWGLTDTLVRNPLPDD EGTNQTTPRD ANVNQRMRQMGUSDVVIGASEEDMHRDPYGSYUNRTSPGA

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1
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 K K L N Q R F K S W G L K H T T I R N P L P D EKLNQRFLEWGLTETVIRNPLPD DAINEMAGRLRLSRTVLGRRMMD AAVNOMSEARKQGKDNYTCADD AASNQTMSDGGLSTRLQRRMMDFAAAEAGGLLNETTAAD EAVRGYDARRWTQDMSQGRRFYTARDAYGSNPPDGASPVG DYLNAQFGRWGL EFLNQRFQAWQMPQTKDNNYDPD PAVTAFLRASGDT TTRSDRLEPELNSFALDEGRDTTSPAA EESFADLMNQTAKRIGMTHTHY VNATGLPDPSHYTTARD PELINQQFASWGLTMTVLRNPLPD ENLNQRFRGWGLASTSLRNLLPD LKGTNTTSPKD DTVQRCLESLHI HGVDVRRGVEDER AFEHHVNNRVTADG ATVNPLMDQLGLPHTKVNSRTAGREDDWKKYGWGQTTPKE GAVTAWLQGRKVAPDD DRYERQLQQAYゆADPRDTATP $\square$ EQTFATMMNEQASRLGMVNSNFENSTGLPTPNHYTSAHD AGLTAFMRQMGDNVTRLDRWETELNEALPGDARDTTTPAS KNANQSMRALGAKDI QVLRGVED QKAFDKGLSNTTTAYD EAVFAQLMNQNAERLGMTNTHFKNSMG DRDPDHYTTARD EDAFADVMNQTASLLGMNNTHYVNSTGWPAEGHDTTARD A AVQAWLRDTGDDDFDVTLSMREALCVMHESVRDHCTPLA AKVTEFARTDGDKTFRLDRTEPTLNTALPGDKRDTTSPQA ESSFADLMNQQAKRMGMHNSHF VNATGLPHENHYASAQD EAVRGYLARRY五KDTRFGPGERLLQSTTAGDEWRQAAPSS EDAFADLMNQHARRLGM NQSHFMNATGWPAENHFTTARD EEVFAQMMNQYAQKLGMYNTNYTMNSTGLPDPELYTTARD EAVNQTCHDMGLMQTRVMRRDDFSS GLPDPGGLSSPFD EEGFVDDMNQTAAKLGMTNTHFENSTGWPAEGHVYTARD VESFANLMNAHAKRLGMTNSHFTMNPNGPDPELYTTARD KYiNQWLQTNGFTQTRDNSRTEGREKDRALYGWGQTTPRE ETVFAQMMNREAARLGLS GSHFTNSTGLPDPNLYMTTAD EAAFADMMNQHAVQLGMNNSHF MNATGLPAEEHYSSAKD QTINQRFDDLGLRATEVNNWLPD
 ESTFADYMNQYGREI GLENSHFVDASGWPH ENHYMSAHD ESAFADLMNQHAQLLGMTNSHF VNATGFPAEDHYSSAHD EPFNAYYQAQGWRETHTAGMEDRPDPKREKGDFSRTSARD DNVNKMLDAQGLHKTRLRRHMMDLAAAKAGNENVSTPHE KKVKQRLKELGDKVTNPVRYEDELNYYSPKSKKDTSTPAA HEVTKFARTLGDNSFRLDRKEPELNNVIPGDERDTSTPRA EDVFADVMNQTAVSLGMTNTQFKNSTGLPQEGHYTTAKD SNFYLFLRLAGARTD VPAGPGKGNVTCARD KVVTEYLRELGVNDIVVANTDKEDGQDKSVQYRNWTTPEG ENAFTDIMNQQAQNLGMVNSHFTDSTG LPDDANLTTAKD EDAFVDRMNQKAAELGMVNTHFENSSGWPAEGHLTTAKD EGAFVDTMNQQAQLLGMKDTHFENATG LPSADHFSTAYD DAVNQRDRKLGLERSQLNRVMMDTLAARQGRENYVTAQE DAVNEECQRLGLADTSLRRKMMDTAAATSGRE NYTSASD DCLNARFRSWGLQHTVMHNLLADLDR GTNTTSAED EDAFADMMNETAEKLGMKNSHF MNATGLPHPEHYSSAHD EADRAMDKRKRDNDVGFGRTAGLQWRPEWAGGWGFDKARA DTVNAAMAAFGLTRTRVTGNGRDLFAALDPTRTSASTPAE NFYAYMKGLGGRT
EMKKRFADKLGHSDPQDEN
ASVTAFARQLGDETFRLDRTEPTLNTADPGDPRDTTSPRA
EEAFLGLMNQTARSLKMDGTNYGDSDGFSENNNNYSTASD EEQFSELDERGRAGGLTNSTGRNSTGWPHPQHRMSCRD
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170
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190
200
MA A|LL|AA\|DRGGALSP QSRAVVLDTMTRTSTGKNRMRAGL
 MLENLRRLLFTDVLSLASRSQLAAWLIMTKTGDARLRAGL TARLLMDRLAAETLPDTSYTHFI RETLLDCQTGKARLPFLQ MAASMRVLTLGDALPAAQRAQLVTWLRGNKVGDKRIRAG MAQSVQKL LINNVLSQENQHIL KTWMMNNTTGYKK R YGGL FGETYRRVLSDDVLDAADRDQLARWLVASETGLNRLRAGLI

 $A V R L L E L F R R G K L L S A E S G D F L L K T M F A T E T G P D K L R G L L$ MA GLLMARLIDFRDLLK PDSAAKLRGWLNASSTGANRIIKA GL
 $M V A L L Y K L D N G T Q L S A Q S R N V L F D L M G R C Q T G T R R R I R A L L$ $M A E N L R Q L V L G D A L P G P E R E R V R D G L L H C Q T G K G R L R A G L$



 L A K L L G Q L L







 I A A T L Q R L V LG D AL KPASRQQQLAD WL DD NRN

LVRMLA HL HK GE I L SLLRSRDRVMNILQR TYNKKLLPA GVV




L
A RAM KEFPQYYPWHA

LA I LAAK H II IQQDFP GH Y Q I Y S E K



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


 IA KL ARATILDQFPENYSMYAE KEFTYNNI RQPNRNKLLW

 F G K T L N K L IA N G K L S K E N K K F L L DL M L N N K S G D T L I K D G V
 MALYLKGIWVFRQLNPGFGEETFQYLLHSKDDNRDPAGV AIALLRALHEGRGLSKSSQALLLRLMIETPTGLQRIKGYC LALLGRALVMDFPQYYSWYKQKWFTYNG DRQPNRNRGLW



 MTALLLALIDWRDEAAPPDACMHMRRMLGLQVWPHRLSSGFP LATYVRATLDFARRHPQEGQRLLDDDLAHPSFHVGLPGLL ELAA FLKMLYNNKGNNTYYARLL S DMKTTVVFHDRLDKY MA QT LTRNLTLGKAGGDSQRAQLVTTWMKGNTTGCSGAFRPG LA L LTRA WI L NFPEYYPWFKEKWFTY NNDKQPNRNR LLW


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UniRef90 F1Z6N3 UniRef90_K9E3G2
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UniRef90-N6VAW1 UniRef90_R5U789
210
220
230
240
PEGTIFAHKTGTLLS GVTDDVG|I IRDPDGRHDALIA|V|F|V|AG PPDVIVGHKTGSSDRTADNDAGFIILPDGREYYITVLVME



P LGWSAAEKTG GGSGTSHD $\square G V V W P A C K P \square V L A \square Y T F S$ PGDWSVGDKTGYCAAPGANDVAI FDPAGGGWYTLVFF LDR
 PAGWFIADKTGAGERGARGIVAC
PPGVAVAHKTGSAFRDAQNDIGIVRDPDGRSYSDAVFVMD PKGWTSGSKTGSCGTA YNDVALVKAPSGEEY ILAAIYLDR $P P G T A D A H K T G S D N G D G N D V G I I N D P D G R R F A D T V F V M K$ $P$ VGTRVEDKTGTLD GVTNDVGVITMPDGRRVAIAIIFARG PAAWTFGHRTGAGGHGTCNDIGI AWPPSAGPVVISAYLTE



 GS GA S I A HK T GT L RFV LG DAGI I E TP S GKR Y L A G I F V R R




 P G WA A DKTGNNGNGAGNDTGVVTLD G GRMAMA AY MA


 P E N WF L A E R R G I A H D S R A E G G Till WR E E H S P V Y V PA GWSYAHKT GTGQDTGYNDVGVMTAPDGTAYAIAVMI GE GPGAKILHKTGDIGKMVGGDAAVVTMPDGRRYVAVALVER EPDAQIVAK T GDIGTVGGDAGIVDMPNGKRYVGAVLATR

RDNSVDG $\quad$ VK TGHTKEAGYCLVASAKRDGMRLVAVVMNTNS SETTVVSNKTGDIG SVLGDVALMDLANGKRYAIAALVQR
 PATVVTVCKTGSID DARGEVVLVNAPGGDFVFCI TKR P D GAR LAAHKA GTGFTPVVNDIVGVYT LKKDDRKFAVVVVFVSG
 PA GWFIA DKTGASKRGARGUVALLGPNNKAERIVVIVGRAD PS GWKIAHKTGTGQNAGFNDVGLLTAPDGRRFAIAVMIGD

 $P K G V V G G T K P G S G S \quad G T C S D V G F D T L P G R G T F A I S V Q V K A$ P T T WVV $V$ GK T GS G
RDP TVVDGLKTGHTDEAGYCLVASAKKGDMRLIAVVMGTNS
 R DE S VD GLLKTGHTE EA GYCLV S SAKK D GMRLIAAVVMGTA S


 QAVWELACKSGW DTGRQHDVGILSVQGRQ FAIAALSQD P P Y $\square Q A A S K Q G A V N E S R S E V V L V N A P H G D Y V F C V A T K N Q$ R DPFVVDGLKK GHTTNSAGYNLV ASTHRDDRRRLI SVVVVGTTGG R D D S V D G L K T G H T DA A GYCLLVASAKRD GMRI I TVVVMGTK S $Q K G Y R V Y N K T G D D G D A \quad Y A D A G L I D L P D G R R A V A G F L V K G$ PETVKYATKNGAVNR SRSEVVYVHAPHGEYVYCVITKK Q
 RDKTV DGMKTGHTEAAGFCLLAASAVRNGTRLITVVMGTKS


## P



 TRKNR
RDNSVDGLKTGHTNEAGFCLVSSAKRDNMRLLAVVLGEPN RDETVVDGLKTGHTEEAGYCLVASSKRENTRLIAVVMGTAN

 $G P G A N D A D K T G D I G F \quad L I G D A G L I \quad I M P T G K Q Y L A G I M E T C$ RDSTVDGLKTGHTEEAGFCLVASAVRDGARMITSVFGTDS
 P H QVMVA HKEGDLE GIANDCGVVF GRRPY LVVLSS
 PPASWVCWKTRAVANGTTNDI AVI WPKDRAPLILV RDSSVD GVKT GYTDYAGYCLIA SALRNDMRLI SVVMGAKS R NVGAD GLK T G H T E E S G F G L TA S A V Q D G R R V I L V V N G L P S

| UniRef90＿F1Z6N3 | $\text { PEGHLIHAN }{ }^{250} \text { MII A Q\|I T RAJL\|YD G }$ |
| :---: | :---: |
| UniRef90－K9E3G2 | SQENDQENAAII ARI SKIIVYDS |
| UniRef90－X8M0G5 | ADTSDDERSEVI R L L G |
| UniRef90－N6VAW1 | PGIS A A R N AVIAEI GR |
| UniRef90－R5U789 | SKLS FEATERVIADISSAVVRTL |
| UniRef90－B8XXQ7 |  |
| UniRef90＿I3NNU9 | NKKDAQQADKA ${ }^{\text {a }}$ A ETTKFILDEF |
| UniRef90－UPI000225DF01 | PREAGAFADALGAEVGAlAAD |
| UniRef90－K8DVY7 | DKKDGKPNDK！VSEVAEIVLKNM |
| UniRef90＿Q2LTC4 | S DRSLS Y Q ${ }^{\text {CTM M }}$ |
| UniRef90＿V5RLB4 |  |
| UniRef90－UPI000289 | $S R E D D R T N A A V I T R \square S R L V Y D Y$ |
| UniRef90＿UPIO003A110CF UniRef90＿J2L9V4 | PRVDSK <br> DSRGHVSRDRワMAEAARAAYDYF |
| UniRef90－UPIO002898F93 | GRD R R ${ }^{\text {P }}$ |
| UniRef90－X4Z6V6 | SPDPLPERERVLAEAGRIVVHGL |
| UniRef90＿UPI000475D12D | PNNDPSAEKFITS $\square$ S R TAYQQF |
| UniRef90－A0AC32 | NHDNTAHDDKVI |
| UniRef90－UPI00036F5DDE | PFGDLAAKS FINQVSHLV |
| UniRef90－EOUHR7 | P Y NDTAGRM MI QEIS RTVYY H｜L |
| UniRef90－W6SQG1 | NNGDTAA ESMI QKMSRQVYQYL |
| UniRef90－K9PN19 | PNNDDRA KAFI RQVSQVVYGYF |
| UniRef90＿R91DW2 | S GYDMARTSAII AEISRIVWW |
| UniRef90－K9RHF0 | PRNDSRA ETLI TSVSRSAYQ |
| UniRef90－UPI00036C5F98 | PDEDDRAAD LI RQMSATAYDYF |
| UniRef90－A6CVT7 | T D L S MSERNQI I NE\｜GGL |
| UniRef90＿UPI00034DEDC2 | PDNDQRA NELI RQVSRATYDYL |
| UniRef90－Q1AVA6 | GPGLGEGG R YLQRISRAVW |
| UniRef90－A0A013XL | DHRGRVMRDRIMAEAARAAYDYF |
| UniRef90＿UPIOO04724296 | GKPDEARFRSVFHDLG |
| UniRef90－UPI0002484752 | PHNDPRA QELTRKISKLT |
| UniRef90－K9XQQ8 | PDNDPQAKE FI QKMSQVAYQHL |
| UniRef90－JON280 | NPTNKDGREVI GTVSRMVYEEM |
| UniRef90－UPI000368BF63 | LQSNA HGLQLI A QMGRAI Y D A L |
| UniRef90＿U3CFJ1 |  |
| UniRef90＿G2IPD5 | TSAPIPKRWELMQSVSRA |
| UniRef90－Q7NHZ7 | PHNDRRA NQLIAKLSQKFY |
| UniRef90－HOP0D1 | PHNDVAGRLLIQDISRTAYQH |
| UniRef90＿Q3V775 |  |
| UniRef90－E1VGT1 | EKARASETMKLL |
| UniRef90－U9W143 | PENDGRARE L I R R T S Q TVY Q T M |
| UniRef90－K9V5T9 | PNNDNRA ETLISSISRLTFQQL |
| UniRef90－W0RL99 | WEPDGTGRSATIIAEVSRAIYEFL |
| UniRef90－W0EV13 | S WTDNNEAEVLTRKLASII WNHF |
| UniRef90－B0T712 | S R L S VA EQEKAl A DVGRVVMK A |
| UniRef90－F9ZZY7 | PNARANESQSLL |
| UniRef90－A0A031TE09 | T P A SMAERNQQIIAGワGAALIEH |
| UniRef90－F3X1L7 |  |
| UniRef90－I2EQN1 | K NADAGVKVLAEVSEMLYE |
| UniRef90＿Q60CK1 | DTDRANAN |
| UniRef90－UPI0003746AF5 | ENSRAAETQKLLA |
| UniRef90－H0A7X3 | S PRSMAEREVVVAD $\mathrm{D}^{\text {T }} \mathrm{R}$ L I Y D Y F |
| UniRef90－F1CKJ3 |  |
| UniRef90－UPI0003688821 | DEARAQETQK |
| UniRef90－F6ET74 |  |
| UniRef90－U7FH66 | EGARARESQKL |
| UniRef90－M7P1P5 | ENVRAQETSKL |
| UniRef90＿G8TU74 | S K DRDTEAFQVLPRVS R A $\square$ F D Y F |
| UniRef90－UPI000466BF49 | EDARAAE |
| UniRef90－D3RQT6 | PRARAEASLALL |
| UniRef90－L5MUR9 | V A E A A L H T G L L G A VV Y |
| UniRef90－UPI0003FDDBE1 | K DQS WQANNELI RNLSALLUNYF |
| UniRef90＿UPI00036A35B7 | EQVRATESAKLL |
| UniRef90＿UPI000374D2FF | EEARAQESQKLLA |
| UniRef90－Q7U8A4 | PFNDPRSTN L I RALLAAAMAPHL |
| UniRef90－I2EPJ3 | KDESWNEGYELLRKVGALLWNY |
| UniRef90＿D9TSS5 | DGSDNSDAYTVI REISKMVYD |
| UniRef90－U2EIV7 | N NARKSQTAAL |
| UniRef90－A6VZ77 | D T ARADESQKLL |
| UniRef90－D7BH62 | S DPRFHPDHPLI GR\AAVVYRH |
| UniRef90－Q1IIZ9 | A ANEREASAALAQI |
| UniRef90－UPI0004634574 | NETDTPCFERFMAEISLELYQEL |
| UniRef90－E4PYM7 | DNKSDKPNDKLISETAKSVMKEF |
| UniRef90－D3VGM9 | PDKEASARPDVLA |
| UniRef90－UPI000262CDA8 | EKAREQETTKLLQ |
| UniRef90＿BOTAI9 | PSET EANAA乌AR】S R \( |
| ) I Y E |  |
| UniRef90＿UPI0003010D70 |  |
| UniRef90－UPIO00475528F | DSSRADDSEKLL |
| UniRef90－B3PKN6 | EKARAAETQKLLA |
| UniRef90＿A1U3B6 | S EARAQEVVQKML |
| UniRef90－UPIO00366212C | PPTPEAERIISEVAMDCYTYF |
| UniRef90－G5F2U5 | M DQGQADALMARVSTAVWEAV |
| UniRef90－UPI00031A7510 | PYNDVRGRN FILQEVSRTTYTYL |
| UniRef90－U2ZRR2 | EKTRAAETQKLL |
| UniRef90－W1KKU6 |  |
| UniRef90－UPI0004782D89 | PVAVLPEADAVIGTAARLAVEEL |
| UniRef90－F6CJ59 | GVK DVREGFADIARLSRMAYD |
| UniRef90－U2D0X1 | KNLSNANE\｜IANINK\IY C |
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| UniRef90－K2A6K2 | D A NRTNYSQAL |
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EI LLIN ETP
ATDDTDAK QA F LVDFDSGKVIJK N ADD S QQLLQEYTATLDSTVVVLYIIQDKDGKVLSLNADKQ STIQGTTDDAFGDMKGETSVYYMDYDGTVANADR MSTVEAEIDGVFAAAGARGFLHARETDSTEEVVSNSKAQ LMDADTGTVFAKNADQH DQSQ $\square R N D \square S S T V G A \square S G T N S V Y V S P V N S K Q T V L V N D G S$ SFVLMDYATGDVLASNPDER GYVLLDFHTNKVLARNSDTR
SAFDTRASHAVIDYESGDVFSKNGEEP
ESAALKKQTQEVVRQQTGSYSVYFSNVDDGRSFGMNENFII ITELEQAIESRLSGLEGTFGIAFKNLNNDEYVEINENER ETQTOESLDAKAWI AV

S
A A EQA TRGAMGISVDDLTSNDRFDGNAEMV ALDDARAWI LMDYASGKVLAENADEK EAKDKKLVDSKMANVSVYVSPVNEDKSYLLN NQT

TAPAMAKGDNRYAAIVVDANTGKTFSANADAQ QLKEELDR AYETTGDVSVYATTPDG QQAQLSTAPQALSVAAK SYILTDFQS

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MNGDTYCGHQEDSA
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MATASETTARRAEEVGVEVRLHAAEVDGNRSLGDGEDVP TAELSAFLAMLASGFAGEVALHVTDIRGRVLCSHQPDEV SWIVVDVNSEQVLSYNPDVR SPGQVSAILMEVSTGAVEQNADEV DARAWIVYDYSSGKVLAENADEK AYYLVDFDSGRVLAENEEDS
 KEVQKYDESRTGSYSFMLKDLDSGAVLFSRAGKR AADTALADNAPALPAKAWL LMDYDSGQVLASNANEA LETYLSKLPAKT VVNLDTGEVEFSRATEA碃 DLQFLLASHPGTVSVRVLS


STA $\square C$ AP $\square$ ASAEKYAS VMDARTGEVLSRNADR 7LMEAETGKVLASDPHEK GH■LMDYDTGKVLANNADMS AYALMDYNSGAVLSLINPDQR ARWA CLMDYNSGATLASNADQR
QALAQEFDTSAPFAIMDFDSGTVLQKNADEP EALLRELRSELDDAGLSGAF GHILDDYTSGKVLSENADEQ SAILMDMDTGKVIEKNSDEK

YMKDDSSGAVLSKDADRR VLDARTGEVLSRNADTR SFALMDFDSGLMLASREPQV
SLKDRTEVFLSTDTHNVGLYYYNLKSNEEI SHNSDST ETELIRTITDRATEVGVRVRLHAVDLDGSRQVGIDATTP QPDPVEKLI ADTAPNFSGEVAIYIKDLKTGKSWEINSDQK ANAKYAGYVIDVNTGEVLADNANAR SWVLMSARTGQILAANENER RAA $\square K T V A A E P Y A$ SAVVIDADNGEVFSRNADVA

GARSAV MDVDTGTVIFKNMDDQ
SPVEERFAAD VIDAQTGETFARHADA TARLVADLAAELDEGGLRGSYFVTDFYSGQVVAARPDTR SWMLYDVTSGQALSQNADAR QAARAFDTRTAAYVVDVGTGTVLAKNADQP MDEDFRTAGVEGRVHARCFDCDGEFGWGADEP SKSSGVKSAlVIEQETGRILQKNADKE AAVKQVLDTKLAQYGGTWSAPYTDAERGRDVTVN DEK SYILI DYNSGKVLTMNADVR SAIVIERDTGQVFEKNSDEK SESLLRELRDALHEGGLTGSFLVRD YTGEELGDDPDTE VID VAANGVLAERADTP ASANPRYAAYVMDAKTGQVLFNRGDEQ


FAMHSVMKFPQALYVADYLHKKGLTLSDSVLVHKDSLDTW LAPASLTKMMTSYVI GTEIVSGNIAPTDMVTISEKAWAKN VVPASVFKVPDALELARQAADGTLDLGARIAVKPGHPTPP FPAASTIGVPLLVQALQEAQAGRLDLTGRVTLGAADRVPG LEPASLTKIMTAYLAFNALHDKRLDLEQSVVPSDKAWKTG
 LDPASLTKIMTSYVVGQALKAGKIKLDDMVTIGKDAWATG LAPASLTKIMTSYII GKEIKSGKLDPNGMVTI SEKAWSKN MTSAGCMKLPDAVSVDRYVEDGNASFDDKIKI EEEDKVYG MHPASMSKLMTLYMLFEALKEGRVQLDTRLPVSTKARQMQ FAPASMAKVMTAYVVLDLI KRGELS RDKVFTVSEATWRKW M DS A GCMKLPDA IALIMEVEEGKIDFDDKVKI ESSDKVYG LPPASLTKMMTSYIVVEALVSGKLKPTDLVTVSENAWCRG VPSASI DK IPPLVELMEQVKTGKINLKEIYTLRAADKTGG RYPASLTKVMTLYMVFNALDNGELTLDEQLPVSRRASQAP MEPASI TKKMTGYVIYKAI KSGKGHLDDKVTI TERAWKTA FPSASLDKVPLLVRALWHVQQGQARLEERLTLRAYERVPG DEPASLTKMMTAYLTFKALEDGTLLKADEMLTVSDAGWHTE FPMCSTWKVLAVAAMLQRVDAGQERLDRRIVRFDAHQLVSW
$\square E P A S T T K I V M A Y V V F E A L N K K E V T P G Q L V V I S T R A W K A ~$
 LH P A S LT K M M T L Y I A F E A VR L G E I G L D T P V RI S A NA A A E P RYP A S L T K V M T L Y M L F D A M K A G DVV S L N E R L P V S R F A A S Q A



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 MP P S S L T K MM TA Y V TF TMLLK S

 MP PA S MA K MM T V Y I A F D LI K K G QLIK L D QP I TVVQP E T WK K W

 VVTASVFKVPVALELARQGAVGELDLAEQVRVAPGHTASP FPSASI YKLAVMWAVYDAlEKNQLKKDSV
RYPASLTTKMMTVYLTF E GLLDAGRFQKSTRDKVSSHAASEP LDP P A S M S K L M T L Y M LiF E A L E K N P A V T D T T F R V S A R A M A K G S Y P A S L T K V M T LF L LF DELLES GRMHL DTMLPVSAHAAA QA
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 S GEELQ F K P D G H L L T T Y E L L L K G M R S CMY VDVNT TATVLDMLKGUI IVQS GNDSAKAMAQHIIS GS $T G \square R N M S S G S E \square S M Q D L L E D M M E D S D N T A A N V V I R Q L G G M$









 $P$ T KI G F R P G Q S I R A E D A A L A M M I T K S A N DVA A AV GE Y L G G S












 P S RLLGLAPGDTISSVQDAILALVTKSANDVAVVVAERLGGS GS K M F V K VG A QVVSLE E LL M GMVVVQS GNDATV ALAA A HVVA GS


 PS R L GLRS GSTI RFRFLI RAAAIRRANDAATAIGEAIIEGS


 GSTMFAELGSRVRLEDLLARIII QS GNDAAMAVAEGIAGS



 $\left.\begin{array}{ll|l|l|l|l|llllll|llll|llllllll|lll|l|l}M & S & R & M & F & I & E & V & G & E & V & A & V & E & D & L & L & R & G & M & V & Q & S & G & N & D & A & S & T\end{array}\right)$


 S S LM F L K P G D K A TV S DL L R GI I I D S GN D A CV AL S D Y V S G G P S KLLGLRPGET DSVVRVI LAALVTKSANDAAVVAAE GI GGT
 GS QIFL E P GEEMTVE DMLKKGVAMASANDASVALAE KI S G S





 $N P V M F L K P G D R V P V S Q L N R G \| I L Q S G N D A C V A M A D Y V A G S$ GS QVF L E P G E E M S V R D M I K A I A I A S G N D A SVVAMAE H L A G T

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140
150
EKVNEYLKKEGYENTSYQSTHPSSSPK $\square$ NLGGGHTTTVRD EGAFAQLMNSWSKQLGMDATHFANSHG LDSKDQYTTARD EQSFAEQATKRAKELGLKSSNF VNATGWPDPNHYMTARD
RSFQEWLHTNGYKTTQLNRYMMDFDAAIDAGQQNYTSSAE EQAFADLMNSEAKKLGMTNTHFVNSTGMPANG HQASPQD DKVNAQUK KGAKDTKDERMDMDTD A LK K GKDNYTSVAD A AVDRVLADLGLRRTRLIGCCEDLFASVLADRTTSSTPRE EEAF ARNMTKRAHDMGMKDSNF T NAAGLADANHYSTAHD DLIDNKDSNMGATDTKLRRKMMDTKKALDDGKDNTTSAHD

 EENFAQMMTERAHELGLE SASFANATGWPDPDHRDSADD ESAFVDLMNAHAERLGMVNTRFGNSHGLHDDE QYTTPRD DNDHEVIENFGDTGTSMENNK
 TNVNQTLNSLGFEQTRLQRRMMDAAASLRGDENL STPAE EAKFASMMTAKARQLGMSRTTFKNAHGLPNSRQK TTARD QDSFDGLMNGYARQLGLTSTTFKTVHGLDAPGQYSTARD DKVNSQI QKMGAKDTKLQRMLMDTA SLKKAKDNDTSAAD DRVNDWLGERGLSGTQLVGLLQRQNAAQRRGERNRTTARD EERFAQMMTARARRLGMRNTTFRNASGLPNMA QHSSARD ERIDQNFFKHVGATHSQLTRKFMDYDALAQGLENVATAKDM ESAFVQDMNKEASRLGMKNTRFANSTGGPHSE HYSTAYD


 EDAFADLMNAHSEKLGMTNTHFDNSHGLDTD QHYTTPRD DAVNSTLRRLGFTHTVVPQDCAEGLRALQPEKSCRTTAAE D AVNAWLAAQGLSGTRLVGKPEQQNEAQRRGERNRTTARAD EDSFVALMNQEAKYLGMNNSNFMNSTGLPETNHDTTARD AETFVEAMNRKTRELGMTHSRF LINPHGLPVEGQTTTARD QD SFDGLMNGYAQK LGLTNTTFKTVHGLDAPGQFSTAR EDSFTSLMNSWAGHLGMVNTHFANSHG LDSTEQYTTAKD DRIDNDIEAQGLKNTKLNRKTSDERAASTGVENDTSALD E EAFAR QMTDRAKALGGENSHF VNASGWPDPDQリMTAHD EADFVRRMNAMAAKIGMTSSKFGTPNGWPDGGVTVVSAAA DK】NET I KEFGMKNTELNRKTADER NFKSDVENYTTAYD
 ESRFAALMTVQARALGMQNTRF YNAHGLPDTRQISTARD EETFVKLMNQEAERLGLKNSHFTNAPG LDPANHYMSGRD D VNVF L REAGMNNSELQLPPGRQNERQRAGERNRTSAHA GNLENFVAMMNMEAK RLGMNHTRFNNPTGLASERHLSTVS A A I T RFARGLDDRVTRLDRYETALDEATPGDPRDTTAPDA
 AQTDSF DAK LIP H SFQQIAYTEEEMSADHDKAYSNYTSPGG EAAFARRMTRTARALGMTRTTFRNAHGLTSDGHLSTARD
 TSAFVRMMNERAKELLGMNDTNFENCTGGDDTVTQHYTSCY ESAFVDDMNAHAQRLGGMTNSRFGNSHGGDSAENYSTPRD VMNFVDTMNKYVEQFGLKNTYFTTVHGLDEDNQYSSAR

 QSSFVSMMNATAVKLGMHNTHFTTVMGLPAPPAHFSTAYD A DVAA S LREF GVVGGVVVRHTVRDETPAERFDPDDVHSARS ESAFADLMNAYAEELGMSASHFVNSHG LPDPQQYTSPRD E EKFIEMMNAKAKQLGMSNTFFSNTNGLPVDNHYTSARD
 E A AFARRMTRTAKALGMSRTSFKNAHGLTESGGHM STARD EGAFVDMMNSQARELGMRQSYFANPHGLPSEESQYTTAQD
 SAVAS LL R RLGFAHTAVPQDCGEELRALLRPEHTCTTTAA E S S I D KL MEEE GLLG Q I DLA GPDSPSATARS EGGFAK MATGKARTLGMNSTTFRNAHGLPDAGQVT TAA D


 EEAFVQKMNEKAKQLGMTNTHFVNPNGLPADNHYTTAHD EAAFARAMTRKAKQLQGAHTQRRNASGLPQAGHF STARD E EVVA QMMTTEAK R L GMSATS F K NSTGGP HPEHYTTTTRD VEVTRALRHWGLR GITAR H GRGHHDPQLDVTRANS GSARA EEGFVAMMNREAQRMGMKNTHFT NTDGIPDPNHYTTAVD
 EKEFVKQMNQEAAKLGLKHTHFENTTGLDVGKNYT TA HD EAAFARRMNRTAKALLGMTRTMFKNAHGLLTESGHLDSTARAD DGVTATAQRYGFTSSEELRTDT GMASGNAVVENWTSTRD QDAFVGLMNNYVGALGLQNTHFETVHGLDAPGQF SSARAD E EEFVGMMNEKARQLGLKNTNF VNTNGLPEKDHYTSAYD A QVEQMVREWGFRDLDTVRHSMRELSETPAERFENT GTARA VENFVAMMNKQAQAWGLKNTQRFKNPSGLTEPGHKTTPRE EAAFARRMTRTAKALGMSRTTFKNAHGLTQKGHMSTARD EQNFARTMTTKARQLGMNSTTEQNAHGLPNNKKQVTSARAD

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200 MATLGQALTRDVPEEYRDYSQKKFTYNGTTQYNRNGLLWD

 I TEELLDAVWTDRAGEPAACERVRS MLARQDWPHRLSSGF $L$
$M G M T L K K I Y N H Q L V S R Q A D E A M L T$ LAKLAKAI I NDFPNQYPLYSE KYFTYNNI RQPNRNLLLW

 | $M H$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | GVR LELLHKGEF DNRSDCDD DLA DLK KPKPTNDTAGL MAKLAQAMD RDVPEEYADHKEKSFTFNNDRQPNRNRLLW

 MAILLGAALRRHFPREFAYFSR SSSFDFRGQTIRGHNRLLGG LSLLAAAMDRDFPEYYPLYYS LREYTYNKITQANRNRLLDW
 AA RYFALLYNSQVNGEPYDDQLILKLMQNSHTYIRT ASRSLQTLLLGDIFSVPARDELTQWIFEDQVADALLRSGL MARLLEWFYLHRDDNKNLS FIWDTMADCNTGKQRUEAALL MATLGVALIRDVPEEYALYKEKSFTFNGIKQYNRNSLLWD MTRLLLGLIWRDEAAAPEACADVRRWMELQVWPHRDRSGFP QAALLGALVRGELLDPAHTRLALDDLERQQLRDLIGRRVP
 DMALDGKALI HDVPDEYADHKEKEFTFNKIVRYNRNRLLW MAILATAMIRDVPDEYA 1 YKEKSFTFNGDTQHNRNTLLWD LSKI WKHLYDGRFDSEKNSKMLIDDLQRQQMKNKLALYIP
 LTLAWKKLSEGSFDSKENSQMLDDILTRQQIKNKDALYI P


 $D L A L L A A A L 1 R D Y P K Y Y P \emptyset F S L K S F R Y N G \square E Q P N R N L L L F$ MAGDL R RLLLGDALH
 MT ILGRRMVYDYPQYYN DFSRREDDAG DAT TRNTNRAVLN LAVLAEAMLSDHADYYHYFSNPRFAWGGKTYKNHNELLG DIAL MSREL LK HKMDTNYTT DWMDT DRGGKTQVNTNKLIRR MAILSAALI RDVPEEYALYAEKEFTYNNGKQYNRNSLLWD DMAl $\square G A R I \square R D L P E E Y K I Y A E K D F T F N K I K Q P N R N G L D W$ LTILARA LIHDDPDWYKLFSEREFVYNKIKQPNRNGLLG VA YLA A R L L H D FPEYYHYFSE KEFFFNKDRQENRNALV LALLARHMIAEYPELYKMFAE PDFTWNNDTQRNRNPLLD
 MATLGSALIKETPEEYKIYSQKSFTFNNIKQYNRNALLWD

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



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DDPSDDGDKTGHTESAGYCDVATARRPNGRLITVVVGTAS LDKEVDAHKTGSGVNAAQNDVAYDCLPNKVCYTLAVFVKD AYAGADG\|KTGYTRAAGFNLVASAQR GRER\|IIATVF TVDGVDGIKTGYTRASGFNLMTSAKRDGHR IVAIIMLGG FYNGATGLKTGTTDKAGCCVSATAERDGMSLIAVVLGSDN RSLEVDGIKTGHTSEAGYSLITSAARDGMRLI SVVMGANS DKTINVDMKTGHTDKAGYNLVASATSPNNMBLISVVM RDPSIDGMKTGHTSEAGYCLLTSAQRDGRRLIAAVMGTKS AGIGADGLKTGYTRESGYGLVGSAVANTQRLIVVVNGCKS TYQYATGMKTGSTEAAGYSLVSSAEITPNNPMKLVVVLGTQ SDASTWSSKTGTLLN GRHEAGVVEHADGQTFGVAVLTES RSMNVDGIKTGHTSEAGYSLVSSAVEGDTRLIAVVMGTDS FYTGTDGLKTGYTKEAKYCLSATAKRGDMRVIAVVM VIEGADGLKTGHTDEAGYGFTGSAEQKGRRLVMVMAGDPS AYKGADGIKTGYTRAAGFNLVASAKR GNERIIATVF RDSGFDGLKTGWTSSAGYNLVSSAKRNDRRLVAAVMGDQG
 ADEVRVSGKTGTLP SVRNEVGVVEYPDGGRYAVGVFTQD PEDIKVGHKTGELD SLRHDVGIILGKKSDY円F VFGSN SVEGVDGMKTGFINASGFNLVTSVKRGGRSVVAVVLGGRT LDDGADGLKTGHTQEAGYGLVGSAQQGARRLIFVIVGGET RYPGADGDKTGYDQASGFNLISSARRDDQRII GVVFGGTS TLDGCDGFKTGYFTKAGFSIAATAKRNGVRLIAVVMGSKD DKSLAVDTKTGHTDAAGYNLVASAKDGDMRLISVVMGGKS FYDGVDGLKTGYTREAKFCLAATAKKDNFRVIAVVL
RPGIDGFKTGFVNASGYNLLTSGVRDGRRVIAVVL
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SDSASWSSKTGTVLN LRHEAGVVEHADGRAFAVVALTES LDPTVDGVKTGHTKSAGYCLISSAKRPSRRLISIVIGTTT APGTDVWSKTGTLPGGTRNEIGVVGYPDGSRYAIAVFTVS TYPGADGMKTGFTNEAKYCLTATAKRNGMRVIAVVMGAAS
 DSNNVDGПKTGHTESAGYNLVASATEGQMRLISAVLGGHS FYPGVDGLKTGFTKEAKYCLTATAVKNGMRVITVVM
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| UniRef90_R5WQQ1 | $\text { F K S G S E A } \square \text { D N }{ }^{250} \text { R S } \square \text { S G VVV }{ }^{260} \text { N Y }$ |
| :---: | :---: |
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| UniRef90-S7WE28 | Y S NLE NANKI I A E $\square$ A R L A F |
| UniRef90_L2F787 | EKARAEQSKELL |
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| UniRef90-T5JTR1 | GEQNDQ $\square$ D A M R L L S L L P Q |
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| UniRef90-Q2SA35 | E EARARET LK L L |
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| UniRef90-J1QIA8 | ERARAAENKKLL |
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| UniRef90_UPI00046AD8A2 | DSARAMESQRML |
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| UniRef90_V9WEC7 | S T S R N A K VA ELL |
| UniRef90-UPI00046488C0 | GRSRDDHMVELI R E |
|  |  |

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$R$ VE A Q S G S R Y A A $\underset{S}{ }$ V V V D A G T G E V V F A R H A D S Q KEVTAYANTFEGS $\square G I$ YAKNDLKTGKTYAYRSDVV A AVLKNARHALAEAGLRASFLVRDLDTGDEIDLDADTV
 KVGYGIYYYNSKRSVGSNQDQP SWILMDVTSNQVLAANPDER S WV L M D Y A T G Q I L A K K D P D L R SAFVIDDAKS GEVLAYNPDVK

KYAA $V$ V D ANSGEMLDKRADSP D R D R L R S ELTVLLANAHPGRVGVAVRDEASPA I CVNGEQR


 SWVLMDYTTGQLLTANE HQQ

 V I DWN NE LA KNAD R
 $G Y V L M D Y N T G R V V E K N A N V K$ G Y V L M M D F H S G K V L A E K E N T K S AVVMMDASTGTVVFEKDAHER S AVLMDA Q T G QVFSK N K N L E
$D S V N A D S I D A Q S G Q T I A Y N S A Q$ VVV D T K T G NVVL S E N A D R L A YPDKYAAIVIDDANTGKTLLFQNAT LK SVLLMERETGSVLEDNAHQP SVLVLNGYTGRELSENADAP
 KTALTAAELAKICDAQDFTVRFKVKNLVTGETIERAATEE
 L E S GTPMTLSSALLAETATGGTVI EKNAADER ILIEA D

ERAALTARDAADDAEHGAHFGIAVVDDRTGEVLEKNSNKA



 D DLDARLDAVTRN GGTVSVWLGDLDGRARWTRAA GVP L DEASTGKVLETNADEK SALL MEAS $S \square E H$ QLD TV I K E L A G N $\square$ S Y AVVLQ F D

A A A K A DMENEEGDLGATVSATLWNMNTGEVVLEQNPDVVQ GLRGSFLVRDLATGEELGQDPDRE | $L$ | $F$ | $D$ | $V$ | $T$ | $T$ | $G$ | $Q$ | $V$ | $L$ | $A$ | $K$ | $D$ | $V$ | $D$ | $A$ | $P$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $L$ | $L$ | $D$ | $I$ | $T$ | $A$ | $G$ | $Q$ | $V$ | $L$ | $A$ | $A$ | $K$ | $D$ | $D$ | $V$ | $P$ |
| $L$ | $A$ | $D$ | $L$ | $G$ | $T$ | $G$ | $Q$ | $V$ | $L$ | $H$ | $E$ | $R$ | $A$ | $D$ | $R$ | $R$ |



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

$\square$ D AVL I ER D $V$ K L LTTNDKEF $V$ VD AKTGKVI $S A L L M E A$ S I D A K T GKTLSSSADAY S VDAQS GQIIAHNSHVQ

TASLVRELRAALDAGGLRGSFLVRDLRSGAELGDDPDRE DLK N G Q I L L D Y
$\begin{array}{lllll}K & Y & A & A \\ R & V & D & G & \\ R & A & A & Y & L \\ D & H\end{array}$ A AYVLDHTTGTE

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50
60
70
80
$L D P A S L T K M M A S Y V T G Q A|I K S ~ G K D T N D D M V| T \mid V G K D A W A T G G$ MPMASVTKLMTVLLAVEAVENGQVK LGDQVVASEAACSMG

 Q H P A S L T K M M T S S Y V V HPVASLVKLPLAVATLERIARGELDPAQPVEVAPGRIIGP
 F I S A S V I K L FIVM Y L Y D QI K Q G K







 FFPASTQKDYVLTELYRQYKEGKLLQPS QTMAMEGSNIVPG




 MAP S S M S K L M T L Y VAF D Y L K A G II K M E D K F R V S R K A WE R K LP DA S VT K V M T MLLDMMEAVD S GKI S LDD DMVTVSENAMSYG


7BB18D



 NFPASMTKMMTVYMTF DALDDARKLTGLDQRLKVSSRAAGMA
 RFPAS LTKMMTLYLLFEEVSKGRYTLSTPLNVSANAASQP RYPA SLLTKDMTLYMMAFDALAMMGTLKPDDDSIIMMSRNASAQA


 WY P A S V T K I M T A YV TTLK A V K D G K I T L D T L L TVVSP TA A S Q S RYPASLTKMMTLYLLEFALDGRSMSLGHPLAVSSHAASMP LDP P A S MT K I M T MLL L I MEAA DE G K L K Y E D M V TVV S E Y A A S M G


 369AF64 | $V$ | $P$ | $M A$ | $S$ |
| :--- | :--- | :--- | :--- |
| $R$ | $V$ | $Y$ |  |
| $R$ | $A$ | $S$ | $I$ |

 HHP A S MTKLPLVVAFERRVVRGELDPDTPVPFTMDEADDQ
 H S S A S L I K V L I M M Y V F H L A R T E Q L D I N D T V P L S R T P R V E G


 FPTASTHKLVVA I AIVYKYLYPNASTSEKQL LPP PA S M T K V M T M L L I MEAALD S G K DT WD EK V R T S E R A A S M G $R A \square A S T T K \| M T A L L A V E Q \quad G H P D A V V T V S A N A A S Q P$ NHPAS LTKMMSVYMVFDADKAGKLSWDSPVPFSKHAASRP I Y P A S L T K L M T L Y VMF E LI E L G K L S LDD K K L LVVSA K A A K M P L P P A S MT K I MTMMTLDMEALD Q G K I K WD D K V A V S E H A A S M G L Y S A S L DKAFVMA QTY



 17 7C WY P A S L SKLMTAYVTFRAI A A GEVVQLDSPIVVTKHSAGEP



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F $F$
$F$
$F$ S N P GGD G G Q Y S
$H$ EEAFVQLMNERAAQLGLKNTHFSNPTGLPAPDHYTSAAAD
 E E R F A S L LM T S K A R A L G M T R T T Y R N A N G L P N T A Q M T T A R D










 K A V Q A F L D Q A G L Q Gll R I D R T E R E L Q T A Y L K D P R D T A T P M K AVDEDMMALGGLDQTWLYKKSMPMPP DQPKY GLGKT TA RQ EEAFSRRRMTEMAHELGLSSSVNFVNTT GLEGDGGHVVSAED G V Q HA H ELGMLLD T M M T Y L E GKYYQT DNGRF QTTPD N
 SNI QAFIE SLLGCQQTRLERKFMDVEAQKLGKENVTSALDD QPQFVAMMNNYVKKLNLQDTHFETVHG LDAPGQHSSAYD A EVVAR LIRAWDCGDLLRVRHRMNLMYECAAGAHANAGTATA
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 A D A F V A QMNARARALGMKDTHF VNNCNGLDVPDHYS SA Y D E R NFV RMMNQKAKELGGKHTNF INSTGGPVDHGKHYSSAY EE GFVVELMNQKA QALGMVHTHYRCAS GPQVPGDHVMSARD





 GTEAGGARRMTERGRQQGGLTNSTANSNGWPAPDHRMSVRDD



 A AVNDC DD GLLGLKGTR LRRRKMMDFTAAAAGRE NVTTPGD
 EEAFVGKMNKRAKELGMNNTHF VNCTGFFDPNHYTSADD VPA A AE RMTRTARA I GMTNTRF RNANGDPDPGQYTSARD EEAF VKAMNRRAE ELLGMQNTHFENTNGLDDTAQHRDSAK D
 D EVVAVVLAA A D CSSPATVVARGDEDVAAREA GLDTNTVTAAA TE GFI KMMNEKAK ELLGCKNTNFVNVMGGLDDDSSHLTTARD E QEFVVRMMNERAA GLGMMNTHFVVDCCGGLTDSPDHVTTTARD ENDNARAEKDGMDEME LNRMMMDFN A LAE GRENHDTAMS

GNVDAFVALMNDTAKRLGMTNDFHNPNGLPAEGQLT TAR D A E NF V RLGELGLEGIKVRHPMGDLLEDTPVERRANT GTARA
 VD K WL A MMN GKARELGMANSHF GTPNGWMDEGRTYVSARD KQPDALT RVLSDLLNLVNTRDHSREAFKEYGYYHSVTTPYE E E Q FVQMMNDKA KK L GLKNTHE VVNSNGLPAENHYSSAED E EAFARRMNLRAAELGAQNTYEVTASGLDDDVNPYSTAED EEGFAALMTRKARSLGMMNTTFGNASGLPHAQQFTTARD EKDFA HLMNDKAKQLGMKNTYF KNASGWHDPLQQQTTARAD
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 $N V P N F V A R M N Q E A R A L G M K D T H F N P A G V T M T D H Y S T S H D$ EA QFA QMMTRKARQLGMTKTVVFRNASGLPSKSQVTTARAD
 QAAFAERMNAEAARLGMNGTHFVNPNGLYSPDQYTTARD ENAFAE LMNEKASVI GMGQ ATTFCNATGWPDPKHLVTARG E D A F A A MMTAKARELGM RSTVVRNASGLPDAGQQTTARD TEDFAK M M ERAREMGMMNSTFA NSNGWPDPRQRMSMRD


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 | $\square A L L A N R V I T D F P S F Y P S E R E F K F D G R A P Q N T R N R N P L L S$ |
| :--- |
| $D Q V L L L Q T I L D A Q S S P E A Q A Q L C E W A M Q N Q D L R Y G D R S R L$ | DAILLSRATMRDFPQYYSYFS I KGFEFRGRYIPGHNRLLTT


 AARLFAKLANHELNGEPWDSMLDDKLRLDNHSFLRTYGYE



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B3BA7C

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 <br> \section*{2} <br> \section*{2}.MA L A QRMIQDFPQYYHYF



-L A R L Y K H $\quad$ F E CR D R DA Y GRE

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 DYA GAD GII K T GYTRAA GFNLI TASAQRGNKRLIA ATVEGGTS
 K S $\square$ K V D GMK TGGHTNKA GYNLVVASAV NNNNMVRISVVVM TP






 PS GWTDGHKTGTGDN GVTNDVVGILTAPDGTHVAMVAAFVAE
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 $K S \square N V D G M K T G Y T S G A G Y S L A S S A T Q G N M R L I D V V M G S S S$ K S M NVV G IIK T GHTSNAGYSLVSSATEGKMRLVAVVMGTKN Y Y S GVVDGLK T GYTQEAKYCLAATAKKDGFRII TVVMGEPK Y YPDANGLKTGWTEEAGYCLLAGTATRGETTLIAVVMGTKS

 $R Y R G M D G L K T G F D R A S G F N L A A S A V R D G R R L I G V V E$ $\square M K G V D G I K T G Y T Q M S$ GSNNLATSMRLDGRSVVAVVMGGKS GF D GAT GLLKT GFTQQDA GF CI SASA QRE GMELI A VVVLGS E T $K \boxtimes A G V D G L K T G Y V R L S G Y N L V A T S R R N G R K L V V V V M G G A S$
 PFDTVDASKGGRGKRG RMDAGIVYRDGAP LFI LAAAYTDG FYDGVDGLK TGYTQEAKYCLSATAKREGFRVIAVVM $L G \square G A D G L K T G H T E E A G Y G L V G S A V Q E D R R V V F V L A G L D S$
 FYEGCDGYKTGSTDAAKYCLAATAEKNGMRLVAIVEGTPD $R Y P G A D G F K T G F I C A S G Y N L V A S A T R N G K R L I A V V L G A S S$ $N Y A G A D G L K T G F I R A S G F N V A T S A D R N G R R M V A V V M$

 $N V R G V D G D K T G Y T R A A G F N L A T S A E A D G R S D V A V V L G G K S$ SYHGCD GLK T GYVKESMYCI SATAQRNGDRFIAVVMM

 $Y D G V R V Y G K T G S F G A D R H E V G V V E D P G G P T V A L A V F T R A$ $D V R G V D G \square K T G Y T R A S G F N L L A S A E R D G H R ~ V I A V M L$ P E GTWTANKTGWV TGVSHDACLVRPADRDPFVLVVCTT



 $R Y E G V D G L K T G F V C A S G Y N D V A T A K R G D T R D I A V V L G G S R N$


 F Y P GVDGLLK T GFTNEAKYCDTA SANKNGMRII AVVM PGATGVVKNGWTEKAGYTLVASAWRDGRE VMLVLLGG RYKGMDGDK T GYTNAS GFNLVSAVEHDGRRVVGVVLGGRT
 F YPGVD GLLKTGFTNEAKYCLLTATAKKNGMRVIAVVMM

 $R \bigvee K G V D G \square K T G Y \square R A S G F N L V T S V N R D G R Q \| V A V V M M G G K T$ $M D P T A D G L K T G Y T K A A G F N L A L T A K R P E R R L I V V V L G T K N$ $R Y Q G M D G \square K T G Y T N A S G F N L V S A \square N H N G R R V V G V V L$ E GYD G $\quad$ K T GF INNLS GFNLVASASRNGQRLVAVVLGGTT S DAARWSSKTGTMLDN LRRHEMGVVEHAD GGVVAVVALLTES




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S $\square$ TRNA HVVA A LMM


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60
 $M P \square A S L T K D V G W A V E S G R$ LDERVTISANAARKE
 WY P A S I TKLLMTTYVALDLVRQGKVSLDSMITISAAAAAEP



 L N P A S L T KL MTA Y V A G Q EVVNA GNI SLDD Q VVVISR NA WA K N


 FPTASTHKLVVALLAVYKYLYDEVDKAD
IP P A S LAKL MTMELVFKAI EAGRYS IDDKFVVSENAWRTG





MQA A S L $\square K$ LF $\square M G T V Y E N Y D A \square C E A G$
 I PPASLAKLMTMEVVFNALKTGRLLSLTDEFYVSENAWRTG


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 H Y A A S TMKVAVLVALYRALVAGRLAS DTAVPVRNEFDSAQ

 LIF P A S TTTK I M T M II M F E A I N N N K K I S F D D Q V T T S K Y A A S M G
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 R S P A S I T K $\square$ M T L L L T F EA L E K G R I K L E D EVVT T S A Y A K S M G R R TA S S DKLA F ITTYMMNLAD E GKLLDLLSEKLTYQES DYY G G


 TAPASMAKTMTAEVVFNEIKS GRLNFDNEFMISENAWRSG VA P A S M S K M M T A Y L VLE S IH N GKVVHWEDPVKI SAKSA QTE


 $L \mathrm{P} \square \mathrm{A} S \mathrm{~S}$ T K L M T M L V L L D G I D A G K I K WT D K V E M S P A A A S L Y FSPASMAKLMTTEIVVNEIRRGRLSMDSEFQITEDAWRGG

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## 6 <br> \section*{6}

G

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P T K $\mathrm{F}_{\mathrm{G}} \mathrm{L} \mathrm{V}_{\mathrm{R}}^{\mathrm{K}} \mathrm{T}$ KGE A
GAGMFADLNSE KREYDEQIKKMMTVS
GMFADLLSEDTREDLIQGVVVQSANDGCIIIAEGMAGS GSQVFLEPGESQTVDTMLKCIVISSANDAVVSMAEMMAGS GSQVFLGPGEEQTLETLLKC:VTASANDASVAVAEYIGGS GSQVFLEEGETQTVETMIKCIVIASGNDASVAMAEHIAGS

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 PGAAWDRQGEAADVDTAIARLVIVRANDVAVATAEFLGGTM


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## F

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## D

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## ${ }_{\mathrm{G}}^{\mathrm{G}}$

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130
140
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160
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俭 LAMLARH ILDYPEFYKLFGEKEFTWNKDRQQNRNPLLN AMMSRELILNHPKMRDYTTEWMDSIRDGAFGTNTNRLVR LVDLVGRLASGTAVSPEADRLVRQWLSANVDQHHASLATS MAIVAQRLLIDFPDEQKFREGTSDETKMTNFNWMLPGLIF


FFEGCDGLK T GF T NEAKYCDSATAKRNGVR MLAVIMGA K S L NVD GI K T G H T S G A GY KLV V S G T S E GMR LI SVVMMGTS S Y NI GVDGI K T GHTEKAGYGI AASAQKDNRRVFVVVNGLKT GYAGADGLKTGYTAAAGHNLVGSAVQGNVRLFGVVMGASS RTYK G $\square$ T GK TGSTSSLA LY NLSASATRDNLSLIAVI MKAPS $R$ YP GAD GMKTGFVCPAGFNM1GTATRNGRTLVAVV $R V A G V D G L K T G Y I R A S G F N L A T S V E R G G R R L V A V V M G G E T$ PVGARIAHKNGWV R GVRHSVGVVYPDDAPPYVLAVCTTN FAYEGVVDMKTGYI A ES GYNF TGGTAERNGMR LIVVVVM
 $P E G V V Q T A N K T G E L D T V V E N D A A D I D Y D T A K G I D D L V I C F M S S Q$ AYPGVVDGMKTGFINAAGYNLVASQRKGNHRLIAVMLGGSN
 HYSGTD GIK T GY Y N A S GFNLV A SVKRHGVRLIGVIFGGKT




 MYA GALGVKT GYTNKAGHCFVGAAEQEDMTVVSVV TYEGCTGI KTGWTSAARGCLSAAAKRDGKELIAVVMHSDD RYE G $\square T$ GLK T GT T G GA G $\square$ CI S A S A T R N G L S L I A V I L G A P S
 $N K A L Y \square E G K T G F T D S A G Y C F T G T A K Q G D N R V I T V V M G T K S$ GGPGAD GVKTGTTGAAGPCLIASATRDDQKLI AVVLNASN $R V P G A N G M K T G Y D C N S G Y N V A A T V T R R G R T L I A V V L G A R S$ F YP GVVDGLKTGYTSEAKYCLTATAKKNDMRVVVAVVLGAAD
 $T D P E V D G L K T G Y T P L A G C C L A A T A L K D N V R L I A V V$ LD D I A D GLLK T GY LE E S GYGLTGSAVQNGQRLIMVVSGLKT
 KYSGTDGDKTGYINASGFNLVATVERNDVRLI GVVFGGKT
 S G GLVLDNNKTGT DSGDRADVGADTRDGHTIAWAAI
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T A QAAEA $\square^{10} \mathrm{D}$ K $\square \mathrm{EAKA}$
20
30
ATLI EASTGQVLEYNADEA VVVHPETGAVLEKNADER S LLVVEVDSGKVLAENATYP SAMVVDF HTGRII SRNATDE

VADMDTGQVLAKDPNAPT SWLLLDATSGQII SQDPNAR SAILMDAESSKILEKNDDEK ED I SATANAKYASFVDNENTKRIYHNNADTR EDLEAASHARVSYVCDVGSGKVFEQNADEK $S A V L L D M D S G D V V N D N G D V P$
$S A M L I D V T S G R I L S K D G D K E$
PNTVRDSLCQLGTSECRGYRDDVE
AGLNRDAALLEQR\|TARSAVVVDPTTGRLFALNPDQP ESSDVSAECAVLIDSQTGEV.

SAFLVDVS GQV $\frac{F}{L}$
SAAVIDERTGKLL
LIDAESGSVF
SAILMDADTGTVIEKKSHEK
SAVLMDADSGRVFGKNENER
SAVLMDGESGRVFAKNGEVE

WSARVADASTGQTWEHTPHEV SALYLDANGQLLDKNDREP GAYL:DVSSGQTLFVNPDKQ

SAlI
SAGLDATTGKVWAKDAETP

D D LD A H LDR RVPGTVSAY
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GAVLDDGESGRVWGKNETEP
SAVLMDADSGRIFAKNGQEE

AADDAEDNAVIQANSGRVGVYLIDAETGTVFAKDEDAP
AKYAAIVVDEK G GKMHEGY GVVNTK
 $R L G A N E D A R$ LMDQESGRVLEKGANKK
 ETDLLGNVGAALIDADSGKILEEQNADTP
1 VNDPQKDDASLGVSADEQQSGRVFEKDAHTK

A DFTR $\square$ VADMDTGQVLAGRNDTR
AGVDQAKAEAE $\square \mathrm{NV}$ VAD

ES S QLQS $\square V N Q \square V Q T A T A K \square$
 AA SLI DVESG AAALMERQSGF SAlVMDAATGLVYEKNATER SAVLMEASTGKILSDNSDEA $S \square T L I D D N K G Q V A G Y Q Q N Q F$
$S A V L M D A D S G R V V G K D A E Q P$
DLDP D G GVTWSVCI RDGVGMPLAASAADVP
EQTA $\square K K \square V K R D M R P V H G R W S V K V T R D G Q R P L A V T T G N K K$ SAII IDGASGRVLAKDEHQK V VDVTSOQVLA ANETGR GALVLDALDGQVI EKNADVA
GAAPAWLVADLDTGEVLARNPHSH GAALMEMDSCRMLA WNEHVK
SLNARAAV LMDADSGRLLSKNETMA
SLINARAAV,LMDADSGRVLGKNETMA
 LT QS WQKDLKEENANVD IAAVYDKKHDKTIT LRNQDT

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

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UniRef90-F8K302

## L L $W$ $K$ $R$ $V$ $Y$ $Y$ $L$ $L$ $N$

 LP M G H M A K L M T A L I A A E E L D S G K L S M L T D V V T V S P TA N A K L MPPASVSKLMTEMIVLDHDTSGTLRWEDRVVISSAYASQMG LR R A S L T K I MTA IVVAI EHSK LSLA SLVKKLPDAVALMHQVTNGQANLDDQIYUDPSNFTEN





1ro

50
60
70
80



 I E P A S LTTK I M T A Y V T F G A L R D K K LPMASMTKI MSMLLDMENIENGSLKYEDKVLI SENAS GMG
 HYAASTMKLPLVI AVLRKAARGEVVLAAPVEVHNSFTSVA RQPA S TIGK VTALI AMQS LLRDQELVSTSARAARMP
 L K TA S V G K V F LLLAEVAARRFD DVTLLDPGEDV AATAA D QVA D RAMASTTKKM TAVVALL GGADDKGTVVTVSPRAAAVG





 FP A STTKKIMTMMLMFEAINKGGTLKWDDVLTCSSAYAASMG



 VYPA S LTK I MTCLLAALE N
 FVA A S TGKGI LAAA AYYHLVET GKAS L GT
 EYPASMTKMMTXCLSSVESGRAD LAVVTDTPAAAD LT A A S L $\square K L Y \square M$ GAVYS S Y D N I VA



 M Y P C SV DK L F VMAATYE W DDE GLLLTMK QCLP Y
M A P A S I TKK M L L L L I S E K M D N GE I K L E QE L T DS E N A A G M G Y A P A S T I K T L L A QVVVLD EVVP







 R P IA S I SKVMMTAGVVVES GANMNDMLTDDSLDTKTP


 LPPAS MTKMMTEYMVLNAVKS GKLLKWDQEI SVVSKEAA STP FPMASTTK IMTLIVALDENN EPDQIVMASAGASAMP






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UniRef90 Q3SSL5 UniRef90-E7G8W2 UniRef90-N1ZPB5 UniRef90-E3HNY4
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UniRef90 W8YUB6 UniRef90-D4J8A4 UniRef90_UPIO0017446F5 UniRef90-R6M388 UniRef90-W7BV77 UniRef90-GOUGR4 UniRef90_UPI0004170DC5 UniRef90-R5GAZ1 UniRef90_UPI0003718C07 UniRef90_U2RRC6 UniRef90_F8K302

GS GDLLIAEGEQASVVRSLIFEAMSIIYSANDAS|V|A|L|AER|V|A GT $G S S M Y L R A G E T Y T V E E E L L Y G L M L V S G N D A A I V A L A C H T A G S$
$P T K M G F G T G T Q L T V D N A L K M M L V R S A N D D A V V A E G V S G S$ GSQVFLEPGETQTVDTMIKCDAVSSANDACVAMAEHIYGS PTKLGLDAGDTDTVSDVIGAIVTKSANDMAVVVAEALAGS


 GTQUWLD DGEKIAVEELIKSITIGNANDACTALAEKLSGS DGSTFAEHGTTRSVLQLCDHAITHSGNLAANDLLEMVGGL GMSLS LKRGDFYTVVELFEGDTLYSANDAAVALAEYMAGS GSSLYL K K GEEMTLENMLYGLMLRSGNDAASAI AEHVGGS RSK $\square Y L Q A G R S Y R A G D L I N A T L L S S A N D A S V A L A E R I A G S$ GTSMGLDPGDSVSLYELIVGMLLPSGNDAANVTAYYLGGN PGKTMALGAGGEIVTVVEELLKGGVII ASA GSQIFLEPGEEMTVHDLLKGIAIGSANDGSVAMAEK GGT
 NSTMFAE DH S SISVDNLLRGAII QS GS Q

 GTQDYLEPGEQULFKDLLYATLLNS
QNRSFLRKDYQYTVRELYEAMAIYSANDAAVTLAEYVG GSSUYLKKGERLTIEEELYGGMMLRSANGATUALAEKVGGS GATMFAALNSSUKVSDLLRGAIIPSGNDATVALAEGUSGN
TATMFAALKSRVRVEDLIKGVAI QGANDACIVLAEGMAGS
Y S S MF 1 MVGDEVSVENLLKGI II AS GNDACVALAEGTAGT
CNCAGVAPGHTYTTRQLLEGLLLASGNDAANTLARMLGGE

GSTMFAALNSRIPVQDLLRGAIIQSGNDSCMALAEGIAGH GSQ YY LEEGEQMSVSDLFKG\|SIASANDACVMVGERIAGT
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 TSTMFAVLKSRIRVADLLQGVTVQFANDACITLAEGMAGS PMGASTAGQQI RQMVQQSNNESWALI LSAV GY
 ANGQEQVDKLLNAMITVVSNDSANTLVGMLGGQ GS Q WWDDTKETVSVDEMLKAMCVVSANDCTVAMAEYLAGS

 QSNVPLRADGTYTIQELYEAMVIVSANAATVABIAETVAGT



 QPRVPLRQDGTYKVRELYEAMAIYYANGATVALAEVIAGS GSSLL L KMGEEMTLENMLYGLMLRSGNDAATAIAEHVGGS MGVIDLRPGEQDKLRELIKAALI HSANDATVAI AEAVAGD GSTLWLEAGDEIIRMGDLLYGMMLHSGNDATVAVAEHIAGS GSRVFLAAGDKHTVLDLYKAMAIGSANDASVALAEQI GGT SD NDAASVI LDQITATQSWS EVKDH DMEGEHYKLNDLLHSLMLESHNDAAVAIAEHVGGS GSLVFLLSGESMSVRDMVKSIGIVSANLDAMVAMAEKVGGS GSADY TIEGQKVK K K RMI HNSDNAATNRLINRLGGF GSA M GLMLRSGNDAAVAIAEHVGGS
 KGSDRLKVGDQLNRAEMLLMML MKS
 GGAMFVPVKSQVRVGDLLQGALVVSGNDAADALAEGLSGT GSSMYLAKGEELRVDDLLYGLMLTSGNDAAVALADE A G S KSQDYLAEGDTHTVKELYTAMSVASANDATVALASFLGGS EVRLGVHEGERYRMEDLYYAMMLESFNDAAMMI A E GTVGS
 GSQVFLEPGEIQTVDTMIKCDSVSSANDAAVSMAEYMAGS
 $K V K L G A K S G S Q F L L S D L D Y A L M L E S Y N D A A V A I A E H I G G S$ IGTDSCLHDVTMSTRDLAFFMLSMSDNAATDKLME LGGT


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EENFAKMMNDKAREMGLSPQAHFПNAPKELLQGETLLTARD VAAFAGMMNDKARADGMTSSAF QNPNGLDAEGHYSTARD EDAFAFAMNANAASQRLGMHOSHWVNPNGLDDERQVTSAR EEEFARRMTQKARTIGMLNTTFRNASGLPNSEQRTTAQD VENFVRLMNEQAKALGMNATSYKNPEGLTEPGHTSTARD AATVAAMTRKAAAVGARNTRASSPSGLDGPGWETVTTPHD ESAFVVMMNKEAQRMGLTNTRFANPHG LPSPENYSTAQD VDTFVTLMNEKAKSLGLENTNFANPHGLDNENHYSTAYD E感AFVKRMNKRAKQLKMAKTVFLDCCGTNENTVSTAHD D $\ A H V L H A A G C S D Q T V \square R R G 1$ EDARAREAGGTNTVTAAD EDSFVLMMNDRARSLGLSPNTVFTNQPTHIGGQTMMTARD DTINAALKAEGFTKTTVGHKLVGNSTFPMGSGRNVSTADE EAAFARLMTSKARAMGATNTVIHNSNGLTARGQQSTARD VENFAKKMNAKAKEDGMDNTNFVTPSG LDDKNHYSTAYD EEEFTKLMNERAKQLGMNDTHF VNCYGFYDPNHYTSAYD EEAFVELMNKKAKQLGLKETFF KNATGLPSAGHYSSAHD QE KFVEEMNRVAKELDDKNSRFVNVTGWPDDNMMSVRD EAAFVEKMTARARELGLTASTFANSNGLPNPGNKMSVRED EKAFIRMMNERAAELGMKDTHF KNCNGLPVENHYSSAYD EGFAKMMNRKAEEDGCSDTWFDTPNDDEGDERVHSTTAKE VENFTDLMDKKAKDLGCGHTNFVTPNGLDGDGIHHTTAED EQAFVKMMNMGMKTAHFANSTGLDTADMPAEFRPTMSALD EASFVKMMNERARGLGMEHANFEDCCGDTDSSTHAMSARD DAVQRATLDLGFTVSGLRDRVRGNRSQDPGTLSTGSAAE KDITHFVEMMNQRASEDGATNTHENPSGDTETGHDTTAHD EKMNKTAKKFGMTSAHYINSSGDENFAPYGGPNDSNSARD LGEFVSMMNERAAALGCSGTHFT NPSGLYEENHYTTASD VKFAQMMNERARQGCTHTHFD NPNGLNDPLHYTSAHD EQQFAESMTRHARELGLENKVFGNSTGLPDGRSKVTARE EDEFAVMMTAKAKEIGMNNTNFA NSSGINDTENLSTVRD QAAVAKMNALAGRLGAHGTTVASTSGLDVPGVPFWSTPHD A VAEVWSLAGARNSVTGRGIEDFAAREAGDTNTVTAALL KEAFARMMNERAAELGMEDSHFVTPSG DDDNAHYSSAYD NDGFVKMMNEKAKELNLTNHFMNPTGLHDDNHYTCALDL VDEFCEKMTAKAKEIGAEDTVFGSPNGLDGHDQHHSTAKD GGLPAFVAAMNAKAQALGMTSTRFDEPTGLSSDNVSSPHD VEGFADMMNEKARQAGCTQTHFVTPNGLDDEGAHHTTAED VDNFSAMMNAKAKEDGCKNTHFVTPNAENSGGTHHTTAED VPAFVRKMNRTARQLGMSTQFYDPDGLPHPNNTASPYD VADFABMMNQRAYETGCGNYMLIDTNALRWGRDNYTSVAD EDDFARMMTRKARALGMTRTVYRNASGLPDDEDQVTTARD EGAFAKRMTERARELGMTASVF QNATGLPDPQNAVTMRD RGLTNYAASDG\｜PYDRSLNTL SEARFADMMTAKARTLGMSRTTFKNASGLPDPDQVSTATD EAQFAAMMNRKAREDGAFHTHF VNPNGMPDANHYSTAHD EAVNTYCKNNGYTDTSMGRMLLEKASANEN GGHYTSARD VENFVAMMAKAKELGMNDTFKNCHGDDEDGHVSSSYDID VEGFVFLMNQKAQEDGMRNSQFANPHGLDDHENHYSTAYD DYVNEFAKSLGLHDTRLNRYMMD SKARAEGRENVMTVLD ETMNKKAEELGLEGYKFVNSTGLNNADLMGMHPAGTGPED EQEFVKLMNETAQKMGMKRADMPEKYRPSEDRETVVSARD KLVTQYCHSLGLDQTVIHHGLLPGAKHFGDGKENKTTPSD VEGCVKAMNDRAKELGMNNTHFTVNVTGLPEPEHLTTAYD DSAVAKMNAKAAGLGAHGTNVVTPSGLDGPGMPFWSTAHD
DRVAKEVEALGYKDSALIDFLRWPRPAGAPRRLSSGTAYE ETMNEKAKKLGLKNSKFVNSTGWNNKDYAGDEENVMSPRD EEGFVHLMNAKAEELGLAHSHFANPHGLDAEGHFSTAND HDTFVRWMNAKALLLGLEDTHF VNTNGYSHPEHWSTAKD VPAFARLMTEKAHEUGAVHTNFINANGLPDDA HYTTAYD EKAKEFGMKTAHFANATGLIDADMPEASRPDDGKETTMSA NQVNCFFKKAGYQGDNDDQTELRMRGNSQAPDRNQDTSQQ VEGFAQMMNEKAAS』GCMDTFFSERDGTSGTKVHSTTATD AEVAARATSLGLRATALHDRVRDVRGADHPATLSTGSAAE NDHFVAMMNDKAKEDKLSNSHFMNATGLH DPEHYTCAKD KRVNQTMKTYGFNHSHLRRYMMDTR ALQRGHDNYTSVND KDGFVYMMNQKAEQLGMKNTRFQNPHGLDDHENHYSTAYD QPSFVDLMNRAAQRMGLQDTHYA NVDGLPDSQHYTTVGD SGYDGFMYKMNQKARELGMTQTVFYDPSGLDARNVSSPRD GPAVAKMNAEAARLGANDTRAATPS GLEAPGVSSSPHD ESEFAQRMNAKAAELGMS GSQFRNATGFADPDQFTNARD EEDFARLMNERAEELGCTETNFVTPNGDHDPEHYTTAYD EA GFVTEMNAKAQELGLKTAQFTSATGLLDTTVIIAKD VENFAELMNEKA【SLGCTQTYFITPNAADEKGVHSSTAED VEAFARKMNARARSLGAVNSYFTNPHGLTGGG QHSTARD ETDFVKMMNEKARKLGMKHSNFKNCNGLDDSGKHFSSAYD DFPAKMNKTAKKMGLSNQSNFVSASGLDKDGKENVSTSKD TAPNDLFETLSMNDSEMDNATGLSNAAAWGNSTTTAPDQ EGEFVKMMNMGDPDYQFVNATGLSNSDLGENHPEGTEPDA
$V E Q F C A D M T Q E A R N Y G C Y H T S F E T P N G D D S A R H Y T C H D$ VEQFCADMTQEARNYGCYHTSFETPNGDDDSARHYTTCHD DILTKYFAQLG

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 LA R L T A Y AL H NPVF KRIVAT EDKSAPNPNESWHNKNKMLLR
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 $\square A \square M S R E L L K H K K \square L N Y T T \emptyset W M E T \square S E G R K T L A N R N K L V R$
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 LA R M M K Y C I MESSP QK D A S K T F Q DTT T GKKK Q Y V CN N H NA F L S A A LI A K Y I V T D H P D F A R Q S K K F R E R D A A P MV N L N WM L E A N
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 $L A V 1 F R A A L N H P V F A E A M P S A V F P A R R G E M V L V N Q N E L L Q$
 A ALLARHMI LITYPDFYK LIF GEREFTWNK DRQSNNRAMLAAAM GLMAS YL I Q LGGD R L F AT T S L Y D S Y $\square R E N S A Q K F W N K L L K$
 LARIMKYCIMDEI TRTESYEFTY LDDGSRSFSCNNHNAFG K L A LI M R Y A I H N DV F L K DT Q T E E Y S F K K R H F S L H N T N A L L H

 MA LLAR H I HTRYPEFFHYYSQ AEFEWNK LDQRNRNPLVAA MARTLTELYSGRLLNAENTRQLLSYM QKTNYEVLIPAAV MA R L S $~$ AA L R R N F P H H Y S Y F GQ T E VT VA GRT DK GHNKAMK $\square A M I$ A A Y G L R N P V G T K A S T $\square Y Y$ Y L Q P A GY K T Y C E N T N A L L Y ALMSRELLEKHPDDTKYTTDYMDSLRDGKSELVNTNK VVR



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 S S V C Y L E LG D Q Y T L R QL I Y G L LI A S GNDA GNAI A Y HV G G S







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 GS S M Y $\operatorname{S}$ L K K

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 C S CVVGVK P GRS Y T A R QL L D G L L LV S G N D A A N T L A R M L G G Q
 GS S $\square Y$ L Q I G E K

 $R G V S R V R D G S E \square S R H D M L L L A L M S S E N R A A T S L A E H Y \quad P$ S S M A GV V P G D QM S L E D L L Y GL M I P S G N DA A N A I A V H V G G S


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VIE 130
140
150
160 EMMNDKSKEFGLK DYKFVNSTGLTNKDLKGQHPE GTTPDE
 V ENFAILLMNQKACEI GLNSSHFDTPHGLLDNE E HYT TA Y E VPAFVTEMNQTARKI GMLSTTYYDPDGLPHPNNMSSPYD
 EDAFVAQMNERAAGLGMKDTNFVNCCGLDVDNHMTSAYDV VDAFARLMTAKAKELGATDTHFVNANGLPDDAMYYTAHD EQTFAQKMNQKAAEVGLSDKTVFPNRPKDDQGQTVMTAVD
 EEEFVSMMNQRAADLGLKNTNFMNTNGLPAENHYTTAYD VEQFAVHLNTYGKTTIGVNHTHFINPNGLFDKNHYTTARD EQAFVKMMNTKAKQLGMKHTHFKNCNGLDDT自EHYSSAYD VDKFADMMNKKASQLGCNSTYFTTPNGGDGQGDHHTTAEE LEGFVYMMNEKAEEIGMSNTVFNNPHGLDDHEEHYSTAYD GYOAFIAAMNAKAKALGMTHTRYVEPTGLSGHNVSTARD DAMNKKAKSDGMKDTHFVNPTGAENKQYKNEENNTSTAKD EKMNRKAWEDGCKNVCFVTTNGWDVADAGGNEHSASAAD
E E ETAFAQRMTALATRUGMUSSRFA NPTGFEDPGNRTTARD ELEKDNVNQKTWCDGPYGRERAA LGELMENRNMLTTNAAA ESEFVKMMNLGLTDFEFGNATGLNNASLGDNYPEGTAPDA EGAFVRQMNLRARALGLTQTHFANPHG LDSGENYSTALD AGDARADREFGDRRTYAPAGRCVDDYCW-GGTRTAASD VEAFADEMNRASAKLGMRESYWANPNGDPDDRQVTARD VEKFAEMMNRKAKEI GALNTTF QNPNGLPNKEHLTTAYD EEKFTELMNRRAAELGMNDTLFTECTGYYGDDAQYTTAHD TDKFVKLMNQKAKELGMTHTSFANPNGLDDEKHYSTAKD EGVFVKKMNLGMTQTTFANASGLDSVSAGRPGENDTSAND EQQFVALMNETAQKMGMDRADMPTKFQPKDKRETVMSAMD DVAVTKMNATAALVGAYGTNAGTPSGLDGPGDAMWSSPRD EAEFAKDMTKTARKLGMYRTTFKNASGLPNSAQKTTAKD SDYGFADMMNAKAWQIGARDSHFMNPHGLPDESHYSTAYD EHTFVNQMREQLVKWSNVYDGEHMYPGTQENDENLMSARD GGYDAF DRAMNAKAKALGMTHTHYVEPTGLSDNNVSTARD QAAVAKMNAKAAALGATNTQAATPSGLDGPGGSGWSTAHD

VSSFAGEMNRSVHSLGLKSLYFEEPSGLSPGNRITARE GGQRAF LEGFSYLMNQKAEEDGMKNTHFANPHGLDDHEDHYSTAYD S DI DF K T K L SVI M GHDWDPKE
A GVVRKANAAA GL K Q T K P F P G S
WGS S WT S PAD
$G G V K A F V A A M N A K A R A L G M T N T H Y T E P T G L S D N N V S T A R D$ IEGFVSMMNQEAARLGATGTHFVNANGTDPDHYTTAYD VQAFADMMNKKAKEDGANDSHFVNPNGGPDNNHYSTPYD KEMNEKCKALGLKHAEMVN PTGLTDYSNETYNKMTTRE ESMNEKAKEMGLEETTFVNSTGLSNSSLMGMHPEGTKARA EANFAKLMNQRAKTLGLSHSHFVNATGLPQEGQFVTVRD LEGFSNMMNQKARELGMKNSNFTNPHAWYDEKHYTTTKKA EKNFVNMMNKKAEEIGMDDTYYFNPNGKEPPDENMSTAHD EEAFVRKMNDKNTTGVDNKSSSLWPLGVPTDMETVMTAED EAAFAEMMNAKAASLGASNSHFINPHGLTSSE HYTTAYD EKMNKKAEKLKGGEHQFVNSTGLNNEDLKGGQQNKMTARG LSAFADपMNERAAQLGMQNTHFVTPSGLHDEQHYSTAYD TTAARTKSFIGMMNKKAKNTKFDSFDGISPGGQNYTTPSD TEAFVQLIMNDRAKVLGLAGTHFMNAHGYSDPNHYTTAND SEKFSQRMNEKAKQ1GMTNTNFVTPSGDDDDNHYSSAKD EAEFVKMMNMGLPDFKFVNSTGLDNESLGKNHPEGTDPAE GGYDAFIKAMNQKARSLGMKNTRFVDSSGLSPDNVSTAAD STSAFVDKMNERAASLGCNNTHFMNPSGLHDDNHYTTARD TTAKQILAEMGVN MASAFHFADGSGLSRNNVATPRA TSKFVTMMNQKAKKDKMEHTHFTNPFGAENDEDNSSTPRD DMARKEDKKMGПTDAEFYTANGLSNPGASDDAENKFSAKD EEAFVGMMNDKAAELGCVDSLFANPHGLDDDGFHHSCAAD QQAFADQMNKKAAELGMTHTQFQNPHGLDADGHYSTARD EAAKSALSQLGDSPNGYR WADGSGLSRRNAATPRA NDKFDKLMNQQASKWHLDASF DDNTDDKNYDLKDKGTSDQ RGFEEGAEAFGLHETEP AF HPSGRWGSTLTTASDQL GNDDNFVQLMNDMNDTRYYTPAGLPSSMTNKNMDDSTAYD EEKFAKLMNERAEELGAKNTHFVNASGLFEDDHM TTPYD VEKFAELMNTKAKDIGMKDTNFVTPNG LDAKNOYSTAYD YiJNYGSHQEGLIR TSGIQDTPQDLYQSNFACPS TQSFCDRMNQKALELGATNTHFMNPHGLDDPNHYSTAYD EDAFVNMMNDKAAELGLKNTHFVNPSGLEIDDPINQTTAYD EDAFVEKMNEKAFELGATNTHFVNCHGLHSD DHYTTAYD EDNFVALMNKRAKELHLNNTHFVNATGLPKEGQKTNLYDM

170
180
190
200 F A RFCAVYVRKYPDHLAQFHSLRELSYPQPHNMLKPQAII ENKMSARHLDQDFPKTLETAKIPKMTFQKNWNWMLKGLVK




 MALIA S Y GYS LDPGFE E IVS TKEDTFPWETHRGRNENQMLW IY L MF QEALK YDVF QDAI S EQYERTWYATSYYFTGA A A AP

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UniRef90_W4QX87 UniRef90 W4C3V1 UniRef90-UPI0004794BC5 UniRef90_R6DPS2

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UniRef90_UPI00030DE191 UniRef90_J0R008 UniRef90_R5HP07 UniRef90_K2ARE1

ACKLAR YLL N NHPEIL RISSSQMQKGMYMSNTNWMLSSIGG




 M A R $\quad 1 \quad$ M R Y C A F Q S P C R E A S R T I I Q D E S G N R S F Y
 MARRLAAY ILDTHRTRYELFS LPE FTWNR IF QRNKNPLLG $R$ L T H S I I G G VA V S S A R S Q A M M D LM K R S L D P A D LAE GA GV







 $L$ L A L L A A



 $M A L L T A R A M K N E K Y Q E D A G T K V H R A P N P N E S W D R M W K N K N$ $Q \mathrm{~V}$ R LT A LTT S DEA N R R Y V R R L M G D VA P E Q A W G V S V A G S D A













 IA Q MVK A A Y K Y P Q I R K Y S T T S V H T A Y F K K P R Y K LA Y T N T N

 F A K L A F Y L K N T Y P Y LTTS FT K H IT Y T S K P NTP Y E E H F H T Y H MAILSQQKLIQDYPEVLKTTEFDNGTDKTQMENWNWMLPGY
 MGRYA RE HYP LIDA SAVMTRSYT T TVGGEQRTFHSTDDLDD

 $M \mathrm{M}$ L G K R A D⿴囗
 MALLGMYATNNELFVK ITTNTRNYSFVSENGRRVNKDAGLD


## 






UniRef90 S3JTR3 UniRef90_J8J7Q3 UniRef90-K7SED4
UniRef90 A6TRH7 UniRef90-R7IVL8 UniRef90_G0JPF1 UniRef90-R7R3P3 UniRef90-A0A011A4T1 UniRef90_R6ND02 UniRef90_UPI00037A998E UniRef90-C6LCA9 UniRef90_UPIOOO4651346 UniRef90-UPI00047EA298 UniRef90-W4QX87 UniRef90-W4C3V1 UniRef90_UPI0004794BC5 UniRef90-R6DPS2

## UniRef90-W2E495

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UniRef90_D7GVVN4


P Y A Y NDGDKTGYDEDSGYHFVGTAERDGKRLISVVFGTDT FEYPGVTGKTGYTVKAKQTLATTAANPK\RLTAVVLNSNL TYQGITGLKTGSTSKAKYCLSATANRNGISLTAVVM LYEGADGVKTGYTK DAYRCLVSSATRGNQQLAAVTLNDGN MMDGALSGKTGFTQDAGYCYVGALRKDGKTVVA
 $H L D Y R S D W N \square Q L T K T G F T N$
$S L E G T D G L K T G S S D \square A D Y N$
SYQGADGUKTGTANAAGKCLVASATRDGRHLIAVVLKSSD


 $Y E G V D G L K T G F T T E A G Y S F T G T A E R D G Q R L V S V V M R T D S ~$
$D G F Q I V G G K T G T T G E A G Y C L V L Y S Y N P S G Q P I I S V V K A D ~$ DGFQIVGGKTGTTGEAGYCLVLYSYNPSGQPI I SIVVFKAD
RYDGCI GVKTGYTRHAGRJLVSAAERDGRMLIVAVTISDPD A ACEEVSLKNGWLGRWVVVSVGLIREAGHD YAVAVLTED $R Y P G A D G M K T G F T C P A G Y N L V A S A T H G G Q K L I A V V$
$R S K I V D G V K T G Y T R A A G R C L V A S A T K D G Q Q L I$
$S V V V$ RYKGSVGFKCGTGPSSGYFAAEGARRDDICCVVAVMM
DGC 1 GLKTGYTKAAGRTLVSCAQRNGQRLVAVTMQDGN KNDPNFKAKTGHTTKAGNNFTGTAVRNGMRLISVVMGANS RYPGAFGGKTGFTDDAKKTYVGGAQRDGRRLVVALMY

 NKWDI QVTKTGYTAEAGHCLVAMRTVINGKPVTLVVLD
$R Y P G A I G G K T G F T N A A R K T F V G A A A R D G R R L V I A M M Y ~$ DYPGVDGMKTGYTSAAGYNVVATARRGDQRLI AVVLGVAG EGSWPDSSKTGY DREAGRCLV MATQQNREPV IMVLG MYEYCTGGKTGYTKRAKRTLVTTASKGNDNLIAVTLNGPD ELKNGWLPRDRHGGRWTVNSIGGVRDGDRTLLLAMDER GVSVKVAHKDGDADEF KHDTADVYTD SPFILSIFTEN
 HLVGKSDWNI QVTKTGFTNAAGHCTVMNNRPVAFVVL
MNGKVFGGKTGTTKAAGYCLIMGTRTEDGREYASVIVGAD HYDGADGVKTGYTDAANQVFVGSATRNGHRLISVIM VVRGVDGLKTGYT NAAGRCLMATALKKG
 $R M E G V L A G K T G Y T S Q A G Y C Y V C A W E K E G R T F: V$
$Y Y E Y F L G G K P G Y L E E S R G N L V S D A K K D N V T L I ~ A Y V A ~$ SVPGVDGIKTGYTDNAGYCLAFSMMVPKNHRLIVGVVLGDG
YSYETDGLKTGYSANAGYCFTGTAEQQGTRLIAVIMGTES
 $M P G S V Q V Q K T G S T A A A G K C I L L Y D V D G N G N P Y I V V V M G A S$
$G R K G V D G L K T G T T D Y A G M C L T A T A V E D G M R V I T V V L H A N G$

 HKTTVDGLKTGYTDLAGYCFTGTAKKNNQRLI SVVMQTDS $K K W K V G L S K T G Y D D V A G R C L A M \square A N V D G K K L V M V M L$
$N K M G C L G G K T G Y T T T A G N T L V T F A E R D N M R L V C V V$
$P V Q G I V R A K T G T L D R G V R A L S G Y L D H R E H G T L V F S I M A N H$
 TEELPVDGGLKTGTSDDSAGACFAATVNKDGHRLI TVVMGAKH
 TYRGLLGUKTGAEDSGTA
PAQGMVHAKTGTDKGVRALSGYVEHPRYGTLVFS\|IGNH
PRVPVDGLKTGYTNQAGACLVATYRQNGHRMIA
GPEDTVGLKNGWGGLDTDNSVGYVAGPGREYLVAVLSDG

 KMSDADGGIKTGFTGNAGYCFVGADKNENKKLISCV
YVPEGMASKYGQYD DAYHDI GIYYEEGVPLYTLVLMSKN ATFHLESWKTGTTDGAGNCLAMYDTKDGKDYVVVASSGN GKNGNIGGKTGTEEQAGHCFVGFYERDGRDLVTVV ATNGYI SWKSGTTTAAGNCLILEFVKDDGDKYVAVI YYPPTVGGKTGYTKAAGRTLVSVAEKENKQLIVVVTINDPD SSDLKDELDRGFVNEGDDSII SSVKRDDYHYYI AVKGMFN $N N N Q V V G G K T G T T G A A G Y C L V L Y S Y N A S G Q P I V S I V L K A D$


| UniRef90_S3JTR3 | A GKSMAEGKA ${ }^{250}$ $260$ |
| :---: | :---: |
| UniRef90-J8J7Q3 | HTARFDETKKL |
| UniRef90-K7SED4 | K ENRWSVA Q Q If E Q V |
| UniRef90_A6TRH7 |  |
| UniRef90-R7IVL8 | K K D R R D S $\square$ ELI |
| UniRef90-G0JPF1 |  |
| UniRef90_R7R3P3 |  |
| UniRef90_A0A011A4T1 |  |
| UniRef90-R6ND02 | Y K VR F A D A S ALL |
| UniRef90_UPI00037A998E |  |
| UniRef90 C6LCA9 | NKADLEEMNELLLS |
| UniRef90-UPI0004651346 | REGRF |
| UniRef90-UP100047EA298 | WVPETDATDAVLASM |
| UniRef90-W4QX87 |  |
| UniRef90-W4C3V1 | REGRFVETRKDF |
| UniRef90-UPI0004794BC5 | PREKYDDTASL |
| UniRef90_R6DPS2 |  |
| UniRef90_W2E495 | D WA D HA |
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| UniRef90-UPI0002D7A6A8 |  |
| UniRef90-Q0AYH9 | R A G D |
| UniRef90-R7ANY5 |  |
| UniRef90-Q9K8X5 | PGASFSYNDTM |
| UniRef90-F2IZX8 | T DKMRDAA |
| UniRef90_UPI00034716C0 | K DHSKNEAIL P F V S Q Q Va |
| UniRef90-UPI0002F8B69B | YGARFKETGKLIF |
| UniRef90-G2SWW8 | GKSN |
| UniRef90-R5IZG9 | D WRDHTA |
| UniRef90-D2AZ47 | S P S M G G |
| UniRef90_UPI0004632BDD |  |
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| UniRef90-G4KPR0 | D WA DHAA |
| UniRef90_U1MZ46 | DQGRYTATKALL |
| UniRef90-UPI00035E679F | EAHRFTETKKVL |
| UniRef90-K5BK69 |  |
| UniRef90-R5YPA0 | GHKKVKERDENDSKMME $\mathrm{TS}^{\text {S }} \mathrm{L}$ N Y M |
| UniRef90-W6M3D2 | NSPNSNTLWAD ARTLLDY |
| UniRef90_R2P4F5 | LDQPNDE NARFAETSKLM |
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| UniRef90-E1R559 | PGENSRDGD |
| UniRef90_UPI0003B47138 | SEEN |
| UniRef90-A0AM87 | G G A |
| UniRef90-R5VSP3 |  |
| UniRef90-B5GU69 | RFRDAE |
| UniRef90-UPI000478E205 | G Q |
| UniRef90-D4L6Y1 | D WND |
| UniRef90-UPI00040BA012 | EEKRFEETAKL |
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| UniRef90-R6WBR2 |  |
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| UniRef90_UPI0004695833 | ESQEDVSR |
| UniRef90-F7V190 | EAQRFEDAKTLC E WVYEH |
| UniRef90_A1R036 | GVDNVGERKRAL $\quad \square \mathrm{AQKL} \mathrm{L}$ E Y |
| UniRef90_C8WAP1 |  |
| UniRef90-K9T912 | P R L S G K A L S K T $\square$ D D $\square$ |
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| UniRef90_Q0TNJ1 |  |
| UniRef90_UPI00039AA42E | IQ D T E D A E K L I R |
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| UniRef90-R5HP07 | GK S N |
| UniRef90_K2ARE1 | P H R WQ D $\square$ R A $\square$ |

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UniRef90 CoXUY6
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T पNQVVEAYロADQGSQロAFSYKNTKTNEEYGKREHEP GTSSYIVMDSDSNAVLAKNEHEH SAVLMDAVTDTLLSKNAKDK AAALEDLTEDTMFGKNAHER
 DTSADQQPVVAAE GAVLMDAATGNVFSKNGETK DDLRVADKP\｜LENYQTT四EMGIGTPTECLVDYQSQKS促 ETYKGNKVSYYYEDAGTGEVVEKNADRK SAKLNKDSSSNEPKLDSRLALVYDRNSGNVLEKNGHKT LRDTDDALS DRSSVAVMDQNTNEVFQKNAAAV DKLKRDITAALANRRGTVAVGLHDRATNTTCSLRASSA SALLEPSUNA【IGKYPNNWGLEVESLTDGTVLSHNADKF SLVETVQAYMAEFGSQVAFSYKNPATGHAFSMNDTEP SGDGAGSGAVMENGEANT円YGKNEDEP AMRKALDADPK SDGRYTVAVEDLNGRAAAVYGGTGA DK LEKDDTAALAKRKSSVALGGYDRSTGTLCTLRATSA AAFMIDAETGTVFSKQPDKP AAAVFNTSTQKTFSKNDYQR
SADADDSDSGQDLAKNADKT YLMDAASGEPLAKRETRR VIDVNTGRMLSHNVDGL
GAYLLDTGSGEELAKGADTK AGVQVSARAVDLATGAVFSVDDHVV GVVLMDKNTGHLLSKNDDTQ CMNADDOSVAQKNQDEK Q $\square$ ATQYGYTGUTAAYDPETGQULNYHGNKK HALLLADNHHLLYGADTL
D पGSRAAV VMVNTDTGEVLARNAFDR VADMDSGQ A A D DDRR
$G \nabla Q \nabla S^{A}$

LSAVLMDGENGRILDKAGEEVV TUAVALHDRTTGTTCTLASTAA DADSGR LSKNKEEK
 SALVTDLKTNEVISSNPDAV GQAVIDVDG $\square N R \square P D P \square A \square R S S Q A V V D P R N G$ $D \square Q A E A G V$ VIDMDSGADLGGKADEP VVDADSHQVLQEDAGVP ATVDSY直AGRPGSTGYVVRDRVTGKVYSNDQSEP VFDLDSGEJVLWRRSATR
ASGSAMIVDLNSNKV QSHPDRV TSVINETNDYYNKSTNRFAYKYVDIYTGGTVSYNENQU
EPNVNARCAAAVYNANTGELYEKNGDTQ EPNVNARCAVALDSNSKVVVYEKNAYEL AVVLDDADNKEUFAKNPDKW
SAYFVNLDTGDVVEQNADEQ पRDTEDALA LRSSVAVMDQNTNEVFQKNPTAV AKLSKDLGVALRGRASSVAVSLYDRKTGTSCAYRAASK AVYYVDEKTNTLLAAHNADQV SAFLLEPTTRTVGEKQADLP
SAVLVDFDTGQUGQSADEP
SAIVSDTDTNRVEKADQV TGKILFKNEDLK SWITSDDDTGEVVAKDPHGR STALLHADTGKVLGENDDDR
AELVAEAG


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UniRef90_R9KGT8 UniRef90_R9KGT8 UniRef90_G5HP92 UniRef90_W3AQF1 UniRef90_C9ACN0 UniRef90_F7Z174 UniRef90_C4ZJC2 UniRef90_UPI0001745D90 UniRef90_R7HHU3 UniRef90_R7L7C0 UniRef90_V2J5X8
UniRef90 L8PDH6 UniRef90_L8PDH6
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UniRef90-R7HJ00
UniRef90-R7HJ00
UniRef90 E1L3Y9 UniRef90_R8VX28 UniRef90_G9RVV9 UniRef90_G5ICX1 UniRef90_Q1LP36 UniRef90-I2N022 UniRef90_UPIO003768B42 UniRef90_-R7X8Q8 UniRef90_G0GD35 UniRef90_A0A011RLI7 UniRef90_E0E2A6 UniRef90_E4Q175 UniRef90-W5XQN8 UniRef90 F4DKI8 UniRef90-FOL3Y6 UniRef90_W3AQP2
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AVVGEETARLLGGLTATRMERLIGGDAPADARGETNEDSAAD I E GF VY L M N EKAKE DGMK DTHFSNP H GLLDGD GTHYSS A Y D EK FYGMMDKYGKSKGDVKT GQMHGNKTTTTDYY QQVWKHQD NEAFAELMNQKAAELGCTDSHFMNPSGLDNPDHYTSCAD MDEFVRMMNDKAKNLGMENTTEDNSSGLENDEKNTSTAYD V K K F V E LM NQRAA QL GCKNTHENNNPNGLP DETHYTTAAGD TEEFTK LMNQEAKKLGGATNSNFVNPHGLQQ DEQHYTTVVYD EKKFVELLMNKKAEEMGLYATHFTNVVGLH DPQHYSTAED NVQFAEKMNAKAAALGCTNTHFTNPHG LNDSNHYTTPHD
 EKNYLNMMNKQAKAFGLTHYKFVNATGLNNKDLQGMQPAG
 $M D E F V K K M N A R A A E L G M K D T R F L N P H G L P A D G Q Y S T A R A$ ET L K E Y GQS L GA K IE GFAKLMNQKAAELGLKNTNFVTPHGGLDSEKHYTTAYE
 K
AEAKAALSELG
DVQKFVDLMNSEAKK GANNTHFNNPHGLPDPNHYT TAHA DKAYTMFGKYGESKGEVKTDRQEDN KTTTDYY E EGF $\square E M M N K K A E E \square G A L N T N F K N P H G L H \quad D E Q Q Y T T A Y D$ $K G L D A A N K R L G L K A T H G D P E G H W \quad G L T R T T A A D$ V S AF A QKMNRRAGQLGCTNTNNGVNPNGLNNANHVTTP H D VEEFSNLMNQRAQEIDGCQNTHF VNPNGLHDPNHTTSAY D EENFALQMNEHARQI GLPDSTFVNATGLPAGGQKTTVRE
 RPQFI RWMNEEAARIGQNGTRFSNPHGLPDPSNHYTTAFD QKAF IN QMRAQVKKWGNGNLGKDAYPGINKNAENTMSAKD



 VSAFARKMNEKAA S L GMKQTHFVTPNGLDAKGHYSSSS D RENFVKMMNDYAASLGCTGTNFMNPDGLHDPNHYTTAAD VTSFTK LM NKKAKELGMTHTYFTNPTGTTN DNNSTSTTAK D T $\square$ S R W A E HF P P T R L N R A L M Q S HA DT DN W $\square$ T A EA EAVNALA Q QLGMNDTRVATYTGLDRPGMSSSAWDMAALA P SVVE E FVGRMNREARNLGLAQTRFVEPSGDSEENMTTALE
 $D V A D A K M N A K A A A D G A V D T H A A T P S G L D G A G G S G W T T P R D$ E DEFDKAMNQKSRDLGGLVNTNFT NASGLDAYGHFTTAHD EAVSARTEALGGLTRTGLLDLDARDHRGPDDAPQLSVGSANE VAAF VGEMNAKAEALGCKNTHFVNPHGDHDS QHYTSAWD V E GFANDMNDFARSIGVLNSHFESPHG LDDSQKHYSSAY D
 TRIKAF LKAAGM THTTPGSGGYWGLTRITAQDA

 EATLEMVNERAREDGTEDTFVATYSGFGLDAPGMSTSAYA G G Y K A F I K A M N N K A K A L G M K N T R F V E P T GLLS EKN V S S A R D EK A F V K K M NAAAEDLGMTNSHYTDPSSGLTASTVVSTAAAD G GVTA F V A A A N RK A R E I GMWD S VF LDD P T GLLSASNV S TAR D

 ETS F V R RMNEAAARDGLTGTHFT NPNGLEDRENYTAARAD DR MAFVNAFRANGMSGLAPQPTGGHPFPDWGFLQQCTPAD T DAFVEKMNAKAKEDGATHTHF VNANGLHSTDHYT TA Y D ERMNSQARALGLRCTRFDSPSGFEEVRLQRQARNRSCPAD


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 VENFAKDMNRDAAKAGAKNSVF LNPHGLTQMGHHSTARD
 $R D G F V E M M N A R \square A Q \square G C$ TGSHFKNPSGLNDSEQVVTAYD G G L P AF VGAMN RKARE LGMS DSHFVDSN GLLS S SNVSS A M D

 PD DPAFASRMNRLVHAMGYTHDFFEFPSGLSPRNTITAR
 EDMNAKAKE $\square G M E N T V F Y N P N G L P T S \| N V G G K P N K T S A R D$ VKKFVNLMNKKAKELGLSNTVFSSPHGLEQQQHYTTAHD

 REAFAE LMNKKARSLGCTDSNFTNPSGLFNENHYTSAYD ELLK Q IN NVNQKTWCDGYYGR EK QFVGEKGENRNRLDT TN A VKK KVELMNLKAK QLGCTGTHFNNPNGLPDELHYT TA S D GGYAAF IAA A M N AKAKA LGMTSTHYVEPTGLDVVNVSTARD VPRFVARMNWEAARLGAFNTAFE NPNGLTAPGHYSSAYD


UniRef90_UPI0002629AF2 UniRef90-A7GNO7 UniRef90-TOV3S5
UniRef90 U2UOX2 UniRet90-R5MX60 UniRef90-R7CDV8 UniRef90-R9KGT8 UniRef90_UPI0001C37CA3 UniRef90-G5HP92 UniRef90-W3AQF1 UniRef90-C9ACNO UniRef90-F7Z174 UniRef90_C4ZJC2 UniRef90_UP10001745D90 UniRef90-R7HHU3 UniRef90-R7L7C0 UniRef90-V2J5X8
UniRef90-18PDH6 UniRef90-L8PDH6
UniRef90_EOU6V9 UniRef90-T3D7M5 UniRef90-UP10003A1C42E UniRet90_UPIOO037423BA UniRef90-V6JEU9 UniRef90-H1HW21 UniRef90-UPI00035F80F1 UniRef90-D6GSC8 UniRef90-UPIO00463EEBO UniRef90-F7V634 UniRef90-F7NGJ2 UniRef90-F6CDH8 UniRef90_W2EKS2
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| UniRef90 | UniRef90-B5XDZ7

UniRef90-F81603

RAGVPVGSkSGTVP GYRHDV|AVIGTPGTTVQRVLAVLTA YYEFATGGKTGFTKKAGRTLVTTASKNGLDFIVVTLKASS

FYNGVFAGKTGYTMTAGNTLVTACKRNNMTLICVILNGHH SYKYTIA GKT GFTKDARRTLVTAALKDDKKLVIVT HKMMVLGGKTGYTDAAGSTLVTYAKRGNSILIAVVLNSTN EGVQVI GGKTGTTSDAGSCLVLYSKKGEKPY: SIVLFKADN HKMGVIGGKTGYTSKAGNTLVTAAEKDGVRLIAVVVM
SGGEAMMAKTGY ISKAGNCAVSYFTSASGRHYICVTGKTQ QPACRDFNKTGRLDR DEHDVAY DQA NETTII AAFSYD GRQGVDGLKTGNTDKAGYCFTGTAKQNGMRIITVVLHAED PEWTISVSKTGYDSEAGRCLVMQTWD HQQPVVMVLMDSS NYAFCDGMKTGYAQAAGYCLI SSGEKDNHRRIVVV $\square K Y N Y V$ RKYGSYDDA YHEAGYVETS K KPYFMIILTQL YLNGVYGDKTGFTNGAGRCLVTSCKRGEDDIITVVLGADT GNWDI GLQKTGFDSEAGRCLVMQARVGGRDVVMVFLDSSG PA GVSVAVKNGWLQRWRVHSVGAFKGGGHDYVITV LTH GA V FAKTGTLS GVRALSGYMNHPQYGMLVFSIVANY
 Y GSAGGPAGLNGWDPRSGTNSI GRVVYGGRTLLVAVLLSR YYPGILGGGKTGYTSAAGNTLVTCAERNGVRLIAVVMKSKR PATVAVHVKNGWDQRATHHSLGTFDGAGHDYMLSVGLTQ NKFLWDGIKTGYTPEAGKCLVSSGEKNGDRLIAVVM $M D D G A D G L A V G A S E Q D G F G U V G S D N Q G G R R V V A T M S G D A S$
$A G Y T V I D G K T G S S D S S G Y C L V L Y S Q K E Q G D D R M I S V I D M K S ~$ TFYGVNGVKTGYTKAAGYCLVATARRGDTELIAVILNSPN QAYPVDGLKTGTTDAAGACFIGTDKHSGARLITVVMGARH

 D K
S Y DGA $\square G \square K T G F T S K A G Y C F V G A A R R Q D K T L V S C V$ YYEYAKGIKTGSTSEAGYCVITTASKDGYNYLA IV SLPGTDGLKTGSSDDANYN
AFVGWTAGKSGELSNC EHDAACFAAEGEQLYAVVLTTYN NDPEGDGGKTGYTDDANHTFVGAVNHDGRRLVAVVLDTYV TLLTRFEGKTGYDDEAGYNDALTAARDETRLIAVVLGAPA
 RYPGAIGGKTGFTNAAKKTYVGAADRGGRRLVIAMMY
 LNGDAHGIKTGSTSQAGHCLVSTATRGTRSFDSVVMGGDR R $\square P G A N G V K T G Y T G Q A G K C L V S S V N H D G R N I I I V V$

 EYKYLISGKDGFTKASGQVFVSAARKDGKTLVVVSI HRDYVRGMKTGFTTDAGRCFVTFAQQDGHTYGLVVLGSD
$N \square N V K V A H K ~$
$N$
 $R L V N D N W K D D D T K T G F T N A A G H C T Q M G K R Q V A F V V L D T K$
$P M D G V V G I K T G T T K A G G N L A A E K E I G G T K Q L I I G A V L G Q$ QQWGLTVVQKTGFDNEAGNCVVMQARVNGRQMMVVL MERTRVATKYGADD DRRHEAGVVFDEAGAPLLVYAYFAD YYPPVKGGKTGY LLKAGNTLVTYAEKDGKRLISVI NDPDGIGGKTGYTDDAHHTFVGALDRDGRRLMAVVLDTTA $R F S G T I G M K T G F D C A S G R N D V G L A T R N G R R V M V V I L G A T T$
$G A D M Q P G L K N G W S D E W V V N S V G F A G P D E R Y T L A I M N H I G K$ VANWVLGGKTGTTQAAGYCLIMASDGDDGKEYISVVLKSA $P Y P G T I G F K T G F T N V A G R S L V A G V E R D G R R R R L G V V L L H S ~$
$E T P K A N G V K T G F T G K A G K C L V T S V D I N G H D V I F V V L N C T$


 KYPGANGLKTGFTNAAGECLIASATRNGHT MMIVVMDND
 $Y R S Y\|K G\| K T G S T Q A A G R N F V S A A V N D K G E T Y I G V V$
$Y C E G A V A G K T G W T S \square A G S T L V T Y A E R D G R R L I A V V$

LD GVDGIKKTGSSTPAGGN
 RYPGLEGLKTGYLEESGFHVVAYARRGPTSLI AVLLGUQA ARSDVDGLKTGTTSFAGATFTGTAEQDGRRLISVVMGAGD LIANVDGLKTGFTGAAGYCLA
LYPGAEGVKTGFTKKAGRCLVTSACRDDFRVICVVLNAQD NDPDGDGGKTGYTDDAHHTFVGALDRDGRRLMAVILDTTV YYPAALGGKTGTTKSAGKNLVMAAQKNNRKIITVTTGYSG
$\square$ G GLLGLGFAEGSGFAAVVS SDKRVVAGKTGYTKDSGNTLITMARKDDRNLVAVV NQ QTKLWSKAGWTSQ VRRHDAAY DE IDPNLPPFLLVVFTEG HKMMVMGGKTGYTDAAGNTLVTYAKRGNMRLVSVVM $H L V N R A N W K T G F T D E A G H C L V$ LVTSMSNRPVALVIL


| UniRef90＿UPI0002629AF2 | $\text { GGTEQQATGROHATARRLL }{ }^{260}$ |
| :---: | :---: |
| UniRef90－A7GN07 | DWDD |
| UniRef90－TOV3S5 |  |
| UniRef90－U2UQX2 | S Q Y S D |
| UniRef90－R5MX60 |  |
| UniRef90－R7CDV8 |  |
| UniRef90－R9KGT8 | P D N【Y Q ${ }^{\text {a M E E M L K A }}$ |
| UniRef90＿UPI0001C37CA3 | N WN |
| UniRef90－G5HP92 |  |
| UniRef90＿W3AQF1 |  |
| UniRef90－C9ACN0 | K T G S GQG $\square$ S W $\square$ R E $\square$ G Q TVYQ |
| UniRef90＿F7Z174 | A NGN |
| UniRef90－C4ZJC2 | GRYTRTADAKRVRK |
| UniRef90＿UPI0001745D90 |  |
| UniRef90－R7HHU3 | NKES YKKKFVNDTSKLLLN |
| UniRef90－R7L7C0 |  |
| UniRef90－V2J5X8 | NLTRFADANRV |
| UniRef90－L8PDH6 |  |
| UniRef90－E0U6V9 | PFES RALVSSIDKIVLQ |
| UniRef90－T3D7M5 | A DLY L D S R |
| UniRef90－UPI0003A1C42E | LGGS TEESDEI |
| UniRef90－UPI00037423BA | GERDQRYRDAA |
| UniRef90＿V6JEU9 | GQPTYKTGVDLVERAAATAVKAF |
| UniRef90＿H1HW21 | T Q |
| UniRef90－UPI00035F80F1 |  |
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| UniRef90－UPI000463EEB0 | DRERAEEARKLL |
| UniRef90＿F7V634 | D TKENLTY |
| UniRef90－F7NGJ2 | RYQDAA |
| UniRef90－F6CDH8 | Q D G D P S |
| UniRef90－W2EKS2 | S D |
| UniRef90＿G2KRQ9 | S Q P |
| UniRef90－D9WQP3 | A A D RYP A A K M L |
| UniRef90－UPIO003B4C5F8 | D D T D L S A L G VMRA VGRDLLE Y V |
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| UniRef90－R5KNY6 |  |
| UniRef90－D3QF78 |  |
| UniRef90－UPIOOO2491518 | HRREDAMCFN＿QQVGQLILDD |
| UniRef90－C0XUY6 | NKARAQQAQQLLHE |
| UniRef90－F5YII9 | S Y G G R $\square_{\text {R }}$ D A |
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| UniRef90＿UPI00035DBE24 |  |
| UniRef90－D9PKA1 |  |
| UniRef90－U2RAZ5 | T E LP ERLAVVI |
| UniRef90－R9M1Q3 | T E |
| UniRef90－S6EZR6 |  |
| UniRef90＿H5WIJ6 |  |
| UniRef90＿R5K9P6 |  |
| UniRef90－UPI000414ABFO | D NRTMGDGVHT\QAVARAVHKDL |
| UniRef90－R6BM04 |  |
| UniRef90－D4JZE7 |  |
| UniRef90＿G5KGB2 | S E Y D D ${ }^{\text {a }}$ T A $\square$ A D DVY E $\square$ L |
| UniRef90－C8NM05 | DKGRPEQARELI |
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| UniRef90－E7RX37 | D S Q R Y S RVA DANR！ |
| UniRef90＿K0FOU0 |  |
| UniRef90－R5T7J4 |  |
| UniRef90－D7WAJ9 | DEARAEQAQRLL HE |
| UniRef90－W8IKD1 | ERERNERSAQYLT Q |
| UniRef90－UPI0004653F5E | DQGGYTDGEQTTTHVAELLF |
| UniRef90－R7AIJ5 | NRPS |
| UniRef90－H0E1G4 | PDPGRQA |
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| UniRef90－R7HDP7 |  |
| UniRef90＿H1LTG9 | T H Y D D |
| UniRef90＿A5N7M0 | S P GR WEET DK】 |
| UniRef90＿R7HJ00 |  |
| UniRef90－E1L3Y9 | D NRWNEA |
| UniRef90－R8VX28 |  |
| UniRef90－G9RVV9 | A P WDAAEDDYAYSHDTAT $\square$ Y D W |
| UniRef90－G5ICX1 |  |
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| UniRef90－G0GD35 | $P W E G M Q E R D R Q \quad A A A L L D Y$ |
| UniRef90－A0A011RLI7 | GFTNRGQRFD ETSRLL |
| UniRef90－E0E2A6 |  |
| UniRef90－E4Q175 | M WNDTR |
| UniRef90－W5XQN8 | DHGPRAWQQA Q L |
| UniRef90－F4DK18 |  |
| UniRef90－F0L3Y6 | DK T R Q E A R R V V |
| UniRef90－W3AQP2 |  |
| UniRef90－B1WYX1 | QKNS QNKN【LPF】S QLVLEMF |
| UniRef90－R5XDZ7 |  |
| UniRef90－14Y1V1 | DAFGKY H F A D A R $\square$ |
| UniRef90－F81603 | RWGEA |
| UniRef90＿UPI0003AAFDBF | $\square \mathrm{T}$ Q R A A D A K K L L |



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SAAATKTVSKVAARA AYVMDAQSGQVLQQNANKK
KNDKLNEEDSNIISEVDGSYQVAlVKEGGSGTVDVIVNADLS
KNDK $\square N E E \square S N \square I S E D D G S Y Q V A V K T L E G D S D V D L N T S E S$
$A A Y A D D A E S G Q V L Q K N A T K R$
$A V L V Q D Q T S G E E V E R N S D A V V$
$V V A D A G S G A M L A H N A H L D$
EALVAGVDGNVTVAVRDTVTGRTTAYRPDPT $L S G R L G V A E V D P A T L R A V A E N P D G V$
 $S A L V V D V N T G K T L Q K N A T R V$ VL NANTGK IL HYNHRTS SYIVKDGCSSSVVVAKDlDRD SAI ALDKESHAVFEQNAYEI
 DLQSRVAAYIATRPGVVSYVLRDRKTGATYSQHASEL

LAEALKGRDGTFSVAVVDVADGTSAAYSSDRT

EK VQALLTRKKPNYS $\square Y$ VK Q $\square$ K T RKTAG $\square N E D K S$ DYKSGQI L GYNLDEII
 SUF KEOSTGRSLFEKAHK LMEDTGSNKELAKKAANTK GAYLLDTGSNKELAKDANTK
QKAGLAAK LK D TT A A L K G RVSVLVNDRVTRTSCVLRPDQA

 $\square$ YVYDRESDQI YEESAGAK GGYVMNSGTGRSLTKAADTR
$G A L M D A D S G V L G K N D H E H$ GA $\begin{aligned} & \text { ILV M A A }\end{aligned}$ DARAA $\square$ A LDSKSK LVLEKNSDMD DMQEFAAAFTDF LQQRGDDFSFAYQD $\square R S G E R Y E Y N P E Q R$ K V S A G L F D LT NKET LA QNVNER KATVQAAE $\square$ SQPN VVGKYALDYDTGE I IYAKGDEK IDS IIINRAGGKWGUVVESVSNPA IVSHNANQF VD Q $\square$ E A D GALLMDAKSSTLLAKNENTH SFIVADADTGEVLAKDAHRQ L I DQDTGRVLEKESDVK


Y QKNADKS
LT QTVAAEEPTVTSETAD D $\square$ SKKSGEVLAKQADKQ
 $A D \|^{A}$ VMDADSGAVFGQNDHVQ MDSESGRVLEKDAYEA
 SATI
EED LISRYAV SAI 1 MD A Q S TGAVLSKNADKA
ENELQKKGDEWAE $\square Y P N S D E F R V Y D D E N E E S Y T Y T N N E K$ NQQLKTQ DDQY ARLSLAACGPDAGSAVASYGDGR EDALDLLKSSVAVIDQETSEVFSKNPQAV LS GAVAAALRPRHSSTAVALYDRSSGTTCGDRASAA $\left.\begin{array}{ll}A A A V I H A D S S G K & L\end{array}\right)$ SAGLMEAESGQIVAKNANQQ LLD G GLLFGKHADRP GAYDK
$H A D Q R$
A LSHDLA GALQGRQGTSAVALYTTESGQ LCQYAYASQ LA GAMASVTVPDGAEVSVAVVDTGTGGAAAY GTGD QAENADDSRVSVLLWDEGSKSALFRRQDAP AELEEQAAALGGDVSUYVYSDDDKEVESKNPDKK VVNKDTDALLQKNGTDR AVLYDATHDRVLYNADAQ GTlVIAQKNGQVLSDDADTK GAILIEPKTNTII SKNMYQT FLVS DDDGTVIDKNADKK
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UniRef90_UPIO0
niRef90 F0Z1D4
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UniRef90-M0QMN9 UniRef90-M0QMN9 UniRef90_W4BSV6
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 $H P T A S V V K L G I L A A L L L R A Q D T D R E P$
FP L A S T Y K Q A V L WAV L R E DD A GRRLRPNERFDVSHE








M Y S A S VT K L P ILLY F IE K Q IK D S R VK LTTDKFK YK G A Y K VEG

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

 F D S A S VVKTTTVLAAALL






 LIPA S N N KL FTTAAALQQRLDSRALI QS KS L



 Y




 VD P A S L T K M M T M Y L T L E QVE N G NL S L D D TVVK FD S A SVVKVTVLGALL RQTE
F D TA S I V K V DV L A A L L L Q A E DA GRS L
HPPASTTKLMTALLVYEKTRLAGE VVVSHEDLSGE YA PA S IT KVVLTSSI I VLEEQC

 HYPAS DT K L M T AL L V L E H C $\quad$ S WP LAA S M S K L M T L Y L L L Q EM D K G E DT F N T KVVK VT D K F Y L P A
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UniRef90_G5I9H4 UniRef90_UPI000366CACE UniRef90_Q252S9 UniRef90_Q8ERG0 UniRef90_R7CR33 UniRef90_A1U6Q4 UniRef90-R6L4G4 UniRef90-K9AXE1 UniRef90_UPI0003813691 UniRef90_UPI0002D31B5C UniRef90_UPI00037D4EF6 UniRef90_R6YXJ7 UniRef90_B0S3G8 UniRef90_B0RFF5 UniRef90_R9JXN6 UniRef90_D6DIK7 UniRef90_B9E9F6 UniRef90_F2JQ40 UniRef90_R5MID2

G G R T A L $|A| V N S A|L| S|V Y| L L Q Q S \square M N S D N T A T N D L D R$

 S S L IF L R T GE Y $\square$ S V H DLLLA GMNIAAS GNDAAY T LA Y A VA G S $S N D I H L M L N R S D N Y A T N R V A D V L G G F$


 N Q S L G A Y P F D G T A V R D L T V R M I H K S D N T A T D I L A R R V G G A QTCGDK E GDQMTLNQALHLLLIDNSANDAAVLIA E GI A GS GSMYSKK GDKFTLNDLLHGLLLRSGNDAAMTISSNVMKY



 TGPDKDLMHQMLNFSDNDAANSLWDKYNGP GSAVGLGPDGVYTVEQLLQGLLMASGNDAAHALAQAVGGD
 E Q $\square C G L Q T$ GDTAT LTY DLLNGLVLYS GNDCAVAIAEHLA GS
 S GEMPKKADNKYY TVDSLKAVAQHSDNVASNAGLGMLGY




EDPTDSNPGMT Y TVRELVNASMVVSANSAADALAEKVVAGS
 GDSCGMGPRGKYTNRQLLTGLIVVSGNDCATAMARELGGR S S MA GFREDEEVTYYDLLYGTL LTTS GGEAANTLAVHVAGS

 GS TVGYYK E G E IV V E ERE L L Y GL M F K S G N D A A DA L A E NVG
 T S LVVVDLV T GTTTS GPE IAAAGPFWKQQRNNVNRYF QS L N WP A QKI GLK E GDRMT LDQALLH LLLIDYSANDVANLIDATNIS GS




V



 $E D G S$
$C$
$C$
S A V

 S S S $\square$ Y A D T GEEFT $\square \mathrm{E}$ D
GQNPQYYFGAA $\quad$ P $\square S E L I Q Q$
 SNH $\square$ LDVGEQ $\square$ TAEQCFYG\|LLQSANEAS\|GMAEHVAGS F S R S R L A V G T R LTRE DMLH LAALMSSENRAA HALGRABF G A S S S A GLDDVGDTLSVRDCLYAMLLK SANEVANALAE HVAGT EDHRADTP Q EKKRATAMITTSSDNDATSALWGQVGR

 NA WSR $\square R V G S Q L R R R D V L R \square A L M S S$
 P S LAAKLNA GETYTDDQLLKQTAIVSSNAATMVLGRKIAGS EAHRA LT A H E VVA L T T A M M T T K S

VSTVRLLDGDRLLVTDLLVRALLIDSSSNDETSALWRTIGEA

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## UniRef90 UPIO002E736A9 UniRef90-B1HSI2 UniRef90 Q03TN5

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UniRef90 UPIo00363BEF5 UniRef90- FoZ1D4 UniRef90-UP10002DB788D UniRef90-C8C0L8 UniRef90-U3SUB1 UniRef90 E4KWX1 UniRef90-R5R2R3 UniRef90-B9DSP8 UniRef90_UPI00040BEF37 UniRef90-G2P515 UniRef90-XONEK3 UniRef90-UPI00036C3B2A UniRef90-UPIOOOO477038 UniRef90-R6FHS8 UniRef90-MOQMN9 UniRef90-W4BSV6 UniRef90-UPIO002DF847C UniRef90-F3B156 UniRef90_UPI000287BA30 UniRef90-UPIOOO2899F0B UniRef90-D3QYV7 UniRef90-14HGV1 UniRef90-UPIO0047AE61F UniRef90_B1XI58
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130
140
150
160 ERKFVNLMNEKAQQLGMKNTHFMNTTGDHHSADHYTTVVKD NAKF IQQLMNQQSRDWGDDAHFDSSSGGLDNTDDKDYHSAKA IPAFCTRMNTLVQKWGLTRTRFVEPS GLSEHNDT TAR D STVNKT IA K L G L N RTS L N R K LA H S GKENMVDD VS D
 GGHSAF DAAMNHKAHELGLVDTRFFDSTGLNPNNVSSARAD EAVLDRMNRLAASLGASETVAGD PTGLDAPGQHTTAHD


 GGRQAF DRAMNNKARQLGMRNSRAHDSTGLSTRNVSTAQD ESHEVKMMNRKARDLGMKNTTFKNSSGWHHPYQLTNVVDLD EAQFAERMNEFVSET【GVKNTTFQNPHGLFDQKHQTTAYD AFVASMNSRARA $\operatorname{V}$ GMMRNSRFTNPAGFDKGIYAGNTSTA GD

 $H V S R F V T L M N R T A R Q L G M T G T T Y Q D P D G L N P G S R G T A W D$ $D G L D A$ ANERLGLLTGTTGGDGPLWGLTQTTAAD VEAFADMMNTEAAALGATNTHFVNPHGLQDDNHYT TAYD T D GF V K K M M N D K C E D L G L K N A L M V N N T N Y E DT D Y N K M T T R E A QT DSF IAAKLIPRSSGQIAYTE E EMSADHDKAYSNYTSPGG

 VIDAFVELDMNQKAAELLGCTNTHFT NPNGLPDENHYTTA H D MEGFVVLMNEKAEWDGMTNSSFANPHGGDDQENHYSTAYD DTTAA ERKMNAKAKDLGGLANTNYDSF DGVVSADSSNYSTPR D DTEDARNQMNAEAQQLGGMTSTHFDGVDGFSDGNNHSTARD TRDKGFLAAAGMT KTVPGANGYWGLTQDTARAD EPMRAKLEE WG■T DYQ IVNSSGGNNSALNGNDYPNS GEND SEAFAKLMNERAKQAGATDTHFANPNGGLHDD NHYDTA Y D

 DE EFANMMNQKASNLGCTDSHE DNPS GL NSPDHY T SA Y D ARVKNFISKMNAKAKSFGMKNTSFDFDGGGNGKNASTAQD K NVD GFLKLMNEYAVE $\quad$ GGAFNSHFESPHGLDENHYCTAYD $E L A T D N V N Q K T W S D G P Y G R E R A R G G E L L M E N R N M L T T S N A V A$ IDD F V ELMN QEARA AGATNSHFENPHGLTSDE HYVTA YD



 EQTLLAMNAEAAWLNARDTVAKTPDGLDAPNQASSAYD
 S DERFCEMMNEKAREDGAKNTNFANASGLYYSENSYT TA YD
 SADVNAE DRRMGYT QTTLLNRYMRMQSQDDA GLENY DNVHEA E DNF AKEMNKKAKNLKSQKYYNASGQNTKEDKQNSSSAK D E EAFAQEMNEFLDEDEDGVTNTHFTNPHGLYNANHYTYA Y D RTE F L N L M NAKAK QLGMKNTYFANPTGGDEDENNSYSTA Y A $\square$ ALEKVNALA QKLGA RNTRAATYSGLDGPGMSTTAFD
 TEN F V M A M N A Y CA R L LE GF TQMMNEKA LDWLGMNNSNFENPHGLDGEEHLSSSAYD Q E EESFVNMMNDKAMQLELGEYGDDYKFVNSTGLDNQYTVRA

 VSAFADMMNQKAADLGCKDTHFVNPNGLHDDNHYTMTAT A GLRAANRLLGPARRTEP G GLNAFVDAMNFKAASLGMADTHYVEPTGLSSNNQASAPD TEDFAVLMNQKAASLGCQDSNFA NPSGLNNPDHYTS VY D $G G V Q H F L D L A G M R D T E P G P R G S W \quad G L T Q V T A R D$
 V D A F VQ DM NTRA QE LGGCTNTVFT NPT GLPDENQHDTA H D GGFDGFVAAMNAKAKA LGMLQTRFVDPTGLSTDNVSTAAD $T E N F V$ S MMNAYAA QLGGCTGTHFTNPH GQQ DENHYT T P Y D VHAFV TAMNARAA GLGLTGTRFATPHGLDAPANQYTTARD

 VVAF VA EMNARAK G L GCEEKTHF VVNPS GQTEPGHMSCAS D
 ERVEAALA D L G H S D P
QA $\ Q \square F M D K V N E K A K A \cap V I D S N F V V P D G Y D A E G Q Y T T A Y D$
 DKMNQEAKRLGMNSTKFYNPDGAPNNKYPQNEDNDSSAKD STFAK RMNGDA $\quad$ MDSNADFSHF DNPHGYHDPDHY T TP Y D


## UniRef90_UPIO002E736A9

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UniRef90 - ${ }^{-15439}$ UniRef90-C7RGK1 UniRef90-R9WF41 UniRef90-UPIo0036FF2B1 UniRef90-A8LAU8 UniRef90 ${ }^{-}$VGJKl1 UniRef90-UPI00036A2C18 UniRef90-R6ZYP7 UniRef90-R4ZYS9 UniRef90-A4SSA2 UniRef90-UPIO003662C35 UniRef90-W4BAKO UniRef90-QOYRB7 UniRef90-A6LUMO UniRef90-DOR637 UniRef90-E5XMF0 UniRef90-C3PLC6 UniRef90-G8TZM9 UniRef90-UPIO00363BEF5 UniRef90- FoZ1D4 UniRef90-UP10002DB788D UniRef90-C8C0L8 UniRef90-U3SUB1 UniRef90-E4KWX1 UniRef90-R5R2R3 UniRef90-B9DSP8 UniRef90-UPIO0040BEF37 UniRef90-G2P515 UniRef90-XONEK3 UniRef90-UP100036C3B2A UniRef90-UP10004777038 UniRef90-R6FHS8 UniRef90-MOQMN9 UniRef90_W4BSV6 UniRef90-UPIO002DF847C UniRef90-F3B156 UniRef90-UPIO00287BA30 UniRef90-UP10002899F0B UniRef90-D3QYV7 UniRef90-14HGV1 UniRef90_UPIO0047AE61F UniRef90_B1X158 UniRef90-H7CYO2 UniRef90-B4VYN4 UniRef90-UPI0004638FF8 UniRef90-C2KYE5 UniRef90-AOLRV7 UniRef90 UPIOO047910AE UniRef90 ${ }^{\text {R9LJIM9 }}$
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 MSLLLQYALTNDEFRQVYTAERYSIKPTNRTFTNKMFQNM DTVVAQHLLAADPTDTAVASKTQATINGTKDYNENSCQYK
FVLFCCRRWPENLARFHARSYFQRSNSPATSRDPPHTRFP LI AMEELNDPKLISATNAEKITKQAMTNTNTKSSKLLANG

 $L A V I G R A T L N D P I V R G Y P R A S L P G R G D E R F E D A N H N T L I G$
$Q L A L L E A V F G G G A S P D E R S R L M S G V V P E Q A W G V A A G G G$ w MYLTTNAATKYSDFNEDQMSSYTTVYTDRNGASKTRQAP LA LLMKYA KNDDFLKKSQTD KYKTKNYDWYNKNELLA
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MFKLATELKKFHPEILKYTTIEKEEPDRKFIDEYNTNPVLG AAMLMNRLFTESLISNEKQKFIKNAGKECKTGDDRVVAPL MFMLASELTKFHPELLKYTTDAKEDPGRNFTEYNTNPVLG MALIAQAAYANPTFRKVCQTNTYCDPTTNVCGEDRWLSNH NVMESGYYQNGPUVSY VAQLTRRAMDNATFDTVVKSVSTKQEAPAANGHTRYYSWD VAQLTRRAMDNATFDTVVKSVSTKQEAPAANGHTRYYSTWD
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 DLAL LTRHLYPEVVDUSKTEHDYLPDTENHQDYDMYNLLT DNLISARSMA ILAYHNDYPDSDDVSSVPTQPGMPGHQAQY MALIASAAYKNDTLLT DSKDKSYRLPKNNPDGVT DQPEHN MSMLMKAALEKDDCYKALSQHKYTTAKRNLSNIFLRRGED LATLMAESRRRHDAFREASPSVTGSSGAVARTWENTNDLEGG
 QYMDILNRLKGDPTRYHIITQALDLM DQUDPDQSWGIY MALITQAAIQNPVERKDDETTYYQLPPTNLQEDSRDLWHY QLALLRTLYGPEVLAPAARAWVRELMADVVPGQRWVGAAA LARLVKAAYAYPLLRDFSTTPEAEVEVGRRTMQFRNTNGL EVKL DELLTSGNVLDAGSRAYALGLMGEVVPGQRWTPAGA LAKITKYAMQNELFGMKSVDWESKTWETNTLNHHRMVKGE MALLMEAAMANDTFRTVAATTSYTLPATNVSGGERVLTNN VYLMLKEALKKYPEFNYKYSDGSDASVVLTATTHYNATGEAT MARLAHALLEKYHKVVNSAMPSCQVRGVALYNRNDLLH LSLLMMHLLKDHKQVLNYSKLVQKGRKMRTTNLSLDPGER QVAL LRQVFVADGSRAWVRELMESVVDGQRWGVSAVADGG


पA! TAKACDEDP\|\SEASNTSYERWPNGREVTYNNPNSPY MAL A AAAFENPTLCRDASTVNYDFPATASVPSVRKDTMG YALLCQHLVVEYPGILKYTKRVDDEETFHTYNHSLEGAKL LSQAAKAAFDDPDLTKAGTSSYNFKVANTSALLDKNSPY


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 RDPGANGVKTGYTGQAGKCLVSSINNNGKDVIIVVVLS GAAMSPGNKNGWCEEWVANSVGFAGPDERYMLATMNNLDAG NDPDG円GGKTGYTEDAHHTFVGADNRDGRRLQAVLLDTT RDPTVIGVKTGWTTEAGFNLVAATRMVHGKPVTLVIMHGT EGINVFGGKNGTTDEAGSCVIGYSQDPQANPYISIVMGAE IVPEVDGLKTGYTNAAGRCVI LDKEVDAHKTGSGNVAAQNDVAYTCDPNKVCYTLADFVKD DISVPVAHKDGDA YDYKHDVA IIYAD QPFILSUFTDK DVPEVDGLKTGYTNAAGRCVI
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LPRNICANKYGEMNGYTNELGVVYTNRPFYSAF LPRNTCANKYGEMNGYTNELGDVYTN RPFIYSAF ETQ Qi WSKAGWTSQ VRHDAAYIEDPHHTPYLLVVFTEG
 DDGN GGKTGFTTPAGRCDVSVYERNGRKIVGAVL ME


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 YYPPALGGKTGTTKDAGKNLIFAAKKHGRSVITAAA FTMPCIGGKEGYTEASGSTLVCEASKNNMKLICIVLNGAS APKGVTTGKTGTTSSAGNCLALLCQNEYGNPFISIVMGAS GFKGSDGLKTGTSDNGYNLALTNHKDNLRLNVVVLNVKY ADGSAWALKNGWLRRGTTNSIGRVSADGRERLVAVVDS S PYPGMGPAKTGWTQEARHTYAALCQRGERK VALILLDS

YRPEVIGLKTGTSSLGGACVVSAAVIDGETYПCVVMGSTK HKMVIVGGKTGYTSLAGNTLVTCVERNGTRLI AVILKSRQ GYKGVDGLKTGSSDTAGFNTAITGKKNDMRII QVMMGVES YNSHVVASKTGYHTPAGRTLVAKAVYDNDE LIGVVMRTD YYPYAQGIKTGTTSKAGHCVISKASKDGYNYLGII M

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20
30
 SALAIDDNS GQI LA K N A N K K A SVVAVVI DADS GEVLYKKANMV AVDLDE GKVLEKDAKEV
 SAVLLDAGTGTILAKNDHDK

EQLMDDFRAEHALTGDNFE | $A$ | $L$ | $D$ | $A$ |
| :--- | :--- | :--- | :--- |
|  | $S$ | $F$ | V |

YVVDARTGEQYDFNETKM
$\square$ VA ESADRR
 VLAIDDAPDERVVCSGEDDP

| $A$ | $F$ | $D$ | $\square$ | $N$ |
| :--- | :--- | :--- | :--- | :--- |
| $L$ | $R$ | $R T$ |  |  |

SAVLMDYATGQVLAENDHQQ
MDM■T GS L SKNADKA



G DKDS A GLLFDLNKKETLA QNVNEQ

S G G TWS $\square$ AFSDPD GKPAVE DNADRV D D L R N VA $\square E N R P$ T $\square$ SAA A LDDVTNNK IL YK H $\square$ HE K


K Q E H Q D $\square$ D K Q Y N P K $G M D V$
$V G A A L A$
 V VN A Q T GEVVFGK
S Y CVVMSDADNTVIEEK DHK KV
TAAVLSLDGGNGKPVLVGEDAP
K WK A LMK NRKMAVGGVVKN P DEAKYASSNGNYM
$G V Y M V N D D T A D V V V S K N A D K K$
A A LAE GVTAET GQVKAA $\quad$ VTEA QS GR』FEKNAEAR
 A Q Y AVA I D AKS GLVLNKNMDER QTPALLRNLA QLSNEDDAAYAVVVFDLDNGSILGKNAS QV GAVLMDGRTGKVI SKNEHTQ

DLS A VVQELDAL QDGG DQAGVAVTS LDGS IT YE K NA DA I
$\square \square A A M V H A D S G A L L E K N D D H K$ V V D MA T GYTL E K N I Q $\quad$ Q
 $K Q V Q A L L N Q K D K K Y S I Y V K E L D D K F T A G V N Q E Q K$ D GLT A K Y G V $L$ L LDCEEN N K IVYA K N Y K K K
 $V$ ID QS T S EVVF KNANVT
 $S V M A V D L T S G V T L E K D P N K A$ A SKA GATITALVLDRSTGQVVSNGNSTP bI A D LD T G R V L A K D P H GR A S G L P A K $\square$ S WLIAA D CES GEVLAAFNAHRR FTKNSQME S WA VTDVRTGDVLARNAHQR AVVHADSGKVFDKDIDAV LDD D K E V L GRN I Y K K
 $S A L V T D A D G N V I V Y G K D D N A D I$
 GK Y A I D A S T GEVI AK D P D A R
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$T L S A A T A G A E V P A G V T A G \square A V F D R Q T G T T E Q L N P G D R$ AVTVA GS GVYETYGPEKS $T G S G Q G A A W G D Q R Q$ A $\square E S Q \square T$ NFES AGYTASFVLVD INT GRADSYNAAA Q
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SGALGLKEGDSMTLN GSYSGFPVNQTARLEDMEHVLLIYSANDVANLIATNLGGS SSSTYADTGEEFTVEQADMAVML SANEMT ALAEHVAGS FSNVPLNAGESYTIROLTESMMIVSDGSAEALALADAGGS KNTSRLSVGSVLSREDMLHDALMASENRAAAALSRYF GS TGTLPI ADNKSYALSEVIDRTAKNSDNVGSNLLA SSLMFLEKGQIVNFEEILKGLSVSSGNDSSIAIAEFVVGN FSNVPLRLGEKYKVRELYEAMAIYSADAASIAIAAETIAGS


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 TD GAHGREGDALLSLEDALRCLLIPS EYKLNLKVGETMNAKDVMDAVMLYS
S GGKSLFRAGETFHLMDLLYAALMTS

E G G PLKEGTTVTINQLLKQAALES GSTAGLVPGEVLTARQLLYGLLLPSGCDAAYALAESFGPG LSVAGFNVGNILTYDELLYGILLKSGADATEAAAYS SGLCGLMVGSDQLTLNEALHLALMSSENRAAHALGRTY NTSSRLAVGSVLSRREMLLLALMSS
RLGTIS
G
$\stackrel{R}{\mathrm{R}} \mathrm{S}$
Q
REDMRLMI SR SDNDAALDE ALHIGKT GRSNNASTRMIDDRLGY SQSilkLRAGEKLKRDEALKLMLI SACEAGNLAVNIAGS GATAFLKAGETLKAGTAMKAAVMITAGDATFALAECAGGQ ASSANFEVGETVTYEWVNITNTKSNNYYADTLLRYIDGQ ASNCGFVVGEEVPYDLLLGAILSGADATRALANNLCGG ASNCGFVVGEEVPVKDLLYGVLLPSGADAVLALCKEVAGS ASAV VDK GTQTESGDELPDGEFQVWYRLSANKFFQEINGS ASMAGFQAGDFVTTEDLLYGTLLASGADATGTLADAVAGS TTSMASL $R D A M S S M L L Y S D N D S Y R Q L R D S Y G$
$W D L F H A L L S S A N D A A N V L A D A C C$
$S$ TPQAKQQSGYRSPPWDLFYGLMLDSANDAANALABACC SSSAYAEEGEQLTVEQCLYGLMLISGNDLANALGEKVSGS GSLPKTADNKYYSLQDVINRTAKLSDNVGSNMLAYYETQ ASVAGFSAGEKVTVEDLLYGAMLPSGADATLGLANYVAGS SSHVARDVGEQMSMEQTLYGVLLASANECAYALAEHVGGD NSSSRLRVGSQLSRANMLHIALMSS

WG ETPGEQTLAESMI RNS PADRQALDVMLRSS
GTRVGTGVGGRYTNRQLMQALIMCSGNSAAENFWNQSGGS
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SMTAGLKEGDKLTLVELLYGLLLPSGNDAAVAMAEHISGS
LTMGSRLEYGATLSRREMILCLIMSSENRAAYALLARHVSGS KHTTSRLSVGTMLTRELLQLALMASENRAASALGRNY ESTVDVTKGDKISEREALESILIASANNVARLLARWDAGS MDVVDIPGGQQUPVSAALKAMMLYSANDATNYPTKGSDSN

 QSLVPVAAGEKDTEREALEALMLPSANNVAHMLGVWDAGS
KAMEGLTEGQTFSQQDMLKMLMIPSGNNTGRLLARWSTKT SSLVDLLTGTTSGPAQGEAWELWQRQRRLVNDWLQGLGWP $N A V Y Q A G D T Q N A T T K Q N D D Q V L T V S D N T A Y S W L V D T Y \quad G T$ Y S S S RLSVGSKLSRADMMHLALMSSENRAAHALGRSY K G T S S R ML G T S L S R A E L L Q L A L M A S E NRAASALGRN Y
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 EEAFAS LMNSYAAKDGMKNSHFVNAHGLSAEG HQTTAY D VKKF VELMNQKARQIGCTNTHFNNPNGLPDEKHYTTAND
 GGRPAF LAA A MAKAK QLGMTDTHFENPTGLTS QNVSSARD LNSFVNLMNDNVINDGDFNMHFVEPS GYSSENKDTAADMA E ENFVVK LMNQKAKQCKFVNATGGLSNKDLKGMYPKNS GPND
 Y A E F $\square E L M N K E A S E \square G A T N S H F V N P H G L T A E D H Y V T A Y D$ DKMNQTAKSLGMNHTHYVNPT GAENRRYQNESSSDSTAHAD DEDFCVLDNSKA EALGCLDSHFA NPSGLNDENHYT TA Y D
 E SLLE S FVVQAMNEKVVSS LGGLKE HFMNP DGLDDDEEHY T TA Y D

 Q A QRTAAKMQTKAVA LGGALL
 QAGF I ARMNDTARAMGMGGAQFTDPSGNPTDDSTHATPTD EKDFV K LMN QKA E E IGMNNSHESNVIDGDEGD NH HSTAR D GGDEAFVVQMNAKARLLLGMTDDTRYVVPTGLSSRNQSSARD LD GF A E L M N QEA LAA GGATNSHF VNPH GLTED N H Y VTA Y D

 S GLREANKRMGLTSTKGGPGTKW GLTQTTASD DK I Q S VM T DPK YKFYDEERGGGLWVGKRYGGGGDTA TVNQ $\square P D F \square A M M N A K A A E \square G C T G T H F A N T H G L Y$ SEDNYTTARD KN EFVKMMNSRAKELGTKHATFKNASGADAGNKVSPYD

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 EQTVKDMQS HADELQARDTHVVSPDGYDEPGQLSSAYD G GLRAFVATMNAKAKS LGMRGTHYVDSTGLSSNNVASARD E E GFVYLMNEKARELDNLHSHEANPMGLDAEGGHYSSAND $R A L F \| G L M N K K V K D L G L T N S H F T \quad N P V G L D D G A Q Y S T A R D$ AVITRVVARYGLK STTTPYDGHWWNTMSTADDLA KATVEKMNEQAKRLHALDTRAATPS GLDDGPGMSTMSAYB
 TATAKEMQTKARQLGARDTTVRSPDGYDSPGQVSSAHANA

 V D S F VELMNARAKELGCKNTNFVNPCGLHDDNHYTTAYD GGMTSFVA QMNKKAAQLGMTHSHFTDPAGLDVENMSTASD GGPNAFVVKANNQKARLLGMNATRFVDATGLDSNNVSTAED
 KEFVALDMNSEAKVLGMNSTNFVTTNGLDDNTNEHLLTTAYD QATV DKMNAKAA ALGATSTHTDSSPSGLLDAPGMMMRTSP HD GGF DAFVNAMNEKAREVGMDQSRFVEPTGLSPDNYSSAGD MEAFVDMMNQKAAEDGIGQTTHFANPVGDYDENNYSTAYD ERMNQKA QE LGMMVNTKYFNCQPYHPVSQPLDGDNDTTPED QD AF LTTKMNDAAEE LGMTNTHYTDDPSGFLDPSTVSTAAAD A I V N R MI PRRGGL T DTAPPPAGYEAYWGYTAMSA D DQTAFVREMNEAAKDLGMKNTVYTDPSGLDKGTVSTAVD EHVNCCRQKTWGD GPF GRERDVFYGVDLENRNALDSTAAATARVV GAFDSWAAQAGTAVQ MAGYGYVTTCARD G GLSAFVRAMNDKARALGMRNTRFVEPTGLSSDNVSSPRD



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MAKl ARAAWFNPMFRKYCTTVYYETPATNKFSETRYपLNH MALISKYLIIETYPDSLLKTTKTKMANFRVSANQEYQMGFAP LVKMVNAAYQYP IIRRFSTDHSYEVYTGKRSQAYNSTNAL
 ENLMTAREVLKTASIPKKKFRPGTADEDNMENWNWMLPGL GGLEYRYAWQNPVFADVVATRTFDFPGHGDHPENDNQLLY YALAAHTVQDTPK LDHFTKQAPTQHGVTYNDLDEGGNM FALISKAALSNPDHLPPSKKYPDGQDDTTHHAMLKKKHEN VAIMVAAAMRDDTFRSVVGGAARVTVRSADGASRTNQML TFTLLQKLVRGELLSAASTAHLLNVLRSLTSFNDRARLTS LVNLAKEAYKYPWIMDTMKKKVSTINTSKKMSLENRNKLV LATMVSEVMKNDLERSQDKATMQVTRNNATVDVPLESTDV CAKLLMSALQDSLISQUTSTKQYTTRRRKIVLQNTCRLLN LAVFGREGLRNPYCSTAHAEFPGDGWPFAIENTNRLLTGE LVTLMWRIPFREIVAAHSHHIAAGPANREHHWETTNRLLR VMKLVKYALQNKKFKEVFGTKTYKNMNGPLKKRITDSSTFN LATLVNVAHGDPLLRELSTSPGYEVAVGPRTLQYNNTNGL LA RMVAAAYRYPLIREDTTTTDQQVYARNRMLQYRNSNAE LTQMMVQAYRQEHAGDRVLAKSLRLQRDRALGFDGVKKAK QIRLLLSVFEGPATNKDSRAYDRTLMTHQAWGVSAVSGSD QCRYYYLLANGQLVNRERSKQMLDVMGDPELAHKFVNTBD LYLITRYAMDNYPGFMTHCSTTDYKMPANSANPDGYTUHT LAKLGARLAKSGTYKQYSALYLDEDGHENGTRTELVNQNK LVTVLRAMYYTSAKQYFYTSLPVAGLIGTVRNRMKSTSAQ
 MGQIMAVAMQNPTAREVLMTENYQLAPTNKTNLFLLQRITKT VA MLLLEDEQEKSISKKYSNQMKTLLKRSLKKEDWQNKQF LSLMAQYAMKNNGFKEVVSNYTYUTPKTNKKDEERYLKSUG MWQAVWAFVSGDAQGASYDKDLLARREESPDANALGPQTY LSSLIMKEALKEPLFRQVIHTASYTMEATNTNKLLSSSSTY MAIIAMNAWKFRKVCSTVRYDVPPTNMCNETRYWLNNNRM
VCSFYYQLALGNLISTERSREMLQUMKKPALHHKFVNTLD GGASFNA MAMIVEYALNNDKTSDEFSAKDYTTYKSNKHYDDRDEDGK LA AREAYQNETLRKMVGTRRYEDPPTNKHAEPTPGNNT LTLARSGLQKKDFRDYCSTVSAKFGDNE RNTNRLLSGD LAKLVVEAYNHPDLRQYSTDYVVEPGGRALQYANSNRLVVT QVRL DRT AYYPSDYKHYVQNGMGTVSHEQSWGVSKSAPNY RYYDMLMNGSGGLPQEQANTDLSNLARSTANGIDGYPQRF LAALMTIPTFAELIHTEQVDFPGFPPNPQDPGDNDNHLLY
 LISMMRCALKEPPFRGVISTTSYKDGATNLHGERLPGSTY LYLIFNQCIQYDEFIKIVSETKYDLPVTSADGTSRTLNLP LSLIFDAALQLPDFVEIVGSATWELPATNMTDELANANGP LVKMVTAAYDHPLIREASTTQRLEVHPYAKRGPLVYGNTN LVKMVDAAYHYPEIVRQVSTDPSQEITLYGRQNPLNFVNTN LSIMAREAAKYQLPNPTNDDFLTSVQVGNPNKFLQQGTDF LVTERAA LIAPVF
LVTLVRAAFAHPELREYSTTGYFRAHFRQPRGNTNVLVHR MAVI MQAAMQDDDCKTVLSNHTYSTAATPQHPENRIEDRM YAMLCTYLIKTYPDILNHTKYPQ\|TVKEGTPYEEHFTSYQ QVILGRAALKDPVFAGIVAQEKATIPVAGT DKNYNDLL RDTVRTYRHILEVAPPAVRDFLMEALRGSTRCASDKFDQH QLKLAEAVMEYDVFRDVVALPNAEIPGHGRDYNNNDRLGLL MAKLWTQGYQQTSGAADVSDEALQWLSGDMTDNSNDHRAL LVKLLTAHARDQQYTTNDQYSVQPIRGRQLVFNNTNRLVK LVKMVRAAYQYHETRHVSTSAAYSVPVHGMRAPGNYVNSN
ENKLSIRDYPGVLEITKKSSSTAGMEIGSTNYMLEGMPA


HKMMVLGGKTGYTEAAGNTVVTFAHRGNMYLVSVVM K N GTID GLLKTGNTDTAGKCIISTGTFAGRRVIVVALHTKG VRNPT WDDGLQKTGFDNEAGECLVMHGRPMIMVLLDS S PKNVRVAHKIGAAD AYNHDAADVFANE PYILVVETKG
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 S LE GTDGLK T G S S DDA DY N
Y Y E N A D G G GK T G Y T S S L A G N T L VT Y A K R G N Q A LITTVILLNGH Q NA QGNIGVKTGTTDEAGYCFAGAFSRDGNEVYTVVLGANT

 GGWNVNIVKTGFINEAGRCVVMHTTLDNRPAVVVLLUGADS YRPEI L GAKTGFIVRS GYCLVTCAENSTGKKLAFVVL P YPGLI GDKNGYTSNAGNTLVAAARRDGRTLVVTVM GMKDVDGLKTGTSDNG
E Y P GT $\square G \square K T G N T N A A G H C L L \quad F A T V R A G \square P L I G V V L H S S$




 VPTAK LYRKS GSWKNFHSDSVLVWGKNPNRRY L LVAL D TNHLLMV
DDPYAI GSKSGLSALGKYTVVTVDEKDGKRVINVVLSSTR L I K S L D GCSTGGSSSEA QYCGVEMVK RKGAVFIAAVI GAAD
 G Y

 NENTYFLSKMGWNSK TRNDAADIGTPDGKHYILVVF
 S K A G WYP E T D G S DA A P A S N DA GVVVDH G S A S S Y V I S VM S T A FYPP C LGGKTGTTKKSAGKNIIFAAEKNNRSIIVVAAGYFG YYADCIGGGTGFTNEAGGTLVTFANLNGRQVVCVVLKSTN KVAPKADVYRKS GSWRNYHDSALVWGPDRKYIVVALD $P K N \square S V A H K \square G G A D T D N$ HDAAIVFAS KPYLLVIVEDG
 H A MGCQ GGK T G Y T D E A R H S L V T Y NPDWEI I QKTGY DSEA GRCLV MQTNDKERPIVMIVFDSK LY D GA DGVKKT GYTKK A FRCLVVSSATHNGQQLVAVTVINDGD
 GYAEPVAVKQ GWGGNWVHLSTGVIGAD RRFIMVIGSMQ DYEGTLGGKTGYTDDARQTFVTAAERGGHRLVV
TYDGLI GVVKNGYTSNAGNTFTGAATRDGRTVLVTVMH TYPGAFGI KTGWTPYA GSCDAAHRTDAGHSLDLYGVVLGE G $\quad V \operatorname{V} V \mathrm{~V}$ K GYTSNAGNTLVAAARRGGRTLLVTVMNPQS H Y P P A L G GK T G T T K T A G K N L I MAAAE K N N R L L LV T I A T G Y S G $E H M T V I$ GGKTGNTGEAKRCLILLDSKDEQGHSYVSIVMGAE VYVE GVQAKTGYTEAA GRCLVA
RLL K N K S WD IA LIS K T GY I N E A GRC
ALVRGGKWDIGLSKTGFINEAGRCLVMSGQPVIIVLL
$G Y N D V T G D K T G T T T S A L G N L V A R K E V N G E T R R I V G A V V R Q$ Y DPSCVGVKS GF T DKA GRCLLSVFERNGRQUVGIV

D S WGVGLS K T GY LT EA GRCLVMVTEDEGRE VVTVLLDS TS GEVI GAKTGFVNQSGNCAVSYEKAASGKTYICV

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

A GLG IVGILKTGSNAGGTLSWAAYKTFDGEDRLILGTMMAQ PEGS RLWSKAGWMSKA RHDAAWWRAPD GSPALLLVA FS D G GDSTTVYTKA GWGDLYA LDNDGG IVASSSGAYVLSVMT


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PAA
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PS F D P
GASNAVYNEA
$P \vee S D L B A$
T K

P

FGTRTP $\quad \square G D A G R \square$
W SDQTGEELRHLVGNADME $P G A H T P E Q \quad L A Q V N R V V R K L L$

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SMTVVNDTKQKMLL $\operatorname{FSSNDYDR}$ LEA Q A A DA GP LLASQSALYMNNRTGEVLQKNMNRV $T G A V R D Q L N Q V M T T U G G E F G V F V E D L R T G G T W A F N D G Y T$ $\square A F S V Y D M N A N T Y L F Y E G A G Q$
$Y V V D Q N S A E V F K N A N V A$

SAlVMEASTGTVVLRGNQ A ADDQESGQILQKDADDLD
 AVIMEDSTNTILYAKNKDAA
SWLVQD LDTGAVIAKDPHAR
 STAQADQTKDEAKAADTVSAMIVDERGNVLYSKNARAV
 SAILMDTMRGQIFEKDADKV AAVQSQ $\square$ ATFEADGYTASFVLAD DTTGRTIAYNADAQ AAS $\square R A D P G A T T G L V L D S B G K E E I A B C A D E P$

A LS ATEAYCDIDADTGLVLAQNMDEE GAYAMNPATGKQFGKAPDGR SWLVADLDTGQVLGAGPHEH SALIDVSDGKVLMKNINQK LLVDANTGK LYQKDDKV SAlAFD I E S GKVLEKNAKK I LS WLVADAASGEVLAYDAHEK

 AVAVEVSSGKDLYDQDAETK AYGADE $\checkmark \operatorname{V} V A D L D T D K I V A A G D D F L$ SAILVDADTGSILEKDAHRK S F A S S LK A LLAA SGARVSVMVADLDTD
$\begin{array}{lllllll}L & A & L & K & Y & D & K \\ P & A & A & \text { S }\end{array}$

GALLIEAKTNTILEKNAYSK A S LE T C L A QLDDAVRSGHDAVSLVDDTNTAAAQVNGNQM RSDFSKYFQQAGVEGTFILYDLQQDQYLVYNSDRR S K VDN Y LK GRPGVTGYYVVRDRGSGGVVY AK S GK S K


RSDWKNLISNKKMAVSVDLLDPEQPRFAQLNGDHM E E DA A LLEDVAPGQLSVSFPDQGESAVGTENDQSP
 TAAMI MEDSTQTTVYAKNMDQV
 TTTLDAK $\square Q A K \square E Q A A D R A G V V V L D A G S G D V V A M R A V K Q$
 GAEVSVAVLDPDSGAGAAY GTGA

[^1]

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MYPASUTKUVTALVVTKY
60
SQSASMAKPMIVSMALRKAR RLNMDEVITDTEDEDDRL EPTASLSKLFALDYALSKVKLDDVGEANDETLK LVPA LDPASSTK MTGMVVMEAKQ

 C PASSVTKMTTLIALENSSDLDVELPDKSSVFESLKNSN

 RPTASITKKLTAMVVLDTGVSGKTPIRRDVEDDRDRLKNS VAIASTAKVMTAMVA QDATAGDLDRPITVPAACVAND FPUASVVKLFDADDLLLQESEGKTTLSTD
LSPSIMCKLMTALITMDKTQ
IYSALSAEAPYLISLESTGT

ПHPASDTKVMT GGDACEKAQGQWDGVSDEVTHEYSDAGTD LRTGSTTKIMTALVVLSQRNVDKREYTDYV IDDVTHVQR GTPASVQKLLLAAAL MPRLDPQQVVTVTKEDLDIE VYPASMTKMMTVLVALENDPNLQKKTTLPTGMFAALEKQG RSDASUSKMMTALLAIESDKLY TP TP TASVTKLMTAMIVLDTGV SGLDRRITIVDQDRDRL ASVASUTK LSMYLVYEALAKGEDTLDTPVSVSPYQLTAN FYPASTTKL MTALVAIEH F G GDLNENFTVGDEMESLEED

 RQAASMIKPLVAQAYFFQMDGKRG-QVRYTDEV FYPASTTKLTTLIDEEQDSENHDTKSQ NSVNTIPKD FYAASLPK AILLGAFEKAAAGKLLKMDADTDAELQQMIRH FLPASTFK FNSLVALEGGTDKDENDEEEATVSKNAVLKQP
VWTASTIKLADAEDLLNRARVGA TNNLIFQVKVGDEDDEVV ПA DASISK DTVGVIEQEDKAGKDSWNTKVKVTKEEAKTE LYPASTTKIMTCLLAVEN AKASLSDKUTFSNDAVFSG RQDASLTKMMTAVMVMEKVEDDEEATUDADT TRTDGTVVG FVTASVVKVDILTALLLTARDAGR
$\square Y P A S L T K M M T D V V A, E N \square P D F K K \square T \square T N S V F Q G L S K A D$ FRSASVVKLLLVLDYLWDRGPEY
RPDASISKLMTAVVARDADRPGNGVL RVTANDRDTVKF

TSPASLTKLMTALLIVDSYNVG DFIEDNFEEYVYE YATASIVKADILAVLLYQSQQQGTPLTDD
 RDPASMSKMFTLYVALEEELAKGKVKGDTYTVATETDKIYE LP AS MTKKLMTAMVVLDSKQKLPLDETVVINADDVHSY
 AVASLVKVFVQLAVMRAVERGELHGHRHVLGAGDGSLLS MYAASLPKIAVLLAAMDAIDKGELKESAEV VADASVTKIMTAYLVLKAHPLKPGEEGPTLTMSAQDFAGY RGIASMSKMVSQYLILEADKNSEITWETKIPMSESKLSAN
 LYPGATVKVMTTLLLTLENHPGAAQLSDQVTMTVSGVTDG ITPTASVAKVMTAYVYLRDHPLADGEDEEGVSELPGRVARD
 VPVAS:SKLLTTYLVYKHVADGKLKWS

DQLAAPNAD $\square$ RATAANTQVE

[^2]
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TDAVLAI TQSNNDAATALWQYAGY GSSMANDTRGTYTAKQDMQAMLVPSGNDAAYVMAYNDGKM YSSSRLPVGARMTRRELDHDTLMSSENRAASALGRNY P ASS IQARQFYS $\square K K L M G Q M I D H S S N \square A T N Q L \square D Y L G S$ GSGISRDVDEVMSMEECLYGLMLASANECGYAI AEHV GK SNVPLVAGPANYSVDQLI DAVIIASANSATVALAEKVAGS $V A V L G L S P D K S V T V R N A L T A M M T Y T G C D V A L G T A V T V A P S$ ASMAGFLPDEKVKAKDALYGDMLPSGAESSLGVAEYISGS
 CTCVGLVAGGQYTVDQLLHGLLMHSGNDAAHAVATALGGD EQARKRLPGDTVTLDQLVSAMIQESDNAAPDYLRDRLGDN
 FSNVELKAGHRYTVRSLCESMMIVSDGSAEALALASAGST GSTAGLASGEVLTTHQLLYALMLPSGCDAAYTLAEAYGGQ GAS $\square$ N $\square T V G N L Y T V E D L L Y G I M L S P G N D A A D A L A E Y V G D G$ NSVAQSADAQSATVHQKVDAVLRNSDN AS YDWLYKTYGGL T GI LQDWPA GTPTVATLANLM S DSDNTATDALID DLGRE FTGSRLKVGSVLSRRDMLHIALMSS
SSHDA DEGE HQRSLAKQMIEASDNNSTSELFDDLGGQ SSH $\frac{1}{A} A Q E G E H V P L T D A L Y A T M M A S A N D G A N L L S E Y F G G T$ RGSSGLLAGGRYPVETVWLGLLLQSGNEAANVLARLGGGA ASMAGFKPGEKLKA!DLLHGSMLPSGAEASMGLAYAVSGS

 SSLVGVVEGHTYQVSDLWRGVFLNSGNDAVHVLAALNGGW YSKAGFK RNSRSRDRIGEARRADLMRAALVSSDNRAAHADGRTTYR SELSNVNLDERYSVRDLLNASLITSSNSA\|IALAEKDAGS SSTAGLEAEEVLSLNELLYALLLPSGNDAAETI AVN IGKK A GVWRHLRAPALPLCDLAVLAAATGDSLAVNLLLDRVGM
 $A S R A G Y V A G D E A T M E D L L Y A A I L V S G A D G T D G L A N A I A G S$
$E S L T P V R S G E P F T E R R A L E A L M V V S A S N V A H E M A R W V A G D$ RRSMERMLQRSSNPDTNKI MDLVSGP S SEDGDK $\square G D S Y N K V N G L Y G L L D G S D N F D A H D L A D A H S G S$
 QVHLLGARAGEKYKVKDLLYGLMLDSYNDCAVILAREAAA

TPEDRGLMESMLATSNDRATDVLAEAKYAGS
GS S LTYLEKGTEDRMDDLVYGLLLRSGNDAAMIIAKNVGGV YSNITLTAGKSYTVKELTEAAMIKSADAAADTLSRATGDS
 ASMAGFQPGLTAAERAYAEAMIVRSDNDAATALWQVVGRA ASMAGFQPGVPPADRARLEVMLRSSDDDAASYYWDHLGGS $T G S R L Q V G S E L S R R D M F H D A L M S S E N R A A A A D S R D Y$ $G K D A Y L E T G Q Q M T V E S G L E F I L D Y S A N D A C D A A S M D V S G$

EDTAATKMI EASDNDSATTLWDDVGSA

 SG SRLSVGSRLSREDMLHIALMSSENRAAAALSRYY P SSLVGVAENRTYEVSDLWNGVFLSSGNDA VVHVLASLGG GSAVGLLAGAKYTVDDLFRALMLVSGNDAAAALAEANGG KRDMRLMI SRSDNQASTRMIDRVGFD HSVLKDAEGEQLTEKQMLE GLMLPSGDNDADTLGRWVAGS YSLSNLWPNEKYS QQELEASSUYSANAATDAMAEYLAGS


 KGTSSKLPKNT P DCNELLKAMLVHSDNYAAHALSRSAGMS YS IS NVPLDARKYTKELLTAGIVVNANSPADALAEKDGGT CSCVGLVPGQMYTARQLLDGLLLVSGNDAANLLADMLGGQ
lupas_21
lupas_14
lupas_28
jnet
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sol25
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130
VEKFVDMMNDEIVKDG
GGMGAFVAAMNAKAQSLGMASSRFYEPTGDDYRNVSTAAD SGYTELAKALGMAHTHLDDTKPDOWSWT WTTPADQVK LVG EYDNHFVKSLRTYDAREGYGKTDLYDPSGFSMQATTNLDD EYYNHFVKSLRTYLIAREGYGKTDLYDPSGFSMQATTNLDD DYUNKYLESQGYKFTKVNFKLMGDRIMPWRPGTGRNRLTS
 VSEFVRRMNDKAALIGALNTHFVNPHGLPDKEHYSTARD EDKFVDLMNKKARELGMKNTHYTNTDGLHNSNHYTTSNDL VENFVTMMNQKAKDLGCTNTNFTNPTGLPDEKOSTAYD QAAFA QHMNDHARALGLHDTHFDSVSGITTPGHDSTARD AAAVAKMNATAAKDGALDTRAATPS GLDGPGMSTSAYD ALIEAAAAGGWHDYMLFSPLGSMLRLAEPDVADEWAAARR DYUNQFMDNRGYEVTRVNFKLMKLMPSNPGSGRNRATANE AAFNKKMQAMNKKARALGMRNTRFVDSSGLDPRNQSTAE DGFDAKMNDAARMGLAATYFADPSGLPVPTDGATYSTPAD A IJARIKARYGLAGTAAPWNGHWD DVNKFVGYMNETAKKLMDNDTYFVNPTGDYDEKQFTSVRD DCFNTWAEQAGAASRMGDRGGYLFTSARDMAKLW TAGY AVEAVTPANAPFPTTRQFFTDKTEDNGALRAAWRSGDAAA GGRPAFVAAMNRKARTLGMKRTHFVNATGLSPRNVSTARD QGLQSTFNQFGMKD STADSSWGLSTTTAKD $\square A G G V A A M N A Q A E \square G \square K H T H F A N P H G D S T D H Y T S C Y D M$ TTAQRTKSFDGKMNAKARKNTHFDSFDGVSNGKNYSSPRD EGRAGGVRAMNEFAEYLGARQTHAATPSGLDGPGQFTSAY EAAFVKKMNQKAKQLGMKHTNFTNVTGLHHANHYTTVKD EKAFVEDMNKKAKEIGMKNTDFNNSSGLEENGGNDSTAYD ERAFVDMMNLGLEDFEFVNSSGLNNSDLNGDAENMMSARA EKMKKQLKVWGINDAKLYNATGLPNSDLGDNHYPKSSAKD DEFWNKARQMQDKARSLGAVDTHVVSPDGYDADGQVSSAY NVNQKFPDTNTKLFEPKGADLKMRGNPEKPLRNKDSAKQ GGMPEFTKAMNRKARALGMRNTYFADCSGLDARNRSTAED EAMKAKVKEWGDTDTKIVNVSGLDNKDLGEHDYPGSSPED KAYEAFVGAMNKKAKEMGMTTNFTNPHGGHSSNHYTTPAD ESVHAR NS SGLERVA LLDRDRDRRGPDHAPHFA DGSARE IDKAFVKMMNNKRELGALETHFANASGLYN PNHYTSAYD EA SFVARMNRTAKELGMRDTVYTDPSGFDRATVSTAAD ADVELVLKQRAPAVFQETR DVEKDPTTGQTYRNQASAHD DSNFAELMNTRAKALGAKNTHFTNPHGYH DPNHYTTPYD

QERMQCYINDTNYGNRDISGGIDQFWLQGEDRПSAKE TENFAKKLNAEARSYGAKSTHFVTPNGTDKNGLHSTTAYD DR MAFNNAFRANGMATLVPQPTNTALFPDWSFQKCTAAD EKFVDRMNQKGKEDGMNHTTFHNPHGLDDNEEGNDSCAYD KKMQAFVKKAGVTDAKLYNQVGLTNSQMGSYGENEMTATD ITDGFDDLMNSRAKELGCTNTHFANTNGLQADDHYTSAYDA EKVSMMNRKAKEMGLKDTNFCTASGLEPDGREHCYSTAYD AGLDAANARLGLTRTAAD EKDFVRMMNQKAADLGMHNTHFANSTGDHNENHYTTVKD AIVDRMVARLGLTTMETEGPATHPGFWGYAAFTAAD GGRAAFVKAMNREARRDGMRHTHFREPTGLSPHNVSTAED DVNEF INDMNNKVMLGMNNTNFNNPDGLDADNHFTSLND AGMSTANAAFGLRDTTPGADDYWGLTTTNVADQDTTSPRS DRMNGKAKKLGMNHTHFTNPSGASNDKYKDEAKTKTTSQD ERTQDFMDSLNQYDEEQGYDDT\LYDPSGFDMDARTTVMD DR\|NKTAKELGMTNTHFSNASGALAQAFQGYYSNITTARD GGMTAFVDAMNRKAKETGMTHSHFADPTGLMSENVASAED GGRPAFIEAMNRKAQSLGMTNTKFEDPTGLNFHNVSTAQD GWRTTAERMEAKAHALGARDTRVESPDGYDAPGQVSSAF EAVTKTVREMNAKALELGAYDTLAQTPSGLDGWQQLTSAY KEYKLYDKQQGGGDWVGKRYGSGRHPEPMKGLSHAATSTQ DQ AFVDKMNETAKALGMTQTHYADASGVNPATVSNAVD EAKWVERMKEKVESWGIHYGTTEKNPDFGDEAENSMSARS EWEGCTDSQKLMDDTRYGR EAQYAGVDGANLNALTPGA VDGFVQMMNNRAVELGCTNTVFTMNTGLPDENQHTTAAD D VPA VVAKMNEAARQLGMTSTTYTDPAGYDAATVSTPAD ED AFIDKMNDAAKELGMTGSTYTDPSGLEKTTVSTATD AK 1 EEYARRLGLTVPVGWT T
R MQFIQKMNEKAKALGMTSTHFTDSSGLSSTNVSSAMD EKMKKQLRDWGTSDAKLVNATGLPNHVLGENSYPKTVAED EGLDAANERFGLTGTEGGDGPLW

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| UniRef90-S1S4J5 UniRef90_Z5X3W9 |  |
|  |  |



## (TA ${ }^{-1}$

 LALLLSYALQNDTFQEIFTSSRYSTQPTNKHFEELNNQSI TVR Y RYLLDEAPEPVRTFVMGNLHQATRYGTDGFDQYF LA R L V D A A A Q D P LI R Y F S T D R
LILSKEVLKNDELDT DMKPSF DSDDEGNDKVYDNTNKL VLDDASRKYAAGLMHEIEPDQVWGVSEAADPGTT PALK ISLLI SSLLKKHPEVINYTKLTHGKQYNQTTNLSLKGEAE EKLLEYDWFLDVVSKSSYTAILPDGSTQTWHNTNVYLDSS FATL Y Y FLTNYPSILDFTNQTVVRTMVGTPYEEEFHSYN LTRMLSAAYQYKMIREFSTDLTMVIAKRPQKFLNTNRGVR LVKMVEAATKYPMIRQFSTWPSYDVNTGRTRLLHYANTNALL DMALFLRAALNEPRFVRYDRLPSATYPAKRSVYGAVGAYE HWNSLTHLPRVHHLGLDYYADLS VCRFYYLLAEEALVNPERSQQMMNTLADPADHHKFVNTLD QIKIAQAAMSDPIFREIVA MPQATLPVAGTVYNVNSML VALVARRLVLDFPEILKISSVATKEFRPGTAGVTKMDNFN AARLLWELFQGTDPSAPSKARAQA LRRDATGEDAANPHY QVLL LRAAMRVPAFARIVGQRVFDPEDGTGARNNGNVLL QLKLAQAVMRNEVF
$\square V K \square A R Y S L N N S K \square Q D \square S N T R A A Y \square R G R N N V F M K N T N K L V$ $Q V A \square R Q Q V D G S V L S E A S R A Y V R G L M E R \square A D G Q R W D T A G P$

[^4]

## UniRef90_R5SE04 <br> UniRef90 LTNQV7

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 HKMYCIGGKTGYTSVAGSTLATYAEKDGMTLICVV YGRQDITGKTGTELGAGYCLVATSFDNNRPVILVTLGAE GYRGADGDKTGATDFGGATLVASATRDGKTFVVSVLNSDD
 YYEGTLGGKSGYTEASGSTLAAGASRNGTTLICVVLSGTE $G E D G V D G L K T G Y T Q A A G F C L A A T A R R R C A G R L D N V V L G A D$
$V Y P G F L G G K T G F T N D A R H T Y V G A A E R K G K R L P V V M V D$ YRSFA GGTGSFGPGA MARAHDEWQPD TKAQWLGEKTGQNSRVLGTTLAMSVDDDEAYVITVIDSRS PEWTVEVSKTGF INEAGRCLVMRARIDNRSLYMV MDG LKTGSTDKAGNCFVGTGVFNNRRLITVVLGTD
 SYNGVDGGK $\quad$ GTNPKLGVISVTVATRDGRR LVAVVFDKD GDADTVYTKAGWGGLYVLNDAGLVMSQSGT YVLAVLTN PDQWRDIAFKGGSEGGVLNDSSRVVGQDGRVHCVVASWND
DSSIVLUKTGFINEAGHCVV LVYAVRGRPVDVVLLGAP SDNFAL KNGWLENGIINSIGYVKNSNGTSYTIAMYSDK
 SYRGAFGVKTGSGPEAKFCLVFAATRGSRT VVGSIL GA LGGKTGFTSLARHTYVGAAERDGRRLVV KGGK VVGGKTGYTRAAGDCLASDA $\square K D G K Q Y I L V T A N A D G$ LYKYTTGGKTGFTEDAKRTLVTTASKDDLNLVIVT DYEGDDGLKTGYTSAAGNSFTGTAKRGDMRLI SVVM YPYERVGINGGSPEKSGPTFDASSKDNKMKVISIVDGAHQ

 PDWTIEVSKTGFIDNEAGRC[LVMQTVINDRRVYIV ARKGVDGLKTGTSNSAGSSFLATTQQAGMR\|ITVVLNTTD
DHGLLFVNKTGR DAGVRAEAGVLAGPAGVAYALIVCFDD HKMYCKGGKTGFTDESLMTLVTFAEKDGMRLICVV EDAEDEGGKTGFTDESMFCLSTVVKYNGKEYICI TTK GREGVLAGKTGFTTPAGGNLVAAERRVDGRPVVAAVMAQR PEAARVYNKTGSTAM LCG GMGVIEDPDRRAYTVVGIIER YNPAVVACKTGYHSDAGQT LVAKAVYGDMELDAAVMYEKT


GAPMRPG LKNGWSGGWVVNSVGFAGP GERYTLADMTAG KYEYC $\square G G K T G F T S K A R R T L V S A A K K D G L Q L I C V T$ SDAPTDGDKTGTSDKAGACFVSTGTYQGHRIITVVLHATG AYEGIVGGKTGYTDLARETLVTCAEKNGMKLICVV
DPGTRWAVKNGWDPRWVVNSTGCVTVGGRVYAVAVLSD ADGKILGGKTGYTAEAGLCLASLAQVGNQEYIM\|SAGAKG $G \square S S V F D \square K Q G W S G F$
$\square E K N Y L G \square K T G W T N E A G L T F \square G V N Q S N N R D \square T \| V$
NGWLP DSDN DLWAVNSIGQVSHGGHSY LVAYLSS EYLGTDGLKTGTSDEG
QKYYVIGIKTGSLDND YNLVVLYQQHNKMFLICSLGSKT HS LDVDGMKTGSSPSAAFNAVVTAKRGNTRLITVVLGVGD $A G D M N D G Q K T G F D N A A G K C L V M Q A R V N N T P L L L V S V G T Q S$
$V$
$V$ PYPGLIGDKNGYTSNAGHTLVAAARQDGRTLVVTVMHPRS FDNQSLNFKTGFTDAAQNTYVCAATRNGHR

RPEATLFRKSGSWKT YHSDSVMVLGPDRRY ILVALI GKHGIVGIKTGSMTVAGGNFVSAVKVGSQTHYIIAVLGQK YYDGVNGLKTGTSEISGASITTTATRNNFSVIVVTMGSKQ $Q V G A E L W S K A G H N L W W F K H D M L R L L V P G R R P L I V A V M T Q$ F SM
GR $\square$ G VIGGKTGYTDRAGGNFV

TAGSTWALKNGWTGLWVVNSTGRVETGGRGCLVAVV
SYAGF $\square G G K S G Y T D L A R E T Y V G M A Q R G G H R L I V V E M Y G D D$

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GE L Q MRQS $\square$ S K $\square \mathrm{AD}$

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S

DTSSSA $\square$ NDTD $\quad$ VYNY
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GLT S PENR

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DARGGDWLKSLIVGLDSAVFDT
RPEDRQARDGITQQI
GYEDGAATDTKDAEM
GG DERFTQTANLYRLIAN

GHASMTEGVARVEHAAREAVR
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S QPDEQTG
D S R R Y E D V N Y V L K T $\square$
RFADA
GKYSRVADAQRVRD
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## D DPAGES ICREL

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