## QUERY

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相 TELSDEETLRYNRQI ILRGFDFDGQEKLKSASVLIVGAGG SELTDAEALRYNRQLVLRGFDFDAQEKLKSSRVLIVGLGG MNDEOLRYSRH1L SELSDAEMLRYNRQI MLRQFDFEGQEALKSASMLILGAGG ELSDQELLRYNRQI ILKEFDFEGQEALRQASVLLIGAGG ELSDEEALRYNRQIVLRGFDFDGQEALKAGRVLIVGLGG DLDAEQLDRYSRHIIMDDVGPAGQARLLDSSVLCIGAGG MNDDQL LRYSRHILLPEVGDQGQEALI RSHVLVVGAGG LTEEQVLRYSRNI ILKEIGGKGQEKL NSKKVLIVGAGG DLSKREINRYSRHLLLPEVGGEGQSRLKRAKVLCVGTGG LSDEETLRYNRQIVLRGFDFEGQEALKQSSVLILGAGG EMDDQQLLRYSRHLELDEDDDDGQTRLLQGHALVIGAGG MNDQQLLRYSRHILLDPDGDEGQDRLLGSRALIVGAGG D\DPEQLDRYSHI MDEVGPEGQAGLLDAAVLVVGAGG AA LDPDEVARYSRQLLVKEDFGVEGQKKLLQSSVFVVGAGG MNEEQEVRYSRHILLKDLGYYGQDKI ANSHVLVIGAGG ELSDSEMLRYNRQILLRGFDFDGQETLKASRVLIVGLGG LPDESIERYSRQILLPETGVNGMHKLSAASVLIVGAGG QMNDHQLLRYSRHLLLDELGIVGQEKLLGAHALVVGCGG GSDSEFMRYRHLLLEEVGEEGQLKLKNASVLIVGLGG ELSDAQTLRYNRQIVLRGFDFDGQEKLNAAKVLVVGLGG MNDEQLLRYSRHILLSQMDDEGQQRLDDGHVMIIGLGG ELSNAEMMRYNRQLVLRGFDFDGQEKLKASRVLVVGLGG TQLSDSELLRYSRQILLPEWDMDAQLKLANARVLMIGAGG KTEEQRRRYORHLVLSGLGPAGQVRGLGSSVLVVGTGG TKLNNDETARYSRQI ILSEI GVQGQLKLKKASVLVVGAGG MDDQQLLRYSRHILLQEIGIEGQQRLLGSCALII GVGG ELSEEQLERYSRHILLQDVGLEGQEKLLNAKVLIVGAGG MNDEQLLRYSRQI MLPDLDDDGQEALLSSHVVIIGLGG ELAHEEQEQYSRHLLLDE:GISGQLKLKNASVLVIGAGG LSKDELRYSRHLIJPEVGIEGQQKLKAAKVLLVGTGG MNDNQLLRYSRHILLPQUEYEGQDKLVNSHALIVGAGG DFTEAELQRYSRHLLLPEVGGTGQAALKAASVLVVGAGG SLSRDESRYARHLVLPEVGMEGQHRLKQARVALVGLGG EMNDAEMHLYSRQLLLDGLGVVGQEKLKAARVLVVGAGG LTKEDVERFGRQMLVEEDGAAHMEQIRHAHVVCVGAGG ELNDDEMHLYSRQILLDGWDIEAQEKLKLANVLIVGCGG MTDAELLRYSRQILLPDFGIEGQERLRASSVLVVGLGG EDTDDEVRRYSRHLIPDVGMDGQKRLKNAKVLVIGAGG MTPAELNRYDRHLRLPEVGLAGQQQLKQARVAVVGAGG ATLSQAELLRYSRHLVLPEVGLEGQRKLKDARVLIVGTGG MNDEQLDRYSRQMLPSDDIEGQQALDDARVLIIGMGG DLTPSEI SRYSRQLULPQFGVSGQLKLRSGRVLIVGCGG E SGEERSRYARHLMLPEVGMA LTDEQLSRYSRHITLKEIGAKGQKKLLAAKVLIIGAGG MNESELDRYSRQLLLPNFDGQGQLNLAQAKVLI GAGGG
 DFSEDEI QRYARHILLPEVGGTGQETLLKARVLIIGAGG EGTKEELDRYARHIVLPGVGGAGQARLKQSAVLVVGAGG ELTKDETTRYSRHLILPEVGVEGQRILKKSRVLLIGTGG EDQIQRYSRHIILKEVGGKGQEKLLSARVLVIGAGG MNDQQLLRYSRQIMLPQVDIAGQQKLLNAKILIVGAGG MNDAELLRYSRHILLDDGVEGQERIAASHALVLGAGG MNDHQLLRYSRHILLDEIDIAGQQKIAAAHALII GAGG MDDNQLLRYARHLMLDALGIEGQEKLLASSVLILGLGG THMSKNELLRYHRQMLLPGVGPEGQARLKASSVVVVGAGG TSLSDKQFQQYLLRQLSLPNVGENGQAACCESHVLIVGCGG MDDDQLDYARHIVLREVGGAGQKALLAAHVLVVGAGG LRYSRQIMLPGLDYEGQQRLLDASVLIVGLGG EMTDQQLLRYSRHILLDEIDIUGQEKLLAAHVLIGGAGG DEDFHERYSRHLRLPEVGGAGQRKLESASVVVVGAGG FSETELNRYARHIVLREVGGPGQKALKQARVLVIGAGG MDDDQLLRYSRHILLDEI GVEGQQRLLDAHALVIGAGG DFSEEQURYYSRHIVLREVGGEGQEALNSARVLVIGAGG FSEAEI QRYSRHILLRELGGTGQARLKAAKVLIVGAGG KFTEAELNRYARHIVLREGGGPGQKKMKKARVLVVGAGG
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LG C A A S Q Y LAA S A G V G N LT L L D F D T V $L G C S A S Q Y L A A A G V G N I S L L D F D T V V L S N L Q R Q I L H R D E R$



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LGSPVALYYAAAGVGELGLVDEDTVDKSNLQRQVIVDQAS
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 S LLS D E E Y L R R Y G R QL L M L A E
 L $\operatorname{L}$ T E E R K Q Y A R H L L L
$E \square R R Y S R B L L L D E V G K A G G Q R K L K A A R V L V V G A G G$
 $E L S L D E Y R R Y G R Q M V V E F G L E G Q K K L K N A N V L V V G A G G$ $M N D D V L L R Y S R Q V L M P E V G A E G Q E R L E A A H A I V M G L G G$ LDT T QL DRYS R HVVMERVGPEGQAALLDAAVVVVGAGG F S NEQI ERYSRHI I LKEEVGGMGQTKLLESKVLLIGAGG DFT D A QI DRYARHLVLDEI GEEGQARLVQAKVLVI GAGG
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 MND D E LLLR YAR QI ML P A I G T E GQERL RQAHAVVMGVGG ELLS D K QL ERY GRHI LL DEI GYE GQLTTLVKKRVGII GLGG


ERYS

## L S L



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$M N D Q E R E R L S R Q M R I K E L G E D G E K R I L K T R F L V I G A G G$
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SDPELDRYARHII LRE MND
 E E GQEKLKNSAVLIVGCGA
TELTTDAEMLRYARQILLEGWDIEAQTRRLKNSCSSIIIGMGG $M N D D Q L L R Y S R H I V M$ P QVDI A GQERIICHGRVLVVGVGG



 SEMNDEALL RYSRQI MLEQI EI A GQERLLA GHALVI GAGG M D D S Q L I R Y S R H I L L P Q I D L K G Q R TIL L N S K I L I I G C G G
 LLS NE DIM M Y S R QL L L P D L GVVQ G QL K L S Q T S V V V V G C G G LD D A S R A R Y A R H L R R M P E V $V$ G E A G Q


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D R Y S R Q Q L F K Q G G K G QE KI G N K HVLIV GVG A
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 I G L P




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 VG R K K V V E S G R R D A L I GKPKVEAA QKHLALLNPFI KI EGYNEALNKENALS L FEK





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 N R LPP K A V A A A K E R L K K I N N S E V $\begin{array}{llllllllllllllllllllllllllllllll}G & G & P & K & V & D & S & A & A & T & A & L & A & A & L & N & P & G & V & Q & V & E & A & V & R & E & R & V & T & A & D & N\end{array} V$

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 FTHVPGSM CYRCIFKEPPPKGVVPTCSGVIGSDQAVEA $M V L N N P P M P P C Y R C V F P K P P P A G L L P G P V V G V M G S L Q A M E A$ SVVNYNE GPTYRCLYPDAPDPDYCHSCPGIVGLLMANEV SVFKYEVDQPCYQCLYSECVENGVLAPVAGLVGTIQALQA

 AVFNHHDLYPTPPTENDNCVEGGVIGDLPGIIGLYMANEA
 SVYNYQG GATYRCEMPTCSEVGVLGVLPGVVGTMMANEA SLFC TEDGPCYRCVFMTCEEAGVLGVVPGTI GTLQATEV SI WNVIQKNGTYESQVPNCREGGVLPTLAGIVGCMQANEA AVFDLQGHSPCYQCDFPGTGEMGVFAPLVGII GCVQAAET

$T T L V P G G$


## $S V F$

S SFK A H LP HP
SSFKA HLP HPCYRC
S V Y N
SVWKLDNTFPCYECIFPN
$M V F E P P Y Q H$

AVWKLNK DYPCYE C I F P | $T$ | $F$ |
| :--- | :--- |
| $S T R D P R Q A$ |  | STY D R K E G L

$M T V L P K E S$ $\begin{array}{llll}M & V & \text { I } \\ \text { S } & \mathrm{V} & \mathrm{F} & \mathrm{W}\end{array}$

SVC\|LPGETPCLHCLLETVPMGGLTCDTVGIISPYQVTEA
 TVVSPYDG PCYRCLAPSCAEAGVLGVLPGVVGSDQALEA FAA DRPGVTPCDRCEMATCDTAGVIGPIDHUVASYQATEA AVFDSRDASPCYHCLFPDEGEASDGPCATGAIGSLQAVEA ALYEPAKRSGCYHCVFRNCSNSGVLASTTTVMGNLQANAA LTYVPGEGGPYRC|FEEDPKDGVIGSVPGIDGSIQALEA SVVFYAKYGPCYRCVYPAPPPAGLVBTCSGVMGSLQALETV STYKSHLPHPCHRCLHPTCSEAGVLGAVTGVMGTLQATEV
 T TLVPDG PCYRCLFPEPPDPGTVPDCPGTI GCLQATEA $\begin{array}{ll}S V F W P N G Q G L N Y R D M V P S C A E G G V L G D L P A T I G A I Q G T E A \\ F S I I D P G K T P C \mid L N C Q G M T C D T G G I I & G P A V Q M V\end{array}$ TVWDPARGAPCMACLFPECAEAGVVGPLPGVIGSMMALEA SVFDRKPGSPCYHCLFPRCAVMGVFAPLTGII GATQAAEA SVFALDPGAPCYRCWVPETPEVGVVGAMTGMVGAAMALET ASFUPGETPCLRCSGDTCDTUGVISADVDVIASVETAEAA TVFDKRDESPCYQCLYQSCSQSGVLSPLVGVVGAMQALEA
 T I DNFAT
 SVFQYNQTKPCYQCLYENCTRNGGLSPVTGII GSDQALQA AVFDPRDPTPCYACLYPPCAENGVVAPLVGVIGCFQALEA
 TV Y YTIIPGE TPCLDCGGATCDTVGVIGBVVQMVVAYQTAEA TVFNVDDGPCYRCLYPECAQAGVLGVLPGVI GLLQATEA
 ANFAGHPGHACYRCFCDTCAADGVLGAMVGMVGTFAAMHA VVFDFNQPQGCYRCLVPRCTDDGVMGPVVGSIGNDQALMA GAFAGHLDEACYRCFCDTCADDGMLGAMAGWAGTFAALQT LVLTPPFQHGCYRCLWPDEAEPTVLGPVVGDMGTMQALEA $M T V I P G R T A C C H C L F H E D D E P P T P I G A I A G V I G S D Q A A E A$
$C V Y N L N N E G P C Y R C I F P K P P E T G I L G T V T G V$ $M A V N H D E N C P C Y Q C F V P N C K D L G V V G A I T H L V A S Q Q A L E A$ AVFNYKYPEPPEPDSVPNCAEGGVIGVLPGII GCMQANEA
 GVFDARRGPCYRCLHPQPPEAGVLGVLPGIVGTMQAAEA SVSVVPKQTPCYNCDGMTCDTVGVI SPAVQIVASYQTAES AIFVPNETPCLRCFDQTCDTIGVISPIVDIVASLQVVEV
 SVFTYKG GPTYRDLLPTCAE GGVLGDLPGVVGCDQATEV $Y V I L P E E T P C L S C M G G A T C D T A G I I A P A V G M V V A H Q T A E A$

UniRef90 M5JIT7 UniRef90-UPIOOO46FCBF1 UniRef90_UPIO004782F2D UniRet90_V4XPY5 UniRef90_D8KATO UniRef90-B7VOK9 UniRef90_UPIooo36A36FF UniRef90_UPIO00424CD70 UniRef90-I6ZYL5 UniRef90-A0A017SG50 UniRef90-F4CFC9 UniRef90-UPI000287BF47 UniRef90-Q0FQ82 UniRef90-V2KID0 UniRef90 ${ }^{-}$A0A023RSM8 UniRef90-UPIO004680136 UniRef90-F8D121 UniRef90-Q2T1H7 UniRef90-J9R2Y2 UniRef90-X0W716 UniRef90-D7W101 UniRef90-UPIOOO4684270 UniRef90-I2GVL3 UniRef90-LODZ91
UniRef90 $\mathrm{U1PRAO}$ UniRef90-UPIO003B6CD89 UniRef90-UPIIOOO3B347A0 UniRef90-E6PYT4 UniRef90-D3NRH9 UniRef90-M4F3A6 UniRef90-UPIO003638E6D UniRef90_UPIooo364D85C UniRef90 O7MB92 UniRef90-UPIO0037EDC9F UniRef90-D01386 UniRef90-UPIO00376412C UniRef90_WODS45 UniRef90-B3EN73
UniRef90 W6EXT9 UniRef90 W6EXT9
UniRef90 A4F8M7 UniRef90-UPIOOO2893E06 UniRef90-D2UAL6 UniRef90-B3LSM6 UniRef90_C7LY70 UniRef90-M8D7A5 UniRef90-Q7NQ82 UniRef90-UPIO004765E23 UniRef90 R7C6X7 UniRef90-S3CSN5 UniRef90-UPIO002555E7A UniRef90_UPIO002D9F084 UniRef90-R50216 UniRef90-LBLXK2 UniRef90-G7CN81 UniRef90-W4RLL3 UniRef90_UPI0004761F2E UniRef90-A1K9B5 UniRef90-A0A059G9B5 UniRef90-UPIO0037BFA04 UniRef90-C8PVB4 UniRef90-Q21N52 UniRef90-D2TTG6 UniRef90-W9DWZO UniRef90-M3HQK5 UniRef90-H3AHF7 UniRef90-UPIO0047AEA41 UniRef90-A5CWI4 UniRef90-UPIO002D49AED UniRef90-W7DKFO
UniRef90 UniRef90-H2MSK7 UniRef90-E6U041
UniRef90 COA9H8 UniRef90-Q0A9H8
UniRef90 E3BIB2 UniRef90-A0A031JWZ1 UniRef90-FOLQJ8 UniRef90-UPIOOO3052172 UniRef90-R9NLS2 UniRef90-A4SFW4 UniRef90-S7Q3J7 UniRef90_UPIOOO3B48239 UniRef90-L8K032 UniRef90-UPIO0034A95CE UniRet90 UPIOOOM7DFF16 UniRef90-K6DT57 UniRef90-E1JXZ1 UniRef90-E6PCE3 UniRef90-D7FVG1 UniRef90-I8UFY6
UniRef90 B7S149

210
220
230
LIKTLVEDERAl|RDSLVVFDLWKNEHRFLIKVNKNKQCPSCG L QYL GLTKNPLTNKLLI WDGSQMQQRLMGYRQDSQCPVC LKLVGLGEPLTGRGQLLDARSMQWREMRYRKDPSCPVCG VKLLLDAGEPLAGRLLVYDAMDMSFETVPYRQNPACPVCG LKLLAGFGEPLVGRLLLVDALGTRFRELRVRRDPSCAVCG LKLLAGFGEPLVGRLLLVDALGTRFRELRVRRDPSCAVCG MKFLSGNPDALRRKLLSFDVWRNEYISS NVARKEDCPSCG KKFLTGAGDLLTDRLLTFNALRGGFREVKLKKNKNCPVCG I KVITASDDARRNSLLTSAYSPQFRSMLRRRANCAVCS IKVVTTYGDVLSGKLLTHDDQKNRYQTISFAVDPN KKVLDGDGDQLCGELLLDGLDLSDRKVKVVEPECPTCG VKLIAGAGQPLLCEMLYYDALWETRKLGLKRREGCPICG LKLA AVGNTLAGRLLMVDAFRMEWTTMALARTPDCEVCG

LK LVEDWSSLRNKLVSFDLWKNQHAAGRVDKKEDCPTCG
LRVIGGDGTTLVGRLMMDDSLRMEWSTMKIARQPDCPVCG I KVLTEMGEILAGRLLKIDLLTLEQTПFEFEKDP
IKHLLGLGCPLAGRLMVYNAAEMQFETISLTKNPNCTCS
IKYFTHPEDSLAGKLWMMNVLNGKTGIIKLRK
LKILLNGETLNGRLLRLDGLTMEWRSVKLNKDPACTACG
LKVLLDIYENFKPFLMLYSGFPNQTRNFKMRRQSSCQCCG LK LLGGLPTLAGRLLLVDGLTMSFRSHALARDPQCPVCG AKLLLGEGEPLVGRLLFYDAASLETEVVPYDQNPDCPVCG ПKILLDDGDSLIGTLLLFDALTMNFNRLKLRQDSNCPMCG VKEL GMGDSMAGRLLLYDALATRFQTVTLPADPDCPMCG LKELLGLGESLSGSLLMMDTLYASYQRIAARRDPDCALCG KLASLVGEPLSERMLLFDALSARIRGVK RRSSQCTVCG

 <br> \section*{\section*{L}} <br> \section*{\section*{L}}

LKLLLGDGEPLSGRLLHVDVLAMRFRETRLAADPHCALC
I KLI L GLGDTLAGRLLTFDALAETFHSYRLHRDPACPACS
LKILVGDTDALNPNLEHFDLWNNRHHQTKVARRDDCPTCG

LQFLGLAHNPLAGELLIWDGGRMSQHKLRYRQDKQCPVC
QKY TGAGELLTGKMLTFDGLTMRFRTVNFSPSKGCRVCG
1 KLIVGGGESLIGKILSIDAWNNRYQVFDVAKDKECHICG LKELLG| GAGLSGRLLLWDSLEARFRDIRLRRDPGCALCG
KKLTTGLGKPLLGQLLNMDLANVEFNKFHLYKDPDCPVCG I KLITGIGETLLGQLLTYDALEMSYRKIRDRKDPSTPA
LKILVEDWEAVRTSFVSFDLWRNQYTSMKMSKDPGCLSCG
KKLAGAGEPLRGRMLIEDGLYSENRLMKISRRADCPVCG LKLLAGCGETLNGRLLLGDGLAMEWRSVSLGQDAACAMCG VKLITGAGAPLIGRILLMDGLAGTQRTVKLKADTSCSTC
LKWLTGRKDKMRRSLLQMDVWSFQTQEITFKPRPDCLTCG LSFLGLGDNPTAQTLLLWNGKTMNLKKLHYRKDANCEICS LKVLGKFGTPLVGRLGLYDAVFGEWRYMKLKRDTQCEVC I KLLSGTETPAGELRLFDGKTSQWRTLALRRATGCPVCG LKKI LNIGQNDNGYILI LDLLNGNFRKAKINKRKKC
| KVLTGFKENFSPFLSSYSGYQQQDRVFKMRKQPNCVVCG LKI ASGDGTSYSQQMLMFDAVESRFRTMKLRKQADCAVCG LKMLVGDLDSLRNKLVSFDLWKNQYSSIGQVDKKRDCPSCG VKLIMARAGRVHEG LSTFDGLSGQWRHFRVPRDPACPVCG LKIILNDGDIVTGRLLHYNALNAQFYQVAFDRNPSCKICG LKMAAG GTSYSQKLLLFDGLDGTYRSUK LRKKPTCDVCG LKIASGQGSILS
LKLLVGDKKALRQKLVSFDLWKNDQMATNVNKKKNCPSCG VKLLLGVGEPLSGRLVHYDALRGQFQQLRMKANPDCPVC IQKLSMNKVYFSNQLHLFDGLNLDWQSFSRSKVNHCLVCG MQWLLQLNHFQSHQVMLFEGLAMQWQKWHLLNDPDCSGC VKVLLALGEPGWGRLHTLDGLEPGMRTMRIAKDPACRTCG LKMLAGLASPGTGKLLLEDGRQQTWRTLNLERSALCPLCG LKVLLALGDPLYDTLLTCNTLTMEFRKVPVRCDPRCPVCG KLLAGMHEGKAS LLYSALGPPFRSIKLRRRPTCPACG TRYL DGETENLFGRLLLDEGLTGAFRTVKLPKDPACPACG TKVLTETGQPLAGRLLIFDALVMETRTISIPKNKNLP LKILVDDFATLRKTFLTFDVWSNQHYTIKLEKKESCPTCG LKLIVGGGRPLDGRDQMDDVWGARDQEVAVARNPDCPLCG KKYLVGEVSKQLVSFDVWKREHSIIDVSKREDCPSCG LKFLVGDVKNRRKSLLTLDIWNNYHYDMKFSPKTDCPTC
 IKTLLGKGDVLSGRLLVYDALKMSFKESDLRKTPGRPA
LKLLTGNKAALKRKLVSFDMWNNQYTSMDVQKKADCPSCG

UniRef90 M5JIT7
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UniRef90-UPI0004782F2D
UniRef90 V4XPY5
UniRef90 D8KATO
UniRef90-B7VOK9
UniRef90_UPI00036A36FF
UniRef90 UPI000424CD70
UniRef90-16ZYL5
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UniRef90 F4CFC9
UniRef90 UPI000287BF47
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UniRef90-UPI0004680136
UniRef90-F8D121
UniRef90-Q2T1H
UniRef90 J9R2Y2
UniRef90-X0W716
UniRef90-D7W101
UniRef90-UPI0004684270
UniRef90-I2GVL3
UniRef90-LODZ91
UniRef90-U1PRA0
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UniRef90 D3NRH
UniRef90 M4F3A6
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UniRef90-UPI00037EDC9F
UniRef90_D01386
UniRef90 UPI0003764120
UniRef90 W0DS45
UniRef90 ${ }^{-}$B3EN73
UniRef90-W6EXTS
UniRef90_A4F8M7
UniRef90 UPI0002893E06
UniRef90-D2UAL6
UniRef90 B3LSM6
UniRef90 C7LY70
UniRef90-M8D7A5
UniRef90_Q7NQ82
UniRef90 UPI0004765E23
UniRef90-R7C6X7
UniRef90-S3CSN5
UniRef90-UPI0002555E7A
UniRef90 UPI0002D9F08
UniRef90-R5Q216
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UniRef90 U1NGI6
UniRef90 G7CN8
UniRef90-W4RLL3
UniRef90-UPI0004761F2E UniRef90 A1K9B5
UniRef90-A0A059G9B5
UniRef90_UPIO0037BFA04
UniRef90 C8PVB4
UniRef90 Q21N52
UniRef90-D2TTG6
UniRef90-W9DWZC
UniRef90 M3HQK5
UniRef90-H3AHF7
UniRef90_UPI00047AEA4
UniRef90 A5CWI4
UniRef90 UPI0002D49AED
UniRef90-W7DKF0
UniRef90-W4Z9V3
UniRef90_H2MSK7
UniRef90 E6U04
UniRef90-Q0A9H
UniRef90-E3BIB2
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UniRef90-UPI0003052172
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UniRef90-A4SFW4
UniRef90-S7Q3J7
UniRef90_UPI0003B48239
UniRef90 L8K032
UniRef90-UPI00034A95CE
UniRef90-UPI00047D3F1
UniRef90_UPI000474B7E
UniRef90 K6DT57
UniRef90-E1JXZ
UniRef90-E6PCE3
UniRef90 D7FVG1
UniRef90_I8UFY6
UniRef90_B7S14S
 QLSAAEKERYARHLSIPEVGAEGQALLLSKKVALVGAGG
 MKDRDFMRYSRQLLED ALEGQQKLLASRVLIVGLGG LSDDELDRYSRQQNFGPIGTAGQQELAAKHVLIVGAGA ELSSDDVARHARHVLEKEGGGPGQNKLKRACHALIGGAGG

ENQK
S $\square T \mathrm{DHQ}$ Q
TPEFNE MDQESDSRYSRQTRFAPFGAQGQHNLEHTHVLVMGAGA
 FG FGKT
A A $\square$ S D TELE NKDLSRWTR D QEQDEYR
LS P
 ASADELERYARHIVLREVGGPG
KLSNQEVERYARHVLLPE:GGAGO

LSADELERYSRHIVMREVGGPGQHRLKGARVLVVGAGG DEYRRYGRQMIMRNVGGPGQNALRNARVLMIGAGG MNDNQLLRYSRHTLLDETGGGGQLKLRSASVLLVVGAGG DRFSRQVKFHGIGEKGQQLLAEKHVLIVGAGA SLDATQLDRYSRHVTMDEVGPEGQAALLNARVLVVGCGG SLPLEDYRRYGRQMILDGFGLEGQDKLSQASVVVVGAGG


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| :---: | :---: |
|  |  |
| UniRet90-K4LDW7 | GMSKAESAKMTLSALNPEIEVIPYDFRLTAANA |
| UniRef90-A7IA80 | GKKKTESAEEKLDAWNPDITI RVIDTTI DAGNVGKLIGR |
| UniRef90 ${ }^{-}$COBFS |  |
| UniRef90-G2LJ4 | RLRAVNSAVRVEGITADVAPDTVEALVAA |
| UniRef90-E5WGZ7 | DKMPKAAAAEKRLKQINSEVEIRSIIGDATPEKLEELAEG |
| UniRef90-R7RTFO |  |
| UniRef90-UPI00037DA889 |  |
| UniRef90-Q1QXC3 | LGRGKAESAAVSARRLNAACQVDVIASRLAGEALQRAVTE |
| UniRef90-E6W4L4 | LDTPKVFSARARLRNUNPDVDVKVYHQWITPEN |
| UniRef90-A1S6Q7 | GKTKAGVAAARLQAREPGLKV |
| UniRef90_L9L | AKALSAAASL |
| UniRef90-EOIBV9 | QMLPKAEAAADRLHAANSLIPVIEPIVTDLVPHHAEELLTS |
| UniRef90-UPI00035EC2FA | S |
| UniRef90-R716D1 | 1 GENKARSAEQTIHALNPNVEVIVYEDMFRPE\\|AQELVEQ |
| UniRef90-K9ESD8 | VGKPRVFKAQETLHNLNPDIEIEAVCEYVSDNN |
| UniRef90-C5zVB6 |  |
| UniRef90 A4FWU4 | GIIKKVISAKEKLKS NSE:NLEUYPEKVNESH |
| UniRet90 UPIoo03496D3F | VGQAKTKAASKVASLNSDVTLEPLCQRASAHTLSAALSG |
| UniRef90- A0A023HW83 | GMLKVDVAT RFVNKLNRDVEVIGGKARINGSNANTVLND |
| UniRef90-K5X4Z4 | 1 GLSKAVSAAQALNQ: NPGCHVIAHVCALTSRNALEILQA |
| UniRef90-F4NU54 | INTSKTDSAATAVRSISSLVQCTTYNTLIDQSNVLEIVSG |
| UniRef90_UPIOOO46 | E |
| A4 | VGMLKVDSADSYLRELNPLVKYNAHQSHLTPENAESLVSG |
|  | ELQSINKTITTEVITKHL |
| UniRef90-F5Z488 | VGQSKVMAAKVRLSQMNSD |
|  |  |
| UniRet90_NiMkJ2 |  |
| UniRet90_S4ZER7 | RPKAVSARESMLA NPL |
| 68VJ3 |  |
| UniRef90_UP10003 | Q P |
|  | R1 K ${ }^{\text {d }}$ |
| UniRet90-F6FR07 | VGSPKTASAAAAL |
| UniRef90-Q7MGM5 |  |
| 2GBC3 | 㑑 |
| UniRe990-UPIooo34D |  |
| UniRet90_A0r |  |
|  |  |
| UniRef90-UPIO00360AE02 | VGSPKATTAANRMVQHNPNVSFQPYPERLEQEKALEIFSL |
| UniRee90-UP10004709BA |  |
| P10002 |  |
| 6V5Q |  |
| niRet90-UP10003B75 | VGRTKLKSARDAVAELNPLVTVRLHDTRLDSHNALALFAD |
|  |  |
| UniRef90 UPI0001E89D0 |  |
| UniRef | VPQGKARLAQRHLQALNPLVESIALEQRLHGEELAAAVRR |
| UniRef90 A0A024PKL2 | RLQEINSG |
| UniRet90-F9MMB2 |  |
| R5WDC9 | 硣 |
| 5HBQ1 |  |
| OA058 | LGRSKAEALAEGI RARNPSVKTTVIREKLDRQSAIDLIQQ |
|  | NPDVALNLHETRLNENNA |
|  | LGGMPKVDSLKES SEALSSTVNV |
| UPI000469B0D8 |  |
| UniRef90 - D6DP00 | RLNQLNPDIELVALQTRLS GEDLQREVAL |
| UniRee90 ${ }^{\text {- UPI000365BDB7 }}$ | NADITVHAHVMDCTASDLTSLLDK |
| UniRef90-F3WW16 |  |
| UniRee990 UPIO0004768B36 | AKDRLTALDPRLHCDIHAVKADAQNLPALLQG |
|  |  |
|  | - |
| UniRet90 UPIOOO472E0F4 | V |
| $\begin{aligned} & \text { Uniretgo_LOA9V4 } \\ & \text { UniRef90_DOZ159 } \end{aligned}$ | VQASTQLS QLNPTVSIVPLTSHLHDNGL |
| UniRef90-U7PD44 | KVYALADKLKVINSNVEVDPIYEEITSTNI |
|  | RKMRKTSSAAEAALQLNSKVKVDEYCLQLDRENALGTVGK |
|  |  |
| UniRef90-UPI0004686A12 | RKLRRTNSETKIEGUVGDVTPMNDDSFGQD |
| UniRef90_15B | VGMEKVESARASIARINPHVTVETHPIRLDAENAAG |
| UniRef90-S4W5N1 | VNKKKI LAAKSKLKALNPEVTIETDDVFFDDKNGEEL |
| UniRef90_A6ROV8 | VGKFKVDSAIHYLKELNPYPKYIPYRVNLTSADAPSIFSP |
| niRet90_B3T |  |
|  | Q |
|  |  |
| UniRef90-HOHJU4 | SRINPNVIVILHDLRVTAANAAQLVSQ |
| UniRef90_Q13EN4 | ARIKALNPHVEVRPHALRLTPANALD |
| UniRef90-UPI0002485EAD | LGRPKVESAADAVARINPAVTVVQHNTRLTADNAVD |
| UniRef90- JopYZ1 | I NQRKTESAQDTIKEINPHVTVEKHNLRLNKSNVDKLLNV |
| UniRef90_M7NVZ6 |  |
| UniRef90-R9AE |  |
|  |  |
| UniRef90-Q3S | AADKIRALNPHVAFRAHHMRLDASNAMALLAD |
| UniRef90-F8NXD6 | VGMYKSISAGQSIRKLNSR |
| EI5 |  |
| ef90_UP100047A |  |
| UniRef90 UPI0004207D44 |  |
|  | VGRPKVESAREYVEALNPDVAVDARRTRVERSNAAALVEG |
| NB7 |  |
|  |  |



UniRef90_G4QN21 UniRef90-L7LHE9 UniRef90-KLLDWW7 UniRef90_A7IA80
UniRef90 COBFS8 UniRef90_G2LJ45 UniRef90-E5WGZ7 UniRef90 R7RTF0 UniRef90_UPI00037DA889 UniRef90_UPI0003F77F6E UniRef90-Q1QXC3 UniRef90-E6W4L4 UniRef90-A1S6Q7 UniRef90-L9L9Q1 UniRef90-E0IBV9 UniRef90-UPI00035EC2FA UniRef90-R716D1 UniRef90-K9ESD8 UniRef90-C5ZVB6 UniRef90-A4FWU4 UniRef90_UPIO003496D3F UniRef90-C5DJG9 UniRef90-A0A023HW83 UniRef90_K5X4Z4 UniRef90-F4NU54 UniRef90_UPI00046FB09A UniRef90-A4RPM5 UniRef90-B6EGV3 UniRef90_F5Z488 UniRef90_A8L2B2 UniRef90-N1MKJ2
UniRef90 S4ZER7 UniRef90-B6BVJJ UniRef90_UPI0003743390 UniRef90-W7TXN7 UniRef90-F6FR07 UniRef90_Q7MGM5 UniRef90-K2GBC3 UniRef90_UPI00034D5440 UniRef90-AOKWK0 UniRef90-L1M2W2 UniRef90_UPIO00360AE02 UniRef90-UPI00047109BA UniRef90-UPI0002493457 UniRef90-C6V5Q1 UniRef90_UPI0003B750A4 UniRef90-A4TS26 UniRef90_UPI0001E89D0F UniRef90-D4E0G8 UniRef90_A0A024PKL2 UniRef90-F9MMB2 UniRef90-R5WDC9 UniRef90-F5HBQ1 UniRef90-A0A058YZG2 UniRef90_F7XB94 UniRef90-W2TKN6 UniRef90_Q0BWN9 UniRef90_UPI000469B0D8 UniRef90_D6DP00 UniRef90_UPIO00365BDB7 UniRef90-F3WW16 UniRef90_UPIO004768B36 UniRef90-R9HOW5 UniRef90-C6XZIIO UniRef90_UPI000472E0F4 UniRef90_LOA9V4
UniRef90_D0Z159 UniRef90-U7PD44 UniRef90-F7A1S8 UniRef90-X5GX87 UniRef90_UPI0004686A12 UniRef90-I5BSD3 UniRef90_S4W5N1 UniRef90-A6ROV8 UniRef90-B3T629 UniRef90_S2XD68 UniRef90-W6RAR4 UniRef90-HOHJU4 UniRef90-Q13EN4 UniRef90_UPIO002485EAD UniRef90-JOPYZ1 UniRef90-M7NVZ6 UniRef90-R9ABN0 UniRef90-F2IYE7 UniRef90-Q3SWN5 UniRef90-B6QEI5 UniRef90_UP100047A89EC UniRef90_UPIO004207D44 UniRef90-V4Y2G4 UniRef90_R7SNB77
UniRef90- TOLT78


 SVVFNY ENGPSNRCLLFPNCSEDGVLGVLPGVI GLLAQATEV
 KTI I P KE T A CLDKCFMKKRTNEEYTS GIMNGITAAVIGGADEA A DF DPRDSSSPCYACDYPPCAENGVVAPLVGVIGTFQALEA $M$ FF D H S E T D P C Y H CLLVFPS S E E Q T I I G P V V GTI G T L Q A L A A $A V F D A R D A S P C Y A C L V G R C A E N G V I A B P V G D I G T F Q A L E A$
 $T V Y H Y D G G P C Y R C V F P Q P P P A E T V T N C T G V L G C L Q A L E V$ MTILP GE TPCFRCLIFPSPPTAGVI SPDIDDI GSLLQAAEA

 M S IV K P K E S A C Y A C L
 SILLNFASVGPCYRCFYPVPPEGGVIGPCIGLVGVMMAVET MVINP GKSPCYRCFFE QQPRAGVI GATVGVVGSMAA GEV
 YTVIP GKTPCLDCAMPTCDTVGVIMPVVTQVTSHQVIEA IVLNTPAAPPCYRCVFPKPPE GGILMPVVGVMGVLQALEG
 L V VR P G S $P$
$K$
$K$ SVCWPD GRGLNYRDLYP AI F DRSNSSACYECLIF P ALFNSSPGHRPDADSVPRNGEHGLAPVVGIIGVMQSLET


 FAQQRFP Q GGCYHCIVFPSDTRAPQNCSSQGVLGPNQTMEE SVVFP DGRGLNYRDLVYSCAEGGVLGVLCAAIASDMATEA





 $M T Y V P H K S \quad P C Y R C V F E D E P D V G I I G A D A G T L G T L Q A M E V$ SVVTY Q D GEPCYRCNALDTVEAGVMAPLVGTIGSLQQAMEAA AVYKS GKRRACYRCDWPTCEEQGVWGVVTGMVGVGMAGEA


 $M V L T P P W A Q Q C Y R C L C D P D E A E P E R N C R T A A G I M G T L Q A A L E A$ $C N G D P G Q S P C D H C V M E R M P \square G S A S C D R E G D I D P M Q S A E A$ AV V R G WE DK P C Y R C F VGGDCA D D G V L G P V T GV M G S LAA A L A

 AVFDPNDPKPCYRCLYRDDGGAE GEPCALGIIGSVQATET






 TVLKPYEPNPTYRDLVPEKPETGUIGGALTGVIGTMMAMEA



## -

NFGVDGPCYRCLIFP K
MVLNNPPKP
$A \vee F R P Q Q$

| Y | T | V | P | G |
| :--- | :--- | :--- | :--- | :--- |
|  | T | V | P | P |

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ERYARNLSLP GWTLETQQRLABESGVLVVGAGG
 $M V P T K N Q L F K R Q Q T L Q E \square G E V G Q Q K V Q N A S V L V V G C G G$ $R Y Q R N L L V D G F G E Q G Q S R L L E S R V T V V G A G G$
 LN A DE LLERYARHVVLPEDGGTGQQKLLKAARVLVIGGAGG
 $\square T$ S E E L E R Y A R H L V L H E V G G Q G Q A A L K A A K V L VI G A G G $M D R F Q R Q Y I V P G F G K E A Q E K L A K A K V L V I G A G G$ MSRYDRQTRFHPFGEDGQHQLSTSQILVEGAGA
 $L S$ NARYARQLSLPGFGPEQQQRLADAHVCCVGAGG

 L S P E E

MERYDRQMKFNEFGENSQKNLMSATLMVMGAGA
NDRYVRQA QFAP $\square G E A G Q A Q \| E S A R V A I L G C G A$

MERYNRQTMLPETGEAGQAK\KAAKVLIVGVGG
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 FSSDEVERYARHLVLREVGGPGQARLQAARVLVDGAGG $\square N R Y D R Q E R V T V I$ GHDGQRRIVAATILIVGGVGA $F D R Q \| \quad P V L G D D C Q E K L V N S R V B V G G A G G$
$E T T R Y A R Q \| I L S E V G T Q G Q Q R L R D S K V L V V G A G G$
ERYAR QARFH GIGGD GQERLMMVKRVLVVGLGA F T A GE WLQYQRHVQLNEMGVTGQLRLKHAKVVIVGAGG $S \frac{L T}{F} \operatorname{L} D \operatorname{DEEDRYKRHLTLNEDGLKGQLKLKRSSVVCIGAGG}$ F S P E E DIE R Y A R HIV V L H DVVGGP GQQ K L K A A TVVLVI GA G G

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

NERYVVQEKFPPLGVEGQKLLRKSSVVLVGVGG
LT P A R L A R F S R QLMMP GF GELLA QRRRLQAARVLVI GA G G


LS P E E I ERYARHLVLRRDIGGPGQSKLKHARVLVVGAGG $S$ G L S E A E Y A R T E R N R V L $M T R Y H R Q \square R F Q H F G E Q S Q R R L Q Q L H V F V I G V G A$
$M N \square F D R Q K A \square \quad F S P E D M A R L R A S T V M V A G V G A$ ELERYTRQ LK LVGE DGQKALKEATVMVAGIGG DEKNHRYSRQII LAQI GERAQARLDKAKVLCVGLGG $M N R Y \operatorname{L} R Q T I L P E I G Q T G Q Q K L M D A H V L I L G C G G$ $E \operatorname{L}$ S E F E R E L Y S R Q $\quad$ L L I SPEI GKGREK RNARVLVVGAGG E EYNRYGRQMIVDESGLPA QLKL KSAKILII GA G G E YYSR L Y Y V K N $\square$ G K E G $\square$ N $\square$ K R K T A A V V G L G G LT REELRRRVSRPLLVVEWAEAGQEKLRAARVLVVGAGG $R Y V R N K$ E T LT D Q D Q N K L L S S S V A V GCG G


 PG L F GKEAMEKLKNSRVAVFGIGG


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 L G KA K A DVAA R R LTR A L N P QV V V A L H R T R L E A D N A A R L V N G

 I G A L K A E A A A A RLS R L N P GCRRLE VVAERLTAAANASERLHG I GA CKVEAAKKTVMALNRDVEVDPVCRHIDETSVNGLVSG A GRAAKV E S A A D A V K R L N P N V V V T P L K A R L T E A N AR E L I R A MMVP KVE A L K K HLL LDI N S N I K I N A L Y QEI T C T N DE HI L R N VGRPKLDSAA DAVRRVNPHAAFEAHPDRLTAENGADLVAS






 $V G R P K V E S A R Q V L A D L N P E V R I R T H N G R L T W E E S E R L G A G$ E QLDP K A A A A E R R L R R I N S D V V QRTPKA DA A K K H L T L I N S K V E V R R C H V M D V S V E EME QL V V G LGEDKKAKSLYNELRKVNPKLNI RYKSLDYVDSNNLPTLI S S













 L G Q K K VVVA A G KVVLA S L N N Q I TII IT H A E K L T Q D N S A A L L N N
 $V$ G T P K V D S A R A A L D A L N P E V V V T A Al N G R L T R D N A Q G L L A D

 $V G R R K V D S A R E T V A D V N P H V R V V E H A V R L D A D N A L D V L R G$ LGRPKVESARDAI ARLLNPLVVVEPHALRLNEANARALI AR



 IG T S K T L S VL Y QL H HHNHETK ME L Y N K R I EN QMA LIE I S Y E

 L N R V K V V E VA K E R L N N I N P D S K I I I I K K M C V V D D K S I D D L I K N $V$ N MLL K C E S A K L S I Q


 IG M S K A K $\square$ A R E A V L K Y N P D V N I I E A H E G D NK N P K P L L A A K W W K L IGKHKVDVAEARVHDDCPDI KVTAHKCFYMPDTADRFFTQ
 QGGNK A E V S A E L L R K K N P F VV K V Q A H P C D F D D S F A K S N T L A EGRLLKVDSAA DTLLRALN PEVVTVVTHPDRDTRDTVVDVVRD
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 FTVLPGKTACLECTYYGLKDEDLPHPSVLGII ASDQVSEA AVFNCQGSKNLRDIFPESPDDEDVPDCDLPGLIGSMMALQ VAFTGSRGEGCYHCLAPQCATLGLLGPVVATVALRQVLDV
 TTLLPSG PCWHCLFPTPPPAGILGPVAGMI GCLQATEA FPFVPAE SACFRCLTPVLPADNETCDTTGII SPAQCAEA A $W$ WHSGPCYQ $P$ ADAVPTCVTAGVLGVTTSVVGGDMSTTA ATFNVAQEDGTYSSNLRNCEEAGTLNATAGMI ATQQVNEV $S V F H A R G A G G Y Y P E E P P Q K E \| V G V L S P V V G V I G S L Q A L E T$ TTLDPGGDTPCLRCLVPTTPTWEVIGVTCGALGSIEASEA YGIDYKGYPCLKCVLDKDPENGVLPTVDYQVASMEVSEL TVLTPYREGPRYRDLFPECAEAGILGTTTGVLGTLAASEA STFNYQGGPKYRDFHNS TTDRA YGIDYQG PCLKCLMQTDPENGVLPPIVSIVASYEVAEV GIFNDSHSSACLNCLYPHKSTLGVVGDVAGQAGLTLANLA MFFDNQSDSACYHCLFPTTEEQGIVGPVVGQIGTMQALEA
 FPRGVAEEQPCLHCLLEALPPQSLTCDTVGVISPVVVTTA NLPQNSTSCGCYACVREDCLSKGVLGPVVGMAACHQATQA $M G G R P E D D A C F R C V Y E N P P A P E V D G S M A G M W G T M Q A T E C$
$T V Y C S G E A G P C M R C V F P G C D T L G V F P P M P G M \| G C V M A S E A$ YG DDFKGPCLKCLMETLPSNGVLPPVDSLI ASMEVSEV
 TVY HHNGSPCYRCLFPNPPPVAACQRCPGVIGCLQALEA SVFNYEAQRKTYRDLYPDEKEMLRMPPPPAVTGSVEATEV MVLNNPPSGPCYRCVFPKPPEGGLLGPVVGVMGVLQALEA TVYNYSN GPCYRCIAPREDNGKVDGMMVGVIGCLQSTEAV LGVRPGDDPCYRCIYPSCSEAGVIGSMAGIIGSIQATEA LAVDPGKSACLGCLVKAPPAYWVIGAVSAMIAQUAALEG TTI RAHEPNPTYRCLFPNCAEAGVLGALAGVMGSLMAMEV MLIDPSKGPCLNDVFPDDCDLIGVTTPLVPLVAANQVSLA MPIRAWQHACLNCVYHNDEALQQTDCDLLGVNTALVPIIA STENYKKKKLEDVFSFGDQENYILPYTVGVVGSIVQAMV AVFNYYNWGPCLRDLEETPPPPHVLGVIPGLLGCFQANEV ALFTPDG SVFNLKKNSPNLRDNTPSCEEFGVIGVSTGLIGVLQANEA TTIRAHEPNPTYRCLFPEPPEAGVLGALAGVAGSLAALEA SLDLRNANSPCYGCDFPQCDNAGVISPLDGII GSMQAQLT KLVVP GKTACLSCFLEPVADPNACET GTTHATVMAMET SVFWAGHPTPPAPGTVPSCAAAGVLGPVVGTVGSAMAMEA AVFNYNFPEVPNPEDIPDCDSNGVLGPLPGIVGTMMAMQV KMFLPDEKICLDVSNAPTAATGGLISPILGVVTAFMATET GVGWRGHGPGYRDLFPDAPAPGEVPSCELGGVGALMSTEV TTLRPFEPNPTYRCLFPTPPEAGVLGALLAGVVGAMMALEV
 AVFNWUDPDPCLRDLYPEPPQRGVLSSTTGVIGSLMAAEA TSFLPGSSPKFKDVFAGAAPEEPAAFFDCAVLGGDQAFEV GVYYYRGSKMNEILNQSLNQKMGVIGVLPTLMGYFQAMEV ALFHLRDLLPLPDPNDPDCATVGVLPTAVGIIALLQANAA
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I KWLTGFGRPLVDKLLFYNLLDHSVYEVSLSKNP
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| KVLTQQPTVDPPTLLIESAYSPMFRSMRLRRKPKCAACS
I RQUAPFGDDSAGRVLLDDLLSDRFRTLALPADPGCPSC
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| K KiL AN GKLLVEPYVLYSGFPGTMRTFKMRRRKNCACCS
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AKML
MKLITGYGDSLIGKDFTYDLLHNKAECDDTKPNPSCPVCS I KLLTGLGEPLLNRLLLVDLAYNTFDVVELR

VK L A $\square \mathrm{G} V \mathrm{G}$ TPLLGRMLVLDALSSRQHE $\square \mathrm{P} \square R$ LL R YL A
$L K L V L G \square G Q P A \square G R V L V Y D M \square T A E W E S V P \square A R S P$

■K LLLkVDDCLVHTLLLFNTQTYQDTKTKYck
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NQFSRTELL FGEAAMDRLAQCRVAVFGDGG A S LS S E R L I R Y S R Q L A N P HFG E T S Q Q R L S T A K V L V V G A G G $L T E E Q V N R Y S R H \| M M S Q G P L G Q R K L M A A K V L G I G A G G$

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


A PLPHNERVRTARHLAL

LHEFSRTE LLRSLGAELTHKIKESRVLLVGAGG
 ARYNALRAALGPGE LERIIRHARILVVGAGG Q F N T Q S L G K P L N M M V K E A R I L MV G A G G
 $E \square S E A E A E Q Y D R Q \square R L \quad W G L E S Q K R L L R A S K V L I I G G M S G$
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 $S \square P E \square D E G L Y S R Q Q \quad L Y M L G R E A M Q K M A Q K A V L V S G M Q G$
 $M N Q F T R T C M L L G E T A L K K I M N S K V A I F G M G G$ REK EQELQAIKGAKV LMVGAGG

 $I S P$ K E K QR $\square$ S R QLV L P GF GVVA Q ERRLASA HVVVIGA G G
$\angle H E F S R T E L L$
$L \mathrm{~N}$ Q F S R T E L L
 SLPA D MI Y R Y S R H L L L L P D

RTQLL
$\left.\begin{array}{cc}F & G \\ \square & G \\ I & G \\ I & G\end{array}\right)$ G $\frac{L}{Q}$ G GS QESVQNSKI LVVGAGG
$\square$ NQFSRTEELL

$\square$ NE F S R T E RLL
$K \square G Y D N D K R Y \square A H \square N L K K$ A ELLT E E E C S R Y D G Q i A

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##  ADFMEDQY LRYDGQVAV


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 WGLD S QK RL R A A R L LI A GVNG $\square G K E G L L K L K N S T V A V F G I G G$ WG LE A Q QRMRNATI LVVKLLK G WGLEA QQKMRNATILIVNLKG

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UniRef90＿I1QBS2
 L GCAALP Y L VA A GL GRVVSLVDGDEVSLSNLHRQVLYK ETD




 $L$ G S A T V V P A L A A M G V

VGSFVVEGLVRAGVSNF IVVDDDK\CLTNLNRQ\｜IATRKT $V G G V A A L Y L A A A G V G C M V L V D R D V V E L S N L N R Q I L F S T A D$ $V G S F A A E F I C R S G I G A M T I I D D G V V D D S N C N R Q L P A T A K N$
 $V G G Y V C E A L A R S G V G K L D L I D N D K V C M S N L N R Q I I A T R K T$ $V G S V V A E M L T R C G I A K I L L F D Y D K V E M A N M N R L F Y R P E Q$













$V$ G SWCAEMLARS GIGEELTVDDGDVVNPSNRNRQLPAVIGT
I GCELLLKNLACCGDGGEVTVTDMDTI EKSNLNRQFLFRPWD
V G S H V A E S L A R V G DG T L I L I D N D T V D I T N I I N R Q I I A L H S T

L G C

$V$ G S WA AE A L V R T G I GA I TLI D M D D V C C V T N
L G C E L L K N L A L S G F R L I HVVV DMD T I D L S N L N R Q F L F R P K D
I GCELLKNLALTGFGEIHAVDLDTIDDLSNLNRQFLFRHEH

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



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IGGKPKVEVAKER ILEDNPNANVEVYQEFFMPDSKE LDDDT I G K P K A E I G A E R L L A L D P G L K L E A V V V

 Q GLLT KVE A A R Q TLLE GIN P D T E V V V P Y Y S F S I G Q P K A DLDMKERI N



 I K K P K A L V A K Y A A H K F N N P K V
 I $\begin{aligned} & G K \\ & I \\ & K\end{aligned}$
 $V G K P K A E V A A A F V Q K R V K G V R I T P Y V G K I Q D K D E D Y Y M Q$ I G K Y K V I GK E K V F CA R R A L A A R D P A CVVV DA RA H A L T A S A T E A A L D G
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 I K K P K A L V A K E V A A K F N P N V K L DA H H A N I K D K Q F N Q WF S G
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 $V$ G L N K A E S A R $\square N$ L L A G N P S V K I TAA Y P $\square P \mathrm{~F}$ S T P N L L P D DS Q I GESKARLLAA EKL SKMMP D G S FLLA VT ENFSP ENALLK LAAS D I G R P K VEVVMK E RILDDDN P K A E V TAA Y Q Q F Y L P E A A C Q L I H D I G K N R A E V S Q P R L A E L N N S Y V T $V$ V T A Y T G P L
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A

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UniRef90-C4LKTO UniRef90 W2RK18 UniRef90-U1L6D6 UniRef90-STZQE1 UniRef90_L7VNY3 UniRef90_M5E5X6 UniRef90-W9BYY9 UniRef90-A0A022L5Y9 UniRef90 UPI0003B6B894 UniRef90 ${ }^{-}$B8MQ74 UniRef90-G6DOW1 UniRef90-W4JP70 UniRef90 J3KED7 UniRef90-R5NQW4 UniRef90-V5Z2Z4 UniRer9o_LTMCD3 UniRef90-GiKGJ3
UniRef90-UPIOOO2F5A123 UniRef90-UPI00046C2697 UniRef90 R6GFE8 UniRef90-W1P0Q5 UniRef90-W9Y11 UniRet90-V9KCN4 UniRef90 F4NUH9 UniRef90-D9TPT2 UniRef90_Q2NRJ1 UniRef90 H2U2Y UniRef90-M4FJK7 UniRef90-E3L838 UniRet90_W2BSM8 UniRef90 F7NP64 UniRef90-UPIO0033338A8 UniRet90-G8M2S9 UniRef90 D5GAF7 UniRef90-MoW350 UniRef90-R7M8M7 UniRef90 ${ }^{-}$W8CAA8 UniRef90-A7RPW5 UniRef90-R6BKM2 UniRef90-R7S6E5 UniRef90-UPI0004650EA5 UniRef90-BONCK2 UniRef90 - F1L101 UniRef90 UPI0003749D4D UniRef90-W5J6E3 UniRef90-UPI0004417F62 UniRef90-M5BRD7 UniRef90 UPIOOO3DOBA21 UniRef90-O6G2G1 UniRef90-UPI00036059C7 UniRef90 UPI000194E6E7 UniRet90_M5G4E3 UniRef90-R7DOO2 UniRef90 - C9S516 UniRef90 B6UD98 UniRef90_UPI000382A80C UniRef90_J9JAU5 UniRef90- UPIO003945E5D UniRef90-A8MGM4 UniRef90-S8BYZ8 UniRef90-R7L5H3 UniRef90-Q0C785 UniRef90-B0K979 UniRef90_UPIO0044174CE UniRef90 UPIO00444A52B UniRef90_B4K4X7
UniRef90


AGVAWAGHGPTYRDLFPVPPEGGVLPSVCALIGA पMCSET
TVYNYKGG PCYRCDFPCPPPPHCVTNCPGVIGS पQADEA TRFEVTD\|YKTSVC
$\square A V L P G Q S A C L A C V M D E N F P E T P V L V S V G V I G V A M A A A A$ TQURLADDSETYNC SAFRVTDIYKTKVC
HTQTLFPVTPCYECCPPGMPEAKREGVCMGIVAGFDAQNA MVYN HNGSPCYRCHFPNPTTTCQTGVVPGVNGCLQALET GLS WAAHPVPPAPGTVASCAEAGALPSVCGVПGGLMVSEA TRFM】KDTFKTH

SVF WAPHGPGLRDLFDGPCAEAGVLGATTAVIGNDMATEA $R V V L P S \quad \square S S C \square E C Q L S M H A P R A A V P L C T L A T D P R Q P Q H C$
QV $\square K G G E T E C Y D C N P K A T P K T F A \square C$
TRFEVTDDYKTSDC
QP $\quad$ RVGHTECYDCTAHPTPTTFPVCTDRSTPSTP
QV IKKGKTACYDCTTKETPKSFPVC
TVFWSAPPEGEPVVEPPSCAQVGVLGALCVQVGGLLAGEV TKLKVADDTRTSVC
QV KK K RTECYDCNPKEVPKSFPVC
FADLDDHEY
QP LLKDRTECFDC $\square \mathrm{PK}$ KTPKTFPVCT $\square$ RSTPSQP $\square$ HC $\| V W$


GFCYRAALFPQLPQNAANCNTAGVMGPAVATDGAMQAQMA
$T P D F K G V T E C Y E C \quad Q P Q P A E K T Y P G C T D R N T P S E P D H C$ F C
EKVQDT DDSKSYHCN
QVVIPR LTESYSSSQDPPEKS $\square$ P $\square \mathrm{C}$
NLFEIT DI F K T S VVCDC
TV $\mathrm{V} V \mathrm{~V}$ GQTECYECQPKPTPKTYPVCT $\square$ TSTPTKFVHC V V
QV IKKGKTACYDCTAKTTP
$\stackrel{F}{\mathrm{~F}} \mathrm{C}$
T K F E VA D $\square$ Y E T S $\square \mathrm{C}$
$R V I L P$ GMTACDECTLE $\square$ YPPQVNFPMCTMPRDPEHCDEY QV K KGVTACYDCAPKDPPKSFPVC
AVWNLHD RGPCYRC $\square F P E T D Q \square R V E R C P A V G V V G V L M A W E$
GLCWSGERVVDGVGFRDLHPEQPVLGASTGVIGNLMATEV T RLE VAD D F AT S VC
F C
TKFEVAD $\square$ YETS $\square C$
FADLI RHDFIIEREKSNMRTE
K VFLAK ILYFCNP
TKFElS D SKMTSVC
ELIKKGLTQCYECTPKAKQKTFPGCTDRNTPSEPDHC\|VW TV IVK GVTECYEC QPKPTQKSFPGCTDRNTPSEPUHC
ELFEVADIYETSVC
FCDLLQHDY
TRFEVADDYKTSVC
E LDFEITT DIS K T S V C CPLDC
SVVLRDVTECYECIQKANEKTYAGCT 1 R NTPSAPTHCVVW
FVFNKNKKSPCLRCFMPEAPETDMLDCQSGMDGSIMANEA
QVVVPFLTESYSSSQDPPEKT DP ICC
QVVYPHLTESYSSSQDPPEKETPSCTVKNFPNA $\square$ QHT $\square E W$ FADLIEHEY
$S V F V$ PY
GPFYDPGQTGCYACSDNNNFKVATFPPVNALSAAMCANDA QVVVP PATPCLQCDAFYQPKVAAEDTTTSUVAAVQVREAA $R V I \quad 1 P G M T A C V E C T L A D Y P P Q V N F P M C T M P R L P E H C \square E Y$
F
TKVRFADDWETYHC

TVHVK GKTECYECQPKPVPKSYPVC
$R V R R G \square D D G C Y A C S L P V R Q R G L S D I P W S C A D E P D G G P A P A$
CISMAKNQTPCYQC APRDGAFPMCTLRHFPRTDQHTLQW

TKGEVEDUYK T S VC
TKFEVAD DYQTSVC
FCDLLQHEY
FCDLLKHEY
Y
TV V VK GKTECYECQPKPVPKSYPVCTDTSTPSKF

UniRef90 R7FCV2 UniRef90-K6YZA4 UniRef90-H9G8F1 UniRef90-A5G9T9 UniRef90 A0A024U9Z6 UniRef90-E3PX48 UniRef90-G3MIC6 UniRef90-D4J117 UniRee90 - W5WSK4 UniRef90-M2N8M6 UniRef90 R5X8B8 UniRef90 S7XL25 UniRef90-XoW854 UniRef90-11EDF4 UniRef90 R7FGZ3 UniRef90-A5D4P6 UniRef90-K1L3U2 UniRef90-UPIO00225F67B UniRef90-R6Q709 UniRef90-GOU297 UniRef90-B8A1Z9 UniRef90 UPIOO03716EF4 UniRef90 UPI000377D13D UniRef90_U2WJI1
UniRef90-C4LKTO UniRef90 W2RK18
UniRef90-U1L6D6
UniRef90-STZQE1
UniRef90 LTVNY3
UniRef90 ${ }^{-}$M5E5X6
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UniRef90-A0A022L5Y9
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UniRef90 ${ }^{-}$B8MQ74
UniRef90-G6DOW1
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UniRef90-R5NQW4
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UniRef90 L7MCD3
UniRef90-G1KGJ3
UniRef90-UPIOOO2F5A123
UniRef90-UP100046C2697
UniRef90 R6GFE8
UniRef90-W1P0Q5
UniRet90 W9YX11
UniRef90- V9KCN4
UniRef90-F4NUH9
UniRef90-D9TPT2
UniRef90_O2NRJ1
UniRef90 H2U2Y1
UniRef90-M4FJK7
UniRef90-E3L838
UniRef90 ${ }^{-}$W2BSM8
UniRef90- F7NP64
UniRef90-UPIO0033338A8
UniRef90-G8M2S9
UniRef90 D5GAF7
UniRef90-MoW350
UniRef90-R7M8M7
UniRef90 B8GQU4
UniRef90 W8CAA8
UniRef90-A7RPW5
UniRef90-R6BKM2
UniRef90-R7S6E5
UniRef90-UPI0004650EA5
UniRef90-BONCK2
UniRef90 F1L101
UniRef90 UPI0003749D4D
UniRef90-W5J6E3
UniRef90-UPIOOO4417F62
UniRef90-M5BRD7
UniRef90_UPIO003DOBA21
UniRef90-Q6G2G1
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UniRef90 UPI000194E6E7
UniRef90-M5G4E3
UniRef90-R7DOO2
UniRef90-C9S516
UniRef90-B6UD98
UniRef90_UPIOOO382A80C
UniRef90_J9JAU5
UniRef90 UPI0003945E5D
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UniRef90-S8BYZ8
UniRef90-R7L5H3
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UniRef90-B0K979
UniRef90-UPIO0044174CE
UniRef90 UPI000444A52B
UniRef90_B4K4X7
UniRef90-11 QBS2


IVWAKECFKLLFGKM
IKLLLNRGDLLRNSFMIDDLYTNDDEVIK
LKYLLKFGTV SHYLGYNALQDFFPTMQMKPNSQC
VK LLGGVGEP LVGVIA Y $\operatorname{V}$ G GMS GRWE Y $\square E \square A$ IIE WAHII K WEEERKDIILDTDDPEH

VKLLT G $\square G E P L \square G R V T T Y D A L S G R F R E V E Y A A S S D$ MK $\square \square T D G D P M \square S K L L L F D G S G T F R H \square K \square R R P E C S \square C G$ $\square R C \square T G \square G E V M A G C R \square I Y D \square A F P E \square I K \square P \square E R D C C P C C$ पRLILGTTPSPGGEVRFEA GRFSQFRFDAAPE

LKYLLNFGTV SEY GYYAMRDFFPSVK 1 KVATRVGEPLCGRMLLFDALSSRFKTVNHKRSSTCTVCG IKLVTGTGDPLLGRVVIHDGLHGTFRELTYERDPE

LK $\square \mathrm{MGS}$ G GEPLVGRVLTYNATSATTRTDRLRRDP IE WAH【IA WE EHRKDDTLDTDDPEH

VHC【VWAKNWLFPQLFGNDA
$\square K \square L S G A G E P L L G R \square A V I D A \square T S R Q H E \square P \square R P$

AK S Y $\square \mathrm{M}$
$\square E W A H Q \square A W G E K R K G E E F D G D D \square E H$
LSILLNFSPSPDGCLVNCDFVQWHFRQFRF VWAKNLFNQLFGE

AK D LLF

AR $\|$ LQWPKEKPFGD $\square$ SDDGDNEH $\square$ QWVFER
$A \square R \square L \square G \square H D D T P K L L L V \quad P S F R S \square K \square R K K K D C L G C S$ $\square K F \| G V G D S R P G L L L S Y D A M S A R$

AKH L
$\square V W$ K H LIF N Q LFGE

A R

LKFDGGYGNLLSDRRVGDWSSQLFTEERSLKKNPHCKVCG I KLLCGLEDRTGKNVLHYDGLRGRWDELDELSFDPECP V R ILQ WP KEQPFGE GIALDGDDPEH
$\square A \square G A \square Q G R P P R P G F \square V L D G \nabla T G D T R H E \nabla G R D P A C$ A R

पewas VIDQPKEKGDपK■DTDDPEH
 UniRef90 UPI00021A45B2 UniRef90_A3YD18 UniRef90-A5UL56 UniRef90_B4KWX9 UniRef90_B8BIM9 UniRef90_H1UWT7
UniRef90 Q896X5 UniRef90 ${ }^{-} \mathbf{C 3 Y V J 7}$ UniRef90_R6DUQ2 UniRef90-R4LQ06 UniRef90-A6GAF1 UniRef90 F2K1S4 UniRef90-B6JWV3 UniRef90_C5DJB5
UniRef90 E2N627 UniRef90-UPI0004415503 UniRef90-A0A024J7K3 UniRef90_UPIOOO4672804 UniRef90-A0A023G0D6 UniRef90- H2XM91 UniRef90_A9E7P8 UniRef90_A9TU56 UniRef90_D6DUU6 UniRef90-Q4N917 UniRef90_UPI00047D3B57 UniRef90_M9NPG8 UniRef90_V2XYB7 UniRef90-E8LGW6 UniRef90_U6IT67 UniRef90 UPI0002B40F09 UniRef90_K1LHJ0
UniRef90 R5D489 UniRef90-UPI00038909B7 UniRef90-H9KFL3 UniRef90-13MLM4 UniRef90 F8EZI1 UniRef90-S9UQM4 UniRef90-LOAXB0 UniRef90-K6T6A2 UniRef90-H2G1H0 UniRef90-A0A010RUR9 UniRef90 H9JK60 UniRef90-FOWHH2 UniRef90-W9WAC2 UniRef90_R9KQL9 UniRef90_DOWJL2 UniRef90-B9QEV2
UniRef90 Q6FSK4 UniRef90-R6Q8F7 UniRef90-C5DW18 UniRef90-R8BE03 UniRef90_UPI0004728A72 UniRef90 A0A023FLJ2 UniRef90_S6GJF0 UniRef90-N6XCY1 UniRef90-A0A059LCP7 UniRef90 P22515 UniRef90-U9T1K3 UniRef90_A9TB34 UniRef90_W4GTU5 UniRef90-K9KB82 UniRef90-Q12RU2 UniRef90-A0A016UTV8 UniRef90-GOULYO UniRef90_Q1N2P3 UniRef90 A0A016SVA0 UniRef90-R6PSX7 UniRef90_C0EB96 UniRef90_F0ZBM9 UniRef90 A0A037ZDP1 UniRef90-D7FXX1 UniRef90-D8RCF4 UniRef90-A1TXZ4 UniRef90-MOUUM4 UniRef90_E9FRU9

20
EAQ $T R L L R S T V A Q V G L G G$ FEPGVQNLETVQNCRVLVVGAGG

SELTPNQDERHSRTMNLSN MSDFD TRFGGIIRL D DDESTYSRQLYV Q $\square$ T E DEAA VY DRQURL YGVSGNHKI DYMKVLVIGLGG LGHEAMLRMARSDVLI SGMRG WGDEAQQRMRNASILVINLKG
 NYDSNNRYSRHSLYYEMAENAQKLLAEKTVGLVGMGG
ADSTEKE DDEYSRQLYV MSAEQ RFGG@KRL 1 GQDSFDKLTKKHVAGVGLGG LGHDAMRKMGASNVLI A GMKG
 VTRSQQERFKEAKI AVI GCGG QELVKKSKVLVVGAGG DEDLH SRQLAV YGRETMKRLFASNVLVSGLNG

EEHAFSRTELI
 ESSYRLHRRFDRMGRL VGDAAMERLLASHVMVIGLGG RLYGQSAYEYFQTAHVCVIGGGG
RTELL
K Q

S $\square$ S A D E $V$ A $\square Y$ D R Q $\square R \quad \square$ RYGAQACV

F LLGDDGQTDKLRNSKVLVINVGA $M S R Y V R Q T I L P E V G A E G Q A Q L A A A R V L V V G A G A$ SALSKEANEWYSR LI YTLGRGAVNLLNQSRVLVLGCKG ELSDPEMMRYNRQIVLRGFDFEGQEALKAASVLVVGLGG MDASWQERFSG DDRLYGRG EA LEYCLS GSRVAVI GLGGG AS L T EDVCARYDTQVAV FGKEFQEKLGRQKFFVVGAGA


MT D A

SEFTEEDCS FGRDFQDKLGDLNYFVVGAGA FGKDFQQKLKSSKYFVVGAGA
 FGADFQERLGRQKYFVVGAGGA FGRKFQSK GNDKYFVVGAGA

$\qquad$ RG1 GSEAL QVLRASHVLVAGIGG LGSEALQVLKESRVAVFGLGG YERTELI

TEQEA IGDAGI K R Q Q CNI FLA GVGG
 1 NKNEQLNLLLNSQITVI GCGG RLYGARALARFAEAHVCVI GIGG TEDDESRFGGGQUARL Y S R QLL Y V

$R Y D G Q I A V$
$E K F D R T A M L$
RIIERLL $R Q Q A F F$
$R Q 1 A R$
$K \square S E D E \square A \square Y$ D R Q $\square$ R L


WVGQALKKLSSAVAVFGIGG
MTDYE QRFAGAER $\square$
APMSAEDSNPYSR LMA L
R $\square$ Y R L GLAKFRDSHICVLGIGG RLYGDGAVARLQVVHACVIGVGG
 RYD GQlid V AN REFLLVGAGA
$K V L M V G A G G$ YSRLMALKRMGVPNYEDTRTDSVLVVGLGG $K M S P E D S N P Y S R L M A L K R M G I S D Y E K I R T F A V A V G V G G$ LSESYLSRFAG $\square G R L Y G Q D A L V K F S Q S H V M V I G I G G$ FEPGPDNMTALQKTRVLVVGAGG A GDETLLEKRVLVVGAGG
DRFSG $\quad \square A R \square Y G V N A V S V F K Q S R I A V I G \square G G$ AKLTEEDCKRYDGQAAVFGWGYQNALFNQKWFVVGAGA
 NDFKVLVI GAGG MSRYARQlAVPELGAHGHAKLRVAQVLVVGAGG RYDHVI RLFGRKF VEDKIMNARTFMVGCGA RYDSQAAL FGREFQQKLSSSQWLVVGAGG TDDYAFRFGGDERL
$F G N E F Q K K \square G S \square R Y F I V G S G A$


50

V
GCELLKNLAGTGFRNVHVIDLDTIDISNLNRQFLIFRKEH LGGTIFEQLDRDGMGTLRIADGDNFEESNLNRQTLCDMDT VGGYTLEALTRSGVGQLDLDDNDTVSRSNLNRQULATYDT LGCELLKDLALSGFGNI DVIDMDTTDVSNLNRQFLFRMQD LGCELLKDLALSGFRRVEVIDMDTVELSNSLNRQFLFRETD VGSSLVMNLSALGVGT1 IGVDFDSVDLSNLNRQLLYNESD LGVEAAKNI LSSGVKSVTI HDQGVCTTADLSSQFYLNESS VAAEAIKNIVLAGIGKLVIVDPAAVAEEDLGACFFFRDED VGSYVVEVLARSGVGELDIFDDDRVCLTNVNRQLYAVLST I GSNVAMNLAAAGVGKLILSDGDTIELSNLTRQYLYKEDQ VGGFATETLARSGIGKL VGVEVAKNVVLAGVKSVTIYDPDTIELPHLSSQFFFTEND VGTAAEALARSGI GR TLIDMDDVCITNVNRQTHALDGN IGGQTVEMLARMGVGQLNLVDEDAFDLSNLNRQTLASDKE LGAEI AKNLVLAGVKSVNLHDDDNVELWDLSSNFFLTEKD GCELLKNIVLTGYGEI HVVDLDTIDLSNLNRQFLFRREH VGSFATEALTRSGDGNLILIDNDTVSISNLNRQIIANLNT VGSYAAECLARSGVGTLTLVDQDTVSVSNINRQLCALTST LGSHVVQHLAGLGVGRLTIVDFDVVDLRNFARQFTYTPSQ
VGS WAAEALARAGVGKLSLVDFDLVCVTNANRQLHAMRGT
VGSWAAEALARSGUGQITLIDMDDVCVTNTNRQIHALDGN
LGCELLVNLACLGFESIDVVDMDTIDLTNGNRQFLERKKD

L GCE ILLANLALMGFK DI HVI DMDTIIDISNLNRQFLFRPS D


GCELLKNLVLTGFRNIEVIDLDDTIDVSNLNRQFLFQKKH
LAVPVLQYLVGAGVGQI TLI DGDVMAESNLHRQPLYRMSD
$L G A E V A K N L V L S G V Q G L G L V D D E V V V L A D L G A N F C L S E A D$
LGCAAAQYL AAAGVGSMTLLDFDTV SVVNLQRQTMESDAT

VGSWAVEALARSGVGSLTLVDADDLCVSNTNRQLPALEGQ
LGVEIAKNDCLAGVKSVTVFDPEPVTDQDLSSQFFLRDED

 VGSNCAEALVRGGI GRLILTDCDVVDTTNMNRQAVAYTET


VGSFVAEALARAGVGSLTLVDHDRVAPSNLNRQLVALRST V G GMAAEALARSGVGRLLLVDFDVVSITNLNRQVIAALHST


 V GS WA A E A L A R S GI GA I T L I D M D DII CDIT NTNR QI HAALHN Q L GVEIDAK NI ALA GVK S L T L Y D P G QV A L A DLLS S Q F F L H P E D $L G V E I A K N V I L G G V K S V T L H D D K N C T V A D L S S S Q F Y L S E T V$

 VGSNCAEALARGGVGHFILVDHDVVEPSNLNRQAVAWQHS
 $V G S Y$ I SEAVARA GVGNI TLV DNDTVAETNLNRQQVALKS T

 L G CEMLLK DLA LMMGFRHI DVI DMDTI DLSNLNRQFLFRKS D




I GCELLKKTLVLTGFKHIHLVNMDTIVVSNLNRQFLFRKSH I G SVAAEMLTRCGDGKLILYDYDHVELANMNR LFFRPHQ $V$ G S V T A E M L T R C GII G K L L L F D Y D K V E L A N M N R L F F Q P H Q V G TVVA EALARS GIGGQI SLMMDLDDIVCVNSNRQSHALAS T


 I G C E L L K N L A M M G V GLLI K I T D M D Q i E I S N L N R Q F LIF RMN D $V$ G S WCA E GLV VRS GVVRHIVVDSDRVCVTNCNRQLMATSRT






$\qquad$
V
90
100
110
120
V S S S K A E $\|$ A T K IVVIK QF C P N|I N|LTV Y D S $\square$ F E S K F G\| D F F K S



 L GKNRAEACLQALTELNTYVTVAAHTQPLT

V G K H K V D V A E A R I H D I N R Q C IV H K Y Q M F Y L P Q N A D S I L S Q V GQPKI EVMRERI LAA NPECEVHCTDDFVTPDNVA DMMPG


 $V$ GKSKARVVARESALSSFNPDANI TA Y H DSVVTSDYGVNFFKK
 I K K S K A LVVAK DAAQPF N P K V K I V A H H A N I K D S Q F V K WF R D


 TGGK P K A TVVMA E R L R L I I H P T C A V E A V V R S F Y E A E T S E E S L F R G $V G Q P K A Q Q A A E A D I Q R R M P N C R V V T P D V S K V Q D \square P M D Q L L Y T$ I K QAKATTAAARAI EHVSNSKLVAHQANIMMDFPDAWFS Q
 $V$ GRPKADAAAEFVMKRAPGVTVTPYFGKIQDKGEDYYMQ V GKNRABAALDRI KEVNPRVVDVAVNTSKVRDNS KEWDSE VGRDKVDVMQERI LDDN P DI NI R NFKEKYNEETSEMF F Q D VGRMKSGTAADAVKKMNPNVKIVAHENRVGPDYTDDFFEA V GK S K A MVA K E SVLRRLCPKANI NAHDSDFNPQYNMQFFKQ
I G R F K VI A A A E A MA A L N P E V I V T P R A E WL T P A N A P A L V A D
 $V$ N K Y K A E VA R DR A LDE L N P K T E V K S L V C D V N S WE P S D L T P


 $V$ QK M K S E I A A L A V K EMN R D I N I DA H Q N R V G P I Y N D D F F E A I G R A K A DVVMAE IV H A I N P A C QV EA E V L ELLHPDTDA Q H F T R

 L G R L LK T DVVMA E R DA DI N P D C R L T A V V P E F L E E D GME T F L S G

 VGRPK TELITKKRLESINPSLKVEAFNQELNDKNVFKIL KG



 V GQRKA QAMKERILSSINPKAEVRACHCFFDPETAGEFFKE L G Q K K TEVVMRDMI ADINPTATVEVVDAFVLEENVDA VVSD $V$ GRPKA QVAA EAL NA QYAHLRVVHVTHVVGRLEEKDEA FYR Q $V G K K R V E A V S D R L Q D M N P R V N L V F D S A D L K S K T D D D F Y K Q$ I G S M K T Q VMA D R I K E $\square$ N P S C NV K T DN E F V L Y D N $\square$ D D D L T D
 I GRPKVEVMKERLLDKDNPDLNVICRAAFYGPDTADELLLIG

 IGGQKRGDVTRAKLAELNAYVPVNVLDSLDDVTQLS QF
$V G K D K S E T A D A A B A R M N P E T K G K Y I A M C Q E N V Y N D D F E D R$ VGQSKARVAREAVLKFRPGVEDVAHHANVKNQEFDDFFKQ A GMTKTAAATQTLMDDNPDVSFEEFTKDITTPTNYEHLLD A GLS KVQAAEHTLRNVNPDVLFEVHNYNITTVENFQHFMD

 $V$ GKSKAEVAAAAVVQRVVGCTVTAHNCRIEDKP PSFYRQ $V$ GESKSVVTARKAI LSSWFSPPSHRYHANDKDEMYDESAFSS Q $V$ G QLKVVDAMAE RLRGDNPDDHVEAVMSFLTQNNHNELLSG VGSKKSTVAGRAVKVFNKDVRI QALSERVEHDFNDDFFAE I G QVVKVDALRRERLLEEINPNANDI TAYQK DYEA KTA DEAHME

 V GQ A K S A A A A DA A K A M N ST $\square$ K L L D R P K T P TAAARA LR R I N P A A Q I HA L Q E K FD A S F D T S F F E S VGRTKTDAMAERLRA!NPQADIRVHFGFLTVKNVGE UniRef90_MOUUM4
UniRef90_E9FRU9
UniRef90_G0MJ42
UniRef90_E6VV95
UniRef90_R5EI41
UniRef90_I3J8G4
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$S M F E V A D D T K T S M C$
F C
RVLIP GVTP CFECT LWWLFPPQTKFPDCTTPRSPAHCDEY

$\mathrm{F} C$
F
C

GP LVIP GETACYECYKDKGDQAPSYGP $\square$ NAMVSS $\square$ QANEV SKIILTTLDKTSNC
F C
TVFSADKD $\operatorname{VNYETMFNDPSKDPPVIGPTPNLDGCDEAMEA}$
EL DKRGLTQCYEC TPKEKQRSFPGCT $\square R N T P S E P \square H C$ F C
QV $\square$ KKG $\square T$ A CYDCTTKETPKSFPVC TRFKDA DI Y E T K V VC
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TQ Q Q DA D LARTERD
RVI LPT IT S CYECSLDMDPSKKTYPDC
QPI IPGATECFDCTTVKTPKTFPVCTIRSTPSQPDHC\|VW SQI KVADLMKTYNC
 F ADLVNHSY

QVVIPHLTESYSSSQDPPEKS $\square$ P $\square \mathrm{C}$
 F

YP VK D MTK CYECDP $\square P K T S S \square P \square C S Q \square P E K P T H C \square A W A R$ T LVRVRDLSKTEHDAM
QVVVPH LTESYGSSQDPPEKS $\square P \square C$
F
 QVVLPD T E S Y S S S QDPPEKS $\square P \square C$
EQLTFSDIRKTSYC
T L L RVTDI SQTS GC
QVVVPHLTQPF
QVVVPFLTESYSSSQDPPEKS DP DC
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$L Q V T I G D L F D T E N D$
$Q V V I P H T Q C Y S E$$\quad$ TQDPPETS $\square$ PLCTLKHFPYQVEHT

$\mathrm{F} C$
F
C
$R$ LQVAH H
QVILP
TRFEVAD I Y Q T S VC
E LLRFADINDTENCRM

ELLEDTDVFKTSVC
QPI LPGNTECFDCTKKETPKTFPVCT $\square R S T P S Q P \square H C \square V W$ QVVLPNLTESY
A AFRVGD 1 YQTSVD
RVI LPS MNACVDCN $\square$ EFYPPQ $\square$ NFP $\square$ CT $\square$ AHTPRHC $\square E Y$
T C

QVVIPY LTESYSSSQDPPEKS DP DCTLKNFPNA $\square E H T \square Q W$ TVHIK GQTECYECQPKPVPKSYPVC
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IQLI PGESACFACAPPLVVAANIDPTTMGVVAGILVQNV TQIQLLDLSKTYQD
$R V V 1 P T L T S C D E C Q L D M H A P R A A V P L C T L A S D P R Q P E H C$
 QP VIVGRYECYDCHPKAANQQTVAVCTVHARPTTMVHCV TQUSVADDNKTYND
QVVYPY LTESYGSSVDPPEKD $\square$ P $\square$ CT $\square K N F P N E \square Q H T \square Q W$ FMIRKAEFWK
TAFRTGTDEDTAGCGC
$R V I L P R$ R S S CFECSLDEAFPPQVSYADCTTANTPRVPEHC GGFCGPAPFPDLPMQMGSCEVNGVLGPVVGVLASLQAQMA QVVVPH
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AK I L WP K E


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$M L Y Q L L F G T P D N N N L L T$

I Q WARDKFEGL
$\square$ Q WARNEFEA $\square$
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VK $\square$ IT G K G T P M A P R VLMF D $\square$ M K
$\square E$ Y A M $\square$ VLWT QQFPDREFDGDNPEH

AKNFLF

VK 1 LLWPKEKPFG

LK HLLS F G QVT G
Y $\square G Y S S \square K D F F P R M D \square K P N P G C A$
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IE WA H
$\underset{H}{V} K V L Q W \square E E A P F N G \quad$ AS $\square D A D D P S H V E W V L N K$
A R D L

TQWALLFG
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## $R Y D A Q \square A \square$

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 DEDLERFRRNYGV FSADAMGRLLQTRVFVLGCGG YSRQLYV LGHEAMKRMGSSNVLVVGLKG YSRQLYV $\square G K E A M L K M A K S K V L I I G L K G$ RYDGQIAV FGRPFQEKLSNDKQFLVGAGA YERTQUL ■GDDGDRSLQNTNTEAGTGG ETTKPDNSRYDNQDAV RDYGAGAARALAVSHACVIGIGG TEDEAADYDRQDRL WGLEAQNRMRSAHVLLVGLTG YMDQFARTQLL LGVDAMERLKKSRVAVFGVGG NKYSRQDLFFSLFKQNKELFANKKILILGLGG MDKYSRQTGA FGDETMAK LVK DRVLIVGDQG RYDGLIAV FGQKFVERLNQQKYFMVGAGA YSRQLYV GGKEAMLKMQNSNVLIIG円KG TTEEEDQR SKGLDDEEGAYSRQQYV
 LGEECFNRI RSTKVVMIGAGG LGSAAMQRIQGAKVLLSGLQG LKGVRVLVVGAGG LEGCRILVIGAGG MASEEDDDYSRQRYD DGDSAMKRMAQSSVLLCGVGG SDEYERRFAG SAKVYGEQAFSHFEQAHVMVIGIGG MSRYERQTVLPSVADAGQAADRQSHVLVVGVGG YSRQLYV LGHEAMKRMGSSHVLVSGLGG MNSCKVLVVGAGG MEKNILVVGCGG YSRQLYV LGHEAMKKMANSNVLIVGLQG RY而KNIVGTLTCEGQNRLLQTTVAVVGAGG QDTEEEAERYARQMILPQVGPSGQEALAAARVVVVGAGG

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 VGSVAAEMLTRCGGGRLLLYDYDTVELANMNRLFFKPDQA IGGDIAGQLAMCGVENFILYDYDTVEESDVSRHMFFKEKY GCEMLKNWSMMGEGRDYVTDLDTVEKSNLNRQFLFRPKD
 IGGSWATEALCRTARGSLTLIDNDRIEKTNSNRQLHTTSKT TGIEAGKNLALMGVESVKILDNDVVQRRDLGVNYFVRASS VGSWAAVMLCRSGVGSVRLVDFDYVTGSSLNRHATALLSD TVAEFKNVVLAGVGSLTLVDDRAVTVDALSANFLIPPDE VGSWAVEALARTGIGALTLIDMDDVCVTNTNRQNHAVREN LGGHVASLLARLGVGGLRLCDSDVFEESNLNRQYFCTEST LGVE:AKN:ALAGVKSLTLYDPAPVADADLSSQFFLQPQD
 GCEMLKNWAMIGKGKI IVTDMDSIEKSNLNRQFLFRPKD VGGHCAEA VRAGVGSITVVDYDVTSSNKNRQLIALDST LGCEVLKNLALSGFKDLHVIDMDTVDVSNLNRQFLFRQAD GCEMLKNWALLGEGGIVVTDNDSI ERSNLNRQFLIFRPKD LGCEVAKNLSMLGMGHLDLVDDDVIEHSNLNRQTLFTGAK VGGYSVEALARSGVGAIDLIDDDKVCDTNINRQUIADVKT VGANVAFMLSRAGFENFILVDNDIVECSNLIRQYPYSEND VGDECAKNLILAGPGADTDHDDGDAEDKDLGTNFFLTEQD LGVETAKNGALAGVKSLAVYDPAPVSLADLSAQFFLSEGD GNESAKNLVLAGLGSLTLLDPEPVTAADLGAQFLLAEEP LGCELLKDLVLTGYGELHLVDDDTITGSNLNRQFLFRQKD LGNEIAKNLVLAGVGSLTVADHENVTEEDLGSQFAAAAAV GCELVKNLVLSGFEHITMIDLDTIDYSNLNRQFLFRAAD LGCELLKDLALSGFRN:DVIDMDTLDVSNLNRQFLFRQKD VGSWAVEALVRSGVGTLTLIDMDVLVASNINRQLPALTET LGAPALQYLVGAGVGRLTVMDGDRVSLSNLHRQTLFREAD
 GGCELLKDLALMGFKKIHI IDMDTMELSNLNRQFLFRKND GCELLKLLMLKGTKHVTIVDNDTUEVTNLNRQFFFTRSN GIDE AKNV VLAGVKSLTLYDPGKTEVADLSAQFFLREDD GGFVIEGLARLGVKKI IAVDMDVFDEMNLNRQALSNVNN LAAPVLPLAGAGVGHITLVDADEVALSNLHRQTLFTEAD LGAEVCKNLVLVGVKSLTLMDSHSVTRNDASSQFLAARED VGGYVMESLVRSGIGCIDIVDNDTVALSNLNRQIIATHSS LMSEIIKNVVLAGVDSI TLVDDHIITTSDLSAHLFIINEDS VGSMAVEALARTGIGRIILIDKDVVDVTNNRQIHALTTT VGSWAAEALARTGVGTLTLIELDGVCVTNTNRQLHALEGY VGGYVIEGLVRSGUGTVDVFDHDTVDVTNLNRQU1ALHAT VGCEMLKNWALMGSGRLHLTDMDLIEKSNLNRQFLFRSTD VGSWAAEALARTAVGRLTLVDLDNVAESNTNRQIHALDGN LGSNGALCLARAGVGKLILDDDKVDGTNLHRQQYKAAQ IGCEMLKNFALLGKGVVTVTDPDLIEKSNLNRQFLFRPH H LGSNIAVMLVRSGI KNLTIVDFDKVDILNLNRQNYFMGQ LGCEIIKSLVLAGUKSVYLVDSACICKPNLGNNNFFTDDE VGSFAAEALARTNUGH1 GLIDKDDVDITNVNRQIHALTST VGSWIVEALARSADGKI TMI DLDNLAES

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 I GLSKAKCAVEFVNKRVPGCEAVAHHCSIQD MDEGFYRQ VGKFKTDGTKQYYEQMVRDARVISYNEIINERFDLGKFFET VGKRRDQVSQPRLAEVNYVPVHVLEAKDLS GTPKATAAARALSARNSACTVVAHPVTLGPDTVAKLLHD LGKNRATASVQRAQNLNPNVVVTSDEGNVCDKPGQEFKKQ IGENKVDVAEARAKDI NPEIVVNKHNVFYLPDSDYEFFAS VGKVISTESVFATSELNPLVTIDVYDKEDETMDDQFTKN VGQKKADLMVERVKLINPDCEAIALNMFYTDETYE ELEYD

v


V

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Uneporqug

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 F V
AKVMVRD $\square$ SKTYNCF
$R V V L P G M T A C \square E C T \square E \square Y P P Q W P K E Q P F G D \square A A A C A T E V$
QVVVPNDTESYGSSRDPPEKS DPDCTLKNFPNADEHTDQW F SNLL GPEHH
RVI P RFTSCFECS LDSFPPQKTYPMCT $\square$ AETPR $\square$ PEHC QVIVPFATESYSSSQDPPEKS $\square P \square C$
$R V I L P T \quad \square T S C \square E C Q L D M H A P R A A V P \square C T \square A S \square P R Q P E H C$
F V
$\square$ QTLLPGRTACFECGPPLIVASG $\square R P T T M G L V A G L L V Q N A$ $\mathrm{M} V \mathrm{C}, \mathrm{V}$
QVVLPHLTESYSSSQDPPEKEAPMC
 $\stackrel{F}{F} \mathrm{C}$


F V
KWCLGQLDARQVREEMMTPEQEKADPYFLGRPGVVQAAVT F C
$T V H \square R G K Y C S C F E C A P K P V P K S F P \square C$
 TQVAFENLWKTINC
QVVVPD LTESYASSQDPPEKS $\square P \mathrm{~V} C$
QVVIPH目TESYSSSQDPPEKS $\quad$ PVCTVKNFPNA
F V
S VF WSRHPRVPEPGSTPTSARAGVLGTVVGQAGTAMATEA
$\underset{\mathrm{F}}{\mathrm{F}} \square$
R VILPR RTS CYECT LDM $\square$ NPK VTYPVCT $\square$ ANTPR $\quad$ TPEHC FV
QVVLPNDTESYS WS QDPPEQSFPMC
$R \nabla I L P T M T S C \square E C Q \square D M H A P R A A V P \square C T \square A T \square P R Q P Q H C$
Q V V VP
YTIFPYQ NACYECNP $\square P$ VAENDDMAAC
F C
TAF $\ V \mathrm{SD} \square \mathrm{YKTSVC}$
GPFVIPBETACLKCDDKETTDDPSYGPMCAMDSSIITNED $\square S F I$ I P GKTACLRC』FPKVEDSGPVPVIGMTPALVASDEA FT
Q VVLP G LT E S Y S S S QDPPEKS $\square$ P $\square \mathrm{C}$
F V
$T 1$ RTRKVTERFYVCGDGVSEPSYGRGLMAPRAALCAAHQA
 F C
FADLIEHDFVIVRERGNIDHETRTRTIVDVKVEGEQGAAA RAVVKGKTKCFDVCARQVQKTFPDCTI RNH

GGFCHTAPFPD LPDRAATCATAGVMGPVVGMDGAAMAQMA G
F
F
FTDFGKNFTC
$R V I L P G M S A C \square E C T \square D L Y P P Q K T F P L C T \square A N T P R H C V E Y$ MVV FFENECYDCTPKIREQSFP $\mathcal{V}$ CTIRGRPQSFVHCVA
AV DT K Y E K $\square$ F G GTSAQGAEK Q $\square G N P V F A P M \square T$ A A $\square E L S E F$ GGFCGGAPFPDLPDRAASCDTAGVMGPVVAT】GAAQAQMA
$T \square H T R K \square G S N F Y \square C G D E T T D \square A H G Q C \square M A P R A A \square C A A H E$ TKLVVTD $\quad$ Y K TEMD
$K$ Q $V$ VS D LA QTAYDPM
SHLQDTDIYKT
QVVVPS LTENYGASRDPPEKS $\quad$ P $\square$ CT $\square K N F P N A \square E H T D Q W$ TLI RVAEFWKVRGCPGGAALRKKFKHMHCRPARKFMCVYG

N VIVPH $\square$ TESYNSHRDPPEEE $\square$ PFC
KALIQDMFQNYY
TRFKIEDISKTYMDPM
QP $\square L K N V Y E C Y D C R P K P P E T K T F A V C T \square H A R P T T M V H C D$
A VWN MP LQ T P S Y A C $V$ F P P CEDE G VLGP $\square T G V \square G V M M A S E A$

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| UniRef90＿A8MGD8 |  |

VK L IT G A G D P LIG R VLVGDAARNRYETLRFAR
$\square E W A S V L Q W P K N F P Q K K F D A$

】E WA H【 】

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

N
H C $\square$ T WAKEF $\quad$ F H Q $L$ F
TKESVTKREVYSTWLLASDASPDPFS $\square R S V A R R$
$\square E Y$
$\square A H L I D Q K P S P \square G Q L I R F D M Q R F H S S S F R F D L A P D$
$\underset{Y}{\mathrm{~V}} \mathrm{~K}$ VLQWGKENPWGSSTTLDGDDPQH
CK LISGKGEPLVGKCMVVNLLTNEYRVFEF
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A R D W<br>E QVLDNRG

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UniRefgo
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UniRef90＿R8VZ79

MSEDRTGWQQRTELL RLVGNERYSKMQGMKVLLVGAGG IGDDGLDRLRHKVLIAGLGG $\square T E T E \square A R Y D S Q \prod A C$ FGKT TQRKTESQKIVFLVGAGA SKFSEEEQNFYSRAINFYKWYWEVQERLKNAKVLLLGCGG SMLIPEEVQRYDAQITVFGRSFQG KLGALINLFMVGCGA EMSAEDSNPYSRLMALKRMGGDNYERVRDYVAVVGVGG QLDPQDLSRYDAQ ISV FGSKLQKKLQDANIFVVGSGA TTFSAAEAAVYDRQMRLWWGVEAQKRLQNSRVLVSGLTA EDTEQETALYDRQRRWGAG AQRRLSKAHILVCGITG ERERRYDRQLRL WGDHGQFSIENAKVCLLRAEG IGTQGLATLRAKTVMI AGLGG FGSKLOKKLEEANTFVVGSGA
MEFYNRTELL


$R V A V V G V G A$
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INEYSRTELL IGGEEGVSRLKKSSVMVFGVGG ELTEQETQLYDRQIRVVWGADAQRRLSKAHILVCGMKG RYDAQMAV RDYGPEAPARLQNAHIAVAGLGG RYDGQIAV FGKTFQNVIANQRQFLVGAGA

R


DTEETAYDRQR
DTEETADDR乌RLV
MNSEETADYDRQTRL $\operatorname{SinNQKYLDQQSRO}$
$M S S E E Q K R Y R Q E$ WGEQGQAALEKASDCLLNCGP MGSEALARVQAARVMVIGLGG
DGKDGLDKLKNSKVIVGVGG EDSDKSMKKYDRQIREERHGTELQKKLAASSVAVICGLGG WGEHGQTLLEAATUCLVNVTA LYGADGLLK QQSAHCVIGAGG
LHRFSREEL RFSRTTLL $\qquad$ GDAAMEKLAASTVAVFGVGG LGTEVLDKI ERVNVIIFGIGGG SSTDGTRYDGQTAV FGSAFQEKLAKQKYFLVGAGA YSRLMALKKMGVKNYDEITRHKVVVVGVGG RYKSYリSL GEDAFQK SKAKVFLVGAGA
QKYDRQDRL
RYDGQDAV DRYDPYRMI RFDRTGRL EKNKQYDRQLRL R F WGDHGQEALENAHVCLINATA FGKEEVETVQNLKVFMVGCGA FGNEQQEAMQNLRYFMLGAGA LGDSAMERLANARVVVFGLGG WGDHGQSALESGHICLINATA GTLGLEAMGKLLIQLRVLII GLRG MGHEAQRRMGESNVLIVNVDG ■GEAGVAKDAAARVLVFGVGG WGVDAQRRLSKSNVFVSGLRG PKLHDKLKNGRVAVCGLGG EKYDRQDRLGARMGQSLLRHSNVCLLGATY AETGKDDENLYSRQMMGAYGVEAVGKLVKLKVFLSGLRG AKMSAEDSNPYSRLMALQRMGDKEYENGRKSIAVVGVGG EQETALYDRQLRV WGADAQRRLSKSHICVYGIVG पT NEQFS R

DKYDRQLRL FFGDEGFAKIQDAFVIVIGLGG WGAEGQRRLANTHVLLIGSCA KILILGAGG SAEYQQRFGGTARL YGRSEDETLRAAHVCVVGGGG \SKDEDD RYDGQ RYDGLIA
LNQFSRTQLL
QKYDRQLRL RYDGQLAV पNQFSRTQLL D R Q $\square \mathrm{A} V$
DEQRFSGTARL YGHEGAQRLCAAHVAVVGAGG DWERRFGGVRRL YGELALHRFRHAHVAVIGMGG


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J809
$\qquad$




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60
70
 $V G S F A A E S L A R S G V G T L V I M D K D D I D I T N I N R Q I H A T T K T$
 VGSWAAEAL ARS GVGEI TLI DMDEI CVVNTNRQLHTLTTT $L$ G C E L A K L L L A M D P S N K L LGAE $\square$ A K N LILAA GVK SVVTLHDEGTVVELWDLSSNFVFSEND V G S WA A M M L ARS GVA K L R L L D F D Y V T L S S L N R H A SA T R A E I GCELLLKNLILLMGFGEIHVVDLDTI DMSNLNRQFLFRQR D




 V G GMAMEALARSGVGNLILVDADTVALSNLNRQUIATEAT










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



 L SNE I A K N L VLAA GI G E L CLLQDTR SVVEKQ DVVFDQFFFVE Q S D
 L G A E I V K N L T L T GVMR S I K V VM D S T P V T L P E L G T N F F L T E S D





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 I GRPKAEVAAEATRRLNSHDQVTPLTHPLDPTTEHDYEDN L GEYKTESLSKTDSKGYPY I DVKDDTVKITKDNDAELLKD VGK LDK SDVAA A A AKAMNPELDNVVAHANKVGPDYNDELFES
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 I GQHKVYATKARLNETLPYVEVEAFVQKVTPESLDEIAER I GKSKSLVAGNAATS INPAMRVTAFDQKMAPTFNETFWNS VGKPKVEVMAERLVAINPACSVHAVADFVTRDGMAEYI T E
 $A G L S K V Q A A E H T L R N V$
$L G K P K T Q A L A A Q L A D V$
$A$

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 Y D Y V I D A V D S L K D K V H L I
Y D YVV DAI D TIT SKLLI I REAYYRK I K II SAMGAGNRFQV

 FKIVI C GILDSVEARRWINSTLCKMFVPLIDDGGTEGFKGQS



$Y$ S A I I D C T D QA A A K I A M I L H A R A L G DP M L L L G GA G G K T D P



 $F$ Q MVI A T QLQ YE E F CK V N S L C R S C QRP FYA S S C Y G L Y GF A
 D DI I V E AF DKA D QKAMLVN GVLLEKM KY LV S GS GM GLLAP S N F D L V I A S N L N E K T L L L L S S K R L W D S NV P L L Y C R S L GMMGT $F R V V I$ S GLDNVEARRWLNSMLCSTIIPLIDGGTEGFKGQA


 F F T GL D
VDLVLSCVDNFAARMS $\quad$ N QACNELGTWFES GVSEDAVSGH
 $F S L V I A V Q L P E S T C L R L G A V L W E A G V P F L V C R T Y G L I G Y M$

 Y DFVVDA DNVK A KL H L L H R CV T L G V PVVVSSMG
F S L V I A T T I S E K V T Q S L L S Q H L W W D I

 FDVVVVNCCSLLTKKSVNAKCRKLPKRVAFYSVEC
 LVVIVVSQPSR】A I R I S ELAWHASPPDPLVCVRSSGFQGVL

Y



 | Y D Y V I |  |  |
| :--- | :--- | :--- | :--- |
| F F S | D | D |

## DF II CEALD DAENKAMFVEEVLKPQKYLVSASGMGKKSLN

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 H SVVLNALDNVASRKYVDERCLFYKKPLFES GTLGTKCNM





 QVVIP HLTESY
QA Q TVVR W
A MF E V A D $\square$ Y E T S $\square \mathrm{C}$
$R \ I$ I K E H
Q V V L P H
T K L E





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VE WA Y L L E WP
AKEFLFH

A R
$\square K Y L L K F G E V T \quad Y Y \square G Y N A D Q D F F P T M T M K P N E Q C$
$\square E$ WA S $\square$ LE WP R VF K D K K LD N D D P E H

F D A L F VN P P T T VN L Y L S

IS Y A MLLLWP
$\square K Y L L G F G D P C P A P A G Y S A D R D H F P T M A D R P N P D C A$

VE Y V S T $\quad$ Q $\mathrm{Y} P$
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 $V$ G G Y V V $V$ G G A A V E S







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


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| UniRef90－J9F3V1 |  |
| UniRef90＿ToY381 |  |
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| UniRef90－U5ZGY0 | FTRL NRSDPCLYCAFPDPPESRVFGVATG】AVVMGAGKV |
| UniRee90－C088FO |  |
| UniRef90－A0AO59ETJ1 | $\mathrm{F}^{\mathrm{V}}$ |
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| UniRet90－G3VJ31 ${ }^{\text {UniRe90 }}$ W7ABP9 | $\stackrel{F}{F}$ FDifgkgrVcy |
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| UniRef90－U5H2M1 | T T $\square^{\text {a }}$ |
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| UniRef90－E5W4S4 | YSVIP GKTPCपHCLLGHपPANTMTCDTAGVIGPYQVTDA |
| UniRet90＿－A1ZN49 | FVITHDSM |
| UniRef90－D3TMM5 | IQFIRPGETACFACAPPLVVAEN $\square D P T T M G \square T A G M L V Q N T$ |
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| UniRef90－R6RMA9 |  |
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| UniRef90＿D4MTH8 | ELIFK】AD【TETSVCPLC |
| UniRef90 C5DBA0 | F V |
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| UniRef90－A0Q3Q5 | TKLQVSDIYKTNVC |
| UniRef90－C3YBQ2 UniRet90＿16UF5 |  |
| UniRef90＿6UBF5 UniRef90 R9SIz3 | SYFi |
| UniRef90 R9SIZ3 | SVFKPDSPKTYEELFNLPHGVPPVIGPTPNIVGSLEAFEA |
| UniRef90－J9B7Z2 | QVVYPH |
| UniRef90－R6EZI2 | SAF乌1ADUEDTKVC |
| UniRet90－V9DR52 | V |
| UniRef90－H1Z852 | SKIVVKD的KTDVC |
| UniRef90－H1SFE1 |  |
| UniRef90 UPIO0037A4F23 | F Q $\square$ MYPGRTPCFECLPPLIVAQGLDPTTMA\VAGLMVQNV |
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| UniRef90－12KA63 | EVTSIWWK H |
| UniRet90－E3H9H9 | AV KRPGDF |
| UniRet90－UP100006CF8CB | T |
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 $\begin{array}{ll}V G G A A A E A L C R C G I & G D L L V M D H D R V D D T N R N R Q L L A\end{array}$ TGSPVVHLLARLGVGRILVIDDDVVEHSNLNRMYGATDAE LGCHVARNLMAWGVRNTTFIDNSRVSYSNPVRQSLFTFED


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$F Q V V V L T N S S$ LSEQ $\square R \square G S F C R A H G \square K \square I D A S T R G L F G Q \square$ FDYVVDADDAVKVKTAIVAFCKRDGMRVVTCGAAGGQLDP ANDIVOCTDDLETRYWI SEYAKSYKKSVIMGSVLKFSGQV
 YDYVI DAIIDNVRAKAALDAYCRDQGIRLI TIGSAGGQVDA


 ADVI FLLTTDTRESRWLDPSVIDAAELNKTLI NAALGGFDSWVV

 $F D F V 1 D A B Q V R V K A A M A A Y F V K N R Q P F I D S G G A G$
 YDFVIDATDKLTNKCVIIAGCRERGLPVLTFGGAG VDLVLSCDDNFEARMAINTACNELGQDWMESGVNAVSGHD
 VDIV VNGMDDVAETI NLYRQCRDKKLIII DAGA
 $F D H Q I D A C D Q V R A K T A M A A W A I K N K A I L I S A V A A G$ GlD\IVCADDFLIHR\|VNEADVKVGLPCVFGASQVSRGRV GVSHLCCVDNFEARMAIVACNELSQVWVVSGAVSENAVGGV VDIYVDGLDFFAFRQQVFAACAAKGIPAVTAAPEGMGAAV F N ALGLDSIEARSYI NAVACETDKPMVDGGTEGFKGHA
 AS AVI DA CDQVKTKTALAAWARRSSVPFISVGAAG

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FC
YVFCYSCVFPEFKVTRENCSNAGVLGSVCG【IGSDQATEV DVERY
F
T C
MS LT P
$T Q F H \square G D \square Y D T G G C$

MRHGKKFQGKCYFCNDVFAPTNSM
TRDRVADLTRTEHD
A Q $\square R \square A R \square N Q T E G C$
MRHGNRYEHGCYFCHDVVAPTCTVTRPGVAMVASSLAVEL
QLI DPGESACFAVCAAQLNCWFDFDPTTMGVVAGLLVQNV NTHTKKRMKNLYLCGDGTSDTASGISLTAPRVTLCAAHQA

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$\square K N \square L N D Y D P \quad Y$ VLTYDA $\square$ DNAFNK $\square$ S $\square R K$

MAS LLQ DKSAASGTSVLIRGFDHNFSTLKLPAYEHCPACS
$\square K Y L L N F G T V \quad S Y Y \square G Y N A M Q D F F P T M A M K P N P Q C$ NMIL
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