

E V L F R T G $\square \mathrm{AADVNT}$
NH L R VYF Q D S HGS $\square$ RES $\square \mathrm{YE}$

LPGTA TAAATTWFKDGKLGTRVYFQSPDLKVIEKCWD LPGTAI A ATTWFKDGKL GI RVYF QS PDLKVIEKCWD



ELLYRSAFA SY $\square$ APTGAWN $\operatorname{LVWFQAADGSTKQARWY~}$ F QRNTAAVSYASKNVNNSRIYYQDNQGN: LESHNS ALAGESWNQGQRKDFTLYFQHHTGDILRMQYG MD LLPNTNLGALNFTDSYGYVNHVFYQARSNNLMMASWN


FNSAPAAASW FNSAPAAASW
FNSAPAAASW

GSNRLDTFGLGTNNSMYHKWWD GSNRLDIFGLGTNNSMYHKWWD GSNRLDIFGLGTNNSMYHKWWD

MYFQHWT GQ R Y K Q
A $\square$ A GES WNTGQRR $\square F T L Y F Q H H T G Q \| R F M Q Y T$ VFSSRPSATSWAE NRLDIFGLGANNQMLHKWWD VFSSRPSAI SWAE VFSSRPSAI S WAE TTULHDTADAALA


TSAPGAVS W
TSAPGAVSW
TSAPGAVSW
QVLFRTGDAAVN
5BBC6
FBBC6

GPNRIDTFVRGSDNAMYHKWWD GPNRIDTFVRGSDNAMYHKWWD GPNRI DTFVRGSDNAMYHKWWD




GQSTYRAWTDAPTLASALGTQVLSPWFYTNSSQTTDERRR GQSTYRAWTIAPTLASALGTQVLSPLFYTNSSQTTIERRR T I PA A V TIPAAV

NSVNLLRITS


GE WVISTVLAPGKALQGTPLTALLWGPQDT VRLYY ND GS WLGGDY STVVADAKNSTPLSAVSYVLDNSSTWHVGY



ASTNVWTSADAKVLDTVKEGTP\SSWLWHSKTSRDARワYY T D R K W $\square$ G G S A Q TVAYD AK P A T P I S AV S FA $\square$ N Q T Q YFHI F Y TKSE E I I K P S VP A K N GTSSLA A I E W N S GNE IRRLGY
 VD GVWY G GP TAPALLTAASFSALASVSWDGGNGAS L F W W NGNGW AQRPEDVI GKGKLNTGIAAI AWANGT
SSTKSWSTVVGKSADDVKEATPDSSLDWHSKNTRDARDYY



 SNGYWK IHPI QNLSGQAKLYTPIAAL GRNKQRHLFY




P S GE WLGGD\SEVVAGAKNGTPLSAVSYVLNEASTWHVFY T DRKWIGGTAETV A GDVKDASPISAVSYAVNSTQ


 SAVS WS S G S A V S WS S G S A V S WS S G
$\square$

## QUERY

UniRef90_B6HN96 UniRefolo-BDPZY2 UniRef90 D8PZY2 UniRef90-B8NIAO UniRef90-B0Y2N1 UniRef90_BOY2N1 UniRef90 U4LRZ3 UniRef90_U4LRZ3 UniRef90-J3NQ14 UniRef90 J3NQ14 UniRef90-J3NQ14 UniRef90-D4AL26 UniRef90 E4UPE8 UniRef90-E4UPE8 UniRef90-K11XQ1 UniRef90 K1XQV UniRef90-A0A014N993 UniRef90-A0A014N993 UniRet90_M4FN45 UniRef90-M4FN45 UniRef90-M4FN45 UniRef90-M4FN45 UniRef90-U4LRB3 UniRef90-U4LRB3 UniRef90-D8Q009 UniRef90-D880009 UniRef90 C5FP40 UniRef90-C5FP40 UniRef90-G9MQM8 UniRef90 G9MQM8 UniRef90-G9NYQ1 UniReffo-G9NYQ1 UniRef90- M2ZYW5 UniRef90-W9C6L7 UniRef90-M2S7H3 UniRef90- E3Q9F8 UniRef90-E9EBRO UniRef90-E9EBRO UniRef90-L2FT54 UniRef90-U4LW88 UniRef90-ROICT4 UniRef90_K5W3V3 UniRef90-Q2GU53 UniRef90-N4VC87 UniRef90 H8N188 UniRef90-H8N1X8 UniRef90-E8V467 UniReffo-E8V467 UniRef90_N1QHC5 UniRef90_C4JNV3 UniRef90-U1HXS9 UniRef90-17J4K8 UniRet90-77J4K8 UniRef90-17J4K8 UniRef90-UPIO00422BBOF UniRef90_UPIO00422BBOF UniRef90 UPIO002EE5065 UniRef90-UPIO002EE5065 UniRef90-R7Y183 UniRef90-R7Y183 UniRef90 ${ }^{-}$R7YY 83 UniRef90-W9C1Z0 UniRef90_W9C1Z0 UniRef90 F9X741 UniRef90-E5A8U4 UniRef90-C4JDY7 UniRe990_C4JDY7 UniRef90_C4JDY7 UniRef90-G2QE19 UniRef90 C5FEG8 UniRef90-C5FEG8 UniRef90-C5FEG8 UiRe90--TONEB UniRef9-TONEB1 UniRef90-A1DD53 UniRef90 UPIO00225BBC6 UniRet90-UPIO00225BBC6 UniRef90-UPIIOOO225BBC6 UniRef90-UPI000225BBC6 UniRet90_B8MPR8 UniRef90-A7F8Y4 UniRef90_A6LYJ9 UniRef90_A6LYJ9 UniRef90_A6LYJ9

VNKDNTLSEFVYDGSKWTTGOTGSVGVKVGSNSKLAA DOW LSTDNTMKDMAYDSKGWYEGTLGKKRFMTAPYSKLAACQL

DTEDNVLQEAAYDGSGWYNGALAGAKFTVAPYSRПGSVFL QDVYGSURESRYEGS WANGTEKNVIGNAKRGSPVAATS


पSPQFELQEWCWDADNKYDGALNAAKVKVAPYSK पGAVSF VDQNNTLKQRSNRNTSWEDGPI NDLNLKVADMVGMQACWY SDSDNLLHDIDYNSDSWDEGTLSSENFIISENSRVSVMYW VDRNNTVRQVTQDNDDWQDGSLNDLNLKASPTTGLQACFY GSSRRVYESDGK GSPV
LNEDNKVMGQTINGGATWDQSGVSDT YTAASTSQLLSNGQ LTA NKVAQDTQSNSDWTPGPLNALNपTAAPTVGLQACFY LSPTNIIQEYAYSNGKWSDGPLASSAFTAFSASQLATCLF IVRNNTVKQATHNNDTWEKGALNDLNGKASPSVGLQACWA

TDNNNT DRQRSNSNKTWVDGPTNADNTKTADMVGMQACWY VTRTNQTE HKWWOWQGHLNELNLKAAPTSGLQACWK LGTDNQMFHKWWDGSRWGPSVTGWEALGGTFNSQPVAVAW LGTDNQMFHKWWDGSRWGPSVTGWEALGGTFNSQPVAVAW DTDGILNNAVYKDDTWCRGFLRGQSITPAHYSKIAAV LTAGNSUREIITSTSNWRQGDLGSSKITAGQGSKLAALRP LGTNNGLYHKWWNGA WGPSTTGWEYLGGVFSAEPTSVSW LGTNNGLYHKWWNGA WGPSTTGWEYLGGVFSAEPTSVSW LGTNNGLYHKWWNGA WGPSTTGWEYLGGVFSAEPTSVSW RGTDNALYHKWWDGS RGTDNALYHKWWDGSRWNDWENLGGTETSAP TTP EADGTTAGWAV
QS SKLHPTLALLAVSWW

RGQNRNLIHKWWNGNRWSDWESLGGTLTSAPT RGQNRNLI HKWWNGNRWSDWESLGGTLTSAPT RGQNRNL HKWWNGNRWSDWESGGGT TSAPT RGQNRNLIHKWWNGNRWSDWESLGGTLTSAPT VDKKNYLREVYLSG GNWTAGDLDTLQIEVAPYSQIAMVS MNKDKQLTEKVGDNPDWEDAKVPDEVRKGPEYSKLTSGSF RGTDNALYHKWWDGSRWSD
RGTDNALYHKWWDGSRWSD
RGTDNALYHKWWDGSRWSD
KWGEWENTGGNAFSAPSATASGVNC

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UniRef90_B6HN96 UniRef90-D8PZY2 UniRef90-D8PZY2 UniRef90_B8NIAO UniRef90-BOY2N1 UniRef90_B0Y2N1 UniRef90_U4LRZ3 UniRef90_U4LRZ3 UniRef90_J3NQ14 UniRef90 J3NQ14 UniRef90_J3NQ14 UniRef90_D4AL26 UniRef90_D4AL26 UniRef90 E4UPE8 UniRef90-E4UPE8 UniRef90_K1XQV1 UniRef90_K1XQV1 UniRef90_A0A014N993 UniRef90_A0A014N993 UniRef90_M4FN45 UniRef90_M4FN45 UniRef90_M4FN45 UniRef90-M4FN45 UniRef90-U4LRB3 UniRef90_U4LRB3 UniRef90_D8Q009 UniRef90_D8Q009 UniRef90_C5FP40 UniRef90_C5FP40 UniRef90_G9MQM8 UniRef90_G9MQM8 UniRef90_G9NYQ1 UniRef90_G9NYQ1
UniRef90 G1 XA82 UniRef90-M2ZYW5 UniRef90_W9C6L7 UniRef90-M2S7H3 UniRef90 E3Q9F8 UniRef90_E9EBR0 UniRef90_E9EBR0 UniRef90_L2FT54 UniRef90_E3RJ75 UniRef90_U4LW88 UniRef90_ROICT4 UniRef90_K5W3V3 UniRef90_Q2GU53
UniRef90_N4VC87 UniRef90-H8N1X8 UniRef90_H8N1X8 UniRef90_E8V467 UniRef90_E8V467 UniRef90_N1QHC5 UniRef90_C4JNV3
UniRef90_U1HXS9 UniRef90-17J4K8 UniRef90_17J4K8 UniRef90_17J4K8 UniRef90_UPI000422BB0F UniRef90_UPI000422BBOF UniRef90_UPI0002EE5065 UniRef90_UPI0002EE5065 UniRef90_R7YI83 UniRef90_R7YI83 UniRef90_R7YI83 UniRef90-W9C1Z0 UniRef90_W9C1Z0 UniRef90_F9X741 UniRef90_E5A8U4 UniRef90_C4JDY7 UniRef90_C4JDY7 UniRef90_C4JDY7 UniRef90-E9FCS5 UniRef90_C5FEG8 UniRef90_C5FEG8 UniRef90_C5FEG8 UniRef90-_TONEB1 UniRef90_TONEB1
UniRef90_TONEB1 UniRef90_A1DD53 UniRef90_UPI000225BBC6 UniRef90_UPI000225BBC6 UniRef90_UPIO00225BBC6 UniRef90_UPIO00225BBC6 UniRef90_B8MPR8 UniRef90_A7F8Y4 UniRef90_A6LYJ9 UniRef90_A6LYJ9 UniRef90_A6LYJ9


160
GGSESAPPNDRVYYQKSNLS GSSIHEYVWSGKWTAGASFG KGPDM TLRVYCQMADN TIIQEYGDNGNWEKMSTLG F WS
 FWSTAAECKTS GWWI TI DGPP T DQEYM WN GDWKE GTN LG K ELLK H L R V Y T L T E G N T L Q E F A Y D S GT G WY N G G GA K F

VACVNKGS QLRVYVLSVDGDVREDQYEGRWMGGEAKNKDG VACVNKGSQLRVYVLSVDGDVREI QYEGRWMGGEAKNKI G



 D DLE LGGWYTGSLNHYQ

 $V$ K S

G G A N R YF Q D T K N GI R E L | $G$ | $V$ | $N$ | $D$ | $G$ | $K$ | $W$ | $V$ | $S$ | $G$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $A$ | $I$ | $F$ |  |  |  |  |  |  |  |
| $G$ | $N$ | $D$ | $G$ | $K$ | $W T$ | $V$ | $S$ | $G$ | $K$ | $A$ |



 Y S A D S Y LIS N L VV $\quad$ Y QD A G S T L R V L R R T G G K T D WV A V T D F G

 GDNDFTRFGMNI WFS IDA HTFQQYAWYS GQDTWVPIQQWK




 GPNRLDDLFGLGTTDNQMYHKYWNGSSWGPSVT GWEALLGGVG GANRSTEVGMHLWYASSETTFEQYGWRDGDTSWEHQLTWN K S F D GK D H I Y V F Y Q T A D $\square$ N G A $\square R$ QVI F K E P S W WQ D R N L G

G P N R
GPNR
$G P N R$
$G P N R$
GPNR GANRLDDFGLL $\begin{aligned} & D V F V R G T \\ & G T N \\ & N G M Y\end{aligned}$

GMY HKWWD GSNWGPS GA N R L
 GSDYGDTDGMHLWYASDETTFKQLGWREGQTTWAHQQDWP GNYYGDSD GMNLWFAT DNSTFQQYAWYN GQDVWVPVQEWK S A N R LDD DVGLGTD NA A Y H K WWD GSRWGPSAS GWENL G GVL


 GENRLDD F GI GT DNQMYHKYWN GQAWGPS QT GYEA L G G G V F GENRLD I F GI GTDNQMYHKYWNGQAWGPSQ

## G N N R

G N N R
G N N R 1 DVFA Q GQGNRLY HK WWDG RCNCGSTPRSQQI QSRSIICGTATAAGRRA $V S S R R N N Q L D V F V R G T G N R L Y K R T W N G$ $V$ S SRRNN QL DVVFVRGTGNRLYKRTWNG
 SKLYY QKAD GYI Y T L S E GlVWT
NQGTGWNPNWAYFSASKDGKMGIVEKDPWH
G N N R
$1 D V F V R G Q G N R L Y H K W W D G$ I DVVFVR GQGNRLVHKWWDG
GNN N R
I DVFVR GQGNRLYHKWWDG

## QUERY

 UniRef90_B6HN96 UniRef90-D8PZY2UniRef90 D8PZZ UniRef90 D8PZY2 UniRef90-B8NIAO UniRef90-BOY2N1 1 UniRef90_BOY2N1 UniRef90-U4LRZ3 UniRef90-U4LRZ3 UniRef90-J3NQ14 UniRef90-J3NQ14 UniRef90-D4AL26 UniRe990_DALL26 UniRef90-E4UPE8 UniRef90-K1XQV1 UniRef90_K1XQV UniRef90-A0A014N993 UniRef90-A0A014N993 UniRef90-M4FN45 UniRef90_M4FN45 UniRef90-M4FN45
UniRet90 M4FN45 UniRef90_U4LRB3 UniRef90_U4LRB3 UniRef90-D8Q0099 UniRef90 D8Q0009 UniRef90-C5FP40 UniRef90_G9MQM8 UniRef90 G9MQM8 UniRef90-G9NYQ1 UniRef90-G9NYQ1
UniRef90 G1
GA82 UniRef90-M2ZYW5 UniRef90-W9C6L7 UniRet90-M2S7H3 UniRef90-E3Q9F8 UniRef90-E9EBRO
UniRef90-E9EBRO UniRef90-L2FT54 UniRef90-E3RJ75 UniRef90-U4LW88 UniRef90-RoICT4 UniRef90-Q2GU53 UniRef90_N4VC87 UniRef90-H8N188 UniRef90 H8N1×8 UniRef90-EEV467
UniRef90 E8V467 UniRef90-N1QHC5 UniRet90-C4JNV3 UniRef90-U1HXS9 UniRef90-17J4K8 UniRef90-17J4K8 UniRef90-UPIO00422BBOF UniRet90_UPIOOO422BBOF UniRef90 UPIOOO2EE5065 UniRef90-UPIOOO2EE5065 UniRef90-R7Y183 UniRef90-RYY183 UniRef90_RYY
UniRef90_W9C1Z0 UniRef90-W9C1zo UniRet90_-F9X741 UniRet90-E5A8U4 UniRef90-C4JDY7 UniRef90-C4JDY7 UniRef90-C4JDY7 UniRef90-E9FCS5 UniRef90-C5FEG8 UniRef90-C5FEG8 UniRef90-C5FEG8 UniRef90-TONEB1 UniRef90-TONEB1 UniRef90-A1DD53 UniRef90-UPIO00225BBC6 UniRef90-UPIO00225BBC6 UniRef90-UP1000225BBC6 UniRef90-B8MPR8 UniRef90-A7F8Y4 UniRef90-AGLYM9 UniRef90_A6LYJ9 UniRef90_A6LYM9

BBBC6

STAPGTGTGATATGPGRTRTYYQATDNKTREHCWDSNSWY SAMPGTDIACTVFKTPKIRVYYQHMEHGI IEKCYDSKGWY K V V YTNFAVTTPRDWSARVYYQNPPGGVLESVHDDGQWT KIVPYTNFAVTTPRIWSARVYYQNPPGGVLESVHI DGQWT KIVPYTNFAVTTPRIWSARVYYQNPPGGVLESVHIDGQWT VALPGTGMGVTCWRGPSTRVWFQTDNLKLVQRAYDPTGWY
 PILNRTPLAACAFSDGHIRVYYQDTEGTVKETYYDDKAGW PILNRTPLAACAFSDGHIRVYYQDTEGTVKETYYDDKAGW QAKLTSPLAATSLGLDKIRVYAVAPNNTISEFAYDGKNWY QAKLTSPLAATSLGLDKLRVYAVAPNNT:SEFAYDGKNWY QVASHSRLAAVSTQRPRLRUYAQLGDNT:QEFGYDGRGWQ


 KLAPYSGLAATFLESSSURLYGQEDDNHUQEWCYDTKGWT $P \mathrm{PN}$
$P$ PN
PPN
P P N
 K A KL N S GI A GCAWANGQI RVVYI DTNNKI CERIVEGGGSWH
 $R$ VAS H S R L A A V F V R R P S L R V Y A QL P D N S V Q E F G Y D G R G WE



 NMNGHAGVGCYSWGPGTVTYVMFVNSENTVEFWWKDTNTN



 NAK L G SGFSVVINFAKN QLRMYFQAESFDI REMDWDNNQT W $N$ N NGRSGVACFSWKPNSTPDTYMMNTPSNTVQQYWKDTN PK $P A D P G T S S D S A V S R P N Q R V W V Y Y Q L A N T Q P V E Y V L Q P Q B W V$ $K P A L G T$
$\begin{array}{ll}G & L \\ G & C \\ C & A\end{array}$ D
$N L N G H A$
DV TV GVGCYSWGPGTATYVMFVNLQHSVEVYWKDTNTN


GVLIT S DPAASSWGPNRIVDVIARRGTNNALWWHKWWDGRRWS GVLT $\quad$ S DPAASSWGPNRI DVVARGTNNALWHKWWDGRRWS
 GTLT $\quad$ S GPSASSSQRENQLDVVFVRGAGNRLYKRTWNGSYWE GTT $\quad$ T $\quad$ G GP
N S T
N S T
N
NSTP
K S T P C G S M T
K DGDGSSMTEYY DNQPAIHLLYMNKDKHMVEKDGDNPDWE NMNGHA GVGCYSWGP TVTYVMFVNDNAVEFWWK TNTN $D V N G H A G V G C Y S W G E G T S T Y T M L V N K E N D V E F W W R D T N T T$
$T \quad S$
SVLT S P PAVVSRTAGTLDIFGIGTDNQMYHKSWNGQRWS

SSEP TAISSWGENRLDDVGLGTDNACYHKWWNGQAWQ

## QUERY

 UniRef90_B6HN96 UniRefofo-D8PZY2 UniRef90-D8PZY2 UniRef90-B8NIA UniRef90-BOY2N1 UniRef90_BOY2N1 UniRef90_U4LRZ3 UniRefofo_ULLRZ3 UniRef90-J3NQ14 UniRef90-J3NQ14 UniRef90_D4AL26 UniRef90-D4AL26 UniRet90-E4UPE8 UniRef90-E4UPE8 UniRef90-K1XQV1 UniRef90-K1XQV1 UniRef90-A0A014N993 UniRef90-A0A014N993 UniRef90-M4FN45 UniRef90-M4FN45 UniRef90-M4FN45UniRef90 M4FN45 UniRef90-U4LRB3 UniRef90-U4LRB3 UniRef90-D8Q009 UniRef90-D8Q009 UniRef90-C5FP40 UniRef90-C5FP40 UniRef90-G9MQM8 UniRef90-G9MQM8 UniRef90-G9NYQ1
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UniRef90 M2S7H3 UniRef90-E3Q9F8 UniRef90-E9EBRO UniReffo-E9EBRO UniRef90-LLFTT54 UniRef90-U4LW88 UniRet90-ROICT4 UniRef90-K5W3V3 UniRef90-Q2GU53
UniRef90-N4VC87 UniRet90-H8N1X8 UniRet90-H8N1X8 UniRef90-EEV467
UniRef90 E8V467 UniRef90-N1QHC5 UniRef90-C4JNV3 UniRef90-U1HXS9 UniRef90-17J4K8 UniRef90-17J4K8 UniRef90-UPIO00422BB0F UniRef90-UPIO00422BBOF UniRet90-UPIIO002EE5065 UniRef90 UPIOOO2EE5065 UniRef90-R7Y183 UniRef90-R7Y183 UniRef90-R7Y183 UniRef90 W9C1Z0 UniRef90-W9C1Z0 UniRef90-F9X741 UniRef90-C4JDY7 UniRef90-C4JDY7 UniRef90-C4JDY7 UniRef90 ${ }^{-E 9 F C S 5}$
UniRef90
G2QEE19 UniRef90-C5FEG8 UniRef90-C5FEG8 UniRef90-C5FEG8 UniRef90-TONEB1 UniRef90-TONEB1
UniRef90-TONEB1 UniRef90-A1DD53 UniRef90_UP1000225BBC6 UniRef90-UP1000225BBC6
UniRef90-UPIOOO225BBC6 UniRef90-UPIo00225BBC6 UniRef90-B8MPR8 UniRet90-A7F8Y4 UniRef90_AGLYJ9 UniRef90_A6LYJ9 UniRef90-A6LYJ9 Unirergo_-AgCrys
UniRef90_KgUW?

210
220
230
240
VGGFSASASAGVSTAATSWGSTPNTRVYWQKGREELYEAA DGAVFPKVQPRTSIACTSYMTSSGIRVFY NTSNMMREMV GGAVFPKAQPRTPLACASWDRGNQVRVYYNNTDNKMQEYC GGUDQPSAAPFTPPAAANWDRGNQVRVYYLNTDNKLQEYC LTTIFDKAPPRCA|AATNFNSSDYMRIYFVNSDNT| WQVC EGTNLGGALPGTG| GATSFRYGPSMRIWFQTDDLKLVQRA
 $N P D V I G K A K L N T G I A C C A W A N G T Q I R V Y F I D A N N K I C E R U C$
 RGANFGPALPGTG|AABTYTTGSTTRVYFQTTDRRVVERV



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





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UniRef90-D8PZY2 UniRef90 D8PZY2 UniRef90-B8NIAO UniRef90-BOY2N1 UniRef90-BOY2N1 UniRef90-U4LRZ3 UniRef90_U4LRZ3 UniRef90_J3NQ14 UniRef90 J3NQ14 UniRef90-J3NQ14 UniRef90-D4AL26 UniReef90-D4AL2 UniRef90-E4UPE8 UniRef90-K1XQV1 UniRef90 K1XQV1 UniRef90-A0A014N993 UniRef90-A0A014N993 UniRet90_M4FN45 UniRef90 M4FN45 UniRef90-M4FN45 UniRef90-M4FN45 UniRef90 U4LRB3 UniRef90-U4LRB3 UniRef90-D8Q009 UniRef90-D880009 UniRef90 C5FP40 UniRef90-C5FP40 UniRef90_G9MQM8 UniRet90 G9MQM8 UniRef90-G9NYQ1
UniRef90 G9NYQ1 UniRef90-G1XA82 UniRef90 M2ZYW5 UniRef90-W9C6L7 UniRef90-M2S7H3 UniRef90- E3Q9F8 UniRef90-E9EBRO UniRef90-E9EBRO
UniRef90-I2FT54 UniRef90-L2FT54 UniRef90-U4LW88 UniRef90-ROICT4 UniRef90_K5W3V3 UniRef90-Q2GU53 UniRef90-N4VC87 UniRef90 H8N188 UniRef90 - H8N1 18 UniRef90-E8V467 UniRefefo-E8V467 UniRef90-N1QHC5 UniRef90-C4JNV3 UniRef90-U1HXS9 UniRef90-17J4K8 UniRet90-7J4K8 UniRef90-17J4K8 UniRef90-UPIO00422BBOF UniRef90_UPIO00422BBOF UniRef90 UPIO002EE5065 UniRef90_UPIO002EE5065 UniRef90_R7Y183
UniRe990 R7Y183 UniRef90 R7Y183 UniRef90-W9C1zo UniRef90_W9C1Z0 UniRef90 F9X741 UniRef90-E5ABU4
UniRef90 C
UJJDY UniRef90-C4JDY7 UniRef90-C4JDY7 UniRef90-E9FCS5 UniRef90-G2QE19 UniRef90 C5FEG8 UniRet90_C5FEG8 UniRef90-C5FEG8 UiiRe90-CONEB UniRef9-TONEB1 UniRef90 A1DD53 UniRef90 UPI000225BBC6 UniRef90-UPIO00225BBC6 UniRef90-UP1000225BBC6 UniRef90- ${ }^{-} 88$ MPR8 UniRef90-A7F8Y4 UniRef90-A6LYJ9 UniRef90_A6LYJ9 UniRef90_A6LYJ9


FDGSRWKDG DNSLPT ATPGSSITANAHKGRAVRWYY FDGSRWKDG DNSLPT ATPGSSISANAHKGRAVRWYY HNVRWSRGATMPAALTGSSTAAVVHQLRNQWGRFRVYY HNVRWSRGATLPAALTGSSIIAAVVHQLRNQW RFRVYY YDSRSWSDGGIVVTAKPRTPLAATSFLMVPGNPQSVRVYY YDSRSWSDGGUVVTAKPRTPLAATSFLMVPGNPQSVRVYY

VGDPWK KGATLPVADV GSNLAAVSWGKPHLRVYY $V G D P W K \quad K G A T L P V A D V G S N L A A V S W G K P H L R V Y Y$ NWHGWKAPKQ DDNDSVVKADISATSFTR DDGTVDVRIYG FNITSWNTMYDPFQVGSARGLPGTHMGVNNSGGNDLLVFF MSNSTQNPKVFKSIA ATAIGAAFIVVENDGKADVIESY YNVTYDETFADTDPAGPVKALGGTHMTVTAYKDTHLYVFF VEGEWSNAGEI STMSGDDRPFKDAANLAGRVYGLVQR YDGSRWHTGGLH $\quad$ KDATPRAAVGVTSWGNVSIRLYY IKDATPRAAVGVTSWGNVSGRLYY YDGSRWHTGGLH AMMKDATPRAAVGVTSWGNVGGRVY YNISFDSSFAITDPAGPVQALGGTHLTLTAFAEKDLYVFF WGDIDRQWDEYPDAKGAKDPVGGAKVATTDDGG DVTLYY FNDNYHDSFFVSDPAGPVKALGGTHLTVTRDGKNYLYVFC VSGDWNSTRKI VAPPLLSTMVAAVQANND
WTGSWQGTTALQTVITDAPVASIHVPTMADW SGGQWTNEGEIE SMSGDDRPV KDAANDAGRVYGLVER WDGTAWWPSLTDWESLGGT
WDGTAWWPSLTDWESLGGT
WDGTAWHPSITGWEALGGVFNSAPAVTAWAANRDDTFGLG WDGTAWHPSITGWEALGGVFNSAPAVTAWAANRLDIFGLG YNDSWSAENSTTFTVQGEPGDPGTHLSVNNSGGNNVVVFY VNANGKKYGSTKDVIATTPKGNLIAAVVATGTKNVDVIVIY YNDSWNDNFTULSAGNGSGGLPGTHLSVNPSGGNDLFAFY


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QPS GQLISELGSNDGG NNSKVE!VEWEWTGGTTYNK $\square G V V D$

T D NQMYHKY WN GSAWT G WEPLGGVFN TDNQMYHKYWNGSAWT GWEPLGGVFN QTNGSD $\quad$ SEYTRDYAGQWSAI D 1 P Q $\square$ A DETVPQGQSVPGSTYPKVSLYQTS QTEGDDVS

RGTGNRLYKRTWNRWENWENLDGSLTSAPAA RGTGNRLYKRTWNRWENWENLDGSLTSAPAA RGVGNRLRTWNGTRWEPWVSLGTTQTSAPAA $R G V G N R L R T W N G T R W E P W V S L G T T Q T S A P A A$

QHHDYS RRLFE SDNSQWYARG
QHHDYSIRLFE SDNSQWYARG
QVEGDEVREFTRDVAGSWSEVGD
QAEGDDITAFTRLAGGEWTKGKL

QSNPPTTHQSTMSDDDG
1]ADGV I HQWEFFS LDSQS YRGMVPT
VGTNNALFHKWWNGQTGWEDLGGVLSSPPSA VGTNNALFHKWWNGQTGWEDLGGVLSSPPSA VGTNNALFHKWWNGQTGWEDLGGVLSSPPSA

QNGTSADSEWVWTQAHGSQLG

QT G GNKI S QYKYTYPK GWQ
RNPVNEVGTLENENGS WKHGTTV $\quad \square$ PA
UniRef90_K9UWR2 UniRef90-K9UWR2
UniRef90-L7EPC2 UniRef90_L7EPC2 UniRef90 L7EPC2 UniRef90-K2RJ31 UniRef90_UPI00035DED74 UniRef90 UPI00035DED74 UniRef90-UPI00035DED74 UniRef90-Q2H7R9 UniRef90-WOVOE6 UniRef90 WOVOE6 UniRef90-WOV0E6
UniRef90 W0V0E6 UniRef90-Q2H6E0 UniRef90-UPI0003674C4C UniRef90-UPIO003674C4C C UniRef90_UPIO003
UniRef90 F4XK02 UniRef90-F4XK02
UniRef90-F4XK02 UniRef90_G1XNY7 UniRef90-G1XNY7 UniRef90-M3C1X8 UniRef90-M3C1X8 UniRef90-M3C1X8 UniRef90-M3C1X8 UniRef90-E9FAY2 UniRef90_K0V9Y1 UniRef90_K0V9Y1 UniRef90-U4LW89 UniRef90 U4LW89 UniRef90-U4LW89 UniRef90-A7F216 UniRef90_G1X5Y2 UniRef90 G1X5Y2 UniRef90_G2YU60 UniRef90_-V6K3Y4 UniRef90 V6K3Y4 UniRef90_V6K3Y4 UniRef90-V6K3Y4 UniRef90-UPI000289D20F UniRef90 UPI000289D20F UniRef90-UPI000289D20F UniRef90_UPIO00289D20F UniRef90 UPI000289D20F UniRef90-C5FT46 UniRef90_C5FT46 UniRef90-A0A031H019 UniRef90_A0A031H019 UniRef90-A0A031HOI9 UniRef90-A0A031H019 UniRef90_A0A031H019 UniRef90_U2EGW0 UniRef90-U2EGW0 UniRef90_U2EGW0 UniRef90 X5JF30 UniRef90-X5JF30 UniRef90-X5JF30 UniRef90-UPI000287B8F5 UniRef90 UPI000287B8F5 UniRef90-UPI000287B8F5 UniRef90_UPIO00287B8F5 UniRef90- S3CN87 UniRef90_S3CN87 UniRef90_UPI0002892EFA UniRef90 UPI0002892EFA UniRef90-UPI0002892EFA UniRef90-UPI0002892EFA UniRef90-D6U4A1 UniRef90-D6U4A1 UniRef90-J3PDV1 UniRef90-A0A010QT59 UniRef90 G8NPR8 UniRef90-G8NPR8 UniRef90-G8NPR8 UniRef90-K2RP34 UniRef90-K2S4Q4 UniRef90-A7EIKO UniRef90_M4FQA9 UniRef90 M4FQA9 UniRef90-U5MTS1 UniRef90_U5MTS1 UniRef90_U5MTS1 UniRef90-K5VZ75 UniRef90-K5VZ75 UniRef90-W9XN81 UniRef90_A5HYP3 UniRef90_A5HYP3 UniRef90_A5HYP3

TSAPAAVSW
GSNR\DVFARGTDNAMWH\WWN
TSAPAAVSW
TSAPAAVSW GSNRIDVFARGTDNAMWHI WWN GSNRIDVFARGTDNAMWHIWWN LLPNTRLSSINFTDSDGTNYHVFYQLTSKADYQSAWN

$$
\begin{array}{r}
\text { QF } \square \text { PRTA } \square \text { AAFAL } \begin{array}{r}
\text { STSE } \square Y \text { TYAQGSNGSVSDAKYS } \\
G Q V A R M Q A C \\
G Q V A R M Q A C \\
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G S S \square A A T N Y T D T N G F H \square Y V F F Q A A N K E L L T S Q W D
\end{array}
\end{array}
$$

| STPAAVS W | GANRTDTFVVGSNNSLYRKWWD |
| :---: | :---: |
| STPAAVSW | GANRIDTFVVGSNNSLYRKW |
| S T P A AVS W | GANRIDTFVVGSNNSLYRKWW |

 SPASGVAAVSRDNTAMEI WWVGPLGSVEGGYYY SPASGVAAVSRINTAMEI WWVGPLGSVEGGYYY SPASGVAAVSRINTAME WWVGPLGSVEGGYYY
 PTSSLAVTKWGAGSQTHFRLYYQSKAGTI EEHCLD PTSSLAVTKWGAGSQTHFRLYYQSKAGTI EEHCLD FQRNLAAUSYESNNVNNSRVYYQDNQGNILEAHNN

NDARPRTPLSSYWRGEGDGDSFNLFYVDKNKVLQEDRSH NDARPRTPLSSYWRGEGDGUSFNLFYVDKNKVLQEIRSH

TS S P A A V S W
TSAPAAV S W
$T S A P A A A V S W$
$T$
T A P A AVV W W
GNNR\DVFGRGTDNAMWHTFWN GNNRIDVFGRGTDNAMWHIFWN GNNRIDVFGRGTDNAMWHIFWN


DNTRVAS $\square$ NWTVSGTRHVAVFYQTRESSLMASTRD RSKNLMMSSYN PGQAVFDLEHQHVAAVSRAPGNLDLFTVGNDSHVWSTFWN PGQAVFDLEHQHVAAVSRAPGNLDLFIVGNDSHVWSTEWN PGQAVFDLEHQHVAAVSRAPGNLDLFUVGNDSHVWSTFWN PPQLLPASNDAAVNYTDTNVTHYRVYFQATTTGIVQSDYD LLPTAALAAVNYTEGNGQHHRVYFQAKSNALYQSAWN

F QRNVAA ISYASNNVNNSRVYYQDNQGHILESHSN

T S A P A A V S W
TSAPAAVSW
TSAPAAVSW

GPNR\DVFGRGTTNSMYHKWWD
GPNRIDVFGRGTTNSMYHKWWD
GPNRIDVFGRGTTNSMYHKWWD


UniRef90_K9UWR2 UniRef90_L7EPC2 UniRef90_L7EPC2 UniRef90 L7EPC2 UniRef90_K2RJ31 UniRef90_UPI00035DED74 UniRef90_UPI00035DED74 UniRef90 UPI00035DED74 UniRef90_Q2H7R9 UniRef90_WOV0E6 UniRef90_WOV0E6 UniRef90_WOV0E6 UniRef90_WOVOE6 UniRef90_Q2H6E0
UniRef90 UPI0003674C4C UniRef90_UPI0003674C4C UniRef90_UPI0003674C4C UniRef90_F4XK02 UniRef90-F4XK02
UniRef90 F4XK02 UniRef90-G1XNY7 UniRef90 G1 XNY7 UniRef90-M3C1X8 UniRef90-M3C1X8 UniRef90 M3C1X8 UniRef90_M3C1X8 UniRef90_E9FAY2 UniRef90_K0V9Y1 UniRef90 K0V9Y UniRef90_K0V9Y1 UniRef90_U4LW89 UniRef90 U4LW89 UniRef90 U4LW89 UniRef90_A7F2I6 UniRef90_G1X5Y2 UniRef90_G1X5Y2 UniRef90_G2YU60 UniRef90-V6K3Y4 UniRef90 V6K3Y4 UniRef90_V6K3Y4 UniRef90_V6K3Y UniRef90_UPI000289D20F UniRef90 UPI000289D20F UniRef90_UPI000289D20F UniRef90_UPI000289D20F UniRef90 UPI000289D20F UniRef90-C5FT46 UniRef90_C5FT46 UniRef90_A0A031H019 UniRef90 A0A031H019 UniRef90-A0A031H0I9 UniRef90_A0A031H0I9 UniRef90_A0A031H0I9 UniRef90 U2EGW0 UniRef90_U2EGW0 UniRef90_U2EGW0 UniRef90 X5JF30 UniRef90_X5JF30 UniRef90_X5JF30 UniRef90_UPI000287B8F5 UniRef90 UPI000287B8F5 UniRef90_UPI000287B8F5 UniRef90_UPI000287B8F5 UniRef90- S3CN8 UniRef90-S3CN87 UniRef90_UPI0002892EFA UniRef90 UPI0002892EF/ UniRef90_UPI0002892EFA UniRef90_UPI0002892EFA UniRef90 D6U4A1 UniRef90-D6U4A1 UniRef90_J3PDV1 UniRef90_A0A010QT59 UniRef90 G8NPR8 UniRef90_G8NPR8 UniRef90_G8NPR8 UniRef90_K2RP34 UniRef90 K2S4Q4 UniRef90_A7EIK0 UniRef90_M4FQA9 UniRef90 M4FQA9 UniRef90 U5MTS1 UniRef90_U5MTS1 UniRef90 U5MTS UniRef90 K5VZ75 UniRef90_K5VZ75 UniRef90_W9XN81 UniRef90_A5HYP3 UniRef90_A5HYP3 UniRef90_A5HYP3

UniRef90 K9UWR2 UniRef90_K9UWR2
UniRef90_L7EPC2 UniRef90_L7EPC2 UniRef90 L7EPC UniRef90-K2RJ31 UniRef90-UPIO0035DED74 UniRef90 UPIO0035DED74 UniRef90 UPIO0035DED74 UniRef90-Q2H7R9 UniRef90 WOVOE6 UniRef90 WOVOE6 UniRef90-W0VOE6 UniRef90-WOVOE6 UniRef90 Q2H6E0 UniRef90-UPI0003674C4C UniRef90_UPIOOO3674C4C UniRef90_UPIo003674C4C
UniRef90 F4XK02 UniRef90 ${ }^{-}$F4XK02 UniRef90-F4XK02 UniRef90_G1XNY7 UniRef90 G1XNY7 UniRef90-M3C1X8 UniRet90-M3C1X8 UniRef90 ${ }^{-13 C 1 X 8}$ UniRef90-M3C1X8 UniRefolo-EFAY2 UniRef90_KoV9Y1 UniRet90 Kovg UniRef90-KOV9Y1
UniRef90 U4LW89 UniRef90 - U4L W89 UniRef90 U4LW89 UniRef90-A7F216 UniRef90_G11 5 Y2 UniRef90 G1X5Y2 UniRef90-G2YU60 UniRef90-V6K3Y4 UniRef90 V6K3Y4 UniRef90-V6K3Y4 UniRef90-V6K3Y4 UniRef90-UPIO00289D20F UniRef90 UP1000289D20 UniRef90-UPIO00289D20 UniRef90-UPIO00289D20F UniRef90 C5FT46 UniRef90-C5FT46 UniRef90-A0A031 HOI UniRef90 A0A031H019 UniRef90-АоА031 Hol9 UniRef9O-A0A031H019 UniRef90 A0A031HOI UniRef90 U2EGWO UniRef90-U2EGWO UniRef90 U2EGWO UniRef90 X5JF30 UniRef90-X5JF30 UniRef90-X5JF30 UniRef90-UPI000287B8F5 UniRef90 UPI000287B8F5 UniRef90-UPIo00287B8F5 UniRef90 UPI00028788FS UniRef90 - 3 3CN8 UniRef90- $\mathrm{S} 3 \mathrm{CN8} 8$ UniRef90_UPIO002892EFA UniRef90 UPI0002892EFA UniRef90 UPI0002892EFA UniRef90-UPIO002892EFA UniRef90 D6U4A1 UniRef90-D6U4A UniRef90-J3PDV UniRef90_A0A010QT59 UniRef90 G8NPR8 UniRef90-G8NPR8 UniRef90-G8NPR8 UniRe90_K2RP34 UniRef90 K2S4Q4 UniRef90-A7EIK0 UniRef90_M4FQA9 UniRef90 M4FQA9 UniRef90 U5MTS 1 UniRef90-U5MTS1 UniRef9_ UsMTS UniRef90 K5VZ75 UniRef90-K5VZ75 UniRef90_W9XN81 UniRef90 A5HYP3 UniRef90 A5HYP3


K WGE WENLLGGNAFSAPSAlI A S GIVNN KWGE WENLGGNAFSAPSAlASGVNC RGTDNALWHKWWNGSRWSDWESLGGNLTSAPAAAVSW RGTDNALWHKWWNGSRWSDWESLGGNLTSAP A AVSW RGTDNALWHKWWNGSRWSDWESLGGNLTSAP A AVSW LDPSNGIRGLISNNKGPFDSSGUNGRYTAGPSSGLASYGR

 I TPDGGVEGAFWNGNDWAPYPDPAEKNSASKTGGLAAV I TPDGGVEGAFWNGNDWAPYPDPAEKNSASKTGGLAAV $\square$ TPDGGVEGAFWNGNDWAPYPDPAEKNSASKTGGLAAV

MTEDRQLMEK VGHTP $\square$ WT DVVKVPD D DK K R P D S R LT G GA F QTAKGSI QEFTYKGTKWSTSKIGGVDAAPFRTPLAAITV Q TAKGSI QEFTYKGTKWSTSKIGGVDAAPFRTPLAAITV SDSEN LLHD IIVYDSDSWKE GTLSSEKY DISEDSRVAVMYW $\begin{array}{llllll}S & R & V & A & V & M \\ S & F & P & P & G G P & L \\ S & F & P & P & G & G \\ S & L \\ S & F & P & P & G & P \\ S & F & P & P & G & G \\ L\end{array}$ K A GGYSASRAMYG K A GGYSASRAMYG K A GGYSASRAMYG KA G GYSASRAMYG KAGGYSASRAMYG
TGKDNEARVVYWNADRWSAKET\|GDVSATAGFSGEA TGKDNEARVVYWNADRWSAKETGGDVSATAGFSGEA

R GTDNALY HKWWDGSRWSD
WE NLGGVLT S S P A AVS W RGTDNALYHKWWDGSRWSD RGTDNALYHKWWDGSRWSD

WENLGGVLTSSSPAAVSW WENLGGGVLTSSPAAVSW

为
 RGQGNRLYHLWWNGSRWSSWQDLGGGRLTSAP R GQ GNRLYHLWWNGSRWSSWQDLGGRLTSAP
 RGSDNALLWHRAFDNGHWA RGSDNALWHRAF DNGHWAAWESLGGSMATSW LNS R R QVQEELYFNA DEWLS GMFSSK QAKSAPGSKMVAVR L N D A N QVA GI DNA GS T WDKS GVSNT FTANPKSNLLSNGI



 QSRDNSLMARAHDSNKWRT
QSRDNSSLMARAHDSNKWR


$R G T D N A L Y H K W W D G S R W N D W E S L G G N L K S A P A B C D$

| $V$ | $N$ | $N$ | $S$ |
| :--- | :--- | :--- | :--- |
| $V$ | $G$ | $W S$ | $S$ |
| $V$ | $E$ |  |  |
| $V$ | $H$ | $S$ | $Q$ |
| $G$ |  |  |  |$W S$ S G E

$\square D$ T D NK $\square R \quad A V V$ S S S WS
T A F Q S N P S S S P S



## UniRef90_K9UWR2 UniRef90-K9UWR2 UniRef90 L7EPC2 UniRef90-L7EPC2 UniRef90-L7EPC2 UniRef90-K2RJ31

 UniRee90-UPIOOO35DED74 UniRef90-UPI00035DED74 UniRef90-UPIO0035DED74 UniRef90-Q2H7R9 UniRef90-WOVOE6 UniRef90-W0VOE6 UniRef90-WOVOE6 UniRef90-WOVOE6 UniRef90-Q2H6EO UniRef90-UPIOOO3674C4C UniRef90_UPIOOO3674C4CUniRef90 UPIOOO3674C4C UniRef90-F4XK02 UniRef90-F4XK02 UniRef90-F4XK02 UniRef90-G1XNY7 UniRet90-G1XNY7 | UniRef90-M3C1X8 |
| :--- |
| UniRef90 M3C1 | UniRef90-M3C1 18 UniRef90-M3C1×8 UniRef90-E9FAY2 UniRef90_KOV9Y1 UniRef90_K0V9Y1 UniRef90-Kov9Y1 UniRef90-U4LW89 UniRef90_U4LW89 UniRef90-A7F216 UniRet90_G1X5Y2 UniRef90 G1X5Y2 UniRef90-G2YU60

UniRef90 V6K3Y4 UniRef90-V6K3Y4 UniRef90-V6K3Y4 UniRef90-VKK3Y4 UniRef90-UPIO00289D20F UniRef90_UPIo00289D20F UniRef90-UPIO00289D20F
UniRef90 UPIOOO289D20F UniRef90_UPIOOO289D20F UniRef90-C5FT46 UniRef90-C5FT46 UniRef90-A0A031HO19 UniRef90 AOAO31HO19 UniRef90-AOAO31H019 UniRef90_A0A031HO19 UniRef90_U2EGW0 UniRef90-U2EGW0 UniRef90-U2EGWO UniRef90-X5JF30 UniRef90-X5JF30 UniRef90-X5JF30 UniRef90-UPI000287B8F5 UniRef90_UPIO0028788F5 UniRef90_UPIOOO287B8F5
UniRef90 UPIo00287B8F5 UniRef90_UP1000287B8F5 UniRef90 S3CN87 UniRef90-S3CN87 UniRef90_UPIO002892EFA UniRef90 UPIO002892EFA UniRet90-UPIOOO2892EFA
UniRet90-UPIOOO2892EFA UniRef90-D6U4A1 UniRef90_D6U4A1 UniRef90-J3PDV1 1 UniRef90-A0A010QT59 UniRef90-G8NPR8 UniRef90-G8NPR8
UniRet90-G8NPR8 UniRef90-K2RP34 UniRef90-K2S4Q4 UniRef90-A7EIK0 UniRef90-M4FQA9 UniRef90 M4FQA9 UniRef90_U5MTS1 UniRef90_U5MTS1 UniRef90 K5VZ75 UniRef90-K5VZ75
UniRef90
W9XN81 UniRef90-A5HYP3 UniRef90_A5HYP3
UniRef9O_A5HYP3




N A WT AMGGVASAAPADSSWHTG Q $\quad$ SDDLFVR GTDNHLLWQRH NA WTAMGGVASAAPA SSWHTGGQIDDVRGTDNHLWQRH
 $N N T L P T T L D T N A T I A A F S S G Y N L V M H V L A Q A D K A P V L T T Y$ MTRLIDNGPFGSKVTMVVVGDG $M T R L L D N G P F G S K V T M V V V G D G$
$M T R L I D N G P F G S K V T M V V V G D G$
T D GVVVA S LLS GEA HLAA WCTNGYRHDTVLSTTSSGGVQLVS NGSFPEKLESDAEI ASFSLGYNSDMEVLLNGPETPGGVRV

$\mathrm{L} P \mathrm{P}$
$\mathrm{M} P \mathrm{P}$
N

 $N W Q N L D G T I T S D P S A V S W G P N R T D V F A R G T N N S L W H I W$
 UniRef90_K5VZ75 UniRef90-K5VZ75 UniRef90-W9XN81 UniRef90_A5HYP3 UniRef90_A5HYP3
UniRef90 A5HYP3

UniRef90 K9UWR2 UniRef90-K9UWR2
UniRef90_L7EPC2 UniRef90_L7EPC2 UniRef90 L7EPC UniRef90-K2RJ31 UniRef90_UPI00035DED74 UniRef90 UPIO0035DED74 UniRef90'UPI00035DED74 UniRef90-Q2H7R9 UniRef90 WovoE6 UniRef90 WOVOE6 UniRef90-W0VOE6
UniRet90 WOVOE6
UniRef90 Q2H6E0 UniRef90 UPI0003674C4C UniRef90_UPIOOO3674C4C UniRef90 UPIo003674C4C UniRef90 F4XK02 UniRef90-F4XK02 UniRef90-F4XK02 UniRef90- G1XNY7 UniRef90-M3С1х8 UniRef90-M3C1×8 UniRef90-M3C1X8 UniRef90-M3C1X8 UniRef90-E9FAY2 UniRef90_KoV9Y1 UniRef90-K0V9Y1 UniRef90-KOV9Y1
UniRef90
U4LW89 UniRef90-U4LW89 UniRef90 U4LW89 UniRef90-A7F216 UniRef90_G11 5 Y2 UniRef90_G1 $\times 5$ Y2 UniRef90-G2YU60 UniRef90-V6K3Y4 UniRef90-V6K3 UniRef90-V6K3Y4 UniRef90-V6K3Y4 UniRef90-UPIO00289D20F UniRef90 UPI000289D20F UniRef90-UPI000289D20F UniRef90-UPIo00289D20F UniRef90 UPI000289D20F UniRef90-C5FT46 UniRef90-C5FT46 UniRef90-A0A031HOI9 UniRef90 A0A031HOI9 UniRef90-A0A031 Hol UniRef90-A0A031H019 UniRef90 A0A031HOI9 UniRef90 U2EGWO UniRef90-U2EGWO UniRef90 U2EGW0 UniRef90 X5JF30 UniRef90- $\times 5$ JF30 UniRef90-X5JF30 UniRef90-UPI000287B8F5 UniRef90- UPI000287B8F5 UniRef90-UPIo00287B8F5 UniRef90_UPIO00287B8F5 UniRet90 UP1000287B8F5 UniRef90 S3CN87 UniRef90-S3CN87 UniRef90_UPIO002892EFA UniRef90 UPI0002892EFA UniRef90-UPIO002892EFA UniRef90_UPIo002892EFA UniRef90_D6U4A1 UniRef90 D6U4A UniRef90-J3PDV UniRet90 A0A010QT59 UniRef90 G8NPR8 UniRef90-G8NPR8 UniRet90-G8NPR8 UniRet90_K2RP34 UniRef90- K2S4Q4 UniRef90-A7EIK0 UniRef90_M4FQA9 UniRef90 M4FQA9 UniRef90_U5MTS1 UniRef90_U5MTS1 UniRef9_ UsMTS UniRef90 K5VZ75 UniRef90-K5VZ75 UniRef90_W9XN81 UniRef90 A5HYP3 UniRef90-A5HYP3
UniRef90-A5HYP3

WDGKSTT
AGKSLGGLISLISAPAAVISSQNR\|DLIFIV AGKSLGGLSLSAPAAVSSQQNR\|DLFV
WDGKSTT

R N
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WDAAEETWAEGVDGSSGATGDEDIAAGSDLAANYGGRVYG WDGTA WNGFD WDGTAWNGFDY WDGTAWNGFDY WDGTAWNGFDY $\quad \square$| $L G G V$ |
| :--- |
| $\square D$ |

WD GSAWRPSLAGYERILG
WDGSAWRPSLAGYERLG
WDGSAWRPSLAGYERLG
WDGSAWRPSLAGYERLG
WDTKAWSGLDPPNLLAAEGAVCTSAPRAVAWGPNRLDVFV WD GANWGPSLTDYAYMGGVC $\square$ GOPEVVSWGANRDDVFV TG

 YTTSGWTYGTLLPYDQHRP LLGTSIAFI DHNDPNIRGYY WDNGWYDHGAFPAREFPTPAAPGTGIASVARTSGHLDVFW WDNGWYDHGAFPAREFPTPAAPGTGIASVARTSGHLDVFW WDNGWYDHGAFPAREFPTPAAPGTGIASVARTSGHLDVFW WDNGWYDHGAFPAREFPTPAAPGTGI ASVARTSGHLDVFW VD ELGGKKYGDDEVTATTPKGNLAAVVAKRDQVIVDY


YS GA $\square$ NT WSATHPSAMSNSTQNFKS $\square$ AVTA $\square$ GAAFAVVE $\square$ WNGEWRGWFEIPGHLIFPAAA HLVSLTRNDDHMELYA WNGEWRGWFEI PGHLFPAAA HLVSLTRNDDHMELYA | WN GE WR GWF E |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | WNGS S WS N E E NLG G NLT S A P TVVSSWDDGRVLDV Y WN GS S WS WNGSSW WNGS SWSN

WNGSSWSN
1 P G G
$1 P G G$
WNGTAWGPSLTGYEAMGGLCVGDPRAVAWGPNRDDVFVVG WNGTAWGPSLTGYEAMGGLCVGDPRAVAWGPNRLDVFVVG WNGTAWGPSLTGYEAMGGLCVGDPRAVAWGPNRLDVVVVG WN G T A WG P S L T G Y E A M G G L C V G D P P R A V A W W G P N R WN G T A WGPSLTGYEAMGGLCVGDPRAVAWGPNRLDVFVVG $R$ D
$R D$
$R D$
WD GS $\square$ WS D WQD $\square G$ WD GSI WS DWQD I G WD G S 1 WS D WQD $\quad$ G WA GS DWS E WEDLGG WA GSDWSEWEDLG WA GSD WS E WE D
WA GS D W
W
G WA GS D WS E WE DLL

| $G$ | $l$ | $C$ | $K$ | $H$ | $G$ | $V$ | $T$ | $V$ | $S$ | $S$ | $W$ | $D$ | $E$ | $N$ | $R$ | $L$ | $D$ | $V$ | $F$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | 1 | $C$ | $K$ | $H$ | $G$ | $V$ | $T$ | $V$ | $S$ | $S$ | $W$ | $D$ | $E$ | $N$ | $R$ | $L$ | $D$ | $V$ | $F$ | $T$ |
| $G$ | 1 | $C$ | $K$ | $H$ | $G$ | $V$ | $T$ | $V$ | $S$ | $S$ | $W$ | $D$ | $E$ | $N$ | $R$ | $L$ | $D$ | $V$ | $F$ | $T$ |
| $G$ | $V$ | $L$ | $S$ | $S$ | $S$ | $P$ | $A$ | $V$ | $A$ | $S$ | $W$ | $G$ | $E$ | $N$ | $R$ | $L$ | $D$ | $V$ | $F$ | $G$ |
| $G$ | $V$ | $L$ | $S$ | $S$ | $S$ | $P$ | $A$ | $V$ | $A$ | $S$ | $W$ | $G$ | $E$ | $N$ | $R$ | $L$ | $D$ | $V$ | $F$ | $G$ |
| $G$ | $V$ | $L$ | $S$ | $S$ | $S$ | $P$ | $A$ | $V$ | $A$ | $S$ | $W$ | $G$ | $E$ | $N$ | $R$ | $L$ | $D$ | $V$ | $F$ | $G$ |
| $G$ | $V$ | $L$ | $S$ | $S$ | $S$ | $P$ | $A$ | $V$ | $A$ | $S$ | $W$ | $G$ | $E$ | $N$ | $R$ | $L$ | $D$ | $V$ | $F$ | $G$ |
| $G$ | $V$ | $L$ | $S$ | $S$ | $S$ | $P$ | $A$ | $V$ | $A$ | $S$ | $W$ | $G$ | $E$ | $N$ | $R$ | $L$ | $D$ | $V$ | $F$ | $G$ |

FENTWRDWTP\SQDTFT
$S G P T V A S W A P G R \square D V F I$ FENTWRDWTPISSDTFT S GP TVA S WAPGRLDVFI WR GTTWS IQQAT LT GQPAGVDNFTADTAT QEMH AEGEWTNVGED STMSGEDRPF K I AANSAGRVYGLVQR

WS G GQT GWTQNNALDDFEDVVKNSA\AFNEDGRVYAFETA WDSNFSTTNNSAAASAFSSDFNLSTVVASAGGRV Y
 Y GPESWT T GNFGNAVTPSPD\|SS\|TYGPNGWMNNLVTW Y GPESWTTGNFGNAVTPSPD\|SSITYGPNGWMNNLVTW

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YRGVFGGVFQLLDTGFPFSFDYCTG\|TAVSWNGAQ\|RLY\|




UniRef90 K9UWR2 UniRef90＿K9UWR2
UniRef90＿L7EPC2 UniRef90－L7EPC2 UniRef90 L7EPC2 UniRef90＿K2RJ31 UniRef90＿UPI00035DED74 UniRef90 UPI00035DED74 UniRef90 UPI00035DED74 UniRef90＿Q2H7R9 UniRef90＿WOVOE6 UniRef90 W0V0E6 UniRef90＿WOV0E6 UniRef90＿WOVOE6 UniRef90 Q2H6E0 UniRef90－UPI0003674C4C UniRef90＿UPI0003674C4C UniRef90＿UPI0003674C4C UniRef90 F4XK02 UniRef90－F4XK02 UniRef90 F4XK02 UniRef90 G1 XNY7 UniRef90＿M3C1X8 UniRef90－M3C1X8 UniRef90＿M3C1X8 UniRef90＿M3C1X8 UniRef90＿E9FAY2 UniRef90＿K0V9Y1 UniRef90＿K0V9Y1 UniRef90－K0V9Y1
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R GVDHAIV HKYWNGSDNWESLGGVV
RGVVDHA】YHKYWNGSDNWESLGGV

F VGNGS LGE WLWS QE G GYT F N G WVNTT】P TDNAVYHKWWDGSAWQGFESLGGVMASPPTA T D NAVYHKWWDGSAWQGFESLGGVCASPPTA T DNAVYHKWWDGSAWQGFESLGGVCASPPTA

T GTD GA LYH KWWDGAKWG
TGTDGALYH KWWDGAKWG
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TGTDGALYH KWWDGAKWG
VVNG TV H QWEFFSPRQWGYLGTVPT
A DRALYHKWWDGANWGGYERLGGVCTCAPRA A D RA L Y H K WWD GANWGGYERLGGVCTCAPRA A DRALYHKWWDGANWGGYERLGGVCTCAPRA

QDVSGTTREYYTEDDKNW QDVSGTI REYYTEDDKNW
A GTD GKI WWWDQNA GA GWYDHGAFP IA
A GTD GKI WWWDQNAGAGWYDHGAFP A
A GTD GKI WWWDQNA GAGWYDHGAFP I A
A GTD GK I WWWD Q NA GA GWYDHGAFPIA
Q G P G

QRVD GRIQTWSYNRGRGWETQD\｜LETAYP



D G K A DE $\square$ E A F VQ D D A VN WD TA G T VD $\square$ G V D GQRR LY A C A WG GE WGWA A 1 G S YP PG S P L G $V$ D GQRRLYACAWGGEWGWAA I GSYPP GSP L G $V$ D GQRRRLYACAWGGEWGWAAI GSYPP G SP L G





T D R G L Y HK WWNGSAWT GYEAMGGDCLGQPEA T D R GL Y H K WWN GSAWT GYEAMGGI CL GQPEA
 T DRGLYHKWWNGSAWTGYEAMGGLCLGQPEA

IG A DNAVWSWDGSNWGEWHSLGGFGLSAPAA I GADNAVWSWDGSNWGEWHSLGGFGLSAPAA IGADNAVWSWD GSNWGEWHSLGGGFGGLSAPAA RGTDRHLYHKYWDGWSEWEDLGGVLTTSAPGA RGTDRHLYHKYWDGWSEWEDLGGVLTSAPGA R GT D R H L Y H K Y WD G W S E WE D L G GVVLTM A P GA RGTDRHLYHKYWDGWSEWEDLGGGVLTSAPGA RGTDRHLYHKYWDGWSEWEDLGGVLTSAPGA

NAADSSVRH NWFDGTDWSF\｜AGALGSAPTA NAADSSVRH NWFDGTDWSFIAGALGSAPTA RHKGGKI HEFATNASWTWQ


T D G S T QLTNEWVY R D S T T F D K T G TVN T T I
AVE GEKLVE WE WQH GNSFVRLGTVNTDU
QVED DTI N WSSAG VVDDG
$T N D R G A I M S A V W \quad R G S T W S D Q P V A L T G Q P A G$ TNDRGA IMSAVW RGSTWS』QPVALTGQPAG

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$R G R N N T H K W W N G T S W S Q W E D L G G F L T S A P C A$ RGRNNTHKWWNGTSWSQWEDLGGFLTSAPCA R G R N N T H K WWN G T S WS Q WE D｜L G GF｜LTSAPCA

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UniRef90- J7T119 UniRef90-J7T119 UniRef90-J7T119 UniRef90-B2AU57 UniRef90-Q0V1K3 UniRef90_U6SJ83 UniRef90-U6SJ83
UniRef90 C5H84 UniRet90-E3QKG2 UniRef90-14HSC3 UniRef9-14HSC3 UniRef90-14HSC3 UniRe90_- R4KC2 UniRef90-R4KC21 UniRef90-R4KC21 UniRef90-J7SHA3 UniRef90-J7SHA3 UniRef90-J7SHA3 UniRef90 U6EWC2 UniRef90-U6EWC2 UniRef90-U6EWC2
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H8KUH2 UniRef90_H8KUH2 UniRef90-G4NEX7 UniRef90-G4NEX7 UniRef90-UPIO002DDBODC UniRef90-UPIOOO2DDBODC UniRef90-UP10002DDBODC
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UniRef90 C4RG20 UniRef90-L7VUC4 UniRef90-L7VUC4
UniRef90-L7VUC4

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PNAPRNGTE $\square \mathrm{G} \square$ A QWEKSSNSYYH $\square \mathrm{FYQS} \square$ S GA $\square$ WERSYT

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I GSPASASWQANRIDSFVRSRNNQMWHKWWD LLNTALAAVT AD TGKDSFLYYQNGQ DILEAHSA SVILENSSLAATNWTDNNVGRAAVFYQDKFNGLNVMLFD

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NPAAVSW GRNRIDTFARGTDNHLYHKWWN NPAAVSWGRNRIDTFARGTDNHLYHKWWN
 GRNRIDTFARGTDNHLYHKWWN

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$\prod$ I AVA WGNDRLDLFGRG\DNAVWHRAWD I SAVAWGNDRLDLFGRGI DNAVWHRAWD ISAVAWGNDRLDLFGRGUDNAVWHRAWD


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UniRet90 C1FM22 UniRef90-K5VHY6 UniRef90-K5VHY6 UniRef90-K5VHY6 UniRefofo-KgRAT4 4 UniRef90-K9RAT4 UniRef90_K9RAT4 UniRef90-U4L9L7 UniRef90-J7T119 UniRef90-J7T119
UniRef90-J7T119 UniRef90-JTT119
UniRefgo-J7T119 UniRef90-J7T119 UniRef90-B2AU57 UniRef90-Q0V1K3 UniRef90-U6SJ83 UniRef90-U6SJ83 UniRefe90-C5H83 UniRef90-E3QKG2 UniRef90_14HSC3 UniRef90-14HSC3
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GTGIGATAWD

NL NQil RVYY NLNQURVYY

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 NKFQVSLYY






UniRef90_C1FM22 UniRef90-C1FM22
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UniRef90 U4L9L7 UniRef90-J7T119 UniRef90-J7T119 UniRef90-J7T19 UniRef90_J7T119 UniRef90-J7T119 UniRef90-B2AU57 UniRef90-Q0V1K3 UniRef90-U6SJ83 UniRef90-U6SJ83 UniRefe90C5H8J UniRef90-14HSC3 UniRef90-14HSC3 UniRef9-14HSC UniRe90_- R4KC2 UniRef90-R4KC21 UniRef90-R4KC21 UniRef90-J7SHA3 UniRef90-J7SHA3 UniRef90-J7SHA3 UniRet90_U6EWC2 UniRef90_UGEWC2
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UniRef90-UPIOOO2DDBODC UniRef90_S8A368 UniRef90 s8A368 UniRef90-S8A368 UniRef90_-J9RGX3 UniRef90-_9RGX3 UniRet90_W3X6Y9 UniRef90-14H6E2 UniRef90-H5WML5 UniRef90-H5WML5 UniRef90-H5WML5 UniRef90 W7SF40 UniRef90 ${ }^{-}$W7SF40 UniRef90-W7SF40 UniRef90_K2RA41 UniRef90 H1V143 UniRef90-H1V143 UniRef90-A0A037ZC64 UniRef90 AоАоз7ZC6 UniRef90 A0A037ZC64 UniRef90-UPIO002FBE41A UniRef90 UPIO002FBE41A UniRef90 UPI0002FBE41A UniRef90-UPIO002FBE41A UniRef90-UPIO002FBE41A UniRef90_S4Y8G7 UniRef90_S4Y8G7 UniRef90-S4Y8G7 UniRet90_S4Y8G7 UniRef90 E9E9U2 UniRef90-E9E9U2 UniRef90-E9E9U2 UniRef90_W6N659 UniRet90 W6N659 UniRet90-W6N659 UniRe990_C4RG20 UniRef90_L7vUC4 UniRef90 LTVUUC4 UniRef90_L7VUC4

QDRDHHGREYCRTTKDWYMSPLCLNYLRPTGT QDRDHHGREYCRTTKDWYMSPLCLNYLRPI GT QDRDHHGREYCRTTKDWYMSPLCLNYLRPIGT

I V A T S W I V A T S W $1 \vee$ A T S W

VDVNGWLS DATWS S
VADETKDACSEW

VDKQNY LRDTYFNGTKWVE GELYDQRWQCAPYSKLAAVRL ID QNNTVRQVTKSNEDWQPGPLSNLNDKASPSSGLQACWK RAGRNTMWHKWWDGAGWSRWEDLGAP RPGFVGKPGVASW RAGRNTMWHKWWDGAGWSRWEDLGAP RPGFVGKPGVASW LDRSAKVADRILSEGTWKDGKVDGWSTNPASTSRDTGGAF LQRDNTLSELYSPNGQWLPGSLNTLNPQASNGSRLAA YW



RGTDNSVFHIA WNGSLWSD RGTDNSVFHI A WNGSLWSD RGTDNSVFHIA WNGSLWSD

WY NHGGTVLED
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UniRef90 C1FM22 UniRef90-C1FM22
UniRet90 C1FM22 UniRef90-K5VHY6 UniRef90-K5VHY6 UniRef90-K5VHY6
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UniRef90-B2AU57 UniRef90-Q0V1K3 UniRef90-U6SJ83 UniRef90_U65J83 UniRef90-C5H834 UniRef90-E3QKG2 UniRef90 14 HSC 3
UniRef90 14 HSC UniRef90-l4HSC UniRef90 - 14 HSC UniRef90_R4KC21 UniRef90-R4KC21 UniRef90_J7SHA3 UniRef90_JTSHA3
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UniRef90 C4RG20 UniRef90-LTVUC4 UniRef90-L7VUC4 UniRef90_L7VUC4

SDASGTETRVFLQ SDASGTEIRVFLQ SDASGTE $\backslash R V F L Q$

NRQANIISPPVAGGRWSRWENLG NRQANIISPPVAGGRWSRWENLG NRQANI SPPVAGGRWSRWENGG DDTHMIVERCYSGSEWDWGKFLY DDTHMIVERCYSGSEWDWGKFLY DDTHMIVERCYSGSEWDWGKFLY PQQPK WHEWESWG
$P Q Q P K W H E S W$ WG PQQPKWHEWESWG
$P Q Q P K W H E W E S W G$ NTDSNDA DWLYYQDEDGYVQEFVEGKWREPQYGQK IDDD MKNRNIEETEYEGLLRAWDPWNNLG MKNRNI EETEYEGLLRAWDPWNNLG MKNRNI ETTEYEGLLRAWDPWNNGG MKNRNIEETEYEGLLRAWDPWNNLG VNHGGYDFVCLYYQDTDTGNIVLVNHSPTYKWQTGNPPLD GNYYGDSDGINWFAVDESTFQQYAWYNGSDAWVPVQRWS QSNR LDCFVQGRDNNLWHKWWDGSRWSGWENLGAP QSNR WNPDGDCYYQGRDNNLWHKWWDGSRWSGWENLGAP QVCPSCTDTLLLAY

ESNGQVQLDNSTKNQWQVMPSUST NVYVVAYSIEGVPIPSPGGTSGGGWETLG




SDGR TDVFVRGTDKALWHKW FHNGWSEWESLG SDGR IVVFVRGTDKALWHKW FHNGWSEWESLG RGSTPTDVGVWVAWQGPDRGFDKVANFSDYSAGVNAVDAN PAVAWSKGRLDVFTRGQDGAVYHNYGNGSPSSWSGWQSLG PAVAWSKGRLDVFIRGQDGAVYHNYGNGSPSSWSGWQSLG DVSTDTAGRLNVLYLRPDHRIAQLRQNPATGGWSRADVI D DVSTDTAGRLNVLYLRPDHRIAQLRQNPAI GGWSRADVI D DVSTDTAGRLNVLYLRPDHRIAQLRQNPALGGWSRADVID GRNR $\mid$ DTFARGTDNHLYHKWWNG SSWSGWEDLG
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GNNR IDVFARGEGNRLYHLWWDG ARWSRWENLG ARWSRWENLG GNNR DVFARGEGNRLYHLWWDG ARWSRWENLG TVYRYPEHLDVFAVASDGRTMSNWWDGWAGWFQLMGGU A TVIDRYPEHLDVFAVASDGRTMSNWWDGWAGWFQLMGGI A TVIDRYPEHLDVFAVASDGRTMSNWWDGWAGWFQLMGGi A TVIDRYPEHLDVFAVASDGRTMSNWWDGWAGWFQLMGGI A

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WNGSRWS NWESLGGTITSAPAVSSWAPNRLDTPARG WN G S R WS WN GSRWS WDGTAWWPTTT
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T D NALWHHKWWNGSRWSDWQS LGGNLTSAPAA T DNALWHKWWNGSRWSDWQSLGGNLTSAPAA T DNALWHKWWN GSRWSDWQS L G GN L T SAPAA TGPDSALHH KWWDGVRWESLGVPLGPGPAA

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UniRe990-J3P8Y1 UniRef90-J3P8Y1
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 UniRef90-U4LS06 UniRef90_U4LSO6 UniRef90 G4NAH4 UniRef90-V7FRS0 UniRef90-V7FRSO UniRef90_G5EHZ2 UniRef90 M7TQZ8 UniRef90-A0A010S3X5 UniRef90_A0A010S3X5 UniRef90_K5V739 UniRef90-K5V739 UniRef90_J3P8L9




LQSTDTAVVSA GSTMYAYFQGNDTKTYEVKSS A ALSFCSQRTNQTRVYYQDKKGELIESVSS $\square R P N A K L A V T G Y R I D D G F R I R L F F Q G P E G N L R Y S D Y S$
 $V S V V S R S A D K L D V F V T G S D G G I Y T A A W E$


VPGNGLAMASYDAGNSQQLETLFVNPAGALGLVWKT $V P G N G L A M A S Y / A G N S Q Q L E T L F V N P A G A L G L V W K T$
 TSTTAWSANRLDLFAVSAQDSSLQHKWW TSTTAWSANRLDLFAVSAQDSSLQHKWW TSTTAWSANRLDLFAVSAQDSSLQHKWW QSLGGTDQSRPTAVARDANRLDLFAVGTDSAVWHQAWD QSLGGTVQSRPTAVARDANRLDLFAVGTDSAVWHQAWD QSLGGTI QSRPTAVARDANRLDLFAVGTDSAVWHQAWD QSLGGTI QSRPTAVAR FKSPPAAVSW FKSPPAAVSW FKSPPAAVSW
FKSPPAAVSW
 S DRLDVVGGGGMDNQMYHRAFE QSN
SPLLQESALAGLNWKDSNDTHFQVYFQSRDGATMESAWN PGTAIAAVS RDPQSMEEWWDGPAGSVEANFWY PGTAIAAVS RIPQSMEEWWIGPAGSVEANFWY $\prod R Q N S G L A A V G W R T K D E R Y M Q L F Y Q D A D D N L M T S W F G$ PNEIRLDTRIAVTNFTDEVGNENYVIYQLYSGAIWYNDSE

UniRef90_W2SDB9
UniRef90_J3P8Y1
UniRef90-J3P8Y1 UniRef90_G9N5F8 UniRef90_A0A024F3J4 UniRef90-A0A024F3J4 UniRef90_A0A024F3J4
UniRef90_E9F5Z3
UniRef90_E9F5Z3 UniRef90-E9F5Z3 UniRef90_A0A021 W6B3 UniRef90_G9MYI9 UniRef90_G9MYI9 UniRef90_Q82B00 UniRef90_Q82B00 UniRef90_Q82B00 UniRef90_Q82B00 UniRef90-M1QJP2 UniRef90-M1QJP2 UniRef90-R8BJK1 UniRef90-M4FRZ5 UniRef90_S3CQD9 UniRef90_R8BLX2
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UniRef90-I7ZR21 UniRef90-M7T2C2 UniRef90 G9NRK5 UniRef90_G9NRK5 UniRef90-Q2GU17
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UniRef90_I7ZR21
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UniRef90_I7ZR21
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UniRef90_J3P8L9

N Q C
$A$ V V
$A V V$
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$S A G$
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130
140
150
160
QCARCANTTYVAFGDNNGFVQMGNFSSSGGWFNQLGNNLL
 SAGRR
$\vee F$
DVVFVR GTS GNGEAY ANL

| 1 | $D$ | $V$ | $V$ | $R$ | $G$ | $T$ | $D$ | $N$ | $A$ | $L$ | $W$ | $H$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |




REASHME
REASHMEI F Y VGNNGNLLMHSYSVDSGSNWVVTDAVLA
REASHMEI F YVGNNGNLMHSYSVDDSGSNWVTAAVLAA
 TAVVRYTNHMDLEVVGTDNRDYSTWWHDTTGWAAWNVSGG TAVVRYTNHMDLEVVGTDNRI YSTWWHDTTGWAAWNVSGG

 RIP G S MEVVWWI GAN GS V QDA Y WY GS Q WK R F E L A P A G
 HDSSS GAHQWAFFADIDNQETGHAESSWKWVYRKILPQDPA AQCENCSNTT I IAF QDKNGF IQTGNSSLDGTWSLNQLNNL Y V VS

 RGTDKLDI FVVGPDGKVQNGWEPKFP
S S S S V A W S A N R L D V S S V A W S A NR L D V S SVAA WS ANRLDVVF GIGGTDNACWHMWWNA S SWWGGWE S L L G
 W T T T S S Y S I R L F Y Q G K D G H L K G DVVN $H$ MCVV Y Q T P D GAVVKMVS F
GNGRIDDFAlGMDDQMYRKV
 QDTVVGTNNTLRVMWLS QDSHLTTLLRGEGA


APNRLDCFVTGANNQMFHKW
APNRLDCFVTGANNQMFHKW
APNRLDCFVTGANNQMFHKW F ENGWS GWENLGG FENGWS GWENLG FENGWS GWENLG
 E A V S WA A N R L D L F VI GT D S A L Y HKA WN GWTP S L T G F E N L G E AV S WA A NR L D L F VI GTDSALYHKAWNGWTPSLTGFENLG EAVSWAANRLDLVVI GTASALYHKAWNGWT
G
G

Q D T A S S N N T L R L M WL S Q GNH L T L L R G K GASPNVVRGF E PR Q D TAS SNNTLLRLLMWLSQGNHLLTLLDRGKGASPNVVRGFEPR E VA P Q G Q F R D L L T DD | $E$ | $V$ | $A$ | $P$ | $Q$ | $G$ | $Q$ | $F$ | $R$ | $D$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $E$ | $T$ | $I$ | $D$ |  |  |  |  |  |  |  |  |
| $E$ | $A$ | $P$ | $Q$ | $G$ | $Q$ | $F$ | $R$ | $D$ | $L$ | $L$ | $T$ |
| $I$ | $D$ |  |  |  |  |  |  |  |  |  |  |

K E S N S GS D S IDDLYYLDGS LDLR VI S K E S N S GS D S I D L Y Y L D G S L D L R V I S $G \vee W$ GVVWS S T P S S S A Q T F D PPNN PPNN QL E V L WKA QN GR WA R I S P P N



 $\left.\begin{array}{ccc|c|cccc|ccc|cccccc:c}T & E & N & Q & D & F & F & V & V & M & W & V & V & D & A & G A & W Q & G\end{array}\right]$ E H Q R P D S G A F $V \vee V S D Q A N R L D V Y V I \quad G T D S A L W H R Y W D G$



| $G A N R$ | L DVVF A |
| :---: | :---: |
| G A N R | L DV F A |
| $G A N R$ | D |

$G P G R L D A F G V G L$
$G P G R L D A F G V G L L$ DDQMYYKAFDNGQWQGDWKGMT GKF $G P G R L D A F G V G L \quad D D$ GPGRLDAFGVGL DDQMYYKAFDNGQWQGDWKGMTGKF
 QNFSNRSQNLVLLLYQTLGANSLSVSRYFSDRPWTVQQLSL

 CLDAPCPQWSYLFWQED DAVEGAGLE PGGQWETLGPSL Q Y G T G A V $\operatorname{P}$ P Q V QY G T G A V P QVEMFY T N D D N R L L GLLSIN EA I N S GYE E D S I K


## UniRef90_W2SDB9

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UniRef90_M1QJP2 UniRef90-R8BJK1 UniRef90_M4FRZ5 UniRef90_S3CQD9 UniRef90_R8BLX2
UniRef90 F4BZ97 UniRef90-F4BZ97
UniRef90-F4BZ97 UniRef90_F4BZ97 UniRef90-I7ZR21 UniRef90-I7ZR21 UniRef90_I7ZR21 UniRef90_I7ZR21 UniRef90-M7T2C2 UniRef90-G9NRK5
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UniRef90_V7FRS0 UniRef90_G5EHZ2 UniRef90_M7TQZ8 UniRef90_A0A010S3X5
UniRef90-A0A010S3X5 UniRef90-K5V739 UniRef90_K5V739
UniRef90_J3P8L9



D P A VG T G|L ALLQP F LP D Q\| N L Y Y QKAK NHNMTLLALDSP GWR D A A N G S AI T A Y H V Q K S TI HVVF F LID GNGHMKEMVSK GD D WT



| $G$ | $L$ | $T$ |
| :--- | :--- | :--- |
| $G$ | $L$ | $T$ |
| $G$ | $T$ | $V$ |
| $G$ | $T$ | 1 |
|  | $V$ |  |

S D P
S D P
S D P
S R
S R
S R LA GPGASVRSFADTNGLPRVVY LDSAGGLHELRINNGAWT GS DWGT GII GALSSNDQSQEVWWI TTTGAINYAPWNPN GWE GS DWGTGI GALSSSNDQSQEVWWITTTGAI NYAPWNPN GWE V A K P G S S QV A A L $V$ A K P G S QV A A L S R V T E HLLDVFAV G S D GLLV H S A WWD A S G G W
 S Q

K
D
D
DASPGS

| G | V | F | S |
| :--- | :--- | :--- | :--- |
| G | V | F | S |
| G | V | F | S | $G \vee V$

D

## T

 TGKFK SPPAAVVSWGSDRRLDVFGGGMDNQMYHRAFENAANT
 GILV S SPAAVSWGPNRIDCFAAGTNNHMWHKWW
 GILV SSPAAVSWGPNRIDCFAAGTNNHMWHKWW GILLV SSPAAVSWGPNRIDDCFAAGTNNHMWHKWW


 | 1 |  |  |  |  |  |  |  |  |
| ---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | $S$ | $R$ | $P$ | $R$ | $A$ | $T$ | $A$ | $W$ |
| $D$ | $S$ | $E$ | $P$ | $S$ | $A$ | $V$ | $A$ | $W$ |
| $D$ | $S$ | $E$ | $P$ | $S$ | $A$ | $V$ | $A$ | $W$ |
| $D$ | $S$ | $E$ | $P$ | $S$ | $A$ | $V$ | $A$ | $W$ | $A N R L D$

$S G N M T$ S GNMMTV | G | $A$ |
| :--- | :--- | S GNMTVVAV G $G T$

$G T$
$G T N$ A LLHKA WH GT T WS G A L L GA L L HKA WH GTTWWS




 KKDKNARLAAYALCPNTSLVAYASNGSVVLYNHTAPAAWE V A P P P G G G I S A A A F Y P N N Q L E A A L VAPPGGGGISAAFYPNNQLEALFVANDGAVRVAWKANN GAW P P S Y G TVVGAAPIGPGSIMHYGPSNTPPTLQVINPATCTN


## 

 LGSVP
## GA A L

GALESVP
K SAP
$K$
$K$
$K$
$K$ A P

KSAP
 SILDGSPLALARSGNPSTRLYLADSNENLMQCQFDFQTGN
 S A AVGG GTI A T L S RIP N S L E L WWIG P H G S V A N F WY E G G Q P Y NADKGTPL LALDVAAKHVRLGYRNTDGNLALYERDSTG

 ALVAGSSMAASTWADGDTRYILDDPT GTIRELLKYDS S GWR

UniRef90_W2SDB9
UniRef90_J3P8Y1
UniRef90_J3P8Y1 UniRef90_G9N5F8 UniRef90_A0A024F3J4 UniRef90_A0A024F3J4 UniRef90_A0A024F3J4
UniRef90_E9F5Z3
UniRef90_E9F5Z3 UniRef90_E9F5Z3 UniRef90_A0A021W6B3
UniRef90_G9MYI9 UniRef90_G9MYI9 UniRef90_Q82B00 UniRef90_Q82B00 UniRef90_Q82B00 UniRef90_Q82B00 UniRef90_Q82B00 UniRef90_M1QJP2 UniRef90_M1QJP2
UniRef90_R8BJK1 UniRef90-M4FRZ5 UniRef90_S3CQD9 UniRef90_R8BLX2
UniRef90 F4BZ97 UniRef90-F4BZ97 UniRef90_F4BZ97 UniRef90_I7ZR21 UniRef90_I7ZR21 UniRef90_I7ZR21 UniRef90_I7ZR21 UniRef90-M7T2C2 UniRef90_G9NRK5 UniRef90_G9NRK5 UniRef90-Q2GU17 UniRef90- W6XYS5 UniRef90-W6XYS5 UniRef90-W7HUV1 UniRef90_W7HUV1 UniRef90_R8GGA1 UniRef90_R8GGA1 UniRef90_R8GGA1 UniRef90_R8GGA1 UniRef90_R8GGA1 UniRef90_UPI0002882758 UniRef90 UPI0002882758 UniRef90_UPI0002882758 UniRef90_UPI0002882758 UniRef90_B2AQG3 UniRef90_B2AQG3 UniRef90_B2AQG3 UniRef90_S7ZYY2 UniRef90-S7ZYY2 UniRef90-K4ZME6 UniRef90_K4ZME6 UniRef90_W9YJF3 UniRef90 ${ }^{-}$W9YJF3 UniRef90_UPI0003605FF7 UniRef90-UPI0003605FF7 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_B2ACH9 UniRef90_B2ACH9 UniRef90-B2ACH9 UniRef90 G2QVJ1 UniRef90_G2QVJ1 UniRef90_G2QVJ1 UniRef90_G2QVJ1 UniRef90-M2UWK5
UniRef90-M2UWK5 UniRef90 ${ }^{-}$M2UWK5 UniRef90 M2UWK5 UniRef90_U4LS06 UniRef90_U4LS06 UniRef90_G4NAH4 UniRef90_V7FRS0
UniRef90_V7FRS0 UniRef90 G5EHZ2 UniRef90 M7TQZ8 UniRef90-A0A010S3X5 UniRef90_A0A010S3X5 UniRef90_K5V739 UniRef90_K5V739 UniRef90_J3P8L9

LNQTYAAFSKGSPワAAASSYSNSWIVVLSILSSSG $\square K V N$


WGNWGGDVRPGTAPDVVAWG WGNWGGDVRPGTAPDVVAWG WGNWGGDVRPGTAPDVVAWG $T \vee G L$
$T \vee G L$
ELAPAGSAARNGSTIALSRDPNS MEVWWDGANGSVQGAF ELAPA GSAARNGSI I ALLSRIPNS MEVWWI GANGSSVQGAF ELAPAGSAARNGSI IAA SRIPNS MEVWWI GANGSVVQGAF $N G G I Y L E G S E S L S A S A S V A N G S S Q L N L Y Y Q T G D G N L Q L T S$ $N G G I Y L E G S E S L S A S A S V A N G S S Q L N L Y Y Q T G D G N L Q L T S$
 NAPVGISAAAGAGITLQRYPPNNQFEAFFVDNNGNVI WKA VGQRVAPSAEDDAAVDYLYGTPGQLDDFVADRFGSVAVKW





A WE LIGGT LV
A WELL GGTLV A WELI GGTLV A WELI GGTLV G T W W T L G G K F K GT WGT L G GK K K T GTWGT ${ }^{-1} G G K F K T$
TTWDTM QNPPGAATGNDQFKSTQGLRLYWQGFEGDIISAR TTWDTPQNPPGAAI GNDQFKSTQGLRRLYWQGFEGDII SAR $L G R L S P T A L Q A Q A P L A V I P R D N T G F$
QLA PNGSAAINGGIAAVSRDPGS MEVWWTGPNGSMEAAF QLAPN GSAAINGGIAAVSRIPGS MEVWWTGPNGSMEAAF KAT DATASLG $\square P$ I ANARAATGPG $\square N T F V L W Q D G R \square L T Q T$ $T G P Y K G Y A L P R T G V A A F T T G T N L G F Q V L T A D P D N G V Q L T Y$


 L G A T L E G A R I G T G L A A A V S L T A S K I H V V F H Q T T D G V I R D C V

UniRef90 W2SDB9
UniRef90-J3P8Y1
UniRef90-J3P8Y1 UniRef90- G9N5F8 UniRef90 A0A024F3J4 UniRef90_A0A024F3J4
UniRef90-A0A024F3J4 UniRef90-E9F5Z3 UniRef90-E9F5Z3 UniRef90_E9F5Z3 UniRef90_A0A021W6B3
UniRef90 G9MYI9 UniRef90_G9MYI9 UniRef90_Q82B00 UniRef90_Q82B00 UniRef90-Q82B00 UniRef90_Q82B00 UniRef90_Q82B00 UniRef90_M1QJP2 UniRef90_M1QJP2
UniRef90-R8BJK1 UniRef90-M4FRZ5 UniRef90_S3CQD9 UniRef90_R8BLX2 UniRef90_F4BZ97 UniRef90 F4BZ97 UniRef90 F4BZ97 UniRef90_I7ZR21 UniRef90_17ZR21 UniRef90_I7ZR21 UniRef90_I7ZR21 UniRef90-M7T2C2 UniRef90_G9NRK5 UniRef90_G9NRK5 UniRef90_Q2GU17 UniRef90_W6XYS5 UniRef90 W6XYS5 UniRef90_W6XYS5 UniRef90-W7HUV1 UniRef90 W7HUV1 UniRef90_R8GGA1 UniRef90_R8GGA1 UniRef90_R8GGA1 UniRef90 R8GGA1 UniRef90_R8GGA1 UniRef90_UPI0002882758 UniRef90_UPI0002882758 UniRef90 UPI0002882758 UniRef90_UPI0002882758 UniRef90_B2AQG3 UniRef90 B2AQG3 UniRef90_B2AQG3 UniRef90_S7ZYY2 UniRef90-K4ZME6 UniRef90_K4ZME6 UniRef90_K4ZME6 UniRef90_W9YJF3 UniRef90_W9YJF3 UniRef90_UPI0003605FF7 UniRef90_UPI0003605FF7 UniRef90 UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90_B2ACH9 UniRef90_B2ACH9 UniRef90_B2ACH9 UniRef90 B2ACH9 UniRef90_G2QVJ1 UniRef90_G2QVJ1 UniRef90_G2QVJ1 UniRef90 G2QVJ1 UniRef90_M2UWK5 UniRef90-M2UWK5 UniRef90_M2UWK5 UniRef90 M2UWK5 UniRef90_U4LS06 UniRef90_U4LS06 UniRef90 G4NAH4 UniRef90_V7FRS0 UniRef90_V7FRS0 UniRef90-G5EHZ2 UniRef90_A0A010S3X! UniRef90_A0A010S3X5 UniRef90 K5V739 UniRef90_K5V739 UniRef90-J3P8L9
 S E S S W K WVVYRRKM L ED D GWRTSSTPTSLGSPDKGTGDSCLTPTLWAVASLRCYY F F
F

WN G Q W LTRGA LK ANADPMGFVDANGVARIVYRGDE DMQA WQSEQPNTWRFEKLSDMPAAI G SLTAVSMNSQHMEVFW WQSEQPNLUWRFEKLSDMPAA LGG SLLTAVSMNSQHMEVFW


A T N G Q WT A S W ATNGQWTASW ATNGQWTASW

DNMGGSVT TKPSGLAWDNGKVDVYG D N M G G S V T T K P S GL A WD N G KVV DVY G DNMGGSVTTKPSGLAWDNGKVDVYG


WN G GWSATEVFK GAKTLENMAAVPKLMANGTMEEESLFF WNGGWSATEVFKGAKTLENMAAVPKLMANGTMEEESLFF

WGGQWTRYQLAPD
G S A A T N G G $\square$ A A VS R $\square$ P S S ME L WW $W G G Q W T R Y Q L A P D \quad G S A A T N G G I A A V S R \| P S S M E L D W$ $D G G K D W K G P A S D N E G M G G S D D P G Q L G V A L T T S S D M N R C F F$ YRDDEWT VAEEVAELADCQPLATMAATRARRVYCVVKT
 PDNSWPSGFTVVPTI SKGGSFAAFS MARQSDARVVVVYLLF WD GTWSRDPAV QI T DGAPATMISAVSWQIPGGDAMGI FY


UniRef90 W2SDB9
UniRef90_J3P8Y1 UniRef90_J3P8Y1 UniRef90_G9N5F8 UniRef90 A0A024F3J4 UniRef90_A0A024F3J4 UniRef90_A0A024F3J4
UniRef90_E9F5Z3
UniRef90_E9F5Z3
UniRef90_E9F5Z3
UniRef90_A0A021W6B3
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UniRef90-F4BZ97 UniRef90 F4BZ97 UniRef90_F4BZ97 UniRef90-I7ZR21
UniRef90_17ZR21
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UniRef90_UPI0003605FF7 UniRef90_UPI0003605FF7 UniRef90-UPI0003720809 UniRef90_UPI0003720809 UniRef90-UPI0003720809 UniRef90_UPI0003720809 UniRef90_UPI0003720809 UniRef90-UPI0003720809 UniRef90 B2ACH9 UniRef90_B2ACH9 UniRef90-B2ACH9 UniRer90-B2ACH UniRef90_G2QVJ1
UniRef90_G2QVJ1 UniRef90_G2QVJ1 UniRef90 G2QVJ1 UniRef90-M2UWK5 UniRef90-M2UWK5 UniRef90_M2UWK5 UniRef90_M2UWK5 UniRef90_U4LS06 UniRef90_U4LS06 UniRef90 G4NAH4 UniRef90_-V7FRS0 UniRef90_V7FRS0 UniRef90_G5EHZ2 UniRef90 M7TQZ8 UniRef90-A0A010S3X5 UniRef90_A0A010S3X5 UniRef90 K5V73 UniRef90_K5V739
UniRef90_J3P8L9

Q D H T G D $\quad$ N Y Y S W D D K K I L Q D H T G Di N Y Y S WD D K K I L V T H D K V Q I S T P L A $L \mathrm{D}$ D GQUREVQY DGSNWSVIGNVQ

QASDDNMLHELFYS GGQW
TAPD GTITHA YWYENTG
TAPD GTITHAYWYENTG
$\prod$ I A N G S VQ D A Y WY E G S Q WK R FE LA S A G S A S I GANGSVQDAYWYEGSQWKRFELASAGSAS GVMD GK I E E Y S WF
LHKSLSHPTAVVFDGSSW
EGAKEK L R GWKMADDTNWEDMGDVD
Q S E G K V K E VVRF D G L N W WLDD L G F L P T
TS E A GK L Y T K SSS D S WN G WT T
T S E A G G K L Y $\quad$ T K S S S D S W WN G W W T


TDNAVWHKWWNGSSWGGWESLGGVATS
TDNAVWHKWWNGSSWGGWESLGGVATS
Q G
Q D G D Q K L Q A E GR S S S T T S L K A D A P A VA P Q V
I GMDDQMYHKAFDNNGDWKGMTGKFKSAPAA I GMDDQMYHKAFDNNGDWKGMTGKFKSAPAA IGMDDQMYHKAFDNNGDWKGMTGKFKSAPAA
$M A S D G S$
$M A S D G S$
$M A S D G S$

1 G P N G SVQ S A F WY E G S Q WQRYELA P A GSAS I GPNGSVQQSAFWYEGSQWQRYELAPAGSAS IGPNGSVQSAFWYEGSQWQRYELAPAGSAS GD D GNAHVQAVWDSSSGSYSGLTVFDWSDNAW GDD GNAHVQAVWDSSSGSYSGLTVFDWSDNAW A NGGVT LL WK A Q N G A W
ANGGVTLLWKAQNGAW
VD GNGVVNVMWVVDGGAWQP\|GLTPPGTA

 $\vee D G N G V V N V M W V V D G G A W Q P D G L T P P C T A$



## SEDGSDNHFLWKRKDGWTRQ <br> SEDGSINHFLWKRKDGWTRQ

VD G G GRITSAAFWYEGGQWTR
VDGGGRISAAFWYEGGQWTR
QAGR RLKQVWHDGKQWVDLGFV
DDDTAEIVEFAWNGDTSYRRVGTVNTTV
DDASSSN NVLRNSAS GWE
IDASSSNINVLRNSASGWE
S G N
SGN
LAR D G

SAAANVAVLSRGPYS LNVFFSGDDGRVRHKAWG SAAANVAVLSRGPYSLNVFFSGDDGRVRHKAWG SAAANVAVLSRGPYSLVVVFSGDDGRVRHKAWG


PHRAWES
PHRAWES
PHRAWES

LG Q K $\quad$ Q Y T P
L G Q K I Q Y T P
L GQK I Q Y T P

S GASFFENRWDVFV


GNKRWDPHWE ILGGDNLMPGGYFAATARHSQN GNKRWDPHWEILGGDNLMPGGYFAATARHSQN GNKRWDPHWEILGGDNLMPGGYFAATARHSQN





UniRef90 C7YJ89 UniRef90-C7YJ89 UniRef90-C7YJ89 UniRef90 ${ }^{-}$B9XAD5 UniRef90-GORBN1 UniRef90-UPIO00463DDB2 UniRef90 UPI000463DDB2 UniRef90-UPI000463DDB2 UniRef90-UP1000463DDB2 UniRef90-UP1000463DDB2
UniRef90-UPIO00463DDB2 UniRef90-G1XPM3 UniRef90-G1XPM3 UniRef90-D5GHT7 UniRef90-D5GHT7
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UniRef90-M2TD05 UniRef90-M2TD05 UniRef90-M2TD05 UniRef90_M2TD05 UniRef90-L7U5V8 UniRef90-L7U5V8 UniRef90-L7U5V8 UniRef90-L7U5V8 UniRef90_S8A705 UniRef90-S8A705 UniRet90_N1WPO2 UniRet90 N1WP02 UniRef90-N1WPO2 UniRef90-FOMBY4 UniRef90 FOMBY4 UniRef90-FOMBY4 UniRef90-S8C2C6 UniRet90-S8C2C6 UniRet90_S8C2C6 UniRef90-C6WFV7 UniRef90-C6WFV7 UniRef90_S8BN14 UniRef90 S8BN14 UniRef90-S8BN14 UniRef90-W4NVRO UniRet90 W4NVRO UniRet90 W4NVRO UniRef90-W4NVRO UniRef90 ${ }^{-}$W4NVR0 UniRef90 W W NVR0 UniRef90_W4NVR0 UniRef90-A7NKV2 UniRef90_A7NKV2 UniRef90-A7NKV2 UniRef90_J4KR73 UniRef90 J4KR73 UniRef90-JUKR73
UniRef90 J4KR73 UniRef90 H8MZ53 UniRef90 H8MZ53 UniRef90-H8MZ53 UniRef90_UP100037D1CEF UniRef90 UP100037D1CEF UniRef90-R8B8M9 UniRef90-S8A8Y7 UniRef90 S8A8Y7 UniRef90-s8A8Y7 UniRef90-M7SBRO UniRet90_M7SBRO UniRef90 W3WNV4 UniRef90-F9G9H5 UniRef90_F9G9H5 UniRef90-UPIO00468CF02 UniRef90 UPIOO0468CF02 UniRef90-E9EIX7 UniRef90-E9EIX7 UniRef90-Q2H1B0 UniRef90-Q2H1B0 UniRef90-Q2H1B0 UniRef90 Q2H1B0 UniRet90-G4N5X0 UniRet90_A5UU42 UniRef90_A5UU42 UniRef90 A5UU42 UniRef90_W3WXQ6

T S T T S S P P LLATPGTFASVK S S
TS T TSS P P L L A T P GTFASVK S S CDTNEAVLYRRWNTDSWNKWESLGGKSIGAPT$V V S W$ CDTNEAVLYRRWNTDSWNKWESLGGKSI GAPT$\quad V V S W$ CDTNEAVLYRRWNTDSWNKWESLGGKSIGAPT VVSW HS SVANAVM HSSVANAVM RGKDGCVYTSWws grgwsregwaplgatrppgs an RGKDGCVYTSWWSGRGWSREGWAPLGGTFPPGSP RGKDGCVYTSWWSGRGWSREGWAPLGGTFPPGSPISATV
RGEDSAVWHKWWNGSSWSGWESLGGVIIDNP RGEDSAVWHKWWNGSSWSGWESLGGVIIDNP AAVSW YYKNQGWSPDDVDRAYYPVREGGEFAFTQW YYKNQGWSPDDVDRAYYPVREGGEFAFTQW

TRKDGVVCTSWLAPGA
I RKDGVVCTSWLAPGA
I RKD GVVCTSWLAPGA
I RKD GVVVC S WLLA P G A
I RKDGVVCTSWLAPGA

1 RKDGVVCTS WLAP GA

| $P$ | $D$ | $D$ | $V$ | $D$ | $R$ | $A$ | $Y$ | $Y$ | $P$ | $V$ | $R$ | $E$ | $G$ | $G$ | $E$ | $F$ | $A$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

VGNSRHVHELWENSDGWAQQDLNLVTNAPAADNDTALTGF $V G N S R H V H E L W E N S D G W A Q Q D L N L V T N A P A A D N D T A L T G F$
 RDD A GRLMQAFRSGAGWSVSVLGGGATARPAAVWH RDDAGRLMQAFRSGAGWSVSVLGG ATLARPAAVWH RGTSGKIEGQNWRDGGPATGSIVNASFTPAADSRLATYW


UniRef90_C7YJ89
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UniRef90_B9XAD5
UniRef90_B9XAD5
UniRef90_G0RBN1
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UniRef90_UPI000463DDB2
UniRef90_UPI000463DDB2
UniRef90_UPI000463DDB2
UniRef90_UPI000463DDB2 UniRef90_G1XPM3 UniRef90_G1 XPM3 UniRef90_D5GHT7 UniRef90_D5GHKN4 UniRef90-M5DKN4 UniRef90_M5DKN4 UniRef90-M5DKN4 UniRef90_UPI00047C253F UniRef90_UPI00047C253F UniRef90_UPI00047C253F UniRef90_UPI00047C253F UniRef90-G2XDC6
UniRef90_M2TD05 UniRef90_M2TD05 UniRef90-M2TD05
UniRef90-M2TD05 UniRef90_M2U5 UniRef90_L7U5V8 UniRef90_L7U5V8 UniRef90_L7U5V8 UniRef90_S8A705
UniRef90_S8A705 UniRef90_N1WP02 UniRef90_N1WP02 UniRef90-N1WP02
UniRef90-F0MBY4 UniRef90_F0MBY4 UniRef90_F0MBY4 UniRef90-S8C2C6 UniRef90_S8C2C6 UniRef90_S8C2C6 UniRef90_C6WFV7 UniRef90_S8BN14 UniRef90_S8BN14
UniRef90 UniRef90_W4NVR0 UniRef90-W4NVR0 UniRef90_W4NVR0 UniRef90_W4NVR0 UniRef90_W4NVR0 UniRef90-W4NVR0
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UniRef90_J4KR73 UniRef90-J4KR73 UniRef90_H8MZ53 UniRef90_H8MZ53 UniRef90-H8MZ53 UniRef90_UPI00037D1CEF UniRef90_UPIO0037D1CEF UniRef90_R8B8M9 UniRef90_S8A8Y7 UniRef90_S8A8Y7 UniRef90_S8A8Y7
UniRef90_M7SBR0 UniRef90-M7SBR0 UniRef90_W3WNV4 UniRef90_F9G9H5
UniRef90 F9G9H5 UniRef90_UPI000468CF02 UniRef90_UPI000468CF02 UniRef90_E9EIX7 UniRef90_E9EIX7 UniRef90_Q2H1B0 UniRef90_Q2H1B0
UniRef90_Q2H1B0 UniRef90-Q2H1B0 UniRef90_G4N5X0 UniRef90-A5UU42 UniRef90-A5UU42 UniRef90_A5UU42 UniRef90_W3WXQ6
UniRef90_W3WM51

170
180
190
200
D A A P GS SIVASVGWWADETRVVYYVANGGNLQERTNHSSGWK D A A P G S S V A S V G WWA DE T R V Y Y Y VA N G G NL Q E RI N H S S G WK
 $N G V S S Y G P G I A S W G V N R L D A F C A A T D S S L Q H K Y W N G A G W F$ SAFAE $\square P Y S V N T A G S G G E R D I Y Q R D D Q K L H K R A N L T D E L S$


A
A A A

 Q L T (

 $V$ V $\operatorname{G}$ K P $\operatorname{C}$ G G Q V
 GARPGS QVAAVSRVTEHLDVLVVGSHSVVYSTWWNASTGW

 LT
A
K S A P
K S A P
K S A P
GYTP
$G Y T$
$G Y T$
$G Y T P$
A AVS W
S GPAVA A A R GK GR I DVVFGIVGLD DAVWQQYY T D GK WS
$P$ PR S GPAVAARGSSRVDVVVRGGDNQLHQRYWNGSAWS

GKIVGAP TVVNWGPNRLDLFVRGTDAGVYHKCWDGTQWS
GKIV GA P TVVVSWGPNRLDLLFVRGTDAGVVHKCWDGTCWS GV GVIT S DVAVGNNKDGRMEAFAKGTD GAVWHRWQTN GNWS
 PFVLNGQATSLSMSPSNLDIVLVRSSGEVITSNFTTDCWV


## K K

V F
G C
$V$ FPA GAP
$V$ F P A GAP
$V$ F PAGAP

| V | F |
| :--- | :--- |
| V | F |
| V | F |
| V |  |

V F P A GAP

| $V$ | $F$ | $P A$ |
| :--- | :--- | :--- |
| $V$ | $F$ | $P A$ |
| $V$ | $A$ |  |
|  |  |  |

$G G \perp A$
G GLLA
G GLL $\begin{array}{ll}A & \text { S A P } \\ A & \text { S A P }\end{array}$
L A $\mathrm{A} V \mathrm{P}$ P S G II A A V S RHP
LAVPGSGI A AVSRHPNTMELWS


GAAPATALTSFAVNPGHPRVYFLLDSNAVGELWSDGASWH
GAAPATALTSEAVNPGHPRVYFLLDSNAVGELWSDGASWH
GA APATALLTSFAVNPGHPRVYF L L D S N A V GE L W WS D GA S WH
TMAATSAPTIATFDGSRVDVVARGTDRGUWHAVKGPA GWS VS GTAA GPLI A SHNGREL RVLYRRTEGKMYEFNRNS GGTT
 TPLPGT FAAVSNGGGSITFLYQDYLSTG\|YMWTDGNGGR
 S S A K T N D L A A A L Y P V S S A V A A A ML G D
S GWP G G GVVAMYPFASSEI RFYYQT NT IIEDS $\square Q N$
QA GK G
QA GK G
S GLT GS P T A L L A
LTVF Y I GK D S QL H A I THKN GA WA S GLTGGSPTAALA S S STVVVFFRGAGNAAFHVWY GTS WS
 GSVMDDPSAI WMKDEEGIRIVARNRLGQLIEKAFTNGEWQ GSMY TKPNAVTWDDGKMDVYGSGSDGSCRRCY
GSMY TKPNAVTWDDGKMDVYGSGSDGSCRRCY
GSMY TKKPNAVTWDDGKMDVVGGSGSDGSCRRCY




UniRef90 C7YJ89 UniRef90-CYYJ89
UniRef90-C7YJ89 UniRef90_B9XAD5 UniRef90_B9XAD5 UniRef90_GORBN1 UniRef90_UPI000463DDB2 UniRef90_UPI000463DDB2 UniRef90_UPI000463DDB2 UniRef90_UPI000463DDB2 UniRef90_UPI000463DDB2 UniRef90-UPI000463DDB2 UniRef90_G1XPM3
UniRef90_G1 XPM3
UniRef90_D5GHT7 UniRef90_D5GHT7 UniRef90-M5DKN4 UniRef90 M5DKN4 UniRef90-M5DKN4 UniRef90_UPI00047C253F UniRef90_UPI00047C253F UniRef90_UPI00047C253F UniRef90_UPI00047C253F UniRef90_G2XDC6
UniRef90_M2TD05 UniRef90_M2TD05 UniRef90_M2TD05 UniRef90_M2TD05 UniRef90_L7U5V8 UniRef90_L7U5V8 UniRef90-L7U5V8 UniRef90_L7U5V8 UniRef90_S8A705 UniRef90_S8A705 UniRef90_N1WP02 UniRef90 N1WP02 UniRef90-N1WP02
UniRef90- F0MBY4 UniRef90 F0MBY4 UniRef90_F0MBY4 UniRef90_S8C2C6 UniRef90_S8C2C6 UniRef90 S8C2C6 UniRef90_C6WFV7 UniRef90-C6WFV7 UniRef90_S8BN14 UniRef90 S8BN14 UniRef90_S8BN14 UniRef90 W4NVR0 UniRef90_W4NVR0 UniRef90_W4NVR0 UniRef90-W4NVR0
UniRef90- W4NVR0 UniRef90 W4NVR0 UniRef90-W4NVR0 UniRef90_W4NVR0 UniRef90_A7NKV2 UniRef90_A7NKV2 UniRef90_A7NKV2 UniRef90_J4KR73 UniRef90_J4KR73
UniRef90_J4KR73
UniRef90_J4KR73
UniRef90_H8MZ53
UniRef90_H8MZ53
UniRef90_H8MZ53
UniRef90_UPI00037D1CEF UniRef90_UPI00037D1CEF UniRef90_R8B8M9 UniRef90_S8A8Y7 UniRef90_S8A8Y7 UniRef90_S8A8Y7 UniRef90_M7SBR0
UniRef90 UniRef90-W3WNV4 UniRef90_F9G9H5 UniRef90_F9G9H5 UniRef90_UPI000468CF02 UniRef90_UPI000468CF02 UniRef90_E9EIX7 UniRef90_E9EIX7 UniRef90_Q2H1B0 UniRef90_Q2H1B0 UniRef90_Q2H1B0 UniReso-Q2H1B0 UniRef90-G4N5X0
UniRef90_A5UU42 UniRef90-A5UU42 UniRef90 A5UU42 UniRef90_W3WXQ6 UniRef90_W3WM51
 GDWFPVPGAAKQPVAAVS R D P $\quad$ R I T LLE S S S P L A N
 K GDAPPQARSGSGLAVLLFSDRNQAELYYQNMDGKLVSYD A GWF A LGV
A GWF AL GVV
A GWFA L GV
A GWF A L GV
A GWFQVG
A GWFQVG
A GWFQVG
A GWF QVG
GVAD T GS GTPYTVLAAFTAGTSDDLKVQVLGLDGLLYNYS GKFVSLGGKFKT GKFVVSGGKFK T

| $G$ | $K$ | $F$ | $V$ | $S$ | $G$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $K$ | $K$ | $F$ | $K$ | $T$ |
| $G$ | $V$ | $S$ | $G$ | $G$ | $K$ |



SLGGSPASTSARNGII
SLLGSPASTSARNGI
GWES LGGTIIDNPAAVSWGPNR IDLFGAGADNALWHK W GWESLGGTII DNPAAVSWGPNR I DLIFGAGADNALWHKW

 SGADGGVFPVGAPIAAVARRPD

## S <br> $S$ $S$ $S$ $S$ $S$ $S$ $S$

 $\begin{array}{llllllllllllll}G & A & G & G & V & F & P & V & G & A & P & I & A & A \\ G & V & A & R & R & P & D & N \\ G & G & V & F & P & V & G & A & P & A & A & V & A & R\end{array} R$


LG R Y T A P GES NPK K VA SPRNYHSEA IIMSMDGAGNDTGTY EEDSPGKKKWPARLAVVSPLDSDEMWVYYMSGNKWQELHR E E D S P G K K K WP A R L A V V S PLLD S D E I W V Y Y M S G N K I Q E L HR G


UniRef90 C7YJ89 UniRef90-C7YJ89 UniRef90-C7YJ89 UniRef90-B9XAD5 UniRef90-G0RBN1 UniRef90-UPIO00463DDB2 UniRef90-UPI000463DDB2 UniRef90-UPI000463DDB2 UniRef90-UPIO00463DDB2 UniRef90-UPIO00463DDB2 UniRef90 UPI000463DDB2 UniRef90-G1XPM3
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UniRef90 M2TD05 UniRef90-M2TD05 UniRef90-M2TD05 UniRet90_M2TD05 UniRef90 L7 45 V8 UniRef90-L7U5V8 UniRef90-L7U5V8 UniRef90 L7U5V8 UniRef90 S8A705 UniRef90-S8A705 UniRet90_N1WPO2 UniRet90 N1WP02 UniRef90-N1WPO2 UniRef90-FOMBY4 UniRet90 FOMBY4 UniRef90-FOMBY4 UniRef90-S8C2C6 UniRef90_S8C2C6 UniRef90 S8C2C6 UniRef90-C6WFV7
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YQNA WLMAYQYGQAKEYПPTMANNRLTANQAGRVYGT\|V


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VIDTNDVLAYVY A DDHTGW VDTNDVLAYVYADDHTGW VDTNDVLAYVYADDHTGW
TDNALWHMYYTGGNWSAPQSLGGTLTSGPAA TDNALWHMYYTGGNWSAPQSLGGTLTSGPAA
LVDGH IREVHY DGSNWSVIGNVQ
HGYDSRVWTQFWSADNGWHADWMPTPGAA HGYDSRVWTQFWSADNGWHADWMPTPGAA HGYDSRVWTQFWSADNGWHADWMPTPGAA HGYDSRVWTQFWSADNGWHADWMPTPGAA HGYDSRVWTQFWSADNGWHADWMPTPGAA HGYDSRVWTQFWSADNGWHADWMPTPGAA

QNTSVVIYE WMWEGGNSYKP $\square$ GVVNTTLPSG

RGTDNQLWQKYWTSWSAWTPLGGY LTSAPA RGTDNQLWQKYWTSWSAWTPLGGYLTSAPA RGTDNQLWQKYWTSWSAWTPLGGYLTSAPA RGTDNQLWQKYWTSWSAWTPLGGYLTSAPA


TDGAVWHRWQTTGNWS GWNSLGGVITS TDGAVWHRWQTTGNWSGWNSLGGVI TS TDGAVWHRWQTTGNWSGWNSLGGVITS

T DNALWHKWWDGSSWLGWESLGGTFQHAPAA T DNALWHKWWDGSSWLGWESLGGTFQHAPAA QAEDGSIQERCKTGDSPWTRGNFLNIS QAEDGS I QERCKTGDSPWTRGNFELNI S QAEDGSI QERCKTGDSPWTRGNFLNIIS


 $V G N D G L V Y T S W L A P G A D W S I G G V F P A G A P I A$
 $\begin{array}{ll}V G N D G L V Y T S W L A P G A D W S I G G V & F P A G A P I A \\ R G S N N K L Y R R V W N W T D W E D L G V G G T S A P S A\end{array}$ RGSNNKLYRRVWNQWTI WEDLGVGGTSAPSA RGSNNKLYRRVWNQWT WEDLGVGGTSAPSA A GLDGSVKDHYWYEGA GWKNFQLAPP A GLDGSVKDHYWYEGAGWKNFQLAPP A GLDGSVKDHYWYEGAGWKNFQLAPP A GLDGSVKDHYWYEGAGWKNFQLAPP

RDSDVWTTQRTGTNWTAWSS LRGPVTSVP RDSDVWTTQRTGTNWTAWSSLRGPVTSVP QVGGALKEVWYNGSKWVDMGFV


$\square$ S NGSA $\square$ MA YS WSAES
S S S S LN HVWY GNTWSALGDPYTSAA


G $\square$ S G GR】HELTATASNPWTWTGVVKTA

APITATSRGHGNIDDLITGNDGHVYTSWWY A P I T A T S R G H G NI D L FITTGNDGHVYTS WWY A P I T A T S R G H G N I D L F I T G N D G H V Y T S W W Y SRLSAVNWQGKDEEHI RLFYQSRDDHI QEAKWN S R L S A V N W WQ G K D E E H I R R L F Y Q S S R D D H I Q E A K WN SRLSAVNWQGKDEEHIRLFYQSRDDHIQEAKWN


LLT TE LDAVSV GTDDH LFYQNGQ DTFETHSA





#### Abstract

LEGTS I GRPKAVSWGPDR\|DLFIKGADNWVYH L E GTSI GRPKAVSWGPDRIDLEIKGADNWVYH  | $P S Q Q$ | $P P S G V G R P S F I F G P Q N A Q H V V Y R S S D G S I Y D L F W T$ |
| :--- | :--- | :--- | :--- | 


## LVDTN TAA $\square N F T D S S N A T R R \square F Y Q D G N G N T T W K Q \square D$ I STPTSVSWRENRLDYFVVGTNGSLYNRFWN I STPTSVSWRENRLDYFVVGTNGSLYNRFWN STPTSVSWRENRLDYFVVGTNGSLYNRFWN



TGLAVTELGDSGG YRLYYHDEDGLVNMLAYD TGLAVTELGDSGG YRLYYHDEDGLVNMLAYD $P$ PA AVTVW SKGRDDVVVLDGDGNVYHNYGN P PAAVTW PPAAVTW
PPAAVTW $\begin{array}{llllllllllllllllll}\text { S } & K & G & R & L & D & V & F & V & L & G & L & D & G & N & V & Y & H \\ S & N & Y & G \\ S & K & G & R & L & D & V & F & V & L & G & L & D & G & N & V & Y & H \\ N & Y & G & N\end{array}$ SKGRLDVFVLGLDGNVYHNYGN
 UniRef90-R8BN52 UniRef90 R8BN5 UniRef90 A1VRS4 UniRef90-A1VRS4 UniRef90-A1VRS4 UniRef90 M7SLP3 UniRef90-G2RB90 UniRef90_G2RB90


N GQA WVQDTTPDAKDGDYAGSADTAYYVDKDNAHTDHLLY


K G WN G ITPAPGGHWANLLGQPLDDLTVVSTATNR\HIF\| K GWNGIPAPGGHWANLLGQPLDDLTVVSTATNRLHI FI

 TTGRWTAPRDMPASVP $\square \mathrm{MA}$ GTPMAVTVFYAPPSPQLILYF

SVASSSVI NDNKT HVVW $\square S A V F S R \square R N P D \square Y T A P K N G T P L A A A A V P P G N P F A V G L Y Y$ DDSSWQPWPVLKGSNEGKDFVSVSAASWGSG DDS SWQPWPVLKGSNEGKDFVSVSAASWGSG DDSSWQPWPVLKGSNEGKDFVSVSAASWGSG

| $R$ |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| $R$ | $L$ | D | D | G |
| R | D | G | V | G |

ETVKGEASTGSGLSAVPNYSGRE QFRLYH
EIVKGEASIGSGLSAVPNYSGRE QFRLYH DDGTLGTSYALSVITEPKEKTPIASI PFEDNQA DGHPWARYQIAPAGSASAVG GITAVSR\|PG DGHPWARYQI APAGSASAVG DGHPWARYQIAPAGSASAVG GHPWARYQ! APAGSASAVGGIT AVSRIPG HMEVWW DGHPWARYQ\|APAGSASAVGGGTAVSRUPG$\quad H M E V W W$ KAGSALAATGFRYDGDYQDRVFY KAGSALAATGFRYDGDYQI RVFY $\begin{array}{lll}Q \\ Q & V & L \\ Q & V & Y \\ Y\end{array}$

D D T D WR
DDTDWR
GNNNWSGW GNNNWS GW GNNNWS GW GNNNWS GW

YDGPVSLKKSGGMATATLQTKGTNVSVVYP YDGPVSLKKSGGMAI ATLQTKGTNVSVVYP
 QTLGGSPLKGAPTVVSWG

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UniRef90 - T5A9 UniRef90 F7YDG5 UniRef90-F7YDG5 UniRef90-F7YDG5 UniRet90_F7YDG5 UniRef90 T5AID6 UniRef90-T5AID6
UniRef90-T5ADD UniRef90 T5AID6 UniRef90-UPI00047C8201 UniRef90_UPIO0047C8201 UniRef90-M4G954 UniRef90 E9F9D7 UniRef90-E9F9D7 UniRef90_C5H8J5 UniRef90 C4RFYO UniRef90-C4RFYO UniRef90 K1X494 UniRef90-K1X494 UniRef90-K1X494 UniRef90 M7T9W1 UniRef90 ${ }^{-}$M2МХН9 UniRef90-M2MXH9 UniRef90-F4L7V9 UniReigo F4L7V UniRef90-4LVG UniRef90_G1XSG9 UniRef90 U4LFP5 UniRef90-Q82NE2
UniRef90 Q82NE2 UniRef90-O82NE2 UniRef90_Q82NE2 UniRefofo-a82NE2 UniRe90_J3NUL9 UniRef90-FOXRW6 UniRef90-FOXRW6 UniRef90 K3VCP1 UniRef90_UPIOOO46A91A0 UniRef90_UPIOOO46A91AO UniRef90 UPI00046A91AC UniRef90-UPI00046A91A0 UniRef90-R8BN52 UniRef90 R8BN52 UniRef90 A1VRS4 UniRef90-A1VRS4 UniRef90_A1VRS4 UniRet90 M M SLP3 UniRef90_G2RB90


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LSPEGRIVGHNWRDFTPGDDGVN WESLGGTGSSQPSAAVW WESLGGTGSSQPSAAVW WESLGGTGSSQPSAAVW ASNPDGHPEGKPGGVFL FQRFMASRTSSLSAMWP WK RVGGS F T S D P L L V S W
WKRVGGSFT

NWGRPQLP PT S WGSTDL
NWGRPQLPP TS GWTAVVSG
Q N S T N T I H QVSLD GKKF QAE QLVKLEILPRLGSPLSATTE Q N S T N TIH QV SLD GKKF QAEQLVKLEILPRLGSPLSATTE

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| UniRef90 R1FY | UniRef90-R1FYQ3

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UniRef90-T5A9X3 UniRef90-F7YDG5 UniRef90-F7YDG5 UniRef90-F7YDG5 UniRef90-F7YDG5 UniRef90-T5AID6 UniRef90-T5AID6 UniRef90_T5AID6 UniRef90_UPIO0047C8201 UniRef90-UPIO0047C8201 UniRef90-M4G954 UniRef90-E9F9D7 UniRef90-E9F9D7 UniRef90-C5H8J5 UniRef90-C4RFYO UniRef90-C4RFYo UniRef90-K1X494 UniRef90-K1X494 UniRef90-K1×494 UniRef90-M7T9W1 UniRef90-M2MXH9
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UniRef90 ${ }^{\text {Q82NEE }}$ UniRef90-Q82NE2 UniRef90-O82NE2 2 UniReffo-O82NE2 UniRef90-J3NUL2 UniRef90-FOXRW6 UniRef90-FOXRW6 UniRef90-K3VCP1 UniRef90-K3VCP1 1 UniRef90-UPIO0046A91A0 UniRef90-UPIO0046A91A0 UniRef90-UPIOOO46A91AO UniRet90 UPIOOO46A91A0 UniRef90-R8BN52 UniRef90-R8BN52 UniRef90-A1VRS4 UniRef90-A1VRS4
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170
180
190
200
T F P A GAPVTA|L|SKAPNSTDTVTT GNDGHVVYTSWWYE GSEW


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CV L P T T GLLAAVVNVNSA QWRVVYHDKD GY I SELLQ GDNS GF N TAYPGTSSLAMVPFASNWMRLGWQRDNTFLV L L A D N D G D W G $P$ VKMTSAPVASSWGAS DLDAWAVGEDGQLYHTYWRGSD Y PVKMTSAPVASSWGASDLDAWAVGEDGQLYHTYWRGSD Y
 DI TNYAKLTVAKNSDGRLEVFYI GTDDRI YHNWTA G GAWS DI T N Y A KL TVVAKNSDGRLEVFYI GTDDRIYHNWTA G GA WS
 TGLNGTALAVVDYKPNETRLFYQDVNSTVVD\|CGNGEKWQ GASS G D Gll A S V S R IP G S M EVVWWLIT GR Q S I E D G Y W
GA S S G D G I A S V S R I P G S M E V W WW L T G R Q S I E D G Y W
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RIGTGAS M GA YWF Q D N N I T L L GI R D S R Q RVVSR IM E S G T

 SA TNLGLSATTKQHLSVFYIGVDAELHAASNADCSWE




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UniRef90-F7YDG5 UniRef90-F7YDG5 UniRef90 T5AID6 UniRef90-T5AID6
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UniRef90 M7T9W1 UniRef90- М2МХН9 UniRet90_M2MXH9 UniRef90-M2MXH9
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UniRef90 A1VRS UniRef90-M7SLP3 UniRef90-G2RB90 UniRef90_G2RB90
210
SGG\| GGTFPAGAPVSASS SGGI GGTFPAGAPVSASS
SGGIGGTFPAGAPVSASSRHPSVIDLFCGNNGHVYTSW FGTAFDWSSNLGQGGEDSWGDGNDDNAW DKPGPV
FGTAFDWSSNLGQGGEDSWGDGNDDNAW DKPGPV
FGTAFDWSSNLGQGGEDSWGDGNDDNAW DKPGPV
GWESLGGVLAKQGVSAVSWGASR DDAFAVGTDHGLWHNW
GWESLGGVLAKQGVSAVSWGASR
LDLFAVGTDHGLWHNW
VDVVYTATDGTLRHSL

GWQWL GGELAHAPDAASRPGGL
GWQWLGGELAHAPDAASRPGGL
GWQWLGGELAHAPDAASRPGGL
NSPFLTEESTGASGAAT
NSPFLTEESTGASGAAT
NSPFLTEESTGASGAAT
NSPFLTEESTGASGAAT
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 PGPTSIEGRVFSGMTAVSWGEHR PGPTSUGGRVIFSGMTAVSWGEHR
PGWASLGGII TSTPAVISNADGR




S GPQVAQGSPVLALPLSADVPRDELRVVYRSTEGGRLAVF


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UniRef90
U5A9X3 UniRef90- F7YDG5 UniRef90 F7YDG5 UniRef90-F7YDG5 UniRet90_F7YDG5 UniRef90 T5AID6 UniRef90-T5AID6
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Y N N G S W
YNNGSW
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FDGATWSD
WRDLS GALEGEVA VANGPNRDDLGRG FDGATWSD WRDLS GALIEGEVAIVANGPNRIDILGRG NPETWVPQPAQPRDLWPRANTPSVPLTITSRGTRYFTLYY NPETWVPQPAQPRDLWPRANTPSVPLTITSRGTRYFTLYY YD ANKTPKWFDTDQQLETCSPQAKITSTSTRQETAHLEY YD ANKTPKWFITDQQLETCSPQAKITSTSTRQETAHLFY FVPTPTNPNDPNSVSSSSNGSQVNAATTTTALLGNTV
FVPTTPI NPNDPNSVSSSSSNGSQVNAATTTTAAGGTVV VAEA WKEASGQDWATESADAVSGAWARADDVGGNQLLVYG VAEAWKEASGQDWATESADAVSGAWARADDVGGNQLLVYG


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RDGK GTWDDAKTPSST SATNADDSE G RDGK

GTWDDAKTPSST
SATADDE
G

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UniRef90-A0A024GZ92 UniRef90 ${ }^{-A 0 A 024 G Z 92}$ UniRef90 A0A024GZ92 UniRef90_A3WV61 UniRef90-A3WV61 UniRef90_C9STX9 UniRef90_C9STX9 UniRef90-G1 XCB7 UniRef90_G1XCB7
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UniRef90_T5AID6 UniRef90 ${ }^{-}$T5AID6

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VDGGLWHRARNGPTWGDWDP LESRLSSPPAA V DGGLWHRARNGPTWGDWIPLESRLSSPPAA QSSPTEI ACSTFNGEAWST QSSPTEI ACSTFNGEAWST | EDRNGNI RHFPGYDGT |
| :--- | :--- |
| EDRNGNII RHFPGYDGT | SNPVGNVEEKKYEGGK WGAATTV



RGENDQVVELWWLNGWHEHILTNTVTSAPKA RGENDQVVELWWLNGWHEH LITNTVTSAPKA

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 T GLDKGIYYEA WTRNSTWGEADIVGAPISAGW SDDRARVVQYAWDAEN
VGNDGVLYWQMYWPGTGYYPLGNMSNPFPS VGNDGVLYWQMYWPGTGYYPLGNMSNPFPS $V G N D G V L Y W Q M Y W P G T G Y Y P L G N M S N P F P S$
1 GTDDRR1 YHWQEPAVGTWSAL QLLSSSGT 1 GTDDRRIYHWQEPAVGGTWSALQLLSSSGT

S N G T

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GDGRVMAGRQVGGAGATWQD
GDGRVMAGRQVGGAGATWQD
P\AEPA
PVAEPA
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S G GDDDSKDTDGGSGSSKDATSSPSTGMTAG SGGDDDSKDTDGGSGSSKDATSSPSTGMTAG

[^1]$\square R R N S R L A V T G Y R G S S G N Y Q R \square F F Q D P D H H \square R F M D K S$ VVVCANYDGRLEVFARSSDNALWHDKQT VVVCANYDGRLEVFARSSDNALWHIKQT G GV SAVARDGTTIDI FVSGKDGNLYQRTWN GGVSAVVARDGTTIDVIVMSGKDGNLYQRTWN
SPVLITSNLAAVNWTDNDGKHYRVFWQERTGSLMMS DKN

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 SVI RALSPETDYCSDRRLYYIDPDGNIQEHMWN T NVGGGTGATENSCSDRRVVYIDGNGNGUEMMWN


GSPLAVTSWVSNSHTTRQLFY DDGNGNVMTTNTT GSPLAVTSWVSNSHTTRQLFYI DGNGNVMTTNTT PSGVTFVGAPAATSWAAG RYDVIAVGNNKVTYHNYWT PSGVTFVVGAPAATSWAAG RYDVIAVGNNKVTYHNYWT PSGVTFVGAPAATSWAAG RYDVIAVGNNKVTYHNYWT PSGVTFVGAPAATSWAAG RYDVIAVGNNKVTYHNYWT

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

VRPNSK LIATGWVTGNGFVCRLFWQGGDNKLRSSRYL

## 

TA $\square L S N T K L A S A N F T D G D N E N Y L V V Y Q V Q N R A D Y D S A Y N$ QSPTSHLLYHSSC GTG $\square$ A GKTVAFNDAVQQHVLARGTDGSLIHRFWS

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S G G T WT D P T T LD T LGGQPKPYS S $\square$ T A G S Y VW N S PRFD L F







S S DK WV VS P I ID GS T SVS DD T GLGLVYYHDSSTRDVHLYW NT STMLVVFPV NDTEFP PKEHGSLA GVGWFDAVTTWACLWY NTSTDLVVPVNDTEFPPKEHGSLAGVGWFDAVTTWACLWY


\footnotetext{
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 LGSDDK Y HKWGDNNTWTDW FSGGDV GWGKD KVABL Y IIWWD QA QWS W FSGGDV

| Y | 1 | 1 |
| :--- | :--- | :--- |
| Y | WD Q A Q WS |  |
| Y | 1 | WD Q A Q W S |

Y I I WD Q A Q WS
Y I I WD QA QWS

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T T S S E C $\quad$ REVGGMDQPVWHMWG\F
T T S SECIRRVGMDQPVWHMWGIF
TSAGTVFHQYWHDGS GWT
TSAGTVFHQYWHDGS GWT
TSAGTVFHQYWHDGSGWT

| G $Y$ | $L$ | $Q$ | $D$ | $L$ |
| :--- | :--- | :--- | :--- | :--- |
| $G$ | $P$ |  |  |  |
| $G$ | $L$ | $Q$ | $D$ | $L$ |
| $P$ | $P$ |  |  |  |
| Y | $L$ | $Q$ | $D$ | $L$ |
| $P$ |  |  |  |  |

GSDVK S GVS
$Q \square S$ T S Y GLLGA S S W

QI S T S Y GLGGAS S W


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130
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160
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FYQ AGSEDRQVQDASAAN
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GAAFSGRENTTVASPRDERNTAATRWNKDETWYRTTLPHP GAAFSGRENTTVASPRDERNDAATRWNKDETWYRTTLPHP AFDGQMTQHI IFVGADGHLHEMWSQWHSGDLTAATATAPP AFDGQMTQHII FVGADGHLHEMWSQWHSGDLTAATATAPP AFDGQMTQHIIFVGADGHLHEMWSQWHSGDLTAATATAPP AAFNPSTNAMELFALGTDNAVWHAYYFQGGWSDWSVMGAT AAFNPSTNAMELFALGTDNAVWHAYYFQGGWSDWSVMGAT VAFTDGTHWTLTARGADGRIDQ RGPSSGWSSLGAPG TLDAFPNTFLGPYN NNTLPSDMYWNLEDEAEFSLPAWN TLDAFPNTFLGPYN NNTLPSDMYWNLEDEAEFSLCAWN AVVKNSDGRLEVFARGTNNALYHTWQTVSHSGPWSNWATL AVVKNSDGRLEVFARGTNNALYHIWQTVSHSGPWSNWATL AVVKNSDGRLEVFARGTNNALYHIWQTVSHSGPWSNWATL SKLFVGTGNGHLYERLWNG SRWVWVDHDTPPGTTV SKLFVGTGNGHLYERLWNG SRWVWVDHDTPPGTTV SKLFVGTGNGHLYERLWNG SRW SRWVWVDHDTPPGTTV LDSAGNPRISYLYEGTDD KYAWHDGSGWHNETVDS
 PVAVQDGGGLSVFVRGNDGFLYVKSLSSFSS $P V A V Q D G G G L S V F V R G N D G F L Y V K S L S S F S S$

WGD WI WVP
WGDWI WVP
$P \vee A V Q D G G G L S V F V R G N D G F L Y V K S L S S F S S \quad W G D W I W V P$

## UniRef90 FOXQC8

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UniRef90_S9P169 UniRef90-S9P169 UniRef90-S9P169
UniRef90 - SgP169 UniRef90-UPIOOO262D61B UniRef90_UPIO00262D61B UniRef90_UPIO00262D61B UniRef90_UPIO00262D618 UniRef90-A0A022PJ12 UniRef90_A0A022PJ12 UniRef90_A0A022PJ12 UniRef90-A0A022PJ12 UniRef90- S3EAl2 UniRef90-G1XFT5 UniRef90-G1XFT5 UniRef90_M2LRLO UniRef90-M2LRLO UniRef90-BgXJM7 UniRef90-B9XJM7
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UniRef90 G2XD30 UniRef90-Q9SIV9 UniRef90-E3FXV0 UniRef90-E3FXV0 UniRef90-E3FXV0 UniRef90-E3FXVO UniRef90-G2Q606 UniRef90-W9BMB4 UniRef90-W9BMB4 UniRef90-w9bmb4 UniRef90-UPIOOO3644142 UniRef90-UPI0003644142 UniRef90_A0A014L594 UniRef90-SOEP96 UniRef90-S0EP96 UniRef90_-Q7N818 UniRef90-Q7N818 UniRef90-D8PHA1 UniRef90-D8PHA1 UniRef90-D8PHA1 1 UniRef90-D8PHA1 UniRef90-B8GE04
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UniRef90 G4NET5 UniRef90 K1WWA2 UniRef90 K1WWA2 UniRef90-W3WIN6 UniRef90_W3WIN6 UniRet90_W3WIN6 UniRef90_B4VNKO
UniRef90 B4VNKO UniRef90-B4VNK0 UniRet90_M7T1D2 UniRef90-W710N6 6

UniRef90 W710N6 UniRef90-W710N6 UniRef90 D3EYY2 UniRef90- HzK K AO UniRe990-H2K6A0 UniRef90_M M2LPO UniRef90-G2XD30 UniRef90-Q9S1V9 UniRef90 E3FXVO UniRef90-E3FXVO UniRef90-E3FXVO UniRef90 E3FXVO | UniRef90-G2Q606 |
| :--- |
| UniRef90 G2Q606 | UniRef90_W9BMB4 UniRef90 W9BMB4 UniRef90-W9BMB4 UniRef90-UPIO003644142 UniRef90 UP10003644142 UniRef90-A0A014L594 UniRef90-SOEP96 UniRet90_S0EP96 UniRef90-Q7N818 UniRef90-Q7N818 UniRef90-D78818 UniRef90-D8PHA1 UniRef90-D8PHA1 Uneto UniRef90-B8GE04 UniRef90-B8GE04 UniRef90_UPI0003B55DA6 UniRef90_UP10003B55DAE Unire90_UPIO003B55DA6

GAlvDP 210
230
240
SIITEFR RGTTPDGIDAGSAVGGFVVGSDTNTYILYQDTDGVIQVVW DWASLGGAITSAP VVMKSSSGRFNLFARGTDNTLWLIQ DWASLGGA】TSAP VVMKSSSGRFNLFARGTDNTLWLIQ AFTQLATPPSSAKGVAVAHYSSLGRVIVTNGFDGRLYRTF AFTQLATPPSSAKGVAVAHYSSLGRVIVTNGFDGRLYRTF QDGLPSPPPKLTALSFIVPQGLSVPEDSLAVMPNGTVLVNY
SSWUSLSGALASAPAAVSTLPGR DVVARGDDGGLLHRR SSWISLSGALASAPAAVSTLPGRIDVVARGDDGGLLHRR TWGT GGAFGGDNSAVAWGNGRLDLFGRGMDNAVWHRA TWGT LGGAFGGDISAVAWG NGRLDLFGRGMDNAVWHRA STANIQAYNQSKVAATFLPSTNQVRLYYESTAGNIQELS
 VDGSKIPVDSGAQLAATSQYDDFNVQULMTK凹AGGVKMAY

PGWSDFQPLEGTSEDDVSRNENGSLEVFATGSDAGTHHKN GSWLDLGGQLTSAPSATSPAPNVTVHVVRGTDNQLHVKG GSWLDLGGQLTSAPSATSPAPNVT HVYVRGTDNQLHVKG GSWLDLGGQLTSAPSATSPAPNVT HVYVRGTDNQLHVKG GSWLDLGGQLTSAPSATSPAPNVTEHVYVRGTDNQLHVKG GWGRHGDGMQLTSSPAVASMGIDHEHVFVRGADGHLHHKF GWGRHGDGMQLTSSAVASMGADHEHVFVRGADGHLHHKF GWGRHGDGMQLTSSPAVASMGIDHEHVFVRGADGHLHHKF A WT SLGGILIDASV A WT SLGGLLDASV
A WT SLLGGULIDASV
SEVFTIAGTETGLALPASFDYTTVIDVAYDKQNGFVTVQS EGMLQDKLAPNSGI AATRTDSGNF VFFQNEGGNLQYVH EGMLQDKLAPNSGLAATRTUSGNTFVVFQNEGGNLQYVH NTVELGTAAQGTKLTAA YANSSAMVIYQMSSNGSVY

RYQLAPNGSARGSLAAVSRDPG RYQLAPNGSARGSLAAVSRIPG RYQLAPNGSARGSLAAVSRIPG R APNGSARGSLAAVSRIPGMEVWWIGPNGSVEGAY RYQLAPNSARGSLAAVSRIPGGMEVWWIGPNGSVEGAY SGALAVDDPAGAGLGGFSSGPGDNTFVLWQDENGGURIMS SDLFAAKSSGPRDLAVVGRGTDSASWMNQ TAWEDRRGNFFSDPATVSWGPGR LD: I GRDANGSMFHKY TAWEDLRGNFFSDPATVSWGPGR LDII GLDANGSLFHKY GWKPLMTNSTCHYAPAAVSGDKGRI GVVSVGMQNFIYYSW GWKPLMTNSTCHYAPAAVSGDKGR1GVVSVGUQNFYYYSW VPNVPIPAATAIGAFAFARESNHSLTVLYQDDDHAIKAVW MGNYKAEVAPGSG|AASWWGRARS:RVYYVDSGARAREVA MGNYKAEVAPGSGUAASWWGRARSURVYYVDSGARUREVA QHPLWGHRVAARSSPSAVVSTAGDPLVFFVDDENNNRETT DWQDLGGSLTDAP TVAFTDPAHWTLVARGADGSVVQRG RAVSLPRGDLGDRASTVAFASGVGFQVLTVDRDGVGLTYY I SGEMASFPSNHSLALTTDEEGSS SLEYIGTDARLHHLL VKGQVLSTPTALAGPPISFVHGGQQHVFARITGNTLAH LQPPSLGGTFGQEPAAVSWPDGR MEVFVRHTNNTLWHRP LQPPSLGGTFGQEPAAVSWPDGR MEVFVRHTNNTLWHRP LOPPSGGTFGQEPAAVSWPDGR MEVFVHTNNT WHRP NFTLPAWDGKTKSTGVTIDNVYTRF LWYIGNDRNLYLLA NFTLPAWDGKTKSGGVTVDNVYTRF LWYGGNDRNGYLLA STDLTPGPAPNGELRAYAFDSEGTRHVVFAGADGRLYELW STDLTPGPAPNGELRAYAFDSEGTRHVVFAGADGRLYELW DWSVNASAKFKGAPTAAYNPDTQALELFALGTDNAVYHAY DWSVNASAKFKGAPTAAYNPDTQALELFALGTDNAVYHAY SEWSSLGGTVSGSPTLVAVGDAVVL YARAGDYTLWQRR LGA WPVADNESSGLAVVSQQSEGKAWLYYWA NETVVQKD A W A W
 T ETVVDSAVGWYTSSLAALDSNG NPRI S YFDDTNDDDLKYA Y
 $T W T S L G G L L G P D A Q P V A G Q D Q D G R L D V V F V R G G D N L L Y Q R W$

UniRef90 FOXQC8 UniRef90-W3XKC5 UniRef90-B6VMR3 UniRef90-A9в3K1 UniRef90-A9B3K1 UniRef90-M7SU14 UniRef90-S31BY5 UniRef90-S31BY5 UniRef90-E9F6K2 UniRef90-E9F6K2 UniRef90_U4L6X2 UniRefo-U4L6X2 UniRef90-R1GDY9 UniRef90-S8AQG8 UniRef90_S8AQG8 UniRet90_S8AQG8 UniRef90-KOBBC6 UniRef90-S9P169 UniRef90- S9P 169 UniRef90-S9P169 UniRef90-UPI000262D61B UniRef90-UPIO00262D61B UniRef90-UPIO00262D61B UniRef90_UPI000262D61B UniRef90-A0A022PJ12 UniRef90-A0A022PJ12 UniRef90-A0A022PJ12 UniRef90-A0A022PJ12 UniRef90 S3EAI2 UniRef90-G1XFT5 UniRef90-G1XFT5 UniRef90_M2LRLO UniRef90 M2LRLO UniRef90-B9XJM7 UniRef90-B9XJM7 UniRef90_B9XJM7 UniRef90_B9XJM7 UniRef90-D9XBX1
UniRefon -D9XB UniRef90-D9XBX1 UniRef90-D9XBX1 UniRef90-G4NET5 niret90-KıWWA UniRef90-K1WWA2 UniRef90-W3WIN6 UniRet90-W3WIN6 UniRet90_W3WIN6 UniRef90_B4VNKO
UniRef90_B4VNKO UniRef90-B4VNK0 UniRef90_M7T1D2 UniRef90-W710N6 UniRef90_W710N6 UniRef90 W710N6 UniRef90-D3EYY2
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UniRef90 G2XD30 UniRef90-Q9S1V9 UniRef90 E3FXVO UniRef90-E3FXV0 UniRef90_E3FXV0 UniRef90_E3FXVO UniRef90-G20606
UniRef90
G20606 UniRef90 W9BMB4 UniRef90 W9BMB4 UniRef90-W9BMB4 UniRef90-UPIO003644142 UniRef90 UP10003644142 UniRef90-A0A014L594 UniRef90_SOEP96 UniRet90_S0EP96 UniRef90_Q7N818 UniRef90-Q7N818 UniRef90_O7N818 UniRef90 D8PHA1 UniRef90 D8PHA UniRef90_D8PHA1 UnReto-UniRef90-B8GE04 UniRef90-B8GE04 UniRef90 UPI0003B55DA6 UniRef90_UPIO003B55DA6 UniRef90_UPI0003B55DAE

250
260
270
280 WN GE WT SDGTVLEPLE $\square$ GRCTA AFQWDGGSCIIRFYY QDGDGWRGPQTYDAAEPGTD IECDTQGAWEGTGVQVRCFF QNTS WDTWCSTGG1LIDASAA QNTSWDTWCSIGGILIDASAA QPDPTSAWASWLDDGRPQD QPDPTSAWASWLLDDGRPQD WNPDQKWSGASAPRMQGMNTTNFTSTAM PGLDNLRFFG WT GTAWTD WLNFGGNLAGQPAIAALPGDEVAIAVRR WT GTAWTD $\quad W L N F G G N L A G Q P A \| A A L P G D E V A I A V R R$



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

QHGTPENSGPS GWQNWAVIGGEGTHLEVANRYDRLFLVAT
 FANNTWGDWV PLGGILTSGPSAVSPNPNWVFIRA FANNTWGDWV PLGGILTSGPSAVSPNPNWVFIRA

 WKAASGWSPYFDLGAPPGGFKG WKAASGWSPYFDLGAPPGGFKG

| $S$ | $P$ | $A$ | $T$ | $V$ | $S$ | $R$ | $N$ | $S$ | $Q$ | $V$ | $A$ | $N$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $S$ | $Y$ | $V$ |  |  |  |  |  |  |  |  |  |  |
| $S$ | $P$ | $A$ | $T$ | $V$ | $S$ | $R$ | $N$ | $S$ | $Q$ | $V$ | $A$ | $N$ |\(| \begin{aligned} \& V <br>

\& V\end{aligned}\)
$R S T A N G T D G A F G P G \square Q V T Q G D G S S T A G L V E T G T V N \square Y \square K R$ SDKT DEWKIGGELEEAKLGGGASMYAVTLEPMP HLGY



Y D S A GWHTETVDSAGEVG
YDSAGWHTETVDSAGEVG
YDSAGWHTETVDSAGEVG
QTGNWGGWSQLGSVAFTGS


UniRef90 F0XQC8 UniRef90-W3XKC5 UniRefofo-B6VMR3 UniRef90-A9В3К1 UniRef90-A9B3K1
UniRef90 MTSUI4 UniRef90-S31BY5 UniRef90-S31BY5 UniRef90-E9F6K2 UniRef90-E9F6K2 UniRef90_E9F6K2 UniRef90-U4L6X2
UniRef90 U4L6X2 UniRef90- F8PY89 UniRef90 R1GDY9 UniRef90-S8AQG8 UniRef90 S8AQG8 UniRet90 S8AQG8 UniRef90_KOBBC6 UniRef90_S9P169 UniRef90- $99 P 169$ UniRef90-S9P169 UniRef90-UPIOOO262D61B UniRef90 UPIOOO262D61B UniRef90-UPIO00262D61B UniRef90-UPIO00262D61B UniRef90 A0A022PJ12 UniRef90 A0A022PJ12 UniRef90-A0A022PJ12 UniRef90-A0A022PJ12 UniRef90 S3EAI2 UniRef90_G1XFT5 UniRef90-G1XFT5 UniRef90_M2LRLO UniRef90_M2LRLO UniRef90-B9XJM7 UniRef90-B9XJM7 7 UniRefo byxum UniRef90-B9XJM UniRef90-D9XBX1
UniRef90-D9XB UniRef90 D9XBX UniRef90-D9XBX1 UniRef90-G4NET5 UniRet90-K1WWA UniRef90_W3WIN6 UniRef90 W3WIN6 UniRef90 W3WIN6 UniRef90-B4VNK0 UniRef90-B4VNK0 UniRef90 B4VNK0 UniRef90 M7T1D2 UniRef90-W710N6 6
UniRef90 - W710N6 UniRef90 - W710N6 UniRef90-D3EYY2 UniRef90-H2K6AO UniRef90 M7TLPO UniRef90-G2XD30 UniRef90_G2XD30 UniRet90_Q9S1V UniRef90 E3FXVC UniRef90-E3FXVC UniRef90_E3FXVC UniRef90_E3FXVC UniRef90-G2Q606
UniRef90-G20606 UniRef90 ${ }^{-}$W9BMB4 UniRef90-W9BMB4 UniRet90_W9BMB4 UniRet90_UP10003644142 UniRef90 UP10003644142 UniRef90-AOA014L594 UniRef90-SOEP96 UniRef90-S0EP96 UniRef90 ${ }^{-}$Q7N818 UniRef90-Q7N818 UniRef90_O7N818 UniRef90 D8PHA UniRef90 D8PHA UniRef90-D8PHA UniRet90_D8PHA1 UniRef90-B8GE04 UniRef90-B8GE04 UniRef90_B8GE04 UniRef90 UPI0003B55DA6 UniRef90_UP10003B55DAE UniRef90_UPI0003B55DAE

QGDDDGLWEQCQNQDGPWFTGAFNNAT QEKGTGRLREVWFNGTDWRNEGYVP
$\square T P$ D G LI H S Y T $\square D R Q D T W T Y E E Q V N T E \square$
$V$ DK T L GV I A R R GNAWSEWQLVDAQLASDP VDKTLGVIARRGNAWSEWQLVDAQLASDP RGTNNGVYHTAWNGWSGWYNHGG
RGTNNGVYHIAWNGWSGWYNHGG
RGTNNGVYHUAWNGWSGWYNHGG
SVRNGDISEMSW
SVRNGDISEMSW
QSASDT:TEALWT
TDTDNELVEWLR $\square$ TGATFQR $\square G V V N T T G S A$

QSNDYADS QLEPNSDWGWFLLGNDN
QDNRLWVKGWANNTWGDWVQiGGDFTSDPSA QDNRLWVKGWANNTWGDWVQI GGDFTSDPSA QDNRLWVKGWANNTWGDWVQI GGDFTSDPSA QDNRLWVKGWANNTWGDWVQUGGDFTSDPSA RGNDDALWQLP WYNWHPWHNDGMVLASDPTA RGNDDALWQLPWYNWHPWHNDGMVLASDPTA RGNDDALWQLPWYNWHPWHNDGMVLASDPTA RGNDDALWQLPWYNWHPWHNDGMVLASDPTA

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AHPDGHI HDLAMVSDGGWDDSSTELT
AHPDGHIHDLAMVSDGGWDDSSUELT


[^2]UniRef90_W7IHU3 UniRef90_F7WBT3
UniRef90-K9ZDI5 UniRef90-K9ZDI5 UniRef90-K9ZDI5 UniRef90-K9ZDI5 UniRef90_G4N901 UniRef90-G4N901 UniRef90-U2RLX1 UniRef90_U2RLX1 UniRef90_G4N4D2 UniRef90-W3XFWS UniRef90-W3XFW9 UniRef90-C7BLE3 UniRef90 C7BLE3 UniRef90_M7SL96 UniRef90-N1JB70 UniRef90 B8NAJ7 UniRef90-B8NAJ7 UniRef90-B8NAJ77 UniRef90_B8NAJ7 UniRef90_E3Q8W0
UniRef90_E3Q8WW0 UniRef90-H8MIE6 UniRef90-H8MIE6 UniRef90-H8MIE6 UniRef90_UPI00036EE115 UniRef90-UPIO0036EE115 UniRef90 UPIO0036EE115 UniRef90_L2G1W5 UniRef90-S3CZ30 UniRef90_Q7N8J0 UniRef90-Q7N8J0 UniRef90_U7QXJO UniRef90 S3CQA2 UniRef90-S3CQA2 UniRef90-S3CQA2 UniRef90 S3CQA2 UniRef90-L7IGV1 UniRef90-L7IGV1
UniRef90 G4U7E6 UniRef90 ${ }^{-}$UPI00035F2F67 UniRef90-UPI00035F2F67 UniRef90-UPI00035F2F67 UniRef90 UPI00035F2F67 UniRef90_R7Z6X9 UniRef90-R7Z6X9 UniRef90_G2PCE7 UniRef90 G2PCE7 UniRef90_U1GK83 UniRef90_U1GK83 UniRef90_U1GK83 UniRef90 U1GK83 UniRef90-S2YCN9 UniRef90_B9XNT7 UniRef90-B9XNT7 UniRef90-Q7N817 UniRef90-Q7N817 UniRef90_UPI00028910ED UniRef90 W3WPK0 UniRef90-J4UTE9 UniRef90_J4UTE9 UniRef90 A0A022PHN6 UniRef90-A0A022PHN6 UniRef90-G4N613 UniRef90_Q7N816 UniRef90 A0A010R4Q8 UniRef90_UPI0003644587 UniRef90_UPI0003644587 UniRef90 UPI0003644587 UniRef90_UPI0003B62C30 UniRef90_UPI0003B62C30 UniRef90-UPI0003B62C30 UniRef90 UPI0003B62C30 UniRef90-G1X1N8 UniRef90-R1EMC4 UniRef90-G9NSY8 UniRef90 G9NSY8 UniRef90_G9NSY8 UniRef90_M4FVQ4 UniRef90 W2F1K7 UniRef90-D7C3Q1 UniRef90-W9GGY9 UniRef90_W9GGYg UniRef90 W9GGY9 UniRef90-J8JL63 UniRef90_J8JL63 UniRef90_G2NMX7 UniRef90_G2NMX7 UniRef90_G2NMX7

TSDPSAYAFESEGTQHV VFLSDDDGHIHELY TSDPSAYAFESEGTQHV VFLSDDDGHIHELY

LFATRAAAGSLAAWYTDPSLLLQDDETSHVRYSLCT LFATRAAAGSLAAWYTDPSLLLQDDETSHVRYSLCT NADGRLEVVVRGGDNALWHIWQT NADGRLEVFVRGGDNALCWHIWQT



GGNQQHVYARTTAGTLYHWWYV GGNQQHVYARTTAGTLYHWWYV GGNQQHVYARTTAGTLYHWWYV PAKDLYFTSVAVLDGQDRGGDRQDLCARGVTGKMYWVSRQ $P A K D L Y F T S V A V L D G Q D R G G D R L D L C A L G V T G K M Y W V S R Q$

T D A VP G T S LGASPAVVRDGSALT TFFRGPHGSLVAANDH

NSDGRLEVFVRGTDNALWHNWQT NSDGRLEVFVRGTDNALWHNWQT S I G TATVNNNKPYVFVKGNDGNLWNNSLS $P \square T \square R N N S M L S \square T G H \square E E D G G W T R L V F E G P D G K L R F L D R S$

NAAliAAVSVTNTANGRLKVFGVGTDNVVLEQTSH NAAIAAVSVTNTANGRLKVFGVGTDNVVLEQTSH $\square R R G S A L A A T G L R R D T G Y E L R V F Y Q G A G G D L R Y S Q Y D$ TK MMNSAVSAVSVANTSDGRLEVFGVGSDHAVWHNWQY GTPGAAVTLAQRTRDQLDVLCTGADGAVLTLWS G GTPGAAVTLAQRTRDQLDVLCTGADGAVLTTWSG GTPGAAVTLAQRTRDQLDVLCTGADGAVLTLWS G TSAPSAVVRKGTNNIDVVVRGGGGNI YWKEWT
 TSAPSAV VRKGTNNVDVVVRGGGGNIYWKEWT $\square L P T T S L A A A N Y T D A G V P H S Q L Y Y Q A P S$ LQULMASRA

QNARLTATS WAGDGGQMYRVISQDRSGSLFASY LE SVTAAANTAGNLEVFGTKSDETI WWLH GT VPDTMAAVTAASDRTGRTVLVWRDPKKVQLRATSYD


UniRef90-F7WBT3 UniRef90-K9ZDI5 UniRef90_K9ZDI5 UniRef90 K9ZDI5 UniRef90-K9ZDI5 UniRef90-G4N901 UniRef90 G4N901 UniRef90 U2RLX UniRef90-U2RLX1 UniRef90 G4N4D2 UniRef90 G4N4D2 UniRef90-W3XFW9 UniRef90-W3XFWs UniRef90_C7BLE3 UniRef90 C7BLE3 UniRef90-M7SL96 UniRef90_N1JB70 UniRef90 B8NAJ7 UniRef90-B8NAJ UniRef90-B8NAJ UniRef90_B8NAJ7 UniRef90 E3Q8W0 UniRef90-E3Q8W0 UniRef90-H8MIE6 UniRef90_H8MIE6 UniRef90-H8MIE6 UniRef90_UPI00036EE115 UniRef90_UPIO0036EE115 UniRef90 UPIO0036EE115 UniRef90-L2G1W5 UniRef90_S3CZ30 UniRef90 Q7N8J0 UniRef90 Q7N8JO UniRef90_U7QXJO UniRef90_U7QXJO UniRef90 S3CQA2 UniRef90-S3CQA2 UniRef90-S3CQA2 UniRet90_S3CQA UniRef90-L7IGV1
UniRef90-L7IGV1 UniRef90-G4U7E6 UniRef90 UPI00035F2F67 UniRef90-UPI00035F2F67 UniRef90-UPI00035F2F67 UniRef90 UPI00035F2F67 UniRef90 R7Z6X9 UniRef90_R7Z6X9 UniRef90_G2PCE7 UniRef90 G2PCE7 UniRef90_U1GK83 UniRef90_U1GK83 UniRef90_U1GK83 UniRef90 U1GK83 UniRef90-S2YCN9 UniRef90_B9XNT7 UniRef90 B9XNT UniRef90_Q7N817 UniRef90-Q7N817 UniRef90_UPI00028910ED UniRef90 W3WPK0 UniRef90-J4UTE9 UniRef90_J4UTE9 UniRet90 A0A022PHN6 UniRef90 A0A022PHN6 UniRef90-G4N613 UniRef90_Q7N816 UniRef90 A0A010R4Q8 UniRef90-UPI0003644587 UniRef90-UPIOO03644587 UniRef90_UPI0003644587 UniRef90_UPI0003B62C30 UniRef90-UPI0003B62C30 UniRef90_UPI0003B62C30
UniRef90 UPI0003B62C30 UniRef90-G1X1N8 UniRef90-R1EMC4 UniRef90 G9NSY8 UniRef90 G9NSY8 UniRef90_G9NSY8 UniRef90-M4FVQ4 UniRef90 W2F1K7 UniRef90-D7C3Q1 UniRef90-W9GGY9 UniRef90_W9GGY9 UniRef90 W9GGY9 UniRef90-J8JL63 UniRef90_J8JL63 UniRef90_G2NMX7 UniRef90_G2NMX7 UniRef90-G2NMX7

QS DGWHHGDLTDSSASVVRAVDP QS DGWHHGDLTDSSASVVRAVDP

PF GWASAHYGTQHVVF PFGWASAHYGTQHVVF

SENTP\|LPEDKT\|IAPPRNGTALAGTGWYDSKDTWASTFY SENTPILPEDKTI IAPPRNGTALAGTGWYDSKITWASVIFY SAGPWSQWESLGGGITSDP ALVHHNADGRLEVVV TNSTPDFPNDTTVVAPPKKNTS LAGAGWFTGTDYFASIVY

PTPTSTANVTVANAREDRRGSSLAASGWWKNTGSEMFLFY PTPTSTANVTVANAREIRRGSSLAASGWWKNTGSEIFRLY TDQWYHFDTGIPGAVPAAGDPMGYVGGVP RVVY TDQWYHFDTGGPGAVPAAGDPMGYVGGVP $\quad$ RVVVY T DQWYHFDTG』PGAVPAAGDPMGYVGGVP RVVY LGGKVADAPAVAFTGPSD WTV FA WTVFA
 GTSTWDLDPDSGSRDMKTYS GTSDAAVVTSPDNQLPDDRVF F NTEAYVA GEVADENSAIAIVSVANNADNRLEVFG NTEAYVAGEVAIENSAIAlVSVANNADNRLEVFG
AVIAAVALGTNRMDVYQ
AVI A AVALGTNRMDVYQ
AVI A AVALGTNRMDVYQ
$A \vee I A A V A L G T N R M D V Y Q$

GNY L N F TQSPPKAGSPLAGTGWYDQTNTWASLFY


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GRRD\GGGPTRGR\VGQPAAYAS\
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VGA GWS G WQS LTG GQ TT S N P $V G A G W S G W Q S L G G Q I T S N P$
$G S K W S W N N H G K P N S G F S Q S M G A T T V$ GDGFWSAVT ILDDRVPLAPNGSTISTY

T GS S WT GWS SLGLQVT S K P TGSSWT GWS SLGLQVTSKP A YGVWSAGQSSNHPAPA PDTP $\square$ AAS S N S PWS G WLS LDN GNVT S K P TYQAWT PPMEAGAAPKVGSPFGAGVYVNTDDRLLEVFV (
 DDGRWNGPAAALTPPGTCVPGAPV PSTGWSDWADLGGWSQDAP PSTGWSDWADLGGWSQDAP TIVSTVDGG PSTGWSDWAD L GGWS QDAP PSTGWSDWADLGGWSQDAP
 TVSTVVGGG TIVSTVDGG VVD: DTAPPSAPWTVAPVAPARNATP\AAYNWRWDDGSETHLFF

TNGTWTPGGVKPADLDPAAGTPLAAAV SSTSGLNVF $\frac{V}{F}$ GLGS WANWAQFP $\square$ WGT LHAVAAEADKDGLVELFG STATWKPSVA $\square$ SAENAVREDPKPRALSSGPGL $V$ TVLW
 TVRTGAPPAMIFSYAFPRQKTQHL

UniRef90 W7IHU3 UniRef90-F7WBT3 UniRef90-KIZDI5 UniRef90-K9ZDI5
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LDPNNVLSEYAYDSTTWAPGSLIASHNTQARGTDGTSAVSF QDKTNDVYYVKYDGSSWGKPVSTITGLR RDTKLTATII

| RDEYRRVYLLTGDDASWTQHPLT RDEYRRVYLLTGDDASWTQHPLT |  |
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QGDDNKTRRSVVDSTANNTSWQGPEELFATENSR\AGSTT QGDDNKI RRSVVDSTANNTSWQGPEELFATENSRLAGSTI RGVDNRIHEFSLT DQWYHFDMTGDPGAVPAAGDPMGYVG RGVDNRI HEFSGT DQWYHFDMTGIPGAVPAAGDPMGYVG
 RGFDGLIVTRGPHTGWT GII SGPNGRGVQGRPSAAV MGSGEKLGGNWREGFTRGGLSDGGWTVGNTGTQMAAYW ITPEGYLADITESGGAWADGTLRDQQYKPGFDADATTDS VSTDSAVWHNWQTAPLPNSSWAGWNKFNGVVTSKPAVH

A S GlV ASGUV
LT S T N SLA YRSY


FDESNSTRNADFKSTGLYMDAESGFYPVVATKSGUAAVSY RTTAGTLYHWWYPGTGWKTANLGG RTTAGTLYHWWYPGTGWKTANLGG AITDSPTAYYA
 VTTEYDMAFNLLPSGTESWRTWSVLPATVRPDTYFAAVWA VTTEYDMAFNLLPSGTESWRTWSVLPATVRPDTYFAAVWA

LTGEDALLPGADLGAKATAS

RGTDDRAYRRSYDHGHWGQWQS $\square G G E \square T D A P S$
VGTDGSVYHNVQSTNGWVTTGLSGVQSGV
VGTDGSVYHNVQSTNGWVTTGLSGVQSGV
RGADNALWHIWQTAGPWSNWQSLN GVLTSDPTVYVNASGR RGADNALWHIWQTAGPWSNWQSLNGVLTSDPTVYVNASGR ATTSGQMCGQVFKNGSTSPDS $\square$ NA $\square$ NF TAPDGTSMASYF
 RGADNALWHNCQUAPNAGLSGWQSLGGMITSN ASRDGHI AHHNWRHGFPLEGTTGERRSMPGGGER $\square$ ACLWP $\square G S P D K L G V N W R E G$ FSRGGLTDSVNEAGYT TSN TAGDGSVQALWADVDHWHGPAVLAPPGTCVPGTAVALAS TAGDGSVQALWADVDHWHGPAVLAPPGTCVPGTAVALAS RGSDNQI YAKILRNNNWSTWS NWSPFGGGACSAPAA RGSDNQUYAKILRNNNWSTWS NWSPFGGGACSAPAA
RGSDNQIMKALRNNWSTWS NWSPFGGGACSAPAA RGSDNQ:YAKILRNNNWSTWSNWSPFGGGACSAPAA VDGGSSVRALWAPASGWRAAGVLDGILTAAAGSQLVAVQC TGKDGQLRMMTGYSSGKWSTVATYQTDPPLRPGSPLAAGCY
TGKDGQLRMTGYSSGKWSTVATYQTDPPLRPGSPLAGCY KTKNNSIRASVNNRASWDWSEQSREMRKAVKGSDLAAAPT QGKDGSTYATRTDSRQ PTGWLAAPVKVSGDS TDASY QGGDGHVHEXWWDG HWHHNDUTSQS DAPPDSGEPCGYV QGGDGHVHELWWDG H
HI Y Y WD WQNGCKPWQSFEAR
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F R D NVVENV|R|L|YATTTAGQLLQEWAWGAYGVSWSQGSSFD $G \square G N N V R P H I I L T Y \square G P D \square N E N N \square P A D S N D D E F S E N M G P D$ $\begin{array}{lll}P & N \\ P & N \\ P & S\end{array}$ P N S $\begin{array}{ll}P & N \\ R & \square \\ A\end{array}$



 $G \mathrm{GT}$ G G Y $\quad$ G
 AVY H N S D G R LEVVF VRGGDNAL WHI WQKP SA GP WS K WD S L L G
 N N S Q D WRVVYYHDQS GF GNAS GFNLGSR\|G

$\bar{V} Y D T G Y V P Q P E L F Y T N A Q M Q V L G \square S M N D L Y T P T A Q E D S \square K$ $V$ Y D T G Y V P Q P E L F Y T N A Q M Q V L G I S M N D L Y T P TAAQE D S ill K | $G$ | $V$ | $P$ | $R$ |  |  |  |  |  |  |  |
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| $G$ | $V$ | $P$ | $R$ | $V$ | $Y$ | $R$ | $G$ | $V$ | $D$ | $N$ |$R^{\prime}$ $G \vee P R$ $\begin{array}{lllll}V & V & Y & R & G \\ V & D & N & R\end{array}$ $G \vee P R$ $V$ RYRTVE ITWERVL


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 NYK G | G GA WS E WQ N | $L$ | G |
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| G GA WS E WQ N | L | G |
| G GA WS E WQ N | L | G | SATWCKGDFPVVIVQGDDLSI KAFQWESVPGNYGGLS GIF RNSDGRLEVFVRSTDNALWHNWQAADTNTWSSWQP Y RNSDGRLEVFVRSTDNALWHNWQAADTNTWSSWQPLY

 SVTNTANGRLNVFGVGTDNVVLHNEQTTHTGSSWNSWTSLL YVPAVTSYGSNRIDI IGTGSNTGAYHRYWNGNSWSGWNNY

 $Y$ VPAVTS YGSNRIDDIGGTGSNTGAYHRYWNGNSWS GWNNY

DQNRGY RLLYYHDEDMHLNELSSY
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 MA YYHKYFDGFDWQPQGGAWEN
$M A Y Y H K Y F D G F D W Q P Q G G A W E N$
$M A Y Y H K Y F D G F D W Q P Q G G A W E N$
MAYYHKYF DGFDWQPQGGAWEN
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VA F T D P THWTLFARGADGAVVQ $R G P A T G W S S L G L P G$ TVARNAD GRLEAFARGSNNSIWWHTYQSTPNGSWSAWADLV TVARNADGRLEAFARGSNNSIWHTYQSTPNGSWSAWADLV PEVVFARSNDYS LWY D K WTASHTYPWTNWQS L S


KQTASHTYPWTNWQSLLS
GALTVDDGSRPYVVVQGTDGNLWSNW WSGSKWSWSNQGKP
$P \quad Y \square M V Q D Q A S N Q M M W Y G Y K Y$ Q $\square Q N G Y F D D T A E S$
L WF T T K E G GLWTH R WT S TQQQHAK S Q
LWFTTKE GGGLWTHRWTSTQQHAKS Q
NAN S S R L EVVFVRGA DNTLWHDWQ TAPHGPWSNWCS L G
 $A V Y$ VN T D GRLLEV FVVRGS DNALWHHLS QAA HSNPWSS WQS L N T GTQMASYWPSTIVQASNGDIMMEVFFDYKSPRFQEPKIVG


E S
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NSTFYFKNEVNSTSGYINDWTIQEEVAPVRTTTNKKGTLS
 GKNHCFNDVLAVVYASDNGPFNETHWRTYSREPDTNT QWK A G $\vee F \vee T P B G G D$
 YED QPGGWTQHA Y Y Q GPD GR V QE I WWGD GKNH HQQLT S G Q
 A AVSRIPNSMEVVWWIGAD GSVQQAYWYE GAEWWYELAAPA G ASPARDGDRVSVFTRGADGSLRQRTGHEGRGDARTGGPTH ASPARD GDRVSVVFRGADGSLRQRTGHEGRGDARTGGPTH

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UniRef90-J4UTE9 UniRef90-A0A022PHN6 UniRef90-AOAO222PHN6 UniRef90-G4N613 UniRef90-Q7N816 UniRef90_A0A010R4Q8 UniRef90-UPIO003644587 UniRef90-UPIOOOO3644587 UniRef90-UPIOOO3644587 UniRef90-UP10003B62C30 UniRef90-UPIO003B62C30 UniRet90-UP10003B622C30 UniRef90_UP10003B62C30 UniRef90 G1X1N8 UniRef90-R1EMC4 UniRef90-G9NSY8 UniRef90-G9NSY8 UniRef90-M4FVQ4 UniRef90-D7C3Q1 UniRef90-W9GGY9 UniRef90-W9GGY9 UniRef90-W9GGY9 UniRef90-J8JL63 UniRef90-J8JL63 UniRef90-G2NMX7 UniRef90_G2NMX7
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## UniRef90 W7IHU3

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AGTSFGGYTFSAAAFKVDVGGNPG\|NLIFW
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 PTNLTTSPMPGLAPVGYAFESNPAVNVIHVGADGVVYEFW K T YTHKAGPRTQLAAVCPNSTDTLIVAYENVNKQURLYY KITYTUKAGPRTQLAAVCPNSTDTLIVAYENVNKQURLYY
SAFP QPRSGD SAFPKGPGSSGDLVTNATNATSGALNTTSAANFTLPA KWDSLKGVITSAP AVGKNSNGQLEAFARGGDNALWHIW DSTFPTTNATNTTSASAAWDGQPQALVFYDGTDDRLYQVG KHWTTPRPVSNARVANWNPYSSDQLHVYYTGLDKGIYEFV NTGMGPAGAAGTVVLSVHWGRNR LDLFALGTDNAVWHKW NTGMGPAGAAGTVVLSVHWGRNR LDLEALGTDNAVWHKW NTGMGPAGAAGTVVLSVHWGRNR LDLFALGTDNAVWHKW AKRLRVQAVNASRLALVPTSTSGGYGI FYQAANSSLV
AKRLRVQAVNASRLALLVTSTSGGYGIVYQAANSSLV
 GWGEFATDEVQGAGASSPGPDGSAVVVLRGVDGRGHRT
SGEDPVTVDSNFTMAFVVSAVNTWIVQDSKTGKISY SLPASVSPLPNTPD
NWKSLGGTLTSNPAAHTNADGRTEVFARGADNALWHTW NWKSLGGTLTSNPAAHINADGRIEVFARGADNALWHI W LSGWQSLGGMITSNPAVYVNANSRLEVFARGADNTLWH R LYETLGGTFSSALSVVVTTTVTVRIDFFGVGNDKGCWHKY KYETLGGTFSSALSVVVTTTVTVRIDFFGVGNDKGCWHKY LYETLGGTFSSALSVVVTTTVTVR:DFFGVGNDKGCWHKY KITYADQSGPRAQLAACPSKCTNTLLVAYENVNQRRHY KUTYALQSGPRAQLAACPSKCTNTLLVAYENVNKQURUHY KTANLGGNL
KTANLGGNL
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NSWKKIADGPFRSTPVV VKPGNHLEAYVVDASGKLVQLV NSWKKIADGPFRSTPVVVKPGNHLEAYVVDASGKLVQLV A WQDLGGKLTDAP SVAFADPDHWTLFARGADGRIGQRG A WQDLGGKLTDAP SVAFADPDHWTLFARGADGRIGQRG GWEDHTGLSPFVGTPVASSWGYGRVDLWAVGKNSNLYHKF GWEDHTGLSPFVGTPVASSWGYGRVDLWAVGKNSNLYHKF GWEDHTGLSPFVGTPVASSWGYGRVDLWAVGKNSNLYHKF SDWSSHGGTVSGSPTLVAAGDTVVL YARAADYTLWQQR
 TNWRSLSGTI TSDP AVHTNADGRLEVFARGPDNALWHOW TNWRSLSGIITSDPMAVHINADGRLEVVFARGPDNALWHIW AGGFPGGAISGFASGRVIRSEQVDTHLLYQDGNGTVQVLW DWETLGAKASSTAVLCLE EQNAAVHI WIREDTRAIQHNY DWETLGAKASSTAVLCLEEQNAAVHIWVREDTRAVQHNY
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TGTDPPSSVAFTPDANDLY
TAPKLAVFYK QDNKVYQMK HVDSVAGVLPDSPIAATQTG HVFA LE G GPQLVVE

 H K I L
 NWATLPSGGQRFTKIATAVTGDGR IALFALDHRRRMWRTY PA WEFP G GSDFPATIHAAGTGDGK ADVVWQGKFGAMWNDH
 N S D L T P Y L A P S L P P TA Y G F T S Q R T H H L L Y T G S D E H V H E L


 $R W Q K L G G R L A D S P$ AVAYENPGSWTLFARGADGRIRVRG P
$R W Q K L G G R L A D S P$

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\begin{abstract}
ATAPWFNSS $\begin{aligned} & \text { TF P S D } \\ & Y \text { D P R VA P P P }\end{aligned}$ YDPRVANPKWTGWFSLGGKVRPGSKIAAVSATEGGVSLFI




 WDGTASSLGVSTHHSGTRS
QTTSSWSAWASTLGGTLIDASV QTTSSWSAWASLLGGTLI DASV
VD WK WLAFTRASDASWPDADPGQRQLAANDFESSQARVYY LNGTDATDTSFQPQPDGTADYVGADITAVGWKD Q DR FF WN GS S WG G W WN GSSWGGW WN GS SWGGW
WNGSSWGGW


LA DQWY H

## LADQWY H

LA D Q WY H

YENDSEGWKGPETDPVFEGADSPTHDACVTAASSTDHCFF


ADDPAPNVSTPLQAA TGAFA TPKTARNLDSLMNFYVLWR ADDPAPNVSIPLQAAI GAFAI PKTARNLDSLMNFYVLWR ADDPAPNVSIPLQAAIGAFAIPKTARNLDSLMNFYVLWR ARGSYFWAGQRRLR $\square A G R P A N L S A E F N I T A L A D T D K H L Y \square$ QGGTWGTWQLFDAGQTRM TQLTARRDGAGQIRLFG YDGGWSAPVEITPQHLTDWGQPYTIVPAVT GDRRLNLFW KGSGGFHHNDLTASSKSSARAAGVPVGFANDPGNRQVVSY KGSGGFHHNDLTASSKSSARAAGVPVGFANDPGNRQVVSY KGSGGFHHNDLTASSKSSARAAGVPVGFANDPGNRQVVSY WGAEWW
WGAE WW
PRTGWTSFDGPEDASVATDGAGRTHLA
PRTGWTSFDGPEDASVATDGAGRTHLA
VRADDDSVRTR
PRTGWTSFDGPEDASLVATDGAGRTHLA

UniRef90 W7IHU3 UniRef90_F7WBT3 UniRef90-K9ZDI5 UniRef90 K9ZDI5 UniRef90_K9ZDI5 UniRef90_G4N901 UniRef90-G4N901 UniRef90_U2RLX1 UniRef90_U2RLX1 UniRef90_G4N4D2
UniRef90 G4N4D2 UniRef90_W3XFW9 UniRef90_W3XFW9 UniRef90_C7BLE3 UniRef90 C7BLE3 UniRef90_M7SL96 UniRef90_N1JB70 UniRef90 B8NAJ7 UniRef90_B8NAJ7 UniRef90_B8NAJ7 UniRef90-B8NAJ7 UniRef90_E3Q8W0 UniRef90_E3Q8W0 UniRef90-H8MIE6 UniRef90_H8MIE6 UniRef90_H8MIE6 UniRef90_UPI00036EE115 UniRef90_UPI00036EE115 UniRef90_-L2G1W5 UniRef90_S3CZ30 UniRef90_Q7N8J0 UniRef90_Q7N8J0 UniRef90_U7QXJ0 UniRef90- S3CQA2 UniRef90_S3CQA2 UniRef90-S3CQA2 UniRef90_S3CQA2 UniRef90-L7IGV1 UniRef90_L7IGV1 UniRef90_G4U7E6 UniRef90_UPI00035F2F67 UniRef90_UPI00035F2F67 UniRef90_UPI00035F2F67 UniRef90_R7Z6X9 UniRef90_R7Z6X9 UniRef90_G2PCE7 UniRef90 G2PCE7 UniRef90_U1GK83 UniRef90_U1GK83 UniRef90_U1GK83 UniRef90_U1GK83 UniRef90_S2YCN9
UniRef90-B9XNT7 UniRef90-B9XNT7 UniRef90_-Q7N8I7 UniRef90_Q7N8I7 UniRef90_UPI00028910ED UniRef90 W3WPK UniRef90_J4UTE9 UniRef90_J4UTE9 UniRet90_A0A022PHN6 UniRef90-A0A022PHN6 UniRef90-G4N613 UniRef90_Q7N816 UniRef90 A0A010R4Q8 UniRef90_UPI0003644587 UniRef90_UPI0003644587 UniRef90 UPI0003644587 UniRef90_UPI0003B62C30 UniRef90-UPI0003B62C30 UniRef90 UPI0003B62C30 UniRef90_G1X1N8 UniRef90-R1EMC4 UniRef90_G9NSY8 UniRef90_G9NSY8 UniRef90_G9NSY8 UniRef90_M4FVQ4 UniRef90_W2F1K7 UniRef90_D7C3Q1 UniRef90-W9GGY9 UniRef90- W9GGY9 UniRef90_J8JL63 UniRef90_J8JL63 UniRef90_G2NMX7 UniRef90_G2NMX7
UniRef90_G2NMX7

LD S N S N I Q M Y T S F S G S G
$V$ GSDNAVWSAYYDPWNGWFSLGG
V GSDNAVWSAYYDPWNGWFSLGG
V G S D N AVWSA YY D P WN GWF S L G G
$V G S D N A V W S A Y Y D P W N G W F S L G G$

| $Q$ | $G$ | $A$ | $T$ | $G$ | $L$ | $F$ | $T$ | $E$ | $V$ | $T$ | $R$ | $I$ | $A$ | $D$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Q$ | $L$ | $T$ | $W$ |  |  |  |  |  |  |  |  |  |  |  |
| $Q$ | $G$ | $A$ | $T$ | $G$ | $L$ | $F$ | $T$ | $E$ | $V$ | $T$ | $R$ | $A$ | $A$ | $D$ |
| $L$ | $T$ | $W$ |  |  |  |  |  |  |  |  |  |  |  |  |



QA T NLLLS A T R K I D WT Y Q I
I G T D S AL H QA S Q S GND A WH I E A S P N A T
IG T D S A L H QA S QS GND A WHIIEASPNAT

VS G G G VEAASTRG
QPARGRLVMGEDNDTTWG
KGTDNALRWWDGTNRGAWESLGGVVTS K GTDNALRWWDGTNRGAWESLGGVVTS K GTDNALRWWDGTNRGAWESLGGVVTS KGTDNALLRWWDGTNRGAWESLGGVVTS


A A DEVWTRSRAS GQWSAWSS LGGTVVGSP A A DEVWTRSRASGQWSAWSSLGGTVSGSP K GDDRQYYYKYWDGASDWHPKGGDFASAPA K GDDRQYY Y K Y WD GAS D WHPK GGDFASAPA K GDDRQYYYKYWDGAS DWHPKGGDFASAPA K GDDRQYYYKYWDGASDWHPKGGDFASAPA V D GQVHRTQ FK
V D TN HVVWHYETTAN GA WN GWA S L G G S $\square$ S S V D T NHVVWHYETTANGAWNGWASLGGS ISS RGANNAL
RGANNAL
S D G N L WV
QS Q G G L K E VWY D GY T WRDCGF $\square A T G$
K L G S P Y HR QWSRNRWGPWNS LGGGYVGNP $K L G S P Y H R Q W S R N R W G P W N S L G G F Y V G N P$ A SK GLP L F H WWQ N D S G S WS NWA S L G G GLS S G A S K GLLP L F H WQ N D S G S WS N WA S L G G GLLS S G Q R D GALK KVVLFD G S R WVD K G F V A D N A L WH DWQTVSHS GP WS S WA S L N GN■IS A QASRQLKH VHFDGSKWADMGFLP

## SEKGNKFVHRYQ\LGGSW

NGTVLQMTKNDDNNGWQTSSTPDA
NGTVLQMTKNDDNNGWQTSSTPDA
NGTVLQQMTKNDDNNGWQTSSTPDA
NNNSTNIE E YRWGGDDPYSV
VDHAGQLWHRQQTAANADVWNAWVAFSTPGA
Q GRDSRVQ

V A T D G H L H QL T WD
V A T D GHLLH QLTWD
GS WH E Q D L T S T GS WHE Q DLTTS T

UniRef90-S7ZYX4 UniRef90_UPI00046AC16C UniRef90_UPI00046AC16C UniRef90_U7QWQ0 UniRef90_U7QWQ0
UniRef90-U7QWQ0 UniRef90-U7QWQ0 UniRef90 C7BLE4 UniRef90_L7HQE6 UniRef90_L7HQE6 UniRef90_Q2KGF5 UniRef90_C3YI43 UniRef90_C3YI43 UniRef90_U7QZC8 UniRef90_U7QZC8 UniRef90_G2RD47 UniRef90_B9XEQ0 UniRef90_B9XEQ0 UniRef90_B9XEQ0 UniRef90_B8LTB0 UniRef90-B8LTB0 UniRef90 E4N8U0 UniRef90_IOKVW5 UniRef90-IOKVW5 UniRef90-UPI0004698C13 UniRef90_UPI00046
UniRef90_Q67MN8 UniRef90_Q67MN8 UniRef90-UPI0001582E38 UniRef90_D0D5U2 UniRef90_D0D5U2 UniRef90 G2R1F6 UniRef90_G2R1F6 UniRef90_Q7SAV7 UniRef90_Q7SAV7 UniRef90_C7Z843 UniRef90_C7Z843 UniRef90_G2XT72 UniRef90_L7HQU8 UniRef90_J3PGT7 UniRef90_J3PGT7 UniRef90_F9FGZ4 UniRef90 Q467G9 UniRef90_B2APF9 UniRef90_Q2H4Z7 UniRef90_Q2H4Z7 UniRef90_W5WMC3 UniRef90_W5WMC3 UniRef90_W5WMC3 UniRef90 UPI00039A53E0 UniRef90-UPI00039A53E0 UniRef90_UPI00039A53E0 UniRef90_UPI000468A266 UniRef90 B9XNL0 UniRef90_B9XNL0 UniRef90_W7N210 UniRef90 W7N210 UniRef90_W7N210 UniRef90-W3XF64 UniRef90-B9XGR9 UniRef90_B9XSL5 UniRef90_A0A010SL35 UniRef90_A7E8F7 UniRef90-A0A016PEU1 UniRef90_S8A488 UniRef90_S8CE42 UniRef90_W7TC95 UniRef90_W9LE67 UniRef90_W3XFY9 UniRef90_Q7N8I5 UniRef90_Q7N8I5 UniRef90_Q7N8I5 UniRef90_A1V3S8 UniRef90_A1V3S8 UniRef90_N0A6H3 UniRef90_N0A6H3 UniRef90_N0A6H3 UniRef90 N0A6H3 UniRef90_UPI000374E3B0 UniRef90_UPI000374E3B0 UniRef90 V6KL08 UniRef90_D9WGI8 UniRef90_D9WGI8 UniRef90_U7QZC2 UniRef90_U7QZC2 UniRef90_U7QZC2 UniRef90_L8EDY6 UniRef90_L8EDY6 UniRef90_J3PE47
UniRef90_G2NVF6

VN A D GRDEVFARSNDYALWYDRQT V NAD GRLEVFARSNDYALWYI RQT $V$ N A D GRRLEVMFAR N T D GRRLEVEARGTDNALWHI WQT NTDGRLLEVARGTDNALWHLWQT

Q N L S $\square$ A A A R WVDG D S THYR VY T LLS G N S S L LE SAR D V N A D G R L E L F AV A S S GVI NHIWWQK V N A D G R L E L F A V A S S GVI NHI WQ K $V$ N A D GRIL EL FAVAASSGVI NHI WQK



AFVGTAGNWAKFFFSTDNGKLYMGTWT FAA $\square$ AT SMQA GNR $\square E F W S S G T S$ GQVWT LYY T

$$
N P \square A Q G A S \square E S P \text { A G D } V R T \text { Y Y Q A G D G S } \square 1 E V T P N
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$P G T P L A G T G W W D E S K T \ A S M F Y \square D N Q G D \| I N A L F N$ PGTPLAGTGWWDESKTIASMFYIDNQGDIINALFN




A GTASTANGGNGTILFWVDPKGASGCCRWF $N \square D G R L D I F Y I A T N D R L Y Y N W V S$ PET $\square R$ Q GSK L S AVGWRKANGDVERLGYLDPQGRVRRSRSG G T P

 $D$
$D$
$D$ SAPAAYLFAAERTRH VIYRGT TGHLIELYC G FEGTDGK LRF $\square$ DRT

N S D GR LE VF $\ \quad$ I T D G H I Y Q Q T A G A N S D GRLEMF GVGA N S DI WH N Y S A HLA F QD T T GD I QYTACN N S NVY HK WY S RNGTA $\square A G V G W W D N T K \| I A S \prod F W Q S E D S V I V N G Y Y E$
 NGGN W $\quad$ K F F FTTDN GK V YMGS WD FSTALAVAGWWDDDLDTPMVFYQAVDNSVVKALDN SAD GKP TN L T E L Y $\square$ S GVV GAEYRKS H D N A D GRLLEV FARGLLDNTLWHIWQT






PGAS LGTRSTASPALVRDGDRLTAFTRGADGSLRQ QS G

VN S D GRDEVFVRGGDNALWHTSQT V N S D GRLEVFVRGGDNALWHI S QT $V$ N S D G R L E V F V R G G D N A L WH I S Q T NAD GRLLDVFFR GT DTQLWH V Y Q NAD GRLVVFFRGTDT QLWH VYQ




DVA QK PRNGTSLT GQGWWNSKTTAASIFY
$\begin{array}{llll}V & Y & M \\ V & Y & M\end{array}$
$V$ SVANTSDGRLEVFG
V SVANTSDGRLEVGG
 VA GSSAATNWSSFTAFSSSVSPTAKLAVGNWANGVQDLGV VAGSSAATNWSSFTAFSSSVSPTAKLAVGNWANGVQDLFV

 GSKVWQGPYA H GNPGGPLAAlAVGRDQDGRIEVFG

NTAPAYGYEELLPAGSVKANTPIASTMWDLNADKRARVYY $P$ GADWSNWEGPGFKGQPRALRQLAAAALQNGNAMLAA




A S S GWQA VF D A LLP P G $\square$ A R A T T Q LT T LS VG S PNSVWK GHAEFKNGSHYYTAKQICVYQ NID GRLLEI FY
 NTGRFGNWVISPDTATIHSNTGLASVVLGQDTGY RVYY

TPQDGLHIADWGGELAGRPTAISYGNQQLIFA
TPQD GLLH A A D WG GEELAAGRPTAA SYGNQQQLI FA
TPQDGLHIADWGGELAGRPTAISYGNQQLI FA H G G GWQ TYYF HLSAFSVAD GTGVTGWTGNTNNSFGAHIHY
 A D DVWHAKD DT DEAGAPTATTDPSAYVFDSE GSQHVVFL

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RDGHWSSRTTDLGGPTGGR\LGQPAAYTSAAEPGR\DVFV


UniRef90 S7ZYX4
UniRef90-S7ZYX4
UniRef90_UPI00046AC16C UniRef90_UPI00046AC16C UniRef90_U7QWQ0 UniRef90_U7QWQ0
UniRef90_U7QWQ0 UniRef90 C7BLE4
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UniRef90-L7HQE6
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UniRef90_C3Y14
UniRef90_C3YI43
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UniRef90_U7QZC8
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UniRef90_B9XEQ0
UniRef90_B9XEQ0 UniRef90_B9XEQ0
UniRef90_B8LTB0
UniRef90-B8LTB0
UniRef90_E4N8U0
UniRef90_IOKVW5
UniRef90-IOKVW5
UniRef90_G1X232
UniRef90_UPI0004698C13
UniRef90_Q67MN8
UniRef90-Q67MN8
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UniRef90_W5WMC3
UniRef90_W5WMC3
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UniRef90_G9P8U4 UniRef90-B9XGR9 UniRef90_B9XSL5 UniRef90_A0A010SL35 UniRef90_A7E8F7 UniRef90-A0A016PEU1 UniRef90_S8A488 UniRef90_S8CE42 UniRef90_W7TC95 UniRef90-W9LE67
UniRef90-W3XFY9
UniRef90_Q7N8I5
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UniRef90_G2NVF6

R G S D N A L WH IWWP N S G WT N WR S LS GA TT S NPAVH ITNA R GSDNALWHI WQPNS GWTNWRSLSGAITSNPAVHINA R GSDNALWHI WQPNS GWTNWRSLCSGAI TSNPAVMHINA R GADNALWHI SQTSGPWSSWASLNGVITTSNPTVHI R GADNALWHIS QTSGPWSSWASL
 NPTV
$M E E S$
$M E E S$
$H P E S$ H
G
G $\qquad$ S A
S A

A S |  |  |  |
| :--- | :--- | :--- |
| $V$ | $S$ | $Y$ |
| $V$ | $S$ | $Y$ |
| $V$ | $L$ | $L$ | NPNADVAMES HP

QAEDGSLQECDLSTGKFTD S

VGPDKAVMCNGQTTPQDNSPWSGWSSFSGQVTSKPAVFDN $V G P D K A V C H N G Q T T P Q I N S P W S G W S S F S G Q V T S K P A V F I N$ LQPGGTI DER QT PVGVWGDDNFSGL YAASNGSSLFSYWY


 GLT G T D QVA GAS LLGGTASAS P

LDSND I Q ELIVY G G G GWSA GT】GALNIATS GTNGMSA S F

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

HDNDSA $\square$ NE LTYT TA D GWD $\square N S L P G L G A A F S G T D N \square T V V S P$ HDNDSA I NELYTTAD GWDINSLLPGLGAAFS GTDNITVVSP $\square G A S S T I L G M A D N E N N N$ N AVVSDDPNDK KMSLGAM IGASSTICLGMA INENN NPAVVDDPNDK KMSLGAM TDSDNITTNYWDTNNFWSQS Q GKGKFRPSPARSAAGIVC






## UniRef90 S7ZYX4

UniRef90-S7ZYX4 UniRef90-UPI00046AC16C UniRef90-UP100046AC16C UniRef90_U7QWQ0 UniRef90-U7QWQ0 UniRef90_U7QWQ0 UniRef90-C7BLE4 UniRef90-C7BLE4 UniRef90-LTHQE6
UniRef90 LTHOE6 UniRef90- Q2KGF5 UniRef90-C3Y143 UniRef90-C3YI43 UniRef90-U7QZC8 UniRet90-U7QZC8 UniRef90-G2RD47 UniRef90-B9XEQ0 UniRef90-B9XEQ0 UniRef90-B8LTBO UniRef90-B8LTBO UniRef90_E4N8U0 UniRef90-10 KVW5 UniRef90-10KVW5 UniRef90_G1X232
UniRef90_UP10004698C13 UniRef90-Q67MN8 UniRef90-Q67MN8 UniRef90_UPI0001582E38 UniRef90-DOD5U2 UniRef90-DOD5U2
UniRef90 G2R1F6 UniRef90-G2R1F6 UniRef90-Q7SAV7 UniRef90-Q7SAV7 UniRef90_C7Z843 UniRef90_C72843
UniRef90 G2XT72 UniRef90-L7HQU8 UniRef90_J3PGT7 UniRefofo-J3PGT7 UniRef90-F9FGZ4 UniRef90-B467G9 UniRefoo-a2 4477 UniRef90_Q2H4Z7 UniRef90-W5WMC3
UniRef90-W5WMC3 UniRef90-W5WMC3 UniRef90-UPIO0039A53E0 UniRef90-UPIOOO39A53E0 UniRef90-UPIIOOO39A53E0 UniRef90_UPIo00468A266 UniRef90-B9XNLO UniRef90 BgXNLO
UniRet90
W7N210 UniRef90-W7N210 UniRef90-W7N210 UniRef90 W3XF64 UniRef90-B9XGR9 UniRef90_B9XSL5 UniRef90-A0A010SL35 UniRef90-A7E8F7 UniRef90-A0A016PEU1 UniRef90-S8A488 UniRet90_S8CE42 UniRef90-W7TC95 UniRef90 W9LE67
UniRet90 W3XFY9 UniRef90_O7N815 UniRef90-Q7N815 UniRef90-Q7N815
UniRef90-A1V3S8 UniRef90_A1V358 UniRef90 NoA6H3
UniRef90 NOA6H3 UniRef90-NоА6Н3 UniRef90-NOA6H3 UniRef90-UPIO00374E3B0 UniRef90-UPI000374E3B0 UniRet90-V6KL08 UniRef90-DgWGl8 UniRef90-D9WGII8 UniRef90_U7QZC2 UniRef90-U7QZC2 UniRef90-U7QZC2
UniRef90 L8EDY6 UniRef90-L8EDY UniRef90_J3PE47
UniRef90_G2NVF6
 QDGDTIYFVFQT GTTLKERTFDGALTLSDTLG GDDGSLWTTWRTADGPDHPGQWAAAP QLLNPNM GIDGSLWTTWRTADGPDHPGQWAAAP QLLNPNM DGRLEVFARGADNTLQHTWQTTASGSWSDWASLN DGRLEVFARGADNTLQHIWQTTASGSWSDWASLN DGRLEFARGADNTLQHIWQTTASGSWSDWASLN NSDGRLEVFARGTDNALWHI WQTAPDSNWSSWESLN NSDGRLEVFARGTDNALWHUWQTAPDSNWSSWESLN TVDGTDYKMLFWQPQNSPGE:KYSAWDSKGRNWEKGSANI TVDGTDYKMLFWQPQNSPGEVKYSAWDSKGRNWEKGSANI GCSAVMGNSGTVFTRGYDGTLRERYWAGSSWAWRNHGKPP GCSAVMGNSGTVFTRGYDGTLRERYWAGSSWAWRNHGKPP SDCR LQVFARGMDNALWNNRQTAPNATWSGWQSLG SDCR LQVFARGMDNALWNNRQTAPNATWSGWQSLG QD DDQHDQVLATFFQEDGVNELTDGRYVENGT
AVGRENDGRVEVFVIGNTGNLYHNWETAANGTWNGWANTG AVGRENDGRVEVFVIGNTGNLYHNWETAANGTWNGWANI G AVGRENDGRVEVFVIGNTGNLYHNWETAANGTWNGWANIG RSG QSKLQI RVFTVLATKEKTDSQMSYNHPDWKTLSSPA RSG QSKLQURVFTVLATKEKTISQMSYNHPDWKTLSSPA AVAPNGDGRLQIFVRNGGGGMSTKWAAPNGGWSGWADMG ALVRVDDTHATAFVRDAQGALNTRSGTTWGTGWTSLGGPV ALVRVDDTHATAFVRDAQGALNTRSGTTWGTGWTSLGGPV



YTSVSNALNWQDLG YTSVSNALNWQDLG
RDSQNTATTRLTWFRSTLPHPLQGNPTTADTNRSDTATNE RDSQNIATTRLTWFRSTLPHPLQGNPTTADTNRSDIAUNE ANSSTASYYPATVYQDASGELGQARMFML QWLDRMTGM ANSSTASYYPATVYQDASGELGQARIFML QWLDRMTGL RDHRYSDTWCD CWYDRDRGSLLCHFYKGSAGWSKPRGFG
 NPCSTCDYNDLVSYQTSDGNLH1MSDRNENADSWEDYDVY
 QYGKDNDFT| RLEYQAPNDT:IFSTYYAMYGRWTAPSSSV CVGRNYDGRLEI FY DGTNDRLYHNWQEKPNGGWQGEEEFK YVVTQHESGHIL QNDLALRRGLVPSSGHDWYVKNLT A AAPRDDQNIAVTRWNSDETWFRTTVPRPGDGGFVNGETIR ${ }_{\mathrm{Q}}^{\mathrm{A}} \mathrm{APRDDQ}$

 GRAFGFGGGQHYVAVGSAGTLQHLSWSPESG VVQADWG ASSHYGTQHVVFRYRAVHLLSRGTGEDASWVQRTLTAATG SDGRLTVFAI GVGTAGTLYQNYQTSPGGSWSGWVAMGSGN SDGRLTVFALGVGTAGTLYQNYQTSPGGSWSGWVAMGSGN
 Y VVTQDQDTGEMLWYGYKNHVVPYYFDLTGSSLTVIGALY KRIFFVVKDSSTCFIDPLGDGDQVEEDNDDAPWNEEKIAG
 DGBGYRIILFGVELSSGKLIHTWTGPGNWWLDGPISQ WYDDKNAKNMTVAF MKGKDNIETSRSQKSGKWKLAAFP TSQLICDNESTVCFWDEAGDVNELVDPNETPADSTVYSP NNQPHVFARGADDTLQHFWPGHH DSWG
GSTNDS AGNDTRDDVFVV SRANNHLLHISKDSETDTWSDYEDLG VVARTVDGRLEVFVRAVDNALWHI WQAPNSSQWSNWASLG VVARTVDGRLEVFVRAVDNALWHI WQAPNSSQWSNWASLG

 SNQFGIPNQTDVFAVGRDGALR VAWVVSAGNWNGPASAG
 SNQFGIVNQTDVFAVGRDGALR VA WVVSAGNWNGPAS: S PRAISVSGTTHVFTRGSDKNV WYLASGTWHRLTGUS VAYESAERWTLFAHDEDG Q $\square$ RSRGPRSGWTTLGAPE VSLNANDELEVFARASDGTLQHNWQTAPSRNEWSGWNSLG VSLNANDELEVFARASDGTLQHNWQTAPSRNEWSGWNSGG GNSDG
GNSDG
GNSDG
RLEVFVRG
DSDQRI HVFFRGTDTQLWHI QQKAGYDSWTSASSLG DSDQRIHVFFRGTDTQLWHUQQKAGYDSWTSASSLG



KAMGGTPMAAVAPPTPQLQLYFLSPEANLAGYNWRGGDDS
 DGSTAKQI CVGQNADGRLEIFYIGTNDRLYHNWQENGGWH AYEGTSLCIVPTSTNKIRVVYQKPNQGINESVQRDQVPE
 G Q 1 AL GRETAETNFT $\begin{array}{lll}G Q & V & G R \\ G Q & V & G R\end{array}$ G G S L

UniRef90 S7ZYX4

## UniRef90-S7ZY 4

UniRef90_S7ZYX4
UniRef90_UP100046AC16C UniRef90-UP100046AC16C UniRef90-U7QWQ0 UniRef90-U7QWQ0
UniRef90-U7QWQ0 UniRef90-C7BLE4 UniRef90CC7BLE4 UniRef90-L7HQE66 UniRef90-L7HQE6 6
UniRef90 Q2KGF5 UniRef90-C3YY43
UniRef90-C3Y143
UniRef90-U7QZC8 UniRet90-U7QZC8 UniRef90-G2RD47 UniRef90-B9XEQ0 UniRef90-B9XEQ0 UniRef90-B9XEQ0 UniRef90-B8LTEO UniRef90-B8LTB0 UniRef90-E4N8UO UniRef90_IOKVW5
UniRef90 $10 \mathrm{KVW5}$ UniRef90-G1 X232 UniRef90_UP10004698C13 UniRef90-Q67MN8 UniRef90-Q67MN8 UniRef90-UPI0001582E38 UniRef90-DOD5U2 UniRef90-DOD5U2 UniRef90- G2R1F6 UniRef90-G2R1F6 UniRef90-Q7SAV7 UniRef90-Q7SAV7 UniRef90_C7Z843 UniRef90_C72843
UniRef90 G2XT72 UniRef90_L7HQU8 UniRef90_J3PGT7 UniRefofo-J3PGT7 UniRef90-F9FGZ4 Uniref90-Q46799
UniRef9O-B2APF9
UniRef90-Q2H4Z7 UniRef90-W5WMC3 UniRef90-W5WMC3 UniRef90-W5WMC3 UniRef90-UPI00039A53E0 UniRef90-UPIOOO39A53EO UniRef90 UPIIOOO39A53E0 UniRef90_UPIo00468A266 UniRef90 BgXNLO UniRef90-B9XNLO
UniRef90
W7N210 UniRef90-W7N210 UniRef90-W7N210 UniRef90-W3XF64 UniRef90-G9P8U4 UniRef90_B9XGR9 UniRef90 B9XSL5 UniRef90-A0A010SL35 UniRef90-A7E8F7 UniRef90-A0AO16PEU1 UniRef90-S8A488 UniRet90-S8CE42 UniRef90-W7TC95 UniRef90-W9LE67
UniRet90 W3XFY9 UniRef90_O7N815 UniRef90-Q7N815 UniReffo-Q7N815 UniRef90-A1V3S8
UniRef90_A1V3S8 UniRef90-NоА6Н3 UniRef90- NOAGH3 UniRef90-NOAGH3 UniRef90_NOA6H3
UniRef90-UPIO00374E3BO UniRef90-UPIO00374E3B0 UniRef90-V6KL08 UniRef90-D9WGI8 UniRef90-D9WGII UniRef90-U7QZC2 UniRef90-U7QZC2
UniRef90-U7QZC2 UniRef90-L8EDY6 UniRef90_L8EDY6 UniRef90_J3PE47


S NPYFPQVTPNSDLAVGMDDDGR DELLYRQDDSSWNQTS PWQSLGGTLTDGP TVAWTGPTQWTLIVRGADGKLWSRT $P W Q S L G G T L T D G P T V A W T G P T Q W T L V R G A D G K L W S R T$ TGNVAQSFSTGSTNGGYSFSASAWVHLFWAGTLGTVYRAP GPGVGGQPEPFDDDAASEQKGVRGLEVWGVSASGQI WTLY


A LPQPLGGLLASDPAAVTP DGПRTAVFARGПDDALWWRE ALPQPLGGLLASDPAAVTP DGIRIAVFARGIDDALWWRE LRANQSSADPNAELAVAYDQKSSTVRIYYMVKDRLSEVLY LRANQSSADPNAELAVAYDQKSSTVRIYYMVKDRLSEVLY NSSMFPTPPNGAPIAAWSLSHFPNTYILYLDSDSNIQMVY NSSIFPTPPNGAPIAAWSLSHFPNTYILYLDSDSNI QMVY KLEALGGNVTSTPAVVSPFKG VMDVVALGRDGRIKHLH KLEALGGNVTSTPAVVSPFKG VMDVVALGRDGRIKHLH ATSHWLSASNPQP WNPRGWASPKSSLSALWPY $\quad$ VQYTSNRGDVSEVK INPRGLLASPKSSLSALWPY GEEEFKDGSYAAKQ $\square C V G Q N V D G R L E T F Y \square A T N D R L Y H N W$ IT PGEYVFPPQAPMAAFAVAQNDNVNIYYTSGTFSVWFT SNAYWPQADEPNAERAVAYEFKSSMVRLYYTVNGQUSEDT RHDSWGGKDTDDPSA RHDSWGGKLTDDPSA FAYDNQQHVFAKTTDNSLFHWW RHDSWGGKLTDDPSA FAYDNQQHVFAKTTDNSLFHWW
 TEGRVYSNPTG FAYGNQQHVFYRNPDGQLEHRF
FAYGNQBVFYNDGQEHR DLGVNVGASHDTHPTGYAFAGDGSRHLPWQGQDRDIGEDS TFNTFSSHVSTTAKLAVGKWANGVLDLFVVGTDGVLYESH QETVPITPLPGABVAVSAHED KLDDIFWMTKNGAVC QETVPITPLPGAIVAVSAHED KLDIFWMTKNGAVC ASWTPAGATPNVSLAVGGFAVASGIDLLYQDDNGTVQVLL
 TGWPSMGGWTFSQNAVAALNSNGTLEVLVIGTDGRVNSAN FNGWADMGSASAGLNADAKNADGTLELFGVDSGGNVWHNY SWQDC

# NWGSLGGGLSSGP <br> DVVENANGYIEVFVRATDNALW 

NWGSLGGGLSSGP
NGPSPGGMPPGAAVA DVVENANGYDEVFVRATDNALE W
 NGPISIG

NGPQVDGPARFTTTPAAASSAPGRDDLVGCSGGDLVTSSW DWYQVDQPARFTTTPAAASSAPGRIDLVGCSGGDLVTSSW SAWTSLGGTVSGSPTLVAVDG GVRLYARAGDYTLWQRA RWGPLPGNPSAAGTPTVARDFDGRLEVFVRATDGSVQHMW RWGPLPGNPSAAGTPTVARDFDGRLEVFVRATDGSVQHIW S S WA SLGGSITSAP VVAKNADGQLEVFARGGDNALWH:K SSWASLGGSITSAP VVAKNADGQLEVFARGGDNALWHHK GHFELVRNVGGDPVIGTNRDG RLELFFRGTDDALWHR GHFELVRNVGGDPVIGTNRDG RLELFFRGTDDALWHR LGPLGVEDPQGSPLAGFAQGGGVALDVLFQDAGGRLLNNN

UniRef90 S7ZYX4 UniRef90 S7ZYX4 UniRef90-UPIO0046AC16C UniRef90-UP100046AC16C UniRef90_U7QWQ0 UniRef90-U7QWQ0 UniRef90_U7QWQ0 UniRef90-C7BLE4 UniRef90-C7BLE4 UniRef90- 7 THOE6 6 UniRef90-LTHQE6 6
UniRef90 Q2KGF5 UniRef90-C3Y143
UniRef90-C3Y143
UniRef90-U7QZC8
UniRef90_U7QZC8
UniRef90-G2RD47
UniRef90-B9XEQ0
UniRef90-B9XEQ0 UniRet90_B9XEQ0 UniRef90-B8LTEO UniRef90-B8LTB0 UniRef90-E4N8U0 UniRef90-10 KVW5 UniRef90-10KVW5 UniRef90-G1X232 UniRee90-UPI0004698C13 UniRef90-Q67MN8 UniRef90- Q67MN8 UniRef90-UPIO001582E38 UniRef90-DOD5U2 UniRef90-DOD5U2 UniRef90 G2R1F6 UniRef90-G2R1F6 UniRef90-Q7SAV7 UniRef90-C7Z843 UniRef90-C7Z843 UniRef90-G2XT72 UniRef90-L7HQU8 UniRef90_J3PGT7 UniRef90-J3PGT7 UniRef90-F9FGZ4 UniRef90 Q467G9 UniRef90_B2APF97 UniRef90-O2H4Z7 UniRef90 ${ }^{-}$W5WMC3 UniRef90-W5WMC3 UniRef90-W5WMC3 UniRef90-UPIO0039A53E0 UniRef90-UPIO0039A53E0 UniRet90 UPIOOO39AS3E0 UniRef90-UPI000468A266 UniRef90_BgXNLO UniRef90-B9XNLO
UniRef90
W7N210 UniRef90- W7N210 UniRef90-W7N210 UniRef90-W3XF64 UniRef90-B9XGR9 UniRef90-B9XSL5 UniRef90_A0A010SL35 UniRef90-A7E8F7 UniRef90-A0A016PEU1 UniRef90_S8A488 UniRet90_S8CE42 UniRef90 W7TC95 UniRef90-W9LE67 UniRef90-W3XFY9 UniRef90-Q7N815 UniRef90_Q7N815 UniRef90-Q7N815
UniRef90-A1V3S8 UniRef90_A1V358 UniRef90-N0А6Н3 UniReftol NoA $6 \mathrm{H}_{3} 3$ UniRef90-NoA6H3 UniRef90 NoA6H3 UniRef90_UPIOOO374E3B0 UniRef90_UPIO00374E3B0 UniRef90-V6KL08 UniRet90-DgWGI8 UniRef90-DgWGI8 UniRef90-U7QZC2 UniRef90-U7QZC2 UniRef90-U7QZC2 UniRef90-L8EDY6 UniRef90-L8EDY6 UniRef90-J3PE47 UniRef90_G2NVF6


QTVSHSGPWSSWQSLNGVITSAPTAV RDADGRLEVFARG QTVSHSGPWSSWQSLNGVITSAPTAV RDADGRLEVFARG VEINSQKHRDFAAGITGGSGIALTAFAFTNASNESMKVYH VEUNSQKHRDFAAGITTGSGIALTAFAFTNASNESMKVYH ITTQGWADTNVGVDEWPAADADSDLALAYERGTDNVRLYY WTGSQWSFGAHGN PGTKLGCSAVMGNSGTVFT WTGSQWSFGAHGN
 YNLEDDVLGNVVGRSRPA QSGGGWSGWLSLTGSFTQNVRPC VGMNQSGKDEVFLTG QSGGGWSGWLSLTGSFTQNVRPC VGMNQSGKLEVFLTG QSGGGWSGWLSLTGSFTQNVRPC VGMNQSGKLEVFLTG

SNGVWSATSGALGGGPDQGGTGTPAVVTTGDGRILAAVRN PTSGWSGDGAPDDR PTSGWSGAGAPDDR QLTAGGPWSRWEGPGFKDQPVPMSKVAAALQNTGNVLLWG MRANQWSGWTEVPGGGLTPSGPG AVVYRGNLYVVVRG MRANQWSGWTEVPGGGLTPSGPG AVVYRGNLYVVVRG
HDGAWSGWESTGGA TAGTPAA TATGAGRYDVFARG
HDGAWSGWESLGGA!AGTPAA TATGAGRYDVFARG
QDGVWKAWSTV
QDGVWKAWSTV
TSFSGSGDGSPSWKT
TSFSGSGDGSPSWKT
YNGSAWAD EWEDLGVSASAAP
YNGSAWAD EWEDLGVSASAAP

ESATARAFPNFTSSDVGTGASFLVLPGMVDRGGNEARFFF ESATARAFPNFTSSDVGTGASFLVLPGMVDRGGNEARFFF

Q N G H WN
ENSSYWESPAVEQNVDEDSDDACSSDAVTNSDPDNVRCYF YDKTWKAWSALEAPPPPQATQSTTPSATNTAVASDT Y DK T WK A WSALLEAPPPPQAT QSTTPSATNTAVAS DT WD GQGTHTIISWGGS WDGQGTHT $\begin{aligned} & \text { S WGGSS }\end{aligned}$

 F A A GS WT RVDLT SELGAP QPREGLAPAAVPDGTRB VIH QNTPNGTWSGWSSLGGSWSQDNDIAIANDANGELEIFMVG Q NTPNGTWSGWS S L G G S WS Q D N D A A A N DAN GEELE I F MV G

$N$ GS WWY T R R I L Q E Q D G I A E P R A G L A A T I GRRRNTI N V Y C
 $P G G K G W D R P K S F D A F N G A D R A B G T S I$
$N R E G K W N D V F F S A A K I L D P K A P G S A F$

 ID WQ WK LMP DQDARLWPAADVASGSFATTSNDDTSEAWUWY


 EGPSDDTQPLDHDVWS GPPDLTGVVP

 $V V G A \quad D R W N G P V P\|S P A G L F P P G A A V A A S N G\| P N Q T D V F A$

VEGRWNAWALVPTAGRVTSAAPGTAFAVRKADGAVLRLPY VEGRWNAWALVPTAGRVTSAAPGTAFAVRKADGAVLRLPY YSSGGGAWGDWSARGEFVSGVFDGALGATAGPGDTVLTAF QTAPNNGWRDDWKVLWVDDVLGDVAVIQDSDGRLEAFVRG QTAPNNGWRDDWKVLWVDDVLGDVAVIQDSDGRLEAFVRG QGTPSWSAWA QGTPSWSAWA QGTPSWSAWA

UniRef90_S7ZYX4 UniRef90_S7ZYX4 UniRef90-UPIO0046AC16C UniRef90-UPI00046AC16C UniRef90_U7QWQ0 UniRef90_U7QWQ0
UniRef90 U7QWQQ0 UniRef90 C7BLE4 UniRef90_C7BLE4 UniRef90_L7HQE6 UniRef90- Q2KGF5 UniRef90_C3YI43
UniRef90_C3YI43
UniRef90_U7QZC8 UniRef90_U7QZC8 UniRef90_G2RD47 UniRef90_B9XEQ0 UniRef90_B9XEQ0 UniRef90_B9XEQ0
UniRef90_B8LTB0 UniRef90-B8LTB0 UniRef90 E4N8U0 UniRef90_IOKVW5 UniRef90-IOKVW5 UniRef90 G1X232 UniRef90_UPI0004698C13 UniRef90_Q67MN8 UniRef90-UPI0001582E38 UniRef90_D0D5U2 UniRef90_D0D5U2 UniRef90 G2R1F6 UniRef90_G2R1F6 UniRef90_Q7SAV7 UniRef90-C7Z843 UniRef90_C7Z843 UniRef90_G2XT72 UniRef90 L7HQU8 UniRef90_J3PGT7 UniRef90_J3PGT7 UniRef90_F9FGZ4 UniRef90 Q467G9 UniRef90_B2APF9
UniRef90-Q2H4Z7 UniRef90_Q2H4Z7 UniRef90_W5WMC3 UniRef90 - W5WMC3 UniRef90_W5WMC3
UniRef90 UPI00039A53E0 UniRef90_UPI00039A53E0 UniRef90_UPI00039A53E0 UniRef90-UPI000468A266
UniRef90-B9XNL0
UniRef90-B9XNL0
UniRef90_W7N210 UniRef90 W7N210 UniRef90_W7N210 UniRef90_W3XF64 UniRef90_G9P8U4 UniRef90 B9XSL5 UniRef90_A0A010SL35 UniRef90 A7E8F7 UniRef90 A0A016PEU1 UniRef90_S8A488 UniRef90_S8CE42 UniRef90_W7TC95 UniRef90_W9LE67 UniRef90_W3XFY9 UniRef90_Q7N815 UniRef90_Q7N8I5 UniRef90-Q7N8I5 UniRef90-A1V3S8 UniRef90_N0A6H3 UniRef90-N0A6H3 UniRef90-N0A6H3 UniRef90-N0A6H3 UniRef90_UPI000374E3BC UniRef90_UPI000374E3B0 UniRef90 V6KL08 UniRef90_D9WGI8 UniRef90_D9WGI8 UniRef90_U7QZC2 UniRef90_U7QZC2 UniRef90_U7QZC2 UniRef90_L8EDY6 UniRef90 L8EDY6 UniRef90_J3PE47
UniRef90_G2NVF6


PSADVQTATESAANSATWSAFSSLGGS PSADVQTATESAANSATWSAFSSLGGS PSADVQTATESAANSATWSAFSSLLGGS
$R G G G V S V S R A A N S P F G G W T D L G G T \| V G V P A G$ RTDEVWWRSRTGTTWSAWTNLGGTTSGSP RTDEVWWRSRTGTTWSAWTNLGGTTSGSP

VD N A D Q LWRDQGSPGGD W G G WVQ S S MP TNDG I Y L NVR DPRGQWS GWTEVV G $T N D G \quad I V L N V R D P R G Q W S G W T E V P G$

KAGGVLHFRQASGGWQPPRDワGGDPAGDPAA KAGGVLHFRQASGGWQPPRDIGGDPAGDPAA

RGRDGK\R\HTRAADNG RGRDGKIRLHTRAADNG

QRNGTVVE VSFEGSGWTE $\square$ GVVP


P T GDM VHA Y Q Q T P S G T WY GWP T L G G S
SNGNTYHVWQDGSRWHSWSNLGG
QSNGS LVQLYYHAEDG LWWKQAVVVPS
Y WS NGT I $\quad$ QAHKN $\square$ S NE WEEYTVLP QT $\square P$
TNGAG L MQLDYTQWK
N S T G
RGADGSLQYFDWTAGGD
YESGNDVVELYRDRRGFWKD
Y S T Q GELL W $M T$

VGRDGALRVAWVSAGNWN
$V G R D G A L R V A W V V S A G N W N$

VN G A
V N GA
RGVDGRVHQTGFPAGS
YDDDQHLHAYQRVDGWAFGDLGGTPQDDPTA
YDDDQHLHAYQRVDGWAFGDLGGTPQDDPTA

10 V 20
30
 GSQQHVFYRNPDGWLEHRFYD GS QQ Q H V $V$ F Y R R N P D G WL L E H R F Y D $G S Q Q H V F Y R N P D G W L E H R F Y D$


PET $\square R$ Q GSK L S A A GWRKANGY VERLFY LDPQ GQ QRRSRSN PGDDRHPSS ALSVTRTESGETYIFYFDLHGNICYLKGS
$T N V L S T S R L A S S N W T D T D G \square A Y R \bigvee F F Q D P N N A \square L A R R W D$

PDRHTVYGVGNGQSAYRRTY I PDRHTVYGVGNGQSAYRRTYI GN QULVV CY Q G E A N Y I A S L T T S S GNQILVCYQGEANYIAASLTS S
DARSNTPPALIVFND DARSNTPPALLIVVND


R N GTS LAA A GWY D GK T TVAS LVF QA E D G S LI N GYY F $R N G T S L A A A G W Y D G K T T V A S L F F Q A E D G S L I N G Y Y F$


LAA AN WTDGANETRHVFYQMQGALFLQQYYE VNGTSVAGLGYQTSGGDD\AIIYQTESMSIIQSQWS A INLAQNKNFKIH WGQLHNLNRRWQANA NSRLAANNYTDSGVVHSQLYYQDNSLDDWNADFN

 A D D GTK L H VF S $\square G S D N N L Q \square H S R D$ RNGTAVAGTGWWDNTKTTMSMFYQAQNGDLINSKFE N A D GRLLVFAR GSDQALWHIWS A NAD GRLLV FARGS DQALWHI WSA NA DGRELVVFARGS DQALWH W WS A GGEADAFY YGA DGGLWYRYSD

$V$ V S GRSAD GR LIEAFAA GAD GVYHSWQNE $V V S G R S A D G R L E A F A A G A D G V Y H S W Q N E$ R N G S A LA GAGWYD TA QLLTMMFYQTEDGSIVNGYYD RNGSALAGAGWYDTAQLLTMIVYQTEDGSIVNGYYD


GLAANGAAARRDNDYYLLFTD SGRFVVKHWT $M V I F G V D A G G G V T H R W Q N$


AVTNFPDGGRLIVFAEGAGNTLWYTWQN ALSATRTESGETYI FYFDSNNKI CYLKGS LT AVIAADDDDENFQVFYNDNTTNI LYRRMH
 E G S FVVDVPSAVLNADNRVSVFVQGGSNTLWSRYEQ N SKLFVGTANGHLGERF
N S K L FVG TA N GHL F ER R
 T T L V A Q G G V S T S $\underset{V}{ }$

UniRef90 B9XQV2 UniRef90-A8M381 UniRef90-A8M381 UniRef90-D9WFZ9 UniRef90-R1EV01 UniRef90-W7S891 UniRef90- ${ }^{-2}$ B3F6 UniRef90_C4JNV4 UniRef90-N1PL56 UniRef90 N1PL56 UniRef90-F8CQT7 UniRef90-F8CQT7 UniRef90-M7ST91 UniRef90- N1RAF8 UniRef90-I2NOUO UniRef90_12NOUO UniRet90 DgWNS9 UniRef90_D9WNS9
UniRef90 Ј3Е3A3 UniRef90- ЈЗЕЗАЗ UniRef90 UPI0003760636 UniRef90-UPIOOO4646305 UniRef90-UPIO004646305 UniRef90 I4IRE3 UniRef90-14IRE3 UniRef90-141RE3 UniRef90-E3Q7D0 UniRef90-E3Q7D UniRef90-D6U2K6 UniRef90-D6U2K6 UniRef90-G0RG45 UniRef90-I1R9G6 UniRet90_W9ZCU1 UniRef90_M2Y810 UniRef90-M2Y810 UniRef90-M2Y810 UniRef90 W3X6F9 UniRef90-F4L7H1 UniRet90_R1EJW8 UniRef90 UPI00047DA3C2 UniRef90-C7Q8R2 UniRef90-W9MA00 UnRe90-W9MAOO UniRef90-R8B197 UniRef90_U4WS88 UniRet90 U4WS88 UniRef90-U4WS88 UniR Ref90-E4N797 UniRef90- В2в6М3 UniRef90-A0A024YHI7 UniRef90-A0A024YHI7 UniRef90 L2GB46 UniRef90 L2GB46 UniRef90-G9MS70 UniRef90 G9MS70 UniRef90_S7UY73 UniRef90_S7UY73 UniRef90-S8EKV7 UniRef90 D9X8U8 UniRef90_D9X8U8 UniRef90-D9X8U8 UniRef90_UP100036A5189 UniRef90 R4SVB6 UniRef90-R4SVB6 UniRet90-W8A540 UniRef90 E9FAY1 UniRef90 C7YPH4 UniRef90-C7YPH4 UniRef90-F8B3P6 UniRef90 B8IMP UniRef90_B8IMP1
UniRef90
NoE113 UniRef90-NOE113 UniRef90 NOE113 UniRef90-R7YM73 UniRet90_R7YM73 UniRef90 J3PHT8 UniRef90_M9MH81 UniRef90 B9XES1 UniRef90-K2RYC5 UniRef90-G1X1D6 UniRef90-G1X1D6 UniRef90 W7LTN2 UniRef90 ${ }^{-}$W7LTN


STSTWEVLPVLD LIKATNGTSLAATIAGTDYNPQTALFY GAGS YGEYSVPDKNDGASTTAVGSDNTLTSTLFQVHVYY

LT S A PVVI S T E D R A HVLIF
LT S A P V V I S T E D R A HVVL F SENRWTTTNVTD VVMGSDNGTPLASAACSYGTVLCLQLWF

DGS GWEGGWSATNEAT K $\quad$ TWS G $L$ AA A S DGSGWEGGWSATNEAT KI WSGLAAAS GGTSLEGYVDIVPATPPVMNGPGTAAA GGTSLEGYVD\|VPATPPVMNGPGTAAA EDEGWSAWAS TGGKAVGDPVTA DGLQWAGGNADAELAGGDNDTGPCAVVF $D G L Q W A G G N A I A E L A A G G I N D T G P C A V V F$
AREGR\|DLFG
AREGR DLG
RNLNKRPSVFV
G N K K L

AS GHYVVKGEYTISATAANETGLSVELLGAEDGY RVYF ASGHYVVKGEYTISATAANETGLSVELLGAEDGY RVYF VGYEWPQGGTKQVAY $V G Y E W P Q G G T K Q V A Y$ $V G Y E W P Q G G T K Q V A Y$ KPKKGGSDAATGWWDSQHVIDASVFW PNTGMSVGPSAVVFGDSIYCFH KTGYYTFDTNGKTVVSE $\square A G A P \square A A V K \square E S P G E Y Q L H$


TAVPGVAVARNPDGRDETFC


UniRef90_B9XQV2 UniRef90-A8M381
UniRef90 A8M381 UniRef90-A8M381 UniRet90_D9WFZ9 UniRef90-R1EVO1 UniRef90-W78891 UniRef90-B2B3F6 UniRef90_C4JNV4 UniRef90-N1PL56 UniRef90-N1PL56 UniRef90_F8CQT7 UniRef90-F8CQT7
UniRef90 F8CQT7 UniRef90-M7ST91 UniRef90- N1RAF8 UniRef90-12NOUO UniRef90-12NOUO UniRef90-D9WNS9 UniRet90_D9WNS9 UniRef90-JЗЕЗАЗ UniRef90- ЈЗЕЗАЗ UniRef90_UP10003760636 UniRef90_UPIOOO4646305 UniRef90-UPIO004646305 UniRef90 - 14 IRE3 UniRef90-14IRE3 UniRef90-141RE3 UniRet90-E3Q7DO UniRef90-E3Q7D0 UniRef90-D6U2K6 UniRef90-D6U2K6 UniRef90-GORG45 UniRef90-11R9G6 UniRef90 W9ZCU1 UniRef90-M2Y810 UniRet90-M2Y810 UniRef90-M7SNJ7 UniRef90-W3X6F9
UniRef90 F4L7H1 UniRef90-R1EJW8 UniRef90-UPIO0047DA3C2 UniRet90_C7Q8R2 UniRef90-W9MA00 UniRef90-W9MA00 UniRet90-X0JMUO UniRef90-R8B197 UniRef90-U4WS888 UniRef90-U4WS88 UniRet90_U4WS88 UniRef90-E4N797 UniRef90-в2в6М3 UniRef90-A0A024YHI7 UniRef90-A0A024YHI7 UniRef90-L2GB46 UniRef90-L2GB46 UniRef90-G9MS70 UniRef90-S7UY73 UniRet90-S7UY73 UniRef90-S8EKV7 UniRef90-D9X8U8 UniRef90 D9X8U8 UniRef90-D9X8U8 UniRef90-UPIOO036A5189 UniRef90 R4SVB6 UniRef90-R4SVB6
UniRef90 W8A540 UniRef90-E9FAY1 UniRef90-C7YPH4 UniRef90-C7YPH4 UniRef90-F8B3P6 UniRef90_B8IMP1 UniRef90-B8IMP1
UniRet90 UniRef90-NoE113 UniRef90-NoE113 UniRef90-R7YM73 UniRef90-R7YM73 UniRef90-J3PHT8
UniRef9O_M9MH81 UniRef90-M9MH81 UniRef90-B9XES1 UniRef90-K2RYC5 UniRef90-G1X1D6
UniRef90 G1 $1 \times 1$ 6 UniRef90-W7LTN2 UniRef90-W7LTN2 UniRef90_WLTN2
UniRef90_UPIO003745390


HDEQKKVNAMAYTTKTWHQDPVGGMGDASAHYSQQNTTVI HDEQKKVNAMAYTTKTWHQDPVGGMGLASAHYSQQNITVI MSQDHHIHEFYVGEGEWQHANLMTQAGAPTAKSRFFVGFA MSQDHHI HEFYVGEGEWQHANLMTQAGAPIAKSRFFVGFA HSEDGD VNGYYGCDGESGNFVLQGEYVISQTANDPSSDG QGNNGQL WYNVYNGSRW HDEQRLVNLLSSTNTDWYNGPVS

LMS LDNTALSAGV


> E K Y WT G T P L WE D S A G G F

> L VP NSRFSVVCR
> TAAWGGHLAACQR
> TAAWGGHLAACQR

VNSDKKVYHNYQNSPHSSWSGWFAQNA
LDADNRI WGLVSEDDIDWKFSAENAGDYSTASYSKLASYQC VGFDHCLYHRWLAGQGWAKDW VGFDHCLYHRWLAGQGWAKDW

|  |  |
| :---: | :---: |
| UniRef90_B9XQV2 |  |
| UniRef90-A8M381 | DLSGTF GGGVWP |
| UniRef90-A8M381 | GQHHVFFRDSDGGLGHRFFDDLSGTF GGGVWP |
| UniRef90-A8M381 | TGFSYGGQHHVFFRDSDGGLGHRFFDDLSGTF GGGVWP |
| UniRet90-D9WFZ9 | GAATPPGVVVMWRDNGAGTLMAAFQDAKGAWGAPRVA |
| UniRef90-R1EV01 UniRef90 W7S891 | ECDACYNANAVVYNDGVLQYATPKTPNGGAQSWNQNPPLP |
| UniRef90-w ${ }^{\text {URiRef90 }}$ - 2 B3F6 | VAQRETGDIITVDHMDGDGQVPTEDWYVQNGNDT |
| UniRef90-C4JNV4 | QEDHGGDHRLEV |
| UniRef90-N1PL56 | PQQAGGTGRI DVVSRDEDGKYLHLYYNSNDGEWTGWEDNS |
| UniRef90-N1PL56 | PQQAGGTGRIDVVSRDEDGKYLHLYYNSNDGEWTGW |
| UniRef90-F8CQT7 | PRGR LSVYFRDEQGNLHNTYLDTRNQAWSS |
| UniRef90-F8C | GR LDVYFRDEQGNLHNTYLD |
| UniRef90-F8COT7 |  |
| UniRef90 M7ST91 | LLDCDGDWVLVYQTPEGHI DVANATDWGNPERVIDR |
| UniRe90-12NOUO | TVVDHGS GMVVCATEPTGAVAHRWQNAPGGPWFAWTGL |
| UniRef90-12NOUO | TVVDHGS GMVVCATEPTGAVAHRWQNAPGGPWFAWTGL |
| UniRef90_D9W | RGAASNTLWHRVV LNGSTWSTWRDI G |
| UniRef90_D9W | RGAASNTLWHRVSFYNQGGQTwCNGNAGGGATWST |
| UniRef90-ЈЗЕЗАЗ | SPCAVNFGNVIYSFYNQGGQLWCNGNAGGAATWLPETQIP |
| UniRef90-UP1000376 | GAVKGNTDRLELFLRGADGHVWHLQKAPNGTSWSKWESLP |
| UniRef90 | FVRFDG |
| UniRet90_UPI0004646305 | SFVSRFDG |
|  |  |
|  |  |
| UniRef90-E3Q7D0 |  |
| UniRet90-E307D0 | ARYFKDDTWRLA |
| UniRet90_D6 |  |
| UniRet90_D6U2 | WPEEGTKQ VAYLGPGNHIHELRVSVGGTWQHTNLSLI |
|  | N |
| UniRef90-GOF | RVFYHDKDSQVASLSYTNKINWNYYG |
| UniRef90-W9 | D Y |
| UniRef90-M2Y810 | 1 RELRWDGTGWHDTDL |
| UniRef90-M2Y810 | L RWDGTGWHDTDL |
| UniRef90_M2Y810 | - |
| M7 | DSTDGCRNAFCYAYQNRDQNVM FACGDDWSQPTQLD |
|  | AASHQGENNITLLMSPSISTAQYETIEVCNLESADTWDI |
| 4L7H | VRTAGGKTIANYYLINGLGADDRLARVKNENNTWIWESLIG |
|  | QNA |
| UniRef90-C7Q8R2 |  |
| UniRef90-W9MAо0 | MTSGNNGTILFWVDPKGATGCCRWFASSGWQAVF |
|  | SGNNGTILFWVDPKGAIGCCRWFA |
| XOJM | S |
| UniRef90 U4W | NADGRLE |
| UniRef90-U4WS | AVGRNADGRLEVFARGSDKALWHI WKSAPDNGWSKW |
| UniRef90-U4WS88 | AVGRNADGRLEVFARGSDKALWHIWKSAPDNGWSKWDSL |
| UniRef90_E4N797 |  |
|  |  |
|  | G |
| UniRef90-AOA | AMENAPDGRLEVFALS DSTFGHLYQMGVNGDWSAWEHFG |
|  | APKDAEDGR |
| UniRef90-L2GB46 | FPKDAETLESTSYFKDETWHLATLPRTLTNDTLTNNTDAA |
|  | NTNNTTDIVSRYNTDGTWHISAFPETTNKTAPSKldid P |
|  | EVSRYNTDGTWHI SAFPETTNKTAPS |
|  | D R V |
| UniRef90-S7U UniRef90-S85 | G |
| $\begin{aligned} & \text { Uniretgo_Sgek } \\ & \text { UniRef90_D98 } \end{aligned}$ | DPEGRLTHTWQRGPQ HGHAWHGNWVDMEGSV |
| UniRef90-D9X848 | A WH GNWV |
| UniRef90 |  |
| niRef90_UP100036A5189 | VVVRSTDGTTWH SVRTLAGQWVGS |
| UniRef90-R4S | AVFVRGADDALYFMQ FENGV |
| UniRef90 ${ }^{\text {W8 }}$ | ADGRMMVFYRGNDDSVWCMAQKSVSYGPPTYEG |
| UniRet90 | QHRLEVYFNDQD |
| UniRef90-C7YPH4 | DGEDGDDDDDQAGGTTNSGTAACAVTSNSI |
| UniRef90 C7YPH4 | DGEDGDDDDDQAGGTTNSGTAACAVTSNS |
| UniRef90 F8B3P6 | DGRIDQFFRGSDDALWYUHQGLLY |
|  | KLFVGTANGHLFERFWTGAAW |
| UniRef90_NOE | MTHVVYRSEGGHLELLWWTDDA |
| ef90 No | M |
| iRef90 NOE113 |  |
|  |  |
| UniRee90-R7YM |  |
|  | D\A GYHDMVVYGNGTEG |
| M99 | RLf |
| UniRef90-B9 | RLEVFGAGSNGD |
| Ref90-K2RYC5 | GGNCGNATSIVIWQSDDDN |
| e99 |  |
| iRef90-G111D6 | GVSRDSDKFIELAYVGTDHSLKHKRNQTWYPAGTETMDWG |
|  | SLPVQGTGNLEVWWGTAEGAI ET TWFPNSDP WVFAGAST |
| UniRef90W7LTN2 UniRef90 UPIO003745390 | SLPVQGTGNLEWWGTAEGADETGTWPNSDPWVFAGAST |

## UniRef90 B9XQV2

 UniRef90-A8M381UniRef90_A8M381 UniRef90-A8M381 UniRef90_D9WFZ9 UniRef90-R1EVO1
UniRef90 - W7S891 UniRef90-в2в3F6 UniRef90-C4JNV4 UniRef90-N1PL56 UniRef9- N1PL56 UniRef90-F8CQT7 UniRef90-F8CQT7 UniRef90-M7ST91 UniRef90_N1RAF8
UniRef90-I2NOUO UniRef90-12NOUO UniRef90-D9WNS9 UniRef90_DJENS9 UniRef90-JЗЕЗАЗ UniRef90_UPIOOO3760636 UniRef90-UPIOOO4646305
UniRef90 UPIOOO4646305 UniRef90-UPIOOO
UniRef90-I4IRE3 UniRef90--41RE3 UniRef9-141RE3 UniRef90-E3Q7D0 UniRef90-E3Q7DO UniRef90_D6U2K6
UniRef90 D6U2K6 UniRef90-D6U2K6 UniRef90-GORG45 UniReffo-I1RgG6 UniRef90-W9ZCU1 UniRef90 M2Y810 UniRef90-M2Y810
UniRef90
M2Y810 UniRef90-M7SNJ7 UniRef90-W3X6F9 UniRef90-F4L7H1 UniRef90-R1EJW8
UniRef90-UPIO0047DA3C2 UniRef90-C7Q8R2 UniRef90-W9MA00 UniRef90-W9MA00 UniRef90-XOJMU0
UniRef90_R8BI97 UniRef90-U4WS88 UniRef90-U4WS888 UniRef90_U4WS88 UniRef90-в2в6М3 UniRef90_B2B6M3 UniRef90 ${ }^{-A 0 A O A 24 Y H I 7}$
UniRef90 UniRef90-L2GB46 UniRef90-L2GB46 UniRef90-G9MS70 UniRef90_G9MS70 UniRef90-S7UY73 UniRef90_S7UY73
UniRef90 S8EKV7 UniRef90-D9×8U8 UniRef90-D9X8U8 UniRef90-D9X8U8 UniRef90-UPIOOO36A5189 UniRef90-R4SVB6 UniRef90-R4SVB6
UniRef90 W8A540 UniRef90-E9FAY1 UniRef90-C7YPH44 UniRef90-C7YPH4 UniRef90-F8B3P6 UniRef90_B8IMP1
UniRef90_B8IMP1 UniRefoto NoE113 UniRef90-NoE113 UniRef90-NOE113 UniRef90-R7YM73 UniRef90- 3 P3 H78 UniRef90-M9MH81 UniRef90-B9XES 1 UniRef90-K2RYC5 UniRef90-G1X1D6
UniRef90-G1X1D6 UniRef90-W7LTN2 UniRef90_W7LTN2 UniRef90_UPI0003745390


PKEFSTDPVITAPEEGHFDVFGRLSNGTTAHLYWNGEEYS PKEFSTDPVIIAPEEGHFDVFGRLSNGTIAHLYWNGEEYS SDVMGDA AAVSPSEGRTDVFYQALRGDVLSLWWMTVTAT SDVMGDA AAVSPSEGRTDVFYQALRGDVLSLWWMTVTAT SDVMGDA AAVSPSEGRTDVFYQALRGDVLSSWWMTVTAT SAATGTPVAGFSTDEALISFFGQDNEDHAHTRDFESGDWT RPGPGAYPYVLVGRYGRLAAFVRGTDGALWHTWSESGA WA TGFLSGPAVCTWGPDRLDVFAKGQDHQILHRFWNGLTWS TGFLSGPAVCTWGPDRLDVFAKGQDHQLLHRFWNGLTWS GVMLSGTPSAVVFN NE:YVFYQGASNNYVTYNPSTSSWS GTWVGNPTAATAFGDGRISVFARKSDGRLRVIAQKHGNWS GHNPQTGPSLIVFQNRLCLVYKGKTESLYVAWYDGTNWS VSPETTGVSAVVSLPGAACLVYVGKDGRIWSKFYDDAKWS VSPETTNVSAVSSLPGAASLEVVGLDGRUWSKFYDDAKW VSPETTNVSAVSSLPGAASLEVVGLDGRLWSKFYDDAKWS


 NTPPGIPTTSYTREDGSRHVIYMNDDRHVRELWWDSAGWH NTPRGPTTSYTREDGSRHVIYYNDDRHVRELWWDSAGWH
T
 GVPADAGTAMAVAPDPEDA KRNDSYPTVADYLVGGGA PGYPWTGTAATSWGPDWWDAFVADNDYGLVHHWRRPDG DGGSGVALTPSPSTSGYTAYVPRASDDGGMAHAYANKLW PGTASLTTQLTTLSMGSTAYLFVSPDGAIDGGSWDANSGT QDDSNSSLAAYYDAENERRVITQGASNSTFYEYYGDGDTQ

 APAPPSSSAAVLPDAGRAGILTVGDSGAVTVGWTSGLTTY

 DVVVNSSLTATAWPTNLTHLFYGGTDGKLHQWQNVNGAWT
 KVTPKFSLPAWTGKPGGLTAFYIGSDKKLYEIASUNFIWS RSTPGAPLAAVMSGPDRVTLFVADTNGG1 YTASGDGWGPW
 EGRP EGRP ALCFSHPDGGDIFYISAADDYVHHICETTGWV EGRP TLLVGRDGGMVVFVRGADGGLHHRWQTGTGGP FGVPLVGEPAITVFGSSVDVFARGADDKLYQTYSNGSQWT

GVHPDSKLAALRLSNDSTRVYFQASGTNTWALNGDDAGWV GVHPDSKLAALRLSNDSTRVYFQASGTNDWALNGDDAGWV GA AYATPSPALLDGSGRIVVAVSDTLYTIQQKSWNSDAWE



 DYMPGTHPVLLEVSSQRFDFF GLDGRDRHLYHWSWTSTTAW TCLAFSRIAATTFAGNKILIAYQNAGGDICQRILSGQTWN TCLAFSRUAATTFAGNKILIAYQNAGGDICQRILSGQTWN PPVQGTADSTDSMGADEGLMS I Y IDTGRPTEDHFNRTGWA



UniRef90_B9XQV2 UniRef90_A8M381
UniRef90_A8M381 UniRef90-A8M381 UniRef90_D9WFZ9 UniRef90_R1EV01
UniRef90-W7S891 UniRef90-B2B3F6 UniRef90_C4JNV4 UniRef90-N1PL56 UniRef90-N1PL56
UniRef90_F8CQT7 UniRef90-F8CQT7 UniRef90-F8CQT7 UniRef90-M7ST91 UniRef90_N1RAF8
UniRef90_I2NOU0 UniRef90-I2NOUO UniRef90-D9WNS9 UniRef90_D9WNSS
UniRef90_J3E3A3 UniRef90-J3ЕЗАЗ UniRef90_UPI0003760636 UniRef90-UPIO004646305 UniRef90-UPI000
UniRef90-I4IRE3 UniRef90_14IRE3 UniRef90-14IRE3 UniRef90-E3Q7D0 UniRef90-E3Q7D0 UniRef90-D6U2K6
UniRef90'D6U2K6 UniRef90-D6U2K6 UniRef90-G0RG45 UniRef90-11R9G6 UniRef90-W9ZCU1 UniRef90-M2Y810 UniRef90-M2Y810
UniRef90-M2Y810 UniRef90-M7SNJ7 UniRef90-W3X6F9 UniRef90 F4L7H1 UniRef90-R1EJW8
UniRef90- UPI00047DA3C2 UniRef90-C7Q8R2 UniRef90-W9MA00 UniRef90-W9MA00 UniRef90-X0JMU0
UniRef90-R8BI97 UniRef90_U4WS88 UniRef90 U4WS88 UniRef90_U4WS88
UniRef90-E4N797 UniRef90-B2B6M3 UniRef90_B2B6M3 UniRef90-A0A024YHI7
UniRef90-A0A024YHI7 UniRef90_L2GB46 UniRef90-L2GB46 UniRef90_G9MS70 UniRef90-G9MS70 UniRef90_S7UY73 UniRef90-S7UY73
UniRef90 S8EKV7 UniRef90-D9X8U8 UniRef90-D9X8U8 UniRef90-D9X8U8 UniRef90_UPIO0036A5189 UniRef90_R4SVB6 UniRef90-R4SVB6
UniRef90 W8A540 UniRef90-E9FAY1 UniRef90-C7YPH4 UniRef90-C7YPH4 UniRef90-F8B33P6 UniRef90_B8IMP1
UniRef90_B8IMP1 UniRef90-NOE113 UniRef90-N0E113 UniRef90-N0E113 UniRef90-R7YM33 UniRef90-R7YM73 UniRef90_M9MH81 UniRef90-M9MH81 UniRef90-B9XES1 UniRef90_K2RYC5
UniRef90_G1 11D6 UniRef90-G1X1D6 UniRef90-W7LTN2 UniRef90_W7LTN2 UniRef90_UPIO003745390


GWT LLDWKAPSSSLTASTWKNGSW DLWTLDAEGSLWHTF GWTLLDWKAPSSSLTASTWKNGSW DLWTLDAEGSLWHTF RVPFEPPVAKGEPISAVVSRG QLMAFLLDAQRNI RQLT


 ADWVPMGGRLASDPSVVLSSNGALSVFARDPGGRVTHTW


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



UniRef90_B9XQV2 UniRef90-A8M381
UniRef90-A8M381 UniRef90_A8M381 UniRef90_D9WFZ9 UniRef90-R1EV01 UniRef90-W7S891 UniRef90_B2B3F6 UniRef90_C4JNV4 UniRef90-N1PL56 UniRef90_N1PL56 UniRef90_F8CQT7 UniRef90-F8CQT7 UniRef90-F8CQT7 UniRef90-M7ST91 UniRef90 N1RAF8 UniRef90-I2NOUO UniRef90_I2NOUO UniRef90 D9WNS9 UniRef90_D9WNS
UniRef90- JЗЕЗАЗ UniRef90-JЗЕЗАЗ UniRef90-UPI0003760636 UniRef90-UPIO004646305 UniRef90_UPIO004646305 UniRef90 I4IRE3 UniRef90-14IRE3 UniRef90-14IRE3 UniRef90-E3Q7D0 UniRef90_E3Q7D0 UniRef90-D6U2K6 UniRef90-D6U2K6 UniRef90-D6U2K6 UniRef90-G0RG45 UniRef90-11R9G6 UniRef90-W9ZCU1 UniRef90-M2Y810 UniRef90-M2Y810 UniRef90_M7SNJ7 UniRef90-W3X6F9 UniRef90-F4L7H1
UniRef90 R1EJW8 UniRef90_UPI00047DA3C2 UniRef90-C7Q8R2 UniRef90-W9MA00 UniRef90_W9MA00 UniRef90_X0JMU0 UniRef90-R8B197 UniRef90-U4WS88 UniRef90 U4WS88 UniRef90_U4WS88 UniRef90-E4N797 UniRef90-B2B6M3 UniRef90_A0A024YHI7 UniRef90_A0A024YHI7 UniRef90_L2GB46 UniRef90_L2GB46 UniRef90-G9MS70 UniRef90 G9MS70 UniRef90_S7UY73 UniRef90_S7UY73 UniRef90_S8EKV7 UniRef90-D9X8U8 UniRef90-D9X8U8 UniRef90_D9X8U8 UniRef90_UPI00036A5189 UniRef90_R4SVB6 UniRef90-R4SVB6
UniRef90 W8A540 UniRef90 E9FAY1 UniRef90_C7YPH4 UniRef90_C7YPH4 UniRef90_F8B3P6 UniRef90_B8IMP1 UniRef90_N0E113 UniRef90-N0E113 UniRef90-N0E113 UniRef90-R7YM73 UniRef90_R7YM73 UniRef90_J3PHT8 UniRef90-M9MH81 UniRef90-M9MH81 UniRef90-K2RYC5 UniRef90-G1X1D6 UniRef90-G1X1D6 UniRef90-W7LTN2 UniRef90_W7LTN2 UniRef90_UPI0003745390

$T$ T G S WT S LGGSPSDK $\quad P \square Y G R P S A V A D T G G T H V V V R A$ NS S S WRE E F A VF QEVDE DSD DACSTLAVTNWEGKEVRCYF

WR GAPNEFFAWENDT DRQQFNVTPNVVHWSAGHTDDS GV WRGAPNEFFAWENIT DRQQFNVTPNVVHWSAGHTDI SGV

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



```
Y D P RVENPAWS GWF ELGGGGVSPT T NVSAVSSGAASLFVVG
Y D P RVVENAWS GWFELGGGVSPTTNVSAVSSGAASLLVVVG
Y D P R V E N PA WS GWF E L G G GlV S P T T N V S A V S S GAA S L F V V G
NATGSWTQATTVPSVNTTSTASQDPEAA
```



```
L V S G G M WH H T D L
\(L \vee S\) G GM WH H T D L L A A T N A P R A V
I NF E WQMMPNQST QAWPLADEANADLAVTNFDSSEAWVYY
```




```
QDI H GWH
```



```
LKGSWYVD GA WE
L N A T WN KF D T QENEKWPLAD DASAALALTYDTSNDRVWDY
\(\square D N\) RWHWNNHGNP F S T I N D N F VG P Li A V L S Y D S T D I DVVYA
M N G D G WN S T
\(\square G H L W Q N P G G F R F E A L E Y Y\) A L G A A P P A A V T W G Y P R L D A F V
```



```
G E GQP Y S F G G N F Q R PL
```




```
QSAPSNGWGNWDSLGGGI DQ।
QSAPSNGWGNWDSLGGGIDDQI
```






```
T D GLLWT QASVVPNATKTAENDPNGTSTASSA
TD GLWTQASVVPNATKTAENDPNGTSTASSA
GTD GTWGKFTVVLPTSVVTP
GTDGTWGKFTVLPTSVVSP
```

SGGEKTVTGRVNQDGSYVSAT
QRGPQHGHAWHGHWVDMEGSVEGRPTVLVGRDGGMVVFAR QRGPQHGHAWHGHWVDMEGSVEGRPTLLVGRDGGMVVFAR QRGPQQHGHAWHGHWVDMEGSVVERPTLLVGRDGGMVVFAR WN A D WS GWKA IP GPTGGTFTDSPA LVA
$V G A E W S N W I G L G G R F A V D P \square \quad A V S R G P G L V D V F V$
 QQA DYNTYKA QATLNGGLLSPPNPMLA D DGRLELGVTG
 HA D A L D S D D S QVVVDD E PA S S WRA SAFTYY I S S L N S Y R V F Y T QRSDYDSFETSVVSLRGQQLGEPTAFLGGQDGRVHAFVKG WT GAA WA W
WT GAA WA W
 WVGAAQSVDLCAAAGAPAAVCDGDLWFCPSDGTLH VAY
 T DAPYNFQEAWRWYPRNTGGVPTTALAAIDNSTTSEVRLFY FRADTSSVAGAK WEDLGMVASSVVPS LARVGSSSGVEMVTTAA LD G E L G G G G A WN G WG D L G G F G T GA K P G M A V WLN GTFDSSWLNSDVEPSSVSNSSAITSNQAG


UniRef90 B9XQV2 UniRef90－A8M381
UniRef90－A8M381 UniRef90＿A8M381 UniRef90 D9WFZ9 UniRef90－R1EV01
UniRef90 W7S891 UniRef90 B2B3F6 UniRef90＿C4JNV4 UniRef90＿N1PL56 UniRef90＿N1PL56 UniRef90＿F8CQT7 UniRef90－F8CQT7
UniRef90 F8CQT7 UniRef90－M7ST91 UniRef90 N 1 RAF8 UniRef90＿I2NOU0 UniRef90＿I2NOUO UniRef90＿D9WNS9 UniRef90＿D9WNS9
UniRef90－J3E3A3 UniRef90－J3E3A3
UniRef90－UPI0003760636 UniRef90＿UPI0004646305 UniRef90＿UPI0004646305 UniRef90－I4IRE3 UniRef90－I4IRE3
UniRef90 UniRef90－E3Q7D0 UniRef90－E3Q7D0 UniRef90＿D6U2K6 UniRef90＿D6U2K6 UniRef90 D6U2K6 UniRef90＿G0RG45 UniRef90－I1R9G6 UniRef90－W9ZCU1
UniRef90 M2Y810 UniRef90＿M2Y810 UniRef90－M2Y810 UniRef90 M7SNJ7 UniRef90－W3X6F9 UniRef90－F4L7H1 UniRef90＿R1EJW8 UniRef90 UPI00047DA3C2 UniRef90＿C7Q8R2 UniRef90－W9MA00 UniRef90＿W9MA00 UniRef90＿X0JMU0
UniRef90＿R8BI97 UniRef90＿U4WS88 UniRef90＿U4WS88 UniRef90＿U4WS88 UniRef90＿E4N797 UniRef90＿B2B6M3 UniRef90＿B2B6M3 UniRef90＿A0A024YHI7 UniRef90＿A0A024YHI7 UniRef90 L2GB46 UniRef90＿L2GB46 UniRef90＿G9MS70 UniRef90＿G9MS70 UniRef90 S7UY73 UniRef90＿S7UY73 UniRef90＿S8EKV7 UniRef90 D9X8U8 UniRef90＿D9X8U8 UniRef90＿D9X8U8 UniRef90＿UPI00036A5189 UniRef90 R4SVB6 UniRef90＿R4SVB6 UniRef90－W8A540 UniRef90 E9FAY1 UniRef90 C7YPH4 UniRef90＿C7YPH4 UniRef90＿F8B3P6 UniRef90 B8IMP1 UniRef90＿B8IMP1 UniRef90－N0E113 UniRef90＿N0E113 UniRef90－N0E113 UniRef90＿R7YM73 UniRef90＿R7YM73 UniRef90 J3PHT8 UniRef90＿M9MH81 UniRef90＿M9MH81 UniRef90＿B9XES1 UniRef90 ${ }^{-}$K2RYC5 UniRef90＿G1X1D6 UniRef90＿G1X1D6 UniRef90 W7LTN2 UniRef90＿W7LTN2 UniRef90＿UPI0003745390

R D A A T SNVGHTYNNAGTWTAWSSLGG

Q GRDSR母Q T $\square$ Y R D Q Q S T W
$F D D \quad S A W L W E Q G T G W T G L G G V I S T A P$ QRNG $\square$ VVEVA FEGLIWTEVGVVP

ENGTFYHKSWDGS GWTK WNAFGE GFAS LP ENGTFYHKSWDGS GWTKWNAFGEGFASLLP S GS S LLHRRFDGLVWSDWKDVG S G S SLLHRRFDGLVWS DWKDVG S G S SLL H R R F D GLVVWS DWK DVG
I S G D E V L
T D G GLHHRWQTGTGGSGWGPLGGRQAGDPAA
T D G GL LHRWQT GTGGS GWGPLGGRQAGDPAA

Q G GD D WG VYYNワF D G S S WT P DAP $\square P$
Q G G D D WGVYYN』F D G S S WT P D A P $\lfloor P$
ID A A GRV．

LD G D P RI A D A K WS D WF PLG DNTFPPTSV

VS E D GHTHELLHQSVVNPWT

$V S N N T V I Q A Y R G S N G T \quad W S K A S V V P T S T$
Q GTRNGEJLWFNGFNGEFWE GDKLVPSSDPSA
Y E S GNDVVELYRDRRGLWK D
GRADGHLHEL WWDSAGWH
GRAD GHLHEEL WWDSA GWH
GRAD GHLLELL WWDSAGWH
YMSDGNLTQVHRSDADTWED
$M G N \square G N L L A Y K W R A N T G W \quad \square A Q S \square P N A F$
PS GAGLRHHWQENNPFDSEDLGGV
SG
1 G Q S S D L R
I GQ S S DL R
VA E GS D ES E
YVS D R $\square$ T E VN F D GD G S WK T A A

VA VD G T IT L A H LS T A GLWQ
VGRD DRLKHKALIGQKEWQDLGGAFNSTPA
V GRDDRLKHKALI GQKEWQDLGGAFNSTPA


GADGGLHHRWQTGTGGPWSDWG
GADGGLHHRWQTGTGGPWSDWG
GADGGLHHRWQTGTGGPWSDWG
RTTGSRVASYNGSSWGSWFDLGAPRGGA
RTTGSRVASYNGSSWGSWFDLGAPRGGA
T DSSSWVAE QTSFADW $\quad$ ST LK G G $\square L G S T \square P A$
N P S S G S IV S Y S R S GA T G WT S N S D N A WGRPA $N P S S G S I V S Y S R S G A T G W T S N S D N A W G R P A$ A NEK

VGK G G S LHEDAWSPGGTWTDLTRVALAPPA
V GK G G S L HEI A WSPGGTWTDLTRVALAPPA


$G G D D G R V L Q \quad A G L R N G G W E Y L G P \| H G G$
A D G S $\square W Y$ T TVDVTKGDGWT R
QSDKDSV
QS DKDSV
TA GVVWHRYVA G GS WT P WYS LGG
A MER GK I A E WR WE D S N S S Y ！
V GLD S SVVYQK T WT K A T G WK D
$V G L D S S V Y Q K T W T K A T G W K D$
I S P S GAVVGGSWSNTS GQYLGAMSQFAVPS
IS PS GAVVGGSWSNTS GQYLGAMSQFAVPS

UniRef90 M7SIS8
UniRef90-L1KZG3
UniRef90-L1KZG3 UniRef90-W9XN36 UniRef90-Dgoliy UniRef90-ROIUY7
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UniRef90 B4V519 UniRef90-B4V519 UniRef90-M4FQV0 UniRef90_D3PXX6 UniRef90 V2XIF8 UniRef90-B2AT39 UniRef90-UPI00032AC2A5 UniRef90 UPIO003675AAE UniRef90_UPIO003675AAE UniRef90-UPIO003675AAE UniRet90-M9TZX6 UniRef90 W8VS86 UniRef90-A0A022QVP7 UniRef90-A0A022QVP7 UniRet90_F2WWP2 UniRef90-UPIO0037E3256 UniRef90-UPIO004777BB7 UniRef90-W9RHY8 UniRef90 UPIO0031EE5B1 UniRef90-UPIo00368F46C UniRef90-U1AIZ5 UniRef90 A4X1N7 UniRef90-UPIO00406B931 UniRef90-H1VBW5 UniRef90_NODOH1 UniRef90 J3JF06 UniRef90_UPI00035DFB73 UniRef90_J3PD77

SGVAHVSLVAQA PD
VRAYADGADGNLWEFSHD VRAYAG GADGNLWEFSHD NML

VVATADGGLELFMF
VLK GTRDAAMDP TAPNATRSGDIFLYHQNWQCQPALYHFE TAPNATVTVTS $\square$ NGQTQLFTTAADGHVISTFWA $Y V D N A G R V V E H Q S D$
$Y V D N G R V V H Q S D$

ATNDDGRMEAF\|LDTEGAVWHA PATALAVVGWYDDRTTVASVFFQARDGSLVNA PATALAVVGWYDDRTTVASVFFQARDGSLVNA D A WTDQSTGTVRVFVTTHDGRVMSARYS SVAVGRHADGRLEVFAVMSDGSVQNRFQD SVAVGRHADGRLEVFAVMSDGSVQNRFQD
 LYGSCSSQPSSTTFGUDKLSLVCVNADHRLQLKYY VFARRADGQUVTTMRA
 GGRLQHWWR
VAVYQPNTGVTEVFARGVDGTLVHTWRN VAVYQPNIGGTEVFARGVDGTLVHTWRN AARNRDGRLELFGVNRDGRI WHTWQT AARNRDGRLELFGUNDGRUWHTWQT ATPALASYRGNLYTVFPQAADNRLVWSRHD ATPALASYRGNLYTVFPQAADNRLVWSRHD VGNDGHVYHEDRN STTAARNADGRDEVAVGGDGNYSKPQV
TSLSAQGTNTMEVWWGTPQGATQTAEFP TSLSAQGTNTMEVWWGTPQGAI QTAEFP
 $\square Y Y S$
PTEPREDVAPAVVVRWVGAAMPNRVFVVTEDGRLMSRVTQ PTEPREDVAPAVVVRWVGAAMPNRVFVVTEDGRLMSRVTQ


NDSGHVRLY EWNGSAWVQRGS SSPAVVTF QGKLFVFYVGKDDGIFYTTRD SSPAVVTF SNELSEMHWF AFDSNDVPYVVYKDDGNHNATVKKF AFDSNDVPYVVYKDDGNHNKATVKKF AFDSNDVPYVVYKDDGNHNKATVKKF N $\square$ T ALTFPDAANRWVNTAHAFYRTAGGGLAE

GDQQLIFSRGTDGALHHWYWI PTPLVYPAESGRVVSARSADGRLEVFAAGADGVHHAWQAE PGDAAUGSTPAFUQSDYGKPGNFEVVVRTADGRLNHWWR TTGALMYSFCN

APLSTVAGLQADNGDSRMFYQRTDNSTWMTHWE SPAQARVAAWWNGVGPQVIVQNTTGLIRYSRCN HDSSNAMTGIVGNYNGS LFMVDTFGNVILREWN NSKTTEVFGRGNDGRLIHTW NSKTTEVFGRGNDGRLIHTW NSKTTEVFGRGNDGRLI HTW
A QLADAPNADGRDELFALSDSTFDHMWQTG

## TGWKQENGMW YFYNTDGSMATGWLQ

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LYVVDAYGSIRE RSS PAPLVYPAESGRVVSARSADGRDEVFSAGADGVHHAWQRE GTAWAGRNADGRPQAFVVRNGKVDTHYVT
 ELVGNAGFSAGNSTRTNGNTPYUIYQDSNKAIVQKY QDPTGKVVYSACN VVS GRSADGRLEAFAAGADGVYHAWQTA

LYSFQTA
TTGAlIMYS FCN

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UniRef90_L1KZG3
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UniRef90 W9XN36 UniRef90-D9WH57 UniRef90-ROIUY7 UniRef90_UPIOO0470055E UniRef90-M0CTB0 UniRef90_C5G981 UniRef90-W7SMS6 UniRef90-W7SIX6
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UniRef90_C7QFZ2 UniRef90_C7QFZ2
UniRef90_S6H8X5 UniRef90 J9MVY6 UniRef90-C4RIS6 UniRef90_C4RIS6 UniRef90_C4RIS6 UniRef90-D9W2Q6 UniRef90_UPI000360F7F6 UniRef90-UPI000360F7F6 UniRef90-G8SDQ7 UniRef90-G8SDQ7 UniRef90-A0A010RLS8
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UniRef90_D7CDH9 UniRef90-D7CDH9
UniRef90_B4V519 UniRef90-B4V519 UniRef90_M4FQVo UniRef90-D3PXX6 UniRef90-V2XIF8 UniRef90-B2AT39 UniRef90_UPI00032AC2A5 UniRef90_UPI0003675AAE UniRef90_UPIO003675AAE UniRef90-UPIO003675AAE UniRef90-M9TZX6 UniRef90-W8VS86 UniRef90-A0AO22QVP7 UniRef90-A0A022QVP7 UniRef90_F2WWP2 UniRef90_UPIO0037E3256 UniRef90_UPI0004777BB7 UniRef90_W9RHY8 UniRef90-UPI00031EE5B1 UniRef90_UPI000368F46C UniRef90-U1AIZ5 UniRef90-A4X1N7 UniRef90_UPIO00406B931 UniRef90-H1VBW5 UniRef90_NODOH1 UniRef90-J3JF06

PAVVAW
LDDARQLWQYRYDGTRWGTESLGTVPADAGQLRTVAGMGK $\begin{array}{ll}L \\ F & D A R Q L \\ F & \text { WQ }\end{array}$ RTPGNNLEVITQTS VDGKGRLVGSMYDGGEWSDVIVIDAKGDSAPPTSPDSTVTR
 VGPERDLYRITVSD RDGAGEWERVGEGP LDKSNVIVQNYSRGTDWQRGNDGSKRYTVPAQSSDA TDGGD WGDAQTAAGTWSPWADFGGSMASPPVT TDGGD WGDAQTAAGTWSPWADFGGSMASPPVT

HNETGLSTVNL HNETGLS IVNL
RASDGSVQHVWQTNNGWDDQVIGDVAVIP HDEDGRVNVLAYDDDTWYDGPVSQLE DADGRLEAFAR HDEDGRVNVLAYDDDTWYIGPVSQLE LGEDGQL HRLA WDGDRWAWKAHARL P DA L ATPTGGIISNKSETTPNGAWSGWNEVGPQGGPF $\square$ GAAKRSG ATPTGGUSNKSETTPNGAWSGWNEVGPQGGVTETVSAARH


VS PT NT LSEYDFQTSTDSATNPS GDRGGTSCSDCDT SELF LTERYEI ANGLFHCNMTTNWUISKPSPSVHQNTGLASLLL VSQNGRLLQFMV YMRKFKWKDCKNPLNVKIASIVD RGMDGTLHTWRNPNGTWDAWDSTGTWQI DGEPAAVYE

 UniRef90_UPI00035DFB73 UniRef90_J3PD77


UniRef90-L1KZG3
UniRef90_L1KZG3 UniRef90-W9XN36 UniRef90_D9WH57 UniRef90-ROIUY7 UniRef90_UPIO00470055E UniRef90-M0CTB0 UniRef90_C5G981 UniRef90-W7SMS6 UniRef90-W7SIX6
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UniRef90-W7IU05 UniRef90-C7QFZ2 UniRef90_C7QFZ2 UniRef90_S6H8X5 UniRef90 J9MVY6 UniRef90-C4RIS6 UniRef90_C4RIS6 UniRef90_C4RIS6 UniRef90-D9W2Q6 UniRef90_UPIO00360F7F6 UniRef90-UPI000360F7F6 UniRef90-G8SDQ7 UniRef90-G8SDQ7 UniRef90-A0A010RLS8 UniRef90_L8EVB6 UniRef90-L8EVB6 UniRef90_UPI0003810349 UniRef90 UPI000472981A UniRef90-UPI000472981A UniRef90-A0A017T1L3 UniRef90-S0DKS9 UniRef90_S0DKS9 UniRef90-C7ZG13 UniRef9-G1XKS9 UniRef90_UPI00035E80E3 UniRef90-F7VQG6 UniRef90-SODL30 UniRef90-UPI00036E4CEC UniRef90_UPI00036E4CEC UniRef90-M7T1A7 UniRef90_A0A014PA86 UniRef90-A0A016PCN0 UniRef90-W9NW25 UniRef90_W7L927 UniRef90-W9IBH1 UniRef90-W0GYR0 UniRef90-F8JUE6 UniRef90-W7NC10 UniRef90-W7NC10 UniRef90-G0RDX1 UniRef90-K6YVM8 UniRef90-K6YVM8 UniRef90_K6YVM8 UniRef90_C7Q9W8 UniRef90_W5WDR5 UniRef90-D7CDH9 UniRef90-B4V519 UniRef90-B4V519 UniRef90_M4FQVo UniRef90-D3PXX6 UniRef90_V2XIF8 UniRef90-B2AT39 UniRef90_UPI00032AC2A5 UniRef90_UPI0003675AAE UniRef90_UPIO003675AAE UniRef90_UPIO003675AAE UniRef90-M9TZX6 UniRef90-W8VS86 UniRef90-A0A022QVP7 UniRef90-A0A022QVP7 UniRef90-F2WWP2 UniRef90_UPIO0037E3256 UniRef90-UPI0004777BB7 UniRef90_W9RHY8 UniRef90-UPI00031EE5B1 UniRef90-UPIO00368F46C UniRef90-U1AIZ5 UniRef90-A4X1N7 UniRef90-UPIO00406B931 UniRef90-H1VBW5 UniRef90_NODOH1 UniRef90-J3JF06 UniRef90_UPIO0035DFB73

130
140
150
160
DDLFAVVRANSHLLHATYASETSKWSDYEDLE $D V T Q D F Y$ LDGDEMQQAQYSNNGWSNSNLGSSTPN ASEFSRAGRIYVFFPGTDDALWYLRNLDLQYETYTAATSLL DYDQRNDHMMYRSLYRNHHRLFYCHFDGARNRWSMPESLS PAAVARDDGVDVFAVRGSEGERYLYHGRFDGGRGDWERLG FEEDDRWSDGSVFP
$\square V T V A G S Q \quad L Y T R A P D G H V M S T F W G G W H E W F S D P T G Y G$ AKLGDGTVVDFAVDADGKLWSYAQSGTVPFWK DLG AKLGDGTVVDFAVDADGKLWSYAQSGTVPFWK DLG GEKDGY RLFYHDEDRKVKMLWYTDDDGWNDGGAISQ GEKDGY RLLFYHDEDRKVKMLWYTDDDGWNDGGAISQ A Y S YEGALTVLHAYQRPHVNGWAFGQ SGTNMS LVIFPYDTDNFA IAGYKEENKDKWSLSSLPLL SGTNMS
KPGPGDTVTS

 LEVFAVMSDGSMPNRVETAANGAWSAWGVYG A D GR

L EVF AVMSDGSMRNRVETAANGAWSAWGVYG
QVYMFWTSRDDQKKDYYSSSVEGKWSAPKFIP AKNQVEYFGVDKDGAMWHNAWSPSTRRGTKLANLP A ALIGDALHLIVRAGNDKLAENVYTASGWSGWSVLPGNGS AALI GDALHLIVRAGNDKLAENVYTASGWSGWSVLPGNGS AALIGDALHLIVRAGNDKLAENVYTASGWSGWSVLPGNGS YGKPGNFEAVVRTADGRLNHWWR $\square N G A P W T$ WNDGGRFA PNLQVTE PNLQVTE VVFVRGTMGELVH TWRNPDGTWGSWDVVG RDADGRLEI FGSNAEGRI WHTWQVRPNGGWVNGELYS RDADGRLEVGGSNAEGRIWHTWQVRPNGGWVNGELYS GPALAELDGVLWSAHTGGNRAYVSSYISGTTWNTAEIVG GPALAELDGVLWSAHTGGNRAYVSSYISGTTWNTAEIVGG GSSQVLAEA
TAARNADGRVQVFAVGGDGNIYTKARTTPTGSWQGLGAGFGS TAARNADGRVQVFAVGGDGNIYTKAQTTPTSGF GSSWS NGTAHTAF LHDTGTD IIFRYAAYDGGWSTHQS DSMFP
 EGKD SVVAPR TESGATYVF
NRGDKLGYRLYYHDEDMHLNEDRYDPNTFTWSWEGTDN PSMN
FEPPDGVGQSGYVDQAADDRGRLWELNGRGTTWSWRSH FEPPDGVGQSGYVDQAADDRGRLWELNGRGTTWSWRSH PQCDYCHPWTYYFCQVPS GRDNGAFRTP WESDDFVNGNDG
 TSIDSVNAQEIAVVFWTTPKNSIDDAFPYSFRNFQRPDTVAQ PSMN LVLYQAPDGTVKT NA RE $\square A V L W T T P K N S \square D G A F L F E E P Y S F R N F Q R P G T V S Q$ AAASSAPGRIDLVGRTGGDLVTASLVDDRWNAWAVVPTPG PNAAVDQDAI QLFWSGAGDDGIFYARFDGDKWGLVGQDNV PNAAVDQDA QLEWSGAGDDGIFYARFDGDKWGLVGQDNV GSDT GRTDTALDSSDVPYVVYRDEGNNNKATVMKFDGSTWVDVG GRTDDAALDSSDVVPYVVYRDEGNNNKATVMKFDGSTWVDVVG ADTTSGPVILGI GPGGLVTSSTD $\square$ GPAWITVPMAA
 $E M E K S P D G R L E V F A L N G N T F Q H Q Y Q T S P N G G W S A W E N F G$
$G A V D E D T A G N Y E L C A V A G G G L I E H W W R G N A G P W R R S A V F G$ GAVDEDTAGNYELCAVAGGGLIEHWWRGNAGPWRRSAVFG NAKEGY RUYYHDTNKTVQVIGYDPDANTFYYGGVVIS
NVVSTKNKALWAMMQNDNGVRKIRVWFVSAGQPNTLTEAG GEEGGY RLLFYNKDGQVAQLGYTRDDGQWYKGMVSK QELFREN $Q V F V I G R N G H L Y Q Y V N D L W H E H Y K S Q H L I L$ P NTGATELFAKGNDDRLIH TWRNPDGTWGAWGGI G P NTGATELFAKGNDDRLI H TWRNPDGTWGAWGGI G
 HINVDMETPYNVYGGMQDNGSWRGPAYTWRDQGDRNSYWQ VSVFMINQTILALSEAAGQLYQMQLTEDSQPDWAEFVPEFD $V S V F M I N Q T I L A L S E A G Q L Y Q M Q L T E D S Q P I$ WAEFVPEFD FQYNGS WYYLNANGDMATGWFQYNGSWYYLNANG $R \square D \square A R T G T D G L A A G S L T G A G W S G F T T V P$
QE R ${ }^{R} \frac{\square}{R}$ D
RYOL TVVSNEDGRMQVFVQNGGGGVSTIYQNSPNSGWSSWVDLG NGNEHFLQVVGVGTDGNAYLVTWQNGQGQWSPGFALP $P G Y R V \quad \bar{M} A V G H A T N G T \square Q T Q L Q N G T W P G T W T T I G D N S$ NQ QT FDGSTPYVVYQDAANSNKATVQRFNGTTWEVVGNAG SSKDGY RLFFHDEAKTVNVMSYTTTDGEWQLQGTDS AAGHNADGRDEVFASNADGVFHRWQ TAPSGGWSGWEGTQ RGVDATSDGRGVWLTGDGGSLGRDDAETGRHTDHT APG $P$ SGRTS $\quad$ LIVVRDNGGNI RYTTQVGSGRAWKKWDS $L G$

## UniRef90 M7SIS8 UniRef90-L1KZG3 UniRef90 1KZG3 UniRet90-W9XN36 UniRef90_D9WH57 UniRef90 Roluy7 UniRef90-UPIOOO470055E UniRef90_MOCTBO

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UniRef90 W7lU05 UniRef90-C7QFZ2 UniRef90-C7QFZ2 UniRefefo-S6H8K5 UniRet90_J9MVY6 UniRef90_9MMY6
UniRef90 C4RIS6 UniRef90-C4RIS6 UniRef90-C4RIS6 UniRef90-D9W2Q6 UniRef90-UPIooo360F7F6 UniRef90-UPIO00360F7F6 UniRef90-G8SDQ7 UniRef90-G8SDQ7 UniRef90-A0A010RLS8 UniRef90-L8EVB6 UniRef90 L8EVB6 UniRef90-UPIOOO3810349 UniRef90-UPIO00472981A UniRef90- UPI000472981A UniRef90-A0A017T1L3 UniRef90-SODKS9 UniRef90_SoDKs9 UniRef90-C7ZG13 UniRef90-G1XKS9 UniRef90_UPIOOO35E80E3 UniRef90-F7VQG6 UniRef90-SODL30 UniRef90-UPI00036E4CEC UniRef90-UP100036E4CEC UniRet90_M7T1A7 UniRef90-AOAO 14PA86 UniRef90-W9NW25 UniRef90_W7L927 UniRef90-W9IBH1 UniRef90_WoGYRo UniRef90-F8JUE6 UniRef90-W7NC10 UniRef90-W7NC10 UniRef90-GORDX1 UniRef90-K6YVM8 UniRef90-K6YVM8 UniRef90_K6YVM8 UniRef90-C7Q9W8 UniRef90-W5WDR5 UniRef90-D7CDH9 UniRef90-B4V519 UniRef90-B4V519 UniRef90-M4FQV0 UniRef90-D3PXX6 UniRef90-V2XIF8 UniRef90-B2AT39 UniRef90-UP100032AC2A5 UniRef90-UPI0003675AAE UniRef90-UPIOOO3675AAE UniRef90-UP10003675AAE UniRef90-M9TZX6 UniRef90_W8VS86 UniRef90-AOAO222QV7 UniRef90-A0A022QVP7 UniRef90-F2WWP2 UniRef90 UPIOOO37E3256 UniRef90-UPIOOO4777BB7 UniRef90_W9RHY8 UniRef90 UPIOOO31EE5B1 UniRe990 UPIoo0368F46C UniRef90-U1AIZ5
UniRef90 A4X1N7 UniRef90_UPIO00406B931 UniRef90-H1VBW5 UniRef90 NODOH 1 UniRef90-_J3JF06 UniRef90_UP100035DFB73
UniRefoo-


GDAGLWYSYNEKWA EGRSFSSLGVTWGNGGLLHAFVRAGDGHAWRVSWDDPRQT S SMSNGPMAAVGWNDTAVRAYYVDDNAVVEVASESTTWE GTQPVKGLAAI STPQSGSRVFWADRSGSLMTRIQDSDDWD GVCT SGPAAVSVGPNRLHLVAWTSTKNSNLQVMYRNGWN NTDGHGG ASVWSDNSYAYLFT DRNTQTIDDWWQDNSWQ DGLTANNAASVTTVNGQTQLFTTASDGHVMSTFWENGGWH DTAGVSGLLGVVPVRDGKRVFGLNGAGSLRSIEYYNDGTQ DGAGGMALGSTLHDFKNITVPFPK GFKSPTP TNKDAVEHIWQTGNGWA TNKTATSKYAFDWSKDV PGAPGTVAAGAHODGRVEVFAVTNGGRLWTFSLESGSWS PGAPGT VAAGAHQDGRVEVFAVTPGGGVREAVANGAE WS VGSVLTDVSATVFKQELVLTFADVQGRLNTASSRDGNGW GGNFTSAPFAFATGNSRIDVLAVGIDGRLKHQARIGKTWA
 TPDA YGPAVATVGDTLQLVVHATDGRIYGNVYKDGRWL SGUAHYGPALVQTRSRTLDLVAARTDGRMQLWWRDDPNWR TEIDGTPSAVYQPNTQTTEVFAKGNDDRLIHTWRPNGTWG PVDRLVSLDVTNNADGRLEVFGTNAEGRIWHTWQTSNGWN PVDRLVSLDVINNADGRLEVFGINAEGRI WHTWQTSNGWN SADSDSRLALVPDSTNGYGLFYQVNGALVALIPDDGSWP GSAAHSAPGLGKTLGRICVDYRATDSQI RESPYAPGRPW SAATQAGSAAVAGMPDGSAQFDAGNDGMTYHNDRRSNGTW TIVANADIAATTSVDGRIELFYTVSDGSIVRHRFQSAANGS SLPALAGDAVLASGGGTPAFVYVNGTALRFTQRSNNDWP QGTASASSQLTTLSFGSTAYLFVSPEGAVVGGSWSDASPD
RPLKGNA
EAKIGTPLTTSVSDKGVSLFYFSVDDTLHYMYRGHESGS GTSTKGDPAVVSPRPGQVDLFSVGTDGLLYRRTLVRGAWQ DVPSNNADAATAGKDGNFTVVTPRDDKNI QLTRWGLDKSC


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 LPAMNTSLAVVPASSQSUNLFFQSASG K
$D V N T V P A D G A A H S G K E N \square T V V S T R D L S N I V T R W N S A G T W W$ SNFPGTVIRPMSKSLSG SLFMFSKDGGLVEYNWNTWNWI TWHMTSDPVAVYQPNTQVTEVFARGSGDIHTWRNPNGTWG TWHMTSDPVAVYQPNTQVTEVFARGSGDI HTWRNPNGTWG TWHMTSDPVAVYQPNTQVTEVFARGSGDIHTWRNPNGTWG N GGRSVTASHNRDGRLEVFASNADSVFHRWQTSPTTWS EISFGDGFDVIPDPDNNRFGYTMSQQGSVQRYDWEGNNYS RATSTVQLASGVISNDRERMYFCTKNGQLLELLGDDHRWT RATSTVQLASGVISNDRERMYFCTKNGQLLELLGODHRWT SAGПEAAPALTAGAPGTLDAFVRAGDHAVLHIPFLDGGWR GDSLTGTPVVLADADGAATVLATTSTGEVQSATWRAGAWT s

 ITPDGSPSTIGSPTTGRAWVFIRATDGNIRHTAAGSTOT FSAGGVLYTTISFNNHIPYVAYRDNSNKITVQRFNGTSWE DPVGGMALASTHSGQMNISVVFPKDAENLVSRLFKDETWR GGPANARLAMENAPDGRLEVFALSDSTFEHLLYQTRNGGWS EGF
SRD
UniRef90_J3PD77

| 90-M75158 |  |
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| Uniretelo-LikZG3 |  |
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| UniRe |  |
| UniRetioluplound | LNSESVGGTVCG |
| UniRefi90-c5c | G |
| niret90-W7SIX6 | WS N |
| (90)-N1 | LDAF |
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| eet90-W |  |
| UniRefer |  |
| Rei90-s6H8 |  |
|  | N1 |
|  | Vobic |
| Uninereso-C4RII | GWV VDGNGWTGSPLGVA GYDDKVRIFARGGDNRYYTA |
| Uniefei90-D |  |
| Ref | AWgal gowklsgidyavyopntat |
|  | w |
| -A0 | TGFPAVTNMPGGAPFADARSSDTQRVFYLDNDANISVIY |
| Ret90-L8 | MAHVGLDGRAYLTWRD |
|  |  |
| UniReto-Upiod |  |
| Unirefolo-A0AO |  |
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| Refet | R |
| UniRefi90-91xKS99 |  |
| Ref90-F7VQG6 |  |
|  | EGTIPDSSFDTS |
| Uniretioupulooos6e4cec |  |
| Ret9 |  |
|  | LAANEPTADTSSAPGAVSYQQSGETWIYYLVNGSUIEAH |
| UniRef90_W9 | I Vakdkdsgnfeaylvias ntivyn |
| UniRet90 W9ibrl ${ }^{\text {a }}$ |  |
| Uniretemoch - |  |
| Uniret90 W7NC10 |  |
| Refi90 GordX1 |  |
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| UniRet90 K6¢YM8 |  |
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| Unifer90-W5Wh | SSERSPDGRVEVFATSGKQ |
| Ref90_B4V519 |  |
| UniRef90-M4FQVO <br> UniRef90 D3PXX6 | $\frac{5}{\mathrm{~L}} \mathrm{~L} \dot{Q}$ |

RST TPKTNKTETSTNATAPGMGDS DDTWYTGTDKK円HQTG EHGTPYKGVTLVGSPGPSFKGN TWDVVGEWDIDGKPAAVYQPNTQTTEVFAKGNDDRLHAW TWDVVGEWDIDGKPAAVYQPNTQTTEVFAKGNDDRLIHAW TWDVVGEWDI DGKPAAVYQPNTQTTEVFAKGNDDRLIHAW AWT GTGGLRDAELTTSRTVD
NQPTHPDPDNTHYGSQKGLTWTTT NHGRPPGANVTADTDAASVRPGL LETVSGAGDVEYD YLNTNGAMETGWLEYNGSW EPERVGGAASARPAAAYSQGRGLVVYRNGGMEGW
 DWE GTGGPADAQLSSERTADGRVEVFAMNGRTAVH RNENRPSVRPASAPQATLNSDGRTQIAYREEATGNMVTAT PGFALPKPSGYNGTFATGDGNSNY QVFGDGSNGVAYLVS TWGPVTSGETPVDPTAFTWQNSNGUAFVTRNTNGSIIRLYA QVGTAAGFSAGVAFYVNLAFSDDKPYVVYGDGANSSKATV LA ALLPSSFKPNYTLPAFSNNTSLGAMVFYLGTDAKLIH DPVKPGSGSSLSAVEAVDWGGDEDSRVYAVDTNGGVERSS TPWRKLEFGTGEPVVATAPGG RTEVFVRDLDTSUVRFT

UniRef90 M7SIS8
UniRef90-L1KZG3
UniRef90-L1KZG3 UniRef90-D9WH57 UniRef90-ROIUY7
UniRef90_UPIO00470055E UniRef90 M0CTB0 UniRef90 C5G981 UniRef90-W7SMS6 UniRef90_W7SIX6 UniRef90_W7SIX6 UniRef90-N1RXR2 UniRef90-N1RXR2 UniRef90-UPI0003831486 UniRef90-C7YX08 UniRef90_C7YX08 UniRef90_W7IU05 UniRef90-C7QFZ2 UniRef90_C7QFZ2 UniRef90_S6H8X5 UniRef90-J9MVY6 UniRef90-C4RIS6 UniRef90-C4RIS6 UniRef90_C4RIS6 UniRef90-D9W2Q6 UniRef90_UPI000360F7F6 UniRef90-UPI000360F7F6 UniRef90_G8SDQ7 UniRef90-G8SDQ7 UniRef90-A0A010RLS8 UniRef90_L8EVB6 UniRef90-L8EVB6 UniRef90_UPIOOO3810349 UniRef90_UPI000472981A UniRef90 UPI000472981A UniRef90-A0A017T1L3 UniRef90-S0DKS9 UniRef90-S0DKS9 UniRef90-C7ZG13 UniRef90-G1XKS9
UniRef90_UPIO0035E80E3 UniRef90-F7VQG6 UniRef90-SODL30 UniRef90-UPI00036E4CEC UniRef90-UPI00036E4CEC UniRef90-M7T1A7 UniRef90_A0A014PA86 UniRef90-A0A016PCN0 UniRef90 W9NW25 UniRef90-W7L927 UniRef90-W9IBH1 UniRef90-F8JUE6 UniRef90-W7NC10 UniRef90-W7NC10 UniRef90-G0RDX1 UniRef90-K6YVM8 UniRef90-K6YVM8 UniRef90 C7Q9W8 UniRef90-W5WDR5 UniRef90-D7CDH9 UniRef90-B4V519 UniRef90-B4V519 UniRef90_M4FQVo UniRef90-D3PXX6 UniRef90 V2XIF8 UniRef90-B2AT39 UniRef90_UPI00032AC2A5 UniRef90 ${ }^{-}$UPI0003675AAE UniRef90_UPI0003675AAE UniRef90-UPIO003675AAE UniRef90-M9TZX6 UniRef90-W8VS86 UniRef90-A0A022QVP7 UniRef90-A0A022QVP7 UniRef90-F2WWP2 UniRef90_UPI00037E3256 UniRef90_UPI0004777BB7 UniRef90-W9RHY8 UniRef90-UPI00031EE5B1 UniRef90_UPI000368F46C UniRef90-U1AIZ5 UniRef90-A4X1N7 UniRef90-UPIO00406B931 UniRef90-H1VBW5 UniRef90-NODOH1 UniRef90 J3JF06 UniRef90_UPIO0035DFB73

250
260
270
FDVTSKTWEPEVGF QVVGDDK\SGPPKAMSDGPGR|V|N|V|FA TGQGPTNDWSKAAVPAGFPSLNKELGSRTVEGDLHTFAVD TGQGPTNGWSKAAVPAGFPSLNKELGSRTVEGDLHTFAVD
QTDDYNSFNAPVSLGAQ VWRPTCGLG QDGRVNVF $\quad$ KA KDGSFWHSGE $\triangle P N T A \square L G R A L L A A A V A T N D Q N E D T I V L Y$ Y $F D G S R D D W E T V G R P S V E S P \quad A A V A R G D A \quad V E V F A$

WNGGWHEWFS $\square P T G Y G D G V T A A N A A V S V T T \square N G Q T Q L T T$ ANADGSWPADFSPVGSFAAAGSPAAILDPALGRLAVVVRG ANADGSWPADFSPVGSFAAAGSPAA L LDPALGRLAVVVRG WNS S LLEADG A AVDRDRSRTRI F Y WNS S L EA A G A A V DRDRSRTRI F Y QD GK WS SA WVS LY S GTPL VIGDPVVASNADGRLEVFALE NGDGWELAKDPGEKKWPKAGDKSARLALVAAPESEELWI F $N G D G W E$ LAKDPGEKKWPKAGDKSARLAALVAAPESEELLWI F LR T S FP G F A WRQHGLP HPPDGQVLGKWNNRG ANGAWSEWNGFVGAGMVKP
 WG G S WY T D
WG G S WY T D
$T N P G R W T P L S P V G L T Q D A P \quad A V N V Y D S E L H L F V$

WRGNAA GAP WARSAVF GHDAVAVTGMLQGSF GNLEVLVLR RNGTWDAWANDG
R NGTWDAWANI G
Q DGGW $\quad$ GG GWRELYT DSDYLTNLAVLANADGRLE VGG
 NDASSWETA QPASSLKGVDA DTDDITCLTMATTHRDDPRCYG D Q HK WKDPAEVI QLGT RPCIPLAAPALTTHNG
$\begin{array}{rl}A \\ A & T\end{array}$ QQTPN GAFSPGWNEILSDSRDI A SVNSAD GRIVELLVY



VDGQLDTWSLVPTAGR $\square$ TGAPGLVSRA EGTLDAFVVR QNYVWR LWWENQSTTYWPQADESNAE LTVVSA IVQDVRIYY KTGSRDTVGSFDQNGDPSTKAESGGCYSNNWGN
WF G G
WF GG
YREGVVWTAG EQVEALADCFTRGSMAVNQAGRVYCVHDT QS D D YDMFGAPVSLGA QUVWRPTCALA QQ GRINDVF DKA RDGSGYWDDAKTLLPTQSANATNGG

VS A G D DD
K S GSRDTVGSFSSDGDFVPSTKAESGGCNNWGN
WN GSAWVQR GS D $\square$ D GEAAGDMSGYAVS LSSDGSVVADGAY GPATPTADPT DWTVTGLPAPTSRPVAATASGGLEL YSDHKLNPYSWTGQRNLGNEDGGQHL Y S DHKLNP Y S WT GQRNLGNE LGGQHL
S N
$F D G S A W V D \quad V G M A G F S A G T V N Y T D \square A F D S N D V P Y V \quad V Y Q$
 NDGT GWQTKTLPGS A D GIVGGASAY QVDE E P S NL WT
VN A P Y G Q WE S F
GTGGTEVAATANADGR】E VFG
$N \square N W V W M N T N L S T S V W P L A D E P N A E F A L A S D A S S A V R \square Y Y$ GDGSED GWKDELDDLGGDGGVGS $\square A A L A P K S W G R D G \| A V R N$

NT N Y F WS $\square E N Q T E S F W P E A D E P N A S V G V A F D F S S S L V H L Y$ MDKNAWKWK
$R N G T W S N W G A T G D W K L S G D P \quad V A V Y Q P N T Q T T E V F A$ $R N G T W S N W G A I G G D K L L G D P \quad V A V Y Q P N T Q T T E V F A$
 ASHAWQTAPDAAFSQWETFGGGGTSI GAANNADGRDEVGG NDPEK QK QGESGGGLTMDATGAENTTLLVVIEPSAAERNVIY

 PGEGGWRPVDPNTATADAPAAVAAG PDRVDVY V Q N LD GTWPGTWTT DGDSS IVPEGSPSAVLSPTTSRVWVFV MD QT T WK WK

A WQTGVNAPYGAWEPFGGGGTEVTATSNADGR】EVFG
 WDNGGNWH G GLLTLPQPS GYNGSFS QLATGNGNNHYLQVVG A D
Q RFN GT T WE L VGTA GFSAGEA DYT S $\quad$ T A F $\quad D \quad D G L T P Y V A Y$ S N $\square$ N WQ WK S MPD Q N S G $\square$ WPVA DVAVI P WE Q W WQTGPA S WSA WT GTGGIP DA ELATSRSVD GRDVEVFA T GDEWESVG
RSGSWSTPERL ID G A S AL T DVAVGDS D E L F V UniRef90_J3PD77

UniRef90_M7SIS8 UniRef90-L1KZG3 UniRef90-L1KZG3 UniRef90-W9XN36 UniRef90_D9WH57 UniRef90-RolUY7 UniRef90_UPIO00470055E UniRef90 M0CTB0 UniRef90_C5G981 UniRef90-W7SMS6 UniRef90_W7SIX6 UniRef90 W7SIX6 UniRef90-N1RXR2 UniRef90-N1RXR2 UniRef90 UPI0003831486 UniRef90 C7YX08 UniRef90_C7YX08 UniRef90-W7IU05 UniRef90 C7QFZ2 UniRef90-C7QFZ2 UniRef90-S6H8X5 UniRef90-J9MVY6 UniRef90 J9MVY6 UniRef90-C4RIS6 UniRef90-C4RIS6 UniRef90_C4RIS6 UniRef90-D9W2Q6 UniRef90_UPI000360F7F6 UniRef90_UPI000360F7F6 UniRef90- G8SDQ7 UniRef90_G8SDQ7 UniRef90-A0A010RLS8 UniRef90-L8EVB6 UniRef90-L8EVB6 UniRef90_UPI0003810349 UniRef90-UPI000472981A UniRef90 UPIO00472981A UniRef90-A0A017T1L3 UniRef90_-S0DKS9 UniRef90 S0DKS9 UniRef90_C7ZG13 UniRef90_G1XKS9 UniRef90_UPIO0035E80E3 UniRef90 F7VQG6 UniRef90-SODL30 UniRef90_UPIO0036E4CEC UniRef90_UPI00036E4CEC UniRef90-M7T1A7 UniRef90-A0A014PA86 UniRef90 A0A016PCNO UniRef90 W9NW25 UniRef90 ${ }^{-}$W7L927 UniRef90-W9IBH1 UniRef90 W0GYR0 UniRef90 F8JUE6 UniRef90-W7NC10 UniRef90-W7NC10 UniRef90 G0RDX1 UniRef90-K6YVM8 UniRef90-K6YVM8 UniRef90_K6YVM8 UniRef90 C7Q9W8 UniRef90_W5WDR5 UniRef90_D7CDH9 UniRef90 B4V519 UniRef90-B4V519 UniRef90-M4FQV0 UniRef90_D3PXX6 UniRef90 V2XIF8 UniRef90-B2AT39 UniRef90_UPI00032AC2A5 UniRef90_UPI0003675AAE UniRef90 UPI0003675AAE UniRef90_UPIO003675AAE UniRef90-M9TZX6 UniRef90 W8VS86 UniRef90_A0A022QVP7 UniRef90-A0A022QVP7 UniRef90_F2WWP2 UniRef90-UPI00037E3256 UniRef90-UPI0004777BB7 UniRef90_W9RHY8 UniRef90 UPI00031EE5B UniRef90-UPI000368F46C UniRef90-U1AIZ5 UniRef90_A4X1N7 UniRef90-UPI000406B931 UniRef90-H1VBW5 UniRef90_NODOH1 UniRef90 J3JF06 UniRef90_UPI00035DFB73 UniRef90_J3PD77

A EKDLWVATYSYNRNWAW
T DNA LDVA VQT TENGNTYQSLGGVIGSA SKDAQKIS

VA P N T N VLH K T
TAADGHVVSTFWTTNGGWHEWFSTPTG
ADNETYHVWETSVGSNTWGDWTTIAATDPSA
ADNEIYHVWETSVGSNTWGDWTTIAATDPSA
!GDDKKDHEVKSTK S GWQLGSN
IGDDKKIHEVKSTK SGWQLGSN
GDGTIRCAWQNVNDWSAWHSLGVPESS
YRNGKDVMELHLDEYGTWAD
YRNGKDVMELHLDEYGTWAD
STTRSTIA WFDGSNWVERG

TFFNGG LIFERTYDRGGNWGKQGL TG $\square P$

RDSKNQLY
RDSKNQLY


LGEKGR\WH
LGEKGRIWH
QREGL VREVILSTNNDWVDNGNVP
$D \square R Y T S G T W Q G F R P \square A G Y E G G A T F Q G S A$
1 RTNRAVYQ
I RTNRAVYQ
SNAAGTFTSFYRESTNAWSSNTFT IVGAPA $1 \mathrm{IGQYGD}^{\mathrm{G}}$
IGQYGDLR

RGDSVVLR VPFANGAWEVGTLSTTGRP $M \square G G K L A E V A L D N D N D W K Q W R T V P E W D P N$

PD GKVEIVEWAWTDYT DYNVVGTVGT TDNALWVAVQNTENGTAYS

GNDGNHVR $\square$ YEWN GSAWVQRGSD $\square \mathrm{DGEAAG}$

DS GNGYRVTVKKFDGSTWVDVGMAGFST
 LT T GSTITEETGDPSGSWSTAPALPTA PSTW
ASGAGVHHKWQ TGFSTWSDWT $\square$ NNTAGPA
$T \square N K T L^{L} T I K F D T D G \square W K P A M A D P V V S P N A$
DAGTVSVTVLDTKRDKKWRDGGPVIVHMPS
YMAKGKLVQVKYENES WKA WSNVP
RGNS GMLIHTWRMPNGTWDAWANIGA RGNSGMLI HTWRMPNGTWDAWANI GA RGNSGMLI HTWRMPNGTWDAWANI GA TSHAGVYHRWQ TGFATWSQWAWLNDSGPA TGSDDGRVHVTKDGGSNWTDVSNGLKGLPAG
LTKNGELI EWKW
LTKNGELI E WKW
LIEASGAMKASQWF
RADNGRLQAASSSPDAG
RATDGS IHRSRQT GSTTWTTWGPVTSG
TNPTGTYH $\square W Q$ T GFAAWSPWGWVNGTA
RGTGVSMTKQSSANGTSWTD $\square K G T V L D Y P A A$
TDAQGNVYLVSWQDSEGWHAG
QDAANSFRATVQFNGTSWELVGT
$\square$ NATTASHAWQTRPNAEFSQW
TSDDGTVSRY
D G A V WT
RGTDGQVYTTTRSVAGGWT


VIAA A NDSNGRLHVFVINSNNQVAYKMQL Y YDYSNDNLKYATNA

APVA $\square$ S SEPG $\|$ VDVFTGGNDND $\square W H \square R \square Q$
NDVRLNSNMAVVNGEVYVFYDGNNNAVVLKKYE SSHNQDI LYFGTNKFMRSM N NNSSIAGTGYESDGHNVAALHYDASSGG\|VQADFS SQLASVRKGDSGQERRLLVLQEDTGHLAVTEWA



GRLRHWYYE
WWQ


TGWKQENGMW YFYNTDGSMATGWLQ
PASPLGHVTHYVQGGTARHL SGNDVESLLC
VYFRGTDNKLWRVNSD
MRVY $\square$ Y S S S NEDPTLLS W

SVALDSNDNPHTS YCNATFLNLEYAWKD SVALDSNDNPHIS YCNATFLNLEYAWKD S F T A $Y$ LPRDGEVVRWTEQ VA WT DAGEETLKVYVRRWS GS SWEALGT
lupas 21
lupas_14
lupas_28
jnet
jnet conf
sol25 sol5 sol0 jhmm

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UniReigo_G7WLV
UniRef90_G2Q4G6
UniRef90-B1C615
UniRef90 UP1000478F850
Ref90 M7SM74
UniRef90-E9EXE6
UniRef90_N1RZV3
UniRef90_N1RZV3
UniRef90_L8HH27
UniRef90_C9SU72
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UniRet90 KOKON
UniRef90-M1PWH2
俗
UniRef90 K9PKB8
UniRef90_GOS1R3
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UniRef90_UPI00037FBEOD
UniRefo Q01YA
UniRef90 E9F695
UniRef90-H8MLU8
UniRef90 A7BSIO
UniRef90- NOBI53
UniRef90-NOBI53
Une90-W5YM
UniRef90-H8N165
UniRef90- A0A024U6N

EQES WSDWSK DFGPPPYNKNDGDAAAATGSEGGDY HLFT
VTLDAKETSPGASSVFGEADGEHERVFY


NRTVTRFRDSEKLDSSAKPGTPLAALNMEADQTGSVHLYY


GDGLDSASVLGTVNDAS AVFAADLNGDGRIDVVA

QSAGVWRDGGVFGPGDAAVGSTPAF $\square Q S D Y G K P G N F E V V V$
 SDGTEAGTVLVKDILTGANGSSPN_NLTNVNGTLYFVWVY
 NNGSWYY $\square$ NANGDM $\quad$ GAKATSSPA TVGLQYNGSW YY
 DAGRWRDEVAAPT YPVVNASQLAMGLGPTNEPLTQDLVY

S NGNWHTET VDDGGTGTSTA LDDNGNPHTS Y
 GDGAWTTVEKDGASGTGGVGSARASQDA INAGGRADAVWF $P$ MSSGRVTNAYQCALQVDVDGKLTVVWFENMNFKDYEWFV


[^3]|  | UniRef90_B4V0E0 |
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|  | UniRef90-I3IIC4 |
|  | UniRef90_UPI00037351DE |
|  | UniRef90 J7WAT0 |
|  | UniRef90-FOK9L4 |
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|  | UniRef90_G7WLV1 |
|  | UniRef90-G2Q4G6 |
|  | UniRef90-B1C615 |
|  | UniRef90-UPI000478F850 |
|  | UniRef90-M7SM74 |
|  | UniRef90-E9EXE6 |
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|  | UniRef90-N1RZV3 |
|  | UniRef90-L8HH27 |
|  | UniRef90-C9SU72 |
|  | UniRef90-A0A024YRF0 |
|  | UniRef90-K0K0N1 |
|  | UniRef90-M1PWH2 |
|  | UniRef90-UPI00037A609D |
|  | UniRef90-K7K5C3 |
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|  | UniRef90-Q9KK30 |
|  | UniRef90_UPI00035D159E |
|  | UniRef90_UPI00037FBE0D |
|  | UniRef90-Q01YA3 |
|  | UniRef90-E9F695 |
|  | UniRef90-H8MLU8 |
|  | UniRef90_UPI000380AEE9 |
|  | UniRef90-A7BSIO |
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|  | UniRef90-N0BI53 |
|  | UniRef90-W5YMIO |
|  | UniRef90-F2RAP0 |
|  | UniRef90-H8N165 |
|  | UniRef90-J0S9C3 |
|  | UniRef90_A0A024U6N1 |

VAGGKD 90 GKVFHTARNATGNW 100

110 VSNNRTMQHFWRNNMDWNAGA SGGFGDVAAASGPIVGTVITS VS NNRTMQHFWRNNM $\square W N A G A \square F G S G \square T S P P V I I Q G Q Y G \square$
$\square G R D N A D W Y R M T Q Q N S W S N W Q T L G G W \square \quad N Q L$ DWSNDDLRYATNASGSWVKKTV DRRGSVGWYTALA RANTGTLWTTGSAGTPGFAANSGRQUQDGTS
WGPTNHLYKRCWGSGGGVDRTADWTPDGGEDGSRPSAVIF VDKSDHLRCTAWDDEEWDELEMNGLPMTVHSESQLS DSDNKNVKVVKWNGSGMDSGNTLDAKY VVNPRMVM
 RDQNGSVSILQYTGRSDTSEGHWGYGYHVTQGASMKAGFV

 ASEDNQVHWFKNNVGGWTHYTILDAADSAPRSLFVAD $\square$
RTADGR LINHWR $\square$ NGTWNDGG
RFASG $\square$ A HYGP $V$ VGRRVDTHEVVTTAQRSPNAGFGGWVS $\square G S P N P G S T Q V G T$ SSGSGGVKYAWKDNSGWHTTTVDQYA LGS SDTKVTSL
 DDTNGS E L WK K SDGTANGTVLVKD DRTGAGNSSS KDGDRTTFPYPDDSDDGVTQETDRTNUTVDTT AAAVNF SNPSG VHHRWHHGGTWHDW RPLGGPAGARL LINANGDMAGWLQNNGSWY YLNANGS MATGW
 QGTDNK LWKVFNNGAQ

 | $G P T K G A \\| L G Q P$ |
| :---: |
| $L P F$ |
| $T$ |

FHTAELLCYARDDSGEWRRDRVD
APGSYGGAPS $\begin{aligned} & V \\ & V\end{aligned}$

S Y N N G S $\quad$ K Y A Y K D TIF G WH TVEVGCSTWMVYPYTSLALDSN SYNNGSIKYAYKDIF GWHTVEVGCSTWMVYPYTSGALDSN ESSRHK WANHFDGTSWGE EAELIESDSGGVASTPQ VRPAGTVHSVQFQTGRWR SDGHSNATSRWTGNPAVAVD R R RTNETVKYAWNDGAWNGQSFEPGGPTLTPVVQGASVDW



lupas_21
lupas_14
lupas_28
jnet
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sol5
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jhmm
jpssm

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| UniRef90_B4VOEO | DVGAVAGCESOWGMN DEVVVBTDNOQHYWRDRSGWY |
| Ree90-3IIC4 | VPA |
| JTWATO | ADRALWHDWQTNNGWS |
| UniRef90 FOK9L4 | GGINGVVVVGRNANRTLEVFTIGTDNALWHIIKQTNSGWG |
| UniRef90-131JE5 | DVGLNTSLALDDSGKVHIS YYDDATKDLKYATNTSGSWV |
| UniRef90-A0AO22 | GVKPGTSPD\\|VSLGDGNFAVAFQANTGDLWT WKGTAGS |
|  | MATGWLQN |
| UniRef90_G7WLV1 | AAAT |
| UniRef90-G2Q4 | PGAAHVALA DPKSVDRLNLFFATEKGEI |
| UniRef90 B1C615 | SGGYKSYIDLCADNNGLYAFGYNGNDEKIVMTKFDGSNWN |
| UniRef90_UPI000478F850 UniRef90 M7SM74 | SNIPNSPVNVILEDPENENLLFVGTDNGLYASINQGVSWE |
| UniRef90-E9EXE6 | NVT SV |
| N1RZV3 | YDYSNLSAVADRSDQDTLYWTDPRGTTGGKRQN |
| UniRef90-N1RZV3 | SAYDYSNLSAVADRSDQDTLYWTDPRGTIGGKRQNWASWE |
| UniRet90 L L8HH27 | D |
| c9SU | RGDPSLS |
| UniRet90_- 0 OA024 | APATSAADEDA |
| UniRef90_KOKON |  |
|  |  |
| UniRee90-UP100037A609D | DHFSVSSPT A M |
| UniRef90-K9 | TGVNGSSPNNLTNVNGTLYFVANDGTNGYELWKSDGTAN |
| UniRef90-Gos1R3 | KLA ELKY $\square$ NDA WQ |
| UniRef90-UP |  |
|  | AMATG P WLQNNGSWY Y LiNan g Mat Gwlin igs wr |
| UniRet90-UPIO0035D159E | GRVADAPVSVAFADPA |
| UniRef90- Q01 | N |
| UniRef90-E9F695 | DVALNSSLGAWPASDERFVVYQETKYGRL |
| UniRef90-H8M | NKDLKYARWTGSAWS |
| UniRet90_UPIOOO380A | GGLTNAA $\square$ ASSSLG NR $\square Y V F$ KGMDNRIYHTSAEDGQAF |
| UniRef90-A7BSIO |  |
| UniRef90 NO | ATNGDLKYAYKDANG |
|  | NGNPHIS YYDATNGDLKYAYKDANGWH |
| UniRef90-W5YMIO | SDGHGI AVWQQGLRNKI WANRFNGIDWE |
| UniRef90-F2RA |  |
| H8N165 | ELRANS SMDVDGQGYPLVVLREQIGGITAMRWTGTAWQ |
| niRef90 J0S9C3 | AKIGGDYVSLIINPEQQVHIYYHHNTTTLRHAWGAPEKW |
| UniRef90_A0A024U6N1 | GVSHVTKLASSRDVAGSWRVYADTTSHKLAVTSRDALGW |

[^4]```
66777773589858608999971685589984377753 B B B B B B B B B B B B B B B B ABBBB BBBBBB B B B B B B B B B
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[^5]

| UniRef90 B4VOEO UniRef90-I3IIC4 <br> UniRef90_UPIO0037351DE <br> UniRef90-J7WAT0 <br> UniRef90-FOK9L4 <br> UniRef90-I3IJE5 <br> UniRef90-A0A022LS52 <br> UniRef90-EOTRH7 <br> UniRef90_G7WLV1 <br> UniRef90-B1C615 <br> UniRef90-UPIO00478F850 <br> UniRef90-M7SM74 <br> UniRef90-E9EXE6 <br> UniRef90_N1RZV3 <br> UniRef90-N1RZV3 UniRef90 L8HH27 <br> UniRef90_C9SU72 <br> UniRef90_A0A024YRFO <br> UniRef90-KOKON1 <br> UniRef90-M1PWH2 <br> UniRef90-UPIO0037A609D UniRef90-K7K5C3 <br> UniRef90-K9PKB8 <br> UniRef90_G0S1R3 <br> UniRef90_UPI0002F6A251 <br> UniRef90_Q9KK30 <br> UniRef90-UPI00035D159E UniRef90-UPI00037FBE0D <br> UniRef90_Q01YA3 <br> UniRef90-E9F695 <br> UniRef90-H8MLU8 <br> UniRef90_UPIO00380AEE9 <br> UniRef90-A7BSIO <br> UniRef90-NOBI53 <br> UniRef90-NOBI53 <br> UniRef90-W5YMIO <br> UniRef90-F2RAP0 <br> UniRef90-H8N165 <br> UniRef90_J0S9C3 <br> UniRef90_A0A024U6N1 |  |  |  |
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RHTDRTWVGAAP $\square$ T TPGVT ${ }^{260}$ T $\square G S$

QNNGWYQDG | $T$ |
| ---: | :--- | QNNGWSNWGSLGGT IDMLD PNGGWSNWQSLGGSV SRGSVGWYSSAVTENQNRRLEVFG TNASGSWVKKTVVD RRGSVGWYTSSLAVVDGFGNVVHVSYY WYGPAATTGTAKSAGDGMKD GTSPAVTRVNGSTVAVSA YNGSWYY LDANGDMATGWFQYNGSWYYATGWLQYNGSWYY

GGGS GWAAG ENLKGSIDSQP S GGDRVED GRDDGDRFVG ENSNYNDTFRTVQAPGS $\square$ DDNTAQFWPRAD $\square$ PHPDFAVAY

YNNSGNNNSAPAQS GWVGQNAPESVFVTDDDGNGYQDVVA YQNA WLMAYQYGQAKEYVPTMVNNRLTANQAGRVYGTIV RDGAGWHEG WDGSWTAVRDDLGGQGGVGAPAVTDAPAVADARVLVFTTN KDNS GWHTTTVDS GFGLFTSLELGSSEYPHVSYF
 SDGTANGTVLVKD $\square N \square G T N G L G A N G S D L S N L T N V N G T L Y F$
QSGAWRTWQDFGDGGYF DQA DR NRDGR DE I A YNGSWY Y LDN ANGDMAT GWVK DGDTWMKASQWFKVSDKWYY VSGEWSPWASVGGTVSGSPTLVAVGDAVV S WLAKRWKGWQ TDGAHQNVINNNTTNNTPLVTPEGW KSSGQWGSSQl

 $K Q P T V V N L K G G T T D L N G N P V S T A S V K N V D G Q T V Y$
KQPTVVNLKGGITDLNGNPVSTASVKNVDGQTVY
FNGSWEMAGSIHGDILGDASAPGKIAFKPDGQVLTAWIQ GA WSPDRSLEPTVLGKAVGTGRLDAT
$T G G A W E P W G G A L E A L P G V D S T T V A S V K L D T Q G R P V V A D H G$
$V N D S S W T T E V V D A A G D V G E Y C S L A F N T M V G S D H A P G I S Y Y ~$ $V N D S S W T T E V V D A A G D V G E Y C S L A F N T M V G S D H A P G I S Y Y$
$E V V G V W S T W N V L Q P S Q V E N D P T F R T I S I G T S R D G Y R C V C G$

UniRef90 I3IJE5
UniRef90-A0A022LS52
UniRef90_EOTRH7
UniRef90 G7WLV1
UniRef90-G2Q4G6
UniRef90-B1C615
UniRef90_UPI000478F850
UniRef90 M7SM74
UniRef90-E9EXE6
UniRef90_N1RZV3
UniRef90 N1RZV
UniRef90 L8HH27
UniRef90_C9SU72
UniRef90 ${ }^{-}$A0A024YRF
UniRef90 KOKON
UniRef90-M1PWH2
UniRef90-UPIO0037A609D
UniRef90 K7K5C3
UniRef90 K9PKB8
UniRef90_G0S1R3
UniRef90-UPI0002F6A251
UniRef90 Q9KK30
UniRef90 UPI00035D159E
UniRef90_UPIO0037FBEOD
UniRef90 Q01YA
UniRef90 E9F695
UniRef90-H8MLU8
UniRef90_UPIO00380AEE9
UniRef90 A7BSIO
UniRef90- N 0 BI 53
UniRef90-NOBI53
UniRef90 W5YMIO
UniRef90 F2RAPO
UniRef90-H8N165
UniRef90-JOS9C3
UniRef90 A0A024U6N1

T T G S A WRKHFDGTRWS GW $\square$ S T G GVV T S GLS A ADRALDWHDWQT $\square G R D N A L W N \square R Q N Q G N G W S S W Q S \square R G W \square$

QANTGK $\square W V W S G T$
LNANGSMATDWVKDGDTWYY LEASGAMKAS QW Q GQGGWLW

NSNDDK $\square \mathrm{W} \square \mathrm{F}$ Y MVNGS
$\square$ T GA DTDK WY DTSDFYTWDAHAVGDATSPS QNTSVLI YE WMWEGGNSYKP $\square G V V N T T L P S G$
RGGGVSTTRQAADGGTPWSDLGGF!VGQPA
GNWKLKYAWKDSSGWHKSTL
RGAADQSLWWASFDGASWSADGHLSAEAPAA TKEGTLVERKLHQRKWKWVVHG
QATDGTNGYKLWKSDGT
NNPGGVHHRWQHQPGSTWHDW
VN GSGAL
RAADYTLWQQRYENGAGWTKQQAFPSAA
QQERD IV WWF GTLGNG
QGTDNKLWRVFTDGSQQSQPNNNTTLSTPA LARDDTV
Q D
KGDDKR TYHTSAADGGNWSVL
VGLNGTILHY DGNQWTTMDSPTT
QETFNDVV
QETFNDVV
SDGSQDDIWANRFDGSTWGT
 VSAVDSSVWARLETPNGW



[^0]:    TD G
    

[^1]:    HDSNVQELMYTFDPEPTWYYG
    HDSNVQELMYTFDPEPTWYYG
    RGADNALWQKAWFNWHDWGRHGGVLASEPA RGADNALWQKAWFNWHDWGRHGGVLASEPA RGADNALWQKAWFNWHDWGRHGGVLASEPA AlISNNEI LE Y
    VAPDLSIKNAWFSNAGGWNTGST

[^2]:    FTHGDLKYAWVGTPLS G
    FTHGDLKYAWVGTPLS G
    FTHGDLKYAWVGTPLSG
    QTGPNA GWQGWTDLGGPFTA
    QTGPNA
    GWQGWTDLGGPFTA
    QTGPNA GWQGWTDLGGPFTA

[^3]:    

[^4]:    lupas_21
    lupas_14
    lupas_28
    jnet
    cont
    sol25
    sol5
    sol0
    jhmm
    jpssm

[^5]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol0
    jhmm
    jpssm

