RVVVDNDPVPTSFEKWAKPGHFDRTLARGPQTTTWDWN ${ }^{10}{ }^{40}$ KI LVDRNPVPTSFEKWGVPGHFSRSLAKGPKTTTWI WNLH
 HTPATDDRWAQPGHFSRTLSKGPKSTTWI WNLH KVTFSSNPVDTSFEKWAKPGHFSRVLSKGPNTTTWIWNIH
 FERWAKPGHFSRSLSKGPDTTTWI WNL H KILVDRDPVKTSFEEWSRPGHFSRTLAKGPDTTTWI WNLH KVIVDTDPVPTSFEKWGEPGHFDRTLVRGPKTTTWI WNLLH TAVGTDPVNAPSEEWSKPGHFSRTLAKGPNTTTWI RDPH RVTVDRDPVPTSFEPWAKPGHFDRTLARGPKTTTWI WNLH EQSPIPTSFERWAKPGHFDRTLARGPKTTTWIWNLH K VVVDRDTVKTSFEKWAKPGHFSRTLAKGPDTTTWI WNLH
 K F P K F S Q GL A NDP T TRRI WF Gl K DPVATSFSKWSQPGHFTKKLAKGPKTTTWLWNLH

VKADPRP DDFAK DDKPGFWSTKLSKGPKTTTWDWNLH VDRDHVPADFEKFEQPGFFSKSLAKGPNSTTWIWNLH RSPKSSRGLSQDP TTRRI WF GI ATKFPKFSQSLSSDP TTRRI WYGI KFPKFSQDLAQDP TTRRI WYGM ATRFPQFSQDLASDP TTRRLWYGI

K \VVERDPVKTSFEKWA KFPKFSQELQQDP TTRRIFYSL KFPSFSQGLA ADP TTRRI WYGI
 ATKFPKFSQALAQDPA TRRIWYGI

VDKNPVPVSTEKWGKFGFYDKTLAKGPKTTTWDWNLH KFPKFSQDI AQDP TTRRI WY GI RFPKFSQDLAQDP TTRRI WYGI RFPRFSQGLAQDP TTRRIWFGll

ATKFPKFSQGLAQDP TTRRDWFGD
 PSRSVRW PAFSEGLAKDP TTRRLWYGL KRSMETTQDGWF F

WS QA GHFNKA $\square$ AK GPKTTTW WS $\square H$ RFPRFSQGLAQDP TTRR $\square W F$| $N G H$ |
| :--- |
| $L$ |

QS DKRFCSAKYWS LIGHFSRDFSKGPYTTTWDWD $\square$
K $\square$ LVD $\square \mathrm{DPVKTSFERWAKPGHFSRS} \mathrm{\square AKGPSTTTW} \mathrm{\square WDLH}$ WS KA GHFNKA $\square$ S K GAKTTTW WWN $\square H$

RFPRFSQGLAQDP T T RR $\square$ WF G $\square$

ATKFPSFNQGLAQDP TTRR $\square W Y G \square$
$\square G N \square H$

ATKFPKFSQD $\square$ A QDP TTRR $\backslash W Y G \square$


ADAHDFDKHSSDDEDNSRKDFAAHFAHLGMFVWMSSFFF ASAHDFETHDGMTEKLYQKIFATHFGHVAII IFLWASSLLF
 AMANDFESHDGMEENLYQKLFATHFGHLAIIFLWASGNLF
ATSHDFESHDGMTENTYQKTFASHFGQLA TF LWTSGNपF ADAHDFDSHTSDLEEISRKVFSAHFGQLSIIFLWLSGMYF ATAHDFEMHDGMTENLYKIFASHFGHLA I FLWTSGNLF ATVHDDESYDGATEKTYQALFASHFGHLAVIFLWTSGNDF
R VHDFFATFEGVSVYQKTFASHFGQ TAL!FLWASGNTE ATAHDFETHDGMTENLYQKUFASHFGHLA乌IFLWTSGNLF

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ADAHDFQSSESTAASVGAKVFSSGLHFS VFFWDGGMF
ADVHDFDSQTSSLEEVSRKTFSAHFGQLATIFLWTSGMHF ATAHDFESHDDTERLYQNIFASHFGQLAI FLWTSGNLF ADAHDFDSHTTDLEDISRKVFSAHFGQLGUILIWLSGMYF
SSSHDFEFHDSSVATVARKVLASNDAHQSLVFFWLSFLAW DURKYFSAHFGQLSIIFWWLSGMYF ADAHDFDSHTSDDEESRKVFSAHFGQLAVIFUWSGMYF

## DYAHDFD $\square$ QQRSTGLIARKVFSSNGAHS LVFFWDRGMHL

SRKMFGAHFGQLAVIFLWLS GMHF


## CRFHDF

ATAHDFESHDGMTEK $\square Y Q K \square F S T H F G H A \square I A W W A G N F$
 S $\square \mathrm{EDVSRK} \mathrm{\square FSAHFGQ} \mathrm{\square A} \mathrm{\square IDWWSGMYF}$

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ATAHDFETHDGMTENTYQKTFASHFGHTATMELWTSGTMF D DESYFGD DNTLSLNQQ FTAHWGHLTV LI WVSGNLY DMTEERLYQKIFASHFGQLAIIVLLWTSGNLF


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UniRef90 A9X3 UniRef90－Q8MAF4 UniRef90－D91X14
UniRef90＿K7X1M8

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QGARFSNYTGWLADPTHVKPGGQVVWP LLGQE LLNGDQGA HVAWQGNFPQWIKDPDHLRPDAHAIWPQFGKPAVEAFSQG HI A WQGNFEQWVSNPTGVVPIAHAIWPHFGKGAVEAFTGG HVA WQGNFESWI QDPLHVRPMLMR
HVAWQGNFEQWUKPLHURP UAHATWPHFGKPATDAFTQA SA QVVWPVVGQETLNGDVGG HVAWQGNFEQWVTDP HGARFSNYEAWLNDPTHIRPSAQVVWP VVGE HVA WQGNFAQWVADPLNTRPDAHAI WPHFGEAALEAFTQS HGARFSNYVAWLNNPTVIKPSAQVVWPVVGQEILNADVGG HVAWQGNFEAWVADPTNTRP AHRIWPHFGEAATKAFTPQ YVSSQGNFEQWVSDPLHTRPIAHAI WPQFGQSAVAAYTRA HVAWQGNFEQWSLNPLKVKP

HGAYFSNYSAWLTDPVN【KQSSQVVWP $\|V G Q E\| N G D V G G$ AVDAFTRG HGAYFSNYSAWLKDPK TPGSQLVWSLVGQD LLNQDGGG HGAYFSNYSAWLNDPTNTKQSSQVVWP TVGQETLNGDVGG H HGARFSNYEAWLSDPTHUKPSAQVVWP VVGQE\｜LNGDVGG

NGSYYSNYWS WLKDEKHCLPSVGKVWSVVGQDLLNSDGL HGARFSNYSAWLSNPTAVKPSAQVVWPIVGQEVLNGDVGG HGARFSNYEAWLSDPTHIKPSAQVVWP $V G Q E I L N G D V G G$


$$
N V R P \square A H A \prod W P H F G Q P A V E A F T R G
$$ HGAYFSNY【GWLSNPTGVKPSAQUVWP\｜VGQE\｜LNAVGA HVAWQGNFEAWVQDPGHVRPDAHAIWPHFGQPADEAFTRG



VGQEILNGDMGG
HDARFSNYEVW■SYPTH $\square G P S A Q V V W P\|V G Q E\| N G D V G G$
PHFGQPAVEAFTRG H $\square$ AWQGNFEQFVLDPTHVRP $\square \mathrm{AHA} \square \mathrm{WPHFGSG} \mathrm{\square TEAMTQA}$ PHFGQPAVEAFTRG H $\square G W N G N Y E \square W \Pi \square N P T I M P \Pi A H G \Pi W P H F G A G G V S A T S G G$ GNFEQWVKDPIHVRPIAHAI WPHFGQPAVEAFTRG HGARFSNYVAWLSNPVKIKPSAQVVWPIVGQEVLNGDVGG PHFGQGAIDAFSQG
HGARFSNYNTWLSSPTNVLPSAHVIWPVIGQEVNKNVGG PHFGQPAVEAFTRG
HVAWQGNFEQWTTDP TNTRP TAHATWPQFGQGA DDAFTQA HIASNANYSLWVKNPIPSIPIAHNI WD PHFTNSTSTP HVAWQGNFEAWVQDPLHVRP亡AHALWPHFGQPAVEAYTRG
H $\square$ A WN G N LE L $\quad$ W L L N P $\square$ A N M P $\square A H G G W P H L G S Y Y S A V V Y S S S$ HGARFSNY I N WLSSDP TS LDNPMA QF V WS VI GQ DLLDNLGGGGK


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UniRef90_K7X1M8





 GF Q GVQ $\ T$ S GFF QL WRAS GI TS EVVELV WCAL A GLLMMS GL M


 NF QGVQ】T S GFF QLWRAE GIT SE\|ELYWTA AGGLIMS GLM
$G F Q G \square Q V T S G F F Q L W R A A G \square T S E L Q L Y S T A M G G V F C A F L M$


GAPDVNDATSGVYQWWYTDGARSQDLYQGALFWVIVSALLL GASSGNI A Y S GLLYHWWYTI GMRTNESQLFQASI FMSI LAC WT
 GA S GNI A T S G V Y Q W WY T I G M T N Q E L Y V G S V F
 GSPVNIA YS GVYH WLY T $\triangle G M T N Q D L Y Q G A \square F L L I L S T V L L$


 Y S H TII DT S GI Y N QLYY T SGGFNTDNQ I Y K T TFFTSSCLLAV I S




LFAGWFHYHKRAPKDEWFQNVESMLNHHTAGLLGLGSTAW AFGGWFHYHKAAPKLEWFQNVESMLNHHLAGLLGLGSLSW LLEAGWFHYHKRAPKLEWFQNVESMLNHHLAGLLGLGSLAW FFAGWFHYHKAAPKLEWFQNVESMLNHHLSGLLGLGCLSW LTAGAFHYHKAAPKLEWFQNAESMLNHHLAGLIGLLGSLGW FFAGWFHYHKAAPKLQWFQNAESMLNHHLSGLLGLGSLSW MFAGWFHYHKAAPKLAWFQDAESMLNHHLAGLLGLGSLAW LFAGWFHYHKKAPKLEWFQNVESMLNHHVAGLLGLGCLSW PFAGWFHYHRAAPQLAWFQSVESMLDHHLAGLLGLGSLPW LFAGWFHYHKSAPKLEWFRNWESMMNHHLAGLLGCGALGW 1 FAGWFHYHVRSPKLEWFQNVQSMLNHHLAGLLGLGSLGW FFAGWFHYHKAAPKLAWFQNVESMLNHHLAGLLGLGSLAW LFAGWFHYHKRAPKLEWFQNVESMLNHHLAGLFGLGSLF W LFAGWLHQPKFQPGLSWFKNAESRLNHHLSGLFGVSSLAW LFAGWFHYHKAAPKLEWFQNVESMLNHHLSVLLGCGSLGW LHAGMFHYHKAAPKMEWFQDIESMLNHHIAGLVGLGSLAW LHGGIFHYHKAAPKLEWFKKปESMLQHHQ\GLFGLGSLGW VAGWLHLEPKWAPSISWFKNAESRLNHHLSGLFGVSSLAR MFAGRLHQPKFKPSLSWFKNNESRLNHHLSGALGGLSSLAW FAGWLHLQPRFRPSLSWFKNAEARLNHHLAGLLFGVSSLAW
 LLGAQLHLPKFAPKLAWLKDNENRMTHHLSVLFGFSSIAW FAGWLHLQPKFRPSLAWFRDAESQMNHHLAVLFGASSLGW FAGWLHLQPKFRPSLAWFKNNESRLNHHLSGLLGVSSLAW LLFAGWFHYHKAAPKLAWFQDVESMLNHHLAGLLGLGSLSW FNAGAFHFHVAAPKLSWFQNVNSMMNHHLAGLLGLGSLGW FAGWLHLQPKFRPSLAWFKNAESRLNHHLAGLFGVSSLAW VAGWLHDOPKFRPSLSWFKNAESRLNHHLSGGFGVSSLAW FAGWLHDQPKFRPSLAWFKNAESRLNHHLAGLFGVSSLAW FAGWLHDQPKYSPTVSWFKNAESRLNHHLSGLEGVSSLAW MFAGWFHYHKAAPKLAWFQDVESMLNHHLAGLLGLGSLSW VIAGWFHYHKAAPKLEWFQNVESMLNHHLSGQLGLGCLGW FAGTLKLQPKFRPPQSFFENNESRLNHHIAGLFGFSSIAW LVGGWLHQPKFQPDGCWFKNAESRLNHHLSGLFGVSSLAW FAGWLHLQPKFRPSLSWFKTNESRLNHHLTGLFGVSSLAW UniRef90_U3SXL8
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QUERY
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 AGHQ HVSLPINKLLDAGVAPQEIPLPHEFLVNRDLMSQL AGHQi HVSLPINQLLDAGVDPKEIPLPHEFILNRDLLAQL AGHQ1 HVSLPVNKLLDAGVDPKELPLPHEFLLNRQIMQDL SAHQIHKMLPANPLLDSGIS
TGHLVHVAIPESRGIHVRWDNLLTTLPHPLGLMPFFTGQW SGHLLVHAIPESRGQHVRWENFLTSLPHPQGLQPFFTGNW AGHQVHVALPGNKLLDLGVSPEEDPLPYEFITNRDLTAQL
SGHQIHISLPDNKLLDAGVAPQEIPLPYEFLINRSLITQL


TGHZVVATPEARGQHVRWSNLLSSPPHPKGRAPFFSGDW TGHLVHVAIPESRGQHVGWDNWLTVLPHPAGLAPFFTLNW TGHLIHVAI PQSRGDTVRWSNFLTTLPHPQGLKPFFTGNW AGHLIHVAIPASR GDYHTISPVGDSTFLYPFYSGNW TGHLVVVAIPESRGKHDGWDNFITELPHPQGLTPFWTGNW AGHQ। HVSLPVNKLLDAGVSPQDIPLPHEFVANRELMSQL TGHLI HVAIPESRGVHVRWNNLLTSPPHPAGLEPFFTGNW TGHLVHVAIPESRGQHVGWDNFLSTPPHPAGLGPFFSLNW AGHQUHISSLPMNFLLDAGVDLRVIPTPASLLENRTYIENLD TGHLVHVAIXXXXXXXXXXXXXXXXXXXXXXXXXX TGHLVHVAIPESRGQHVGWDNWLTVLPHPAGLAPFFTLNW TGHLVHVAIPEARGQHVGWDNFLFTPPHPDGLLPFFTGNW TGHLLDITIPASRA
TGHLVHVAI PESRGEHVRWNNLLTALPHPQGLGPFFAGQW TGHLVHVAIPEARGQHVRWNNFLTTLPHPQGLTPFFTGNW CGHLLVVAI AASKGYSATAFLKPIP DGLNPFYSAKW AGHQVHVSLPDNSLDDAGVDKKLPTSTALLFDRGYLENF

## QUERY

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280
YPKVDWGFFSPFFTFNWAAYSDFTTFNGGLNPVTGGLWपS YPSFEKGLW PFFSLNWGAYSDFLTFRGGLNPITGSLWMS

Y

## Y $Y$ $Y$ $Y$ $Y$ $Y$ $Y$ <br> \section*{Y}

 TPFY
Y
Y

Y | TPF |
| :--- |
| PF | YPSFAKGPDPFFTLNWGAYADFLTFNGGLDPDTGGLWMT

 YPSFAQGURPFFTLNWATYSDFLTFNGGLNPVTGGLWMT FPSFAKGLDPFFTLDWSEYSDFLTFRGGLNPVTGGLWLT AAYANPDTASHDFGTSEGSGTADLTFDGGFHPQTQSLWLS
 YPGLASGDGN FFSANWWAFSDFLTNNGGVNPVTGALWST GVYARDDSSSHRFNTSQGAGTARPTFTGGFHPQTQSPWLT GVYANPDTVNHAFGTADGSGTAILTFLGGFHPQTESLWLT
 GAYANPDTSEHLDNTSQGAGTALL GAYANPDSLNHAFGTSEGAGTACLTF
AVYANPDTAGHLFGTSEGAGTALL
TVYANPDSANHYGTAGAGTALL
YPSFAEGANTPFTLNWSKYSEFLL VPGGGSGGVNFFSLNWMAFSDLLTFKGGLNPVTGSLWMT GVYADPQAGPP

AL THEGGGLPATGTLWLT
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 DCAH H H L A L A V L F I V A GHMY K T S W G I GHKI K DI L E A H K G P D 1 V H H HLALAVLEI FAGHMYKTNWEI GHSMKQLLETHKGP D A A H H H L A L A V MF I A G H M Y R T N F G G H S
 DIV H H H L A V A A I F L I A GHMYRTNWGL GH GLLKEILDDVHK G P DI A H H HL A AVAVLFI A G GHVVYRTNWN GH GMKELLDDAHQ GP DIA H H HLALAAVMY I A GHMYRTNWGI GHSMKEIIMESHKGP D TA H H H L A A AVAFSIA GHVYRTNRGI GHSPKEVPEAHKGP
 D TAHHHLAI AVLELIAGHMYKTNWRIGHNLKDLLEDVKGP DTA H H H LA A A V L F L VA GHMYRTXXXXXXXXXXXXXXXXXX D $\square$ A H H HLAA A TLL FI I A GHMYRTNWGワGHS $\square$ K EMLEA HK GP D MA HHHLAI A VLEIVAGHMYRTNFGI GHSMREILEAHKAP DIAHHHLALSVI FLFAGHMYRTAWPI GHNMQNLLAAHKGP
 DV SHH H LA F GVVIAI I G GHMYRTNYGI GHSMKEILLDSQQGF DVAHHHLAWAVELMFGGHVYRSRFGIGHSMKEIMGNVKGF DIA H H HLA I AVVFI I A GHTYRTNFGI GHSIGGALEAHIP P
 D MA H H HL A I A V I FIV A GHMYRTNWGI GHS I REILGAHNPP
D




D A H H H A A A L FLIA GHMYRTNWGI GHGIK DI L EAHK GP

DIA H H HLAI AVI FI I A GHMYRTNFGI GHSI KEILDAHKGP




DI A H H HL AL SVLEI XXXXXXXXXXXXXXXXXXXXXXXXXX
DI A H H HLAALGVVLVVAGHMYRTNWQKGHSLKA ILEAHVPP
D I A H H H L A A I A V L


 D MA H H HLLA A VVVFVA GHMYRTNFGIGGHSMKEVLDAMSAP

DI A H H HLALSVLFI FAGHMYRTNWGI GHSMKEILEAHKGP D I A H H HL LA I A Fil F L IA GHMYR TN F G I GH S
DV A HPHXAI SVLEXYCWEXCTEQTGLVXRMREDLEABKGP DI A H H HLAI AI L F LVA GHMYRTNWGIGHGDKDILEAHKGP QI A D H HCLV GIV FI




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 D TA H H H L A L A V L F L V A G H M Y R T N WG: GHSMK E L L A A H K G P D MAHHHLAI AVVEI LAGHMYQTNFGIGHNDKDILEABEPP
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410
420


440 MI R D Y VPS QHYNNVLDRLIRHRDALI SHLNWVCIGILGTHS



 MVRDYDPTNNYNNLLDRVIRHRDAI I SHLNWVCIFLGFHS MVRDYDPTNRYNDLLDRVLRHRDAII SHLNWVCMFLGFHS $M \operatorname{RDDYNPAQNVDNLLDRMIRHRDAII~SHLNWVCMFLGFHS~}$ $M V R D Y D P A V N Q N N V L D R M L R H R D T I I D H L N W V C D F L G B H S$ MVRDYDPTTQCNNLLDRVLRHRDAII SHLNWACIFLGFHS $M V R D Y N P A D H V N N V L D R V L R H R D A I I S H L A W V C Q F L G F H S$



 MTR YSPYSSATNLLDRVLLHRTTLIAHLNWVCIFLGTHS


 LTR DYSPERGRGNVLAARVLEHKEAII | F | R | $D$ | $Y$ | $D$ | $P$ | $K$ | $Q$ | $N$ | $K$ | $D$ | $N$ | $V$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $F$ | $V$ | $R$ | $R$ | $M$ | $L$ | $E$ | $H$ | $K$ | $E$ | $A$ | $I$ | 1 | $S$ | L $L$

$L$
$L$ <br> \section*{} <br> \section*{} F V R D $\quad$ R Y D S E


$\frac{L}{F}$F


MTRDYS PYSSATNLL DRVLLHRTTLI

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


L $V \operatorname{R}$ R D Y D P A T Q Y N N L L

F I R D Y D P E A N K D NVLA R IL D HKEA
FI R DYNPEKNKDNVLARMLEHKEAI I


MVRDYNPAKNYNNLLDRVVRHRDSII SHLNWVCIFIGGHS
FVRDYDPETNKDNVLARMLEHKEAII SHLSWVSLFLGFHT

MVVRD Y D P T T R Y N DL L D R V L R H R D A I I S H L N WA C I F L G F H S
MVRD Y DP TNNYNNLLDRVLIRHRDAII SHLNWVSI FLGFHS
F I R D Y D P E Q N K G N V L A R I L D H K E A I I S H L S WV S L F L G F H T


WI RDYDPEQNKGNVLARILDHKEAII SHLSWVSLGLGGFHT
MV R D Y N P N Q N Y N N L L D R V I R H R D A I I S H L N WVV C I





FVVRDYDPEANKDNVLARMLE HKERL
IP H L S WVS L W L G F H T



LI Y D Y



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TAPGGTAPNAAATASVAFGGDVVAVGGKVAMMPVVGTAD LAPANTAPNALATTSYVFGGEVVAVANKIAMMPMKLGTAD KADASTAPYVGASVSPVFGGDVVAVGGKVAMMPMVLGTAD SAASATAPNTLSTPSYVGGETIALAGKVAVMPMTLGTAD FAPNITAYNADFSTTPLWGGELLAVGGKVAMMPISLGTAD LSVASTAPNALSGVSEVFNGSMVAVGGKVAVAP:PALGTAD MTIESTAPYVSHGTSPAWGGDVVAVNGKVAMMP:SGLGTSD $\begin{array}{ll}L & A \\ F & L\end{array}$
 IAPTGTAPHALATASYAFGGDTVAVANKVAMMPITHGTAD NVAGTIAPLAEGASSLAWGGDPLFVGGKVAMQHVSLGTAD AGLGQTAPHDMGPVSHAWGGGVVAVAGKVAMMPIPLGTAD

 AAPGGATAPWVGGTSPTWYTGALSANDKISISPIHIGTAD KTAYGFDLLLAAGQSLWLPGWLEATNNNNNSLFLTIGPGD EAPGTTAPNALAVSSYVFGSGTIAVNGRDADQPIFLGTAD AVAGSQAPWVGAATSPVWGGDTIAVGGKVAMSA:PLGTAD SAVGTSLLAGTAALSEVFNGSLVEVGGKVAMAP:PGUTAD KASYGFDPAFNAGRS WLPGRLDAIDNNSNSLFLTIGPGD KTLYGFNVLLQAAQSLWLPNWLEAINNNNNSLFLTHGPGD KVLYGFDVLLSNPDSAYLPNWLEAVNSSKNSLE:PD:GPGD KALYGFNVLLSNPDSVWLPGWLAAVNSETMSPFLTVGPGD SAPNPTAPNATAGTSLTWGGDLXXXXXXXXXXXXXXXXXX
KALYGSNPDSIASTAWWLPGWLEAINNGTNSLFLAGPGD KALYGSNPDSIASTAWWLPGWLEAI NNGTNSLFLAADGPGD KMMYGSDPNSAASSMPGDHFWMNAINDKSNSNFMPIGSAD KDSLLSNPQSDASTAWWLPGWLDAVNGANTPFLNIGPGD KAVYSTSPATVAGNQWWLPGWLEAINNNKNDLFLKMGPGD LAPGATAPGATASTSLTWGGDLVAVGGKVALLPIPLGTAD KALYGFNTLLSNADSLWLPGWLDAINSGTNSLFLTIGPGD KIIEGFGGPGVTAPGEFLTGWLGSVNANNSPIFLPIGPGD


 LAPSNTSPNSLATTSYAFGGDILSINNKUAMMPIKLGTAD KLVYNSDPTLAAGDSPWDDGWLKQVNSNANSDFLEGGPGD KVRYGFNPASMASQNLWLPYWLTAINDTSTSLFELPMGPGD KAVYGFDPASVAGSE WLPGWI EAI NNDKNDLFLT:GPGD AAAGSTAPNALAGVSEVFNGSVVAVGGKVAAGP1PLGTAD LAPGNTSPNSLATASYAFGGDVVSVGNKIAMMPIPGGTAD KThYGFDPALTASQSLWLPGWLDALNNSSNSLFLTAGPGD EAPGTTAPNALAVSSYVFGSGTVAVNGR1ADQPDFAGTAD LIAPGTTAPNALATTSYAFGGEVVEVGKIAMMPIKLGTAD KTTYG TAPD $\frac{\square}{L} T A P N A D A S T$ SUWLPGWLNAVNENSNSLFFTTHGPGD VAPGNTSPNS回ATASYAFGGDUISVG
$\square A P Q \square T A P N A \square S A T S A T W G G D V V A G G K A M M P \square S G G T D$ LQPPME EMLDKKIIRDTQELGTAD KALYGFDVLLANNASPWhPGWLDAL NGTTNSVFQPIGPGD KAFYGFDVLLSSNQSPWLPGWLDAI NNTNNSLFLTIGPGD VVPS DTAPNALTTASYAFGGDTDTVGSKDALAPLPLG KTA YGFDVLLLSTASGAF GAG KTAYGFDVLLSSTNGPAFNAGVVAVGSKDADMPTKПSTAD KAAYGFDPATVAGSQILLIPNWLEAINSGKNSLIFLKIGPGD ETDAQTAPNALAATSATWGGDVIAVGNKVAMMPIPLGTAD LAPGATAPGATASTSLTWGGGDLVAVG LAPQLTAPNALAATSASWGGDVVAVGGKVAMMPTPLGTAD KTVYGFDPAFAAGQSLWLPGWLEALNNNNNSLFLTIGPGD
KSTYGFDPAYNASQTLWLPGWLSATNGASGTLELITGPGD KTLYGTTHFSVVNPS SGWVQSVNKSFGSLLLP GPGD KALYGFDLLLSNSQS LWLPGWLEAUNNNQNSLFLTUGPGD
KSLYGFALTTMAAQNTWLPGWLEATNDESNSLFFATGPGD KALYGMDPDSIAHTAGRLATWLVRSNSGTNSLFLTIGPGD EAPGTTAPNALAVSSLCFDSGTIAVNGRDADQPIFLGTAD N 1 PHDTAPNDLGISYVFSGDSLLVNGQ AVGIIVLS

KA㕷TDN
KTLYGYDLLLSASASPWLPGWLDADN
KAFY VAPGNTAPQ! KN $\square Y Y P D Y P L N Q R D P R L N G W L E T I N N L K V S P F L N V G P G D$

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|  |
| :---: |

FLVHHTHAFTlHVTVLILLKGVLFARSSRLTPDKANGGFR FIVHHIHAFSIHVTLLI HSKGVLYARNSRFVSDK DELGFT FLVHHADALGLHTTTLIVKGALDARGSKLMPDKKDFGYS FLVHHA!ALGLHTTTLILVKGALDARGSKLMPDKKEFGYS

FLVHhTHAFTTHVTV
 F MV
 F LEHHA $\square A G G L T T T L I L V K G A L D A R G S K L M P D K K D F G$
FLVHHATALGLHTTTLILVKGALDARGSKLMPDKKDFGY LLAHHA:AAGLHVTVLILMKGALDARGSKLMPDKDHFGYG FLVHHA\ALGLHTTTLILVKGALDARGSKLMPDKKDFGYS
FLVHHATALGLHTTVLILVKGALDARGSKLMPDNKDFG FLVHHAIALGLHTTMLIVKGALDARGS


FLVHHA $\downarrow$ ALGLHTTALILIKGALDARGTKLIPDKKDLGYA


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UniRef90 A0P8O6 UniRef90 G9BYU1 UniRef90-J7IGD4 UniRet90_B6CWQ2 UniRef90 Q6TNW7 UniRef90-E1CID7 UniRef90_UPIO003D2784A UniRef90 K4EKR8 UniRef90 B9TU94 UniRef90-UPI0004740477 UniRet90_B9TU98 UniRef90 Q9XQV2 UniRef90-V5JV14 UniRef90-Q1WFP7 UniRet90 B9TUA0 UniRef90 B9TUA3 UniRef90_O9TJ81 UniRef90-Q8MAF3 UniRef90 LoB8Z4 UniRef90-UPI00047383AZ UniRef90-T2JVS6 UniRet90_U6EG22 UniRef90 O8HT46 UniRef90-E0×092 UniRef90-A9X3X5 UniRef90 Q8MAF4 UniRef90-D91X14 niRef90 K7Х1M8
 $F P C D$ G P GR G G T C Q V S G WD H V

FPCDGPGRGGTCDTSAWDAFYLAVFWMLNTTGWTTFYWHW YPCDGPGRGGTCQISPWDHVFLGVFWMYNSLSVVIFHFFW FPCDGPGRGGTCQVSPWDHVFLGLFWMYNCUSUTUFHFSW

FPCDGPGRGGTCD $\square$ SAWDAFY $\square \mathrm{A}$
FPCDGPGRGGTCQVSAWDHVFLGLFWMYNATSVVIFHFSW YPCDGPGRGGTCQUSPWDHIYLAVFWMYNSISIVIFHYFW

FPCDDPGRGGTCQV
YPCDGPGRGGTCQI SPWDHDFSAVFWMYNCDNVVFHYFW FPCDGPGRGGTCDI SAWDAFYLAVFWMLNTIGWVTFY FPCDGPGRGGTCDISAWDAFYLAV

FPCDGPGRGGTCD $\square$ SP WDAFY $\square$ AMFWM $\square$ NT T G
FPCDGPGRGGTCQVSAWDHVF $\square$ G $\square$ WMYNS $\square S \square V \square F H F S W$

FACDGPGRGGTCD $\square$ SAWDSFY $\square$ AMFWM $\square$ NTNAWT $\square$ FYFHW FPCDGP


## FPCDGPGRGGTCDSSS

FSCDGPGRGGTCDTSAWDSFYLATFWMLNSNTWTSFYFHY
YACDGPGRGGTCDपSAWDALY $\square$ AAFWS $\square$ NACAW $\square$ I YFHW
FPCDGPGRGGTCD $\square$ SAWDSFY $\square$ AMF WM $\square$ NT $\square G W V T F Y W H W$

KHMTIWGGN
KMQDVWG

K HI TLWR

K
$\mathrm{KH} \square \mathrm{A} \square \mathrm{WGG}$


#### Abstract

KMQSDVWGTVAPDGTVSHITGGNFAQSAITINGWLRDFLW KMQSDVWGTVSQNSLVSHVVGGNFSQSAI TI NGWLRDFLW KMQSDI WGTVNPDGTIEHI TGGNFATSAINI NGWLRDFLW KMQSDVWGSVSSDGVVSHVTGGNFAQSAI TI NGWLRDFLW KMQSDVWGNVTSNGZVSHITGGNFVQGSITINGWLRDFLW   KMQSDVWGNLNNQGVI NHITGGNFSQSSITINGWLRDFLW KMQSDVWGTVSSSGDVTHTTLGNFAQSAITINGWLRDFLW KMQSDVWGAANANGGVNYLTAGNWAQSSITI NGWLRDFLW KMQSDVWGSVNDQGIVTHITGGNFAQSSITINGWLRDFLW KMQSDVWGTVAPDGTINHITGGNFAVSSITNNGWLRDFLW KMQSDVWGAVDANGTVNHITGGNFAQSSITVNGWLRDFLW KMQSDVWGNI SDQGVVTHITGGNFAQSXXXINGWLRDFLW KMQSDVWGSI SEEGVVNHITGGNFAQSSTTINGWLRDFLW  KMQS DVWGTITPSQA TSHLTNGNFARSSTTVNGWLRDFLW KMQSDVWGTVYPDGSVLNITVGNFAESALTINGRLRDFLW KMQSDVWG KHDT LWQGNVA KHI TIWQGNAS KHLGi WS GNVA KHLGi WS GNTA KHLGGWQGNVA KMQSDVWGNI SDQGVVTHDTGG KHLADWS GNVA KHLAAWQGNMA KNLASWQGNQA K QLSVWS GNLA $\square$ I S D Q GVVT KMQSDVWGS $\square$ S D Q GVVTHT KHLAI WSGNVA K WI SI WGDNVA $K H L G W Q G N V A$ KMQSDVWGTVTANG VSHDTGGNFAQSANTVKGWDRDF W KHDT LWQGNVS QFNESSTYLMGWLRDYLW


KH LIS $\square$ WQDNVA QFNESSTYLMGWFRDY $\square W$ KMQS DVWGSTAS GNVSH $\square$ TGGNFTQSA $\square T$ I NGWLRDFLW KHLDAVWQGNPAF FDESSNYLMGWLRDYLW KHLGGIWQVNDN
KHLGIUWQNTK
QF N ESS S Y Y
QF YES S T Y
LIM W WL R R
KMQSDVWGTVNADGSVSHTTNGNFANSALTTNGWLRDFDW KMQSDVWGSVADNGYVGHITGGNFAQSA\|TINGWLRDFLW
 KMQSDVWGVYDSTQK VHLTGGDFSVNSDTINGWLRNFLW KMQSDVWGTUTPSQA ISHLTNGNFARSSUTVNGWLRDFLW
GNVS

QF NESSTY YM GW WRDY $\square W$
KMQSDVWGSTSDQGVVTHTTGGNFAQSSTTTNGWLRDFDW KMQSDVWGIFKEDGVIAHI QPDFSVNSVTINGWLRNFLLW

K MQSDVWGF VS $\square$ QK H $\square$ S H Y S Q G DFS $V$ N S $\square$ T $\square$ N G W $\square R N L L W$

KMQSDVWGSVA NNTVSH $\square$ TAGNFAQSANT $\square$ NGW $\square$ R DF $\quad \square W$

KELT LWQN $\square \mathrm{T}$<br>F QFDESSNY $\square$ NGWFRDY $\square W$

H LT P R QF S E S S T Y L E S WF R D Y $\square \mathrm{W}$
NA VS QF YESSTF $\square$ NGWFRDY $\square W$
T N R $\square F$ DESSVC $\square M G W \square R D Y W$


LN S A QLI N GYNNNLA I WA WIIFLF GHLVWAISFMFLITWRG INSSQII NGYNNNLSPWAYMFLAGHLVWATGFMFLI SWRG ANSAPVITGYTNNLSVWAWMFLFGHLVWATGFMFLI SWRG GYSAQLI NGYTNSLSVWAWDFLLGHLCWATGFLFLI SWRG LINSSPLINGYNNNLSVWAWMFLFGHLIWATGFMFLISWRG AQASQVI QSYGSSLSAYGLFFLGAHFVWAFSLMFLFSGRG SQSSQVLNSYGQD SMYGLMFLGAHFVWAFSLMFLWSGRG QYSAPLINGYNSNLSVWAWMF F GHLVWATGFMFLISWRG
 ANSAQLINGYNNNLSVWAWMFLFGHLVWATGFMFLISWRG AQS SQVI QS
$\square N S S Q L I N G Y G M N S \square A V W G W M F L F G H L V W A T G F M L I S W R G$
$\square \mathrm{L}$ S A QLIN GYNQQLADVAWMFLFGHLV
AQASQVI QSYGSALSAYGLIFLGAHFI WAFSLMFLESGRG LN SSKLI NGYNNSNAVWA WMFLEGHLVWATGFMFLISWRG LNSSQLI NGYNNSLSVWAWMFLFGHLVYATGFMFLI SWRG

AQAAQVINSYGSATSAYGLMFLGAHFVWAFSLMFLFSGRG AQAANVINSYGSALSAYGIMFLAGHFVFAFSLMFLFSGRG

LN S S QLIN GYNNSLSVWAWMF LF GHLIYATGFMF LIS WRG SQAAEVI QSYGSGLS GYGLIFLGAHFTWAFSLMFLWSGRG AQSSAVIQSYGTPASAYALIFLAAHFTWAFSLMFLFSGRG
$\square N S S Q L I N G Y N N S L S W$ WA WMF LIG GH LVWATGFMF LISWRG
A QAS QVIQSYGSSLSAYGLFFLGAHFVWAFSLMFLFSGRG SGSAQVLQSYGTPLAGYGLIFLWAHFLWAFSLMFLFSGRG

SEASQVIQSYASS $\square$ CPYGS $\square$ F $\square \square$ AHF $\square$ WAFS $\square$ MF $\square$ FS GRA

GQSS QVIQSYGSA $\square$ SAYG LIF $\square$ GAHF $\square$ WAF

FNSGS $\square \square R G Y D N D L S V W A W \square F \square A A H D C W A T G F M F L D S W R G$

FNSTPLIHGYSNDLSVQSWSFLLTHDAWAGFMF LISWRG
FNSAA LIRGYDSA $\square$ SVWA WAF $\square$ GAH $\square$ CWATGFMF L $\square$ SWRG
$\square N S S K L \square Y G Y T S E T V S \square N S V W A W A F L L G H L V W A T G F M F R G$


Y WQELIES IVWAHNK【KVA
Y WQELI ETLVWAHERTPI ANDIKPVA $\square$ S $\square V Q A R$
YWQELI ETLAWAHERTPLANLIR
Y WQELIETLVWAHDR【PVLWPEKPVA LTIVQAR
Y WQELIESTVWAHNK LKVAPA TQPRALS TTQGRAVGVAHY Y WQELIESIVWAHNKLNVAPSIQPRALSIVQGR

Y WQELIETLAW
YWQELI ESILLWAHHK LKTVPNTQPRALSTTQGRAVGLVHY YWQELIEA IVWAHRKTRVSPMIQPRALSITMGRSVGVAHY

YWQELIESTVWAHNKLKVAPATQPXXXS IVQ
YWQELIES IVWAHHKLWI 1 PR R $\square$ QPRALS 1 THGRAVGLVHF



 Y WQE L I E T LVWAHERTP $\square$ AN $\square$ FQP VA $\square S \square L Q A R F V G L V H F$

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| QUERY | LLGGTAT T WAFFLAR\ITVG |
| UniRef90＿Q9TLO5 | LLGGЏATTWAFFLSRA！S】G |
| UniRef90－D91XP5 | LLGGTGTTWAFFLARSVS吅 |
| UniRef90－I6NJZO | LLGGIATTWC |
| UniRef90 UPIIO0046EFEOB | LLGG｜GT WAFFLARSLAVG |
| UniRef90 Q06J42 | LLGGlGTTWSFFLAR\｜IS |
| UniRef90－A7M901 |  |
| UniRef90 D3EPK7 |  |
| UniRef90 B0C474 UniRef90 Q2WGC4 | LLGG\｜VTS WS F YLAR\｜LALG |
| UniRef90－K8GD09 |  |
| UniRef90－B4WP20 | LLGS\VTT WAFFLARMAA】G |
| UniRef90－G8IVY1 |  |
| UniRef90－Q7NFT6 | $\underline{L L G G T A T T W A F F T A ~}$ |
| UniRef90－Q33IIZ3 | SAGY LTYAAFLIASTSA |
| UniRef90＿K7X8J2 | LLGG｜GTTWAFFLARATT |
| UniRef90＿Q9AL93 | LGGGAT WAFFLAR I S G |
| UniRef90 A2CC73 | LFGGIVTTWAFFHARLDGLG |
| UniRef90－Q2WGC5 | SVGY\｜FTYAAFPDPSTAG |
| UniRe990 O9TLQ6 |  |
| UniRef90 D3EPK8 <br> UniRef90－Q2JRU9 | TVGYVLTYAAFLIASTAS <br> TVGYVLTYAAFVIASTASL |
| UniRef90－UPI00034D8CA4 | ATGFlFTYAAFVLASTAT |
| UniRef90－B4WP21 |  |
| UniRef90 B4WP21 | TVGY\｜ATYGAFLIASTGS |
| UniRef90－A2CC72 UniRef90 C7EDU6 | AVGNIFTFGAFVIASTAS |
| UniRet90－C7EDU6 | VIGFVLTYAPFLVATAS |
| UniRei90 ${ }^{\text {AOTOM }}{ }^{\text {A }}$ |  |
| UniRef90 K K KB64 |  |
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| UniRef90 UPI00036AB945 |  |
| UniRef90－Q7NFT5 |  |
| UniRef90－UPIo00234F27D | SVGYDFTYAAFLDASTSG |
| UniRet90 M1 1005 |  |
| UniRef90－16NIT4 | SVGYПFTYAAFLI |
| UniRef90－G8A327 |  |
| UniRef90－－P58387 |  |
| UniRef90－Q6WD70 |  |
| UniRef90－991X4 |  |
| NiReto－ECD8 |  |
| UniRet90－006J40 |  |
| UniRef9－UPLOOO2002D3E |  |
| UniRef90－T2J5R9 | LLGG■ATTWSFFLAR【AVG |
| UniRef90－b3RGA0 |  |
| UniRet90＿E1CIE3 |  |
| UniRef90－Q9XQV3 | $M \square G G T G T T W A F F \square A R V V A D$ |
| UniRet90－K7X7S6 | LLGGLGTTWAFFLARATT |
| UniRef90－16NMH7 |  |
| UniRef90－K3Z2T0 |  |
| UniRef90－E1CID1 UniRef90 J71P20 |  |
| UniRef90－Q216P3 |  |
| UniRet90－O8 |  |
| UniRef90－DoFLZ93 |  |
| UniRef90－K4EKR3 UniRet90 U6EFU9 |  |
| UniRef90－E1CIE5 | TGGLS Thars |
| UniRef90－AOP8Q6 |  |
| UniRet90＿G9BYU1 |  |
| UniRef90－J7IGD4 |  |
| UniRef90－B6CWQ2 |  |
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| UniRef90－E1CID7 |  |
| UniRef90－UPI0003D2784A |  |
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| UniRef90－UP10004740477 |  |
| UniRet90＿B9TU98 |  |
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| UniRef90＿－5JV14 |  |
| UniRef90－Q1WFP7 |  |
| UniRef90 B9TUAO |  |
| UniRef90 B9TUA3 |  |
| UniRef90－Q9TJ81 |  |
| UniRef90 Q8MAF3 |  |
| UniRef90 Lob8z4 |  |
| UniRet90－UPIOO047383A2 |  |
| UniRet90－U6EG22 | STGLILTYPPF\｜TGATS |
| UniRef90－Q8HT46 |  |
| UniRef90－E0X092 |  |
| UniRef90－A9X3X5 | A $\square$ |
| UniRef90＿O8MAF4 UniRef90－D9114 |  |
| UniRefoo－K7X1M | TVGYLTYAAFLLAST |

UniRef90_P58309 UniRef90-Q2I6P1 UniRef90-P58383
UniRef90-H6T945 UniRef90_Q52W92 UniRef90-Q5DVM6 UniRef90_Q52W87 UniRef90_Q52W91

UniRef90 P58309 UniRef90_Q216P1 UniRef90-P58383
UniRef90-H6T945 UniRef90_Q52W92 UniRef90-Q5DVM6 UniRef90_Q52W87 UniRef90_Q52W91
 T RKVFSSNLAHLSLVFFWIGGMHF S DAHDYALELTPQQTTSSKIFSSNLAHLSLVFFWLAGMHL GSVGAKVFSSGLAHLS VVFWLGGMHF

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XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXGA HGAYFSNYDT WLKDPKHC $\square P S A Q L V W S \prod I G Q D \| L D K D \square G G$ HGAYFSNYHCWLKDPKHSSPSAQSVWHLVGQDILNAEVGA HGAYFSNYSAWLKDPK TPGAQLVWS $\square V G Q D \square L N Q D L G G$
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$\square G P V N D A Y S$ GVY QWWYT $\square G L T N E D \square Y T$ GA $L \mathcal{L} L L F L S V I S L$
 YF QS $\square R \square T$ S GFFS $\square$ WRS E G $\| \mathrm{V}$ T QVH $\square$ KY A A A A A $L I G T \square V T$

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LGGWLHLQPKWKPSVSXFXXAESRLNHHLSGLFGVSSLAW I LG SYFHMHISWSSSWYY LKFK S LSIHHLSVLFGLSSSI S W
 $\square$ WA A Y F HMH $\square$ S WS S $\square R T \square G S \square S S Y N K A Q L A G L A G L G S G A W$

UniRef90 P58309 UniRef90_Q2I6P1

T GH L V $\mathrm{H} V \mathrm{~V} \square \mathrm{P}$ GSRGEYVRWNNFLDVLPHPQGLGPDFTGQW AGHLFHI SMPANRILDSGlDPVLI



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$R L G X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X$

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UniRef90 P58309 UniRef90_Q216P1 UniRef90-P58383 UniRef90-H6T945 UniRef90 Q52W92 UniRef90_Q5DVM6 UniRef90-Q52W87 UniRef90_Q52W91




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

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UniRef90_P58309 UniRef90-Q2I6P1 UniRef90-P58383 UniRef90-H6T945 UniRef90_Q52W92 UniRef90-Q5DVM6 UniRef90_Q52W87 UniRef90_Q52W91
 KQLNVFSQSQL FDESSTYTMGWFRDYLW KVLSLWQSSTAVS $\quad$ DEDSLYLMGWFRDYLW

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## lupas_21

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