## QUERY

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## A A

AHSRLEE
FAEQAl
 FPA WTPGEHGARERLGQFLDHGLK L WTPGESAARSQLEEF WT GEAAAHGRLGQFLKAAVS FPAGEAAAQKRLRAFCQQPAA WP
 IEPGEAAAQERLETFTHSMINGYQEQR EPGEVAAWERLTDFDDCAIDEYEEKRNYPADDGTS FPVGEKAALSRLRHFCRQSVADYERDRDYPAVDGGSGRLS WTPGEKAAHDRFETFCDDLLSDYHKGRERPYADDTSRMS WPAGEDAADRRLADFAEERMAWYQERRDFPADDGTSQLS WTPGEEGAQQRLHVFVEDALEGYKENRDYPARPATSMLS
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## P

$\frac{W}{\square}$ WAPGTRAAHDRLEAFRATALDEYDEQ WPDGEEGAKKLKNFLKNKVKRYNEDRNDP\IEGTSRIS WPAGEHEAAQRLQKFLSQRUNKYSESRNLPAGNSTAVIS WPAGENEAHARLRRFVDERMEVYHDDRDFPARPGTSTVS WVPGEAGAFERFKEFLEDNLKGYSQNRDVPSKNHTSCLS WTPGEAGAWQRLQAFKNEDLADYENRRDLPSDQGTSRLS PCRPGEVAAVDQLAVFADGPLLGYEPDRNFPGTAGTSGLS WTPGEDGAQQRLHDFLEESVSRYADERDFPAEEVSSRLS
WT P GeAkAL保 GEABAQRQLKKFVKNSVEN WQVGEAHALMLLDQFIDEHLAAYKTA WPTGEGFALEQLDVFIENHLSDYKLE WEPGEREAHEHLEDFLRHDCARYGKGRDFNVKGISQLS FPAGEQAADKRLRAFAQHAVLDYPKQRDLPARDSTSRLS WTPGETGAHKRLEAFLDGGGKGYETDRDRMASEATSSLS GEADAWARLEQFLDADIYDYDERRDFPAVDGTSLMS WPAGEESALNRLKGFLENKVSNYSKDRNDP IIDGTSRMS GERAANTRLANF KHDVADYDKARDFPELDKTSHLS EEEALKRLKHFCYESVPHYAKWRDRPAVDGTSRLS

ERARERLEAFCEDDIYRYGERRDYPADGCT

WP $\square \mathrm{G}$都FPDDAT

## w

## WQAGEGA

 FPAGEGA $\mathrm{V} P \mathrm{~T} G \mathrm{M} S \mathrm{G}$ WPAGEDA$\qquad$
 $W R V G E K H A R N L L$
$L K G G R K E G L S Y I$
$E R I V$

 WAVTE QHAQQLLDDFTREQMQDYQQQRDFP WVP GE T A ALSHLADF LDGPVGVYATERDRP
 WQ P GE R A A Q S R
P A G T E A A R T E V I Q A L R E F E E K K V K L Y A E N R D YP
A GEAS AYEQLESFDENDLATYHVNRDLP WT P GEK GARARLRAWLDTDAASYDDCRNRPDQDRTSRRS 1 RPGMAGARAAWADF Q


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P A $\quad 50 \quad 60$
PAKFGAIGIRQAWQAASAAHALSRSDEARNSIRVWQQEL




P HL HF GEI S PRTAWHAVRHA
PHLAHGEITPFQDMGAVSHKHSGEADPT

A DLRF GTLS I RHVFHESMRL VPQASEPAREGワQTF DSEL

PHLHFGEI SPRQVWHAVKQSDHARTGGA






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PYLVLGVLSPRQCFNALLQRESPEEALVDYTSPAKT
PHLRFGTI
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AWREFYRHLMTYHPECKHRPF IGWTDGVKWSDNKSHLEAW AWREFYR MHAMTYHPECKHRPFIGWTDGVKWSDNKSHLEAW LWREFYKH L VGGYKVSRRAFKPETEFDAWRHSPKDLLA W AWREFYQHAMYFFPELANGPYRDQFKDFPWENNEDYFQAW GWREFCRHLLFDVPDMADRNLQEQFDAFPWKRNADAGEAW AWREFYQHALYFFPELAEGPYREAFQDFPWDNNEDHFQAW VWREFYRHLLVAYPKCRHKPFDAWTDNVRWSGDADH LAA A W
GWREFSYSLLYTHPDLPTQPLQHKFAGFPWDKNDKALRAW GWREFSYSHLLYNHP KIGHRNLGRKEAGFPWDKNDKALKAW DWREFYFQLLDHFPHVEKHSFKPEFENDKWENNEAVFFEAW AWREFYQHCLYFFPQLAEGAYREQFKQFPWENDEKKFQAW A WREFYQQALYHFPELATGPYRDTWKDFPWENNEELFHAW AWREFSYNLLYHFPDLPEANFQSKFDAFEWDECEDKLKAW VWREFSYHLLQEWPDLANENFNTKYDSFPWRSDDEQLRAW I WREFYRHLLVAWPSCRHQPFDGWTEKVKWQQNGRHLEAW A WRDFYKHVLVHWPYCMNKPFKPEYSNI SWSYDNEHFAAW A WRDFYKHVLAHWPYCMNKPFKPEYTNI NWEYDDANFTAW LWREFYQQLMFDFPKSRHQPFQDQTKTDPWKDNDAHFKAW
AWREFYQHAMYYFPDLADGAYRDSFKSFPWQNNEKHFQAW AWREFYQHAMYHFPELAEGAYRDVFKNFPWSDNQEHFQAW LWREFY LH L LAYWPACRYKAFDPWTERVQWNQNDAQFAA W V WREFYRNI MHSFPKVLNKPFQDYTDSIKWRHCDNELKAF VWRDFNYHLLEHFGPLADKNFNDRFDNFSWRSSKKDLKAW L WREFYKHI LVGYPRVRHRAFRDETEAVPWRDAPKDLEAW AWREFSYHLL FHFPRLASANWNDRFDGFEWRNNSGDFEAW GWREFSRQLLYDRPDLATCNLQTSFDDFPWRDDAPALASW GWREFNHSI LYNWPHMPSANFKPEFDGFPWVKDEGALEAW LWREFYKH L LVGYPRVRHRPFREETEALRWRQAPAELEAW DWREFYYM LDMHPESKRQAVNTQYREDEWEKDEEGFKAW GWRDFADYLAHHFGS LRDENFNRQFDHFPWRSNPAGLDAW LWREFYKHLLAGHPRVSMRADRTETEALPWRDAPQELAAW VWREFYRNIMHSFPKVSKKPFQEYTDNINWRYDESEFQAW A WRDFYKHVLAHWPYCMSKSFKPEYTDI HWEYNAEHFQAW AWRDFYKHVLAHWPY四WHKPFKYEYTNI E WEYNDAHFDAW GWREFSHSILTYADNLSQTNWKSDFDGFAWVQDENGLTAW GWREFSYHLLFHNPHLHKQSFRPEFEGFTWRRDRQATKAW GWREFCAHLLFTVPDLPEQPDRGEFAAFPWRDDPELLVAW A WREFYQQALFHFPELADGPYREQWRRFPWENNEDWFDFW GWREFSYHLLHFFPE DEKAFKENFADFPWQPDKTRLERW A WRDYYNMIYAMNPQQNTQSLRPEFQKDAWRNNHNDFLLW AWREFNYHVLYHRPDVATKNLQGRFDSLPWDPPRAELDAW
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I WREFYQHLLYFEPKLSRESFLPWGVHDRWENCPRR DKAW AWREFYADVLHHRPETARKNYDERFDKLEYDTGRECFERW LWREFYQHILFDFPQVSKHPFKAATQNVQWRDDSEGFEKW HWRDFFTHILYHFPHVLGNSFKEKYNQIQWENDVDKFKAW A WREFSYHLLFHFPELARDNWNDSFDGFGWREDEDGFHAW LWREFYQHILFDYPKVKHRPFKDQTAQVAWRNDPAGLAAW GWREFQYHLLHHAPELPERPLDPRFADFPWREDAAGLQAW A WRDFYRHVLVNWPYCMNKPFKYEYRNDEWEYNDAHFEAW GWREFSRHLLFD LPQLAEKNLQPSFDAFPWRNDRKALRAW A WRDFAHHLLFHWPDI ARENWKSQFDAFPWKEDTAAFTAW A WREFYAHVLRGHPNVVTENYKEYEEDDAWRDDDEELAAW DWREFYQHLAYFEPKSKGESFNPWGEHLRWENSQVFLEAW AWREFSYQLLYYHPTMRDQPLMEKFTDFEWDTDKKALNAW VWRDFYFMLLDHFPHVEGASFKPEFDALVWDDWPEGLAAW I WRDFYVQVLHNFAHVGHQSFKPDYDA HWPHAHKGFDAW GWREFSYQLLYHFPQLMEANFKPQFDAFPWQNDEEGLRDW YWREFSYHLLAEEPDUARRNDQPSFDAFPWRECSGELKAW

## QUERY

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QQGRTGFPII DAAMRQLDATGWMHNRDRMVVAMFLTKNLL
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 CEGRTGFPIVDAAMRQLNHLGYMHNRCRMIVACFLAKDLL CTGQTGYPIVDAAMRQLNHMGYMHNRCRMITASFLAKHLL

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 K K G V $V$ T G F F P $\quad$ L Q R G R T G Y P P QQGRTGYPLVDAAMAQLNQSGYMHNRLRMVVASFLTKDLG C EARTGYPLVDAAMRQLNQTGYMHNRLRMVVASFLVKDLG $R R G L T G Y P L V D A G M R Q L W Q T G W M H N R V R M V V A S F L A K H L L$
$K E G R T G F P L V D A M M R E L A E T G W M H N R V R M V A A S F L V K N L G$

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D WRRGEAWFRDTLVDADPANNAASWQWVAGSGADASPFF II DWREGEA WF WDTLLDADLANNVGNWQWTAGSGADAAPYF I DWREGERWFMRHLI DGDLAANNGGWQWSASTGTDAVPYF II NWQWGEKYFMQKLI DGDLSANNGGWQWSASSGMDPKPLR IV HWRDGMAWFEDTLVDADLNVNAASWQWVAGSGADAAPYF I DWRHGERWFMHHLI DGDLAANNGGWQWCASTGTDAVPYF LDWRWGEKYFMQRLVDGDLAANNGGWQWSASSGMDPKPLR
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I DWRMGERYFMEHLI
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I DWRMGEDYFMEHLI DGDFASNNGGWGFSASTGVDPQPYF
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150
S F LL V|K D|L $\frac{160}{1}$ SFLLKK KLL KHGRTGYPLVDAAMRQLNQTGWMHNRLRMVVASFLTKALL QEGQTGYPIVDAAMRQLNATGWMHNRLRMI AASFLVKDLL QQGQTGDPIVDAGMRQLDATGWMHNRVRMICAMFLTKNLL KAGRTGYPVVDAGMRQLRTEGWVHNRVRMLVASFLTADLL QKGQTGIPMVDAGMRELWLTGSMHNRVRMVVGSFLVKNLL
 KEGKTGYPIVDAAMLQLQKTGWMHNRLRMIVASFLTKDLL KAGETGYPIVDAGMRQLLAEGWMHNRVRMLVAAFLTKDLL TAGRTGYPFVDAAMRQLRHEGWMHNRGRMVVASFLAKDLL CKGMTGDP VVDAMRQLNATGWMHNRGRMVVAMFLTKNCQ QRGLTGYPLVDAGMRELWTTGWMHNRVRMVVASFLVKHLL TKGVTGYPIVDAGMRQLWRHGFMHNRVRMIVASFLVKDLM QRGQTGFPIIDAGMRELWQTGYMHNRVRMLVASFLVKNQLL QSGQTGYPIVDAGMRELWQSGWMHNRVRMI CASFLIKDLL RTGQTGFPIVDAAMRQLNATGWMHNRLRMI VASFLTKDLL QQGQTGDPVVDAGMRQLLVTGWMHNRVRMITAMFLCKNLL CNGQTGYPIVDAAMRQLNKTGWMHNRLRMIVASFLTKHLL KEGRTGYPVVDAAMRQLNREAWMHNRARMIVASFLTKDLL
㑆 QHGRTGYPLVDAGMRELWHTGWMHNRVRMVTASFLVKHLL QSGRTGYPLVDAGMRELWHTGWMHNRIRMVVASFLVKHLL
KDGMTGFPIVDAAMRQCKHMSYIHNRCRMIVASFFAKDLL CEGRTGYP VDAAMYQLNQTGYMHNRLRMVVASFGVKDLL QRGHTGVPIVDAGMRQLWITGWMHNRVRMIVASFLTKNLL
 QRGQTGYPIVDAGMRELWQTGYMHNRVRMIVASFLVKHLR KKGQTGYPVVDAAMRQLNHTGWMHNRLRMVVASFLIKDLH QKGMTGYPIVDAAMRQLNQTGWMHNRLRMVVASFLTKDLH QQGRTGYPIVDAGMRQLWRTGWMHNRVRMVVASFLTKHLL CEGRTGYPLVDAAMRQLNSSGYMHNRLRMVTASFLVKDLG

K

## \section*{} <br> K K C C K $R$ $R$ $K$ <br> R





## 

## T <br> T

- 

K RRGATGYPFVDAGMRELWATGWMHNRVRMVCASFLVKHLL

 QQGRTGFPLVDAGMRQLLATGWMHNRVRMVAASFLTKDLH

C
$C$
S
S

## $R$ $R$ $R$ $C$

## K

## C

Q

## Q

## Q

Rogk Ger voaghelina

## UniRef90_A2BUR6 UniRef90-A1S3R2 UniRefofo-J4WV79 UniRef90_V2VU87 UniRef90-F8D8R8 UniRef90-A3D723

 UniRef90-UPI00036A0AF1 UniRef90-UPIO004759284 UniRef90_UPIO00378F2EB UniRef90- $-7 \mathrm{TM}^{2} 35$ UniRef90-L9VM49 UniRef90-U7PUY6 UniRef90-।131AQ5 UniRef90-QOBDKO UniRee90-UPI00047707DF UniRef90-S314Y3 UniRef90-UPI000378F49C UniRef90-UPI0002624F80 UniRef90-Q03Y03 UniRet90-K6UXW4 UniRef90-A9ASJo UniRef90_U1LDGO UniRef90-A5UYV1UniRef90 MOPHC9 UniRef90-A0A059E4R5 UniRef90-E5AS07 UniRef90-UPI00022601C6 UniRef90-M3DAF4 UniRef90_UPIO004759882 UniRef90-UPIO003B6A7EA UniRef90-181AX0 UniRef90-R8EDM4 UniRef90-UPIO003A339AA UniRef90-C5BG83 UniRef90-F6EMA3 UniRef90-E2CLK5 UniRef90-E8LXK8
UniRef90 F9RK27 UniRef90-F7RYU2 UniRef90-D5QHZ9 UniRef90-D0.J6L3 UniRef90-C7NYW0 UniRef90_UPIO0038041D4 UniRef90_Q10W56
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UniRef90-UPIO00225C20C UniRef90-K9T8L1 UniRef90_UPIO00474D28E UniRef90-UPIOOO4662B3A UniRef90-B4WS74 UniRef90_S2KI25 UniRef90-W7CQ69 UniRef90-P12768
UniRef90 G8YVU5 UniRef90-E6PGE7 UniRef90-C5WCP4 UniRef90- 3 HOZ 4 UniRef90_U6B904 UniRef90_18HZS6 UniRef90-UPIOOO37586A6 UniRef90-K5WK78 UniRef90_MOLSW3
UniRef90_HOA99P
-

170
180
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\section*{-} HDWRWGERYFREQLI D GCLLAANNGGWQWAA GTGCDAAPYF | $H D W R L G E E F F M Q Q N L$ | $D G D L S S N N G G W Q W S S S T G T D A A P Y F$ |
| :--- | :--- |
| $H$ | $D$ | I DWRK GEQWFMQHLIDDGDLAANNGGWQWSASTGTDAAPYF $V$ DWREGYDWYRQHL ADHESANDAAGWQWAASTGPDAQPYF I D WR WGERYFRQKLID GDLAAANNGGWQWSA GCGCDACPYF L NWHH GE QWF WDCLV DADLAASNSASWQWDA GCGADAAPYF L N WQWGELYFMQQLVDGDLAANNGGWQWSASSGMDTKPGR


I DWRE GY DWFRRKLADHDTANDVGGWQWAASTGTDA QPYF V D WRR GE QWF MRHLVD GDVASNVGGWGFAASVGVDPQPYF
| D WR WGE Q Y F M S QL I D G DFAAN NGGWQWSAS TGTADAA P Y F
I DWRRGE RYFA LRRLNDYELASNNGGWQWAASTGCDA QWFR
ID WR H GE T WF RETGVDA DPANNAAS WQWVA GS GA DASPF F
QHWHN GA R WF WD T L V D A D LA S N S A S WQ WV A GCGN DA A P Y F I D WR WGEAYF HN KLL DYDAA SN DGGWWQWAAS T GT D S VP YF
I
I WR Q G E Q WF MQ H
D WRE GE A WF WD T
I DWRK GEAYFMSKLI DGDLAASNNGGWQWAASTGCDAQPYF
I DWRWGERYFMQQLVDGDHAANNGGWQWSAGTGTDAQPYF
AD WRQGYEYFRETLADHDTANDNGGWQWAASTGTDACPYF
I NWRE GE A WF WDTLVVDADEASNPANWQWVA GSGADAAPYF
I D WRE GERWFADTLVDDHDPASNPMNWQWNAGTGVDAAPFF
L D WRQGE $\square$ Y F MEHLIDDGDFAS NNGGWGFSASTGVDPQPYF
I D WRWGEAYFAAKLMDFDLAANNGGWQWAASTGCDAQPYF
I P WQE GA R WF WD T L VDA SLLA QNSLLGWQWSA GCGADAAP YF

I DWRQGEAFFMRHLIMDGDFASNNGGWQWCSSTGADGAPYF

I SWQHGENWFRDTLLDADVANNSASWQWVSGTGADAAPYF V D WHVGGERYFMSKLV DGDYAANNGGWQWCASTGCD GQPYF
L H WH H GERYFMQK V V D G DYA ANNGGWQWSASTGCDA QPY F

LD WRRGEAYFAEKLNDFDLAANNGGWQWAASTGCDA QWFR
I D WRA GYEWFKERLVDHDTANDNGGWQWAASTGTDAQPYF
I D WRR GERHFADQLI DYDLAANNGGWQWAASTGCDAQPYF I N WQM GA E WF E S LLL I D Y DVVC SNWGNWNYTA GVGND GRGFR
 V D WR DGE RYF LINKLVD GDYAANNGGWQWCASTGCD GQPY F I D WR WGE E Y F Q E A L M D Y D SAA N
Q D W CDWRWGETAFMQRLVDGDLAANNGGWQWSASSGMDPKPLR ID WRHGYEHFRDLLVDHDTANDNGGWQWAASTGTDS QPYF
 I $\begin{aligned} & \text { D WRR G E R WF AL K L }\end{aligned}$

 V DWRRGARYFMQHLVDGDLASNNHGWQWVAGTGTDASPYY MWWPVGARHFMDHLLDDGDMASNSHGWQWAAGTGTDAAPYF ID WRA GEAWFWDTLVDADAASNAANWQWVAGCGADAAPYF D WR WGERYFRRKLI DGDLANNNNGGWQWAAGTGCDARPYF
 $V$ D WRV G A R Y F L E L L V D G DIA N N QL L WQWMA GTGTDSRPNR V D WREGEKYFMSKLI DGDYAANNGGWQWCASTGCDGQPYF I DWRRGEQWFWDCLVDADPANNPGNWQWVAGCGA DAAPYF IV WWP A G A R WF LD HLI D G DLA S NTHGWQWIA GTGTDAAPYF LDWRRGERYFMETLIDGDFASNHGGWGFGSSTGVDPQPYF I W WRWGERYFMQKLVDGDLAANNGGWQWSASVGTDPKPLR
$\begin{array}{ll}I & D W R W G E \\ V & \text { D WR W G M Q H }\end{array}$
L P WQLGGAHF LY SHL ID G DLAAANTLLGWQWTA GCNTDS FP LS
LS WQQ G E A WF WD T L V D A D L A N N S A S WQ WVA GC GA D A A P Y F $V D W R R G E R F F M Q H L I D G D F S A N N G G W Q W A A G T G C D A Q P Y F$ I D WRL GE RWFMS QLI DGDFAANNGGWQWSASTGGDAAAYF
I DWRMGA EWFESVLLI DYDVCSNWGNWNYTA GVGNDAR GFR I D WRE GE RYFAEKLI DYDRASNAGGGWQWAAS TGGVDADV Y F V D WR E GA R H F LDD L L V D G DVA N N Q L N WQ WVA GTGTD T R P N R
I D WRYGEYYFADNLID T DFA SNNGGWEFSASVVGVDPQPYF
L NWQWGERYFERQLADADLAQNNGGWQWAASTGTDAAPYF
I D WR $\square G E K Y F M L L L L D G N L A D N N G N W Q W D S S T G N N S W P Y F$

I D WR LGGEKYFMS QL I D G DLAASNNGGWQWAASVGS DSVPYF
I P WQE GE R WF WGTLVDDADLA N NTMGWWWVA GCGA DAAPYF
$\left\lvert\, \begin{array}{ll}1 & H \\ I & W L R \\ \text { S W A A W W }\end{array}\right.$
$\begin{array}{ll}I & S W R W G E R Y F A Q H L V \\ I & D W R L D G E\end{array}$

220
230
240

UniRef90 A2BUR6 UniRef90_A1S3R2
UniRef90_J4WV79 UniRef90-LOM5B9 UniRef90 V2VU87 UniRef90-F8D8R8 UniRef90-A3D723 UniRef90 UPIO0036A0AF1 UniRef90-UPIOOO4759284 UniRef90_UPIO00378F2EB UniRef90-J7M3U5 UniRef90-L9VM49 UniRef90-U7PUY6 UniRef90-।131AQ5 UniRef90_QOBDKO UniRef90_UPI00047707DF UniRef90-S314Y3 UniRef90_UPI000378F49C UniRef90-UPI0002624F80 UniRef90-003Y03 UniRef90-K6UXW4 UniRet90_A9ASJo UniRef90_U1LDGO UniRef90-A5UYV1
UniRef90 MOPHC9 UniRef90-A0A059E4R5 UniRef90-E5AS07 UniRef90-UPI00022601C6 UniRef90-M3DAF4 UniRef90-UPI0004759882 UniRef90-UPIO003B6A7EA UniRef90-I81AX0 UniRef90-R8EDM4 UniRet90 UPIOOO3A339AA UniRef90-C5BG83 UniRef90-F6EMA3 UniRef90-E8LXK8 UniRef90-F9RK27 UniRef90-F7RYU2 UniRef90-D5QHZ9 UniRef90-DOJGL3
UniRef90 C7NYWO UniRef90-UPIO0038041D4 UniRef90-Q10W56 UniRef90-J3QA37 UniRef90 UPIOOO2D5CFC6 UniRef90 AOAO23V UniRef90-TORE18 UniRef90_UPIO00200138A UniRef90 M1 XSR6 UniRef90_13UA50 UniRef90-UP1000472D453 UniRef90-B9GWN1 UniRef90-B1XLX0 UniRef90-Q04449 UniRef90-D2S8X0 UniRef90-E9UZD7 UniRef90_UPI0004721B78 UniRef90-S8A8G7 UniRef90-C6XGZO UniRef90-V6KM54 UniRef90_U2ZKIO
UniRef90_V4NMC1 UniRef90_K6W878 UniRef90_BOXR57 UniRef90_O2JPS4
UniRef90 FOLZB2 UniRef90-A4SVE8 UniRef90-M2Y3R8 UniRef90-UPIOOO225C20C UniRef90-K9T8L1 UniRef90 UPIO000474D28E UniRef90 UPIOOO4662B3A UniRef90-B4WS74 UniRef90_S2KI25 UniRef90 W7CQ69 UniRef90-P12768
UniRef90 G8YVU5 UniRef90-E6PGE7 UniRef90-C5WCP4 UniRef90-R3HQZ4 UniRef90-U6B904 UniRef90_8 I8ZS6
UniRef90 DOMJ32 UniRef90-UP100037586A6 UniRef90-K5WK78 UniRef90_MOLSW3

TFNPYTQTKKFDPTCKY\||KFWIIPELISKIVIPNKDI DNGETSD RFNPMSQSEKFDPEGRFIRKYLPELAQWPTRSLHQASPGL RTFNPTQSKNFDSNGLFIKKYINELKDLDKKDUBPDESI RFNPTTQGERFDKEGEFIRQWVSELAEVPQKAI HEPWKWA RFNP円SQSEKFDPNGDYIRRWVPELRSLDDKTIHEPYAKG RFNPMKQGREYDPDAEYVREYVPELADADPDEIHDWHDLS RFNPMSQSEKFDPDGSFIRKYLPELASWGDKQLHQPSTAQ RFNPVTQGEKFDPDGEYURQYIPELKELPNKYLYNPSEAP DFNPMTQARKYDPEAEYVGQWLPELQGLTTAELGSGNDPP RFNPVTQGKRFDPKGEFIKAYLPQLEHVPEKYLHEPWKMP RFNPTKQGREYDPDAEYIREYVPELADATVDEIHDPADRE RFNPTRQSERFDPEGAYIRQWVPELRGDDNAAIHEPYARA RFNPCSQSERFDPKGDFYRKWVSEVAHLSAKEIHNPPAP
 RFNPVVQGTKFDPQGEYVRRYIPELNNLPDCYI HTPWDAP RFNPVTQGEKFDPEGKYLRRWVPELSALPDRFVHQPWAAD RFNPVSQSRKFDPEGQYIRTWIPELAHLDAKTI HAPYESK RFNPVLQGQKFDPQGEYTRHWVPELSKMSAEKI HAPWTAS RFNPITQSEKFDPDGSFTRTYVPELKNVPAKHI HFPHDYL
 RFNPMSQGERYDPDAEYVKEHVPELRGLDADLLHEWHELIS RFNPVLQGQKFDPQGAYVRRWVPELARVPSGCVHAPWDA RMNPILQSEKFDAEGEYIRRWVPELQRVPASMI HAPWAAD RDFNPLQSEKFDPQGEYIRKWIPELRDVKGKAIHDPEGKV RFNPVSQSEKFDPEGKFI RRYLPQLAALDNKQI HAPWLAK


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 RDF N P T Q G E R F D P D G D F $\quad$ R R H W


 YF N IPPK Q A K D Y D P E G K Y V K H W L P E L G K V P P A K V H E P W K G V
 $R F N P D T$ Q G E R F D P Q GEFVVR Q WL P E L A Q V P D K Y L H Q P WK WS
 RFNP Y A Q S K K F D A D G E Y I R R F CPP E L S H F S N K D D A A A P H A K C RF N P M T Q G E R Y D P D A A Y $\operatorname{li}$
 RFNPISQGEKFDPEGHFVRKWVPEI QSVPNKFI HNPWLWS
 RFN PVVT Q S K R F D E NG T Y I R T Y Y I P E L N H V P D H Y I H E P WK M C

 $R F N P V A Q G R K F D P D G A Y V R R W V P E L A G L P P A T D H E P W A G V$ RFNPTN QSKK F DPN A QFI R HY L P E L T H Q A LA A I H Q P L N G N
 RIF NP T Q GK R F D P Q GTFIIRHWLPELNNVPT QYI HAPMSWN $V L N P V T Q G R R Y D P Q G G Y V R R W V P E L S T L A G A A V B E P W K L P$






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

 RFN P W L Q S E K F D S E G S Y I $R F N P V L Q G Q R F D P E G A F V R A M L P A L R G V P T K Y V H A P W Q M P$ RFN P T T Q G K K DD P N G D F I $\quad$ R K W W L P E L N E V P S
 R F N P V T Q S Q K F D P E G R Y L R H W V P P E I G K L P D K A A M H A P W L A D RFN PVGLQSKK F D P E G R Y I R R WL P E L G R L P A P C I HAP WEAP R F N P W L Q Q Q K F D P Q G D Y L Y Q W L P E L R K V P DK T I H Q W W Q K




## UniRef90 K1PMJ9

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UniRef90_DOFZ20 UniRef90-B5HCZ1 UniRef90-D7DL60 UniRef90-AOAO22PS46 UniRef90-E2SDH5 UniRef90-UPIO003817770 UniRef90-UP100047E63FC UniRef90-AOAO11 MYB1 UniRef90-M5BMN4 UniRef90-G0A149 UniRef90-B6BWL3 UniRef90-WOV2FO UniRef90-A7RWD1 UniRef90-WOP4T9 UniRef90-Q6DFA2 UniRef90-F2JTA9 UniRef90-M2MPB3 UniRet90-GOA1Q7 UniRef90-W5U707 UniRee90-UPIO0030A6F16 UniRef90-E8RSQ6 UniRef90-A0A025Z275 UniRef90_10kG03 UniRef90_JgYY UniRef90-A4TCBO UniRef90-R7WR99 UniRef90_R7UL99 UniRef90-UPIO004732CF7 UniRef90-A9UXR7 UniRef90-UPI000377C9D2 UniRef90-W2UQU1 UniRef90-C5E333 UniRef90_UPIo0037EF877 UniRef90-K41GZO UniRef90-L1J295 UniRef90-S9T167
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1
FH G GEAEALT RLLERHLERKVAS FERPKMSQQSLDPSQQLS
 GGESE GRDRL T A WL R R DAGA YE D QHDDLLA GDATSRLL S WS P G WS N A D K $V$ V L Q A F LP T GMS G GKALL E D F L E

$\square K$ G GRK Q A L A AL $\quad$ D R L
EAGEQAAHEQWEAFVG WLP GEDAAVRRLKVFVE $P$ GS QGAEKTVLDF WPAGED DAAHE
REGRR $\begin{array}{llll}E V L R R F \\ R & R M A A W L & R & \\ K K L T D F & T\end{array}$ YPAGEVAACHRLDQFVADDVHNY VVAS LI QKGLEQLTRFIEEGLAQY HDDRDFPGKEGTSF S WQPGADAAMNRAIRFLDSALDAYAQGRDDPGTTGTS SL S WPA DHDTAK QK LWQF CHHKER HYQE GRDYP DEPATS T L S WDFSEDGAHARLEAFLHDGVYRYEKESGRADAPNTS WPATD QAA HQVLDNFI K GRLLARYAEGR WHVGEAAAQQAL QDFLGGALDDYDH WS PGWSNADKVLSEFIVSGHLLDYS E WTSGEKAAHANLHRFI ENALADYETNRMKVEGTTTS FPGGETEALDRMERHLKNWI CNFEKPKTRADAPGTSLLS PA GEKAALDERWKYF QKNGLDNYDEGRNLAGDDGTS KL S WPVAE GEAEAR LRREFVEAEVTAYAERRDFPARQGTSRLLS LPA GEAAALLEAWEDFRDGALADYDTGRDRPDREGTSRLS

$P$ LPTGMRGAQQLLQDFMP WQVGEVH A QHLL N QWCE QAMMEYATARDFPANPSVSHM

PFKGGESAALLARMADYLSDKVCAFEKPKGNPARPSTTVLS WHPGEEGAI QKLKRFMKNSLKVYSEKRDCDWLDATSNLS


EQDALHVLQQF IDTSLPYYHRQRDIPAVS GTSRLS WY P GWNKTEKALTEFVVQHLLDYSKNRLKVGGDSTS LL S

GGESAGRKRFHDWEAS LP T GMQGGLTLFNDFIE WSPGWQNANKAFSEFLEHNMSRSYS TASSPRPADKGVSYLS YPAGEEAARRRWRD W K E QVVTQYD DVR DLVPGVDRTS RMS EA GEAAALKRWETFLHNGLTAYDDERDRPDLDTTSRLS

 $\square P$ T G M S G GA G L F E Q F L P R R I A N Y G VA R D F P A L K G P S Y L YPGGETEALLERLEEVYMED WVCKFEKPNTAPNEPSTTVVLS
 WK GGESSEALCRRLEQHLEKQVANFQKP QTVPNLDSTTGL S WP A NYAH LK ETLDSFCSLKEA DYEAVREDPSTAGTSLLS WPA GNDAGMKRLDHFLDNDKDEDYKAHRSEPAKDATS RMS
 DFMQHKLNNYHHDRDFPAIIKGTSGLS

PFK G GESVALLARLNAY IWGRRLKTYKETRNLLLGEDYSSSKFS WTP GEKAA Q D QL S R Y L K T D I D DY K DA R D R P D L D Q T S K L S
 WTPGEA GAAAALATFI ES GLAD YAVVRDVPGRRGTSRLS PFKGGETAARARLQYYLWESLASYKDTRNLVGGDYSSKFS

PAGEDAALATWSAFLDEDVEHYAAERDRPDHAGTSRLS
PATEADAHE LLQEFDS G GNYHQTRDFPAQDGTSLLGG

WEF GEEGALKALEEFVRFGCHHFGRGRFRADRKYTARV
LDP TGMS GGATLLDDF EDRMDDYHARRDFPAVRGPSYLS
FK G GR R A A L D T L N R FPAGTSGAFELFDDF,RERMSDYGRTRDFPALKGPSYLGG

A A ARD RLD A F CAS G $\square$ T QYK D R R D D LEA D A VS RL S $R G G R Q A A L A L L D D M D Q$

 GYRAARERFDGFLEHGIRSYADTRDDLARAAVSRMS EAGHDAAAARLDDFCAADI YRYVEAREYPAMDATARIS
 $\square K$
P G G R R E GF K
P



## UniRef90 K1PMJ9

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UniRef90-K9YK79
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 PYLA GA SVKQLIAEVQC HFPDILQTPSKDEFTWINEL PYLALGVISGRMVLNEAAKLGKGKRLEGRDTGVGMWVQEVV
PHLHFGTLSAAELVHRARRKEGAGPAA
PYLALGIVSVKQLLAE SQLHFADLLQMTSAPAFSWI NEL

VHLRFGTVSURYLARAAWQTGSAGAS
PYLALGALSVRQCIARLTMEGYWQQSYLSNGREVWLSEL
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VALSAGTLAPAEAWRAARMAM RDPAAREGAVTWRGEL
VHLRFGTI STRQLVAFAVQEGSAGA
PYLAAGVISARTCVREALETCGKKKVDVSRDTGVRWLSEE
PYLAFGCLVAAELARKAREHGGAGAEA
AY T GVI SPRLCYQAAKAQEQLHGNDGDNEDTNRWUNE

PYLHFGE GPRQVLALIAARYGTVEAPAAEA

PYLAAGVVSARECLRRTKQDTKGKDHVGRDSGVAMWNTE

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PYLRFGCLSARRFFAELNDLYRKIKK SPAPLSLHGQL
PYGAAGVLSPGQALRAALAAN QGELDSGKAGAATWINEL

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A H L H F G T L S P V V V C V H R A R R R G GP GA D A
P Y L R F G LI GY R K L I Q A A L S V K N E
P YV R F GELSPRRRI FHE IVVRHRYKAK

$P Y L K F G V L S P R E V Y Y S V N E E$
V H L R H GTMS I RA LAR SAHDAQRHGDKGAET
P H L A G G T $\square$ G $\quad$ I $R$ R E V W A A VT D V
A Y L K F G C C S I R E A Y Y Gll M E T L G E E
P HLLHF GEVVSPN QVWY A I K D R F GT SEDK S DE T
P HL L F GEIISPAEIWHRV
PHLRFGTVSVRKMVEKAIAEDNE
APLKYGEI HPRTILADLAAHPAADGEGARR
PYLATGAI GDREMWADATDAFEAATGDERRNDDK
PYESFGGCL
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 AWRDFYNHILAFFPRVSMRPFLEKYAHIQWETNEAHLQAW AWRDFHHQVLAARPDAAWSDYRARGD RWRRAGRDADAW LWRDFYHHLMFFDPDLSRQCFHAWGDRLLWDDNPELLAAW AWRDFYRHVLDYKPELDQHQANETDVKINWSYNEDDFDAW A WREFCYHLLFHFPELDEKNWNDSFDAFGWRDDEKSFAAW A WRDFYNMIYMVNPDQKTMSDQKPFRQLEWDNHPDWFQAW GWREFAHHLLYHFPHTATDPLDPRFARYPWRTEGELLAAW A WRDFYRQLMSHFPFCKSRPFKPETSA LIWRQNEEEFQAW
AWRDLAYWQLTLFPDLPWESLRPPYKALRWSTDCRHLKAW SFRDFYAHVLAA WPKCMGHAFITKYEDVVWETDSSTLDAW VWREFAADMLLYHFPHTMDKP LDSRFEQFPWAADEASLRRWW GLDREYSRYLCFNFPFTYERSLDGNDKHYPWRADEGQFKSW GWRDFAWMQMFTTPDLATRNLRAEFDHMPWRADAADLAAW LWREFFYTVGAVTPNFDRMKGNPVCRQDPWGSKPEHLEAW DWREFYRHLLYLEPHSMNQPFQRHTRADAWSHDEKHFTAW AWREFYADVLWHQPKTARENYDRKFDKFEHDTAQQRFEAW IWREFYQQLLWHYPHVVEESFKPEYRQLGFPNDDSLFVAW A WRDFYFM LLWHHPQVATQSFKPVYDRVQWDDAPELWQAW YWREFAHYLLYHFPHTPEKAGYSQFDNFPYQENTELLMAW LWREFYQHLLAAYPSSMHQPMKPETAAVPWRDAPDDLAA W GWREFTCHLLFHYPDLPEKSFKSNFHQLK LEDDEEKLHAW LWRDFFRFTCLKYGNSVFHKSGLQNDQLPWQENQNLFELDW LWRDFFQFQFCKHGSRFFHPNGDRDVEKAWERDREAFDRW A WRDFYHMI YAHFPFTKTEAFIEKYRHDPWSRDDERFEAW GLREYSRYLCFNFPSTDEKPLLGNDAFFPWKTDPANFKAW IWRDFYVQI LHHNPSVAGRAYKVEFESLKKPNDTALFQAW GLREYSRYI CFNFPFTHERPLLGALRFFPWDFDQARFKA W AFREFYADVLHHRPDSAHGYYNPALARMEYDRPGESDDAW AWRDFYRHVIVDRPD VVKGYNKQADKKVIWSYDMDDFQVW VWREFYADVLWHRPDSAWHDDRPEDARLPYDSGDETDDAW VWRDFYFMILDRFPHVVERSFRPEYDAVVWEQAEQAFADW
AWRDFYTHVMAAFPRVSMRPFHEKYADVEWETTAAHLKAW AWRDFYTHVMAAFPRVSMRPFHEKYADVEWETTAAHLKAW I WRDFYFQI IVNFSHQDGHSFKLQYDNLQYENNESFFESW I WRDFYAMILFNHPHVVGAAFKPAYDAIVWETADAAFAAW LWREFFTTAAYKTPNFNKMVGNS LCDQVPWDQNDEY $\square$ AA W LWREFYYHLLISSFKKKNQALVEWENRIDWNNNDKHFNAW LWREFFYTAASSTPNFTHMVGNPDCDQ: EWYKNEEQLQKW AWRDFYKQLMWHFPRSMRQAFKPETEQQDWSKNDTHFQAW VFREFYRQLT IITPHTTMNPQNDKFDFVQWEDDVDGWKKW YWRDFFTQIAFHFPRVFGHAFHERYDKIVWRNDREEFQAW LWREFFYTAASNNPSFDRMEGNPDCVQIPWDQNPEALAKW A WRDFYRHLLHHFPDNKHRNFNAKYNGLSWLNSPKLLHAW A WRDFSYN LQQQPELDRVNFKSAFDAMPWRDDPAGLRAW IWREFYRHLMTYYPSCKHCPF IAWTDRVQWQSNPA HLQA W I WRDFFRFVALKFGTRDFKPSGIRYDDKKWDHDLA LFHQW GWREFSYSLLYYSKNLSSVP DNLKFQNFPWRKSVKDLDLDW AFRDFYAAVVAEWPRSTWWNWNSTFDA DEVDDAQRAFEAW AWRDFYADFLHERPDTARRNYDGRFDAMQYETADEAFAAW
LWREFFYTAATNNPKFDRMVGNPDCVQVPWDKNPEALAK W GWREFSAHLLHQFPYMAQRAFRPEFDAMPWRADPEGLAQAW GWRDYFRFVALQHGTADFKPGGVQHKDVPWRASPADEEAW
 AWRDFYKGVVMCNWPYMSMEADKFETMDDKWENDEEKFSKW A WRDFHRQVLAAARPAAAHADYRTRHDHWRPRTARADDEAW $\square W R E F Y K A L L Y N H P K T Q N S A F K P K Y D R D E W R N D E N E F E K W$
$A$ AWRDLAYWCL WKFPTMADHPLRPQYAHQTWDYDQKQLRAW YWRDFFTLLAYYNPYVFGHAYKREYDCVPWVNDTNDFSAW SWREWNYLLLYEFPELASENYNDPPNE I A WRNDDAELAA W YWRDFFTH AFHFPHVFGQAFHRQYDALPWRNNPDDFQAW GWREFSYYLLFHFPTLPNKNFNDKFDKFPWRTDAKALKA W I WRDYAHVQI WVMPEYGSKNARGTFDNMPWRDDREDFAAW I WREFFMSILWHFPHTQNESFKAKYDRDEWRNNETEFKAW AWREFYADVLWHQPRSAWRDLRDADSGMPYDRGPEVNEAW AWREFYAQVLYFNPAVVTENYDDYENPIA WRNDGAEDAAW LWREFFYTAATNNPRFDKMEGNPDCVQIPWDKNPEALAKW YWRDFFT I AFYFPHVFGNAFNKSFQNVWWSKDENTFTGW A WRDFYADI LFQRPDSARENYDKKFDKI ELDHAQELFDAW
GWREWFQYLMYYNPETVQENYKD MKPVVERDNPEHLQA W

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UniRef90 U1KR21 UniRef90＿B0LQ55 UniRef90－YOKJP4 UniRef90－K9ULC6 UniRef90－Q7MFG3 UniRef90＿G3IZT8 UniRef90－UPIO003815CB8 UniRef90 U7HMU3 UniRef90＿UPIO00382277B UniRef90－R7SYP5 UniRef90－UPI0002EDDBA5 UniRef90－I5B6V4 UniRef90＿UPIO004046ADA UniRef90 UPI0003C1253E UniRef90－UPIO0047015AA UniRef90－UPI00036DC5FE UniRef90－A6VUF2 UniRef90 ${ }^{-}$M3ZPM5 UniRef90－Q4P1D4 UniRef90＿UPI0003754D6F UniRef90－M0U9S8
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UniRef90 F4FZY9 UniRef90＿G8M701 UniRef90－L9VXA6 UniRef90＿UPI00036193B0 UniRef90－S5ADG8 UniRef90－A0A031JE64 UniRef90＿UPI00037FA41B UniRef90－E6J．J940 UniRef90－B9LS48 UniRef90－U3A9W9 UniRef90 S7PB29 UniRef90＿UPIO00380AOCD UniRef90＿UPI000476C2E8 UniRef90＿G0QAU1



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AEGKTGFPWIIDA $\square \mathrm{MMQQLRQTGWDHNDARHSV\mid ACFDTRGDW}$
CRGDTGYPDVDAAMRQLNQTGWMHNRLRMIVASFLTKHLL
KDGKTGYPIVDAAMRACKARGWMENRVRMVSACFLVKS LL

RQGRTGYPLVDAGMRELWATGWMHNRIVVIVSSFAVKFLL
 CRGETGYPIVDAAMRQLNQTGWMHNRILRMIVASFLTKDLIM CDGKTGFPIVDAGMRELNATGYMHNRVRMUTASFLVKDLH
 KAGQTGYPIVDAAMRQLNQSGYMHNRLRMIAASFLVKDLL KDGRTGVPVVDAAMRQANTMGWMHNRGRMAAMYLTKDLL QAGKTGYPIVDAAMRQLNQTGWMHNRGRMIVASFLTKDLH CTGRTGVPLVDAAMRCLNATGFMHNRLRMVTAMFLTKDLL
 QQGRTGDPLVDAGMRELWHTGWMHNRVRMVVASFLTKNLIR CEGRTGFP VVDAAMRQLNQTGWMHNRLRMVAASFLTKMMF
QKGKTGYPLVDAAMRQLWLTGWMNNYMRHVVASFLIAYLH
 $R Q G R T G Y P L V D A G M R E L W A T G W D H N R S R V I V A S F F V K F L C$
$Q Q G Q T G F P L V D A G M R Q L A R T G W M H N R V R M V V A F L T K H L C$ TEARTGYPFIDAVMTQLALEGWDHHLARHAVACFLTRGDW KTGKTGYPFVDAAMRQLLKEGWMHNRTRMVVASFLVKDDH


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$V$ NWRDGE YFMQK V V V VCSNWGNWNYTA GVGNDARVFR
I
L WR WGE R YFA R H L V
I D WRRGERFFMQHLI DGDFAANNGGWQWSASTGTAAAPYF
I D WRLGEAYFAEKLLDD DLLAANNGGWQWSASTGCDAQPYF


V D WR L G E E Y F K E K L I D Y D S A S N I G G WQ W A A S T G T D A VP Y F L P WQA GA A WF WDTLVDA DLA ANTLLGWQWTA GCGADAAPYF $A D W R R G E A Y F M S ~ K L I D D G E F A A N N G G W Q W S A S T G C D A A C Y F$
$L P W Q E G Y R W F Q D T L M D A D V A D D A M M W Q N G G M C G L D H$ HD WRHGERRHFSDLNFIDDQDFASNNNGGWQWSASTGGTAPQPYF
 VS WE QGMMVFE ELLLLDAADWSLLNAGNWMWGASASAFFAAQYFR L E WQLDGA DFFMEHLV DF DVAASNAH GWQWTA GT GTADASPYY I SWRRGEDYFMS QLI DGDLAAANNGGWQWAA GTGAAAAPYF V P WWWGARHFMRQLI DGDLASNQHNWQWVAGCGTDAAPYF $V$ D WR WGERYFA EKLI DY DLAA ANNG GWQWAASTGGCDA QWFR V S WE E GMKVF DE LLLDDA DWSVNAGSWMWLS CSSFFQQFFH L D WR R GERHFAA HL NDYDLAAANNGGWQWAASTGGDA QWFR L P WQT GA R WF WDTLVDA DLAANNTLGWQWVA GCGADAAPYY
 I P WQ K G E E WF WN RLV V D A D DLA Q S V C N WQ WI A G C G P DVVA P Y F


 I D WRWGERYFAEKLI DF DLLSANNGGWQWAASTGCDAQWFR L P WQ WG M K Y F W D T L L D A DLEEC D DL G WQ Y D S G S LDP D G H Q LE



 I D WR WGE EYFK EKLDD Y DFS ANNGGWQWAASDVGCDA QWF R

 I D WR K GE DYFMS K L I D G EFA AN NGGWQWSAS T GCDADVP Y F I D WRWGERYFARHLL DYDPCVNNGNWQWAASTGCDAQPYF I S WESGMMRVF E EMLLDDADWSVNAGSWMWLS CSAFFQQFFH $V$ D WRLLGEKFFMQHLI DGDLS ANNGGWQWAA GTGCDA QP YF


L N WT L G E QYF QE TLL LDY DEA SNAA GWQW

I S WE E GMKVF E E QLL LDA DWS DNA GM WLWWLS CSSFF QQFF H I D WRE GE A WF WD TLV VA D Q A SNVQ NWQWVA GSGA DA A P Y F $\begin{array}{lll}I & D & W R G G A \\ I & W & L \\ \text { W }\end{array}$
 $V$ D WRWGERWFRKHLL DA DLA SNAGGWGFCSSTGIDDAQPYF IV D WRVVGAAHF LIH WLVVDGDISSNNQLNWQWTA GTGTD S RPNR I D WRWGEAYFAEKL L DYEMS SNVGGWQWVAGSGVDAAPYF $\bar{M} H W V D G E K W F H D T L V D A D V A \square N A Y M W Q N G G H S G L D D Q W N F$ ID WRR GE QYFA DVLNDFDFAANNGGWQWAASSGCDA QWFR V D WR WGEKYFATKLVDYDPSVNNGNWQWVASTGVDARMFR I D WRRGEAYFEALLNDFDLSNNNGGWQWAASSGCDAPPYF I D WR DGAAHFR D RLVDDHDPATNAGSWQWDASTGTDSVDVR V D WRWGERYFARHLLDDYDPS $\square N N G N W Q W A A S T G C D A Q P Y F$ L S WHE GE R WF WD TLL DA DLAASNSASWQWVA GSGADAAPYF I D WRH GA R WF WD TLVDADYANNSVNWQWVAGSGVDAN $\operatorname{V}$ V S I D WR WGEAYFA EKL HDYEMASNVGNWQWVA GSGVDDAA PY F VVWPVGA R HF LDD HLLD G DLA SNNHGWQWVA GTGTDASPFF ID WR RGARY FT T QL I D H D HA S N H GA WQ WTAS T GT D S VDDVR CDWRVGGYHFRERLVDHDTANDTGGWQWAASTGTDAQPYF I S WE E G

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UniRef90 F4FZY9 UniRef90-G8M701 UniRef90-L9VXA6 UniRef90-UPIO0036193B0 UniRef90-S5ADG8 UniRef90-A0A031JE64 UniRef90-UPIOO037FA41B UniR Ref90-EGJ940 UniRef90-B9LS48 UniRef90-U3A9W9 UniRef90-S7PB29 UniRef90-UP1000380AOCD UniRef9O-UPIOO0476C2E8 UniRef90_G0QAU1

CYCPVGFGKRADPTGDFIIRTYLPVLKGYPAKY\|YEPWTAP RFNPVTQSKKFDPEGNFIRTYVPELADTPSKYIHFPHDAS RTFNTTQSQKCDPNGDYVRYWVPELKNLKGKAVHDPPRNE
 RDNPALQGAKYDPEGEYIRQWLPELARLPTEWUHHPWDAP RFNPVSQSERFDPQGKFIRKYVPELAKCSDKEIHAPWIDAL VFNDTKQSLDYDREGNYVKHWLPELAQVPAAKVHEPWKGV RENPITQGEKFDPNGEFVKHWLPELAEVPSKFVHQPWKWL
RINPWLQQLKFDQDCRYIYRWLPELQAFPPKTIHQ WDKK RFNPVTQGERFDPQGDYVRRWVPELADVPGKKVHQPWKLS RFSPVRQSRRFDPEGRFIARYVTELAELDNNAIHEPWKQP RFNPISQSEKFDAAGKFIRRYVPELANLSDKAI HAPWAGV RFNPYTQSQK DDPGGEYI RAFVPELAKVRGPEI HKPPPAL VLNPAAQGRRYDPDGGYVRRWVPELDGVPVRALHEPWRAT RFNPVSQGKKFDPGGRFVRAWIPELESVPDRYVHCPWTWK
 RFNPILQGEKFDGDGDYVRRLVPELEKXERKYYGKPFEAP RFNPVRQGERFDPQGTYVRRWCPELAGLPDKFI HQPWAGL
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$R D S P E V Q G Q K Y D P D G Y V R N W I P E L A R V P E W I H Y P W D A P ~$

 RFNPIEQGKRFDENGDY:RKYVPELAHCLSAAE:HEP RFNPTTQGEKFDPNGDYVRKYVPELRGVPGKTVHKDDKDP DFNPVTQSQKFDPEGKYIRRYVPELAALDNKAIHAPWQAK

## I


RMFNVIDGE K K F DAE GYYVRKWIPEIAKMPNSYVQKPWEAP

 RFNP I E Q S K K F D PD GTY I R T Y V Q E L A S FP S L Y I HE P WK S N R D D P A I H GA K F D P E GE Y V R Q WL P E LA RMPA E W I H H P WN A P

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


## R

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


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


## R

RFNP LQSERFDPQAK
 TYCPAS F G R K A D P T G D Y I $\begin{aligned} & \text { R K Y L } \\ & \text { R }\end{aligned}$ RFNPVT QGEKF DPAGRYVRRWVPEIRALPDRWLHAPWSAP HFNVVI K QA K TY DP TA E Y V H L WWV P E L R GLLDA P QA H V P F K L S RFNPTTQAERFDPAGDYVRSWVPELAHLA GASVHRPWEAA RFNP $\square T$ Q $\square K K$ F D K D L K Y I N T WV K D L N E F
$R \square F N M K Q C E R Y D P D G K F V K M W V P E L K D A D N V R I D R E G R S E$ $V L N P V T Q G R R Y D P D G A Y V R R W V P E L A D V D G R R V H E P W K L P$ RFNPYSQTDRFDKDKKYIMKWI PELN
VMHPVFAAKSCDPEGDYVRRWVPELSKLPPEYDHCPWEAP I F N PV T Q S E K F D P Q GR F I R K Y L P Q L A GIL P D K Y I HAP A T A P I F N P WL Q Q K K F D P E A V Y I K K E WV Pr E L

 $R \square M A P L V Q S P K F E A A D Y I K Q W V P E L A Q L D D K D I H D P D A Y D$ $R F N P T T$ Q $\square D K F D K K L E Y I K Q W W A P D F Q E L$
$R F N P V T Q Q G Q R F D P D G D Y$ I R R WV P E L L R H L P GA A A HE P WL WP

 RFNP WLLQSRKF DPDA GY I K K WI P ELLKNDPSAHI HQWDY K D



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 WVGGETEALQRLSRHLEHKVATFGKPKLSLLCASQTGLG

 WT P GEA GAAQRLEEFV DRARRYDEQRNLPS CSGTSML $P G Y E G A R Q R Y D D F L T G G G E T Y N D T R D D M Q A A A V S R M S$
 F $\square$ G GE T K A L E $\square$ ME E Y $\square K$ D R V N S F S KP F T S P N KP S T TA L S
 WDF GEEGAWKALE LIF LSEGVRKYEKESCRADHLNTCRIS LP A GEDAALE RWRTFVD D DL S GYES DRDRPD LDVVS S RMS

G G R Q A A QR T L E S F L T T R GVVD Y M R E M S S P A E D S C S R L FRGGETSALYRLDEYDWDKPKTYKETRNDVGGDYSTKYS

PGYAGARDRLDRFTQEGLLTYNDTRDDLGGATVSRMS
A GEDVAAQD LL F QFMDTGVDRYATGRDDMGVNGTSRMLS PGGETAGRDRLARWTSGGMAAYGERHDDLAGDATSRLS
 WQP GEAAARARLREF L DHDLLGSYDAARDEPSAGAT

WQVGEHKA
$L Q H L$
$W$
WSK K
K
WPAGHDAA
QQRLNEFLS


$\square P G G R H A A L D R L A$
E E Q A VA N WQT F L N E S
EAYETNREVLAEDGTS
KNYGETRDFPAKNGTTRLGG
PAGENGWRYDSFVKERYVNYSKM


PGEDGA IDRKLKEFIKYKLVDYRKGKETVWPSKTS


 GGTAQAYKYLNSFLSDRHFGYNKNDSKPAEASCSRLS WS P GWS NADKALT TFINGPLLEYSQNRRKADGATTSLLLS
PS GYEAARDRLDRFCDRGIVGYNDTRDDLAQAAVSRMS
 K G GE K L A WRY L K S F V V D R V K N Y N R H DS K P S R T G C S R L S WPA GTEAAHKLL Q HYVLDEKVA DYKQS RDFPAEPGTS SLS


WTPGEAGARERLAQL DLANYAEERD DPALNATS LL S
EQQARKA WEAFLSEDI SNYKKMTDDVSQDYVSGLG

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P F R G GETVALTRLEDSLEKWVCEFEKPKGDPTAPATTVVLS
R GGERAARERLDA WLSSGLAA YPDRHDDLP GAATSHLS
WTVGEDAAHERLGWW A DHVAEYEDGRNLDSVD QTS QMS
WQVGETAAWRQWQAFQEQGLPHYSDQRDFPAIHGTS GLS
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CRVGEEAA QDRLDEFIE TGGARYQDLRD L P AVVGTS GL S
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A R
WS P GWQNADKALSAFLNGPLIDYSVNRKKADSANTS


GGREAGRERLRAF TERIAEYPGSПSSPARPGT WQMGEQAAWQQANNFLTDSIHHYPKQRDFPS\|MGTS DL WEPGEPAALARLREFLDDDLGDYAFSRDAFAGGATSNLLS


E EA A $\square$ S R L R K Y LE D GI D KY P EK D I LIMH S S SHMS
PGGRAAGARRLRQFVAD IDEQYPGNDSAPARTGTS
Y K G GES E A L K R L Q WMV K N D F T EP E $\square T \mathrm{~T}$ I S L LX S A T


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FWRDFYRFWADKYGNQMFSSGGYNYNWQEDRENVR W FWRDFYRFWADKYGNQMFSSYGDYNRYYNWQEDRENVRRW
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LWREFFYTASVGIDNFNKMADNPVCGVDWDTDSEYLAAW LWREFFYTASVGDPNFNKMADNPVCTQVDWDTDSEYLAAW YWREFFYAKSYTVKNFHFMQGNPLCKQUNWNKDEEITKKW LWREFYYHLLDGFPEDKFQSDTKWEKN DWDDNDKYLNAW VWREFFMQI LYHFPNTVTEAFKKKYDR NWRNNEDEFEDW AWRDGSYWLLTLWPDLPSQPTRVHYRDQAWSRDPGHLKAW AFRDFYADVLYNWPKSLWHNWNDQFDDDALDTAEKHFDAW HWHCHFMQRLESEPAMEFRNLNRAFDDLRPEWNQEHFDRW IWRDFHYHQLYYRPD TAEDDMRDTDANTRWQSNSVGGDNS IWRDYFHF ALKFGTRIFKQSGVKNDMKQWKRNQEVFEKW SWREQNYHLLYYNPDLAVSNYKSIPNKDAWRNDDEDFRAW CWRDFHHQVLAARPEASWRDYRTRDDRWRGEDDAEDTAAW LWREFYYTAAASESNFDRMDGNKFCMQDPWEDNEEHLTAW GWREFCHHDLDDHPSLPEAPLDPDFARFPWQDDGTLFRAW VWREFYRHLLVSFPGQRYEPFRPEAERDSWDDNQQHLEAW VWREFARAGLWHFPHTETHPFQAKFETFYRPESSKNYQAW VFRELYRQTTLTTPHTAMNPQNLKFEFVQWEDDEEGYDRW AFRDFYAAVLDQWPDSVWWNWNKSFDKIEVDDDEDAFDAW AWREFYRHI MIAHPWISMGKPFQYESWTPEPLATTYFTAW CWREFFTHUGFHFPHVFGHAFDRRYDGLDWRNGEDDFKRW WWREFMQL LWHFPHTVHQSFRPKYDA DWKNDEKDFEKW LFREFYYVLMVTYPEMATQSFKPNYRQE WSGNKANFERW IWRDFYMMLTHFPHVAKGNFHKKYDALEWRNNEAEFQAW HWHCHFIQKFEDECRMEFENVNRAYDTLVKPKNERYTKAW
 GWRDFCFHLLHYYPDFPEKSYKGNFDETVWKVDKEKLKLW IFRDFYAYALFHTPHVESENYKYSFNG\| KTVEKEKFIAF IWRDFYAMILWHFPYTVDAAFKSQYDQIIEWRNNAEEFKAW CWRDFYYQVTATFPEDSTRPLREKADQN WRYDDDALRAW A WREFYADVDWHHPASARHNLDRRFDRDELDEDRDHFDAW YWRDFFTHIAYHFPEVFGHAFVRKYDALPWRNDQAQFYAW RWHCHFDQKFEMEDRYEFENINRGYDSIRQNENDILYEAW GLREYSRYTSFNHPYSHERPLLGHLKFFPWIINQSYFKAW SWREQNYHLLYYNPDLAVSNYKSDPNEDQWRDDDEAFKSW IWREFFMMILYHNPRVVDESYKEKYDR $\backslash$ KWRNEEGEFRQW GWREFAWHLLAGFPDLASANFQTGFDRFPWRTDEAAFAAW GWHCHFWQKFEMESRMEFEPDNKGFLEFYPKVNHDWIQAW DWREFYRHLLVLFPEMRWEPFKPEEEKLSWQYDESLFQAW SWREQNYHLLYYNPDLAVENYNEFPNQMQWREDKDDFNAW VWREFFMMILYHHPQVVTESFKKKYDNDPWRNNEEEFNKW LWRDFAWHRLYHLPNLLATENVREKFDRFDWSWDDPRLKDW MFREFYY LLMTQYPETATKAFTEKYRNMQWSYNKQNFDAW RWQAHF QKFEMECSMEFDAVNKGYRNDNRVNEKYHKAW FWRDFYTLLAYYNERVFQEPFKAKFKDVKWENDRVLFELW A WRDFAYHLLHHTPRLATDNWRPEWAAFPWNTDEDAPEAW A WREFYADVLWHRPESAWEDLRPDLGRMSYDDGPETDRAW A WRDFHHQVARAFPDDPVRDYRPRDRG WREDPDADDAW CWRDFHHQVLAARPAASHADYRTRDDRWRTRTAAGDI EAW LWREFFYTAAYATANFDKMVGNPDCKQDPWKDDDELLSAW A WRDFHHQVTAAFPAVNVRDYRPRDRK WREDPDALDAW AWRDFYFQI LDHFPHVEKHAFRREYENDPFLNRAEDIERW AWRDYAQNIVYQFPDYPRETYRDAGDDTKLWRNQEELEAW AWREFARSILWHFPESEHQAFQPKFEGFYPDADHKNYQAW IWRDFFKFFALIKHGNADFFSAGYKGGAGPWRDDPAALAAW VWREFAYHLMFHTPHLLTKSWREEWQSFAWSENEDTPEAW GWRDYAQNVIDQYPDYGTRNGRDALGGLEWREANADLKAW GWRDFAANI DQFPDHGDAPNREAFNRFPFDDDPVGLTAW GWRDFYFMLLWHFPYVVSKAFKPAYDHDQWRNNEEEFRRW AWRDFFHQLLAARPAAAHEDYRDAHRT WRDDPAADDAW VWREFAYHEMHHTPHMDDSNWREEWEAFPWRTDPDSDEAW YWNEHYTQKLGDWPGWLNEAFKEKYRKIPWSHDQNNFKRW IWREFARYLLFFNPDLQTQAYQAKFNQLSWPAPDEQVTAW 1 WREFAWHVLFHSPDLATKNWREQYDAFPWPRNRAHLETW VWRCHFMQKLEDQPDLDQLCMHQAFEGLRPHHNDAHLQAW AWRDFHHQLLSARPDTAWTSYRPG PFAVRDDPDAVAAW IWRDFYAQILANFPHVAENSFRPEYDFDEWRNNEEEFAAW AWRDFYKHTMSFWPYLSMDPFNDASENMKWDNEEPNFEKW A WREFYADVLHARPETARQY LRPEFARMRYDEPGEHLDAW YWNKHYHQKLEDWSGWTTTAVNPAMRGCRAEHDPELVTAW

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UniRef90 B0EVY5


R
 CEGKTGYPIVDAGMRELNTTGFMHNRVRMIVASFLTKHLL

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







 QRGRTGFPLVDAAMRQLWLEGWDNNYLRHVVASFLISYLR





## R


 EK GET GVVPMVDA GMRELWHTGYMHNRVRMVTASELTKNL L





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 $K$ Q GR T G Y R F V D A A M R E L Y V T G K M H N R A R M I V A S F L T K H ML QQGRTGYPDVDAGMRQLWTTGWMHNRVRMITASFLTKHLL CEGKTGYPIVDAGMRQLNTTGFMHNRVRMIVASFLTKHLL


## K



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K


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, DRVGEAWFWD TLVDA DEASNPASWQWVA GS GADAAPYF I D WRWGEAYFAEKLDDYDLSANNGGWQWAASSGCDAVPYF I D WRA GE QWF WDTLVVDADEASNPANWQWVA GSGADAAPYF I D WRE GERWFWDCLVDADYGNNSVNWQWVAGTGDDANMFG L P WQ WG LIK H Y WD A QI D A D L E C D A L G WQ YV S G GMS DA H P F Y I D WR WG E A YFASSK LL D F D L S AN NGGWQWAA GTGTDA QPYF HD WRE GAYHFEEKLI DHDVQQNYGGWNFSAG


 $V$ D WRE GAR HFRKRLVVDHDPANNAASWQWTAS TGTD SVVDVR II SWEEGQKVFE ELLLDDGDWALNAAGNWQWLSASAFFHEFFR ID WK WGEAYFAK KLL DF D LAA QNVGNWQWVA GT GCDS SP YF

LP WWWGAK WF LDD QLTTD GDMASN QH GWQWAA GTGGTDAAA Y F
L H WRVVPGEF LAAH HWLDNEPG DHWA QVQMQ S STVVG DNRVR
I D WR E GE K WFWDTVVDA DVASNP GNWQWVA GCGMDPP YFR
I D WT WGAAYFES QLI
I DWREGARQFTRKKL
TH WRIGQRWF E E CLV
VDWR GAR HF LDDLVVDGDVVNN QLLNWQWAA GT GTATRP HR

I DWRLGGEQWFWDTLV DADGASNAFNWQWVAGCSGADAAPYF
I
$I$
$I$
D WRE
D W A G A A
I
$I$
D W
D R A G G A Q W Y F N D T
I D WKK GE QYFAKKKLL DYEASSNDGSWQWAASTGADSVPYF
$\left\lvert\, \begin{array}{ll}L \\ V & \text { P WQ WGA R WF LD D Q } \\ \text { D W }\end{array}\right.$

I N WQ WG E A Y F A E K L L D F E LAA SNVVGNWQWA A GT GCDAAAP Y F



V WWPH GAAHFLDDLLLDDGDPASNAHGWQWVAGTGTDAAPYF
I D WRH GARWFWDTLV DASYANNSVNWQWVA GSGVDANDFT
I P WQN GA E WF WD TLV DA D LAA LNS CS WQR T G C GAD DS YF Y
L P WQ WG E RFFA EHLL DYDKA SNVLS WQWSA GTGVDPPPYF

I D WRWGEAYFARK LLDDYDQASNVGGWQWAA GSGNDAAPPYF
L P WWWGARHFMEHLVVDGDLAASNQHNWQWAA GSGTADAAPYF
IS WR WGERYFA QHLV DYDPCVNNGNWQWAASTGCDAAPYF
QP WK R G A M H L G R Q
LP WR WG M K Y F W D T L L

I D WRWGEAYFARKLL DYELSSSNNGNWQWAA GTGGTDAQPYF
$\triangle D W R R G K Q W F W D T L V D A D F A S N P F G W Q W V A G G T G A D A A P Y F$
Q N WKA GA D H L G K C F L


I DWRWGEAYFA KKKLLDYE LAASNNGNWQWAA GTGTDAAQPYF

$\frac{\square}{\mathrm{V}}$


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

$V$ D WR DGA RHF LIELLVDDGDIANN QLDNWQWMA GT GT DSRPNR
V Y WE K GRDVF DRLLI DADWS $\square$ NN GNWLWLSASAFFNQYHR
$V$ HWREGA DHFHA HLVD GDVANNYGNWQWVAGTGNDTRPNR
I D WR DGEAYFARKKLRDYDLAAANNGNWQWWIA GTGNDAAAYF



D WRAGERWFWDCLV D GDYGSNSVNWQWTA GTGMD SNMFS


L P WR WG M KY F WD TLLLD A DLLES DA LIGWQ Y I S G S L P D S R E D H
LD WRA GA A HYTE HLL DA DVVANNSLLNWQWVA GTGTATARPGR
$\begin{array}{ll}\text { T D WR } \\ \square & \text { G Q A WF E E T L } \\ \text { L }\end{array}$

QP WKI GAD HF Y E HLI D GDAA I NYT QWQSQC GLVGRP G LR L
QH WLV G Q Q WF E H T L L



I
I
D WR W W
I D WRWGE R WF RN R L I D C D L A S NVGGWWG LVS STGVDA QP Y F


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UniRef90-E6SFH1
UniRef90_UPI000382E752
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RFNPDLQQKKFDPAGEYVARWI PEL
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VFNSDKQSKDHDKHGEY
 RFNPVTQARKFDPQARY, TRWVPELEAGMVNARFAPWEFP RMNPFSQAATHDPDASYI QHWVPELGTVPAN ILQTYLTQ


 VYSPVSFFQKTDKNGDFI RKYVPALKHFPSEYDYEPSKAP RFFNPLYSKLFDMSGSFI KQFI PELKKHVPNQYIHQPYEWS RFNPTTQDDKFDKNEAYI KEWVPEYGS VMHPVDAALTCDPDGAYVRKWCPE $\square A A \square P N D F \square H Q P W K C P$ RFNPETQAKKFDPDGDYIRRWIPE
IYNPDKQARDQDPTGDF I RRWVPELADVPTDFDHAPWEWS VFNPVLQGEKFDTKGVYVRKWVPEI AA L P DCWI HKPFAAP YFNDGRQADMYDKDGEYVKLWLPELCKVPAEKVHFAGLLS
 RFNPDTQAKKFDDGGAYRNAWI AE GQRNAPKTALDPQAWN
$V L N P T V Q A R R F D P D G A Y V R R W V P E L A D V A G R R I H E P W R L D$



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 RFNPESQTKKFDKDGKYLKRKWVPEFKA P R PAAYLHDTEKNK
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 RFNPITQGQKFDPKGDYIRRYVPELRDVAGKAVHQPRD RFNPWLQQQKFDGDCEYI YRWI PELRPFAPS II HT WDKK MYNPVKQSKEHDPNGDFIKKWVPELQNVPIAFIHEPWKLS


RFNPVAQGEKFDADGAYVRRYVPEDAGLPDRFDHRPWDAP
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 VLNPVVQAKRYDTDGAYVRRWVPELEKLGAPAVHEPWRRE I YSPITFAKKYDRQGNYIKHFL AFNPLRQARRFDPEGVYVRRYLPELADLPGGRAHTPWREE RFNPAEQARKFDPKGLYI RRWVPEFDSLR RMAPLKQSEKFDAAGYI RKWVPELADLPDGEDHDPTDDC RFNPIRQSERFDPQGDYI ARWVPELASLPSKQRLAPPTDQ $K F N D A K Q T K D Y D P E G E Y U K Y W V P E L G R K V P A K Y I A E P S A G C$
$R F N P D G Q L D K F D P K G R Y Q A Q W I A E G N P K P P D T A R A P K S W Q$ $R F N P D G Q D D K F D P K G R Y Q A Q W I A E G N P K P P D T A R A P K S W Q$
$R V M A P V V Q S P K F D A G D Y D R E W V P E L A G V K G D A \prod H D P E E A G$ RIFAPVGQSAKFDAAAYI RRWVPELAQLPDDAUHAPWEAG RFNPDEQTKKFDPQLEYIKKWVPEFREL
IDNPQLEGYKFDPHGEYVRRWLPELARLDTEWDHHPWDAP
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| UniRef90-W8BJA9 |  |
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1 10

20
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$G E G A A Q S R G A F M S S V E G Y D D G R D T S O D G T S N L S$ GEGAAQSRLGAFMSSKVEGYDDGRDMPSQDGTSNDS PCCGGETQALQRLHHYFWETVASYKDTRNLDGLDYSTKFA GGRNAAVDDLRGFLNHRSSGYGRHDSGPSAVYCSRLS
$\qquad$ GEKSAQSRDGAFMAHGVADYKANRDLPGVDGTSNLS WT WT GGELGAHRRLEHFVEHALEDYGQRDEPSMDATSGLS GTHRAATTQLRGFVDQWIGSYPNNDSAPARTGTSGLS GGEDAGMSRLQEF GGNSLKKY DQKDLLPDERSSHLS GEVAANTRLAQFLDVADDGYKERRDYPALDATSGLS DHPGESAASHRLGDFAAHRUADYADARNDLADQGTSGLS G WAPGEAGARKRLEEFMGE TSSYGADRDVPAQDATSHLS KADEETALKKLTEFTSKRASKYNNDKDLDDLTGTSLLS PFKGGRTMGLKYLNSFLESRYVNYMSHTSKPARTGCSRIIS QGGETTALETLRSFLYHRGVGFSKGUSSPNSSWTSRLS PFRGGESEALRRLRESLSDKVANFEKPKGDPSAPATTVLS
WPAGTDAALQMIERFFRGRLECYOERRDHADRSSTSRIS RVGEAAAMDRLHAFTDGAI SDYKDARNFPADEATSSLS FQGGETAA

LDRLHYYL
WRPGEAGAHEALLVEVVDGAL
PHRGGETRALGMLEEILADKTATFEKARDRLDQVGTSDLS PGLEAGHAVLGDFLGARGQRYPGG\|SSPAWTASSRLS FKGGETEGDKRLQYYLTDLIKNYKETRNLLGGDYSSKLS WPAGHAEGAKRMDSFLKQ SHYASTRSNPAANSTSRMS FPGGEDEADNRMEKCLKKSICGFEKPNTAPNEPSTTVLS
EGGETVGRRRETAWLSSG|DAYPDVHDDLPADRTSRLCS
RGGRDVAREKLEKFVGGDQSYPGNDSSPARDGCSGLS
EYLCERLKNLNNYESNREYPALDETSHLGG

## GlRRDKEF

QGGEAAAHD LLESFLQRRGR
GRKTADEKMHNFIKN
GGENAARRRLTAWLPT
F DGGETAALSRVSEYFWKKLDRYDDIHDDMAGDETS
KGGTTTALRYFESFLTDRINGYNTYYSKPSRKHSSRLS

$K G G R G A G V R A L T$ S $F V \operatorname{S} T R G E S Y Q R$
AWLRGPLDRYAQRQDDLAGDATSRLS
WVPGEAAAQARLDE
WSPGEPAAALRLDRFLRERAGYHADRDRPAADAGSSHS
WDPGEEGAWRRLHAFLEKRLENYRVRRDFLALDTSSLLGS GGESEAMRLLNAFSQERVGDFEKPRTSPDAPSTTSLS QLDQF ASKLAHYSQDRDYMALNGTSGLS GEAAAQARLDAFDRGPVDDYARLRDFPGAAATSGLS PYRGGETEALKRLEHYFSSPAAHYKETRNEMGADYSTKFA GEASAQARLQAFLQNDMAVYNDRRDELAGWGGSDLS FYGGESYARQSWNHFLNHEVTVYSQLADDITRNNISGGLS GEEAARGRLGAFMSNGIDAYVTARDDLATNGTSHLS GEQAADERFAAFDDEPWSAYRNGRDRLDLAATSLLS
PAGTSAARD LGQFLNEKLDRYYWQLSYPGAEVTSGMG
HGGEASAQKFPSEDFSRKLDAYEKLRDFPGADATSH1GG GGRQQGQAVLESFLNGRGARYHRELSSPAFESCSRLS
GGILRAARQTLASFLEHRGRDYRRASSSPSREHCSRLS VKGGEDNGLERLQYFNSELLTGYRWTRNSDGLDYSSKFS DKGGEVEALKKLGNDCKDAVATFAKPKTSPGQDSTTLLS PFRGGREEASRVLHTFLNGRGSRYRGGISSPSESAGSRLS

QGGPLHARTVMQSFFAERGKGYQKGDSSPSLSQTSRLS

## WV

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HRGGETLALEALEKIIEEYTATFEKPKTAPTAQATTLLS PFQGGERAGRERLAHYLNGPVRTYKETRNGFGDDDSSKLS GGRGAGLERLESFLNQRGEHYQRAMSSPGTSACSRLS GGRDGGLATLASFLTARGQEYRRAMSSPGAAACSRLS FVGGEDRALATLNSFLSHRFWGYHWKMSRPWEAASSHLS GTHQDAVEQLDSFLDRTRAYPEHDSAPARVGASGLS



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AHLKFGA: HPRTMVAGLDRAEEEGKAG GAGT VHLRFGTVSDRELARY $\qquad$
GHS乌K
PWLALGCI SPRYIYEQDRKYEKERTANQSTYW VIVFEL
AHLAWGSLSVREVVQSVKKRQQQLINTDDKKRFGRNFNSRL
AHLAWGSLSVREVVQSVKKRQQQLNTDDKKRFGRNFNSRLL
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DHLRFGTI
AF SVGLISARTVVNSAFSLLNVGKSPKDMSPA

ENLAWGE GPATVWHAGLRAHDEGQRGAE
ENLTYGEI STRTVWHSGQRAREEGKAGAET
VHLRFGTLSIREAARSARERQLLGDTGAGA

 PYUA WGNLSAREVYHKA QANHLKQTAKNKQALDAFMSRL $P Y L T W G Q S L R H V V Q A L Q E R Q A Q L K T Q K C R S D D R W L R S F V$
$P Y L K F G C L S S Y F Y Q C L K D V Y K N V K ~ R H T S P P V S V V G Q L$
 ENLTYGEVSPRQCWHAGQRADHAGAQGAE HWLKEL QFLAYGLLDDREVVNDLLA

V


## P

 P H L R F GT
$\square A$
P Y I RFGLI
APLAFGTVSARTVLRQALARAVAEQDAQWERSGRS
A D I K F G N I S $\square R$ R A Y H Y $\square K$ D P E
P Y L R F G CVVS PLA VA T R AG D R
P WLA S G S L S P R FI Y E E VKR Y E K E R LA N D S T Y W



$P H L H F G T L S A V E L V Q R A R \quad K A G G E G A G G D A$
P R L R F G E L S P H Q V WQR R S I E CA GE A Q S TA EA E T
PAL R WGELSPRTVWHRAIAAAGVDAG
VHLR F G TV S I R S L I K D A RQA S E K


TQLRFGT
ENLTYGE:
A ALAHGLL
QYLA WGEI
AYLTFGCLSAREVINHLDEGYDSDENSRPGPYESFIRREL



P HLLK F GTVVVREVWA
P HLLAWGTLSMREVVQLSRRRGAAPVG
P HL A WGNL S LRRQVYQATLER RQAPGWRYPLTAF S S R R L

P Y L A L G C L P Y L K F GCL

PHLMAGS
$\begin{array}{ll}P & Y \\ P & A \\ L & A \\ R & W \\ N\end{array}$

| $P$ | $A$ | $L$ | $R$ | $G$ | $C$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $E$ | $N$ | $L$ | $A$ | $Y$ | $G$ |

P HL HFGS L AYLANGSLSPRRVLHELEQHEAKHGANESTYW

A PA WGN

$P$ F L N G GL S V R QV H QA VSERA PSCRGREM
PY FA L G V L S PR LAAA WEALRRRGGE GAR K


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 FWNKHYEQKLEDWPGWLETAVNPVLEFNAEQYDPDLVAAW AFRD FYAAVLYDRPASAWRNWNRDYDRDRTDKA E HLLVE V W W VWREF A YHL MWHTPRLLY DNWREE WAAFPWNEDERRSEA W I WR DFYAMM LWHFPRQTIHESFKKPYDNDTWRNNEDEFKA W

 VWREFAYHLDMHSPRDLT DNWREEWQAFPWNEAEAEVVKA W RWHCHF DQKFEME CRMEKEHVN T GFEHDAKPLDKKKV K A W A WREFNWNEYFHCEDDATVVNVRREFDAFPWRDASEAEGAW AWRDHFMQKLEDEPA GE WRCLHPAYDGRPRDADAARMHAW
 A WRD FYKHA F CYWPY L S M D P F N L L G S V Gil K WL N DK S H F E K W
 VWREFAY HLA FHTPKI T QENWKS QWNDFPWEHEDEAVLRW VWRDFAYHLCFHTPRLTTSANWREEWDAFPWKDDESEIJHA W A QRDYCLQQLLYHLPQLTADKAFHPELDRLDPWDHGPH GFQA W

 RWQSHF VQKFEME HTMEK ESVVNKGFQKGKKD DSEDYQDA W HWRSHF Q K L E SEPEME QRDVNAAFRRQPGDWNECYYQA W


 LWRDFFRLMGKKYGEKDFLKGGTKREEPSLRDNWQNMRPW IF REFYAYLLYHFPHLAWKNYKYT P P Y Y E ENQESYERF GWRDFAH HLLHHHFPATPEHNLNPRFARFRWTPDPA QLQA W V WREFAYHLMYHWPHLLTTDNWKPEWDAFPWNTPDPDTPEA W
 LWRDFFRFMGKKYGNK』FQDGGTRGQDPRWTENPQVLQKW $V$ FRE LY RQHTVCVPHTSMNPQNDKFNSVQWEDDKE GWEK W DWRE YYYCAAAYEADFDRMKGNSLCDQUPWQENKKYLEAW

 LWWRE F F N S VLLYNF P H S EFNNNF K K NV N
 HWRDHF IQRLESEPRMEFENLNRAYDGLRPHWNEEYFQRW Y WR DF Y L Y I A Y HF P Y VF GSNFNRKYN DK WENKEKY DDA W CWRDFYHQVVAGFPDLSTAAYRRGARE DWRYDEHALDDA W IWRD Y F RFLS LIKYGNSIF HLGGPRKAERGWSQEQKLFESW

 A WRDHFMQKLEDEPEIERRCLHPAYEGLRPRADAVRLAAW AWRDFHHQVLAARPSAAHADYR TRHDRWRRDEQEAEAW


 MWREFFYCYACGTPNFDSQERNPGCKQIKWRLRPENHQCW DFREFY A MLLYHFPHLSEQNFRYPFRGIA NEEYFNAF
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 I WREFFMQILWHFPNVVSQPFRDKYAGFQWKNNEADFKTW VWREFSYHLLYHTPHI TQRNWRAEWNAFPWRGDNEQAARW IWRDFYMMILDQFPRVEKYNFKQKYDK■EWRNNPEEFKAW RWGS GFA QRFRY LPQLLELRSLYS DFDQDGWEFDETDYEA W A WR DFYMM I LWHFPPHTVNSAFKPAYNNDKWRNNEDEFEA W

 VWRDYF TFKGMRFGDMDFK TEGFKKKKVVEFND IKLLFKRW LFRDMYA CAEHADGDAFNQRYMDWYDPTVYDKDGQADMAY HWHCHFMQK LESEPPADE YENLHPAFNGFRDQSYQNRLTAW
 DWREY FYTMSVNNPNYGQMAGNPDCDD DPWSPE GDELLQRW F R DMYF GAQAA LGYS FSQTYNNPACREDPWHEAEDHFKRW

 A WRD HFMQK LE DQPAME $\quad$ R CLLHSAY DLVRPNVP DATALSA W RWHDKFTQRLYYHPELATQNPDPEFDRYHSGNDQELFWAW VWNDHYNQKLVDWPGWT DTAVNPVFEYNEDRHDPELVQAW LWRDFSYHLLSHFPEMAQRALDPRFEA LDPWREDE GLLFQA W UniRef90_A4BYS5

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K D GRTGFPW|lDA|V|MRQ|IDEGWTHHAGRHA|V|ACF|L|TRGGY K H GQTGFPMVDASMRCLRQTGWLNFRMRSMSASVYYHLLQ
 KRGRTGMAFVDAAMREMYVTGRMHNRGRMIVASYL CKHLM




 ATGGQTGLPFVDACMRYLTHTGWLNFRMRSMVMAVASYHLW



 CEGRTGYPLVDAAMRQLQQSGYMHHQLRVLTANFLTRHLN QRGQTG I ELV DAAMRELYVTGRMHNRARMI AAS Y L T K H L M R S GT TG G S L V DA GMRE L WHTGYMHNRVRMVVGS F L T K N L G

 REARTGYPWDDA $\square$ MVVQLREWGWMHHLARHCVACFLTRGDL K DGMTGVPIVDAGMRQLKNHGWMHNRLRMITAMYLVKDDM K Q GRTGEPFVDAAMREMYVTGKMHNRARMIVASYLTTKHLM


 $K$ Y GVT GFPWIDALMRQLREE GWIHHLGRHSVACFLTRGCY





\section*{| K |
| :--- |
| C |
| C |} K S G T GYP MV A A MRCLRNTGWLNFRMRAMGVSAYFHLQQQ

 QEGQTGYPLI DATMRMLRATGWLNFRMRAMLVSFAAQHLW K N G L T G Y P I V D A A M R S L N E T GY I N N R LR MVV S S F LVVK D L H
 $R N G C T G Y P L I D A N M K E L S A T G F M S N R G R Q \| V C S F L V R D M G$ REGKTGYPLVDAAMRCLNTTGFINFRGRAMLTGFFTHHLW
 SKGETGGPFVDACMRSLRATGWLNFRMRSMLMAVASYHLW RTGRTGYPIVDAAMRQLAHEGWMHNRARLLTASFLTKTLY QQ GRTGGVPLVDAGMRELWETGFMHNRVRMVTASFLVKNLQ QRGETGFPFVDAGMRELWRTGFMHNRARMVTASFLTKNLL







## K

 $K$ G RKGLTGEPVI DAAMRQMYVTGTMHNRARMLVASYLTKHLMM CEGKTGYHIVDAGMRQLNCSGYMHNRLRMITASFLTKHLL K T GQTGFPI I DAAARCLQATGWMNFRSRALYSSFLSNLMN


 CEGQTG $\square P \mathrm{FI}$ D A HMRQL NETGYMSNRGRVNCASYFVHDLN KMGQTGFPWIDALMRQLRLEGWMHHLGRHSVAAFLTRQCW K A GQTG WP L V D A C M A M L R D T G W I N F R M R A M L M S T A S Y L L W
 RQARTGMPLVDAGLRELWVVTGRMHNRMRMLTASVLCKTLL



 KRGETGFPMVDASMRCLAGSGWLNFRMRAMCASFFSHVLH LE GRTGGVPVVDAAMRELQATGFLDNRARMCAAQFAVKYL


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230
240
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 LWREYFQWMMHYHGARMFAFDGIKKKRPLTSFYCEKFKAW MWRDYFRFMMKKYNAKFFQKAGIQSKGDQVNKNNQHQQEW AWHDHFDQKFESESRMEFRSVNKAYEEFNYEDAQYLLFEKW
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$L W R E Y F Q W M L Y H Y G R F R F K G I A N K R P L T G Y A E A F M A W$ HWHCHFDQKFESECEMEFRCVNRAYECMPRDEASERLRAW YWHCHFVQKLHTEPELEFNSMHRMCDELRTEHDNEMIDKW A WRDFYLYQAVYNPDF FVYEKKFDFSGDEDTLFERW A WRDLAYWSLWRFPHLADEPLRPQYASQWWCSNDANLRAW IWRDFFKYISLKKGNNDFKLEGILHKAYEWNTDSKLIQQW LFRDMYFAAQAPDGHAFSRTYGNEDARFDDWHAEEWFQRW LWREYFQWY LAKHQAKLFYFSGDQQVAPLSEFNQQTFTRW SRRDYWHWMGLRFGDRLFFSYGPHPEHPDWRHDRKVVQRW LWREFFYWRAEVDGKSMFMLAGKTGKPRRSTFEPRNFARW QWHCHFLQRLSDQTTLNSRNLHVEADGLRDRDADPRLEAW LWREYFHWSATNNPRFDKMEGNPICVQGPWDKNPEALAKW LWREFFYWRAQLDGVHLFLPYGVARKKQLRTFDPRQFTRW MWRDFFKYDSLKYGDQIFKIGGULEKDYDWKTNKAAKKEW LWREFFYTVASATPNFTQMAGNPICLQDCWYKDAERLHKW LWREFFQWRAVIDDHGDFHDGGVQKRGRRCCFDPRAFARW LWRDYFKYDSLKHKNKIFQLGGILNRHYDWNRDKDTLNQW LWRDYFRFLHLQHGRRLYRARGLAERAVPPAHDAAAFARW L WRDFLY LLCLQEGSAVFRDRFDLYKQSATPYEATDCNQAW WWRYFKYYSLK GNKLFQLDGLLGKKYDWKFNEKALRQW LFREMFFKAARFIPWHLQSNYDERTYTIDDEQAEDWFRRW MWRDFFHHKAMLKGAMLFKFTGSQGGRPLTSYYPQRFKSW LWREYYQWVHYKVGAKTYQFKGLAKHRPLTTFYPERFNKW LFRDMYFAAHCQVGAFGQQTGNPVARFIPWHKAEEYFQRW YRREFAYWQLHNWPELPSKSVRGHYEWLEGDEAAVAGHRW LWREYFQWYAHHHGVRLYHLKGDQGRSPLTSFYPQRFKSW LWREFFHWLQCKYGAKWFRFSGIQGRKPTYCHDPETFSRW LWREYFYWLQQKFGSKWF QLEGUKSKDPNTSHDPQVFVGW IWRDYFRYLF LIRYGKKLFTTKGLRKTEPDMYNDDDGFEQW HWHCHFTQKFESECAMEQRPVNRGYLAYPYRTDNADLAAW DWRDYFKYDSGK ESKDFR GGDLDREYDWSTDQKVIQQW LWRDYFKYUSLKHGDRLFALSGIRARKYTWQDDPEKLAAW GWREFSWYNGY THPDMAQRP TNPKYEHMQWQSNPAHGQAW SWRRQYMQTFETRPELEFECMLAQFNGVREADYWEHFTAW IWRDYFRFLSAKYGNSLFHLGGPRNVEHRWSQDKEHFESW I WRDFAWHRFYHLPNMATVNVREAFNRFPWEWTPRAKAAW I WREFNYHLLYHQPDLATQNHNEQWNLFTWSNTAAAYDCW RWHCHFMQKLEDEPAZEFYNMHPGFDGLREPYNPTLFAAW RWRDYFRFLHLQHGRTLYRAARGLGPARATPHDDQRFAAW LWRDYMRTRKGEKLFRVTGFKGDTTPKWKSQQLLQRF
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 QRAQTGVDVVDAAMRELYATGRMHNRARMITASYGTKHLM QQGKTGFPLVDASMKQLQSMGWMNFRMRAMCANFLTVICG RRGRTGVPIVDAGMRELWHTGWMHNRVRMVVASWLSKHLR ARGETGYGLVDAGMRQLLSEGWMHNRVRMVSASFLVKDLIH QRGKTGFPLVDASMRQLWRTGWMQQSVRMVCAAFLTEYLN KSGATGFPLVDAAVRCLTKTGWCHNRCRMLIANFLVKVLIF
 CNGTTGDPFVDAHMRQLNQTGYMSNRGRVNCSSYAVHDLKK KEGRTGFPLVDACMRCLKETGY LNFRMRAMLVSFLTHHLL KNAKTGDPFVDANMKELNDTGFMSNRGRQNVASYLVNDLLK
 Q Q G Q T G LP LVV D A A M R E L L A T G Y M S N RAAR Q NAAA S F L V H D L G
 T A S G Q T G F P WI D A I M T Q L R E E G W D H H L A R H A V A C F L A R R G D W
 QQGNTGYPLVDACMRCLHATGYDNFRMRAMMVSFLTHMLL

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$\stackrel{M}{K}$ VEGQTGYPMVDASMRCLAKTGFMNFRMRAMVVSFACYGLA





Q GQTGYPLVDACMRALRQT

RAGHTGFPIVDAGMRELWK CSGHTGYPLI DAAMRSLLATGWLHFRGRAMLVAFASYHL W CAGQTGQPLVDAAMRELAATGYLSNRLRQVAASYLDHDLA


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 VNWTWGAAYFEEKLI LDWRRGAPTY WGULVDADQASNPFNWQWVAGCGLDAAPYF QDWRAGADWFEQHLLDYQVSANWGNWAYTAGHGANPRAI VDWKWGEQYFADKLIDYDMSNNDGNWQWTAGGVTSSPWFR VDWRLGAWWFEHCLI DYDVASNWGNWRYQAGVGRDPRQDR VDWRLGAEFFESQLLDYDPSSNYGNWQYVAGVGNDPRASR HWEQGRDVFERLLIDSDWAINNGNWMWLSCSSFFYQYNR II SWEEGMKVFEELLLDADWSVNAGMWMWLSCSSFFQQFFH 1 HWWHGEQWFWDTLVDADEANNPVSWQWVAGCGADAAPYF I SWERGAEVFEELLIDHEAACNIGNWQWLSCTAFFAQFYR LDWRLGARWFERHLVDHDVASNWGNWAYIAGYGHDARGGR
I DWRIGERYFAEQLLDFELASNNGNWQWAAGTGCDAAPYF LHWRDPALHLARLFTDFEPG\|HYSQTQMQSGLTGGNADR ISWEEGQKVFEELLLDADYSVNAGNWMWLSGSAFYHQYTR NHWREPGLHLARLFTDYEPGUHWPQVQMQSG VTGUNALR MDWRDGVAHLAQLFDDFEPGI HYPQFQMQAG VTGTNT:R

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| $Q$ |
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DWRLGEQWFWDTLVDADAANNPHNWQWVAGCGTDAAPYF
I PTTKVAEYDATEFLDYEPGDHHVIHQWIAGTGTEFNEMM

HWRHGEEWF WDTVVDADAASNPFNWQWVAGSGDDAAPYF LHWRLGEEWFWNTLVDADPASNPGNWQWVAGTGADAAPFF LHWRPLALHLAQCFIDYEPGDHYPQDQMQAGTGTGDNPNR


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UniRef90-х2MLE7 VYSPSTFGKKWDPEGLFI RKYVPALSKMPVKYIYEPWKAP WYCPVEVGKKVDPTGDYVKRYVPEVRGRPSEYVCEPWNAP RFNPDTQAAKFDPDGVYRNHWLSGSGARDFAAAVPVSWS DYNPTKNLTEKDPKFEFVRDWIPELRDCTDEQULSGEDGE $R F N P V L Q A R R F D P D G A Y D A R W V P E L A A L D A$
$R F N P D R Q A E R F D D G A Y R R Y C A D L B R L S$
LLP TSSSQDPDGAYTARWVHELERLPRKWLHQPWLAP RFFNPRQSAQHDPQAVFIKQWVPELRNVSVRTIHKWDVFC IYNPDKQGKDHDPEGEFIRKWVPELKNVAIDFIHEPWILS VYNPIEQARDHDPQGVFVRRWLPALRRVPDTWLFEPWRMP YTNPVHQSNKYKAQEFIRKWIPELAKNNDVEVLIPWTFD DYNPVKQAEDHDPEAVFI SKWVPELAQLPDPYRLKPWELS YFNIEKQASEYDPKGEYVDFWLK
ПYNPTKQAQEHDPDGKFIHKWVPEDANVPAPLLFEPWTपT RFNPELQAKKFDANGEYQRTWATDAMATP
$\square Y N P V K Q G K E Q D P D G T F \Pi R R W V P E G S H L D T A Y V H A P W K M C$ YFDVAWQSQHYDPDALYGRHWLPELAELDPTARIHRDPWLA CYSPVSFGKKWDPQGTFVRHYVPELEKFDKKYUYEPWKAP VFSPDSQLKKYDPDLAYVRQWIPEYN
IYNPVKQAKDHDPQGVFIRRWIPELKNTPDPWDGEPWNTP YFNVLKQAGHYDPKGLYVAYWLPALASLPGQERHQPWR QFNPIKQAKDYDAKGEYVRCWLPELAKVPQKSDHNPWL
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 RFNPHRQWRQYDPGLTHLHQWLPELGTVTLKQV EAHQRG
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RFNLATQAKKFDPDGSFVKKWLPELAELPDTLLHKPWGGL FNTQLQAERYDGNHKFRKDWL
RFNDERQAENYDPHKQYRRLWLPEGGSLPSDAVHAPYSLL
LYNPASQSKKLDPEGEFTKKWVPEDGSDPSDAVHAPYSLL R
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RFNPARQADRFDQKCAYVRTWVPELK

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$\square F N P V K Q A F D Y D K S G E Y V K A W V V E T R E D E K E N V F Q L W T T P$
$R F N P$ T T Q GERF DRDGEF|I RQWLIPA LRD|I GKA|I HEPWRWA

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| UniRef90 A0YV59 | LSG YPEPMLDWYEMRKDNGKVVSELRKQV |
| UniRef90-UPIO004674013 | ELLRDYPRPQVELAAGRQDALDAFARLR |
| UniRef90-A0LF | NHKAERAEALTRWAAAKAAV |
| Unire90-0389M9 | KEGRAYPSPVDLKQRTK WT |
| UniRef90-A8G331 | KFNCDYMKPIVDISKTSREA |
| UniRef90-N6XQL3 | RVGED $\backslash$ ALP VVDLETATRAAKTR $\downarrow$ HALRA |
| UniRet90_UPIO0029A9A06 |  |
| UniRef90_15C8D5 |  |
| UniRe990-UPIOOO2D63159 UniRef90-F2PEU1 | ELK S C Y |
| UniRef90-UPI000347F4F0 | PIVDLRASRDDatarf |
| UniRef90-Q2S050 | VIGKDYPERVVDHNDAYHHAQDA的ELR |
| UniRef90-K2JN19 | Y |
| UniRet90_W2SA61 | UADQKYPKPMFD |
| UniRef90_UPIO003B78DB6 | IVGEDYPWPVVDPK ${ }^{\text {V }}$ |
| UniRef90-H0J039 | $\checkmark$ APTQFPEPLVMPDEWQRWLIA |
| UniRef90-F4RLP7 |  |
| UniRef9o-M4DO01 |  |
| UniRef90 M 4 DX76 | VGKDYPKPMV |
| UniRef90-UPIOOO46EB5D1 | REGKNYPLPMVDLKTSRQAAL |
| UniRef90-UPIooot72C947 | ALGEDYPKPIVNIEQTGKRA |
| UniRef90-N1 | DQKYPKPMFDFNERRED |
| UniRef90_U7G163 | D QLA Y PAPVISL |
| UniRef90-H2CFS |  |
| UniRet90-G6YwM6 | GGNTYISPVDHEQAARVARK |
| UniRef90- -5 2RA28 | VIGRDYPAPVVDH |
| UniRef90-UPIO00363CCB9 | VIGRDYPPPIVD |
| UniRef90-A8T3C2 | APDSCYLIAPI I DLD |
| UniRef90-UP100037FFFDC |  |
| UniRef90-UPIO002DE474F |  |
| UniRet90_E1SU94 | DLSTGPRARQLLWQWRA |
| UniRef90_Q15ZK4 |  |
| UniRef90 UPIO002E952 |  |
| UniRef |  |
| UniRef9-UP10003774EC6 | PLVAEYNAP |
| UniRef90-V2XU36 | IIGESYPFPMLNDEVEKKRCMARMKACYKA |
| UniRef90 - 4 HMR ${ }^{\text {U }}$ | E $\square$ G ${ }^{\text {d }}$ |
| UniRef90-UPI00036D3E75 | DAYLPQIVNLKVSAKFARDKVWGTRKS |
| UniRef90-F5LCD3 | A |
| UniRef90-C1MT40 | ALGGREYPKRVVDLEGARLKSLRAVVEVRRA |
| UniRef90-K9FDX7 | $\square \mathrm{ADQTYPKPMFDFNKRRETC} \mathrm{\square AGMKHA}$ |
| UniRet90_K6ZW41 |  |
| UniRet90_A4H5L0 | YLGKNYPYPL KLWQGAQRSLSA |
| UniRet90_H3NWJ1 | - |
| UniRef90_A0A059G6P6 | VLGQTYPMR\VDM |
| UniRef90-L8Y162 | LIGVNYPKPMVNHAEASRLNDERMKQD |
| UniRef90-UP1000381BFED | ERLLDYSAPLLPL |
| UniRef90-F3KZ48 UniRef90-A3XGD4 |  |
| UniRer90-A3XGD4 UniRef90 UPIO0035A1C37 |  |
| UniRef90 - B8KWL8 | $\square \mathrm{PQQT}$ |
| UniRet90 B8KWL8 UniRef90-UPIOOO255AD81 | LDPQT |
| UniRef90 ${ }^{\text {N6 }}$ |  |
| UniRef90-M2 | GS DYPEPVLTVSEEDERARQ |
| UniRef90-UPI0003FC1E87 |  |
| UniRet90-A0A059FEL1 | MRMVDHVAAAREARERI |
| UniRef90 G7XDAO | VEDRTYPEPMFDFDERRQTC【AQMKEA |
| UniRef90-V4J6Y7 |  |
| UniRet90-A1SV39 |  |
| UniRet90-W9W8G6 UniRet90 A4S782 | ■ADQKYPKPMFDFTERKQFCIDQMKKA |
| UniRet90-UPIO00255803F | APPRH |
| UniRef90-UP10003666998 | LNG YTPRVVNGKDRAKEMKSRVFTDRS |
| UniRef90-K7RHB5 |  |
| UniRef90-F527V88 |  |
| UniRef90-UP1000304CB2B UniRef90-M1FGF9 |  |
| UniRef90-M1FGF9 UniRef90-UPIO0037384cc | H $\square$ GDHYPAPLFELAPASAAARDRLWDWRS |
| UniRef90-UP100037384CC |  |
| UniRet90-F2G297 Unita |  |
| UniRef90-H5CYY2 | QKALDYPQP V V DKEARLRTLAAYEEARKG |
| niRef90-UPI00036AAEE0 |  |
| UniRef90-M1FG24 |  |
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| UniRef90-L1MKD 5 UniRet90 A8QB38 | ALTPLYPEPMVDUESRKTALAAYKDU |
| UniRef90_I1DV01 | VLGRDYPAPVVALPQAQQQARAR |
| UniRef90-A0AO14P6H8 |  |
| UniRef90-H1W0T8 |  |
| UniRef90_X2MLE7 |  |

## UniRef90 A7EIM0

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UniRef90-H9K9F9
UniRef90-W6TPB7
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GGEKTALDHLEQYFSSDLANYKTVRNLDGWENSTKMS WHGGENAALMHLQQYFSSRLPSYKETRNADGWNNSTKFS GGASSGUERLKHYCSGPLFTYKKTRNALGRDGSSHFS FAGGETDGLAHCSGYFATSLAHYKQTRNELDGDFSTKFS EAEGYAHLQEFDEERLTGYDERRDELGEDNTSQLS GGEENAQKHLRYFNSDAASGYKQTRNALHGNHFSTLS
 QGGETAGLALLAAHVTDEDATFEKPATAPDRPATTLLS

 STERFRADVRTTARLS FQGGEMEGHQWMKEWDWERDKKYKETRNMVGSDYSSKLS GGLFAAQQHLHYFSSPAPASYKETRNELDGSNTTKFS FKGGEGQALVHLNNYFKDAPSRYKTTRNALDTWTDSKFS PFKGGENPAWDRLYHLIKS GMTTYQETRNLLGTDYSTKDS KAGTTKMS HGGFKSAQTHLEQYFSGLLPSYK DTRNEDDGNNTTKFS FYGGEASGDSHLKQYFTNAPSHYKDTRNALGCEKSSKFS CHPGEMQAQRKFRDF LEGLADSYKDNNDDPSADATSGLS PFIGGYSQAKRYLEEFDEKKLHKYKDYRSHPEDDYQSNLS FIGGEQAGDAHLHDYFSHPYAHYKQTRNFDGKENSTKFS PFTGGATTGHSRIKHLITSAMTNYKQTRNLLGEDYSTKGS PWPGGEDAARKRLENYLTDGADNYKQTRNMIGTEYSTKFS RGGRNEGRALWRSFVQARGRRYRGSLSKPAWEFGSRDS EPGEEAALAGLRAFLEAKGPRYAEERDRLDGEGGSRLS FKGGETSGLDHLDHYFSRNYACYKQTRNALLDGENSTKFS GGEDAGLAHLENYFSHDYANYKHTRNFDGUENSTKFS PFVGGGSQPGRERDHHLI ESGMTAYKDTRNLLGLDFSTKLS PLPPGSAAGQARLEAFLREGLPRYARDRNDPLREGQSGLS $K G G R T Q A R A V A A K F F T A K L K S Y P F S V S S P A W N G C S R L S$
$F E P G E K A A R K E M E S F L A A R L D S Y N T L R N D P T K N A L S N L S$ FHPSRSKALEQLQSFVENHLGLYARDRNFDFGPNTSCLS PFHGGETEALRRMKESLQNKVAKFEKPKGDPSAPSTTVLS

 FTGGETQARKRLKAFLKDGFSGYGAGRNMPEAAAASHMS WQGGETEALARLDKHLERKVANYERPRMNANLASPTGLCS
 PFKGGETEGLRRLETLLAGA DTASLTGSFGSEEGTAVLS FRGGHTEAAERLDSFLKDAFAGYGAGRNKPEAGAASHMS PFTPTRSAGFDRLQAFLPDAGRQYAETRNYPGRGNVSQLS PFGMGEEQAVQRLRYYLEAPDATYRETRMQPGVDSSAKLS PGEEAAFEILDSFIESKLEFYSDKKNDPNENADSNLS GGEVAALTRLRAFMGQQLAGYADTRNDPTQDGSSRLS $Y R G G T R A A K R L L R R F M L E E G L P G Y A S G R D Q P H A G G V S H M S$
$F V G G E T V A Q R M L S F F I$
$V$
 LEPGETAAEARLRSFVTGRLSRYADERNDPNSGAVSGLS FTGGETEARRRLKAYLAGPFRSYGSDRNRPEAGAASHMS

 CQPGESAGRARDTSFDQLGLPRYHDSRNDP DREGQSDLS F LDPTHAALERLSAFVPQAGRDYATRRNYDFGPGVSGLS KPGYENGIKELENFLQNRLKKYGDERNNPLSNALISNL S K GGEDDGLEHLTELLKPGSDDY DKSSSKVAADFSSKIS

 LEPGYTMACAQLQSFCVERLADYSAKRNDPTVNALSGLS PMPGGSSAANARWTRFLEHGLPQYDERRNASDGEGTSRLS

PGETAAAESLENF IK S RLSGYATARNDPNSNALSQLS
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## UniRef90 A7EIM0

 UniRef90－W9YVY7 UniRef90－UPIooo37157ED UniRef90＿U1P5X8 UniRef90 UPIO000EOFEC6 UniRef90－W2RWK3 UniRef90－F8WRD6 UniRef90－Q9KS67 UniRef90－B70664 UniReffo－B2W5Z1 UniRef90 U3AX02 UniRef90＿W2U2W2 UniRef90－L8E6H2 UniRef90＇UPIO002E194F7 UniRef90 F2JZG5 UniRef90－UPIOOO3482530 UniRef90－S4TZN6 UniRef90 F5SUK0 UniRef90－Q2COV8 UniRef90－UPIO004410C21 UniRef90－UoF3NO UniRef90－UPIO004720AA9 UniRef90－U1KU87 UniRef90－X0QRV8 UniRef90＿W9V7Z9 UniRef90 W9YTB6UniRef90 F2VHS2
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80
有 AWLALGC TARQUAAQLVDFEEGRDGKGENTGAAAVRFEL PYIA WGNI TIKQTYQKLLDTLNEADYQGWKRALSAMVSRL
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A WLANGSLSARMVAAELDNYEYRHGSGESTRTDF PWLAQGAISPRQVMNSLAFYESRMGSNDSTYW PWLAQGA SPRQVMNSLAFYESRMGSNOYFL A WLSRGCLSPRQVHQAVKDWEAASHGQCESSYWUTFEL
A WLACGALSPRKLVARLKRYETEKTANESTYW $\square Y Y E L$ PWLACGAHSAKMIMARLQDYEKYKEKNSSTYWDF FEL PFLSVGALSARQIFWAVRDAEDTRDGGGNEDSYWLIFE PWLAVGCLSPKRIF ILLQEYEQRERANDSTYWIF PHMAVGAVSTRKLYHTAR PYLAHGALSPQQVLRALNEYENQHGSNESTYW PWLAQGCISVKRIYETLRTYEKVKGANDSTYWDF FEL PHMHFGSVSVRRFWWAVQDVLERRRLAKQPPHPVNRGGQL
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A

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A HL R R G T
A WLA LGCI
PYLHFGQI

P YV TH G 1
 P P Y MHF GE
P L H G
PY H F GQII

P
P
A Y V R Y RLI

| $P$ | WI | $A$ | $M G C L$ |
| :--- | :--- | :--- | :--- |
|  | $A$ | $L$ | $C$ |
| $K$ | $G$ | $V$ |  |

T A L K F G V V
${ }_{P}^{P}$ Y L H F GH

| $P$ | $W$ | $H$ | $T$ | $G L$ |
| :--- | :--- | :--- | :--- | :--- |
| $A$ | $F$ | $L$ | $S$ | $L$ |

$\square \mathrm{H}$ L H F G H

## A

P

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 UniRef90-W9YVY7 UniRef90_UPIOOO37157ED UniRef90-U1P5X8 UniRef90-W2RWK3 UniRef90-F8WRD6 UniRef90-Q9KS67 UniRef90-B70664 UniReffo-B2W5Z1 UniRef90-U3AX02 UniRef90-W2U2W2 UniRef90-L8E6H2 UniRef90-UPIOOO2E194F7 UniRef90- F2JZG5 UniRef90-UPIOOO3482530 UniRef90-S4TZN6 UniRef90-F5SUK0 UniRef90-Q2COV8 UniRef90_UPIOO04410C21 UniRef90-UoF3NO UniRef90 UPIIO004720AA9 UniRef90-U1KU87 UniRef90-XOQRV8 UniRef90-W9V7Z9 UniRef90-W9YTB6 Uniinef90-F2VHS2 UniRef90-B6BTC6 UniRef90_D5WYW5 UniRef90-C1FGJ5 UniRef90-UPIo003605A4A UniRef90-Z5XYT4 UniRef90-UPIOOO4723805 UniRef90-F9G158 UniRef90-E4X840 UniRef90-F3BLZ6 UniRef90-F3LFM4UniRef90 ${ }^{-} 7 \mathrm{FWD} 47$ UniRef90-Q2SQU0 UniRef90-M1RJZ7 UniRef90-U5A918 UniRee90_UPIO00440C953 UniRef90-I1CT06 UniRef90-F7SMD6 UniRef90-H7GEU2 UniRef90-UPI0002EF350E UniRef90-UPIOOO2D523A0 UniRef90-X7YFZ3 UniRef90-M2MSP5 UniRef90-E3CZU8 UniRet90-A6GLE5 UniRef90-Q8TIS6 UniRef90-M3TW98 UniRef90-B8A2K1 UniRef90-U5YD42 UniRef90-UPIO0036A0B76 UniRef90-FOXJ25 UniRef90-B1LX32 UniRef90-Q2NNQ4 UniRef90-S9VVC6 UniRef90-V4NPL2 UniRef90 F4C6S99 UniRef90-АоАо37UQX5 UniRef90-B1ZAB1 UniRef90_O2N8F4 UniRef90-E1ZJV5 UniRef90-I6ZRF9 UniRef90-UPIOOOO4782818 UniRef90-Q1AY95
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GLREYSRYLCFNFPFTHEKALLGHLKFFPWNPDADIGKNW HWHCHF $\square$ QKFESECEMEFRCVVRAYDQQSSDAPAAQLAAW LWREFFYCAATRNPNFDRMHNNP DCVQ DPWDVNAEALAAK W
 L WRE YF YWYARRYGSRLGVFSGUSERVPLTSFYAHRFQQW L WRDFSYHLLYHFPWMTERP LDPRFQALPWQEDEA LFRA W M I YVSFPN QKNEPI QENYRFIEWENNREFFKAW LWRD Y Y Q WMMHVQGARMFAFDGLKQKRPLTRFHSEKFKAW L WRE YF QWYSMKY GARLFSKS GIHNKT LINSSFYAERFRKW


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 L WRE YFY WY GVTHDKEL F LFK G DSHQAPANRHNQQRLEA W
 LWREYFKWHALLKA GKSLLFSFK GQKQTKPLTTFMPNRFAAW L WREYF QWYARKYGKK LFHRAGQQQRAPLASFYPQREQQW LWRDFA WHRLYY Y WPTLATRNVREQFNAFPWAWTDQPTADW ARNFCYYNPNYNHYE GIPDWAKKTLEEHKNDKRDYVYE EF
 LWRDFFRFLVA GS GNRVFHLLHGFRYSNKVWKSNNDQFNKW



 AENF CLHTPGYDTVEAFPDWARKTLAAHASDRRPALYRELD DWRQGYLQQQEN HTGGET DAF Y G G G DEPAEVVNQEF LNAW
 LWRDFFYTVVYGTPNFDRMKGNKICKQ\|PWSENEDLGVAW GFREYSRYLSFNFPFTHERSLLDSNLKSFPWRVDESFFKAW $\begin{array}{ll}A & E N F C T Y E E H Y D T P D G F P R W A Q E T L\end{array}$
 LWREFFYTAATNNPKF DRME GNP DCIQDPWDRNPEA LAK W SRRD Y WH WMGLRYGDRLFFSYGPHDNIPNWRHDAKVVQRW LWRTY WK G WLELLHPDA WT RF LAAERAHSRESFHD IKA G DA LWRDYFRFMFKKHGNKFF LQQQGFSNEDPAYEVGDALFDRW A WRDFYY QVTYNA QLH QQWCFSENWN KDN WTNNLEWF QK W AMNHVFHTVEGYDDYARADVE WARKTLA EHADAARYS E E E L
 S DNFCYYNKKYDSFEGFPEWAQKTLDEHRRDKREYVVYEEL SFNLCHYNPHYDTYDGLPDWAKRTLEEHAGDRREVLYTRD

 SENYCYYNERYDSFDGUPEWAKKTLMEHAGDHRDAI YEQF


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M
F
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 LWWRD YF RFMLKK YPNDFFKEK GFKKE Q DMSKNDQLLED K W ADNFCYYNKNYDNLKGLYPWAIKT LEEHRTDERNPTYTEF S DNFCYYNKNY DNLKKGAYDWARKTGLDDHRKRKRTHVVYTR D S Y N WCVVRTPAFD QL S A LPA W WVQRTMQEHVNDPRPEELYTRD


## UniRef90_A7EIM0 UniRef90- W9YVY7

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UniRef90
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UniRef90-M3TW98 UniRet90-B8A2K1
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UniRef90 F1KXR8
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 LRGTTGTGLI DASQRELFLTGYTSNRARQNVASYLAKHLG CAGNTPWPGVNACMKELQATGYGSNRGRQNVASYCAHELG KTGTTGIPIVDANMRAVIATGYINFRMRAMLVSVLSHHFN MRGETGISLIDASQRELWCTGYTSNRARQNVASFLAKHLG RQGRTGFPLVDAGMRELWATGWIHNRDRVIVSSFAVKMLL
QTGHTGIPVVDACMRCLIQTGYLNFRMRAMLVSVLTHHMN ANGQTGYPWI DA $\square M R Q L R E E G W I H H V A R Y A V A C F L T R G W$ RSGRTGVGLI DASNRELFVTGYTSNRARQNVASFLSSHCN KKGETPFPIVNACMHQLNETGYMSNRGRQLVASCLVHELG YEGRTGVPLVDAAMRELHATGFLSNRARMNAAQFAVKYLG QEGKTGFPLVDAAMRQLKETGWMHNRGR MASFLTKDLL

 CDGKTGFP VDGAMRQLNHSGYMHNRCRMVVASFLSKDLL CEGSTPYPIVNAFMKQLNQTGYMSNRGRQIVASCLVNELS KEGKTGDPFIDANMRELAATGYMSNRGRQNVANFLAGQMC CRAETGDPIIDAGMTELNTTGCMPNRDRILCATFLVKNLQ
 CEGTTAFPLVNACMKQLRATGYMSNRGRQIAASCLINELE KYGCTGFPWIDALMRQLRQEGWMHHLGRHAVACFITRGCY LINGTGFPLIDASMRALRYSGYINFRSRAMVVSFACHYLR CSGNTGFPMVDACMRCLNATGWINFRMRAMLVSFAAYHLW QFGQTGYPLVDAGMRELWATGYVPNYVRHVVAGFLIEYLN CQGTTPFPLVNADMHELNETGYDSNRSRQIAASCLVNELGA QNGETRYPIINACMKQLNSTGYMSNRGRQLVASAFIHELG QRGTTGMGLIDASQRELYHTGYTSNRARQNVASFFAKHLG CNGSTPYPLVNADMNELNATGYDSNRSRQIAASCLVNELG CNGSTPWPLVNACMKQLNQTGFLSNRGRQDVASLIHELG QKGETGDPMVDAGMRELWATGTMHNRVRMVVGSWLTKNLG KNGETGFPLIDAAMKALINYGWDNYQLRGLLMSFAANQLW ENAKTHDEYWNAAQLELLKTGKMHNYMRMYWCKKIIEWTQ KCGNTGYPVDACMRQLNTGYVSNRGRQLAASCLIYEGG KVGQTGMPYIDASMRELINTGFLNNRGRQNVASYIAKDLE KRGQTGVPLVDACMRSLIATGWLNFRMRAMLLSHATFGLG YEGRTGVPLVDAAMRELHATGFLSNRARMNAAQFAVKXLL
 KAGETGFPLIDAGMRQLRQTGFMHNRVRMAASFGVKDLH EEGRTHDPLWNAAQRELVLTGWMP GYGRMYWGKKLLEWTP QHGRTGFAYIDACQHFLQQTGWLINMARATUVSFACVQLG EAGKTHDPLWNASQDELDRTGKMHSYMRMYWAKKILEWSE RDGQTGYPWIDA IMUQLKRWGWWHHLARHSVACFWTRGDM RQGRTGYPLVDAGMRELWATGWLHNRVRVIVSSFCVKFDQ ESAKTHDPLWNAAQRELDSAGRUHNYVRMYWAKKILEWSE A AGETHDRYWNAAMREMRETGYMHNQLRMYWGKK LLEWSP AEGKTGFPWIDADMTQLRQEGWDHHLARHAVACFLTRGDLD CNALTGTPLADAAMRELTGTGFVADVGRQALVWLLVRGYS EQGRTGDAGFDDWALELQETGYLHNHARMWFASIWIFTLG KRGETGDPFVDAAMHQLNTDGFISHTARMLVAHYLVSNLN QNGETGYDFIDAGMKELKETGLLHNRARMVCASFLVKNLQ AEGKTHDHYWNVAMREMRETGYMHNQLRMYWGKKILEWSP
AQGQTGLPFVDACMRELGATG
$E E G K T H D S W N A G E E M K T K G$
EEGKTHDSLWNAAQFEMKTKGKMHGYGRMYWAKKILEWTN QQAETHDPYWNAAQNEMVRTGRMHNYMRMYWGKKVLEWTA QEAATHDPYWNAAMVEMRHTGYDHNHMRMYWGKRILGWTR EDARTHDPYWNAAQLEMVHTNKMHGYMRMYWGKKWTPDYE EQAKTHDPLWNAAQHELLQSGl HGGYMRMYWAKKILEWSR ERAQTHDPLWNAAQTQLLETGIIHGYMRMYWAKKILEWSA EEGKTHDEYWNAAQAEMRMTGYMHNHLRMYWGKK LE WSP QEGKTHDDDWNASQDQLTRTGKMHGFLRMYWAKKILEWTE
$M R G E T G F G C F D A W A R E L A Q T G T L H N H R M W F A S I W C F T L K$ ERCATHDALWNAAQRELVVSGKQHNYGRMYWAKKMLEWSA VKGNTGDDCFDHWAQELVATGYDHNHTRMWFASTWIFTLR REGRTGVPFVDANMRELFLTGFMSNRGRQNVASFLTKDLG ESARTHDPLWNAAQLEMLHRGKMHGYGRMYWAKKLLEWTA
 KDGETEHSLVDKYMKELNDTGFIPHAGRLVVVATFLI HVLK EHGKTHDPLWNAAQQELVYQGKMHGYMRMYWAKKLLEWTA EPAETYDELWNAAQRQMVRRGWMHNMMRMYWAKKWSHSNA
RFGETENDVVNQSMLLDKTGYLPYFARMVSSFLVQEYN EGASTHDDLWNAAQMQLVHEGKMHGFLRMYWAKKILEWSS俍 QRAQTGDRLWNAAQTELVQEGWIHNYPRMLWGKLWTRDYE SSGNTGFPFIDACMRSLNFNGWINFRMRAMLMSFASYNLW


UniRef90 A7EIM0 UniRef90 W9YVY7 UniRef90-UPIO0037157ED UniRef90 U1P5X8 UniRef90 UPI0000E0FEC6 UniRef90-W2RWK3 UniRef90-F8WRD6 UniRef90 Q9KS67 UniRef90 B7Q664 UniRef90-B2W5Z1 UniRef90_T2C0G0 UniRef90 U3AX02 UniRef90-W2U2W2 UniRef90_L8E6H2 UniRef90 UPI0002E194F7 UniRef90 ${ }^{-}$F2JZG5 UniRef90-UPI0003482530 UniRef90-S4TZN6 UniRef90 F5SUK0 UniRef90-Q2C0V8 UniRef90-UPI0004410C21 UniRef90 UOF3NO UniRef90 UPIO004720AA9 UniRef90-U1KU87 UniRef90-X0QRV8 UniRef90 W9V7Z9 UniRef90-W9YTB6 UniRef90-F2VHS2 UniRef90_B6BTC6 UniRef90-D5WYW5 UniRef90_C1FGJ5 UniRef90 UPI0003605A4A UniRef90 Z5XYT4 UniRef90-UPI0004723805 UniRef90-F9G158 UniRef90-E4X8U0 UniRef90 F3BLZ6 UniRef90-F3LFM4 UniRef90-D7WD47 UniRef90-Q2SQU0 UniRef90_M1RJZ7 UniRef90_U5A918 UniRef90-UPI000440C953 UniRef90 I1CT06 UniRef90-F7SMD6 UniRef90-H7GEU2 UniRef90 UPI0002EF350E UniRef90-UPI0002D523A0 UniRef90-X7YFZ3 UniRef90-M2MSP5 UniRef90 E3CZU8 UniRef90-A6GLE5 UniRef90_Q8TIS6 UniRef90-M3TW98 UniRef90_B8A2K1 UniRef90-U5YD42 UniRef90-UPI00036A0B76 UniRef90 F0XJ25 UniRef90 B1LX32 UniRef90-Q2NNQ4 UniRef90-S9VVC6 UniRef90_V4NPL2 UniRef90-F4C6S9 UniRef90-A0A037UQX5 UniRef90 B1ZAB1 UniRef90-Q2N8F4 UniRef90-E1ZJV5 UniRef90_I6ZRF9 UniRef90- UPI0004782818 UniRef90_Q1AY95 UniRef90-F1KXR8 UniRef90 Q3AS84 UniRef90 Q8KF2 UniRef90-UPI000366B261 UniRef90-E9HAM9 UniRef90 UPI00047B0E72 UniRef90 C1E6D6 UniRef90_UPI000237A092 UniRef90-UPI00044105B8 UniRef90 F2NHT2 UniRef90-F7ZGS6 UniRef90 H9K9F9 UniRef90 W6TPB7 UniRef90-UPI0003600F80 UniRef90-I3ZK25 UniRef90 TOMR63 UniRef90 ${ }^{-}$W8BWG3 UniRef90-B0WAC3 UniRef90-C1AAD6 UniRef90 A1BHU7 UniRef90-UPI0004740CA9


QSSHNNRS $\square$ HNNQS
AFNPVKQAKDYDPKGEY $\square$ KAW $\square \square P E L R G L R G E K V W Q P W L L N$

HFD\AKQTEMYDPDHAF $\square$ NQW
HFDLGKQTGMYDPDHAFINKW
RFNPVKQALDYDSNADYVRAWVPELRGV
R P V F
YDPL KQQAEQDPKGEFVKRWLPGY
REVTGK $\square R Y M$
AQEWN

RE $\square \mathrm{FGK} \mathrm{V}$ R P M


VR N $\square \mathrm{H}$ Y L A H Q H D Q T G $\square \mathrm{Y} \square \mathrm{K}$ R W $\square \mathrm{P}$ Q L S K F T P
$\square R D \square K K \square Q N \square L D A Q G E Y \nabla K R W$
RFNPELQQKKYDPTSSYCNKF LKSRPT $\square$ NK
RFKTVSQGERYDPEARLIQAWVPQLAALRPAQL YMNYAGCKRKFDVSKYTINVF

A VFGK $\square R Y M N Y R K Y K Q T \square G E Y V R C N Y K \square A G R K \square E G H V E P$ RPVYGTIRYM
RPVYGTIRYM
RDVFGK $\square$ R Y M
 $R P \mathrm{~V} F \mathrm{GK} \square \mathrm{RFM}$
RD DFGK ${ }^{\text {DR }}$ Y M
AFDLDKQMK ILD
R P I F GTVRYM
RPIFGKI RYM
P IDWQKLINTHYPKG
RPIFGKVRYM
REVVFGKI R YM
$R P \nabla Y G N \square R Y M$

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D E E K

## $\square$

HGERDYAHPIVDRNHGWDRAERVFEEA DEAGEYPTPVVD DE DAAKMARDRLWSFQK
$P \square E A Q Y L K P V M D L E A S A K Q A R D R L W Q W Q K$

LLGKDYPFPLVDHKERRK LADARYE
D E S K G
PEHFARP
ARKNGYPEP V V HKDSRARALSAYKN
MPNKD
LS GRG

P D A $\|$ VD L K L S R QLAA LD T Y K V I

1 E
1 A D Q
NDESNYPQAQYNFQER\|RESKDLLWQWKKSIL GTSAYPPPIVNERSAVKQAKDRIYADRQS ALGRHYPKRiV

L
$\square$ RAKAYPAPVVKHDEASKNAKKAFEEMKAA

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

K E ER
QPG VD Y P $\square P$


PKKKD

E LD N T Y P T P ا I

UniRef90 R5PPA8 UniRef90-D7AMR1 UniRef90_UPIOOO4746BOA UniRef90-TomJS1 UniRef90-UPI000441DDEA UniRef90-UP10003D0B143 UniRet90-D3TMD1 UniRef90-B1ZG15 UniRef90-MORNC4 UniRef90-L2GL16 UniRef90_Q9YVK7 UniRef90-Q2XUS9 UniRet90_S7U1R6 UniRef90-A6FW14 UniRef90-UPI0004662F26 UniRet90-K4A8X2 UniRef90-H2TBM7 UniRef90-E8RV19 UniRef90-A0A022QT55 UniRef90-A3YTZ4 UniRef90-C6XUB6 UniRef90-R4ZEC9 UniRef90-A0A024MBE8 UniRef90-Q28NI6 UniRef90-S7WYG4 UniRef90-G7WMK4 UniRef90-UPIO003B4E056 UniRef90-S7TH77 UniRef90-T1HKC6 UniRef90-UPI00036E0055 UniRef90-AOA034W1A3 UniRef90-UP1000475DBD6 UniRef90-UPIO003739650 UniRef90-K8FE60 UniRef90-Q05QV7 UniRef90-D5BRZ3 UniRet90-E6XPP7 UniRef90-UPloo04755023 UniRef90-C4V741 UniRef90-G9MR52 UniRef90-Q9XHE2 UniRef90-AOLNOO UniRef90-B2IZA0 UniRef90-1019z7
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UniRef90
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UniRef90_D7W3H0 UniRet90_S8E7L9 UniRef90-A0A010YRW5 UniRef90-H6RHA7 UniRef90-UPI0003B3D027 UniRef90_UPI0003B5174D UniRef90_UPioooula

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GYTAACEQLQSFCMKRDPDYADKRDDPTVNALSGLS FTPALNAARARLDAFAPRAGRHYAAERNRDSRDNVSLLS RAAGLDRLAAFLANEGAEYPGARNDDARSTTSALS


GGEEPAQTALKNINPD YTGGEKKALEALNQLVEMPFSDFG\|L
 $Y$ QGTYSAGLKVMDDFFNNKFHDYNECRNNPDVDGLSNLS GGETRAVAQLRYVIKQGAAFHESNDLEDSQECLRLA YRGGTSRAKELFETFLRDDIGRYTEDRNQPHAGAVSHMS

GGRKAAQDALQK $\quad$ DPVRYAQTRNFFTGAVT RMS WKGGTHAGLERLKVFTGRLLVDYDSQRNHPETDGTSCMS AEAWFNQFLQERFHDFGKYEDAMVAGETSVLS PTKGGSEAARKALDLFLREHRDYYVARNQPQRDVTSGLS FPPTRAAGLQRLADFVPHAGEAYAKNGNNDDGPYGVSGLS YPTTRNGAKQWLNHFVRERLDQFGPYEDAFSLEYHSVLT YPTTHQEAEHWLDNFLKHRLYNFGMYEDAMVANYHSVLT AQNTWENFAKYKLNDYAKLRNFDNESSVSKLS VKPGEDAAMEARKGFLKERLSHYNTKRNNPNFPALSQLS CKPGEDAAMEALKGFLSKRLSKYDAQRNDPTADALSNLS WKGGRNEALRLLNDFLKHKLDLYMTKRNRPEATAT VKGGRNEALKMKSFVTKKLQTYETGRSEPNRPATS FKGGRKEAYKHLEYFFNQLLKDYDK RSDPALH QSYMS PHRGDPAEAARRLAAV KPGPYARTRNRDGGEVT KLS WAVTRAQALQVLEDFIQHRDPHFGPWQDAMDFLYHSLLS QPGTSEGMKMLDSFVKERLRYFSSARNDPTKSVCSNLS FAVTRDDALTVLSDFLEERLPHFGQYQDAMVEGYHSHiA WPVTRAQALQALDDFAANRTKFGDYQDAMWSNYHSLLS SAAESWLRDFLRQRLPRFGDYEDAVVAGWHSTLT
पEGGEDAADRVLNYFDANNTTYDKERNDPNSGKQSLLS
EKKAEELLKDFCSKVLDKYNVKRNDPNSDAGSVEL
AEHWLDTF LEQRLA GFGTYEDA $\square S$ SHHHSVL T
GGRKEA $\square R \square M A K F L K E G \square P F Y S E E R S E P R P P E T S R L S$ EFLPNAGSHYANERNSDLRDNVSLLS RAAGLARLQTVLPRDGRAYAAGRNHDHGPGVSGLS REQALEALDLFINERLSSFGDYQDAMAWMYHSHIS PGGSRAGYARWNAFRENGLSSYDQTRNDSADPAGSRLS



WPVTRRQA $\square$ S D $\square R H F \prod E R C L P R F G D Y Q D A \Pi S D D Y H S R L S$ QWFQQFLEQRFLEFGTYEDAVVAENSSVLT KEAEQWLEQFLEMRFPEFGDYEDSIVEKHHSVLS CKPGEEAAAEVLDGFLTMKLKNYFTDRNNPVKKALSGLS FPVTRTEALLARLRHFVEHRLAAFGPYEDAMLANAHSLL
 FPFTKSEVI TNLDNFSQHELHNYTSNRNFDYGANVSKIS

## UniRef90 R5PPA8

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UniRef90-101F15
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 PWLHFGQLSAQRVAQAAFAAAAPDESRDAFLEELIVRREL





## P P <br> P

## P

## P

P

P Y L L H F G H H $\quad$ H
PWIRFGHVS

PYIRHGVVS

P Y L H C G M I S A Q K CVVNK L IGK D N K N N E S IGE S F I E E I F I R R E L
PYLRHRLVTEEEVLVKVKQSEAPKSAKDAFLEELVVRRELL
PLMNSGLILPTEVVKRAL LTFSQEEDDPTNSTEGFITQUI
$P Y L H F G Q \| S A Q R V A L E A A K W E A D P R S K A A F L E E G V V R R E L$




PYLRRRLITE
PYLHFGQISGSEVATAA! GAFGDEGAER FVGSV

P
$\begin{array}{lll}P & W L & L \\ P & \text { Y G C C } \\ \text { P } & \text { S }\end{array}$

## 

 P Y I R Y G V LPYLLRGVL
PYLHEGHV
PLMNTGLL GPVTIAAAVKANPRDRAARDSYFNELIVWREL
PY RWGH SSHEIVQRLLDREGWHPSDEAFLDQLVTWREL





PY HF GWI G


| $P Y$ |  |  |
| :--- | :--- | :--- |
| $M$ | $N L G G I$ | $S$ |

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

 VAL N L K L L N P R E V I A A A E Q A Y Q Q G R A P P M L $\operatorname{N}$ N I G L L



P Y L H F GMDS SEELIN HSQRGKNEGFFHPNPNVNSFLDELL PAVRHRLITEDEIVRAVLGSHSFQAAEK
PWI RRRLVTEEEVVRAAVAAHGGAADK


P WL H F GHII S S FE IVNE VLT S QKWNPMLITPPHNGFLD QVI


$G A L N A G L L R P R E V C E A A E Q A Y H \quad D G S A P D N A V E G F I R Q Q L$
 PMMNVGGLLTAEEVVEEKADSFARE NDIMVNSVVEGFVRQUL P Y L H F GQ Q S A Q R CALLEA QK RK Q Y P Q A V D A F L E E L I I R R EL AAINLGGLDPREVVERAERAYRSGAAPLAGVVEGT$R Q L L$
 A ALRRRVVSEADVVDAVVAAHGPDAAAS $\begin{array}{llll}P & Y \\ P & R & R R F \\ N\end{array}$

30

UniRef90 R5PPA8 UniRef90-D7AMR1
UniRef9O-UPIO004746B0A UniRef90-TOMJS1 UniRef90 UPIO00441DDEA UniRef90-UPIOOO3DOB143 UniRef90-D3TMD1
UniRef90-B1ZG15 UniRef90-MORNC4 UniRef90-L2GL16 UniRef90-Q9YVK7 UniRef90-Q2XUS9 UniRet90_S7U1R6 UniRef90-A6FW14 UniRef90-UPI0004662F26 UniRef90-K4A8X2 Uniinefol-H2TBM7 UniRef90-E8RV19 UniRef90-A0A022QT55 UniRef90-A3YTZ4 UniRef90-C6XUB6 UniRef90-R4ZEC9 UniRef90-A0A024MBE8 UniRef90-Q28NI6 UniRef90_S7WYG4 UniRef90-G7WMK4 UniRef90_UPIO003B4E056 UniRef90-S7TH77 UniRef90-T1HKC6 UniRef90_UPIO0036E0055 UniRef90-A0A034W1A3 UniRef90-UP1000475DBD6 UniRef90-UPIO003739650 UniRef90-K8FE60 UniRef90-Q05QV7 UniRef90-D5BRZ3 UniRef90_R9GP17 UniRef90-E6X7P7 UniRef90-UPloo04755023 UniRef90-C4V741 UniRef90-G9MR52 UniRef90-Q9XHE2 UniRef90-AOLNOO UniRef90-B2IZA0 UniRef90-1019Z7 UniRef90-UPI000380708E UniRef90-UPI00040525BC UniRef90-Q3A105 UniRef90-G2H8X5 UniRef90-EOTB60 UniRef90-D9QP60 UniRet90-R8ZM27 UniRef90-UPI0003B571FF UniRef90-A8G6H2 UniRef90_V7EL93 UniRef90-10Z4K4 UniRef90-Q33BU1 UniRef90-BosCl3 UniRef90_B9TKL5 UniRef90-N1W561 UniRef90-Q7RKS9 UniRef90_A9NE57 UniRef90_101F15
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SEHYCYHEKNYDNTDGALPWAKQSLLDHSNDKREHDYETL
ADNFCFYNPNYDKI EGAYDWAKTTLK HAKDKRPHRYKQL ADNFCFYNKSYDQLEGAHDWARDTLILHARDKREYLYDQL
AMNHIYYEPNYDSYEAAPAWARKTLDAHRGDPRPY旨YEQF
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AVNHVWYAKGYDRYETLPSWARKTLDAHRGDNRPALYDELLD
ADNFCFYTDNYDTFDAFPDWAKNTLNKHRFDSRPYFYELL ADNFCYYQPHYDSLAGAWEWARKTLMDHASDKREHTYTRE TDNFCFYNENYDSVEGAHEWARKTLKDHAKDKRPYUYTRR CWRSYWRGY DEMRPALWASYVDYLLSDEAETARQDTYCAA ADNFCFYQPHYDSTQGAWEWARKTLMDHASDKREHLYTRE AWRDYWQRLWLRLGDGLWENLEPLKTGHPEAYAPELPGDI LWRDYFRFMFKKHGDAFLQETDLEKDDMQADERVDPAEKW ADNFCYYTENYKSLESCPNWA DMTLNAHDNDKRDKHFDEL AHNFYYCRDTYDTFDCLPEWAKKAMDEHRHDKREY円YKEL CWRTYWKGWLELRPSAWAEYRRDLDHD DGTGVAKA GWREFDRGMYECKGRYSR SDNFCFYNRGYDTFDAFPAWARKTLDEHRNDPREYLYDQE ADNFCLHEPRYDALDACAAWAQATLDKHRGDKRSYVYDFN ADNFCLHAPDYDSISCFPDWAVRSLDKHRGDERPWLYDDL A WRDYWQQ WWIAKGEGMNEDLKRE GPEVENYKMPENL ADNFCYYNKNYDNGKGIYSWAFNTDDEHRYDERNPSYKEF FWRTYWKGWLQMRPRVWRECANQKARLAHEPGLRAAVMAA FWRTYFKGHLETHPAAWTGYAEGHERLAAEPGLRRTYAAA ADNFCYYSPQYDTDEQKYDWAKDTLRMHAGDKRTYTYEEF
$G W R D F W Q R M W D L G D G I N D D Q E A L N T H D P A S Y A R S G P T D G$
A WRDYWQRRYRQNPHDI WHDDEAYKTGFTADDYAETLPAD
QWRDFNRFMLKKHGPVLEMSSKKLKPAEKLKF NW
A WRDYWQQVWIHKENAIDSDLKK HPQPTVENYEDPKIV
SDNFCFHDPDYDNPGCFADWAVGTLEDHLADDRPYVYEQL SEHFCYHNKDYDNUMGALEWARDSLHEHAKDEREHLYEELD
 GWRDYWQRLYVKLGDEI WKDQEEYKTGYTAEYLPELPQDI GWRDYFQRVYRVLGLGIWRDLEPKTGWSAADYADTLPAD AVNFVRYTQKYDSPECAESWAKATDREHARDEREHLYRQLJ GWREFDYQVYYRMESGRUSKQRTKNFWGFSRKKPATF GHLDFCFKRHDYDRMESLPAWAQTTLQDHMQDPRPYLYEEF YWRTYFKGWLERRPWVWYTDDRDRRLNELSGDQATAYQAA LWRTYWKGWLQMNPEVWTR YQAERDAPRASGDERAVAQA GWREF RGUYQNFDE KREGVKQTNNYFSHTRHATKHW FWRVYWKGWMENRPKVWENFISEKN LDF LIMELYKKA WWRTYWKGWLERRPAIIWSAYRQGLTRDHVESGDRQQWEAA SDNYCFYTPNYDTHDACYPWARETLQKHTADKREFIYTRE SDNYCHYVENYDSLDAAYDWARQTLNDHRNDKREHVYEQF SYRDYFROVWYRFGEALMQPMESPKVGDR
IWRDTGYLFFWKDPDWVKSNFKKHKSDTR
ADNFCFYNKNYDNFNGAKDWAKESLKKHELDKRNHDYEDF AYNFVTYDKDYDVFEFMTESWAYETMYEHERDHDYSLDED GWRDYFQRVLAHEGERVHESLLRSWKTGDEEDYAPEMPPDV SDNFCFYNDNYDSDEGTNDWAKKTLKDHAKDKREYVYSRE GWREFVRGFYWHF $\quad$ MPSLKSDNYFNHNRSLPDFF
 GWREFMRASYTELGVKMRTS LGQLDEFSYDPWRCQTVYSDDGDPRPKDDQHPQAEEWLAAW AHNFYYYRDTYDTFDCLPEWAKKAMDEHRHDKREYDYKEL ADNYCYYNKNYDNFEGGRDWAKESLKKHDADKREYDYEDF
GWREFMAAMYLRHGVTMRNSNFWNFE
WREFYRHVLVRWPHCMNKPFKPDYADDEWSYNAEHFNAW TWRELGF LFFHKSPDFLPDWAKKTLEFHKSDPRKYVYEELD IWRGYFKGWLERRPQVWTSY LRGRDDLERLDSDQARVAAA GWREFVRGVYWKMPDYRDMNYLEATRKLPSFY
IWREMSFHFCELYYDKCPEWAQTSLREHASDDRTYSWEEL TWRELGFVYCYEHPDHLPEWAKKTLEEHATDERPYVYEQL ADNFCYYQPHYDSLAGAWEWARKTLKDHAGDKREHYYTRE A WREYFHHLWRHWGDGD LSAR RPAPAARYAAELPADV RWHCHFMQKLEDQPSIEYENLHSAYDQLLRTELNQQCFEAW
 GWREFVRGVYGYOGVY ADNFCYYQPHYDSLQGAWEWARKTGKDHAADKREHIYTRE A GRDEVWHLYWYFPRYRTANALDARRELAKKWFASLDADAV GWREFIRGIYTVKGSYER TLNYWGFKRKDPKSF FWRTYWKGWLEQRPA ${ }^{\text {WWTRYGAGRDAARRDTDLAERHGDA }}$ FWRTYWKGWLESHP
G WREYMHG\|YHFVD

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ENATTTDSYWNAAMYEMQKTGFMENTMRMYWGKKTI EWSR EQGQTHDSLWNAAQLEMVRWGRMHGYLRMYWAKKLLEWTS



 ERGETHDRYWNAAMMEMRETGYMHNHMRMYWGKKILEWSA

 VEGRTGFPFVDAAMRQLRTE GWLHHVARNTVAFFLTRGTW EKAETHDPYWNAAMKEMIHTGFMHNYMRMYWGKKVLEWSE CNGQTG DDGFD H WA HE LI QT GY LDH HARMWFAS DWV T L G
 QEAQTHDDHLWNAAQY QMVTE GKMHGFGLRMYWAKKIL E WTS QKA QTADQLWNAS QLEMVHHGKMHGFMRMYWAKKILE WTN

 E E GCTHDVVY WNAA QFELVVFTHKMSGY LDRMYWAKK WS H DYE
 TKGETHQPLWNAAQRQLVDEGFLHGYMRMYWAKKILEWSP
 ■TS QTG $\square R A V D Q A \square R E F Y Q T G Y M H N H M R M Y V A S L A C N G G K$

 EQAKTHDNLWNAAQRELVYGGKMHGFMRMYWAKKILEWSD REGNTGLA CMDAF QREELVTHGWLDHNHARMWMAA Y VV H WRRR
 AEGTTGGIAIDDEA SSLLYKTGYMHNHLRMYIAS ABCNVAK
 QVGAT GYGLVDADMRQLIVTGHVGTRSHKLIVNFLAKFAG QCGATHDELWNAA QLDEMVHVGKMHGFMRMYWAKKMAGEWTQ ENLRTHHDEYWNAAMTEMKFTGYMHNHMRMYWGKKILLEWSE RQGTTGRVClDSFSHDLKETGYLHNHARMWLAAYIVHWRR







 ESAKTHDELWNAAQTELVKTGKIHNYMRMLWGKKVIEWSK

 EFSKTHDDHFNAAMKEARDTGFMANYLRMYWAKKDMEWSG LAA A ETGTTDFVDA WVA E LLHDT G WLLHNQQQRMK LAAA Y V V H F R R WT GETDMACLRRTLRQIRRHGYAHHDQRLMVLSNFALIS G TRAKTHDQLWNSAQKQMVREGKMHGFLRMYWAKKILEWTT
 WTGDTEMACLKDSI GQVLEHGYGHHI QRLMVTGLFALLWQ Y D A T T G LDP P V D D A I G R V L E T G Y C H H I E R L MV L G G I M F L C E AEGRTGFPWIDA LMRQL REEGWMHHL GRHSVACFLTRQCY EEGCTHEVYWNAAQFELVFTHKVPSEFFNCICC RSAKTHNDMWNCCQLQLI NEGIMHEFLKVYWAKKILNWSG Y Q GT T G $\square P P D D D A D K R A I D T G Y C H H D E R L M L L G N M M L L C G$
 VD GHT GDACFDA WT QE L R S T GY LIHNHTRMWFASDWI F T L N

 ENAETHDPLWNAAQTQLRKEGIIHNYLRMLWGKKVLEWCP Q NAKTADPLWNASQLEMVHHGKMHGFMR
REGRTGVPVIDASVRT LYDTGYLHNHARMWLASYLVHLRK K T G NTGYPMIDACMRALIATRWLNFRMRAMLMSFASYMLW WS GNTDMRCMRRAIEMTRNHAYAHHDQRLMVTGNFA LLLC G

 QKARTADQLWNASQLELVHYGKMHGFMRQFWSGVFRMYWQ EA Y T G E T G $\$ E P V D N S I K K V L K T G Y L H H I E R L M L L G N F ML L C E



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RPVFGT $\quad$ RFM
EHIRRQTGGRFNPRGLAQEARVPRETPMPPAQ $\square$ PRT $\square$ TAP
RECSGK TRPMNQPKHWYSRMWNNE
RAVFGKI RYMNYA
RNVFGKI RYMNYA
RKIFGKI RYM
P V Y
YMNYAGCKRKFNVDGYYVKK LVGETKKRKSDDHSSPA $\square$ KPDYGKRSMKSFKCPGYIDTW
RPIFGK $\square$ RYM

RPVFGKIRYM
Y M N Y A GCKRKFDVDGYYVKKMVGETKKRKAETLLNGKAKE

RN $\square$ YGKVRYMS QDRMYKKFN $\square Y E F Y D K \square D K$
GGSNY $\square$ RKMSNYPGGE WEE $\square$ W
REIFGKVRYM
$R P V F G S I R Y M$
RE $\square$ FGK $\quad$ R Y M
NQEN $\square N K F F Y S D Q N G T F \square D V A Y D T F N Q M E$
RP $\square$ F GK $\square$ RYM

RE $\square \mathrm{FGK} \square \mathrm{R}$ Y M
NRDN

NQEN $\square$ NRYCHTTQSTTF $\square \mathrm{DV}$ VAYEDFEN $\square$ S $\square$ PEVLTETY $\square$ P

VVSPVHEAFELDPNGSFVRKWMPELRRD
YMNYNGCKRKFDDKAYYVSKAVAEAKA
FGTVRYMAASGLERKCDIKGYVEEMKRDRA
ERYTEGVYCQKCP
$R P \square F G K \square R Y M$
SGSNY I MKMSNYPKGKWQE $\square \mathrm{W}$
$R P$ VF GK $\square$ R Y M
R P

CGSNYYQKMGNFPKGEW
SGSNYLLKMGDWKKGPWQQTW
$R P$ VF GK
RAVFGK I RYMNYA
R NVF
KFGGESWCQQCRVTCPFEGTYEQLHQQLFTDAVVAKKP K K $R N V F$
RSVFGK $\square$ RYM
ADGGMDSTKPYAASAQY $\square R K M S D Y C R H C$
A S S Y DNKMSNYCKNCGYQVSKKTGPKACPFNY LY
SASNYLLKMSDFPKGEWQETWDGLFWRFMDKY
ADGGLMASKPY $\square A S G Q Y \square N K M S G Y C Q H C P$
SGSNY $\square$ RKMSHYPKGDWAE ${ }^{\text {G W W }}$ DGGYSSFSYY $\square Y$ E P W $L$ APKS $V$ QREAGC

S G S N Y VR K M S D Y K P G D WC G $\square \mathrm{W}$
RRFQPRQSERFYPDGDY $\square R Q W A P Q L I D L D N$
REDFGTVRYM

D G GY $\square$ A S K P Y A A S GS Y $\square$ K K M S NYCDKCH

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SGSNYLMKMSNYKKGEWQAVW
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YMNYAGCKRKFDVDAYHVKKLVSELES
RMSDYCGGCRYDPK
SSSNYVYKMSDFKKGEWDSTW
A QAD N $\square K F F T N A R F Y P R N Q \square K E N Y \square L D K N \square T N G K$ P

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VH HLD P P E P
$1 \mathrm{I} G \square \mathrm{D}$ Y P A P M $\square \mathrm{DEKEEKNRN} \mathrm{\square ERMRAAYQA}$

UniRef90 A3II31 UniRef90-C5BIV6 UniRef90-K9UYM7 UniRef90-A9LH56 UniRef90-R7HZ37 UniReffo-MOEUB8 UniRef90-H8MR73 UniRef90_C7M2C5
UniRef90 D4TQ06 UniRef90 UPIO00477C399 UniRef90-UPIO0036F356A UniRef90-UPIo00463F51F UniRef90-UPIO00381E641 UniRef90_Q1GEA3 UniRef90-D81X67 UniRef90-K2KHB5 UniRef90-A2C3R3 UniRef90_D4GX25 UniRef90-K9XN86 UniR Refo-AGDFNO UniRef90 Q4KT08 UniRef90_UPIO002557FD5 UniRef90-UPIO003B4A545 UniRef90-Q2S7E7 UniRef90-UPI000468AC4E UniRef90-F7SIW1 Unii effo-U2UBF3 UniRef90-UPIO0047739F1 UniRef90-E4NJP4 UniRef90-UPIO0037E1DE6 UniRef90-UPI00037AOFA2 UniRef90-K6ZBB9 UniRef90-UPI000405CFFD UniRef90-D2R5E5 UniRef90-UP10003F7A7DB UniRef90-UP100034ADEC6 UniRef90-D2S7C5 UniRef90_UPI000381E3D0 UniRef90-B6B656 UniRef9-BM1118 UniRef90-UPI0003690A3C UniRef90_UPI000255B8F9 UniRef90_15C169 UniRef90-B8K4H2 UniRef90-UPI000378F7AF UniRet90-F7RVQ7 UniRef90 ATHEQ88 UniRef90-Q9RIY1
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PFKWGRS QAL QVLDHFLENNLNNFGTYQDAM|ITGEHSLI S FAVTR QQALYALDKFIA ERLASSGDYQDAMLESYHSHLS $R T$ Q A L E V L E Y F 1 LPVT R R Q A KA FL K H FI E S IL P NF GK WE DAM WT GY H S R L S

TEADLLLDDFIQNKLPQYAEFKNNPSKNVLS GLSS
RGGRKAGLKALDAFLDERLEGYDTGRNDPGLGQQSNLS WPTNRVGALRRLRAFIDEGLSRFGPYEDAMLADAHSMLS


RAAGEARLQDFAPRMGKRYTNGRNYDNHRDVSMLS FAVTRTQALRALDHFAKELLPGFGDYQDAMLRNHHSDLS
$\begin{array}{llll}L \\ L & K & \text { C E T E L L C Y S S K R N F DLL G K N V S K L } \\ \text { L }\end{array}$
 A A ARERI A AV

 GGRKAAETALE

K V D A A YTK SR
 WLNQFFEYRFSEFGTYQDALVKQHHSLLS WP T S R K Q S L EVV D Y F CE H LLLE HF GTYY DALVYS GHHS R I S WPVTRRQALQLLQHFCERCLPQFGRFQDAMTDAYHSRLS FATTRSQALQALDHFIGHSLPTFGDYQDAMLRGYHADI S

K G GRE E GI K LLLQK F L K R GL S GYAE L R SNP E ESYS S F L S R R Q A L Y R L N N E F I D E E R L D E F F G P Y E D A M A E L F H S Q




## G G A A

A A RL E R F L D R L S R Y G NAVT V

 F AVVTREDALA AL ERFAGEALPDDFGDYQDAMLE GY H SVVLS
 WPTVSRE D A L S A VL R S F V A H R R L P E F G R Y E D A M L LA G S H S L L S S WPCTRKEAI E V L R Y F C EKKLLFA HFGTYQDAMHSEFHSRRLS WP $\square$ NRS QA L NL L A HFCQ HCLP RFGFFQ DAMWS LYY S R L S WPVNRQQSLQLLEAFMKERLPYFGQYQDAMSRRFHSRLS
 LP P TR S A A L A RI A RV RPAAYARTRNHLDGAVT WPVTREDSLSVLNYFCKNLLVHFGDFQDALHTDFHSRLS WPVTP S D A L R AL E S F DE N ELLPLFGAY Q DAM WS G S H S L L A

RA QS L E QL DYF CE HLLLDHF GDF QDAMH T DN H S K L A S

 WP LT RTEALQALADFI EHRLAGFGQWQDAMWADHHSRRL FAVTRKGALEVLAKFIDERLPLFGKFQDAMDEDYHSHI G
 Y P T T QA S A A A WF D Q F L R QRFD R F G D F E D A DS WL WH A M L T
 WPVNRQQSLQLLDFFCEYCLPNFGRFQDAMTQHGESRWS $W_{P} \vee V^{N}$

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P \frac{\square}{W}
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 PEFGQFQDAMRNDAHSHIS WP L NRAEALQQLEAFIADGLPQFGDFQDAMSRRSHS LL S WPINR

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REDAQA QFDWF CEHALDQYGAYQDADDTNFHSVLTT
 LQ G GETRAE ELLLSK F L T K A I N E Y QLLKRND PS L R K Q S HL S PTRDA GLD RLLA A F L PRAGAAYAAGRNDPGKGAVSQLS WPTNPEEAEATGEHFLAHMLPEFGDWQDAMAWEQHGLI
 WPVNR A Q S L S L L A H F C Q QVC L P L F G H F Q D A M T V E Y H S R L S

 WPVTRSEARRALKRFVEERLETFGPYQDAMLSDNHSLLS
 WPVT S

Q N A L L L L D Y F C E H L L L P P N F
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UniRef90-UPI0003690A3C UniRef90-UPI000255B8F9 UniRef90 $15 \mathrm{CC169}$
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 APLNMKLLHPRECVDAAVQAYRTGKAP LNSVEGFVRQIL KYMNLGFISSQRAGLEVIKSNAEDपNKEVFLEELIIQKEL

PWFHWGNLFPGE $\qquad$ AARAADAAKGKDHPAVQSFVEELL VALNLGLLHPHEVVEAVERAFRDGR VGLSSAEGFLRQVI PYLNLGLLHPMEVI QAVQEEYNKHQLN LNSVEGFIRQLL $P Y V T H$ G F D D $\quad$ I P GVI A RLSRR H A LT T D D K P Y L R R R LV LE Q DAVA TAV A HEHGAE GAE K

 P Y L T H G M V




 P L L N S G L L N P L E V V K K A I A A Y G D Q N N I P D N S M

## F

## F P A

 A A L N I G L L G P LIE V $\operatorname{L}$  $\begin{array}{ll}\text { V } & P \\ L & N \\ N & A \\ N & G \\ L & L \\ L & L \\ D & P\end{array}$ A




 F A L N S K L L FA L N V K L I F A L N S K L I $\operatorname{S} P$ P L L E | P | $M$ | $L$ | $N$ | $I$ | $G$ | $L$ | $L$ | $T$ | $P$ | $Q$ | $L$ | $V$ | $L$ | $D$ | $A$ | $A$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $F$ | $S$ | $L$ | $N$ | $T$ | $K$ | $M$ | $L$ | $S$ | $P$ | $K$ | $E$ | $V$ | $V$ | $F$ | $A$ | $A$ |  | F S L N T K MLGSPK EVVEAALAAYE ENP


SYLTLHGLL TLDEVLARGVLQRERLE



F A L N T K M M S

P Y L R R R L L

## A A MNLKLLDPREVCA

FY L N A GLLTP LEVVIKAVEQEYHNGNA



## 

## 


 LYY NAGLLEPADVCHQAEAAYRAE

PWLRHRLLT
PALN $\square G L L D P \square D \square C R R A E A A W R E G R A P A$
 F SL N S KLLSPSEVI DAALSAYHASSKQGAPSIDDFIRQII A

## \section*{A}

A A NVKMLNPREVVARAEHAYHSGAAP LAAVE
A A I N I G L L T P D E V V Q A A $\square$ A S D A P L A S VE G F
$P W L H H G M I$ A ATRLVRAA ANSPTKGAR QLL
 S S L N I G G L L N P K Q V V
FY Y N A GLLLDPKEL CHMAEQAY LK Q QAP
S SMN LKKMLTPREVVAAAEAAYRDKKAP


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GWREFVRGIYWKMPGYGKENFLNAKRKLPPLY
GWREYMHGLYHYVEA
GWREFTRGIYWHMPRYAEDNFFEHQQPDPSFF
GWREFIRGIYWLK
SDNFCLYCRNYKT LDC DP पWAKNSLMEHEND LRVYNYKDF

GWREYVRGFYWWQ
GWREYMRGVYMYESKRD
ARETLSRHRKDPRPHSFEEL GPTYRSQAALGAERPLPPAL A WREYFQHVWRHLDEGVFEDRMP QPPASCYGEVLPDDV $\square$ WRAYFKGWMERRPVVWDQYRRD $\square$ AVLDRDRS $\square R R R L E A A$

GWREYVRGIYF LEGE DYPTRNALEQTRALPALY GWRAFYRYVWSRRGARDFDS DHAGPDPEAA YARELPDDI GWREYVRGVYWT DMPGYKANNA LIASTRPDPDF
LWRDYWKGYLENYKS DWFEY DNFK
GWREFVRHVY RRSMPELAEANQLDQTEPLPEAY
GWRDYWQRLYVK DGNGDWEDQEPYKTGYKEEYQQELPEDD
AWRDYWQSQWNYHGAKUNHDLR H H SMAYNKHGMPSRL
ADNFCFYNSNYDTF LGAPNWAKETLVIHKSDSRQY Y S QF
GWREFVRGVY $\square$ AKGSFSR


GWREYVRGLYWTQMPAYKRENQLGFE



GWRE Y V RGG Y WK MP DYRETNF LGGA
GWRE Y V WHL Y WHF GEDYRHRNALRHTTPDPDWF LDDLDA DA
GWREYVRGFYWYFMPS LKENNYLEAKRALPDF
GWRE Y V R G $\square Y W$ W
GFNFCSRNDNFDQDESLPTWVQKTLDKHAVDPRPNLYDQF
GWREFMYGLYES $\square$ GRKQRTSNFWGFKRKIPPS F





GWREYMR GVYWK MPDYE QLNYF GHERADDKWF


GWREFVRLIVW R R M M S YKT LN HFQHENPLLPEFY



GWRE YMRGMYWKMPDYKQENFLLENKNKLLP DF F
GWREYMRG $\quad$ Y WK MPEFASMNFFGHNRK L P S WF
DWREMSFHFCE LHAEK LDCPGWAQET LDCDHSKDKREHPRD
FWRTYFKGHLDETHPEAWTRYLSDLAEARARLAAEPTYEAA

GWRE Y V R GL Y WKMPDYAA QNALGATRPDLPSFY
GWREFMRATYADLGVTMRQ
GWREFVRGIYWTH MPEYAEKNYFDHDREVPSFF
GWREY I R G V Y W WLK GPD Y A K T N H L N A S G K L P D F Y WD PD

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GWRE Y V RA I Y WNMPDYATKNQLKAKNTLPP YF
GWREFVRGFYWHMPGLDKDNYFNATRDLPSFF



GWREYVRGVYWHMPDYAKRNTFDAKRSLPAWF

IRRE F AVNFVLHNPSYDSADSCPRDHAHEKRTHTYTEEQLL
GWRTYWK GWLEQRPGVYDLYRRAENRLDTEE GLRRATHDA
GWREFVRGVYWKMPEYGLRNALEAEGKLDPWFY

GWREYI RAVYW ANMPAYATKNHYSADRALLPHYF




GWREYVVRGMYWV
 GWREYVRGI YWQMPGYLERNAFEAFEPDP
G WRE Y I N GLY WHF G D L Y R N E N A L A A E R P L L P L L F T D S T
UniRef90 A3ll31 UniRef90 C5BIV6 UniRef90-K9UYM7 UniRef90_D5SWH4 UniRef90_A9LH56 UniRef90_R7HZ37
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UniRef90 H8MR73 UniRef90_C7M2C5 UniRef90_D4TQ06 UniRef90_UPIO00477C399 UniRef90_UPI00036F356A UniRef90_UPI000463F51F
UniRef90 UPI000381E641 UniRef90_UPI00038
UniRef90_Q1GEA3 UniRef900 $81 \times 67$ UniRef90_K2KHB5 UniRef90_A2C3R3 UniRef90_D4GX25 UniRef90_K9XN86 UniRef90_A6DFN0 UniRef90_Q4KT08 UniRef90-UPI0002557FD5 UniRef90-UPIO003B4A545 UniRef90_Q2S7E7 UniRef90_UPIO00468AC4E UniRef90_F7SIW1 UniRef90-U2UBF3 3 UniRef90-G7QP89 UniRef90-UPIOOO47739F1 UniRet90_E4NJP4 UniRef90-UPIO0037E1DE6 UniRef90-UPIO0037AOFA2 UniRef90-K6ZBB9 UniRef90-UP1000405CFFD UniRef90-D2R5E5 UniRef90-UP10003F7A7DB UniRef90-UP100034ADEC6 UniRef90-D2S7C5 UniRef90-UP1000381E3D0 UniRef90-B6B656
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UniRef90
B8K4H2 UniRef90-B8K4H2解 UniRef90-A7HEQ8 UniRef90-Q9RIY1 UniRef90-B1Y5DO UniRef90-UPIO004081474 UniRef90-B5JLQ7 UniRef90-UPIO003684FOF UniRef90-UPI000422ABC7 UniRef90-M5TA86 UniRef90-M7YZC8 UniRef90-17ZHE9 UniRef90-D5BN93 UniRef90-K5XTD3 UniRef90-A3X5Z8 UniRef90_FOSIK8 UniRef90-UPIOOO479EE20 UniRef90_Q1YU58 UniRef90 UPIOOO4779EF5 UniRet90-UPIOO0255A9CE
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UniRef90 O1QZ55 UniRef90-UPIOOO380C4FC UniRef90-U2FSW7 UniRef90-U1N4X8
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WGAPTDMN WGAPTNMNCLSQCVSETRQHAYAHHI QRLMVIMGNFALLAG
 WDGDTEMSCVKQSMQQVIDHGYSHHI HRLMVLGNFAQLWG ENAKTHDRLWNAAQDQLINDGG\HGYLRMYWAKKILEWSQ $M R C L R E T G R L N F R M R A D C A S V Y F H V L Q Q$ D Q GRTQDALWNASQRELRERGRIMNYLRMLWGKKILEWSP
 WT G DT D LNCLHQTLEQLHRTGYAHHIQRLMLLSNFNLVLG R A A RTGVVPVVD H AVVRTLYATGY LVNHARMWLVASYVVMLRK WA GQS GL NYFD S WA E ELVETGYLHNHARMWFASIWUF TLE WGA E TGGME CLLKC AVA Q T R D E A Y A H H D Q Q R L M M V T G N F A L I A G
WGA RA GAT GMHCLS QAV

 AHGTSKRVCIDSSSRDLREDGYLHNHMRMWLAAY VVHWRR
 Y K G T T G I E PVD DAVK K ALK T GYCHHIVRLMVLGNFMLICE WTGKTKMKCLQHALSQSLDTAYAHHIQRLMVIGNFTLLTQ WD GDTHMRCVSKVVGQSLQYAYAHHIQRLMVTGNFCLLTG WGAETKMACMEAAI GQTSREAYAHHI QRLMVTGNFALLAG WD GNTDMRCLQRAIQMTDDNSYAHHIQRLMVTGNFALLCG ETARTEDGLWNAAQRELMERGRDHNYLRMLWGKKLLEEWS ENSKTHDVI WNAAQKELVLSGCMQNYLRMLWGKKWSPDYQ WS GETRMNCLSECLKPVIENGYSHHIPRLMVLSNFSNLTE VRAR CLLS GALA QVRDTGWVHHMPRLMVLGNWALQHG WT A E T DMNCMANCVGDTRDHAYAHHI QRLMVLGNFALLAG VTAN CLLSTVLARVRDTGWTHHIPRLMVLGSRALQDG WT GKTRMNCLS QCVNDTKEHAYAHHI QRLMVLGNFALLTG
 Y T GDTG IIE PID T T I K KL L K T GYAHHVERLMVFGNFMLLCE
 $D D G A V D A A C M S D V L G D L R R D G W V H H D P R L M V L G N Y A L Q R G$ WTAETDMACVAAAVGQTRDEAYAHH QRLLMVIGLFS TGAQ
 VR A R WS GDTDMHCLHHAIRNSLDNAYAHHI QRLMVTGNFALLAQ WT GDTKMHCLRHAI TQSLEEAYAHHIQRLMVTGNFLLLAG WT G K S G M N C L N Q A V G Q S L E H A Y A H H I Q R L MV T G N F T L L A G WT GETG $\square$ G PI D DVI K R I L K T GYCH HI E R L MVLGGFMFI C E WNADTKMNCVKHAVEQSLETAYAHH\|QRLMIVTGNFGLLAG DAARTHDPLWNAAQRQLRVEGVIHNALRMLWGKKILEWSP DADAVRANCLRTVLAQVRDTGWTHHDPRLMVLGSHALQRG RQARTGVPVIDEAVRTLYATGTLHNHARMWLASYVVHLRH WT A DTKMNCMHHAI DNSLENAYAHHDQRLMITGNYALLTQ WD GETE MNCDREVVTRTMKYGYAHHIQQRLMVTGLYALLHG WTGKTKMNCLKNAINNSLDNGYAHHIQRLMITGNFALLTQ WT GQTKMACLRHSIGQSLEYAYAHHI QRLMLTGNFMLLTG WE GKTE DA L WDA A QRS LV RHGELHNNVVRMTWGKAF LDMTK VDGRA GLDGFDTWAR DLVATGWLHNHARMWFASDWIF TLR WN A Q THMQCMAQTVGQTLKLGYAHHDQRLMVEGLFALLLG WTGDTRMNCMRQSI SQTARYAYAHHI QRLMVLGNFALLTG WDA GTEMNCLR QCVVRTTRDHAYAHHIVQRLMVLGNFALLAAG
 WD GETDMRCVRESMSHVVNHSYAHHIMRLMVLGNLSQTVG

KTDMACVSEAAVRHTRDHAYSHHI QRLMMITGNFA LALA G
WT GETKMACMKQAI DQS LEYAYAHHI QRLMVTGNFAMLAG WDADTSMQCLHQAVGQTLKFGYAHHIQRLMVTGLFAQLLG WGAPTQMACLSAAI GQTQRLGYAHHIQRLMVTGNFALLAGB WHAKTKMNCMHHALCESGTTAYAHHI QRLMVIGNFCLLTA WD GYT NMNCMRQCITQTKQNAYAHHI QRLMVI GNFS LLTE WTGETRMNCLAAAI GQS LQYAYAHHI QRLMVIGNFALLAG
 WDANTD ILDPFDSAMARDLDNSYANHI ERLMMVESNLALLLCE WS GDTDMRCLS QALK QSLDLGYAHHIQRLMVIGNFAL LAG
 EQGRTHDQYWNAAQFEMI DTGKMHNYMRMYWAKQVILWMD CA GRTG DDCFD SWAR E IVARNYLHNHARMWFAS I WI FTGR WT GETD MACVADAVRS ARDHAYAHHVQRLMVTGNLAMLLGG WTGDTRMHCVK QAVTQS LIEFSYAHHIQRLMITGNFALLSG WDGQTKMHCMKHALDQSLEYAYAHHIQRLMVTGNFCLITG
 D A D AVEAACLK DAVAGVRDRGWVHHIPRLMVLGNWAAQRG WD GRTRMACMSHALRQSLEDAHAHHILLRLMVIGNFALLAG WDAETDMHCVHQSVVKVI ERAHNHHIQRLMVLGNFATLGE ERGNTDDPLWNAA QTGIVRHGVMHNNVRMTWGKGTVRWVD EKLLKTKNDEWNAGMNELKS TGRMHLYVFDYWCKHLLFMTK WT GDTKMHCLSSAIGQSLDYAYAHHI QRLMVTGNFCMLTE
 FWGDTKMFCVVEVVVRQTSVEAYSHHIVQRLMITTGNFAL LAG


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170
180
190
200
 L A P D EVNE WY LI VY A D A Y E WVE L P $P N V S G M D L$ FA D WV M QT NVI G $A 1 D W V S D P N$ TLGMGSQF
 VHPRLFHEWHM A MYVDAI DWVSLPNTLGMS QF
 QP WR $\square$
T P E E A VQPAAMLD WM WE RFEWVMVPNVIGMGDWAD GGVMATKPYR TSPQSVVD WFHAVFDD AY THWRVGAD WMYRHLLDGDLASNTDSWQWV AQTNVIGMGLF LP WRL GADFFFTHLLD GDAASNTL GWRWVAGGLHTRRGKPYG V N P A EVVHE WY LAAVYFE WVEAPNVVGMSQFA DGGDVGSKPY
 $V$ H WRA GA D WMV GHLLD G DLA S N HLS W W WV A GT
L S VEA I C D WY LAA VYMD A Y
A S N HLS WQ WV A GT
L P WQ L GA R LF MK HLLDDGDAASNTLSWRWV A GMNTLGMVMH GFVDAFHWVTTPNVAGMHTNKKPY GS F A V R WQT GAK WF LE HLLD GDPASNNMSWQWVASTFSHKPYYF YHWHDPARWMYY HLI DGDWASNA LS WQ WVA G C L N GK KY IA TPE QASDY LN DRYSLD GRDPNGYVGCMWS DC GLHDRS F L E

 D P GQVS QWY V K P E A
S P L Q R I A F L
N D K Y
T V
S

,

s
 VH WRA GA D WLVA HLLD G DLA S N HLLS WQWVA GT

$$
V \text { HPD E V D K WY L G I YM D }
$$

$V$
$\begin{array}{lll}1 & H P D E V D T W Y & L \\ C P E Q A M C C L N N H R Y A L L\end{array}$

LDPVMVNEWY LVVYA DA YEWVELPNVSGMVLFA
LD P A EVNNEWYADA YE WVEMPNVT GMMLFADGG
I D P D A V Y R WF MEMYD WVMVP NVYAMSQHADGGGIT T K P Y F
$V$ HPDK FHEWHMAMYLD A DD WVSLPNTLGMSQF







K WED A YRF L VAQNNKW

LP WELGADFFLLRHLLDGD L GASNTLSWRWVAGDHTPGKHYA $V$ HPDAVD DWYMVVFADAY E WVEMPNTRGMATAF CEPDEVVDDWY LGI Y IDD ALQWV EMPNTRGMALG


LD P H DV HE WY LDD AFEWV EMPNTLGMS V S PQQTS DWF NEMY ID A Y DPEEAMQE LNDRYALDDGRNPNSDDWVVLDNVLGMALH TPEEASFSLYGKYS LEANYPYS L WWIMYS DCGVMDQGFGE L Q P A Q V

 | $V$ | $D$ | $P$ | $K$ | $E$ | $V$ | $H$ | $A$ | $W$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

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UniRef90－D8IX67
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A D G Gll L A S K P Y A A S A N Y I N K M S D Y CKNC D G GYLASKPYAASGAYI NKMSNYCKQC ADGGULASKPYASSANYINKMSDYCKNC
GDGGIVGTKPYCATGAYISRMSNFCQSC
GDGGVVGTKPYCSSGNYINKMSNFCKGCRFDY
FPVTGK V （RRM
YDPR K QVRDQDPDGEFVGRWVPELDPLPAAHLDAPEKTP
RMSDYCRSCEYDPRCPFTTLYWWFLDRHRERFAHHPRMAP ADGGLLASKPYAASANY $\square$ NKMSNYCSGC
NADNYAPAWASPGTCDDAPYEVLEARADQAADCGPERGAP AQGWN
VS SGNY $\square$ DRMSDYCG
DNDSYFTKYRFNPKGQLNEKDISKYQNHHNNK】V
ADGG\｜IASKPYVSSGAY DDRMSNYCGSC
ADGG $\square$ MASKPYAASGKY $\square K R M S N Y C S Q C P$
T DVLSSKPYASSGNYVNKMSDYCSSCP
NQEN $\square$ NKYCGS $L E E Q T F L D K S Y D E L S Q \square$
R QVF GK 1 R Y M
SGSNYLKKMGDYGNGEWQK $\square W$
SSGSYI NKMSNYCSGCH
ADGGLIATKPYVSGGAY $\square$ QRMSDYCKGC
$\square$ ASKPYVSSGAYINKMSDYCKGCSYK
ADGGLMGSKPYCASGKY $\square$ DKMSDHCQHCSPKQVTGPKACP
R N VF
A D G GVLASKPYVSSGNY
C
DGGVLGSKPYAASGAY $\square D R M S D Y C G D C$
SGGAYIKKM SDFCAPCAYRPDHRTGEGACPYTAGYWS
ADAGNLASKPYAASGSY DNKMSNYCKSCD
ADGGILATKPYVSSGSYINKMSNYCSSCH
$R P \square F G N D R Y M$
SGSNYINKMSDYP
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RMSNYCKSCRYDPK
AD G GLLGSKPYAASGNY $\square$ NKMSDHCAGC
SAGAY！HRMSDLCDGC
AD G GLVATKPYVSSGSYاHKMSNYCDSC
ADGGIVGTKPYVSSANYI DKMSNYCGSCH
ADGGIVGTKPYAASGAYINRMSDYCKSCRYK
SGSAYI RKMGNHETGEWCD $\square \mathrm{W}$
ADGGLLATKPY $\square$ S S GNY $\square$ NKMSSYCKDC
$R P \square F G T V R Y M S S Q N$

A D G G $\|$ VATK P YVS S GSY $\square$ NKMSNYCQNCHYK
RMSNYCDGCQYNPD
S S GSYlHKMSNYCDGCH
ADGG IVGSKPYVASANY $\square$ DKMSHYC
ARRDNTRRFRHDPAGLDEDAAPLEEAMPPREVPLAAADAM ADGGVLGSKPYVAS GRYIENYCAHCRYDPGKA】

DGGYLASKPYAAGGAYINRMSNYCKNC
S GSNY\RKMSHWDK GP WAEVW
GDGGIVGTKPYCSSGNY $\operatorname{CNK}$ K
ADGGVVATKPYAAGGNYINKMSDYCKGC
ADGGLIATKPYAASGSYI NKMSDYCKDCH
ADDGRMASKPYVATGRYIURMSNYCAHCP
SSANYIAK MSDYCQGC
ADDGIIATKPYAASGNY $\square$ NKMSDYCKNCHYK
ASSYINKMSDYCKNCGYSVTKKTGEKACPFNY LY
S SAAYIDRMSDYCKGCH
ADGGlVGTKPYAASGSYワNKMSDYCKGCH
ADGGLI ATKPYSASGSYUNKMSDYCASC
SSSNYLRKMSYFKPGDWSTLW
GDKGLMASKPYAASGKY IQRQGNHCKAC
NAANVAKYAPRDSTGTAIDCSYEALDRD ARDPSAAA ADDGIMASKPYAASGKY $I A K Q G N H C Q Q C P P K D T T G P K A C P$

EN $\square$ AR F T G GRFDPRG
ADGGIVGSKPYAASGAY DDRMSDYCKGC
ADGGIVATKPYAASGSYI NKMSDYCKDCH
ADGGIVGTKPYSASGSYI NRMSDYCKGCHYK
ADGGYLGSKPYCASGKY IDRMSDHCAQC
RMSDYCGDCRYDP
SSAAYIHRMSNYCKGC
ADGGKLATKPY $\square$ ASGKY $\square$ DKMSDYCKGCNPKHTTEEDACP
$R N \nabla \ G K \square R Y \square K S \square K A P Y \square S M W$
ADGGWIASKPYAASGSYIQKMSDYCGSCHYKDKETGELAC SSNYILKMSHY QKGEWSE DW
ADGGLMASKPYAASGKYDQRMSNFCKSC
ADGGLMGSKPYAATGKYI DRMSPYCKTCPDPAKRTGEDAC
A DGGKLATKPYAAGGSY ISKMGTFCKSC

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UniRef90-A6DFN0
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UniRef90 A0A031FTZ7
UniRef90_UPI00035D46E
UniRef90-UPI00037A2740

L I G E G Y P Y P VA D Y E R A R L E F R E R Y GAVH GA $\square L H N D D R \square G D L T A \square R E R A R Q \square L E L L D A G L$

${ }^{1}$ WP\|TRTQANELLLAFFCQHCLLPNFGRFQDAMTGQYHSRULIS ${ }^{30}$ PWPVTRKQACEALARFDDERLGEFGQYQDAMWAMAHALL G YPVTHAEAEQLWQHFLDFALPAFGDYQDAMASGFHARIS RAEAEAARDHFLTHALPRFGDYQDAMRQGAHAHLA WAVTREQAELAALAHFLDFALPCFGDFQDAMSDDFHSLLS




EKQADEQLRYFCEYLLKYFGDYQDALHTSFHSRLS AQARLALDDFIAYRLPSFGTFQDAIWLGYHARLS WP LT RREARAGLARFIEHALPWFGPYQDAMSTRSTSGLS WSTTRADAERARDHFMEHALPDFGDYQDADP WDFHSVLS WPVNRKQATQLLSFFCEQCLPRFGQFQDSMTGKYHSRI S WPVTKKECDSTLDYFCNELLPYFGDYQDAMHDDFHSRLS $P G E G B D A A L R R F L D E R F M Q F G P Y E D A D S A E H H A A L$
$V$ WPVNRQQAKELLDYFCRYGLPRFGQFQDAMWSDYHSRL WPLNRAEAGACLQHFDDQVLPDGGRYEDAMSTASTSQL WPTNRKQSQALLSYFCRDLLPLFGRFQDAMTTKYHSRL WP
 WPVDRAEAKARLDAFI SHVLPQFGNWQDAMHTEFHSLI
 WP VTRDEAEKAADAFFAERI EKFGKFQDAMDDLYYSM

 YPTTRNEVLDQLDYFCSHLL IVYGGDYQDAMHTLYHSRI S


 WPLNRSEADACDDAF DDTALPHFGDYEDALAAQAHSLLS
 $\square P G G Q T A A N L A L S N L G B Q L R G Y A K D R S E L D S R G A T V M S$

 WPVNRQKASELLDFFMCRYCLPDFGQFQDAMWSQFHSRLS
 DEARYALKKRVDHRLDPFGPYEDADWTMAHSLLS
 FPATRREALAGLRRFVEHRLAAFGAYEDAMLAAGDTTM SH YPATHAEAQARLTHFYAHRLASFGDWQDAMWAGFHSRLS YPATHAEADARLRHFVAHRLPDYGRYQEVMSAGTHSVLS WPVTREQGLAVLRDFI DVRLAAFGPFQDAMWTD

lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
SOlO
jhmm
jpssm


[^2]



[^3]UniRef90_UPIO002F55D01 UniRef90_U1QGQ8 UniRef90-U2ZTW1 UniRef90_UPI0002F653D2 UniRef90_N6X5A5 UniRef90-UPI0003B51450 UniRef90-V4J7T1 UniRef90-UPI00029AE37F UniRef90 B6IRE2 UniRef90_UPI00047D1560 UniRef90_B8C6C5 UniRef90-UPI000371F381 UniRef90-R4VGI4 UniRef90-N6XAL8 UniRef90-UPIOO03493419 UniRef90-R9PK26 UniRef90 UPI00047D8B63 UniRef90_UPI0003B4E22F UniRef90_Q5V4M4 UniRef90 UPI0003B3115D UniRef90_UPI0003A5D7C3 UniRef90-UPI000363D9AF UniRef90- Q2C0V7
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 WDGDTEMECLSQTVGDVHERGYSHHI QRLMVLANFATLWG WT GQTRMNCMRQAI GQTLELDAYAHHI QRLMVTGNFALLAG WTAETDMACMRDAVEQTLTHAYAHHI QRLMVTGNFALLAG WT GETDMRCMHQAI DATRRNGYAHHI QRLMVTGNFALLAG WGAPTDLKCLSQAVDATRRNAMAHHI QRLMI LGNFAMLVG WS GETKMACLHHSI SQSLQYAYAHHI QRLMLTGNFALLAG WT GNTKMNCLKHSI KQSLDYAYAHHI QRLMI TGNFALLAG WTGETPMTCLREVI GQTRREAYAHHI QRLMVTGNFALLAG WTGDTSMTCLSESIGQTLKHGYAHHIQQRLMVTGGLFALLYG
$C V G N T G Y E L V D A G M R Q L W A E G W M S R K A R L L A A A C L V E G M G$ WTGNTKMNCLAVSIKNSLNNAYAHHDQRLMITGNFALLTQ WD GQTDMACMADAMAGLLRHGYAHHI QRLMVLGLFAQLYG WT GETKMNCLHHAVSQSLDSAYAHHI QRLMI TGNFALLAG
 WTAETKMNCLQKAI GQSLDSSYAHHI QRLMVTGNFALLTQ WT GETGLEPVDLVI RRVLERGYAHHI ERLMVLGNALCLDR WNGDTDMACLSDVVDGVRERGYSHHI ERLMI LANFGLI YG WT GTTQMNCMKHAI EQSLDYAYAHHI QRLMI TGNFCLLAG WTGRTQMRCLQHAI GQSLDHAYAHHIQRLMVIGNFALLAG WTAETDLNCLAHCVGDTRDHAYAHHVQRLMVLGNFALLAG WT GETKMNCLKDAI GQSLEYGYAHHI QRLMI TGNFALLA G WTGETHMRCLHHA I GQSGLQAYAHHLQRAMVIGNFALLAAG WTGATDMRCMAQAI GQTLRRAYAHHI QRLMVTGNFALLAG WT GKTQMRCLAHAI GQSLTEAYAHHI QRLMI IGNFSLLGG WS GDTRMRCMHKALDATRRNGYAHHIQRLMVTGNFALLAG QNAKTSDPVC
WT GETDMRCLADSI RSTKENAHAHHI QRLMVLGNFALIA G WNAKTRMRCLSHSIEQSLQYAYAHHI QRLMVTGNFALLAG WDADTRMNCVSKTVAQTRDEAYAHHIQRLMVTGNFALLAG WT GKTKMNCLKYSINQSLEFAYAHHI QRLMITGNFALLAG WT GDTRMACLREAI GQTLELGYAHHI QRLMVTGNFALLAG WTGKTKMNCLKNTI NNSLDNAYAHHIQRLMI TGNFALLMQ WTGKTRMACVASAI TQSLQHAYAHHI QRLMVIGNFALLAG WN GDTKMNCLRESISQVLEKGYGHHI QRLMVTGGFALLYG
 WTGDTDMRCMAQVI GQTLAALGYAHHIQRLMVTGNFALLSGB WGGETRMTCVAHAVGTTAKEAYAHHI QRLMVTGNFALLAG WS GDTHMRCLHLAI TQSLQTAHAHHI QRLMVIGNFALLAG WNAQTDMRCLQRALSQSLDLGYAHHIQRLMVIGNFALLAG GMACVDFALDELHQDGWLVNQTRMWLASHWSVRNG VHGRKGFPKGGEALVEWLQPA QHENAWHSRRVMSC TGMACVASAVGHVERHGYAHHDERLMVLGNLADTAG WS GETDMACVADVVSATRANAYAHHI QRLMI TGNLAMMDG WTGRTRMACMAHAI GQSLQEAHAHHI QRLMVIGNFALLAG
 WTGDTEMACLSTVITQTITHAYAHHI QRLMVVGNFSMLAG DGDAVTAACLGHTLNEVRDRGWTHHI PRLMI LGNFALQRG
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lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm



[^4]

lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
jhmm
jpssm


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UniRef90-V4J7T1
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    jhmm

