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-
 KLPNVVILATGGTIAGSGADSTTTVGYTSATVGVERLIAA
 SDNIKILATGGTIAGSSESSTDTTGYESGALNIKTIIKA
 KLPNVVILATGGTVAGSAANDAQTVG


 QKPKIRILATGGTIAGVSKSNTETYNYKAGEIGIYQLIA
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 E LPCVAVLATGGTIAGSAESSAQA GYRSGMVDVEAMIAA MKKVYVLTTGGTIAMSEDEATGT
 MKKILI IHTGGTI AMSEDTKT GAVKPNPLNPLHDT LPVI AVLATGGTIAGAQADAT, SAGYKAGSFSVNDLLAA KLPNVMILATGGTIAGTGASSTTTVGYTAAK $\square$ GVEALIDA SKKKVMVLATGGTIAMKMDEK IGGLVPACTGEDLVAA LDPTIALLGTGGTIASTAASNTALTDYTVTEGDDALLTA MPRVLI LATGGTISGKADARSADGYDAGAATGEQLIDS $M K K V A V V A G G I A G A G S A N$ MKKVAVVFNGTISTVDPRVK $K P N V V V L A T G G T I A G A G A T V A N S$ A V A K GVDK A G

S L P

$\qquad$ KVAVIFTGGTI SMKVDPR
E L P MK NVI I GTGGTIASRID YETGAVHPAFTAEELAKA

QKPK!IILATGGT\AGQGASA NRAGYTAGKI PVSELIGS KKIVVIGTGGTIAGQSGSAEDLTAYQAGELTIDEVLA MKKILI LHTGGTI SMYEDKR
$M K K V A V V F T G G T I S M T \square D P R$
MKKILVINTGGTIAMS
KIIVIATGGTIAGSGETDAQSESVKPLDDHAVEKI MKNIIIVATGGTIAGSGK VGKATNYRAGGKVED MQKI KLIATGGTIAMRKDSFGKT NYQAGKAVNGHELLDES MKKILVLHTGGTIAMEEDKETGVVQ APGAQNPLLKF
 $K$ LP $\operatorname{NVQILATGGTIAGGGESNTSTTDYKAGEVGVDELIKA}$ LARVALLATGGTI AGAQDSA ESAAYRAGALSI DALLQA KLKHILILATGGTIAGSGPEGNTTGYQAGVISI DEILAD $N V V V$ GTGGTIAGQGKASVNTSTYMCSVLGG DEVLGS PR LA G SLLPRVALLATGGTIA GKAAARAANAYDAGAL GVRQLVDA



 Y Q A GAL GLASLLDA | $Y$ | $S$ | $A$ | $G$ | $A$ | $V$ | $T$ | $V$ | $D$ | $K$ |
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 NSATYTAA KV PVDKL L A G




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$A G Q G N P Q G Y$
 G Y K
 A GA GASSANIGVYQAAVVAVDKMMAA


 $G Y R S G M V V D V E A M I Q Q$ ASYAAAKYPDKLCAG GSYTSGTVTVDKLAA
 S GEVVKPGTNPLLES $\square G A$ A I P T L S GEQI M S M $M K N V P M N V M N P L Y S T$

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$G Y$
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| $Y$ | $L$ | $S$ | $E$ |  |  |  |  |  |  |  |
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VPEVKKLANVKGEQFSNMASENMTGDVVLKLSQRVNELLA VPELKKVAHVKGEQVFQDASESMGNEHWLTLAKRINVLLA

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$\qquad$ F

P T A S A GPM
RAVR R
 P A TAMSADGPFN L Y N A V L L A S H E S S K G K GV L V T L N D RI A S P P T A MS A D GMLLNLYRAVILA GSKEAVGKGVLVMLNDTIHS PATADSADGPLNLYNAVKIASTKDARNTGVLVALNDRI GA
 P A S A I S A D G A M N L L E A V TVVA A D P N A K G R GVVMVVL N D R I G S PATAI SADGPMNLLSAVTVASDKKSKNRGVLVVLNNKI GA P S T S L S A D GP L N L Y N A VVTA G SPES $\quad$ TGKGVLIVVMNGSILGG P ATALLSAD GPLNLLNAVQVAADKNASARGVLVVMNNEI NG P S T GI S A D GPANLVGAVAAAASPNSKGRGVMCCMNNLLLDD PSTAVSADGPANLYNAVVTAVDEDSKGRGVLLAMNDTVLD PATGMSADGPLNLYNAVVTAADKNAMGRGVMVCMNDIVLD
$P$ GT A M S A D G P L N L Y R A V I L A G T K E E A A G S G V M V M L $P$ VT A MSADGPMNLYNAVTLAANDKS $\square G K G V L V A L N D T V N C$
 PATAMS QDGNRNLLDAVMVAASPESKGVGVVI AMNEAVLA PATADSADGPKNLYNAVSLAGDKNAKGKGVMIIAMNDKIHA PSTAI SPDGPMNLYNGIILAASPAARDKGVLVALNDTINS
 PATALSADGPLNLYNAVAIAGGPEAVGKGVFVSLNDQISA


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UniRef90-I8SJU2
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UniRef90_L5N3H5
 KGI I HA GVGDGSVAAQMKPALVEARQKGVLIVRSSRVGQG
 $K G I V H A G T G N G S I G K A E Y P A V E A A Q K K G V V I V R T S R V G N G$ K GIVVAGAGNGLLSDAADTGARDAVKKGIVIVRSSRVGSG $K G I V V A G S G N G S M S S A S S E G A T D A G K K G V I I A R S S R V G S G$ DGIIVAGTGAGSVSVRSDAGDKKAEKAGIVVVRASRTGNG A GVAGAGAGSVSVRSEAGIKKAQNAGIIVVRASRTGSG
 DGIVLA GVGDGNFYKDVFDEALKARQKGILVVRSSRVPTG DGIVSAGVGNGNMYKAI FNELAKASKEGTMVVRSSRVPTG DGIVHAGVGNGNLYHTIFDLAVKAREQGDQFVRSSRVPTG KGIVHAGTGNGSIGKAEYPAVENARKNGVVVVRSARVGSG K GII HAGTGNGSIANPTMEGLKDAVAKGVVVVRSARVPNG KGLIYAGLGNGNMSQDDRKGLDNDEKQGVVIVRSTRVSSG
 K GLVVA GSGAGSDHENQKNYLDELLDKKLAVVKSARVGSG $K G I V Y A G V G N G N M S Q A \square K Q A F R E L Q S Q G V V I V R S T R V N N G$ $K G I I N A G M G N G N P F P S A L E A L G E A V K G G V V V V R D S R V G S G$ QGIVVAGTGNGSLHALLQQALAEAVQRGVTVVRSSRVGSG K GIVYA GVGDGSISVQLEPAAIAASKKGII ARSSRTGAG A GLVLA GLGHGKVPEPVWQALQSLMAQGLVVVRAARALGG $K G I V V A G S G A G S I H K N Q K D V L K E L L K K G L K V V V S S R V V A G$ KGIVVAGTGNGS $I$ HATLQAALQEAARRGVAVVRASRVGSG KGII HA GMGNGNPFPLTQNALEKAAKSGVVVARSSRVGSG $R G L V V A G T G N G S D H V T L Q Q A L A E A A A R G V A V V R S S R V G S G$ K GLVVEGTGRGNLPPQMATSVKKADEKGI PVVMVTRCYRG $D G I V L A G V G D G N F Y K D V F D V A L K A Q N S G I Q I V R S S R V P T G$ EGIVIAGAGSGTFSSNWLEEIKNDENKGVQVVRSSRIGNG KAIVHAGTGNGSVADRMVKPLQDARGKGVLIVRSARVPYG K GIVVECMGRGNIPPSMFSGIKYAREKGIVVVVVSRCHSG KGII I YAGSGNGSVSDEAKKGAVAAVKKGAAVVRSTRTGSG KGUVTGGLGNGNLNKVNSDAAASAVKKGAAVARASRVPSG
 Q GLVLA GLGGCGKNPDYVGPALERAVKRGVIIVRASRVLGG KGIVIA GVGNGNMNKASLDACARASKKGIIVVRSTRVATG K GI I LA GVVGDGSSKEAMAALNDAVKQGVIVVRSSRTGSG $K G L V I A G V G D G N M T Q P A L D A L T K H A K K G V V V V R S T R L P S G$ HGUILTGSGSGNYSQEWLAAINDLSKQGIVFVRASRVNQG SGIVVEGFGRGNVPPAVVPGIKAALDKGIVVVLTTRTAGG KGII HA GVGGGSVPEYMVGPLNE $\square R G K G V F V V R A T R T G S G$ $K G V Y A A V G D G S L G A G D K P D L D E A R K K G V V V V R S S R V G N G$ $K A V N A G T G N G S V P G Y L V D K L K D \square R S K G A I V I R S S R V P D G$ $R G I V I A G V G D G N L N A R A L R A A A D A A Q R G V V I V R S S R T G G G$ K GVVIEALGRGNVPPLMVDGIKRADKKEISVVIVSRCFEG KGIVNAGLGHANVPNEVMNSLDAAKKAGAAVVVDSRVGSG KAII HAGTGNGSVAKAVVPALQELRGQGLQII RSSHVNAG RGIVIA GDGNGNMNDVSVKMAASMAENGI WIVRSSRVPTG D GLVIEADGQGNVPPAVVPGlRRADEKGVPVVLVSRCFNG QGIVSAGVGNGNLYKTVFDTLATAAHNGVAVVRSSRVPTG K GIVIA GTGDGSTPSWIQDAIKDAMKKGIVVVVASRVYTG DGLVI EAFGQGNLPPRTLPALKSLIDKGIPIVLVSRCFNG DGlVLAGVGDGNATDLAIEGLSRAAASGVAVVRSSRTGSG KGlIVEGFGRGNTPPMMEDGIISDACAKGVVVIIDSRTPGG Q GIVIA GSGNGSLSPRAEKGVRDAKKHQIPCVRSSRTGSG $K G I V L A G M G D G N I S A E A L A G I E R A T K S G I I V V R S T R V G S G$ KAII HAGTGNGSVSSRVAPTLQELRKQGVQII RSSHVNAG K GIV VEADGRGNVPPAMVSGIERAINKGVIVIIVSRCFSG KALI HAGMGNGSVADRVVPALQELRGKGVQIVRSSRVADG $K G 1$ I YA GMGNGNLYPSVLKALSLAVQKGVVVVRSSRVPSG $K G L V L A G M G A G G W T T P G R N A L K T A Q E N G T Q I V V S S R T M G G$ $K G I V L A G M G N G N P Y P S V E K A L A E A V K Q G V V V V R G S R V G S G$ K GIVIAEAMGRGNVPPKMI EGIAENAINKNIIPIVIVSRCPTG RGIVVEGTGLGHTPSGLI PTUERAVQEGVAVCMTSQCLYG KGIVIAGDGNGNMNQATIKKAAQKAASGFCIVRSSRVPTG KGII HA GVGNGNDHKNDFPVLIDARKKGDLVVRSSRVPTG A GIV 1 A GVGNGNFSKAFTEQVKQAVKTGUMVCRGSRCVSG H GLVLA GLGHGMLPERDRQLVENLDDIPVVRSSRTGSG DGLVI EALGQGNLPPQVLPGIRKLLEEGIPIVLVSRCFNG KGIVI EAMGRGNIPPKMVEGVQYAIDRNIPVVIVSRCPAG $D G L V I E A L G L G N V P P A \| V P V L Q Q D L A K G V P I V L V S R C F N G$ DGIVVIGGTGSGNYSQAWMQKLDEL AESGIVIVRSSRVPHS RGIVIIGSGSGNYSQAWLNEIDELAAKGIIFFRASRVNQG EGGVIEAFGRGNLPPEVVPSVGKVAENVPVITSRCLFG DGII I EADGQGNLPPRTLPALQRLIDKEIPVVLVSRCFNG KGIVIAGSGAGSVSSGFYDAI DDASTHSLPIVLSSRTGNG RGLVLEAFGRGNVPPAADPGIRRAVEKGIPVVITTRTDAG KGIVYAGSGNGSMSEVADEAAKEAEGAGVEVVRSSRTGNG QGIILAGVGDGNATDDADAAIDRAVAKGVVVVRSTRTGSG DGLVIVTAGDGQLSKHWLDAI NVLLAQEYPLILSTRVFTG $R G L I Y V G T G N G N V A S H L I D P L R D A A R R G V H V V R A S R T G S G$ K GLVYAGMGNGNFGEPVGKALAD $\square$ SKKGVVVCRSARANS G $K G V L A G V G D G N T S G K A L D A L Q Q A A R Q G I V V V R S T R G S G$ $K G V V Q A L G M G N M N Q P M F E A V K Y A L G K Q V P V V I S T R V Y N G$ RGIVLAGLGAGFWTSKGTEEI RRGVRETKIPVIVSRRPEG



## QUERY

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1 VP P DEELP GLVS DS LN PAHARILLMMLALTRTSDPKVIQ
Q E
 TVVGDLAKNFVTADSLNPQKARILLMLALLTKTKDPKKI QN


 STTDDAKYGFVAAGTLNPQKARILLMLSLTETKNYKEVQQ





 RVVKDDENGFIVVTDNLTPQKARLLLMLGLTDTSDPQK LQE
 CVVDSDE K L G F I S A E DL N P Q K A R V L L M L A L T K T S D P K K I Q E
 HVMP D DAMMGV S A G T L N P Y K A R V L L M L A L A S GT D S A A L Q R
 $P \mathrm{TV}$ DD SKYHFVAALNLNPQKARVLLQLALTKTHDWQQI QK III TD DD K Y S N C I I P S Y T L L S P P K K S R I L L L T L A L T K K T K D Y S E I I K R


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 $R V V D D D A N Q F I$ AS DELNPAKSRILLMLALLKNPTHDCVQD $R V Q D V Y G Y E G I F S N G L N G Q K A R I W L M V L L A N D D D M E S D I R S$
 $Y$ VSTHENADG S GFYNPQKSKVVIL E L A L A K GESVVDEI R K $V \vee Q D T Y G Y E G \square F T N G L N G Q K A R L K L M V A L E K T S D R E R L Q D$
 RVLDVV GYPGI MGGEI SAAKARLELILALSENPDRKTLQE



 $M \mathrm{~V}$ V D A K Y G F L S G D D L N A P K A R V L L M L A L S Q T H D P K K I Q E

 $R V N L D V Y S T G I P C E D M L P E T A Y V Z K L M W V L G H T D D L N E V R R$ TVVDD DTEGFIASDEVNPAKARILLMLALFKRVPRHQIQQ PTTLD A E Y Q F V A S Q E L N P QK A R V L L M L A L T K T N D WK K I Q E
 $M V P N D S R H G F I V S D T L A P S K A R I L L T L G L T K T K D R A A L Q E$ $T V E D V Y Q Y E G I$ F S N GLL N GQKARI QLLMLALERTKDPEKI K E
 QV Q DVY V Y A GIIF S NGL NGQKARLKLMIALQHTCDPAELQ G
 R TAP P D Y G Y P G L F A G D L IVVQDV Y S Y E G I F T Y G L N A Q K A R I K L L V A L E V T K E Q A E I Q S
 $R V L D V Y G Y E G I$ SVIPKDY IISANSLNPQKARILLMLSLTKTENKEKIQK SVMNDDGHGTIAAGELNPQKARVLLTLGLMRSHEPVALQR

 FVNRNVEVNFAVSLDLNPQKARILTTQLLVANRTSPAEVQR
 GFVGPCRA GI GA GF L N P QKARI QQL QL ALEAKMDNDA I RA IVQDTYGYEGI F TNGLTGQKARLKLMIALETTTDHEQLQS



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| Ref90-A6TQ93 |  |
| UniRet90_U2LPX8 |  |
| iRef90-UPIooo2D69492 |  |
| Ref9 | VESLTSIASIEVDDFLNDPSPHMTPELMFQLAERLKSRVG |
| riRef90-AOAA | VVPGLCNVSNVRGVQUANVDSGDVNSTILT T |
| UniRef90-L7EGW8 |  |
| UniRef90-WORTK5 UniRef90 UP10004700853 |  |
| UniRef90 R5C708 | VKGAEKLAKLEGEQVLNISSDDTT WGDWLSLAGK |
| UniRef90-UPIo0046AC544 | VPELADVADVTGEQIANTGSSNINQETLLKLSKAINEALA |
|  | VPGIGKFATI TAEQVSNVGSQDMNDGI WFQLAKRINETFD |
| UniReef90 B7RZ28 | VPQLSELADISGEQVANVGSQDMSDEVWLLLADRVNTL LA |
| UniRef90 UPIIOO0047C7777 |  |
| UniRef90_BOVHI | VA VEVMDYLN P SPYMTPAMMFELAELID |
| UniRef90 A6LLE | KN VVNVELMEFSNIPSPHMTP TDM |
| UniRef90-R6A4P7 | S S WADV DVVEFSNVPSGWMDTEKMLSLARTIDGLAD |
|  | DNDGOSHKKLREYCEYDK |
| UniRef90-UP10003B75D60 |  |
| UniRef90 M1E7 | VPC RE:ADFEIVNFSNFASCNMSPENLLRLAKKVEDILK |
| R | S |
| UniRet90-R5PQK |  |
| UniRef90-UPIooo2888 |  |
| Cly | DSKDMTETVWLHLAARIEAALA |
| UniRef90-V8QWP2 | VPGLEKLATLNAEQIASVGGSQDMNDKIWFSLAKKI K SLLAD |
| UniRef90_UP10003B6s | AGIFSQFADLTVENIF |
| UniRef90_D5WMS1 | VPGIEKLASINAEQISNVGSQDMNDK】WLQLARRIDEAFE |
| UniRef90-K6VRV |  |
| 998 | A |
| R5E | VREFSNHASCAMTPQKMFQLSQMIEEALK |
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|  | Y |
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|  |  |
| R5P | DSSSMT SIIWLELGRAI EKAAA |
| UniRef90-19KZ92 | FGADADL ETEDVFNVPSP |
| iRef90-U5LD58 |  |
|  |  |
| niRef90 UPI00039B | Q ${ }_{\text {Q M M }}$ |
|  | PHMDPKNMLRLRQRIMEAYE |
| UniRef90-FOXE72 | D |
| UniRef90 UPIO0031A3F1B |  |
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|  |  |
| UniRef90-UP10003B3 UniRef90-FOT727 |  |
| UniRef90-D81PE0 | VPE |
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|  | LPELEDVAEVTSRQUCNVGSPDLNSELLISLSQQIEKDLM |
| UniRe90_R7M 8 |  |
| UniRef90-F9L9Q0 | PSPMMTIEK |
|  | D S |
| UniRef90-O5H | OMND T AKK NODCN |
| UniRet90-D1P027 | Q |
| UniRef90-C4LB83 | VD DFCSVGS |
| UniRet90-R5NH88 | D S S D E PY HWARLARDVER N |
| UniRef90-UP1000046FF722 |  |
| Unif |  |
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| UniRef90-R7 |  |
| UniRef9 | NPELLDMANI RGKAVLNI LS ENMKPEYWVETARAVYREDD |
| UniRef90 UPI0003628A |  |
| UniRef90-A0A059KGD9 |  |
| UniRef90 C4 | $\checkmark$ DSKEFGEKELLLMLHEAVSRS1R |
| R5Y2S1 | S D |
| UniRef90-Q46G.J6 | DFKGRVISSILSENMDSESWO |
| UniRet90-C5NU98 | Y $\backslash$ GLUVEDLYHLASPQI |
| $\begin{aligned} & \text { 2efog } \\ & \text { Sota } \end{aligned}$ |  |
| Ref90 |  |
|  | ITPELDDIJANIRGRVVTNILSENMKPQVWTELARAVYEEIN |
| 12476 | MP EFHRPEMPDHEYQPLMDSSDMTPQDWQVA |
|  | S |
| UniRef90- UPIO00479F465 | OYLQVSNVGSN |
| UniRef90-UPI0003624788 | E |
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| 3 C | D |
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## UniRef90 C6PQ19

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UniRef90-E8SHG4 UniRef90-R5PVG4 UniRef90-F2JGU4 UniRef90-19KZ92 UniRef90-U5LD58 UniRef90_W4ARLO UniRef90-UP100039BACFF UniRef90-B8KJY1 UniRef90-UPIOOO4685EOE UniRef90-FOXE72 UniRef90-UPI00031A3F1B UniRef90-W4QAJ9 UniRef90-K9B7S5 UniRef90-UP10003B31EDD UniRef90-FOT727 UniRef90-D8IPEO UniRef90-UP10002EDC5DF UniRef90-R7IM87 UniRef90-D2BPL6 UniRef90-F9L9Q0 UniRef90-A5E6N2 UniRef90-O5HP67
UniRef90 -D1P027 UniRef90-C4LB83 UniRef90-K2NT33 UniRef90-R5NH88 UniRef90-UPIO0046FF722 UniRef90_B5FF15 UniRef90-AOB7W3 UniRef90-UP10002E6E49B UniRet90_R7EZVO UniRef90-D9PWUO UniRef90 UPIOOO3628A62 UniRef90-A0A059KGD9 UniRet90_C4R503 UniRef90-AOAO24PZB9 UniReffo-R5Y2S1 UniRef90-Q46G.J6 UniRef90-C5NU98
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UniRef90_U5SDTO





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160 NSSEGGYDGPSNLAAAVCTALSPQSRCKGVLVVMNNEVNA PATALSADGPMNLLEAVTLATAKQAENRGTLVVLNDRIGS PAGYASADGSANLIDAVKVASNPLDQNRSVMVVMNDSIFA PATAlSADGPMNLLNAVKLASDESAYGRGTMVLLNDNIGA SSNELGADGPHNFISAVKTAATDEAKGKGVLVVFNDEI HT PATALSADGPGNLLSAVRLAGSKSAKGRGTMIVLNDKVAS PSDGVGDDGPANLLAAVRMAASPASRGRGTMVVLNDE:MA PATANSADGPQNLYEAI ALAASEEAKGKGVLAAFSDLI LS PATAISADGPFNLLEAVTLAADDGAEGRGAMIVLNDRIGS PGGVVGADGPNNLLEAVEVAASPQAQGRGVMVVMNDT:HD PATALSADGPLNI FNAVAVAADAEAKGRGVLIVINDDIHG SSNELGSDGLYNLLSALKVAVADHAKSMGVLVVMNDEVHT SGDElGGDGPRNI GSVRVASHPESDDKGVLVVMNDE1HT

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\mathrm{S}
$$ SUNEDGADGLYNYISAI RTACHDDAKNKGVLVVFNDEI H P A T A LS A D G P L N I LD A V R V AA A A D E A R D R GVVLVVVLN N T I H S


NS SEELGYDGSSNL A A AVCTAVSEKARHLGVLVVLNNEVNS SANEI GSDGLHNLETAI QTASTPDAAEKGVLVVMNDEI HS S S N E I G S D G L Y N L DA S L R VA V S S E A M N K G V L V V L N D E I H T

 P A T A $i$ S A D G PM N L L A A V T LAA A S A K G R G R G V M V V L





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$P$ L A E R R T D G K E N L T T A V Q








 $P A T A A L A P D G P Q N L L D A L S V A R \quad Q P G A Q G V V A V C A C T I H S$ SAD R PSSSDNVMNAI CATKVVAVSDDAEVVCTVMHESSSSDDHY
 P A T ATSAD GPMNLYQAVSIAASEKS LGRGTMITLNDRIAS GGDEVSADGPANILNGVRVAVSESAKGQGVLVVLNEDISA





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| :---: | :---: |
|  |  |
| Ref90 U2LP>8 | SMY |
| UniRef90 ${ }^{\text {W }}$ | TTFMDPSQAP FPRVDIIYSHTQMD |
| UniRef90-UPIO | DVSKDETDPKVDIVYSYQDM |
| UniRef90-Q9KCE | ESYTVSSIDHRVVLLKAYAGMDGSVVDAIIADTGU |
| UniRee90-A0A016PEL4 | ASSPKKALPQVDVLYGHQEADPELIQAAIDSGA |
|  | GVSLKCAC |
| iRef90_WORTK5 | GVS ELP RVD |
| iRef90_UPIO004700853 | ARRWP |
|  | HTRFTTEALKRUPRVEI AYFSADADPE1 |
| 促 | TDKPHFDVTSLDGLPKVDIVYAHQDMDPALIF |
| UniRef90-W6WS4 | DSRQSPYTLPAAGPLPRVDIVYAHSNMDASQIDHAVADNA |
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| UniRef90_UP10004 | EHFHAEKMDKKVLLI K Y Y A GLE GDVEQHLI SQPL |
| UniRet90-A6L | STP SKLSAKVWMVTCWSGMEGDIIRAAGEAQV |
| UniRef90-D4JDX5 | QT |
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| UniRet90_R5P |  |
| UniRef90_V9H357 |  |
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| UniRet90_C9LYU0 |  |
| UniRef90-V8QWP2 | T |
| UniRef90_UP1000386 | TVEPRVALK K M A M D S |
| UniRe90-CTMJK | S S A A Pr |
| UniRef90-D5WMS1 | QSARAALSLPANGQLPRVDVVYAHSNMDGRQLDA |
| UniRef90-A9B | Q |
| UniRef90-R5E | ELTARVDIVTGQTGDGRDYIDFAVAQGC |
| UniRef90-14D8F4 |  |
| UniRef90_UP1000399 | QTLP |
| UniRef90_U6EB94 | P |
| UniRef90_B9E6L8 | SD |
| UniRet90-_6BJB9 |  |
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| UniRet90_E8SHG4 | LTNINASLQIPLIKAHMGMGCEMLDFYAERHIV |
| UniRef90-R5PVG4 | F S |
| 2JGU4 | AFRQHIDTDSVERRVDLKTVLDMDDRLVRSAVDLGA |
| 佰 | Cob |
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| UniRef90-UPI00039BACFF | TAQR\VFDVSNLTKLPKVGl 1 Y AYSNTEAD |
| UniRef90-B8KJY1 | HTTASEFDVSAVASLPTVLVLSDFTGLDAAVVRHFGELPM |
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| UP100031A3F1B | PMFGGASGD |
| UniRef90 ${ }^{-}$W4QA |  |
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| UniRef | RVDVY |
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| UniRef90 R71M87 | PVGRQCFAPKALTAKVDLIPAQTGLGSEYIDFAISRGC |
| UniRet90_D2BPL6 | S |
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| UniRet90-O5HP67 | VNLRVPLVKAYMGMEDDVLSFYSQQHV |
| UniRef90_D1P027 | EKLPAVGIVYNYA |
| UniRef90_C4LB833 | KPLKMHSLQPQPI G |
| UniRef90-K2N |  |
| UniRef90_R5NH88 |  |
| UniRef90 UPIO0046FF722 | TPOPDGVV TMYPGLSAEVIKNTLROPV |
| - | DRLEPRCALTKYFPGADPEIFNHLIRLGY |
| UniRef90-UPI0002E6E49B | ¢ |
| UniRef90-R7EZV0 | GPLRVQKN MDPSVLSI D DFPGMKPEVLNYLLEPGV |
| UniRef90-D9PWU0 | SAEL ELHDRVEERVALIKSYPGMSPDII EWHLERGY |
| UniRef90-UP |  |
|  | - |
| UniRef90-C4R50 | VIVLYAHQGFDPQIVRLCASQNV |
| UniRet90 A0A024PZB9 |  |
| Ref90 R5Y2S1 | SUKPLKPHFL FDTNVIVLTLIFPGIDQEHIVTEVLKMGLL |
| UniRet90_Q46GJ6 |  |
| UniRet90_C5NU98 |  |
| UniRef90_Q03 |  |
| UniR | VVEVMSYAGASGVVVEALLTQGV |
| UniRef90-D5E6V7 | (l) |
| UniRet90-G0EEK5 | KLVVENGFDDRVALIKYYPGMKPEII EFLVEQGY |
| UniRef90-PoCZ17 | EVIILYSYQGLNPELIVKAVD |
| UniRet90-UPIOOO479F465 | P A ELLTDYAGFDSTVMRAAIVRRP |
|  | CDIDHVVDH |
| Un |  |
|  | S T |
|  |  |

## UniRef90 C6PQ19 UniRef90-AGTQ93 UniRef90 U2LP UniRef90_W7E5Q4 UniRef90_UPI0002D69492 UniRef90-Q9KCE7 UniRef90-A0A016PEL4 UniRef90 L7EGW8

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K6VRW1 UniRef90-A9BQC6 UniRef90-R5EJ43 UniRef90-14D8F4 UniRef90-UPI000399F153 UniRef90_U6EB94 UniRef90-B9E6L8 UniRef90-BEBJB9 UniRef90-10GMS6 UniRef90-E8SHG4
UniRef90_R5PGG4 UniRef90-F2JGU4 UniRef90 - 19 KZ92 UniRet90_U5LD58 UniRef90_W4ARLO UniRef90-UP100039BACFF UniRef90-B8KJY1 UniRef90-UPIOOO4685EOE UniRef90-F0XE72 UniRef90-UPI00031A3F1B UniRef90-W4QA.J9 UniRef90-K9B7S5 UniRef90-UP10003B31EDD UniRet90_FOT727 UniRef90-D8IPEO UniRef90-UPIOOO2EDC5DF UniRe90-C7Z2A5 UniRef90-R7M87
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UniRef90D
D1P027 UniRef90-C4LB83 UniRef90-K2NT33 UniRef90-R5NH88 UniRef90_UPIO0046FF722 UniRef90_B5FF15 UniRef90-A0B7W3 UniRef90-UP10002E6E49B UniRet90_R7EZVO UniRef90-D9PWUO UniRef90-UPIOOO3628A62 UniRef90-A0A059KGD9 UniRet90_C4R503 UniRef90-A0AO24PZB9 UniRef90-R5Y2S1 UniRef90_Q46G.J6 UniRef90 C5NU98 UniRef90-QO3HC4 UniRef90-UPI00047DD052 UniRef90_D5E6V7 UniRef90-UPIOOO4712476 UniRef90_GOEEK55 UniRef90-UPIOOO479F465 UniRef90-UPIOOO3624788 UniRef90-C7RBC6

UniRef90_U5SDTO

250
260
270
280

HG|IVI|EGMGRGNIIPPKMVISGVEYALLSKNIIAVVLVISRCLKG KGI ILEAMGRGNIPPAMIPGVEYAIKNNVAVVMISRCPTG KGIVIAGNGNGNVSTNMEAAI GKLHQQGIPVVMSTRTGAG KGI ILAGVGDGNTSADALKALQEARKKGVIIVRSTRVGSG DGIVVAGSGNGSVPSAVRERISQLNEDGYPVVLSTRTGSG DGLVIEAFGQGNLPPAVVPSIKRLHQANDPVVLVSRSVSG EGGVLAGLGAGGWPDEAADEIKKLNETDIPVVVVRRTAWG KGIVIEGMGSGNDPPGMLPGIDYADNRNIPIILVSRCITG | $K G L V V A G A G R G G T P S A M R Q A I D R A M A N G V V V V D G S R V G S G$ |
| :--- |
| $Q G I V L A G V G D G N T T D A L Q A L A G A A A R G V A V V R S T R C G S G$ | EGLVIAGAGSGLFSKPWKEKIARGIAREIPVVRSSRVGNG KGIVIAGSGNGSIPDTLKPLVKQAVEDGI PVVRSTRTGNG KGUVIAGVGDGDVSKAALAAMERAAKMGIVVVRASRVGTG KGLVTAGVGNGNMTGDALQALERARAEGVVVVRSTRVTSG DGLVIEALGQGNLPPMMLPGLK ALLDKNVPIVLVSRCFNG


 DGLIVDALGCGNVPPKCKTEMMKLGEAGLPMVLTTRVPSG DGVVIAGTGSGNYPSADKDVIEK SNDDCILVRSSRVIEG RGIVIEAFGRGNVPPELEDGILFAREKKIPVVITSRCYNG HGIVLSCTGNGSVPLVFEPVLQKAHD VVCVRSSRTGSG

 AGGVHAGTGNGSIHEALLATLADAAGKGIGVVRASRTGAG RGIVLAGVGDGNTSATALKALEAARKDGVVVVRASRVQNG DGLVIEGLGAGNLPPQTVSAVGRLIAKHVPIVMVSRAFNG KGIVVAGVGAGGWPTKAKEALEEVVKKTKVPVVVSRTAWG KGlVVAGEGDGDMSKEALAALDRAAAKGTVVVRSTRLVSG AGVVYVGHGAGNVPSDVLPRLGALVDAGVVVMRASRVCSG KGIVIDADGMGNMNVAMLDAAKYALGKNVPVVVSTRVHNG KGIVLEGFGRGNLPAIVEPADKDATDKGVVVVITTRTPGG GALVIEAFGRGNLPPHLVPEIAEVVERGIPVVITSRCLFG EAIVVEAYGWGNMNAEMHDAIVDVIAKGVPVIVATKVYNG KG\| LMEGTGLGHCPDHLIPSLQRAADENI PVVMTSQCLYG DGLVIEALGQGNLPPSSLDG|QYLIDKNIPVVIVSRCFNG KGGVIEGTGRGNVTPTMVEGI KYALANNVIVVIVSRCLTG QGIVYAGMGNGSIPERAEKELAAAVQAGIPVIRSSTSVSG DGLVIEALGQGNLPPTAMPGVNACLDKNIPIVLVSRSFNG RAIVHAGTGNGSIHCCTDEALADAADAGVLIIRASRVTTG VGIVIEAMGRGNVPLKVLEGIRYATSKGVIVVIVSRCQSG HGVVI EALGAGNLPPATLPAVQKLLDMQIPVVLVSRCFNG DGVVIEALGQGNLPPAAAVGVQSLIEANIPVVLVSRCFNG KGIVIAGAGGGDYSKPWIDKVGELKNNNIPVVRCSRISSG KGVIHAGLGNGNIHKNVFPVLEKAREQGILVVRSSRVPSG DGLVVRTFAGGRMSAGMLAGLASMSERGUPVVVTSRVPKG KGLVFAGSGAGSWTDDGNAAAEKAI ENGTAIVYSRRPMDG RGIVIQALGFGNVNAALYEADREAIVQGVTVVISTRVANG
 KGIV NSGGYS KGMVLEGTGLGHCPEELTPSLERAADESIPVIMTSQCLYG KATIHDGTGNGSVAEQUVPVLQEVRSKGVQVIRASRTGSG DGII IEALGQGNLPPTCLVGLNQCLSNNIPVILVSRSFNG KGVILAGMGAGCWSKDGGQAISKVREKGDLVIVSYRTAYG NGIVIEGFGRGNTPPAMEEGI DRAVAKGIAVVIATRAFAG DGLVIEALGAGNLPPDASQSLQRLLDAKVPVVLVSRCFNG DGIVVEALGQGNLPTTCLHGLKQILDNDIPIVLVSRSFNG KGLVIATMGAGSFPSKCNKFLADTVSADFPIVYSKRSMDG DGVVIEALGQGNLPKSCLNGLQQCLKKNPPLVLVSRSFNG QGIVSAGVGNGNMYKT IFDSLANAAKDDIVVVRSSRVPTG KALILLTYGVGNANPAMLRLLREASARGVIIVNLSQCLRG RAIVEAFGRGNAPNGFAEAI APIVERGIPVIIASRCHEG KAVVMKTFGSGNAPPWF KLI KEAAERNI II NITGCQSG RGVI LETYGSGNATTWFLDLLAEAVQKGIIIVNVTQCLSG NAMILLTFGVGNANPELLAQLKEASERGVVVVNLTQCLSG RGMVIEGTGLGHVATDWIPFIKKATDNGIPVVVASQCLSG NGLVVEALGQGNLPPTALDGLHKLMDAHDPVVVVSRSFNG KGIVLRTYGAGNIDPWFINAIKKASDSGKFIVNVTQCSNG KGLVMEGTGLGHCPDTLIPVLREAHDMGVPVAMTSQCLNG KALIYGGTGNGSVADYMEEPLKEVRKKGLIVVRATRTGSG KAIIHAGTGNGSVSNQVVPALRELRAQGVQIIRSARVTAG RGVVEATMGAGSLSKETNIDELYKAWKEGTPIVFSKRSMDG DGLVIEALGQGNLPKETITPLRDLIQNQMPVI LVSRCYQG KAVVMKTFGTGNAPEWFVRAVREATQRGLVII NITQCPSG RGLVLEGTGLGHVSTKWIPKIQKATDAKMPVIVTSQCLNG DGLVIEALGAGNLPPKTVPAIRNCTEKNTPVVFVSRAFNG KGGVI EGLGAGNLPVEVVEPIQALIDNDITVVMVSRCYNG QGLVVAATGNGTLHHALEAALLKAQAAGIKVVRATRCLNG KGIVIEGTGLGHVSTDWVPEIKRATQTNIPIVIASQCLHG KALILRSYGVGNANAEFLTELLRQASERGIVVVNLTGCLSG KGIVLAGSGAGSWTATGSIVNEQLYEEGIVIVHSRRTADG RGIVFTSFAGGRLSGGGQAAVRMAGAAGIPVVVASRVPGG AGVVIEGLGAGNLPPVTLPALQRLLDRHLPLVLVSRCYNG DGVVLQSYGAGNANQALMDA: REACANGQVIVNCTQCLKG KGVVLETFGSGNMDEWFLNALSNAVKRGVVII NVTQCVTG

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UniRef90_U2LPX8 UniRef90-W7E5Q4 UniRef90_UPIO002D69492 UniRef90-Q9KCE7 UniRef90-A0A016PEL4 UniRef90_L7EGW8 UniRef90-W0RTK5 UniRef90_UPIO004700853 UniRef90-R5C708 UniRef90_UPIO0046AC544 UniRef90_W6WS49 UniRef90-B7RZ08 UniRef90_UPIO0047C7777 UniRef90_BOVHI1 UniRef90_UPIO004116EBF UniRef90_A6LLE3 UniRef90-R6A4P7
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UniRef90 V9H357 UniRef90-V9H357 UniRef90_UPIO00288BBD0 UniRef90_C9LYU0
UniRef90-V8QWP2 UniRef90_UPIO003B694F7 UniRef90-C7YJK4 UniRef90-D5WMS1
UniRef90 K6VRW1 UniRef90-A9BQC6 UniRef90-R5EJ43 UniRef90-14D8F4 UniRef90_UPI000399F153 UniRef90_U6EB94 UniRef90-B9E6L8 UniRef90-F6BJB9 UniRef90-E8SHG4 UniRef90-RSPVG4 UniRef90-F2JGU4
UniRef90-I9KZ92 UniRef90_U5LD58 UniRef90-W4ARL0 UniRef90-UPI00039BACFF UniRef90_B8KJY1 UniRef90_UPIO004685E0E UniRef90-FOXE72 UniRef90_UPI00031A3F1B UniRef90-W4QAJ9 UniRef90-K9B7S5 UniRef90_UPI0003B31EDD UniRef90_FOT727 UniRef90-D8IPE0 UniRef90 UPI0002EDC5DF UniRef90_R71M87 UniRef90_D2BPL6 UniRef90_F9L9Q0 UniRef90_A5E6N2 UniRef90_Q5HP67
UniRef90-D1P027 UniRef90_D1P027
UniRef90_C4LB83 UniRef90-K2NT33 UniRef90-R5NH88 UniRef90-UPI00046FF722 UniRef90_B5FF15 UniRef90-AOB7W3 UniRef90_UPIO002E6E49B UniRef90_R7EZV0 UniRef90_D9PWU0 UniRef90_UPIO003628A62 UniRef90-A0A059KGD9 UniRef90_C4R503 UniRef90-A0A024PZB9 UniRef90-R5Y2S1 UniRef90-Q46GJ6 UniRef90-C5NU98 UniRef90-Q03HC4 UniRef90_UPI00047DD052 UniRef90_D5E6V7 UniRef90-UPIO004712476 UniRef90_G0EEK5 UniRef90-P0CZ17 UniRef90-UPIO00479F465 UniRef90-UPIO003624788 UniRef90_C7RBC6 UniRef90_UPIO0046A23C5 UniRef90_R6P687
UniRef90_U5SDT0

300

320

 $F V N N D D Q N Q F I V S E D L N P Q K A R L L L Q Q I L L A N K N N L D Q I Q K$

 $K V S D S Y G Y K G \| L G G N L N G Q K A R I K L M A A L G F T N D L C E I K K$ SVVPGEGVSMVGTGDLNVQHARVLLMLALTKTTDAREVAR

 $\square V S$ AKEEGI GSGALNP QKARILLLSLVLTETDDMDKVRG FVVNRNVEVDGVAS LDDLNPQKARVLETLLIANGTTPAKVQQ

 RVLPEYGYEGILDAGMKGVKARLKLMALFGKYQDADVVRR



 PVVTRWQVNGMI PS GTL N P Q K A R I L L Q L S L K K G LDDLE K I K E
 $Y \vee Q D V Y N Y D G \square F S N G L N G Q K A R L K L L V T L E M T N N H D E L Q E$
 $A V V N D D Q S G F V V S P G L N P A K A R V L T Q L L I A N K I T P D C V Q Q$

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


 RTMLNVYSTGISVGDMLPETAYVWLVWALGQTSQYQEVKQ IA S GN Y Q Y E G I F S N G L N G Q K A R L K L I V A R V L D T Y G Y K G L L G E NL N G L K K A R I K L ML S L G Y S N N Y E E I K R $M V V K A E E A G F I$ AS GLLLNPRKARLLLQAAVVCGKGTADLRN IV S A V Y A Y E GI F S N GL N G Q K A R L KL LVAAL SND F Q H D Q I Q D
 I A Q DV Y A Y E Gll




 IV Q D I Y A Y E GIIF A N GL N G Q K A R L KL M M I L E Q T S DLLS QI Q A



 RPY QSYA YP GSVVGGEAS GAK T RLLKLMMILLSEASNRDELER IA E P V Y S Y Q GMFADEVVNS QK A R I K L I I AAL N A G L D L L S E L R P
 $\bar{M} V P E G A F Q N A I A G G Y L N P Q K A R I L L Q L C L N A G Y D L K K I K Q$ VV S P V Y A Y E G $V$ F S N G G







 GEQPDD QY DWVVSHD L N P QKARIL LAMVALAR GADSKA L QR $M V P \square V Q F D G C M A S G Y L N P Q K S R I L L Q L C L G A S M K D R Q I A D$



 $R V L P K P G D T L P D S N G L S P V K A R V D L L L H L$ $R V C D R V Y D T G I E A E D M L P E V A L V V L D C V L G Q T S D L S E V Q K$
 RVVNMNVVYAS GI P G S DMLDPEVAAFVKL SWVLKRARDPE EAKR


 YV D MMRYETGLSGYDTTTECALVKLMYLDGQGYSNEKVKQ I A Q D V Y D Y M G I F A T G L

| UniRef90_C6PQ19 | Tf EK |
| :---: | :---: |
| UniRef90_A6TQ93 | LIE S |
| UniRef90_U2LPX8 | Y F D |
| UniRef90-W7E5Q4 | S |
| UniRef90-UPI0002D69492 | Y F |
| UniRef90-Q9KCE7 |  |
| UniRef90-A0A016PEL4 |  |
| UniRef90-L7EGW8 | 1 F K Q |
| UniRef90-W0RTK5 | MF |
| UniRef90_UPIO004700853 | L |
| UniRef90_R5C708 | 1 F K Q Y |
| UniRef90-UPI00046AC544 | YFE |
| UniRef90_W6WS49 |  |
| UniRef90-B7RZ08 | YFNKY |
| UniRef90-UPI00047C7777 |  |
| UniRef90-B0VHI1 | F F K Q |
| UniRef90_UPI0004116EBF | C F E |
| UniRef90-A6LLE3 |  |
| UniRef90_R6A4P7 |  |
| UniRef90-D4JDX5 | 1 |
| UniRef90-UPI0003B75D60 | C |
| UniRef90-M1E785 |  |
| UniRef90-R5E1U7 |  |
| UniRef90-R5PQK2 | Y F D K |
| UniRef90-V9H357 |  |
| UniRef90_UPI000288BBDO | M F |
| UniRef90-C9LYU0 | M F R |
| UniRef90-V8QWP2 | A |
| UniRef90-UPI0003B6؛ | Y |
| UniRef90-C7YJK4 | 1 |
| UniRef90-D5WMS1 |  |
| UniRef90_K6VRW1 | F V D |
| UniRef90-A9BQC6 | V F D |
| UniRef90-R5EJ43 | L LD |
| UniRef90_14D8F4 | ML LT |
| UniRef90-UPI000399F153 | L F D K |
| UniRef90-U6EB94 | 1 ME T |
| UniRef90-B9E6L8 |  |
| UniRef90-F6BJB9 | MFQS |
| UniRef90_10GMS6 | F LR |
| UniRef90-E8SHG4 |  |
| UniRef90-R5PVG4 | AFSK |
| UniRef90-F2JGU4 | L |
| UniRef90-I9KZ92 | F |
| UniRef90-U5LD58 | L |
| UniRef90-W4ARL0 | M F N |
| UniRef90_UPI00039B | Y |
| UniRef90-B8KJY1 | 1 |
| UniRef90_UPI0004685E0E |  |
| UniRef90-FOXE72 | V |
| UniRef90-UPI00031A3F1B | L |
| UniRef90-W4QAJ9 | L F E Q |
| UniRef90-K9B7S5 | Y |
| UniRef90_UPI0003B31EDD | T |
| UniRef90-FOT727 |  |
| UniRef90-D8IPE0 | 1 M WK Y |
| UniRef90-UPI0002EDC5DF |  |
| UniRef90-C7Z2A5 | V |
| UniRef90-R71M87 | 1 |
| UniRef90-D2BPL6 | F |
| UniRef90-F9L9Q0 | Y F E E |
| UniRef90-A5E6N2 |  |
| UniRef90_Q5HP67 | Y |
| UniRef90_D1P027 | MFEQ |
| UniRef90-C4LB83 | LM Q Q |
| UniRef90-K2NT33 | EF E K |
| UniRef90-R5NH88 | LM N T |
| UniRef90-UPI00046FF722 | LM Q Q |
| UniRef90-B5FF15 | MMQQ |
| UniRef90-A0B7W3 | M ${ }^{\text {DS K }}$ |
| UniRef90-UPI0002E6E49B |  |
| UniRef90-R7EZV0 | A F E K |
| UniRef90-D9PWU0 |  |
| UniRef90-UPI0003628A62 | 1 L |
| UniRef90-A0A059KGD9 | V F M E |
| UniRef90_C4R503 | 1 F K T |
| UniRef90-A0A024PZB9 | M F |
| UniRef90-R5Y2S1 | L M N Q |
| UniRef90-Q46GJ6 | MLRE |
| UniRef90-C5NU98 |  |
| UniRef90-Q03HC4 | Y M H |
| UniRef90_UPI00047DD052 |  |
| UniRef90-D5E6V7 | L $\quad$ Q |
| UniRef90-UPI0004712476 | $L$ MQQ |
| UniRef90-G0EEK5 | L M L E |
| UniRef90-P0CZ17 | V F |
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| UniRef90-UPI0003624788 | Y L S T |
| UniRef90-C7RBC6 | KMSE |
| UniRef90_UPI00046A23C5 | LME Q |
| UniRef90_R6P687 | V F S |
| UniRef90_U5SDT0 |  |

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UniRef90 BOTZ59 UniRef90'UPIO00464E802 UniRef90-A0AO23VLJ1 UniRef90-M3HP16 UniRef90-X8IMR0 UniRef90-C0C1W8 UniRef90-A6UWS4
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UniRef90 $\mathrm{C4YCF}$ UniRet90-R5A796 UniRef90-U2DKA2 UniRef90_UPIO00469E71F UniRef90 D3RX33 UniRef90_R6YHM2
UniRef90-W4EMC4 UniRet90_B5IAQO UniRef90 R2RRG3 UniRef90-F7RX25
UniRef90-H1QOW3 UniRef90-F8DOZ9 UniRef90_W2C752
UniRef90-UPIO0037FFAB5 UniRef90-UPI0002 195A1C UniRet90_R6BGX0 UniRef90-A9KTD6
UniRef90-A9DNZ3 UniRef90-U2QMO1 UniRet90-R7LDU3 UniRef90-A3G176 UniRef90_C4ZJ57
UniRef90 A4C9R8 UniRef90-A0A037Z802 UniRef90_11DYG7 UniRef90_UPI00037746A1 UniRef90-A0AO22FUD6 UniRef90-E7GRB6 UniRef90-F4B2R4 UniRef90_C5F8X9
UniRef90_C2NS49

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PSVLLIYTGGTI GMIENPET
G MNKVLLIYTGGTIGM ENPGQN $N A V T G$
$Y R T G A$

GALENS ENPMNQ MNKVLLIYTGGTIGM G GQNAVTGALEPLDFNHLVES MKKILVIHTGGTISMMEDADT GAVKPGEENPLSAH MKKILVLHTGGTISMQADDNGQVIPNSYNPMN
PNVLVI GTGGTIAGQSTDATSFQSYRAGTLADEDMVGE KQVLIIGTGGTIGMAVDPDTN NGSAGPFDFENMSRK MKTILILHTGGTI AMSQNEDGGVAPNSANPLDTFKNP LPKTLILATGGTIAGSSSSATDSTAYTAGVVGDGVLVQA RKPRVALVGTGGTISSIGRDSDDVWEYTSRKAEPEELLQR
 MKRILLIATGGTI ASVQTENGDAPASTAPASTAEELLSY QLPTVSILSTGGTVASRVD VRTGAVSSQFTPDDIMDS MKKVLLLSTGGTVASIKTEKGLTPG


SQYTAGKVSDDALINA
 KPRVKLGGTGGTVASKADSTTQTAGYDLGGLTIDQLLSQ S $\square P R L L L L G T G G T \boxtimes A G T A P E S T Q L N R Y A A G V I G A E A L L T T G$ MKKTLVLHTGGTTAMHSDRSGH\|VNDSNP

NGASEAFEMMAS VLIVYTGGTI GMIVENPH YETGGALEAFDFEYMEQH
 SLPNVTIVATGGT:AGSGSSNTATTGYSDGSVGVLSLVDAA KKIYUAYTGGTVGMQKSAK GOGYVPGAGFMTNSLAA s
 MKRILILHTGGTISMSEDEHGAVRPDEKNPLDAAGQKLD MKNILLLATGGTIASVEGKEGLVPG
$G Y$ GPVSGHAEEALLQY EKPN|LLIYTGGTVGMVKDYERTGGVLKAFDFNTLLKS
 MKRILVLHTGGTI AMQEDSLTK MKElLVLHTGGTHSMQSDESGKVFPNQUNPMN MKKILMLGTGGTIACKRGDSGLK SMRQLVLHTGGT:SMQADAAGQVAPNAINPMT
SLPNUKVLGTGGTUASKGLTSHQTAGYEVD LTDEDLVNS
MKKVLLLATGGTTAARRGRQGLAPD $\square N C G D F L D M$ LKNI SILSTGGTVASRVDYNT GAVHPAFTADDLIRA MKNLLALHTGGTISMSQDEKGGVVQNDENPDDNNDLLGL LPPRVRLVATGGTI MSKVD VGRTGAVYPSFSLEDLYAM MKRILLITTGGTI ASKPTSDGLT GAVPSVTEEEILEY RLPVIAVEFTGGT:GMSPTEGGACGVAPGGNFDKLLNQ MKHILLIATGGTIASRKTDQGDT PQLSPQELLGY VLLIYTGGT GMDENPETGGALENFDFEHLQKH KKKSIYVAYTGGTI GMQKTSN ELDNVKVISTGGTIASKVD YRTGAMPVAGFLTECVNS PSVLLIYTGGTI GMIENPET MKKILLIHTGGTI SMHVNEE LPTI SII GTGGTI ASYVD $\qquad$ T KRKRIYI AYTGGTIGMMKSAH KVLLIYTGGTIGMGCDPRT KMKKLLLLSTGGTI SKSSVLLIYTGGT GMVENDGL GMVENPETLAPGE $\qquad$ MKKULITTGGTA AMGQDERQDVQ


PNILLIYTGGTIGMIKDFETLAG KKRIVVINTGGTISSVKTDHASSAYEPAPGYVESALAQ LLPRVVVLATGGTHAGSSSSAASSAKYQAATVPVTALLDA SKAKILLIYTGGT: GMDKDYETD GADKAFNFDELLEK




UniRef90_C6C5W8 UniRef90-H0PWQ9
UniRef90-X2GVC2 UniRef90-R8ANYO UniRef90-H3NKW5 UniRef90_B6HE41
UniRef90_N6VTPO UniRef90_UPI0003786C18 UniRef90-J9BPJ2 UniRef90-F9D6M0 UniRef90-K4M7D2 UniRef90_G5JXD4 UniRef90-G4HHD1 UniRef90_UPIO0029A09CE UniRef90-J1F3U7 UniRef90-M7WYU3 UniRef90-F3ZUU0 UniRef90-K7PER6 UniRef90_UPI000379F86A UniRef90_UPI0002375EC4 UniRef90-R6Z187 UniRef90_Q0W7A3 UniRef90-B2A299 UniRef90_UPIO00365CF36 UniRef90-F9V7P7 UniRef90-D2TZM6 UniRef90-FOXAV9 UniRef90-B5E2J0 UniRef90-W6MQ40 UniRef90_A4CY73 UniRef90_UPIO00362385F UniRef90_UPIO0047094E9 UniRef90-Q8TV84 UniRef90-W9Y7C7 UniRef90-F8DDJ5 UniRef90-H2FX79
UniRef90 F2QRD0 UniRef90-UPI0002EEDE33 UniRef90-R2S1F9 UniRef90-UPIOOO4729843 UniRef90_IODNX6 UniRef90-A4AMP6 UniRef90-W8X2C0 UniRef90-W7Y7D0
UniRef90-K1MH50
UniRef90_R2RZP5 UniRef90_G5JZZ5 UniRef90_B0TZ59
UniRef90_UPI000464E802
UniRef90-A0A023VLJ1
UniRef90-M3HP16
UniRef90-X8IMR0
UniRef90-C0C1W8
UniRef90_A6UWS4
UniRef90-G2KTE5
UniRef90-E1QRJ9
UniRef90-R7BF41
UniRef90-E6VZ08
UniRef90 C4YCFO
UniRef90-R5A796
UniRef90_U2DKA2
UniRef90_UPI000469E71F
UniRef90-D3RX33
UniRef9O-R6YHM2
UniRef90-W4EMC4
UniRef90-B5IAQ0
UniRef90-R2RRG3
UniRef90-F7RX25
UniRef90-H1Q0W3
UniRef90-F8DQZ9
UniRef90-W2C752
UniRef90_UPI00037FFAB5
UniRef90_UP10002195A1C
UniRef90-R6BGX0
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UniRef90-A3G176
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UniRef90_A0A022FUD6
UniRef90-E7GRB6
UniRef90-F4B2R4
UniRef90_C5F8X9
UniRef90_C2NS49



160 PATALSADGPMNLYEAVSVAAHGESDGRGVLVSFGGDIHA
 SSNEIGSDGLDANLRSALLVARAEASAQRGVLVVMNEEIHT






 SANEI GSDGLHNFQTAI QTAASDEAKNKGVLVVMNDEIHT PSTA I SADGPNNLLQAVTTAVSPNSRARGTLIVLNDRICA $P A T G L S S D A A M N L L N A V R V A G A P A A R G L G V L V L L N D E I Q A$ PSTSLSADGPLNMLDAVRVAACREAVGKGVLVVLNQQIHA PANALTPDGPQNLLDAVAVVQAPGA SGVLAVAAQQLHG
 SSDRPSSDNAMNA CAAAVAVSDUAGVTVVMHGSTSDDAR SSNELGSDGVYNFLSALRVASHDKSADKGVLVVMNDEIHA SSNELGTDGIYNFLSALRVAADDASHDRGVLVVMNDEIHS PATALGADGPLNLYNAVIVATDKEAGNRGVLLAMDDKVDS
PASALSADGPMNIFQAVSVAACTAARGRGTMIVTNDRIGS
SSNELGSDGVYNYLSALRVASDDRAADKGVLVVMNDEIHA PASALSADGPMNLYQAI LVAASKSSRDRGVLVSFNDQISS
 SSNALGSDGIYNYLCALRVAAHPKAYDKGVLVVMNEEIHA
 SSDRPSSDAASNLIAACAFAGDGEVGEVTVCMHEVCLVVR PADHPGADGPANLLQAVRVAADDRFED GVYI AFGNLVHA PLVELRSDGRNNLLNALYIAAEYP DHEVGLFFNNRLFR
 SI NELGSDGLYNFQSAI RVAACKDADGQGVLVVMNDEIHS
 $P$ I G DL RTDAKENLI TSI QI AA DRKSVIQEVGLYFEYKLYR PASALSADGPGNLVNALLAAADPASRGRGVLVAMNDRIVA PLSTI RTDGKENLITAALDIASTYHAMVPEVCIGFQDKLFR SSNEI GADGLANLRSSIIVAASPESRNKGVTVVMNDEVHS SSNELGSDGLYNFESAI RVAACPEADDKGVLVVMNDEI HS
 SANEIGSDARYNYLTALCRASHDKAKGKGVIVVMNGKAHA PSTAI SSDGPMNLYQAIII ASNQMSKNRGVLIVTLNDS I GS PATAISADGPMNLLEAVTVAADPEAKGRGVMVVLNDRIGA P $\square E Q M F T D A R R N L Q T A F A A V$ EAGDPKVMVAFDDKI $\square \mathrm{N}$ S SDRPSSDAALNLISATMCATEQDKGVFVVMHGESGHLHR SSNEDGADGVFNFKSADQVAASDEAKNKGVLVVFNTGGIYA
SSDRPSSDAFENMLAAVLVARAPFAGSYVVMHASTNDVHA P LAAAVDSDARSNLLNAIVFACD SRAHGVHLLFDNKVIL Y Y SESGYDGDRNLINAVRACLDPDPPGTGACVLMTDRIFA S I DEDTTDAKTNLLDSLRYACSGES GVCIVFGSHVIA P 1 GVLRTD GKENLMTSIEDAAACNGEGPEVCI FFENHLMR $P L S Q L R S D G Q T N L L N A L Y I A A N Y P$ VAEVCLFFNNKLFR SSDRPSSDAAMNMI CAAHAALSDDGEVVVVMHGTTSDDHR
 SSDRPSSDAYMNLLSAVKVAKSDDGEVAVVMHDDYCHIHR SSNELGSDGLYNFESAI RVASCDEAVDKGVLVVMNDEIHS

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

 PLTHPLTDA DDNLRYALAMAAT G T P GI Y L AFHRKVIL
 PIGQLRTDGKENLLTS SEDAAATDPRVPEVCIFFESRLMR PSTAI SSDGPMNLYQACVIAASRESRGRGVMVALNDRIGS PATALSADGPLNLYQAVELACRPAAARSGVLAVVGDRILP $P L S Q L R S D G Q V N L L N A M F L A A N Y P I D A B E V S L F F N N Q L F R$


 $P S T S L S A D G P L N L L D A V R V A A S A G A A G K G V L L V I N Q E I B A$



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| :---: | :---: |
| UniReefo－HOPWQ9 |  |
| UniRef90－X2GVC2 | AVNTTKT |
| UniRef90－R8ANYO | GNRTTKAHADGFDAFASPNFPDLTEVGDNTRQITKSTLTV |
| UniRef90－H3NK | ATYVTKTHTTNVATFQT |
| UniRef90－ $\mathrm{B6HE}^{\text {H }}$ | ALFATKTHANTMDTFKA |
| UniRef90－N6VTP0 | GVKVRK |
| UniRet90＿UPI0003786C18 | A |
| UniRef90－J9BPJ2 | GNRTTKПNAENFNAFRSFN |
| UniRef90－F9D6M0 | GNRSTKINADGFHAFDSFNYPHLCDAGV |
| UniRet90－K4M7D2 | GTKVRKMHTSRRDAFRSUNGKPI GYVDYKAMQLTTSGEHA |
| UniRef90－A6CR96 | AKNVTKTHTSNVSTFQSPQYGPIGIVTKRGVIFHHKPTTV |
|  | AKYVTKTHTSNLATFQTPTHGPLGIIMKRDILFFQ |
| UniRef90－G4HHD1 | ARGVTKTNDYRTDTFETPMLGAVGYVDEE |
| UniRef90－UPIOOO29A09CE | GNRTTKYNAEH |
| J1F3U7 | A MYCEKTQANTLATFASPE |
| UniRet90 M7WYU3 |  |
| UniRef90 ${ }^{-178 P E}$ | AStLRLETFRSADLGMLGYADPDGR\｜IYRAPVRR |
| UniRef90－UPI00 | ARDVTKGHTSAVDAFVSPMAGPLGFVQDGYVRFAHAPSRV |
| UniRef90－UP10002375EC4 | AQQVQKVHPYRAHAFSSGDAGPLGWI EEGRVRLAQAWPPA |
| R62 |  |
| UniRet90－Q0W7A3 |  |
| UniRef90－B2A299 | AKKINSSYDAFDSUNYPVVA |
| UniRe990＿UPIO | KYVTKTHTNVSTFQTPTHGPLGV |
| UniRet90－F9 | ARYVIKTHTTNVSTFQTPTHGPVGLATKHKLI |
| UniRe990－FOXAV9 | AWYTEKHHANSVDSFYSAEQGQLGVFLIEHRPVFFYGP AV |
| UniRef90－B5E2J0 | AKYVTKTHTTNVNTFQTPTH |
| UniRet90－W6MQ40 | GFFVSKSNSNSLETFSSGKFG |
| UniRet90＿A4CY73 |  |
| UniRef90－H5WRI8 |  |
| UniRef90 UPIO0036238 | YVTKTHTTNVSTFQ |
| UniRef90－UP100047094E9 | GNRCTKISADQFSAFASPNYPPLARVG N HYDRRMRLS |
| UniRef90－Q87V84 | AYYVTKNNANT |
| UniRef90－F8DDJ5 | ARWVTKARAGRPEAYASPDA |
| UniRef90 H2FX79 |  |
| 2QRDO |  |
| UniRef90＿UP10002EEL | RSVKVRTMGFDAFESVNCEPVG |
| UniRef90＿R2S1F9 | ARYVTKTHTTNVATFRTPTLGPVG |
| UniRef90－upiout |  |
| 硅 |  |
| A4AMP6 |  |
| UniRet90＿W8×2 |  |
| UniRet90＿W7 |  |
| UniRef90－K1M | AMYVTKTHTTNLATFQTPTFGPLGIICKNEVFYFQKLI ${ }^{\text {a }}$ |
| UniRef90 R2RZP5 | ARYVTKTHTTNVATFRTPTLGP GLVSKKR1LFLGELELED |
| UniRef90－G5JZZ5 | AKY |
| UniRef90 B0TZ59 <br> JPI000464E802 | ANDSKNTM |
| UniRef90－UPI000464E |  |
| UniRef90－М3НР16 | GFYITKSNANSLDTFKS $\square$ GQGYIGNFVNNE |
| UniRef90－X81M | ATTLDTFKAPEEGYLGVI |
| UniRef90＿C0C1W8 | GCRATKVRTDGFNAFESTSANYLGEVYADGD |
| UniRef90 A6UWS 4 | GVKVRKSHSTRRDAFKSIISSUPVAENPFKK |
| UniRet90－G2KTE5 |  |
| UniRef90－E1QRJ9 |  |
| R7 | RARKTH |
|  | VKVNSLNVDAF ESREAGIVGYVAGESV |
| UniRef90－C4 | GYYUSKTDANSLDTFKSLGHGYLG |
| UniRef90－U2DKA2 | GNRTTKLSAENFNAFGSFNYPVLAEAGTHTKYNNVOTHVN |
| UniRef90－UP1000469E71F | GNRTTKAHADGFDAFASPNFPLLEEAGIUIRLRAGKIAPL |
| UniRef90 D3RX33 | GVKVRKNHTSRRDAFQSVNYPPLGKVIYPDGKIE WLAERF |
| UniRet90－R6YHM2 |  |
| UniRef90＿W4EMC4 | KTS T SNV |
| UniRet90＿BIIAQ0 | TRVRKMHTSRRDAKSINSKP |
| UniRef90－R2RRG3 | ARYVTKTHTTNVATFRTPTLGP GLVTKHRILEMQELLAT |
| UniReigo－mrax | GN |
| UniRef90－F80073 | G |
| UniRef90 W2C752 | GNRTSKINADDFNAFSF |
| UniRef90 UPI00037 |  |
| UniRef90－UPI0002195A1C | KT |
|  | GTRAKKVHSKSFNADS |
| UniRef90 A9KTD66 | T |
| Ref90－A9DNZ3 | RTTKUNE |
| Ret90－U20M01 | RAKKTRSKSFQAFSSINHP |
| UniRet90＿R7LDU3 | RTTKINSEGFNAFRSFNLL |
| UniRet90＿A3C | KSNANSLDTFKS⿴囗口⿺𠃊⿴囗⿱一一儿丶 |
| Ref9 | AAALAKRHPSAVDAFS FEGAL |
| UniRef90 A4C | GNRATKVHSDGFNAFASPN |
|  |  |
|  | GVAAM |
|  |  |
| iRet90＿UP1000377 | QKISAQRFN |
| UniRef90－A0A022FUD6 |  |
|  | GCRAVKVRTLGFEAFESVNAPYLAEVFANGMRRYHEPEKP |
| － | ANRTSKISAENFEAFTSPNYPELLTSGVHLTIDNEDALWK |
| Ref90－C5F8x9 | KTHTTNVATFRTPTFGPVGLVTKDGVRFF |
| UniRef90 C2NS49 |  |

## UniRef90 C6C5W8 UniRef90-HOPWQ9 UniRef90-X2GVC2 UniRef90-H3NKW5 UniRef90_B6HE41 UniRef90_N6VTPO UniRef90_UPI0003786C18 UniRef90_J9BPJ2 UniRef90-F9D6M0 UniRef90_K4M7D2

 UniRef90_G5JXD4 UniRef90-G4HHD1 UniRef90-UPI00029A09CE UniRef90-J1F3U7 UniRef90-M7WYU3 UniRef90-F3ZUJO UniRef90 K7PER6 UniRef90-UPI000379F86A UniRef90_UPI0002375EC4 UniRef90-R6Z187UniRef90_Q0W7A3
UniRef90-B2A299
UniRef90_UPIO00365CF36
UniRef90_F9V7P7 UniRef90-D2TZM6 UniRef90-FOXAV9 UniRef90-B5E2JO
UniRef90 W6MQ40 UniRef90-A4CY73 UniRef90-H5WRI8 UniRef90-UPIO00362385F UniRef90-UPI00047094E9 UniRef90_-Q8TV84 UniRef90-W9Y7C7 UniRef90_F8DDJ5 UniRef90-H2FX79
UniRef90 F2QRD0 UniRef90-UPI0002EEDE33 UniRef90_R2S1F9 UniRef90_UPIOO04729843 UniRef90-IODNX6 UniRef90-A4AMP6 UniRef90-W8X2C0 UniRef90-W7Y7D0 UniRef90-R2RZP5 UniRef90_G5JZZ5
UniRef90-B0TZ59 UniRef90-UPI000464E802 UniRef90-A0A023VLJ1 UniRef90-M3HP16 UniRef90-X8IMR0 UniRef90_COC1W8 UniRef90-A6UWS4
UniRef90- G2KTE5 UniRef90-E1QRJ9 UniRef90_R7BF41 UniRef90-E6VZ08 UniRef90-R5A796 UniRef90-U2DKA2 UniRef90_UPI000469E71F UniRef90_D3RX33 UniRef90-R6YHM2 UniRef90-W4EMC4 UniRef90-R2RRG3 UniRef90-F7RX25 UniRef90-H1Q0W3 UniRef90-F8DQZ9 UniRef90 W2C752
UniRef90 UPI0003 UniRef90_UPI00037FFAB5 UniRef90_UPIO002195A1C UniRef90_R6BGX0 UniRef90-A9KTD6
UniRef90 A9DNZ3 UniRef90 U2QM01 UniRef90-R7LDU3 UniRef90-A3G176 UniRef90-C4ZJ57 UniRef90-A0A037Z802 UniRef90_I1DYG7 UniRef90-UPI00037746A1 UniRef90_A0A022FUD6 UniRef90-E7GRB6 UniRef90-F4B2R4 UniRef90_C5F8X9
UniRef90_C2NS49
 GRTTRFPMPADAAALPRVDLLYVAAGTSPDLLDAATHLGA

 $N V K H V V$ DVSNVDSVPRVDILYAYEDMQVDSLYSAMKNGAA RSEGSKKVEINTKDEEKVALIKVYPGMDGEII RYYVDKGY A EPRVRFNLDQDSGT DPI 1 KAYAGMGLGDGI
 KRGARVLKDREALDPKCALVKFTPGASPDILFYYVDAGY EKYSVKSVAK K I ALI I KAHAGMDSALLSALKELQF
 YTTLNGSFSVSKRMDSNVALLKDFPGDNENVVRSVLEPGV DYHPDEHVVNH VYLIKAYAGMDPEILEFMDNEET PTFKQVYDISNVTEDPHVEMFYSYQGADFELLNTTVANGA DKNKKLKAHY L YDPHVA VTGFPGDQRDIVAPVFENKV HAPATEFDVRGRTDDPRVDIATSYAGADGAAIEAFVAAGA $T V P R L A V P G \quad D W P L V E V V A S Y A Q P G R V A V D A M V A A G V$ PENKSREVLEKLAHWPWVEVVLSHAGACGMVVDALVREGV DGTVRFYENLK QKRGEKSLELRDKMDGRCALVKFYPGMPADII DFYLDKGY
 HTDGENQHLD SSVKGKVPVVKAYAGMTGEVFDLVDLSSL

 RQVIS RESVLQSPDWPRVAILYSHQGFDKELI RLSI EHGA


 SVS IPPALETTARVEVVTSGL $S G K P L N V S P D T P Q P D G V V T L Y P$
 RTGDFK $\square$ E

 DTGAEFSLAGGRADP KEGAPFSVAKKMDN DYYP IE HVR
 VDI VLDYQDAPAHPYAAAI RAGS $N V G L L K L F P G M N E A F L E A B L Q Q P G L$ EPRVRFNURTVAGTVPDIDKAYAGMQGDFLEALSQTAM GNVVSVDDLEKIKALPHVEVVFESP Y S GKLHFFH DLNPNVALMKLIPSMGAHVLDYMAEH AEPRVRFDLKELSGTDPIVKAYAGMGMDGSILSIMSPDNI
 HTEEKPF CLKENLCPNVFLLKLIPGTNPDIFECLLNMGY

 DDGPDFY TSLDPKVFVLRLVPGMNPDI FSFGLKEHY APRRKLKPR DIEPNVPLITAYTGMDRSLVDHARSQGM PTGRRLFRLGTAPALPEVIVFYAHQDFNHDLVKDAVENAV PWSETGDPVFYHNLNSRVFLLKLTPGMDPAAFAA AGQLC

$\qquad$
 $\qquad$ K F F P
 $\frac{L}{\square}$ $\square$
$V$
$V$
$Y$ KRDNDDSVKGT I P VVKAYAGLSEDMLERMLE GM KPEVLEVAEVTAQEDGVVTLYPAYGMSASVIDDNLVKHPV
 QLVRPLKPHYA K CDKNVVILKLEPGDTEAVVSSVLHPGLL MT CSYPAFYSPDADVSKKIPVMKAYAGMDGQILSDFAEEH $C S Y P A F Y S$
$\square T G K$
 A DGAPFKPHFLDRN





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 RGIVLTLPGNGSMPTAWEETIRRTAATGI PVIRASRASAG
 KALIL RSYGVGNANAQLLDELHEAARRGIIVVNLTQCFSG Q GLVI EGLGAGNLPPATLPALDQLIVQGLPVVMVSRAFNG
 $D G V V I E A L G A G N L P P E A A Q E L E N L M F K G I P P V L V S R C F N G$ KAVVMKTFGSGNAPEWFDRLLKEATDRGI IIVNITQCASG RGIVMRTFGSGNAPPWLMHALREAARRGIVVVNISQCVSG HGIVIEGTGLGHVSTEWIPQI GKAVSSGVPVVITSQCLHG $E G V I I E A D G Q G N I P P A A V N G I E T L I N E N I P V V L V S R C D N G$ DGLIIEAFGAGNLPPEAAKSIAKLI QEGIPVALVSRCFNG KGIVTAGTGAGGISREMSAARKEAI EKGVVFVTTTRTGSG RGVVLETYGSGNAPTWFMNSLKDAI ERGVIII NVTQCDAG NGIVI EADGAGNLPPRVLPAIKKLLARKIPIVLVSRCFNG
 QAIVVAS LDPPGVTTPAEGDALWQARQRGVLVVLSSRAGSG K GFVVAAAGNGSVHETLAAALGDALAHGVAVVRSSRTGAG QGLVVAGTGNGSVHHALEAALLRAQSAGVRVLRATRCPEG DAII I ESYGPFYNKRNFLSGLENLTKKGKIVV DATQVMEG K GLVI E GTGLGHVNS GWLPTVKKAIDSGMTIVMASQCING



 QGIIFAGCGAGSMTAETNEYAFTLWKRGVPMVYSRRSNEG EGLVFTGTGAGQLSAVERNALAQWQGPRPLMLRANRCGMG KAVVHAGTGNGSVPDYGVPALRKAREAGVHIIRSARVPDG DGVVVEAFGAGNMPPKAAIALENLIKGGTPVVLVSRCFNG
 KGIVIA GAGAGGTSTSFNYAI EDVLNRKVPVVQSTRANSG DGIVLAASGlGNTTPELGDAVADTVADGIPVVVATRCYDG KALLLLSYGVGNAPQNMLKLLTEASARGVIIVNLTQCDRG K GVVTAGMGAGSDTAPARDALNDVYEKGVIVVQSRRMQEG

 KALVLETYGAGNTEKWLLNCLKNADDRGLHIVNVTQCSGG RGIVVAAMGNGSDSPAAAQGCADAARRGLVCVRASRVPDG KALVLETFGSGNTDKRFLGMVEKAVQKGLIILNVTQCLAG S GLVI E GLGAGNVPPAILPGLHQLLAQDIPVVMVSRSFNG D GLVVEALGAGNLPPATLPPLQKILASGLPVVLVSRCFNG

 Q GLVI EADGAGNIPPLAVPEVETLI AQGDPVVLVSRCFNG KGLVLATMGAGSLSETTNQMLYELVEEEFPIVYSKRSMDG DGIIVAGTGAGSVSVRSAAGIEKAEKAGVVVVRASRTGSG
 K GIVI EAMGAGNLPVVTLPAI KK ILDRGIVIVLVSRCFSG HGIVIEGTGFGHVREELLDPI KRAIDSGUPVVIASQTDFG DGLVI ESFGPCYDNEDFI DAVADWI ACGKALVMTTQVPHE RGLVIE GFGAGNVPPTLVPALEACLADTDPVVLTTRCDEG AGIVMATMGAGSLRDDTNAMLAELSQKHIPVVYSKRSMDG DGLI IES YGVGGIPDVYLEELDKLIRQGKTVIMATQVPEG KALVLETYGSGNAPDWFI RRLCEASKRGVVIVNVTQCNAG KALILLTYGVGNAPPALLETLKRANDKGTVLINLTQCLQG RGFVI E GTGLGHVSTDWVETIKR DAEDSLVVMTSQCLWG KAVVLKTYGSGNAPPWFI QLLKDATSRGIVII NISQCQTG $H G V V L E G L G Q G N V P P A V V T G I K A L L D H Q U P V V L V S R C F N G$ HGAII $\square$ GTGLGHVGTHLLDTIKEKIKDGMII GITSQCLYG DGLVI EADGAGNLPPQAVTALKKLLDQKIPVVLVSRCFNG KALILQSYGVGNAPQSLIDALQRAIDANI IVLNCTQCFKG RGIVMRTYGSGNAPQWLTRRLKEASENGAVVVNVSQCDSG HGIVIEAYGLGGMTSNMVAAVGELIDRNIPIITSSQCLYE RGVVLETFGSGNTDEWFLKQFREATERGIVVVNVTQCTGG KGIVI EAMGLGHVPPAMIPGDERAVAASVPVLVCSRSPRG DGII I EADGAGNLGEDAARGVQKLLDADIPVVIVSRSYNG DAVI I ESYGVGGLPSDFLKEVDKLIADGKIVVMTTQVMEG KGIVI EAFGSHFVNRNLMEKLKKLVADGDPIVVSSQCLYE KAIILETYGAGNTEAWFLNFLKEIKQKGIIIVNVTQCSGG DALII ESFGVGGLPEGFYDCVRRWMEAGRVVVLTTQVENE RAVVLKTYGAGNAPPWFVERIKRLIDNGIIVVNITQCSKG KGLVIATMGAGSLADETNQYLSDLVESMFPII YTKRSMDG A GLVLALPGNASLPEAWRPALEELDNADPVVLASRCGGG KALIIMSFGVGNANPQLLAELEAASKRGVVII NLTQCIKG K GLVI EGMGRGNDPPKMVSGVEYADSKNIPI LVSRCLMG RALII KSFGVGNAPPELLQQLREASQNGLIIVNCTQCFKG $R G L V L A T T G N G T V H H A L E A A A F K A Q D A G V A V L R A T R C T N G$ RGLILETYGAGNAQPRFLQLLKEACDRGI III NCTQCKEG $A G L V V A A A G N G S V H Q S L V D A L V D A A G A G V A V V R S S R T G A G$ KGIVLEAFGAGGLHFFLLEKLEQLTKAGISVVACSQCLYE RGVVLETFGAGNTQPWFVDALKATIKRGVPIVNDTQCUSG

|  |  |
| :---: | :---: |
| UniReefo－HOPWQ9 | R GVV ${ }^{\text {R }}$ |
| UniRef90－X2GVC2 |  |
| UniRet90－R8ANYO | KVNMEGYATGISGYDMTMEAALAKLHFLLSQEFSADEI RH |
| UniRef90－H3NKW5 | VIEDDYDYTGIFAQGLSGVKARIKLMVVL NTTEPVAIDQ |
| UniRef90－B6＇ | EVPTEDAQTKIASGLFNPQQARILLGLLLAEKKGLKEIRE |
| UniRef90－N6VTP0 | RVNMNVYSNGIGCEDMLPEVAYVKLMYLLAN YSLEDVKK |
| UniRef90 UPIO003786C18 | I AEPVYAYAGMFVK ELLNAQKARLKLLIAL NAGLKGQELKD |
| UniRef90－－J9BPJ2 | AVEMGRYETGMSGYDST |
| UniRef90＿F9D6M0 | SVEMGRYDTGVSGYDSTVESA |
| iRef90＿K4M7D2 | CDRVYDTG｜EGEDMLAEVA |
|  | QDIYGYAGIFSNGLNGQ |
| UniRet90＿G5 |  |
| UniRef90－G4HHD1 | YGGGEGIISGDNLSPQQAR |
| UniRef90－UP100029A09CE | MWRYETGVSGHD |
|  | FAQPGDYPNTIACGG N－MKARROL |
| UniRet90 M7WYU3 | SVEMQRYETGI SGYDSTTECAVTKL |
| UniP | RV限R |
| UniRef90－UPI | HVPRPAGGVFVSAAD |
| UniReeso Uf6003 |  |
| UniRef90－Q0W7A3 | RVCDRVYSTGI DGQDMLAETALVKLMWTLGQTTDPGEV |
| UniRef90－B2A299 | GILEGGYALGI SGKDMTPSALVVKMMWALAKNQNFEEL |
| UniRet90－UPIO0036 | PVYGYEGLFVKELNAQKAR |
|  | VYA Y |
| UniRef90＿D2TZM6 | RDAEYGFVAAERL |
| UniRet90＿FOXAV9 | LQGDDWIPSGCLSPQ |
| UniRef90－85E2JO | A YQGFFVKELNAQKARLKLLI ALNAGLTGQALKD |
| UniRee90 W6MQ40 | RGM |
| UniRef90＿A4CY73 | R ${ }^{\text {a }}$ |
| UniRef90＿－ 5 SWRI8 | PDDKYDWVVA ${ }^{\text {d }}$ |
| UniRef90 UP100 | YEGMFVKELNAQK |
| UniRee90－UP100047094E9 | NVNMNYY |
| UniRef90－W8Y74 | RVPMSDTASHAASGFLDPQKARILLGLVLAQGKNL |
| UniRef90－F8DDJ5 | AVGARYGGPGIPAGELPPWKARIILLGLALSAFDDHEAVRQ |
| UniRef90－H2FX79 | SVNMEGYATGI SGYDMTTEAALTKLHYLLSK |
| UniRet90－F2QRD0 |  |
| UniRet90＿UPI0002E | DSTYOT |
| UniRef90 R2S1F9 | OYGGI FCRGIINSQARIKLLIAMNADLSKEQLKH |
| UniRef90－upiout | NMEGYANGI SGE |
| UniRer90－ADNX |  |
| UniRet90＿A4AMP6 |  |
| iRef90 ${ }^{\text {W7Y7D0 }}$ | T GLS |
| UniRef90－K1MH | YEGIFA |
|  | PVYDYDGIFCNS |
| UniRef90－G5JZZ5 | PVYGYQGGGAKELNASKARLKLLIALNAGLTGADLKA |
| UniRef90－B0TZ59 | HNYKFDLVSSGTLSPEKA |
| UniReef90 UPIOOO46 |  |
|  |  |
| M3 |  |
| UniRef90 X8IM | VVPVDDGQPGLVADSLNPAKARILLMTALTQTKNPQVIQQ |
| UniRef90＿C0C1W8 | D |
| UniRef90－A6UWS4 | RVNMNVYSNG |
| UniRe990－G2KTE5 |  |
|  | R |
|  | 促 |
| 6V | GVWPIYGYPGILCGRLGGPKA |
|  | MVPTGAMPK |
| UniRef90 R5A796 | SDLSVYQVGHRVTYDMTLEATVTKLMWVLGQTSDPQEIRR |
| UniRet90 U2DKA2 | TGVS |
| P1000469 | KVNMGGYATGSGADMTEAALTKLHYLLSQGLGTEEIUR |
| D3R |  |
| 90＿R6YHM2 |  |
| UniRet90＿W4EMC4 | GV |
| UniRef90 B5IAQ0 | T Gl |
| UniRef90－R2RRG3 | YEG｜FCNSIINSQKARLKLLIAL NNGLNNHELIS |
| UniRef90－H1Q0W3 | KVEMNRYGAGVSGYDSTVEAAV |
| UniRet90－F8DQz9 | RSDLTKYEVGDSARDMTSESAITKLMWGLGQ |
| IRef90＿W2C752 | FDSTSECAV |
| UniRet90 UP100037FF | V |
| UniRef90－UP10002 195A1C | A |
| UniRef90－A9KTV6 | D SIVQAGIPAYDMTTEAAVTKLWALGQSNDEEEVRK |
| UniRe90 A9DNZ3 | ， |
| UniRef90＿A9DNZ3 |  |
| UniRef90－R7LDU3 | SVEMHRYETGTNGYDSTDEAMVTKLMF |
| UniRef90 ${ }^{\text {A3GI76 }}$ | RVPGGTFESAlPGGYLNPQKAR |
|  | WLDAGALDP品ARVRLAGLGA |
| UniRe | SVNMGGYATGI |
| ef90－A0AO377802 | KVLDDYGYEGILGDNLNSHKARIKLIVALGYTNKIYEIKD |
| ee90－11DYG7 |  |
| UniRef90－E6VB26 |  |
| UniRet90－UP100037746 | Q ${ }^{\text {a }}$ |
| UniRet90 A0A022FUD6 |  |
| Uni | PSDFSDYEVG｜PGRDMTTEAAVTKLMWALGQTQDPSEVRK |
| Ref90－C5 | VAQAVYNYEGIFCQGLNGQKARDKLQVGLSDGKQGQDLAD |
|  |  |


| UniRef90_C6C5W8 | $\square \mathrm{M} \mathrm{Q} \mathrm{Q}$ |
| :---: | :---: |
| UniRef90_H0PWQ9 |  |
| UniRef90-X2GVC2 | F |
| UniRef90-R8ANY0 | $\square \mathrm{M}$ Q Q |
| UniRef90-H3NKW5 | A |
| UniRef90-B6HE41 | VF Lik |
| UniRef90-N6VTP0 | LINK |
| UniRef90-UPI0003786C18 | Y I Q |
| UniRef90-J9BPJ2 | KMN |
| UniRef90-F9D6M0 | LM D |
| UniRef90_K4M7D2 | 1 M |
| UniRef90-A6CR96 | 1 F R |
| UniRef90_G5JXD4 |  |
| UniRef90-G4HHD1 | WFET |
| UniRef90_UPI00029A09CE |  |
| UniRef90-J1F3U7 | F |
| UniRef90_M7WYU3 | AFEE |
| UniRef90-F3ZUJ0 |  |
| UniRef90-K7PER6 | MF DE Y |
| UniRef90-UPI000379F86A | LF S Q Y |
| UniRef90_UPIO002375EC4 |  |
| UniRef90_R6Z187 | M F Y T |
| UniRef90-Q0W7A3 | 1 ME T |
| UniRef90-B2A299 | V 1 H T |
| UniRef90-UPI000365CF36 | Y |
| UniRef90-F9V7P7 | F |
| UniRef90-D2TZM6 | M F ${ }^{\text {K Y }}$ |
| UniRef90-F0XAV9 |  |
| UniRef90-B5E2J0 | YME |
| UniRef90-W6MQ40 | VF E |
| UniRef90-A4CY73 |  |
| UniRef90-H5WRI8 | VFME Y |
| UniRef90-UPI000362385F | Y |
| UniRef90-UPI00047094E9 | L M M T |
| UniRef90-Q8TV84 | L M R T |
| UniRef90-W9Y7C7 | V F |
| UniRef90-F8DDJ5 | TFE |
| UniRef90-H2FX79 | $\square \mathrm{M}$ |
| UniRef90-F2QRD0 | V |
| UniRef90-UPI0002EEDE33 | 1 |
| UniRef90-R2S1F9 | FMEE |
| UniRef90-UPI0004729843 | 1 DE T |
| UniRef90-IODNX6 | L M Q |
| UniRef90-A4AMP6 | 1 FET |
| UniRef90-W8X2C0 | $\llcorner\mathrm{L} R$ |
| UniRef90-W7Y7D0 |  |
| UniRef90-K1MH50 | F |
| UniRef90-R2RZP5 | F MES |
| UniRef90_G5JZZ5 |  |
| UniRef90-B0TZ59 | LF D R F |
| UniRef90-UPI000464E802 | M F Y Q |
| UniRef90-A0A023VLJ1 | Y |
| UniRef90-M3HP16 | VF S |
| UniRef90-X8IMR0 | YF H T Y |
| UniRef90_C0C1W8 | 1 FNT |
| UniRef90-A6UWS4 | LMNK |
| UniRef90-G2KTE5 | YM |
| UniRef90-E1QRJ9 | LM |
| UniRef90-R7BF41 |  |
| UniRef90-E6VZ08 | L F E |
| UniRef90-C4YCF0 | V F |
| UniRef90-R5A796 | L F |
| UniRef90-U2DKA2 | R M |
| UniRef90_UPI000469E71F | Q M Q |
| UniRef90-D3RX33 |  |
| UniRef90-R6YHM2 |  |
| UniRef90-W4EMC4 |  |
| UniRef90-B5IAQ0 | LLS Q |
| UniRef90-R2RRG3 | F M |
| UniRef90 F7RX25 |  |
| UniRef90-H1Q0W3 | H |
| UniRef90-F8DQZ9 | F F ${ }^{\text {T }}$ |
| UniRef90-W2C752 | H M Q |
| UniRef90-UPI00037FFAB5 |  |
| UniRef90-UPI0002195A1C | F L H E F |
| UniRef90-R6BGX0 | M F Y T |
| UniRef90-A9KTD6 | MF Q T |
| UniRef90-A9DNZ3 | VFET |
| UniRef90-U2QM01 | L F Y T |
| UniRef90-R7LDU3 | L M N |
| UniRef90-A3G176 |  |
| UniRef90-C4ZJ57 | WF E |
| UniRef90-A4C9R8 | L M Q |
| UniRef90-A0A037Z802 | IF E K |
| UniRef90-I1DYG7 | Q M Q |
| UniRef90-E6VB26 |  |
| UniRef90-UPI00037746A1 | LMET |
| UniRef90-A0A022FUD6 | L F A E |
| UniRef90-E7GRB6 | 1 F D T |
| UniRef90-F4B2R4 | VFET |
| UniRef90-C5F8X9 | FV ${ }^{\text {d }}$ |
| UniRef90_C2NS49 | I I E T |

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UniRef90-V4JAU4
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UniRef90-UPIo00362D691 UniRef90_U4KL39
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UniRef90_DoLXX2 UniRef90-S5ZV36
UniRef90_F9N3D9 UniRef90-A6FDH7 UniRef90-Q481HO UniRef90-U2EY35
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UniRef90-W5YAN4 UniRef90-R6Z5R5 UniRef90 ${ }^{-13 C 4 L 1}$ UniRef90-Q3AVY7 UniRef90-E1KSV3 UniRef90_H3ZJL8
UniRef90-R6WQ19
UniRef90-UP1000360ECBE UniRet90_U1QY67 UniRef90-UPI0003B4048B UniRef90-10TA06
UniRef90_UPIO002F9E10C UniRef90_U2K5A3 UniRef90-R6VF80
UniRef90 UPIO00372593B UniRef90-K2PT05 UniRet90-X5D8Y6 UniRef90-U1KTQ4 UniRef90-E1GVL0 UniRef90-K4RNLO UniRef90_UPIOOO2F6F759 niRet90_C6CVN5 UniRef90-D50HS4 UniRef90-MODDE3 UniRef90-UPI00047E27FE UniRef90-F3KN34 UniRef90-UVVA71 UniRef90-B9WN17 UniRet90-P30363 UniRef90-FOQ2322 UniRef90-R5Q2W4 UniRef90_E7QN13 UniRef90_UPIO0046674B6

KKKLLLLSTGGTIASVASDAGLV MKNILILHTGGTIAMSEDQNGAVS MKKLLLLTTGGTi ASMEGDNGLV KQPSVLLIYTGGTI GMIDQPD MKKLLLLTTGGTIASVEGENGLSPAGAL bary dion lisy LARVLVLGTGGTIAGQASARAGNA YDSGKVSAANLIAA MKKILILNTGGTISMSEDHTGKVSPTENNPISAGEGIA MKRICLLHTGGTISMVKNEAGVLQ CAPSTGEHVLEY MTKILIYTGGTIGMVNDPKTGV GYPFDFKQUQN VAVIGTGGTIAGVSKSRVSFQSYESGQLPVSRLVED PRIAVI GTGGTFAMHARHRFDESGVVHPDAKLLDDLGD

 PRILIIYTGGTIGMIENPATGT GLGPDFSHLLDN

 VTLLSTGGTIAS


KPNDLIYTGGTMGMVKNFETGALKVNFKKLLQN
PKILLIYTGGTI GMIKDFKTGS EKKSIVVVYTGGTI GMKYSLHGYVPASGNFNFDDLLKH SKARILLIYTGGTI GMMKDFET GALKAKNFSKLLQR PRILIYTGGTIGMGKDADT GMGALEPGDFNHLVSS MKKVAl TTGGTIASKHNEEGRLLN KKILLSTGGTIASKPDPEGLK GVVITSEEILTY RKPRIALLATGGTHAGVASSPDETKGYTAGQLGADDLLAA QKAKILLIYTGGTI GMSKDFET GALKAFNFNKLLQK
 MKKIVFITTGGTVSMKYAHE SGGVVPSLIGKQLLDS RVHFLLSTGGTI ASRVDPA GYQPEPGSLQRLLSE YVTGAVYPYFTAEELYSM KKSTYTAYTGGTПGMQHSEH KKRIYVAYTGGTIGMMQS
KKILLLSTGGTI ASAPTEHGL

MKRVLMIGTGGTIASKGADSSQTAGYHVD ASGQELLES NILLI YTGGTI GMVENNQT GALEVFDFSHLTSH MNKVLLIYTGGTIGMGKNP VTGALDPLDFNHLYAA KNILVLHTGGTI SMTADEMGHVNS KRILILNTGGTISCDKTKNGYEPGYVGSADQQDPLLQH
 SKAKILLIYTGGTIGMRKDFDT GALKAFNFSKLLQR দrRIVVLGTGGTVASKVDSGYEGAVHPSFTAEDLIRA MKKVVLLTTGGTUASAPASAKDSGKLASGSLTGEELTS AMAEDERT GDVRPLGSEGLQRV KVLLIYTGGTIGMGCNPDT GALEPLDFDHLADN
MKRILIIGTGGTIASAKTDAGFKS VLTDDELEK RVLLI YTGGTI GM GCNRESGADEPLDFNHLISC
PKVAVIGTGGTI AGVSDTRVSFQTYRAGQLPDADLVKF LPTVSLISTGGTIASTVD YRTGAVTAQFDAEDVLRA KPNIKLFGTGGTIASRLD YRTGA

## पs S

 KVLLIVTGGT GMGHNKRTLSSILIIYTGGTIGMKTDPAT LLVYTGGTI GMVENPE
KH1 Y AYTGGT GMQP SSA KKTSHLIYTGGTIGMVQDPK KRKKIYIAYTGGT GMKKSSKGY NGALKPVKFDKIQERV KVLLIYTGGTi AGRGVVTSTSLSS
$A E G F L T$
$S Y G A G A$
$G A L E P$
LALIGTGGTTAGAASAASVSTDYKPASLGVSALLKA EKPNVLVIGTGGTi AGAAGDKTNFQNYAAGTYTMADMVDT S LPFVTVISTGGTIARHSDNPCDTVDYAEHDLGGGHLLSA LPTVSLISTGGTVASTVD YRTGAVTAQFDAEDVLRA
 LPKILLLSTGGTIASKVDENYRTGAVTPVLTADEVNSS KKTIYIAYTGGTIGMQPTTQGFNPSPEFLAKQMTELPA LPTIKVLGTGGTIASKGVSSHQTAGYEVD TIDEDLDST KKVALITTGGTIASRKTESGRLLGAAGAVSGPELAE PACSGKDLADA




## UniRef90 A8YX67

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UniRef90-F4KNZ0 UniRef90-F4KNZO
UniRef90 G0LBV9 UniRef90_R5BBM6 UniRef90-Q3IRA6 UniRef90-A1K2J8 UniRef90_UPI0003B44113 UniRef90-D2RSV6 UniRef90_UPI00040C53C5 UniRef90_UPI0004704445 UniRef90 ${ }^{-}$F2K828 UniRef90_UPI0003FB6135 UniRef90-A6EM05 UniRef90-D2TZA7 UniRef90_UPIO003B79E5D UniRef90-R6YM35 UniRef90-E6TYQ5 UniRef90-R5IYA8 UniRef90-G4NXEO
UniRef90 N6YAK5 UniRef90_UPIO00419DA60 UniRef90-P38986 UniRef90_UPI00035F4BF2 UniRef90-FOSW11 UniRef90_D0LXX2 UniRef90_S5ZV36
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UniRef90 F0Q2B2 UniRef90-F0Q2B2
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GCRAKKNHETFVDVFHSPNFPLLGE\|GRP\|KLFEWRRRRS
A R S V T K T H T S A L E A F R S R N A G P V A T V D R N GVVA I H R R P R S E




GNRTTKDNAEHFNAFNSPNYPALADAGMVHMRCLQSCPLPK
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A QYVKKEHASNDQGFNAFGFGYLGDI DNDKLHDYQKPIKK
GTRGKKERTKSYNAFSSDNFPY: A I I QEDH:LFYDDDKAQ
A RYVKKQHASNVDGFFSPGFGYLGTADQDE DADHQRMIKR
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GYY
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AMDVQKTHAFNVAS $\square A A P G R G P I G G I L G D R M I F Y Y Q P L D R$
GNRATKVSVGEFAAFESPNFAPLGRAGIDDDIVWRRVLDP
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GTRARKTYSKSFGAFSSINYPVLGVVQDNCLVPYDRPQAQ

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ARDVTKTNADRMDTFQTREYGVLGVVDETRDRMLRAPARA
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ANRTVKQSAEEFAAFRSYNYPALLEEAGVNFTFDEHRILVP


GNRSRKVDADGFNAFDSPNFPPLLEAGINURLNAGULAEP
GNRTLKRDAELDSAFRSVNYPELAVAGIDIKFSTEFIYYP
GNRATKMHADGFAAFGSPNMSPLAKVGINGELIAGQLSPS
ARAVTKVATQGVGAFQSPDLGPLGWVDDSGVHLABVASG
GNRSTKQNAEEFNAFNSFNYPHLCEAGVKFKFNTHNILTP
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## 

210
220
230 PREKTGAPSLLNTD\|DSNVVLVIKLIFPGFDPKLDFAMVIDSGC TADP $\square$ KDVVNH $V$ V
 D M S L L P L K P H Y L


 F K GRSK G L L P E N GF D E R V A L I K Y Y P GMA S E V I D F L V D R GY $P$ V E P L K V QQCGK P GWKTP F D P LP K V E I A Y S Y Q GA GP E A V K A FA DA GA




 RAKLQYHPH



 H A N D G K Q L S S V G L
 K S S K DLLI V H K H L N N
 $V$ V PLLT F Y H Q M D S S V G L M K LI P S A D A S L L D Y MAA H Y $E T$
$D$
$C$


 QHCEPEHLLNH NVEIVKTGUGELP
 K GREKAAV E A Y P R F S D K V A L V K F Y P GM T P D I F S F F S E R G Y

 K F K L R L E E Y M P T P R F P E V CII I Y A H Q S V D P E L V D $L$ L A K R Y A EPVFY D A L L N S R V A L L K L DP GASA GQLLRFLL DEN


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

| $S$ | $S$ | $I$ | $P$ | $Q$ | $V$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $N$ | $L$ | $D$ | $N$ | $N$ | $V$ |
| $A$ |  |  |  |  |  |


 K VF P GMD G E I I N Y Y V D K G Y
 R VFP $\quad$ V LP P V E GVVYLV KAAA G T D D L L I Q A A L Q A K A
 R HVVGWP K G Y G S G G E IP P R V D I SY S H A GA D G V G I R A F V A A G A P G A E A P LIP P V F R T L D D D R V A
 $Q V$
$D Y$ KP K K P M A P $\quad$ HLLE M N S N V F V


 PA H A D A E L R VAA A A LD D R V L V I R L





 PTVVA WK TPS T WP R V D WATP F D LK T IS K D S LP VV E



## S

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 $N G L V I$ E A L G A G N L P P H V L P S L K K I I D K N I P V V L V S R C F N G
 K AVVLK T F G S GNAPEWF DKLLLKNVVAR GVIIVVNIS QCLA G K GIVI ES YGS G G $\square P$ F E E RNL L E ELLVES GVVVV ITT QCLLE E





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

 A G AVL A F P G N G S V P E A WK P A I D A A L H A G MVVLVRAS RVVPA G RGFVI E GYGPGNVPASLMPFLKRARKQHIPVVITTQMERS D G L V V E GT G L G NV T A GL A D A A R D A DVA GV PVVVVTS R C L E G
 $R G I V M R S F G S G N A P P W L L K Q L K E A S M R G I V V V N I S Q C I S G$ $R G I V I A G T G N G N V S D Q L L P E L A N L G D K$ TLLVRSSRTGSG

 KALI L R S Y GVG NAPS QLLKCLEKACQQDI IVVNLTQCLS G

 DAVI I ES F GVGGGLPSYYYRAVAHWINLGKTVI MTTQVTNE



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

 DAVILESFGPS GETGEFYEVIRKASAKGKTVVVTTQVQNE K AIVLLETYGS GNAYEWFIEALQDAVKRGLIIVVNIT QCEM G

 K GlV $\operatorname{l}$ HA GSGN GS IIH GQTEPALVVEA TGII LE GVGRGQVAPKMMTEI EKADAQGMKLVITTSAEEG K GVVLETYGAGNAPTWFDALLVKAINNGMHVIVNTQCSGG K GIV L E GT GLGGHAPEY I FNNIVYALDNNVIVCMTTQTDNG $R G L V V A A T G N G T V H H A L E A A A L R A Q D A G V R V L R A T R C A N G$ $K G L V L E G V G R G Q V S P R M M E S I V R A D E S G V V V V I T T A S E E G$ $R G L V V E A L G Q G N L P P A M L P G L K K V V G S G I P T V L V S R C H H G$ $R G I V A A A T G N G T L H H A L E A A L L R A Q S A G V R V V R S T R C P Q G$ $R G I I S A G M L P G M C T P A E N V A L D E A V A R G V V V V Q A S S G Y C G$ D ALI LE DY GLLG GCGPSFKEAIVDWVDS GRSIVLTTVQPE E
 $P G L V F T G T G A G Q L S A A E R S A L Q A W S G K R P L M L R A N R C G S G$ RGIVMMRTYGS GNHTPWLMKLLKKEASQRGVVVVNVSQCISG $R G I V L E G Y G A G G \square P Y R K R D I L S K \square R E P Q I P V V M T T Q A L Y D$ $R A M V M R T Y G S G N H H P W L M R L L K E A T S R G I T V V N D S Q C D A G$ $K G V V T A G T G A G G \square S P K Q S A A R T D A A A K G V V F V S T T R T G S$

 RAVVLE TYGAGNAPPEFIRTVREAVARGLLVMNVTQCSGG $R G V V L E T F G S G N M L P W F L D A L R S T V A R G V V I V N V T Q C V T G$ $R A V V L E T F G A G N A P T W F I R T L Q E A I D R G V I V L N I T Q C G G G G$ NALI L L S Y G VG NAHPA LLEEQLQQRARDNQUPVLNCTQCMRG


 K MV WT GT GA GQLSAGEREADKTWPGVLPLMLRANRCGRG GIMRSYGSGNAQPWLI KLFKKATARGVTIVNDSQCIS G $E G L V S A G V G N G N L F P S V L S A L A E A A K K G V V V V R S S R V G S G$





 NGI I LESYGTGNAPNQFLKALQQANNRGVVIVNCTQCLQG QGI I LATMGAGSMSEKTNQYLSDLLNPNYPIVYSKRSMDG


 A GLVLE G T G L G HVVH D WV D R I G E L V D D G T T V V V M T S Q C L G G


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 AVYP TY Y Y E GI L G D D D D S K K A R MKL A V A L A S G FVEDTYGYDGIVFANGLNGQKARDQLMAALHVSRDPARLQT
 $G V V R R Q E L C Q R A A G H M R P R Q A R I L L A A L M L M T G A D G D A!Q T$ $G L D L G V Y E V G R A G G D M S T E A D V A K M M W A L G Q T R D P D D I E Q$ S V I M G Q Y A GVI N G K D $\square T$ T E A A I T K L M Y L L G N N $\square$ Q A K V F K T $P \vee Q D D E R L G L L S A G S L N P Q K A R V$ QADMNRYDTGVSGYDTTVEAALTKLMLLQAQYDDPEMVRQ GVDLTK Y E VGI P A K D M T K E T T I T K L M WAL G H TK NVVEEVK E



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




 QVEMSRYDTGISGGDSTVEAALTKL MFLYATCTDTETIRAA






 EVYT T Y D Y A GI L G K DYDSKK A R MK L A V L L A S Y K E E G I K D QL L PRPGDTLPATQGLSVVKARVELLL

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| UniRef90_A8YX67 | F N T |
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| UniRef90-D8ILX9 |  |
| UniRef90_UPI00047BEF38 | LME T |
| UniRef90-R7D5F8 | RMNT |
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| UniRef90-F2K828 | \M Y K |
| UniRef90_UPI0003FB6135 | L F E T |
| UniRef90-A6EM05 | 1 F |
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| UniRef90-UPI0003B79E5D | 1 FE T |
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| UniRef90-S5ZV36 | L F Q T |
| UniRef90-F9N3D9 | L |
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| UniRef90_S6E492 | V |
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| UniRef90_UPI00040AE6BA |  |
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| UniRef90-F5SBF2 | F F K E Y |
| UniRef90_C5T695 |  |
| UniRef90-W5YAN4 | L F D |
| UniRef90-R6Z5R5 | L |
| UniRef90-I3C4L1 | 1 Y E T |
| UniRef90-Q3AVY7 |  |
| UniRef90-E1KSV3 | Y M N K |
| UniRef90-H3ZJL8 | $\square \mathrm{MHT}$ |
| UniRef90-R6WQ19 |  |
| UniRef90-UPI000360ECBE | WF T K |
| UniRef90-U1QY67 | RMQT |
| UniRef90-UPI0003B4048B | $\square \mathrm{M}$ |
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| UniRef90-B9WN17 | VF K T |
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| UniRef90-R5Q2W4 | K Lie E |
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| UniRef90_UPI00046674B6 | R F Y T |





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| UniRef90 H5UQB1 |  |
|  | MVELRSDASDNLTTALLLAGNYD IPEVCIIYFNG |
| UniRef90 14X4U5 | SPEEVGTSVYSNLRNSUYVAVDHSL |
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| UniRef90-UPIO002FF1A32 | PI DLAITDARSNLLDSL |
| UniRef90_S6 | PI GEIREDGTENLITALQIAAAR |
| UniRef90-H1HJE3 | P $\mathrm{C}_{\text {GQLRTDGKENLITSIELAAAQHEDGPEVCIYFSG }}$ |
| UniRef90-S5F3L5 | SSNELGADGLINLQSAILVALNEESRDKGVLVVMNDE |
| UniRef90-JoKFAO | PSTALVPDGPQNLLD AVAVAASTGAQG |
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| R4 | N |
| UniRef90-R6A | DGR |
| UniRef90-UPIO00255B1CE | P\\|GDLRTDAKENLTTAIQTATLNEPLDQEVALYFEYKL |
| UniRef90-K1YF64 | PI GMLRTDGKENLISSUEIAAAKDSNPEVCIYFENR |
| UniRef90-F4X9G4 | SICLENTDARLNLYNSFLYAAAEGS HGV |
| iRef90_D3HW21 | RTDGKENVVTSI ELIAAAHNADGPEV |
| U1Y | DVYINI RHA! Y TACD |
|  | DGPMNLYQAICIAAN |
| UniRef90-H1Z4H4 | ADRPSSDNLMNGLCSAAAAVSDLLGEV |
| UniRef90-V6SBK4 | P GDLRTDAKENLITA A A A N N Q |
| UniRef90-A3HYL2 |  |
| UniRef90-UPIO003767DAD | PLAQPHSDGPSNLSHALYLAANY |
| UniRef90_A4FWR5 | D A |
| Q1 |  |
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| UniRet90_UPI0003FC406F | RSDGQTNLLNALYMAAYP HEVGLFFNN |
| UniRet90 R $411 /$ | DGYTN |
| L9 | DRPS |
| ef90-UP1000419 | GKPR |
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| UniRe990-B8GH20 |  |
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| et90_R7ACG3 | PIEALYTDAKKNLSDAIIRFACE GINGVYVTFDGMVIN |
| 0003 |  |
| UniRef90 UPI00020D9AD8 |  |
| IRef90 - V6IYM1 | AKKNTNDALTFAQ KADIPPGVFIVFDGKAIL |
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| UniRef90-H8KN48 |  |
| UniRef90_UP10003D0D0C0 | RNDGRAN |
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| UniRef90-C5A6T2 | NSDAPRNLKTALTFAMK |
|  | PLSEldis Gront insthman |
|  | PISTDGTDAKLNLRDSULYACDDYSQN VVLVFD |
| UniRet90-L8HE50 | PLENSITDA |
| UniRef90 -12GVG33 |  |
| UniRe90-F6FST3 | WQDFGADGPANLYNAVKLAASQATFCYGTVLMLND |
| ef90 17L8U7 |  |
| UniRef90_R7J1F3 | EVRTDGEENLITALQUAAAKDPDGSG |
| UniRef90-F9Z5A 7 | TDGRENLIAALEIAAATKAVVPEVC |
| UniRef90-U1R265 | S DNVVNAVCAVEAAKS |
| UniRet90-GOJTM | S |
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| UniRet90_A0A031LP02 |  |
| Ref90-_8AHM4 | EPGSDAPRNL |
| UniReef90 UPIOOC | TDARINLLNSLYAAHHPIN E EVVLFFNNQLFR |
|  | ADGPMNLYQAlCIAASPKSRGRSV |
| UniRef90-UPIO0047B08D3 | DVFQNLSDAMHVACEKKALDLGSSIVVFNGDIFA |
| UniRef90-KODE41 | DGLYNYQSALRVAADKNSRHRGVMVVMNDE |
| ef90-E1STP2 | PLIAQLRSDGQQNLLNALYIAANYPITA EVCLIFFNNTLLR |
| Ref90_10A2J6 | SSDRPSSDSPFNLIAASUYATSDUCEPAVVMHGETSDSHR |
| Ref90-L0 |  |
| UniRef90-UPIOOO362135E | Q |
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| UniRef90-UPI0003703EF6 | PLSELRNDAQSNLVTSIELASS |
| UniRef90 UPI00036776. | D |
| Ref90_UP100035 | PLSQLIS SARVNLLNSLYDAAHHPTN EVCIFFNNQLFR |
| UniRef90_A8A8Y3 | SSDRPSSDATLNLI GATIAAARSDIAESIIAMHGESSDHR |
| UniRef90-13D | PLAKPRSDALQNLITAIQIAS QYKIPEVC\\|LFRDTLLR |
|  |  |
| UniRef90-D5WW09 | DGPKNLSDAlLVARSPEAAGLGPVIVFAGFI YS |
| UniRet90-H3FVV7 |  |
| Ref90 E3QQ15 | PLTGISSDATANLTAAFRVAAHPPNEPAGVLVVANDEI HS |
| iRet90-UP100034 | NPTLAGADGPANLLAAVRTAAHPSTRDQGVLVVLADEIHA |
| UniRet90_L9VUU3 | ET S P |
| UniRef90-M7X0G3 |  |
|  | PISKDVTDAKTNLLDSFIYASDDESQN VSIVFDG |
| UniRef90 UPIOOO423211D | PISKDVTDAKSNLLNSFIYAADDESQN VNIVFDGKVIC |
| UniRet90_C6LIH9 | DAGPMNLYAACIASDSKSRGRGVLVSLNDQISA |
| UniRef90-12GIW7 | TDARENFITALEIAAAQQPIVPEVCI Y F NSML |
| UniRef90-H2MN78 | GR |
| UniRe990 Q6A | DG\\|RNLQNGL I ACTSLPPGGDVLVQMADWLFS |
|  |  |
| Uni | PIGDARTDARENIITALEIAAAQWPLVPEVCIYFQNYLDR |
| iRef90_K7G1W5 | PI YELRNDGRANLLGALLIAG QFVIPEVCLYFYNKLYR |
| UniReforidtao | PIEAMYTDAKKNLIDAl傦ACE EITRGVYVVFDGVV |


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| :---: | :---: |
| UniRef90－Q28Q006 | GNRSSKVKSSGFDAFDSPNFPWLANVG |
| UniRef90－14X4U5 | AKYVKKVHSSNLQGFDSFGHGYLGIIDND |
| UniRef90－R6GZ65 | GCRAVKVRASGFSAFESTNSHYVGRVTAM |
|  | GCRSTKVDAAGFQAFDSPNYPDLGHI GVTIRPHPELLL |
| UniRef90－UP10002FF1A32 | GTRAKKEFSKSYNAFSSTNYPDIASVHDNRIIFY GDDKDQ $^{\text {S }}$ |
| UniRet90＿S6C | GNRATKVSSTNFGAFQSFN |
| UniRef90－H1HJE3 | GNRSTKRNADGFDAFDSFNYQHLCEAGVD |
| UniRef90 S5F3L5 | AKFVTKTHTTNVATFQTPTFGPCGLVTKE |
| UniRef90－JoKFAO | AQRVQKVHPYRVDPFSSGDAGPLGWVEEGAVRLVQGWPAV |
| UniRef90－C5LZU7 | GCRSVKVDSGSIEAFES |
| UniRefoto－R4VT89 | GTRVRKNHTSRRDAFETDGAKPLGEVDYDAA |
| UniRef90－R6AVW6 | GCRAVKTRTTSLNAFESLNYPY恧TVSDGRM |
| UniRef90 UPIO00255B1CE | GNRT |
| UniRef90－K1YF64 | GNRTTKYNAEDFRAFRSAN |
| UniRet90－F4X9G4 | GTRARKERTKSFNAFSSVDYPELAVIRDGKLIRYLAELEY |
| UniRet90－D3HW21 | GNRSTKINADGFNAFES |
| UniRef90－U1YH16 | AKYVKKVHASNTQGFDV |
| UniRef90－06 | KTNANSLDSFNVRQGYLGNFVNNEIHYYYPPVKP1 |
| UniRef90－H1Z4 | GTRVRKMHTSRRDAFRSIDTVDLGKVEYPSLEVSLNKHAV |
| UniRef90－V6SB | GNRTTKISAEHFNAFSSPNYPELAESGVDLKVNTDLLLKK |
| UniRef90 A3HYL2 | GNRSKKVQSVHFDAFESENFPPLA EAG |
| UniRef90 UPI0003767DAD | GNRSTKVHAEDVDAFASPNYPPLFEADSAMLPLP |
| UniRef90－A4FWR5 | GTKVRKLHSSRRDAFKSVNETPIAETFDKKVT |
|  |  |
| UniRef90＿Q18GL3 | GTRVRKNHTSRRDAFKTVGATPIGKDEYDTETVSFHRDHA |
| UniRef90 UPIO003FC406F | GNRATKADANGFNAFDSPNFRPLLEAGYQISLKAGSVKPL |
| R411 | RTTKVN |
| UniRef90－E6N6D9 | GNRSKKV |
| UniRet90 UPI000419C573 |  |
| UniRef90－13YLJ5 | ANRTTKRSAEALSAFRSYNYPPLAEVGVNTAYNLPA历L H |
| UniRef90－UPIO0029B | ANRTTKDNAEHFQAFSSSNY |
| UniRet90＿B1KEJ | GNRTTKAHADGFGAFASPNFPLLLEAGIKIRVKAGKIATD |
| UniRer90－B8GH20 |  |
| Q92A68 |  |
| P100037 |  |
| R7ACG3 |  |
| P1000 |  |
|  | ARFVTKTHTTNIATFGSPISGVMGLLTKRQI IYLYNLPKR |
| UniRef90－V6IYM1 |  |
| UniRef90 ${ }^{\text {H5W }}$ |  |
|  |  |
| UniRet90＿UP10003D0D | GNRVTKVDAGSF |
| UniRef90＿R5ZAD6 |  |
| UniRef90－C5A6T2 | Q |
|  | GNRTTKSHADGFDAFSSPNLLDPLLEVGVNIRYLYKEKLHN |
| UniRef90 J4UBK2 |  |
| UniRet90－L8HE50 |  |
| 12GVG3 |  |
| UniRef90－F6FST3 | ARDVTKTNSYRMDTFQSREYGVLGWVDQNDITLGRA |
| UniRef90－R71F3 | GNRSTKRSADNFNAFKSHNYPAL |
|  | GNRTTKDNAESFDAFQS |
| UniRef90－U1R265 | GTRVRKNHTSRRDAFETVGGEPLGRVD |
| UniRef90－GOJTM | RAKKVQSVHFDAFES |
|  | GTRAVKVRTTSFHAFES NTPP |
|  | GVKVKMHTSRRAFQS NDRP |
| UniRef90 F8AHM4 | GVRVSKVRAVGLNAFQS |
| UniRet90 G8BSM6 | GYY |
| UniRef90－UP100047B08D3 | SKYVKKDHTSHINGFGVSGFGHL |
| UniRef90＿K0 | ARFV |
| UniRef90 E1STP2 | GNRSTKVHADGFAAFD |
|  |  |
|  |  |
| P10003 | RSTKADAD |
|  | GAHARKVKTRS |
| UniRef90－D9QVO3 | GTRADKMRSKSMNAFESUNRPY |
| UniRet90 UPI0003703EF6 |  |
|  | G |
| UniRef90 A8A8Y3 |  |
| UniRef90－13D7 | GNRSKKVDATNYFGFSSPNYPV |
|  | GCRAVKVRASGFSAFESVN |
|  | GREVKKIDTNALQAFGAPGWGP |
| UniRef90－H3FVV7 | GNRTVKTDNSALSAFDSPNMLPLARMNTNTKVNYDSTFRS |
| UniRef90－E3QQ15 | PRYVTKTHTLILGTFNSPWLGPIGYVDGEDVNMVSR QAS |
| UniRef90－UPIOOO3 | AGRVRKTHTTSVATFRSPNGGP |
| UniRef90＿L9VUU3 | ARDVTKTHTSALETFDSPSTGPIAALTRSD |
| UniRef90 M7X0G3 |  |
|  | GTRAKKERAKSYNAFSSINFPYLAVIQDGVI |
| UniRef90－UP1000423211D | GTRAKKERAKSFNAFSSINFPYLAIIQDER |
|  | GYYAKKTNANSDDSFN V |
| UniRef90－H2AS25 |  |
| UniRef90 12GIW7 | GN |
|  | GNQ A |
| $0^{-}$W8 |  |
| F8EBA7 | G |
| UniRef90－K7G1W5 | GNRVTKVDAGSFDAFSSPNDPPLANAEVDIT罭NWETVWRA |
| UniRef90＿R6JTA0 | GTHAMKVKTRNADAFKSINYPVIAHCKHGRITYNEVLEPL |

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UniRef90-H1Z4H4
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UniRef90-R411A4
UniRef90-E6N6D9
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 SGRMGDIPVFNPDS VSTLQTYPGISARVLEAVLDHS ETGPARFLPTVAGPDPRVDV1 KCHSGQDGYLIDMLVSGPC PPRPANGLTVHPLSEARVGALRLFPGISAELVANVLRSPL NTRPLVFYHQ MNTNIFLMKLIPGTDGRILDTLLADS AAGGTLAP A LS MDDAVSVVFLYPGDTEAVLRPQLESKV AFAKPMIPHF DMNPN
ERYP QQQVTKA NVMVLSLFPGIQADLEKHALDAPL SQGKGLAAMQNDAPWPWVELVVSHAGASGRAVDALVRDGV
PKGRFHVHTCMENSILVI RMVPGFADLD AGVSFRREYAHDALEPNVDLVKFAPGMNERIVEIAAED
SENSKELKSHKST
PETWNNELSTKT
RPRPVFYH
$\mathrm{C} P$
E S
GCHKFK■N

MNTNVAVLKL

RRGSSEPELCA DLEEKVGLVQFYPGMSPDVIRSY DGY
TTGEKLKVVNKTFDDNVVVVKMFPGMNESVLHALLHDPG
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FKDAKYNPRMKVD
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RERGRFRVWK
LDLSDSVCVLEMMP
QGCHPSANEEP $\square$ FNFPKVCILYAHQAFTVDLLEVVCKH
QACDRPQDWMTPFDDS TVVEVVYSYQEAGGESIAAFHAAGV

 Y R T R S ET D DVVA A D M A T DVVALVVKFTPGMDPAABLDHLDGKG E E GK K LR C V V N K LDD K S H D LD T





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 $R G V V L E G T G L G H V A S S F V P V L K G L R E K G V F V G M T S Q C R F G$ KGVVLESYGSGNAPTWFLNAMQEA!NRGTFI LNVSQCDGG

 KALI I LTYGVGNANTSLLKVLISEASARGUILVNNLTQCLQG
$R G L V L S G T G L G H V S T T W F R Q L G S M D E D G T T I V M T S Q C L S G$
SGIVLEGVGRGQVAPKMMPAIDRALDANDPVVITTSAEEG
KAVVFRTFGSGNAPKHFLEILRETTSQGIIIVNISQCFVG $R G V I D E S F G I G N E H N D I V A K I H E L I D A G V A V V I T T Q C I Y E$ NA I FEGTGLGHVGRTMYDMIKKADEKGLFLGMASQCUDG K GLII ESLGGNGGLPFDLVSGVEKLVSKGIPVIITTQCLEE
AGLVVAGTGNGTLHADLEVALKAAHARGVPVMRCTRCARG
$R A V V M E A F G S G N T D P R F L A V L K E A I N R G I V I L D I S Q C M G G$ EGIVLETYGSGNAPEDLLEELKKATDRKVVI LNCTQCLRG K GIVI自TFGAGNDPKELLPMIQRAFEQGTIVTVTSQCVHG HGIVLEGYGAGGIPYRGRNLLEAVVAREKPVVMTTQALYG

 DGIVTAGTGAGGISRAMGQARTAAANDGVVFLTTTRTGS QGIVIEGYGLGGMNFNUVAVIGDLIKKGIPVIATSQCLYE RGVILRTYGAGNGPTWFMDCIKNGIGRGLAILNVTQCGNG RGLILETYGSGNAPTCFLEKIKEASQKGUIIVNVTQCQGG

 RGGVLEGYGVGGIPYRGRDLEDRRVATEIDPVVMTTQTLYD
 EGI I LEGAGRGQVTPMMLEEDDRALVQGKKIVITSSCDEG
 KGIVIEGSGLGHVSTEIIDSIKNVIDRGTIVVMTSQCIFG DGLVI AALGTGNLPPELPALIAACAR PVVIATRTHAG
 K GLVI ETFGLGGIDYNVVSKVKEVIEAGVVVAVTTQCVEE RALILKTYGVGNMNKALMKALENAHSRGITTLVNLTQCTTG $D A F I L R T Y G T G N G P D A D H A L L A K A T A E G K L I V V N T Q C H R G$
$Q A L V L L T Y G V G N A Q E Q L L A T L K E A S E R G I L I V N C S Q C L K G$ K GVII E GTGMGHVPEYLVDACIKELTESGIFVGVTTQCVMG KGIILKTFGNGNAPPSFLSFLKELQERKIPVINVTQCIRG KGIVIEAFGGVNVLHRGLRGIHRCVEDGVSVVVTTQCLYD EGVVLQAYGRGNAHPTVAQAVGRLVGDGVPVIVTSRCNAG QGVILQTFGAGNMPTDILDALREAINRDVLVVNDTQCLKG KGLVSAGFGPGLGTRQETLALEEAISEGVVVVQSSRLGAG DGAVIAAFGVGHVPRHLVPALEDLADR VVPVVLASRTGAG DGVVVNGTGLGNTTSDLGGAIAAAVAAETPVVVVSRCQAG
 DIIVIESFGVGGMMEKFYEEMDNLAGTDKLAVMTTQVANE DAVII ESFGVGGLPDYFRHADQRLVSAGKIVVMATQVHEG EGVVVATMGAGSMPDGVNAF CLINMKIPVIYSKRSMDG RGVVLETFGAGNAPTWFLDALKAAIDRGVMIFNVSQCEGG Q GIVLETYGSGNAPPD LLAELKAATDSGVII INCTQCLRG E GLVIEGFGAGNIPPTAVGAVRHULQAGIPVVLASRCURG KGIVLQSFGAGNVPKDLLEELKAACDRGLIIVNCTQCASG RGAVLETFGAGNTFPWFLHELKEATERGVVI MNVSQCDGG KKKATERKVVIMNCTQCDGG KGVIIESFGNEGNNNNIAGKIYELIQAGVAVVITTQCIYE

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SSNLNVYQVGI QGGDMTTEAAMTKLMWALGQGFQPEETRA TVDQGGYQAGVSGVDMTAEAALTKMIYLFSDDLPPEDIRQ SDMEVYQVGKVISYDMTLEASVTKMMWVDGQTQDDRECRR GVEEKRYATGVSGYDMTCEAALTKLMHLFGQGLT
FVEMERYDTGUSGRDSTVEAAVTKLMYLYGRGNDTQTDRH QLLPTPGNALVAAPGLSPVKARISLVLDL RVELNAYAVGISAGDMTVEAAVTKLSYLLGRGDPDQQRRR RVCDRVYDTGVEGEDMLPGTATVKLMWTLAN RPDSVAE QSTPDIYEVII SAGDMTTEAATTKLMWVLGHTSGDDGVRN GVVMGHYEQLI SGKDDTTESAVTKAMYLLGQEVDPALFKS KVDMDAYSTGIGGFDSTTEASITKLFFILGHTSDDQEIKR SDMEVYKYQLMEAYNMTLEAATAKLMWALGQTRESGQVRQ TVAMERYDAGVSGRDSTVEAAVTKLMYLQARYHDPRDIRE HVYTTYDYPGSAGKDYDSKKARMRLAVLLAS D DDDIKE MIPVDPSSTGIASGYLNPEKSRTLLQLCLKQQYNMEKIRT RVCDRVYDTGI EGEDMLPEVAMVKLMWVLGMEDDKEKVRQ SVNMNKYETGU SGHDDTTEAADTKLMYLLGQQVSSSDFKN RVDQGRYETVISGTDMTTEAAVTKLDFLLGQHQSTEEVKK SVNMAVYATGKAGYDMTLEATVTKLHFLLSQNMPIAEVKL PVIPIYGYPGIPASFLNAHKARLLLLVLLSDGRDLGEDRR RVCDRVYDTGVEAGDTLPGTAKVKLMWALANHPDP KVNMGGYATGI SGYDMTIEAALTKLHYLLAQNLSQAELER RINMEGYATGISGFDMTIEATLTKLYYLFSQRLTLEQIRC RVNMNVYENGVPLDNMLPETAMVKLMWVLGKKASYETVKN RVEQGRYEMGVIGGDDTSEAAVTKLMYVLGLGLPREETRK GVDMRKYEVGLPAKDMTKEATVTKLMWALGHTKDVEKDRE KVSMELYETGLCGHDMTTEAAVTKLMYVLGDDLPDDRTRA KVNMKGYATGISSGSDMTTEAALAKLHYLLSTSLTPNEIIRT RVCDRVYDTGVEGGTLLPEVALVKLMWVLGQEKDEEKARM NVYTTYDYEGILGKDYDSKKARMKLMVLLA SQEEl KVKMERYATGV[GHDMTVEAADAKLMHLLGSGKSSDEVKR GI DLSSIYEVGIIGADMTTEALTMKLMWALAHYDSIDEAIKE SVRMTVYESGRPLENMTPETSLVKAMWASGNSENADEGKS GQNMDLYAGGITAGDMNTEAVVAKLMWVLSQTSDPATUKR AVVGRGAGALPHAGALSPVKARDELMLQL
TVELGHYEMGILSGDMTYEAATTKLMFVMAQNDPAEELKL TVTPVYAVGVIPGSDMTPEAALAKLSYVLSKTDSWEEKRE TVS GTYAGAVSGYDDTTEACVAKLYYLFSKGYDSNKIKE GVDLRRYEVGI PAGDMTKEATLVKLMYALGRTNGLEEVRR RVNMNGYATGIISGYDLTIEAALTKLHFLLSQNDSKEKI GSNMEDYQVGUEAYDMTLEATITKLMVLLKRYTSYSDLRR
 GSVYGGSGNVIAGGDLTPDKARLLLALSLTFSDDVEQVRT RSDLTRYEVGIS ACDMTTESAVTKLMWALGQSMDVKEI AQ GVHATRYVGGVSGHDVTFEAAITKMMFLLAQDLTTTQLR RVCDRVYDTGVEAGDTLPGTAKVK $\square M W A L A N$ RPESVEQ RVIQGRYQTSMSGADDTTEAADTKMMFLLANEPDETEIKR A ANFNDYQVGDEAYDMTTEAAITKLMWALGQTNDLKKI RT RVNMNVYTTGVPGEDMDP EVALVKLMWVLAHEQDIERIKT GVDLLTKYVG| PAGDMTKEATI TKLMWI LGHTRDVGEVRR AVNMQGYATGI SGGDMTTEAVIAKLYYLLSQKVSYVQLVE MIPDGTFGNIISSGYLNPEKSRILLQLCLFGNYTISE:RQ RVFAAYDDLG|LGGDYDSKKARMKLAVLLSAGFLGEEEK VAEPVYDYLG| FVTSDNGPKARLKLMLGLSNHENHVDLQT RVNMNVYSTG||SGENMLSETAFVKLSWLLGNFKDEEETTR GVNMSGYATG| SGTDMTDEACLAKLHFLLSSTGDSQEE:R GVNLGVYEVGI I G GMNTEALVGKLMWALGNFNNLSDVKC RVKSDSYAAG|AAADMTVEAAYTKLHHLCAMQLSAEEIRQ TVHQGSYAAGVGGLDTTTEAMFCKLHHLYSUGLSTEEVKA STNVNVYATGRPGGDMLTEVATVKLMWALANGYPPEEVPK SADLQVYQVGGQGRDMTSEAAMTKLMYALGKKYSYEEVQE AVAPDYGDGGWFAGDLAGEKAR】LLGLMLASGLSREEMYR QVDMHYDDGVIPGSDMTSEAAMAKLCYVLGRNDDHEKKKK GLAATYGFPGI RAGFLDPYKARVLLWALLATGHDRPDITE VTAPVYGGGGI HGDDLPAHKARVKLAVVCAVADAFEERRR SNMTGYEFHMLESYDMTLEATMTKMMWLRGLNYSNKRLRE GSNMTVYEVGIESYDMTLEATITKLMWLRGMNYSNARLRE SDMSIYQVGKVMSYDMTLEATVAKTMWALARSTDAAAFRN
MIPTGSHCNVIASGYLNPEKSRILLQLCLAENYSGNEVRR RVTQGRYQIGVVSGDITTEAAITKLMILLGRESDARRIST TVSASYEAGLI AGGDMTPEAALSKLSYVLAKNLGLDDAKKK GVAPDYDYPGUSAGALNGTKALLLLKYALSNQVDRSSLQE RVTQGRYQTVVSGGDMTTEAALTKMMGVLGRETDVERDRE


| UniRef90_H5UQB1 | $\square \mathrm{FD} \square \mathrm{H}$ |
| :---: | :---: |
| UniRef90-Q2BQ06 |  |
| UniRef90_14X4U5 |  |
| UniRef90-R6GZ65 |  |
| UniRef90-C7LP92 |  |
| UniRef90-UPI0002FF1A32 | L F Y K |
| UniRef90 S6CFA8 |  |
| UniRef90-H1HJE3 |  |
| UniRef90-S5F3L5 |  |
| UniRef90_JOKFA0 |  |
| UniRef90-C5LZU7 | A F |
| UniRef90-R4VT89 | T M R T |
| UniRef90_R6AVW6 | M M T |
| UniRef90-UPI000255B1CE | T |
| UniRef90-K1YF64 | M |
| UniRef90-F4X9G4 | LFEQ |
| UniRef90-D3HW21 | K M Q |
| UniRef90-U1YH16 | VF |
| UniRef90_Q6CQZ8 | $V$ |
| UniRef90-H1Z4H4 |  |
| UniRef90-V6SBK4 | A F E T |
| UniRef90-A3HYL2 |  |
| UniRef90_UPI0003767DAD | A M K |
| UniRef90-A4FWR5 | L M S K |
| UniRef90_Q1J287 | V F E |
| UniRef90_Q18GL3 |  |
| UniRef90-UPI0003FC406F |  |
| UniRef90-R411A4 | QMQQ |
| UniRef90-E6N6D9 | L M L K |
| UniRef90-UPI000419C573 | L L S |
| UniRef90-C6A532 | 1 M ${ }^{\text {T }}$ |
| UniRef90-13YLJ5 | L L |
| UniRef90-UPI00029B04BA | 1 Y E |
| UniRef90-B1KEJ9 | A M Q Q |
| UniRef90-B8GH20 |  |
| UniRef90-Q92A68 |  |
| UniRef90_UPI00037F5797 | L |
| UniRef90-R7ACG3 | Y M |
| UniRef90-UP1000374DC3E | LMLE |
| UniRef90-UPI00020D9AD8 | Y L Q T |
| UniRef90_V6IYM1 | M I Q T |
| UniRef90-H5WP43 |  |
| UniRef90-H8KN48 | MLS T |
| UniRef90-UPI0003D0D0C0 |  |
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| UniRef90_C5A6T2 | \MEK |
| UniRef90_W0P797 |  |
| UniRef90-J4UBK2 | AF Y E |
| UniRef90_L8HE50 |  |
| UniRef90_I2GVG3 | V F N |
| UniRef90-F6FST3 | WVE Q |
| UniRef90-17L8U7 | F F E T |
| UniRef90_R7J1F3 |  |
| UniRef90-F9Z5A7 | Y L N S |
| UniRef90-U1R265 | VMQ T |
| UniRef90_G0J7M0 | R M |
| UniRef90-R7GHJ1 | $\square \mathrm{F}$ ET |
| UniRef90-A0A031LP02 | KMLE |
| UniRef90-F8AHM4 | LMLT |
| UniRef90_UPI0003B641C8 | L F Q |
| UniRef90-G8BSM6 | $\checkmark \mathrm{F}$ |
| UniRef90_UPI00047B08D3 | A FN |
| UniRef90-K0DE41 | Y $\square$ R |
| UniRef90-E1STP2 | MMQQ |
| UniRef90-I0A2J6 | LF A T |
| UniRef90-L0A2C0 | VFEQ |
| UniRef90_UPI000362135E |  |
| UniRef90-R7N6L2 | Y $\square \mathrm{E}$ T |
| UniRef90-D9QV03 | F ME T |
| UniRef90-UPI0003703EF6 |  |
| UniRef90-UPI0003677639 | M |
| UniRef90_UPI00035F1816 | L L V T |
| UniRef90-A8A8Y3 | $\checkmark \mathrm{M} V \mathrm{~T}$ |
| UniRef90-13D7B0 | NF Q K |
| UniRef90-R5EMA2 | LF |
| UniRef90-D5WW09 | 1 VQA Y |
| UniRef90-H3FVV7 | L L Q T |
| UniRef90-E3QQ15 | $\checkmark$ F |
| UniRef90-UPI00034BD57F | A F |
| UniRef90-L9VUU3 | LT |
| UniRef90-M7X0G3 |  |
| UniRef90-D4IZT8 | A F Y T |
| UniRef90-UPI000423211D | AFYT |
| UniRef90-C6LIH9 | LF Y Q |
| UniRef90-H2AS25 | V F |
| UniRef90-I2GIW7 | $L \square A T$ |
| UniRef90-H2MN78 | L M A Q |
| UniRef90-Q6APK1 | L F |
| UniRef90-W8BYY9 | L M Q T |
| UniRef90-F8EBA7 | CLLT |
| UniRef90-K7G1W5 | MLSE |
| UniRef90_R6JTA0 | Y I E |


|  | 1 | 20 30 40 |
| :---: | :---: | :---: |
| UniRef90_F4G0J6 |  |  |
| UniRef90_W5N5J3 |  | $G M V Y$ H E V L A P D Y Y D P P E T M V L P S P |
| UniRef90_W9V1Z8 | M K R V L I I Y S G G T I | GMQP S E Q G Y VPMK GFHKLL $\square$ |
| UniRef90_D7JGL7 | M K K V L L I IT G G T I | $S M$ GRKANNSLLAPLSCNQVLA S |
| UniRef90_R5VLN4 | K SVLI I Y T G G T |  |
| UniRef90-M5JCU9 | MQE I L I L T T G G T I | A SQETDNGLAPG M M D E K L M |
| UniRef90_R6T6P4 | L L L I Y T G G T I |  |
| UniRef90_A2TX46 | K P N I L I V Y T G G T I | $G M \square K$ V K T N A L K A F D F S Q I T K N |
| UniRef90_B4L5C6 | $\mathrm{H} \vee \mathrm{R} V \mathrm{I} Y$ T G G T I | GMMRNERNVLAP GAGASMGPLVLPYV |
| UniRef90_UPI000249 | M TKLL I I H T G G T I | SMHTDENGSV EKSD N P P L L L L |
| UniRef90_D4LYU2 | K R I L I I N T G G T L | S SVK S S K G LVP G M M S M M E |
| UniRef90_H1XXT3 | MK K I L L I H T G G T F | GMV P VE P D Q T $\quad$ L A P A R V Q N H I I M M |
| UniRef90_A0RZ07 | LP KV L L L S T G G T I | $A S R \\| D$ |
| UniRef90_W6WQ07 | $R \mathrm{~K} P \mathrm{~K}$, A I I G T G G T I | S S L A N H P LE $\square$ L L Y A S G L L D C D A V VA M |
| UniRef90_FONY24 | PKıLI I Y T G G T I | $G M A M D Y D S Q S$ |
| UniRef90_UPI000366 | A T G G T | $M S R \square D$ |
| UniRef90_R6LRR1 | M K K I L M L G T G G T I | A SRQ TK D G LA P G LTTPE DI L S |
| UniRef90_UPI000345647F | M T S I L I I Y T G G T I | $G M \square E$ S E D R T T L L P F L K HVLE Q |
| UniRef90_A0A010Q4M8 | M S R I V L L A T G G T I | S SRENAA G G S R A S D SAA QLLAA A LHHA |
| UniRef90 C5C7R1 | M T R V HVLA T G G T I | A S R S GE GSGA T A G D A A A A L A G |
| UniRef90_R7JSB6 | M K K l L Fi A T G G T I | A SKK TE NGGLT P Q T T P E ELL S Y |
| UniRef90_R6RNK2 | K K K I LI I T T G G T L |  |
| UniRef90_K6DGD6 | $K \mathrm{~K}$ K V A L I T T G G T I |  |
| UniRef90_UPI0003F06816 | $V M \vee 1 \quad Y T G G G T I$ |  |
| UniRef90_B8EIS5 | QRPRVII L S T G G T I |  |
| UniRef90_E1QYM9 | LK H I L I V A T G G T I | $A S T P$ Q G G G L A P G L S G R Q A D Y |
| UniRef90_O57797 | $R \\| L$ |  |
| UniRef90_R7QWW6 | M K Q I L V I A T G G T I | ACRSTEK G LM P P |
| UniRef90_R6E470 | K K R V C L Y T G G T I | $G M V P$ T E $\quad$ LGY A P K Q K Y F S S L L D E |
| UniRef90_UPI000411FC0C | N I L V I Y T G G T I | $G M D Y A A D G K$ H L D P F F Q A L L K |
| UniRef90_F5J427 | H I L L I Y T G G T I | $G M V E N P \quad$ VT G S L E P F D F A H L N S H |
| UniRef90_UPI000319A70C | M P R V L M L Y T G G T I |  |
| UniRef90_R5XR12 | K K R I L I I N T G G T L | S SVNGENGLMPGMKS R D M M L D E |
| UniRef90-Q5WGV6 | M R H V M L L T G G T I | A STTS ES GKLL |
| UniRef90_Q9U518 | HVLVLYTGGTI | GMK Y D D D Y V S T Y Y S D A E I R P Y C L P P L |
| UniRef90_H1Z9Z6 | K P A I L L 1 Y T G G T I | $G M V K$ F K T GALRAFNFNQLVER |
| UniRef90_I2EZJ5 | $V L M \mid Y$ T G G T L | $G M V Y$ D T K S S |
| UniRef90_E9G593 |  | GMMRNEN GA LVPA A F G G A G T HKAPLA |
| UniRef90_A0E9N5 | KVLIL N T G G T | SMFPSSS GYV T D Y T Y F K A T D D F LI T P |
| UniRef90_L5NBB4 | M K R I L L L S T G G T I | $G C \square Q T$ E E G L P P G |
| UniRef90_C7DG76 | $R$ LP K I SL I Y T G G T I | $G S K \\| D$ |
| UniRef90_I6URL2 | $K\\|L L\\| G M G G T$ | A SVKGENGYE A A S L S VKEVL D |
| UniRef90_K6YWG6 | K H $\quad \mathrm{Y} \mathrm{Y}$ V A Y T G G T | $G M K P S K N \quad G F V P A A G Y L S K T L L N$ |
| UniRef90_MOLVI7 | L T I L S T G G T | A S TSGEA GAT P S S S G D L V A |
| UniRef90_R1E5E5 |  | $L S K \square D$ |
| UniRef90_Q29917 | $R \vee H V I Y T G T$ | GMMRNS S GVLAP A Q P E N S SLMVL PMV |
| UniRef90_A0A022LKY3 | $V \vee A T G G T L$ | A GRA T T Q D S Y S N Y R A G TYP M A EL I P E |
| UniRef90_UPI0003B4BD7A |  | A SAATDG G G A V A Q T TAA ELLKA |
| UniRef90_N2AT50 | K N L L I 1 A T G G T I | A S NK TKK G L S P P T S T G D DLI S Q |
| UniRef90_D1PNE9 | M K K I L ML A T G G T I | ATLK T E E GKVV $\quad$ P QLLTSQELL L R T |
| UniRef90_H9KBY5 | HV L V L Y T G G T I | $G M \mid R N E N G V L T E K R F G S M G P L V L P M T$ |
| UniRef90_C2FWG4 | MHN\\| F I I Y T G G T |  |
| UniRef90_UPI00036BFD89 | M I I A T G G T | $G M R P$ GFAGLAPA G A A A R A E A L N Q |
| UniRef90_H0W0T5 | $H L L L I Y T G G T L$ |  |
| UniRef90_U5Q3W0 | $1 L^{L} \mathrm{~L}$ I Y T G G T I |  |
| UniRef90_E8R9J8 | $L P R V T$ | A SKVD Y E T G GVTPVLTPGEI LE W |
| UniRef90_L2FFF4 | K R V G F S T G G T I | A S $\square$ A M DEF D FMDYNAERV S G Q R L D Q |
| UniRef90_UPI00036AAB02 | $M \vee L G T$ | $A G T S E V A G A N V G Y T A A Q \square G V A Q L L A A$ |
| UniRef90_UPI000304F6FB | K K K V V L $\quad$ S T G G T I |  |
| UniRef90_R1FUV1 | M P LI AL A S L G G T |  |
| UniRef90_UPI00032B1BFF | $R L L A B Y Y$ T G G T I | $G M R R E D G V L V P G A H A Q A C G L P E D T L L$ |
| UniRef90_R6K950 | $S \mathrm{~V}$ K N L I \\| A T G G T I | A S T D G D GLV P P I DVK K L S Y |
| UniRef90_A2SGY4 |  | DS L G Y T A A KLG G A QLLAA |
| UniRef90_X8K2D1 | $M K K \subseteq L L I A T G G$ | A SVQTENGLK PAI SPEMLLSY |
| UniRef90_B5DTT7 | K R V L V I Y T G G T I | GMTP ND N G V L V P L H D P S L Q V P D G F LA |
| UniRef90-B3S6K3 | K V L I L Y T G G T I | GMKK T E R G Y EP P Y D Q ELIF S P P D N L E S |
| UniRef90_W5J585 | K M P R V L V I Y T G G T I | $G M M R N E K N A L L$ |
| UniRef90_L8JKW7 | I L I V Y T G G T L |  |
| UniRef90_UPI000429DB4B | M K K V K L T T G G T I | A SRKNE E GRLL E A GLYY T GEELSASR |
| UniRef90_UPI00035E4FD2 | M GR! V V I S T G G T I | $A S R R Q G A G L A A D A D G G E$ |
| UniRef90_B2RH44 |  |  |




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UniRef90-Q5WGV6
UniRef90_Q9U518
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UniRef90_G3WI03

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S SDRPSSDSG $\square \mathrm{NLL} \mathrm{V}$ S SIV LLA NQAPFGEVVVNMHGESSDHR P DYEMRNDGRDNLLGALLIAG QFVIPEVCLYFH HK LYR
 PI GTIRTDGRENLIAALEI ADDDKAIVPEVCILFGAKLFR PLEMIETDADRNLHDALTVAS QADLRGVYLVFNGLVMA
 PIFETRTDGKDNFTSALIIAGNY VIVIDEVCVFFGNKLMR

 S PDRPSSDAAQNLAAAASFLTQVDSGLYVVVMHLDGNDGAS
$P$ PSALSSSDAGLNLANAVRAAVDPACRDMGVLVLMNDELHA
 SLDRPSSDAALNLYSAHHFADKSEYSGVFVVMHGTTSDHR
 PI GMDRTDARENLITAVEFAMHDEPVLQEVAI YFEDMLYR SPDHPDSDGPRNLRDAILVAADPASRFHGALLCFGGEIHT AADHPDTDGPRNLRQAVLAAAQPDARGLGVLIAFDGALLS
 A PQDIGTDVYSNLRNSIYVAVNEELKNVGVVVVFNERIYS PLFELRNDGRDNLLGAIYLAGHVAADPEVALYFNNKLFR RADQPGADGPANLLAAVRVAASKAARGAGVLVVIDDEIHA PMGSPFTDARLNLYQSI LYAADDLSSD GVSVVFGGQVIV
 P L C E D R R S D G R R D N L I N N S ML I A A A D GlV A A N P I $\quad$ S A N N R T D A R R E N L I
 S I A D P VA D A M E N CRC GI HMA A A G G CP G V F V AF N R K V M L GPEQTGSDAFMNLRHAIYAACEPDLKKTGCVVVFNERIIAA



 S S D R G S S D A F M NI IC A T T IA A T S D $\square$ A E V G I C M H D S C S F I R
 RPDEVVSPDGPSNLLTAVRMASHERFQGTGVYIAFDEELHA SSDRPSSDAFFNLLSSAVYDNSD@AEDAVVMHGTSSDDHR
 S S D A A DT D GP R N L R E A I
 PI F D S R S D GLD NFLSSLIIAANH NDPEVCVVFFGTNNDMR


 SSDRPSSDSAFNL RAAFITASKAPFAESVIVVMHGETSDHR PLD GKS SEAAA NL LAA FRVAAKHTHPNSPGVVVVINDEDHS $P A T A D A P D G P Q N L L D A V A L A A E P S A R \quad G V L V A A A G V V H G$ S P A TIGGT D A F S NL R Q A I L L A A R E E A R S L G TVVVLF NE KI LP $N A G L F S P D G P A N L R N A L T V A A D P R S R G R G A L V V L N D D V M A$ $P$ I HA L Q S D GRENLLGA L LMAS QFVIPEVCL F FQNQLFR
 P AT A VQ A D G P Q N L LD AV A LA R E P G A A
 P I YEQRSDGRENLLGALI I AGHY

 \begin{tabular}{cc|c}
$G G$ \& $L$ \& $N$ <br>
\& $I$ \& $P$ <br>
$V$ \& $I$ \& $P$ <br>
$V$ \& \& $P$

 $\begin{array}{lllllllllll}G & V & C & A & V & F & A & G & S & V & F \\ G & G \\ G & F & I & V & F & D & G & K & A & I & L\end{array}$ 

\hline$V$ \& $I$ \& $P$ <br>
$V$ \& $V$ \& $P$ <br>
\hline

 

$E$ \& $V$ \& $C$ \& $V$ \& $V$ \& $F$ \& $A$ \& $N$ \& $K$ \& $L$ \& $L$ <br>
$E$ \& $R$ <br>
$V$ \& $T$ \& $L$ \& $Y$ \& $F$ \& $D$ \& $H$ \& $K$ \& $L$ \& $Y$ \& $R$
\end{tabular} GPDAL GSDAYDN RHACY TA A A PVMTGGEVVIVFDYVLLR P L GAV D GDGPGNLHDALLTAATTARGLGVVVVNERIVS

 PSTSMSADGPFNLYNAVVTAADKASANRGVLVVMNDTVLD P I G E I R T D A R E NL IT AL E I A K H GR S LIDQEV CI YF D S K L FR
 $P$ VGR!RTEARRNLVTALEMAAARHPRVPEVCLFFNDQLDR PWDVI GT DGPANLYQA KVA GS GKTKWF GTVVMLNDVI FA $P$ I H AL WN D GRENLLGALLMAGHY LIP EVVCLFFQK QL FR



 THDELSPD GPANVRGALDAAAHDHVQD GVVVLFNE QLHA
 PI FHPRSDGLDNFDASLVIAAS Y NIPEVCVFFGTNLMR $P$ I DLDEDT D A K S N LI D S F L Y A A D D R S G Q GVQIV F D G K V DA



UniRef90 F4G0J6 UniRef90-W5N5J3 UniRef90-W9V1Z8 UniRef90-D7JGL7 UniRef90_R5VLN4 UniRef90-M5JCU9
UniRef90-R6T6P4 UniRef90-A2TX46 UniRef90-B4L5C6 UniRef90_UPI0002490AED UniRef90-D4LYU2 UniRef90-H1XXT3 UniRef90-A0RZ07 UniRef90-W6WQ07 UniRef90-FONY24 UniRef90-UPI000366C521 UniRef90-R6LRR1 UniRef90_UPI000345647F UniRef90-A0A010Q4M8 UniRef90-C5C7R1 UniRef90_R7JSB6 UniRef90-R6RNK2 UniRef90-K6DGD6 UniRef90_UPIO003F06816 UniRef90-B8EIS5 UniRef90-E1QYM9 UniRef90-O57797 UniRef90-R7QWW6 UniRef90-R6E470 UniRef90-UPI000411FC0C UniRef90-F5J427 UniRef90_UPIO00319A70C UniRef90-R5XR12 UniRef90-Q5WGV6 UniRef90_Q9U518 UniRef90-H1Z9Z6 UniRef90-I2EZJ5 UniRef90-E9G593 UniRef90-AOEMN5 UniRef90-L5NBB4 UniRef90_C7DG76 UniRef90-I6URL2 UniRef90-K6YWG6 UniRef90_M0LVI7 UniRef90-R1E5E5
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UniRef90_W8F5N1 UniRef90_UPI0003618AA9 UniRef90_UPIO002C46CA1 UniRef90_Q2BKT4 UniRef90-_R6PIS7 UniRef90-M1NX39 UniRef90-W1NB15 UniRef90-UPI00035D90BC UniRef90-I7CK44
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170
180
R R AF Q V N D L A KVIWKEKLV KLL L R T D GNRVTKVDAGSFNAFSSPNLAPLANAEVDDKINWDTVWRA G N R S T K V K S S A G F D A F D S P N F P W L G S D
 GTRADVKK S K S Y GAFES DNY P Y L A SVAD G QFK M LYEP




 ANRATKVNAENFDAFDSPNFPSLGDSGVHLDVKKNLLFHY
 GNRTKKFSTEAFDAF $\square$ S PNYPKLAKAGVNLNFDFNE LFRC A LPDLRKAHASALQPFS ARGTRKGHTMASQPF GTRAKKVRTKSYNAFSGGT LVGGTTHGDGFHLHARPHRP
 A K Y V K K V H A S N V Q G F E S F G Y G Y L G I I D N N IV V S I Y Q K P I
 GTRAHKQRTMSFNAFNSVNFPDPADI RADRIVRDGGMGMS $G V R A S K \square R S M G F D A F$
 GNRARKVRTMGLDAFDSPNFPWLAEDGUGITMAPQPSAL


 GNRAKKKESSQRNAFRSENYPSLAEAGVTIDDFNFPFIMPF









 G N R S F K Y N S A K F E A F R S P N Y P V L V E A G G
 GNRTTKDNAENFRAFRSPNYPHLAEAGDHMKYNKNFIS

 AR Y V V K K K H H P L R L D A F D S G D T G P L G WV EA GRVVRWA PA A Q A








 GNRSFKYNSAKFEAFRSPNY PVVGEAGVHLKYNRPA LMN GTRAKK T R T F S F E A F S S DN Y P F L L A E I Y D G K I I R Y D S Q N K N
 AREVVKSNSHRMDTEDTPMFGALGYVDDPAVR\YRAPARA









A WGVYKRSTDK P DAFRSAR

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UniRef90 R5VLN4 UniRef90-M5JCU9 UniRef90-R6T6P4 UniRef90_A2TX46 UniRef90-B4L5C6 UniRef90_UPIO002490AED UniRef90_D4LYU2 UniRef90-H1XXT3 UniRef90-A0RZ07 UniRef90_W6WQ07 UniRef90-FONY24 UniRef90-UPI000366C521 UniRef90-R6LRR1 UniRef90_UPI000345647F UniRef90-A0A010Q4M8 UniRef90-C5C7R1 UniRef90_R7JSB6 UniRef90-R6RNK2 UniRef90-K6DGD6 UniRef90-UPIO003F06816 UniRef90-B8EIS5 UniRef90-E1QYM9 UniRef90-O57797 UniRef90-R7QWW6 UniRef90-R6E470 UniRef90_UPI000411FC0C UniRef90-F5J427 UniRef90_UPIO00319A70C UniRef90-R5XR12 UniRef90-Q5WGV6 UniRef90-Q9U518 UniRef90-H1Z9Z6 UniRef90_12EZJ5
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UniRef90 K6YWG6 UniRef90-MOLVI7 UniRef90-R1E5E5 UniRef90-Q29917 UniRef90 ${ }^{-}$A0A022LKY3 UniRef90_UPI0003B4BD7A UniRef90-N2AT50 UniRef90-D1PNE9 UniRef90-H9KBY5 UniRef90-C2FWG4 UniRef90_UPIO0036BFD89 UniRef90-HOWOT5 UniRef90_U5Q3W0 UniRef90-E8R9J8
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UniRef90 B4MTI7 UniRef90_UPI00047D8E0E UniRef90-E2COK9 UniRef90-G2T2Q0 UniRef90-D3L118 UniRef90-SOKHXO UniRef90_B9JJD2
UniRef90_G3WI03

YRRKSDHDEMNAKFDERVV|L|LIKFYPG|L|KPDIVEELLLSAGY NTTAKF F $\square$ QTSMNRNVGLLRLFPGITAETVRAFLQPPM
 $P$
 PNDWYQSLT TNTELDTRVSILKMHPGITPEVVRNTLCKDT

 LVEKKGIFKPQTAYSDKVALLKLYPGDSPEILDMYYEKGY EGP P VF H LIPGFYPQAVVLTIQPSMSPGYFYSLFDQND

 KRDDSREIKGMNNFENKVGLLKTFASMPQEASDYLVDKGY RHADKFYYDMKDS
$\qquad$
PRLPHPTQNFGDQ


 E E K V F TKDNYQIKKQDPRVDI I KCYSGADGVFDEAADKAGA SATEKFKVQEK MNTNIGLLRCDPGADTETVKAFLQPPAM PAAPPPLMRFGGGRPP IVPVVEAGPGLERETVAALAAGGF
$\square T G V P A Q A T P D G A A P A H G S L K P P T L Y D R L C E R V G L E G N F$
 $M P K Q A R E F S L T E M K Q V P$ I GVLVIVFPGDQFELVEQIVAE KL



| R E F Y E |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| P | G | N T | P |

SSMAPFVVHDQL

PNEENLQVNKKFCTN
CT
NRNQKKAVSAVTGYSSKVAMVKAYPDADPSTLKFYEDKDY NGEVTL DSGIEDAQNPESSLLSEI GLVSLYPGISADVVKNIIQQPV GSRS $\square$ SVDARRPTATVPMVKTGVGVDAQQVTDALRMDA RKRNNNSPYLDDKDCKKVALIKTYPGSDPDIIKYYVDKNY
 D

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 CT LIE K F Y V V H T S L L N R$R Y K Q F$ P H R A P L G A A S LPP C S P A K V V $\operatorname{L}$ R L T






 P T G L $\quad$ P $\operatorname{L}$ G $\operatorname{V}$


 A A LPLPAVPDAA VPRVDMIMHHCDADALMFDAALAAGA

 $\begin{array}{lllllllllllll}D & M & P & P & V & Y & H & S & L & N & E & N & V \\ V & V & V & A & V & G & D & K & P & V & E & V & A \\ V & V & P & V & L\end{array}$
$P D T P$ L R V H Q QLL







 $R \mathrm{~V}$ I E E MVQQPAKEVVEI


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UniRef90 K6YWG6 UniRef90-MOLVI7 UniRef90-R1E5E5
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UniRef90 W8F5N1 UniRef90_UPIO003618AA9 UniRef90_UPI0002C46CA1 UniRef90_Q2BKT4 UniRef90-R6PIS7 UniRef90-M1NX39 UniRef90-W1NB15 UniRef90_UPI00035D90BC UniRef90-I7CK44 UniRef90-B4MTI7 UniRef90_UPIO0047D8E0E UniRef90_E2C0K9 UniRef90-G2T2Q0 UniRef90-D3L118 UniRef90-SOKHX0 UniRef90_B9JJD2
 EGIVLETYGSGNAPDNRADLLEEATDRGVIMINCTQCLRG RGLVLQTYGAGNANKDFDEVLAHASTSGVTILNDTQCAYG KAVILETYGTGNACKWLYRLLAEANKAGIVLLNITQCRAG KGLILETYGSGNTDADFLNK QQACEKGIIIVNVTQCQGG HGVIIESFGNGGLPFNLIPAIEKDTARGIPVIITTQDEEG RAII METYGSGNTRDWFLDVVKESSAMNKIIVNVTQCLAG KGVVLETYGAGNAQEWFLNLLKDAVQKNIKII NVTQCVAG RGVVMQSFGSGNVPKDLIDELKAAAARGVIII NCTQCPNG HGIVIEGMGAGNLPPKVAEALQRFDDADIPVILVSRCYSG
 $R G \operatorname{FEGTGLGHVGRQMYEAVGRAAEKGVFMGMTSQCIDG}$ $R G V V S A G F A P G Y T G D A D A A V L S K A V E N G L V V V Q A S R G G S G$ KAFI IEGYGTGNDFTWFIDILKKKVEEKVHLIINTQCAGG RGILI EGTGLGHVPHSDIDAIKYATDKGVIVAIASQCLYG
 AGLIVLGGGAGNPGSALVEAIAEATQAGVVVGLASRTFGG $D V V V L A G T G L G N A G P G H A E A V A E L A D R G V P V V L A T R T L A G$
 KGIVLEGVGRGQVSPYMMDAGKKAIAAKITVVMVTSAEEG

 KGIILEGYGVGGDPYRGTDVFEDVI SKRDPVVLTTQAIYD DAVII EGFGVGGIPMKYKEKIAELIDDAGTEVVITTQVPEG DGVVLETFGEGNI NHTLVNSI RRASQNGAVVSVCSQCYSG K GVVLESFGSGNIPTWLLKLLQKLVDRKILI FNVSQCAGG KAIILETYGSGNAPPWFIRLVRETVKKGVVIVNITQCNTG $K G V V L H S Y G V G N P P S F L L D A L K A A H E R G V A L L N V T Q C A Q G$ RGVYVEGFGLGGMPNDFI GAVKKAVENGMVILAGSQCRYE
 EGIILETYGSGNTEPWFLETLRCATQKGLKVI NVTQCSSG RGVVLETYGAGNAPEWFLEELYEATKRGIVIVNVSQCDGG

 DGI I I E GTGLGHVPMSWLPWI K SAADKGVIVGITSQCUYG RGIVIEGYGAGGIPYRGSDLLQEELSKEIPI VMTTQAMYD NALILLSYGVGNAPQNLLAQLVQAQENGVIVVNCTQCFRG DGIVVEGTGLGNTTSAALDAVADADEADVPVVITSRCQDG

 QAVVLAGSGAGNGNHAMLAWVKEAVRTGTVVGLSTRVPDG QGII AEAYGALGNFDRSYEEAIVFDWVHSGKIVVITTQVPEE E GVVLQSYGT GNVPSNREDII KEATKRGVIIVNITQCSTG

 RALI I ETYGSGNAPTWLI SMMTNDTVKK GTIVVLNVS QCPA G
 A GIVVAA T GNGTLLHAALEQALARAAAA GVRVRVASRCP Q G $K G I V L E A F G R G Q V H P A V A E Q V Q Y A D E K G V V V V V T T S T A E G$ $R G V V V A A T G V G H V S S G T A D V I A R L V P S \quad I D V V V A S R T G A G$ $K G V V M E T F G S G N G P P D L L Q E L R A A T A R G L L I V N C T H C L Q G$ $R G V I\|E S F G \square G G\| P C T A G D E I G E L T E A G I$ AVVIT TQCMYE $D G V V V A G T G N G S L H H A L E A A L R S A Q A A G L V V Q R C T R V A D G$ $D$ II VI ES YGPFY DKRNFLDNEL RALLTEKGKII VIATQVME G $M G V V L E S Y G S G N \square P S N W T E L L R S A V N R G V I I V N C T Q C L S G$ E GVI L L S Y GS GNAFPNIINEFRKACDRGVLILNDSQCCRG

 $R G V V L V A T G A G N A T P E D A E A V A A A T S R G V L V A L T T R D V A G$
 G
 $D G L V V$ A A F G VGGHVP E S V V D DL S G L A A E R M P V V L A S R T G S G $R G A V L L T Y G S G N A P P W F L Q A L R D A T D Q G L L L L N V S Q C E E G$ $K G V V T A A G T G A G G \square S S G L S A A R S A A D T N N G V V F V S T T R T T G S$




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

 RCI I L E SFGPENLLSTTFYQLMHKYQNERLVVVVSQVANEG


UniRef90 F4GOJ6 UniRef90-W5N5J3 UniRef90-W9V1Z8 UniRef90-D7JGL7 UniRef90_R5VLN4 UniRef90-M5JCU9
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UniRef90_G3WI03

R/VIN M NVY Q 290
300
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320
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 SVAE VYDVGVIPGYDMTPEAALTKLAYVIGKSEWSDEVKK
 GSNLSVYETGUQAYDMTTEAAMTKLMWVLGQT GDLREMKE
 MVEDGRYATVI SSYDLTMEAARTKKVAYALKGQNSSSEEVAQ RINMHVYETGGGCEDMLPETAFVKLMWVLGNYKDMEDAKR GSNMTVYEVGI EAYDMTLEAVITKLMWLMGREE QDMQK NVEQGKYAGVVSCGDMTLEATVTKLMFLLGQSDDSEWVRD SVAATYAAGAVALGDLPGTQARVLLALLLSTGA REETKD PVLGVYGDGGVPAGELTPFQARILAATVAASHPDPPEFRA
$S D M T V Y E V G E M S Y D M T P E A V A T K T M W L L G N R D D H E S R E K$
 KVYPAYGYVGSAGEDYDSKKARIKLAVLLAS
TVVCSYDAGIIPGGSDMTVEAALTKLSYVLNKGLSVEEKRK ETLCASYAYAIPARWLDARKSRIALQLALAQGADLAQTRA GLDLGVYEVGRAGDDMTTEALVAKLMWALGQTRDRQRDRE GVDLQRYKVGDPAGDMTKEATITKLMWDLGHTKNDEEVKQ S NLDIVEVGRTFAYDMT DEADVTKMMWVMAEAYTHEDIRK

 EV DQGAYATGIAGGD $\square$ TLEAAVAKLIVLLGRGLSGPALRK GSNLSSVYETGRQAYDMTAEAAMAKLMWVLGQTDSLREIRE KVYPTYDYKG\|LGSDYDSKKARDKAMVMLAANKELAA QVDPDYY

 AVEMI YEMGVISGADMTSQAALTKKGYLLAQEDDVDKVKD $R V N R S V Y A G A V Y C E D M T A E T A Y V K L S W L I G K N Y G K E K A R E$


 TVAPTRAAGMISGNELLPQKARLLLALVSRAFTDDVANKKK $P \vee V P \| Y G N G G V A A G A L N L G A A R M L L A A L L S S G A E V D D V$
 HVSNLYEAGIISGFDMTPEAALTKLAYVLSKEWDMQTKRE SVELGRYETSQGGYDMTFEAAVTKLMYLQGEFEDQKDVAY ATHLANYATGDDGSDMTPEAAFTRLHWLLASGYHGDTLRQ SVTPGYGANGVSGLDMTSEAALAKLSYVLGLEDSLERRQE
 RMLADQDARWQDADGLSPVKARVSLLLLLAATM NVKVVYDTPGDLGRDYDSKKARMKLAVMLAA EVGEDKE PTLRSTYGFQTMAGWLDARKARILLHVLLASGADRDRIER TVTSDYAAGTAMAGDMTSEAA LAKLSYVLGQGLSLDQRKE GVSDDVYEVGIVAKDMTTEAVTMKLMWALAHYTKMTDVKE A VLPT GHDALPISEARTPA QARDELMLALMA
SDAEKYEYNVLQSFDMTVESAVTKLMWLCAEHEGYEEDRD SVAA $\square Y$ DAGAV $\operatorname{SSDDMTSEAAYTKLAYVLGTDDPHENKDE~}$
 RVIDGGYDTVI EGADDT DEAAGTKLMLILGEEQHVGADKK NVYTTYEYPGILGHDEDSKKARMKLTACLQAGSSASE PVSEDYTHGGVPTGTLDRAGQARIAVLSALLATTDPREGER YVDMHRYETGISGYDSTTECALIKLMYLFGRGYTPERVKA ATTQDAEYGFVASGTLNPQKARVLLQLALTQTKDPQQIQQ SVELGRYEMGVLSGDMTFEAAVTKLMYLQGEFEDQSEVAR
GSDTD $D Y E V G V E A A D M T L E A T L T K L M W V L A K N R T W A Y I ~ E D ~$ SVLERTYAFPI PAGFLDPLKARILLWHLLSNGHDDADIRQ RVLQGRYETVI GGDDI TVEAADTKLMFVLGLNEKPTRTRH GSVYGGSGNTVAGDNLNASHARMMLLLSLAFSNDVSQDRS TVTSDYAAGAALADDMTTEAALAKLAYVLGRGDSLDDRKQ DVYQGQYACVLSAGEMTQEAVFTKLHFLLATETEDEDRKK GSNMTVYEVGLEAYDMT LEEAT@TKLMWLMGLKMKYKEFKN
 SVIDPGHYETVI DAK DMT T E S A L A A K L M Y L L G I G G E K E E F S L
 GS K M DVVY E T GRAE A H D MT S E A A L T K L M W L L G M T S D I S E DR D

 $S \| T S N Y A A G M A L S G D M T S E$

| UniRef90_F4G0J6 | $\square \mathrm{M}$ |
| :---: | :---: |
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MAHIVVLIATGGT\| ASTRDSSPGATATEA $\quad \square D S L K E$ $M P K V L L L H T G G T L G M \quad A G G Q P S A L D R P A F F R T L K Q R$ $R V M V L Y T G G T I G M Q A S A N G L A P A S G F E A R M A G Q L A D$ $M K N V V V L T T G G T I A S A L D G T G R \quad N A S G A D S G E T L L E H$ $M P R L A L I N T G G T I A S R P D P G G A G L T P Q T P P \quad$ I KILMMMGGTIASDKGKEGYES AMASANEDLK $K V L V I$ YTGGT GMMRNEKNADL EPRPNEFVRKIRQ MGHLVVLATGGTISTSSDADGVKRPTRSGA

TSDHPLSN
$M K R \ L M L G T G G T \prod A C K H T E G G L T$
PA T P EEVVGF
KKLLIINTGGTLSAVMKEQGLSPD
PTMTGHDLLKY $K T L L V Y T G G T I A S G E G R E G L T \quad G A D K A F D F D H L L V Q$ PKVAFI GTGGTLSSVGRDSLDLLDYTATELEADAILDA KRI L M MI GTGGTIASKQTENGLKPG $\stackrel{L}{\mathrm{~L}} \mathrm{~A}$ VPKVAI I GTGGTVSGVAPSRTSFHRYEGGRDRIRDLTEE SVSRVLVLYTGGTI GMKCVNGSYDPTLNKMPTFCDSDLTE

 LPTVAIVATGGT, AMKTDPRTDYTNYDGKHLTGDELLAR $R V L I V Y T G G T V G M V K G P K G L F P Q A P V P A L G Y A D L A A A$ $V L V I Y T G G T F G M V Y E P Q \quad A G Q L V P F D F E R V V D R$ VTVI ALGGTIAMARPADGSTGGVPALDVDELLAS RVLIIMTGGTI CMRRSPDGYVPAEGFEELTLKSLRTP KI YVAYTGGTI GMVPSDHGYVPDAAFADVVLQKLTQY MNKI LIVYTGGTI GMMETDSGLAPSSGLRTRIHHAVGDN $M K K I V V G T L G G T I A M T A D N L G Q M Q \quad P \| L T S D M L I K N$ H A AVV SLGGTI TMTSSAAADGA GVVK P SLDAA DLALAS


 EMKRLAVIHTGGTIASRPNPNGPGVTPQTPP SKSKI SI GALGGGTICMSACGN EGGVKPSFSADDLIAA

MK K L
$R \vee L L I M T G G T \| C M R Q S P N G F V P$
 MAAAPMPAFNDKSPS $\square P$ RVLII MTGGTI CMQPSADGLVPAYKNGALTLDSDRTP $K V L I \quad Y T G G T I G M Q P F A N G \quad T L H P V P G Y L T R Q I H S$ $R L L A V Y T G G T I G M R S E L G V L V P G T T L P M F H D E E H A R A$ $R L L V I \quad Y T G G T, G M L Q Q A N G L T P G G N F R D R R L H Q A L S H$


 $L P T I S L I$
$K$
$L$
 $R \vee L I M T G G T, C M R P S P D G L V P H A M A P R P S F N D L R T P$


 $V L I I M T G G T I M M Q R S P S G F \square P D D G S R P S V V M D V V V N A$ $K I A L L T T G G T I A M T N Q G R G A D V S I S G Q A L G A$
$K V L I \quad$ NTGGTIGMVGKP Q GFIPAAGFLSETLAN L L V I Y T G G T L G MVP GERGLIP G KN NE QR L RNA L S QL $R V L I L Y T G G T F G M A P D A D G$
$T L H P K S G F L E Q K V K E$ V L V I Y T G G T F G M $\quad$ YY D P K A N
$R V L V I D T G G T \| C M R P S A E E G V T M S D L S C T P$ LICCQLDR
 KKNTLLIATGGTIASSKSEHGL RVLI I MTGGTI CMKQSS MSKI I VITTGGTIACTTDPN SGFVPARGFQEQCLAR $R V L I I S T G G T I C M Q E G P D G L T P S A G A P R P T F N D M S G Q$

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    M P
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$R V V V I T T G G T I A T S T D A N G V R R P T V S G A$

E L G K V V V L T T G G T L S C T M D P N G AL DP TVVS GE E L I E D I I
A A A G

        M A R \begin{tabular}{llll|lll}
    $I$ \& $T$ \& $V$ \& $L$ \& $A$ \& $T$ \& $G G T$ <br>
$L$ \& $L$ \& $V$ \& $I$ \& $Y$ \& $T$ \& $G G G T$ <br>
$l$ \& $A$ \& $S T$ \& $R$ \& $S$ \& $S$ <br>
$G$ \& $M$ \& $D$ \& $S$ \& $P$
\end{tabular}

        \(G \square S\)
            S P GATATE S IDDDLLQ S
                    \(\square\) P D F E A R L R H A L A AL P P
                                    GALKAFDFNDLLKK
        VLVVFTGGQMGSRMDENGEFVNENDTPSMLIHDLLS
        \(R V L I I M T G G T M C M K S S P E G L V P P D P M P V M T T N T T E E Y\)
        \(I T V V S L G G T I A M T P S S E G G V T \quad P G L G A A D D V A A\)
        S G GV
    MKKIVVLTTGGTIACTTSPEGVLLPTVVGRDVIAPVMAK
    
$R \vee H V I V V G G T I G M D R N E S G L H T A P K V L A R Q L Q E F L P A$


UniRef90_UPI00034DB8BE $\quad S \square P \square V A / V A S \square G G T\|S M T P S D A \quad A G G V V P T\| D A A Q L A R S$


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$R R D V D G V V L T H G T D T M E E T A$ PAFDGVVVTHGTDTLAYTASA
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 | T | L |  |
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## Q

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\begin{aligned} & \hline \mathrm{DL} \\ & \mathrm{~A} \\ & \mathrm{~B} \end{aligned}
$$

## Y



A Y $\qquad$
GAQR
 VDGCDSVLVLHGTDTLAYSAATSFQLLGLNAPVVFTGSMLL AQHFDGVVVTHGTDTLEETAFFLHLTLGTHTPVVLTGSMR SGAEGVVVAHGTDMMSYSAAALFSTIGKPVPIVFVGS RH RGFVVL

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 SADAVDADGPANLRDALAVARDPRWRDRGVLVSFAGSVFE PLAELRSDGQSNLLNSLHI AANYPDN EVVTLFFNNQLDR SSNEIGSDALYNLISSIRVALSSDAYSKGVLVVMNDEVHS SIADPVADALENIRCSIYMAASGYP GIFVAFNRKVML PITQPNTDALDNIYSSFLFAAEMRDRQRGITVAFGGQLDH
 PINMDVTDAKTNLLDSFIYAADDESQD VNIVFDGKVIV PLGAVRTDARENLLAALEIASAKNHRGPEVCIYFNYRLLR PWNVLGSDAPANLYNAVSLAASARTTGFGTVVLFNDEIVA PVFEFRSDGWNNFLGALMIAGGKYAMCEVTVLFHAKLFR PIFALQSDAVGNLLGSLIIAGTF VIPEVCLFFHNRLYR SAMQAGADGPANLLDAGRVALJATCSHGRGAQVVINGEIHR PPTGLGTDSDVNLIDCTRVAAAPQSAGRGVLTILNNQI QA NASDRDSDGARNLNAVRQILTPATASLGVTVTLNHAINA P GEPYTDAKNNLISSLKAAHV NIPEVVMVFGGLLMR PIGVARSDARENFI TALEIAAATEADVPEVCVYFNSLLDR $N P S L A G A D G P A N L L A A V Q V A A S E Q A D G L G C V V V F A D Q V H A$ PMTELQNDATDNLLGSLLIAGHFM DPEVCLFFNHELYR PMFKSRNDADDNVYGALDALLEGP NGVFLFFGGKLDE PLGMKRSDGLANLEAAMSVAETPSLGR VTVLFHHYLME IPCEASADGPANLLAATRVAADPQSRNRGVLVVMNDT:HS AAQVAGADGPANLLASVHTAASPASRGRGVLVVMNDE: HA PПHALWNDGRENLLGALLMAG QYVIPEVCLFFQNQLFR GPESAGADGPGNLLAATIVAGSAPARGMGVLAVLNDEIHA PDFETRTDGKDNFTSGLILAGNY VIPEVCVLFGNKLMR HAEAASWDGPGNLLDAAQVALHPATAGRGPLVVFGGDVFD NADD\|SADGAGNIYAATTVALEPESRNRGVLVVLNDTIHS P FEPRSDGVDNFVSSLLIAGG LLNDEVTVFFGSKLYR SI SNDDTDAKNNLIDALIFASKEKS HGVNI VFNGKVIC PIYELRNDGRANLLGALLFAG QFVIPEVCLYFYNKLYR PMLELQNDATENLLGSLVVAGHFM I PEVCLYFNNRLFR S WFALQSDAVDNLLGSLIIAGTF VIPEVCLFFHHTLYR
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 PLEAEGSDALNNVETALRFAALPSLAQEVAVCFAGKLMR
 PI GVARSDARENFITALEEAAAVDPLVPEVCLYFNSLLLR $P V S H D N T D A K R N V A V S L L V A G Y$ S GACEVLVCFGTRLLR SFDHPESDG $\square$ SNLFESUVIAMDASARG $\square G V L I V F G H A V I P$
 PFDHPESDGLTNLFESIIIASDNSAKNLGVLIVFCHAVIP $P \square F S L Q S D A V D N L L G S L I I A G T F A V I D E V C L F F H H K L Y R$

 $P$ FDHPESDGQNNLFEAIMVACDTSARD $\square G V L V V F G H A V L I R$ PADATSADGPANLLSAVRLCFHLTDEPSGVYMVMNDTIHA TPDSVGQDGALNLQDAIAUAGSTESQGRGVLISFAGEIHP PLERTGSDALGNI EAAMRFATD ARLQEVALCFAGRLDR PI GDLRTDAKENLITADQDAKNKRSYINEVGLYFEYKLYR
 PPASPGADGPANLLGAVRLAASPSARGLGTLVLFSDEVHA P IS AMRSDARENLMTALEIATAKKPIVPEVCIIFFNHKLIR SFDHPEADGPGNLFEACVIAADDSARGDGTLVVFGHAVIP
 P I F E A R S D GRENFIL GALLLIA GN YS
 $P$ STAD $\quad$ S A D G S K N L Y N A V A L V $A$ A N K E A K N K GVVMVADN D K I L S P LTT F E H T D A K K N I N D A L L A A R T $\quad$ I D F P G V Y Y V V F D G R V I A


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 GNRSTKRESVQFNAFTSENYPHLA GNRATKVNATAFAAFQSPNCPPLATVGINTTALLWDLPTRP GARAHKANTSALQAFSSPNTTPLALLRGELGDEWNWRKM PYWVQKSHTVKVETLQSGLAGLLGTVLEGKLEYFNDRNFVV GNRVTKVDSRRFAAFCSPHDPPLAVMGTDVTINRELVRKA
 ARTVTKVHSTAVDAFGGYPGPIGRI GDVGETPQVRFF AKWAHKSNTFSLQTFVSVNAGVQGLVVEGRAKYLS
GNRTRKVSATHLHAFDSPNCVPVVEVGLEMEVNKAADFKP GNRARKVRTKSFDAFDSUNYPLIAIIHDGKVLRYDDDKSD $G N R C I K V A A S D F A A F E S P N Y A P L A V T N S T R T N V N W E V V R R$
$G N R T K V S A S S F E A F D S P N C D P A K V S T G V V V N A L I R R ~$
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GRE
 GNRTTKVSASSFEAFASPNAAPVAEVKNRDEYSRA KPP GCRTTKVNSDSFHALDSPNDPPLGKMNVKVEDNSRQDFRP

 GVCTRKWDTHRFDGFASPNYP LL GEMVDCAPVLYEVQQRG GNRTTKTENMADVAFHSPNHPVLALTGVETVLEHGLILPY GNRSTK QESVQFNAFDSENYPHLAA TAGVSI DYNRRGDR

 GNRSTKVAASDFAAFDSPNCAPLAVTTSMRTSVNWELVNR


 A LGTHKVNTQDLKAFGGTE P P I I GSVAEDTFTLDH
$G N R T V K V N C D S F A S F D S P N F P P L G S I G V Q \square K V D P T$ R A
ARGCMKWHTSDPLAFATN
ARDVRKSHTSVVDTFESGPAGPDGILTDSEIVLYREPGSEY
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 GNRSKKVQS DHFDAFESENYP PLAEAG』I IDYNYAA IDRY

 GCRSTKLNSDSFHALDSPNFAPLGRASVNIEINSRQUFRP GDRAHKAHTSDWQAFNSPNHPEYG L G I D WRWRESAQPKL A R GVVKTHSLNVDAF
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A
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703048
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## H G GIVK F Y HEMEDS

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 WRTPFDVRECAGDRDPVVEVVLSYVEAGAATVDGPLDAGA






 VPPK IRDI EFKTEA VGGLTLHPGLPSYSYQGFLDDQC
 GALAA PVP

## N

 NTRKKFQ V

GEAARYP
$P \vee P P G R A$


## P T E K F Y V V K K




## E


PRSLKHFSIQTNLDTACVACLRIIFPGIVKPEMVDAVLREGL

| P |
| :--- |
| P |
| E |

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250
260
270
280
$H G V I \bar{I} G T G A G N G N H A L T E W V V E A S A A G V V V \mid G / S T R A F G G$ $R G L V L E A Y G A G N F P R S L R P L F T Q A R E Q G I P V V V V S Q A Y R N$
 E GLVVI E G L G R G H VVP P S WL D A I G R A A QVVGI PVV VV S S C Y Q G Q GLVI A AL GTGNLPPELLDPI QE SPVPVVIATRTHAG K G I I L E GY G A G GI P Y R N S DLL L S T I S EREEI PIVVMTTAQAVY D $R G V V L Q T Y G A G N L P P D D L E A L R D A A N R E V L I V V C T Q C T E G$ $R G I V L Q A L G S G N A G A A L I D G V R G H C R D G V T V A V S T R V P G G$

R

 S GLVSA GLAP GMTPPAEADALAAAARAGVLVVQSTARAS G D CIV I E S F GVGGGMPHEFYE QMS A WK E K E K L V V MTT QVAN E
 $K G V V L R T Y G A G N I P Q D L L D A L K E A S D R G I L M V N V T Q C W R G$ $R G L I L E T F G M G N V P G S L D Q V I M S A V Q R G V I V V N V S Q C V N G$ $D G L V I A$ GFGAGHVSAHWAEVI E GIAARHIPVIIATRRTGCG $D G L V A A G L G S$
EGIVVAALGMGNDNAALLAADRCADAQGVVIIIDATKLENG $K G V V Q A F G E G N A P K D F V E G L K Y A D N K G I V M V D T T Q C G N G$ $R G I V L E T F G A G N T D A W F L D V L K G T V D R G V L I V N V S Q C E G G$ D GMVVAAFGAGHVPVAMVEPLTELAQR MPVILASRTGAG K GLVLETV GA GNLD E R LI S V L G E A C R R G I I I V N V T Q C LTT G $K G A V L L T Y G A G N A N P E F L A L L L K K A S D S G C V I V V N V S Q C G A B$ $K G L I L Q T Y G A G N D A D H E L T F L K Q M K E Q R K T V V N V T Q C H H G$ AGLI I A GFGAGHCSFQEAD IVRQYAKK DPII IASRSHHG

 E GVVLQTFGAGNIPKDLDDELKNATERGVLIVVNTQCTTGG $R$ GLI L E T F GM G NVVPGRLTEVVIRSAVERGIVVVNVSQCVNG $D G L V I A A L G T G N L P G E L L P L I D E$ T TEI PVVIATRTHAG DGVVI DGFGAGHVSFGMMDEIKKL KIIPVVVSSRTGSG

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



 Q GLV EA Y GA GNGPSNFMAVVIEAATAADDVVVVV T Q CVVRG




 $R G I V L A G M G Q G N A P R V V L E A L A A C A A S G V P V V R A S R V D E G$ A GLVLAA T G S GNTHPDDTAEVADAVQRGVTVVVTSRVPYG R GLL L L E TF GA GNAP NAMTNNVLASSAI QR GIVVI I NITAQCLT G D A L V L S L LP G G G H VP A D L V E A L K E A V A T S K P V V F A A R T Q G G
 H GALLEVWGSGNDPDDLAGVFA QAVGE GKLLAAADSQACPQG


 $R G L V L E T F G A G N A P H G M T N V L A D A D K R G D V I V N V T Q C L T G$ Q GLVI E GMGGGNVGKEVALALEEALGKGIPVVITTRVPRG

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 $D V I V L H T T G N G G V Q P P D T E A R D K A L D A G I P V T A S T R V Y S G$ $R A I I L L G T G A G N G N H A W L T W T Q Q A V E S G T T V A L S T R V P A G$
 RAIV LELLF G G GNVDPNLFRALSLAKEKGCVVVVTS QCAS G
 $A G L V L A G V G A G H V P G Q V V P V L A E L A G T$ MPVVLASRAGAG RGVVLETYGSGNSPPWFI QCMERAVKKGIIILNVSQCNGG $E G I V V E A M G A G N V G R Q L A L G I V D A L D A G U P V V V T T R V P R G$
 K GI I L R N Y GVG NV P S H L M QVI E E AV K R G IVVVVNVS QCLA G $K G V V L Q T F G A G N F P E D L L D E L R E A V H R G V I I V N I T Q C S A G$ $K G A V L M S Y G A G N A N T A L L A L L K G A A D R G V V I V N V S Q C G A G$
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 S D M MVYEVGKKVT Y DMTDEAT I TKAMWL MA QDMSYEDMK S

 $V V P R L R E R G I L S A D N D T P Q K A R I L L A A L A L T M L T R D P G A V A E$ KVMQGRYGTSRS GYDLTSSEAALAKMMML LAAAEPQDEAAKK AVYRSGMPEDPAAEDLLPQKARMLLVLALGDGGDRARAHT GVKAVYEYGVTPGYDMTTEAALTKLAYILSKTENKD
 A TA QATYGFAVMAGFLCPRKARILLWLLVA
$R A D P V Y G F P G V F A D D L S P D K A R V L A L L T L P D T Q D R D A D Q A$




 P T T R T Y GYKG L M S GY L S A V K A R L L L WA F L A K GL S Q K Q DA $T T Y T Q A Y G F V I$ GA GWLDPRKARILLLSCVLSESNDRARLSA AVT S D Y A A GMVVS GFDMT SEAA LAAKL S Y V L G H G LTTLD D RK E $P V S R T Y G Y P G L S A G D L D G V K A R L M L Q L L L R A G V D R A A Y G A$

 $P \bigvee 1 P V Y G Y A G I P A S F L N A H K A R I L L L V L L S L G G N R D A I R R$ MATKTYGYKGVMSGWLLSA $\quad$ TKARLLLDMLI ADEIPPQEIKN

 S $V$ V
 $T V A L A D Y A A G I S A G D M T A E A A T T K L S Y L L G K G Y T Q E E I A A K$



 $\mathrm{F} V \mathrm{~S} P \mathrm{~L}$ Y A A G VVVF G H D L LT T E A A L $M V$ S S A Y E D G VI S GY DMT Q EAA A F T K L A Y V L A K $E V P L E D K V G A B G A R G L A P S K A R A A L M M V A L G T G G G P R A V R D$ SVEPGRYAAGI S GLDMTVEAADTKLYHLFALNLPDPQIRAA

 $H V S P V Y A A G V V A G Q D M T T E A A L T K L A Y L L A L D D D T P E$ $E T N R T Y G Y V G I P A G T V D A L K A R I A D A D L V S S G A D R R A D A A$
 KV NMNGYANGVS GQDMTPEAALAKLHYLLSKGMPPSHILKR

 TCSSLQ T Y A N GI E GK D I T T E A A FTK L A Y L F G K G F K D E E L R A
 S V S P V Y A A GVI A G LDD MT TEA AL T K L A Y LL L G DV HGTAAKGAI GSTYFRSGQARVLLADAVATGTHPATC




 S VLP LY G N G GAS L G DL P WS QARIL LAAL L L S TQ H S I SI SIGGAYAAGLS GDDMTPEAAVTKLVVHLLAQPLDDAERRR SVVMM NYETVI S GKDDTDEAAITKMMMYLNSQNLDPKVVKT
 $M L T R T Y$ G Y P GI P S G F L D P Y K A RILLL R L L L A D GAA RERI GA $R V I Q G R Y E T \ L S G G D I T T E A A I T K M M F L L A N E T E E H I I R R$ DV ATLAAK GALGSTYFRAA QARVLLAVVAIA S GVHPA TL TTTYYKTYA YA L M G GF LDS P R KA R L L L S AMM WS KMMDRS KI C E GVF QDTYASGSVGSDMTAEAAFTKLHY LFACDEQVDVIDR $M V A N D Y E V G V I P G Y D M T Q E A A F T K L A Y V L S K$
$R I A A G V Q A G V I S G D D M T Y E A A F V K L H F L T G L G L T A K E \square K T$

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| UniRef90_UPIO0035E8F34 |  |
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| UniRef90_UPI000371DBFD | Y F |
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| UniRef90_UPI000343F754 |  |
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| UniRef90-V5SJ31 | M M E S |
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| UniRef90_B0S0X5 | EFY S |
| UniRef90_UPI000392D0ED | MLS E |
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| UniRef90_V5IM34 | R M S Q |
| UniRef90-C5LBH1 | A F |
| UniRef90-Q86U10 |  |
| UniRef90-H0IYP7 | RFL |
| UniRef90_D5TZY9 | L M L T |
| UniRef90-UPI000370CB3A | M M Q |
| UniRef90-TOVJ08 | F M E |
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| UniRef90-D2B0W2 |  |
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| UniRef90_UPI00031B5F16 | A F D |
| UniRef90-J9SLK9 | Y F |
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| UniRef90-J2PDD0 | F F D H F |
| UniRef90_F7MGD2 |  |
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| UniRef90-A0A023B1C2 | M M E Q |
| UniRef90_UPI0004766C52 |  |
| UniRef90_R9IW95 | VF Y K |
| UniRef90_A1C543 |  |
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| UniRef90-M1VXD4 | Q F S Q |
| UniRef90-U4LQM6 | Q M S K |
| UniRef90-S7QDQ3 |  |
| UniRef90-A0A024M6B2 | W |
| UniRef90-B4MTW8 | M M T |
| UniRef90-D8KNL2 |  |
| UniRef90_LOK5E1 | A VY E |
| UniRef90-D5NVZ9 |  |
| UniRef90-E1VC62 | R F LT |
| UniRef90-A3XHT0 | $\square \mathrm{F}$ E |
| UniRef90-L11830 | A M L Q |
| UniRef90-W9CE44 |  |
| UniRef90-UPI0003703048 | A F |
| UniRef90-U5BMK2 |  |
| UniRef90-U3GYR2 |  |
| UniRef90-E8UG43 | HLR N Y |
| UniRef90_M5DQ19 |  |
| UniRef90-Q9VH61 |  |
| UniRef90-W1RQT3 | ML |
| UniRef90-B6V679 |  |
| UniRef90_G9WHV5 | 1 MQ T |
| UniRef90-V5GK86 | L M |
| UniRef90_UPI00034DB8BE | $\overline{\mathrm{A} \mid \mathrm{L}} \mathrm{A}$ N W |

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$K\|W L D A T G G T\| L S R D D$
1 SLLT T G GTDACTADP MPRVAVIATGGTIASTATDSGVVAGALVPTVTGEELVRA RVA KAKKVLVIVTGGTLDMKPNAGDGALDVCPGFDS ELLASS $N V L V I C T G G T F C M V K T D R G Y M V Q K G L G Q Q G Q R K D E L V$
KVTLIVLGGTITMTADASGGIT
PKLAI AALGGTVS $\square$ QARNAGE RVLI IITGGTI CMQPSEDG LSAGGTI AMAAEAVGEAAGLVLGAAS GAAA
 MKRVLL I Y T G GTI GMEKDYDTGS
 KKANVVILATGGTIAGAAGSGVQSGYTSGQVTDDAMVNA
 MS Q LVLYTGGTI GMTQTAQGLAPASGLQGRIERA
$P R V S I$ GS L G G TVVSMQSAAPGQ GVTPRLDCAALLST
 $K N L F V L Y T G G T I G M L Q T S E G L A P A S G F E A R$ M R E W WLA G ,

VALFALGGTI SAAGRSGSPRVGAV
MKK L L L L A
VHVIYVGGADGMVRNAEGVLPNYHDP HV YGGA GMVRNAEGVLPNYHDPNFSFLVLPSV $R L M V L Y T G G T I G M Q A T E N G L A P A S G F E A B M R A F L A Q$
 $M T H I$ QL L GTGGTVASRGSGERGS VVAVVVDDFVSA RI HI TYY TGGTI G MVVESPNGLVP GADMM GWLRRLIEEDA RVLVIV VGGTM GMERNENNPSPNKLLLQKLKM HSQMM D Q R P T $\mathrm{T} V \mathrm{~L} V \mathrm{~V} L \mathrm{~S} L \mathrm{~L} G \mathrm{G} T \mathrm{I}$ $K$ S G A $\bigsqcup$ S G E E L A S

LPSVLI I H T G GTLGMQGTGGDYTKALQPGKLLLN LVTA RVLI IMTGGTICMRPSPSGNASGERVSHRSLRTPLST
VLVLY T G G T I GMCSHGGVYGPEPSDGAVGDSSGDCQ $K V L M I Y T G G T I G M R S E N N G N R K F Y S K P Y V P V E N Y L C A$ $\mathrm{Q} \square \mathrm{P}$
$P L \vee A \vee I A T G G T I A S R R G A D$ GAST GAASPSLRAE DLLALL

ED DDGYYEAHLD SLLMPATVVS S
 $M K R I L I L H T G G T I G M E A T P S G L K P M A G F G A L L K R R R L G E T$ $V H I L G T G G T I S S R T R E R A G A T A T D G A A S L A G M L$

 P S V L L I V A G G TII CMQD S K E G LVVTGTQCPTVSREAPSLQ


GE■S PSLGTATVLS
$R$ VLIVMTGGTDCMRRSSSGFVPNDGSNPGPVDVVINA $R I L I I Y T G G T I G M A Q G P R G L A P$ SLPRI KI L GTGGTIASKA DDSSQTAGYHVD LTDQDLLDA MK KI LVLHTGGTI SMQADDSGHVNP SEDNPMNH

PRRILV I NTGGTTI SMN KDNGVVYRPEPEVSSPTCFNDPAH $P R \vee A V \vee A C G G T$ I A SEPSD LPRLSI AS LGGGTASMQAGEPGR $M R T L T L L S T G G T D A T T A A G E Q G L S V$ LPR RLLVL SLGGTI TMTPAA G
 $M K K \amalg S L G A \square G G T \Perp C M K E N S S G G G T$
$P R \bigvee R V L A A G G T \square A S E P G E D G$
VLVLT $L$ G G T $\square$ A M T R T A A
A A PAKAGSELVDR YQA A K V GVE QL I A G
$K \ L I I N T G G T \prod S M V H S D G N D N K S V L K P S K S W K E V I Q N$ MPKLLVLYTGGTI GMQQTASGR_APASGFEARLRS

 MS DI LVI HS G GTI GMVPSAA GLVPD PNFVARLQAA $M K R I C F L Y A G G T I G M Q P T A H G L A P V P G V M H A A L A P L L P A$ $V E V L S L G G T I F M T E D A R G$
$E \square K R V L V L Y Y G G T F G M L K N E K G V L$
S A R P D D D A GAR|L

 KVLVI Y S G GTI G MVNK S G GYEPSYMTEKGMEDFLILDH
 $R I H I V A L G G T I A S T A S D S G G D A P S A T A Q A \| V E T$ TA




|  |  |
| :---: | :---: |
| $\begin{aligned} & \text { UniRef90_Q8ZYO4 } \\ & \text { UniRe90_H2080 } \end{aligned}$ | SSDRPSTDAVLNLKAAIAVAARAPFAESVVVMM |
| UniRei90-UPIO00368D3A4 | AFDHPDSDGPGNLRDAVEAARTSA |
| UniRef90-M001T1 | AGDAVDGDGPRNLADAVRVAASPEARDLGV |
| UniRef90-J3P3 | STIFALQSDATDNLLGSLTI |
| UniRef90-W7U8P | PLAEVYTDARNNLVTSLLFACRQDF HEVCIFFGNRL |
| UniRef90-J9J0K1 | PLSELKNDAVDNLLGSLLVAGHFQ DSEVMIFFANKL |
| UniRet90-UP100036A5F9E | GPEAAGADGPANILASVI AASSDQARSRGA |
| UniRef90-J2ZJC0 | SAKQAGADGPANVLDACRVALIAENSRRRGVQVMNG |
| UniRef90 W3X550 | SIFALCSSAVDNLLGSLIVAGTFEVIPEVCLIFFH |
| UniRef90-Q8FNV4 | PADHPEADGPGNLEEACLIASDASARGDGV |
| UniRef90-C6V | PTGDLRTDAKENLLTSLYYAENDEAVIQEVTVYFEYK |
| UniRet90-S8BHE |  |
| UniRef90-12G6G4 | PLSELRNDA |
| UniRet90-UP100046F6A87 | PSTAVSADGPLNLYNGVAVAADPNARNRGVLLVMNDWI |
| UniRef90-F2R5J9 | PFGTGDGDGPGNLYDALQVASSVS DLGVLVVFDG |
| Un | MNRSDATANL |
|  | DSDAPANLRDALAVAACGH DLGV |
| UniRef90 V6UZM9 | SACQPGADGPANLLAAVQVA $\$ A DGSRGRGV  \hline 2UX & G $T$ |
| W | PAGAPGSDAWANLGALDVLEGGQAN GVQLYFGGALLA |
| UniRet90-F8JJC7 | NPTLAGADGPANVLAAVRVAADPAARGLGALVVFNDQLHA |
| UniRet90_G5Gz78 | DSDAEK |
| UniRet90_UP10003 | AGADGPANLLAVQ |
| UniRe990-B4NKK | ETRSDGRDNFVGSLLLAGNYANDPEVVV |
|  | A GFP |
| UniRef90-R70881 | MAMPRSDARQNLVDAVTVACADQL QEFALCFGG |
| UniRef90-R7WN11 |  |
| UniRef90-A0ZZF7 | , |
| UniRef90 D6WSz8 | D |
| UniRef90 G2G412 | MAGADGPANLVAAV |
| UniRef90 UPIO0026558 | PUHALWSDGRENLLGAL |
| UniRee90-UP10002F/ |  |
| W9W11 | PrsmRKNDALEN |
| UniRef90-CIFDIT | RSDARQNL |
| UniRef90_C5FHQ2 | ADGPDNLRHAVVVA ADPQARGLGV |
|  | PDGELRSDGRENFLGSLLIAGGDQD IPEVTVFFNNNLDR |
|  | EVTIYFNSKL |
| UniRef90-A1B9W4 |  |
| UniRef90-FOLCU44 | TADHPNADGPSNLAAAIETALDQTNAERGVLLSFGG |
| UniRef90 F9ECC9 | PLGVVGSDAAPNVTGALRAATSRRAV GVSLFFGHHL |
| UniRef90-13X5T7 | RSDALKNLEMALILAAQHP!R EVSICFGR |
| UniRef90_16WVF5 | AADSSHPDGPDNLADAVAAAA |
| UniRet90-A3U05 | PPNTAASDAMVN |
| UniRet90 S2ZIU1 | PFDDPDGDGPQNLLEAVLTAGEPSARDUGTLIVFGHAVLP |
| C4V47 | D |
| - | DLRTDAKENLTS SLYASFYEAVIQEALYFEY |
| UniRef90 F9X5S2 |  |
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| UniRef90-UPI000455F381 | PLSQLRNDAVDNLLGALT! AGSF IIPECSLYFNHTL |
| UniRef90-C5P4J6 | PMLELQNDATDN |
| UP100037 |  |
| UniRet90_ETNG28 |  |
| UniRet90_UPIO0036 | ELGSDGIYNYLSAI RVASH |
| UniRef90-F1L45 | PMREIRSDAPNNFFGAL |
|  | S ${ }^{\text {G }}$ |
| UniRerso- 1 IH8 |  |
|  |  |
| UniRef90 V6LVX1 | PLSSPYSDGYFNLAGSIICAS QLQIDPEVTVFINN |
| UniRef90-D3UJL7 | GPEELGADGLANLYHSVLLATHPKA QGVMIVMNQ |
| UniRef90-Q9V2K1 |  |
| UniRef90-V41 | SDAPANLLTAVRAAADD |
| UniRet90-UPIOOO3755C0A | A ${ }^{\text {a }}$ MLILLYNAVAVASSKEAYGKGVLVTMNDEIQS |
| UniRet90 UPIO003732EA7 | ADGPANLLAAVQTAGSAEAQGAGVLVVMGDE |
| -1088 | SSNELGSDGVYNYLSALRVASDEKARGKGVLVVMNDEIHS |
| Ret90_DOGKH2 | PIREMRSDGLQNLLTSIEMEECLPVVPEVCIFFRDHLFR |
| UniRet90_UP100046 | SDAWTNLFGAMQALQ QGVAAGV |
| 602C | SSDAPDADGPANLRDALAVAASPKTRDLGVLVTFAGTVWQ |
| Unif | PIFEFRSDG |
| UniRef90-G8CVZ2 | A |
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| UniRei90- UPIO00440791D | RNDAVDNLLGALSITAG QYIIPECCIFFNQCL |
| UniRef90-Q0TYG0 | PMMELQTDAQDNLLNSLIIAGHFM IIPEVCLFFDSKL |
| UniRef90 UPI000365888B | D |
|  | S D A |
| UniRee90-UPIO0026C6E9C | adgrantrdav |
| Ref90-H9JT | SbinntLCAV |
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| niRef90 Q979L8 | DTKENMEGAI NFAATDLLEVGIIAMHKGISDGHR |
| UniRef90 UPI000359B1 | P\\|YETRSDGRDNFLASLIIAGNY IIPEVLICFNEKVFR |
| f90 | SDGPGNLFEAVMIASDTSARDITGALIVFGHAVIP |
|  |  |
| D4YLI8 | NPTLPGTDGPANVRSAlITAADPR\\|QMLPAVLVFADEVHD |
| iRef90_D8TR59 | SIIQVATSAFSPPHEVAVCFGGKL |
| Ref90_A0A010QZW8 |  |

## UniRef90_Q8ZY04 UniRef90_H2S088 UniRef90_UPIO00368D3A4 UniRef90_M0QIT1

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UniRef90_L9X535
UniRef90_D4YLI8
UniRef90-D8TR59
UniRef90 A0A010Q
 GNRVTKVDNRSFNAFSSPNDAPLANAA $\square D \square T \square N W D T V L R A$ AHGVRKVHTANLDAFDNQAW
ARGTRKMHTTALSAFDSVIGGSVGDVSAGTVSITSTPRRP GNRTTKVSASAFAAFDSPNFPPLAKVTSGGVDVNWSLVRR
 ARAVTKSHTGLCSAFTSGAVGPAGEDMEGRPFFFAPPSP ARCVRKTDSLALQAFSSPDFGPAGLLVENHVGYD$C$
 ARGCTKWHTTDELAFATN GNRTLKYSAEYFDAYQSPNYPTLGQSGVHLNDEKDFLYRP GNRTTKVAASDFNAFDSPNCPPLAVTTVMRTNVKWDMVHR GNRTSKVSNNALAAFDSPNMAPLARVGDNDEVAWNLVER A QTLTKVSTTAVQTEMSPDRGLI GTSAYGKNEY
ARGTVKTQTLAADAFSDPSAERLGRVGFSRVDDERQPERP GNR QQKVSSGRFEAFHTPNNDLLGELADHVQLYPERMSEW ARGTAK QHTLAVDGFGDPSGPRIGDVSQGRVLVRRRPPRR AARVRKTASLAMAAFESPGAGAI GEVEEGCPIYRQAAAPR GNRVTKSSSWAFTGFESPNAAPLATTGA PWQWAPS ARWVRKTHSTSTATFASPDDGPDGQVVEDTVRVLARPPRQ

 AARCSKIRSFGRHPFKT GNRTDKVNCDSFEAFGSPNLAPLATMGVNVEDNEGLVRRA ARGVRKAHT $\square A S D P F D G G T V$ VAHLEGEAVRVAALPVRR GNRVSKSSSWAFEGFSAPSTGPLARTGTPWHWYAGDSAGS GNRTAKDSSDHDNAFDSPNYQPLAEVGDDDKVNKHF IDQP ARHVQKVHSTSTSAFVSPGAGPVGHVVEGQPRFHFAVPRQ
 GNRTTKVSASAFDAFASPNFPPLAKI TAVGTHVEWNSVKR

 $P L G L H K R H T A E D N A F T G R A L G$
$G N R S V K C S A T D F D A F T S P N Y P P L A R D G D D R V V D G R Y E A V A$
$M$ $G N R T T K Y D N N S L D A F C S P N V P P L A T M D I R V N V H W E A V F R$
$V W G L Y K F T S D A P D A F$
$V$ $V W G L Y K F T S D A B A A F$
$A W G L$
GNRVTKVSSDELAAFDSPNFAPLVKVGDD\|VVNWNDVIRQ
 ARGVRKTQTWELTAF ASDVSKTSNFALDAF
ARGALKFHTSDELAFGTN
GNAAKK $\square$ HSRADDAFRS $\quad$ GRAE $\square D$ DAPEA GNRCDKASAENFDAFKTPNYP LLGQSGVNLEADRNILYRA GTRITKDSASSYSGFESPNAGPLATVSETGIVVHWDNLQH
 GNRVSKGSSNDLNAFHSPNFPPLVNVGDDIEVNWNDVIRQ GTRATKVAASDFAAFASPNFPPLAVTTSMRTHVKWEQVHK ATRVRKLDCSADEAFDSPNAPTLGE YVGRQWRLDAQRLT GYYITKTNANSLDSFN VRQGYLGNFVNNETHYYYPPVKP AKYVTKTHTTNVATFNTPTHGPLGIIMKHEILFF
GNRVTKTSSTAMHAFESPNHPRLVRFDAF LHYDSCDNAKT ATRVRKTASLSMAAFESPGSGSVGELVEGLAVYRQPPCPR

GNRSQKFSSWSLDAF P L F VQKRHSLTLDTFDSLH
 GRDVSKMDNDKTEAFKS AWGPLGMVVEGKSYWFRLPAKR ARHVKKLHTTSPGAFGSPNTGPLGDVAEGSARFHRLSKP $\square$ AKYVTKTHTTNVNTF
 $P L G L R K D S T V N D A G F A G T A V G A V T A G M F E P G V$
GSRUVKCSSDQFHAFASPNYPALA ICGTEDTFFPELVFRP ARGTAK
GEATRKVDAQSYAGF
GCRVRKAHS LADAAF
 GNRATKISAEDFNAFGSPNLPPLATVSSTKTNVLWHRVHR ARGTVKEHTSDLAAFA YRGP
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 GNRCDKSDSGSFSAFSSPNMPPLVTLEDEIKVDWTAVFR ARGCIKWHTSDDLAFATN
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 $P G V Y R P R D K D E R N$ VVRIPVVPGLRPQDGYGDLVARGV $P P L P G P G P R F D G T$ RVDIVTAYPGARPDLLHAAVEAGA GCG APVALPQVRPASVEVIQATLGASVALLDAAAGLADGL SRKAELVVHGSMEQD VGLLRLXPGIIPTALVRVFLQPPM KDNFNDSSDRPRVDIIKCHTGSDSDFIEASVQAGT STSLEAFSTQSDLELHHVACLRTEPGDKPKMVEAVLRTGL RAHRRVAYTPRLKLEPSVDRLP:VPGCDPKKAYGDLARGV TKRRPFLGEFSAATAPRVDDVAAYPGADPVALDACVAAGA STEMKKMTVQVEMNPNIALLRDFPSISCDCIRAFFAPPM EGATVTRPLPAPVDGLRVDVVATHPGSDGLHLEASAAAGA TSDRRFKAHKDLSS KVVTI RLFPGITAAMMSVFCAPPV SEAGTGWPHPKPYERHDVVVIDLAPGITAARLRALLTPLP AEAKAFFIPKKFEPEAVAVLTIHPGLSSPVVEVALSSPHLD LPLPTESF PVPARRLLALPEGAVPRVDVALSYSGSDGAALRALTAAGA EPERADPVEPVKLGDVRVDVLYAYPGAPRDLIDSVLACGC PKDETFDDDLH SK KVVFLIWLFPGMNLNEVENFVASETG AAPGPFLPWHRLGADPRVDILHCHSDGDAAAIEAFIAAGA P S DTVPFD AAEFPPVAVLKTALADDGRDLEPLVALGY PTVRKHFSTQMNLDTTHVACLRDFPGIVPAMVDAVLRPGLC $Q V P A V V D R L Q P D N P D Q V L S V R L A P G F N A R W F G E Q L Q A P P$ QGCHKFRVDGKHFKDPEVCILYAHQAFPP
HTNAPFRVCHDLCRD VSVLRTYPSTKPETVARHLQDPM VPVDPLADIESPADVPEVPVIHSGTGVGSGALERALDAGV MVLPLPERVGH RVALLEACLDADTTLLQAVAAFGF
 ALPSLPLPEGELDPPVALLKMTMGDDGRLLRAVPGLGC KPFDPAPTYPAPRNDNKKVLCYAHSLDDGKELLEWAGSHY PRIYGDEFSSDFRYNHKVLVLKLIPGLSGDVFEAALKIGYY HTMDSEFD TKNDKSLPDVEVAYSYGNVSDTAYKALAQSGA GSVPLPRAAGALPQVEVVTASLGSSGTLLKGLENEA KTAEPRVHFHLNKDTGLIPIIPTYAGMTTELLDMLDLKRD SDRQFYVDYQUSTDVLMMDVFPGF NPQULKKIFEDNSNI AKVPPQLGGLVAATAPRVDVVAFYPGSDAAAMEACVASGAA
 A G T
ESAYLRGAWRGFQEAAVATLLITPGMPSSAFAPLLADDKL A APSGVRRIVPESLPAVALVWLAPGATLDAAVATLALPHL TSLRRFKAHK DMSSRVATLRLFPGISAETIRAFLKKPP STDLSPFTDQTSDDTGHVACLRVFPGITPAMLDAVLRDGL TSETSLPDGRDAADYADVPVVHSGTGVDGSFLERVLDGA LPRPARSGGLPPDRFPAVPLLSAGLDEDLALLDHLPAEAL PGSVPNECRLHDQLSRKVYILKVAPTITPELIRGVCE GMM YRKAEEENLLLDHLDEKVSII YFHPGLVASDVENMIE GK PTEKERFVIHTNMCPNVGLLRDFPGITSQTVRAFLQPPV
 SSNLSDCDLEATPEMTVPVVATGAGAEAPLMEQAVNGKY EGAYKPRF
EGA YK R F E LDPRVIRI P

 QGVVLETYGSGNAPPDLLEELKKATDAGVIIINCTQCLRG DGLVI EADGSGNMSTGFGEAAARADHAGVPVVVATRVPFG TGVVI A GTG $\square G N A N P S V V E A A T E L L A S G T V L L L S T R V P E G$ KGLILETFGMGNDDGSFTKVIRSAVERGVVIINVSQCTNG HGGILLLYGTGNGDTSLLEAVKLATSKGILVVVLTQCFQG QAVII QAYGMGNIPKELLDLIKKADEKDVIVVILTQCHKG KGAVI EAMGAGHVAERLSEPLGALAATMPVALASRTGNG DGLVIA GFGAGHVSES WAAMIEVIAGKDPVIIATRTGSG KGLILETFGMGNVDGSDTKAIRSAVERGITVINVSQCTNG DGLVLSDPGAGHVAAEAAPALEKLSARGPVVFASRTGAG QGLVVEAMGSGNVGTAMGAALGRALDDGDPVVMTTRVPRG


$R G \| V L V A T G A G N A T P E \square A A A V A D A V A Q G V L V A V T T R V P A G$ HGIILMTYGAGNVNPAFLSFLTEAMLRKKIVVNITQCLHG Q GVVLAGTGAGNATPAFVGAVAEAVSAGVLVALTSRVPAG SGLVVAGFGAGHVSEAWAEALKDVADS MPVIIATRTGSG EAVILRAFGVGNVPPGLTDVVERVIDAGTAVIVTSQCHES QGLLLECYGSGTGNEALLAALGAARKRGVLLAAISQCPAG Q GLVVAGFGVGHVPSALAPRLGALAGR MPVVLASRTGGG RGIVLEGYGLGSVPESFLPTLDRAKTRACTVVLTTQCVYD DGLVVAAFGVGHVPQGLVPVLSELAEH DPVVLASRAGSG K GVVI QTFGSGNVPEDLLDELREAVDRGVIVVNITQCASG QGLVLECYGSGTGPSDNNAFLTEASAKGVVLLAVTQCHEG NGVVLMTYGAGNDPEDFDGALREASERGVLILNVTQCSGG RGAVI EAFGVGNLPDQWMDWFKDQREKGLELYLASQCLTG EAVVLAGTGTGNAGPGFVEAVADLTARGTPVVLSTRVSSG EAVLLRAYGVGNVPPGLTDVI ADVLHDGVPVVIASQCQQA EGLVLQSYGVGNIPTELLQVI EEAVRRETVIVNITQCPQG VVIAAFGAGHAPKTWAEPLGALATR MPVI LASRTGAG KGVVMETFGSGNRPPDLLQELRVATGHGLVIVNCTHCLQG KGIVLEGVGRGQVTPTMMEAVKKYANEGTVVV$T T S A E E G$ $R G L V L E T F G A G N H D N K L T Q V I S D A V Q R G I V I V N V T Q C L T G$ RGIVLEAFGVGNMPTGWIPWLRSQRKQGMVI YLTSQCESG RGLVLETFGAGNAPSRMTKVLADADKRGDVIVNVTQCLSG RAVVLAAMGSGNAGTAMDEGVRRHCRDGTVI AVSSRVPDG EGVILQTYGAGNVPSTRRDULEKATSEGDVI LNDTQCWHG
 $D G I V L A A L G S G N A N P G I A V A V K R C A E R G V P V V V S S R V P E G$ QGVVLEAFGAGNAPQDLLQAI RDACDRGVVIVAISQCTKG EAVVLRAFGVGNVPPGLADVIAEVIGAGVAVIVASQCYEA $R G V V L R S Y G V G N V P A R L L A A L G G A V A R G V T V I N T T Q C V F G$ DGIVLAGTGIGNAGVGFVDEVARAVAAGIPVVLASRVAWG A GLVVAGMPPGRAAPGDRAAMLEAVAAGVVVVQSSRALRG QGUVVAAMGNGNVGTEFAEGLGDALEAGGIPVVQSTRAPRG RGI I I EGYGLGSVPTSFLPALQLAYEAGCTVVLTTQCIDG KVLILRVFGSGTFFKNIENILLNIRANGTEIVIISQCISG K GAVLETFGAGNMPLS IIPSLSKAVQRGVAIVNVTQCLHG $R G I V I A G F A P G Y A T S R Q A K A L E T W V H E G G G I V D A A S Q A F G$ $R G L V V E A A G G G S V P P A W A T P L G K L A B R I D P V Y Y A R T G A G$ HGVVLETFGAGNAPTDDMEALKEACARGVIIVAISQCAKG RGLVLETFGAGNAPNAMTKVLADADHRGIVIVNVTQCLSG QALLVEAYGSGNLPEELLDTLGALATR UPVAVCTQCLRG

RGCVIQSYGMGNMPKDLHSVLLDATQRGCVLVSCSQCKSG $G G V V V E G T G L G N V T G A L G D A L G E A V E S V P V V V A G R P P A G$ EGLVISGFGAGHVSSAWSDVLGELAP NLPVIVATRTGSG $R G L V L S G F G A G N T T P D T T R A C V E L L G S G V P V G L A S R V G A G$ A GLVIEGMGAGHVPAAVAEIVGEVAAA I PVVLASRTLAG $K G I L L Q V F G E G N G S D Q F C E K L G E L H K A G C V I G L V S Q A H T S$

 KAII HAGT
S GLVVAAFGVGHVPESWCSRLEALAAAMPVVLASRDGAG D GLVI EAF GAGNLPQEVAQKLSRMTASGLPI ALVSRCFNG K GLVLRTYGSGNTPQNFLETIRY\IDNSGVILNITQCTVG RGLLLECYGSGTEDAALLAALKTAHARGVVLAAVSQCPHG $R G \operatorname{VLEAMGSGNAGEPDIDGVRRHDAAGVTVAVSTRVPDG}$ K GLVLRTYGAGNVPAARKDLLRSASERGVLILNVTQCYRG TGIVVLVATGSGNTHTRVVDAVADAIGRGVVVVVCSRVPRG RGLVLLSYGVGNLPERLHAALRAAIARGVCVVNVSQCLRG A GAVLAGYGAGNVPDALAPHLDAAAGRGVVLATVTQAWQG QGVVLETFGAGNAPQDLMEALREASER CVVVAITQCSKG KGLILETFGAGNTPSAMTRLADAVKRGIVIVNVTQCLSG QGIVVEADGAGNDGTDLARGVEEALRRGIPVVVTTRAAHG DGVVVEGTGLGNTTGPLGEAVADAVEAVVVVVSSRCHAG A GLVI DGVGMGHVSPAAMPRLRRLLGEGVPVVVAARPFGG EGVVLETYGNGNIPKEDYKEI ERAVKNNVLVVNVTQCDNG RGLVLESFGVGNMPAGWLPWLHDQRKKGVIMSMISQCSLG QGVVLQTYGAGNAPNNRTDLEKEACQWGVLIVNDSQCSRG QGLVIEAMGSGNVGTDIGVALGEABDAGIVVVISTRVPRG DGFAVVQSGRGGTSPAISDAVEATLDAG\|PVVSSTRNFDG SAAVLAGVGGGHVPVNVLERVTAALASQMPVVYCARTGAG

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 FVSPLYAAGVVFGQDLTTEGALTKLSYLLAEGLSYTETVG GVLLEKYSVGVAGHDMTVEACTTKLSYLESAGGDLAKUKS PVFKTYGYKGINAGRLSGLKARLLLQLLLASGGDRED STAQHSYGFALMAGFLCPRKARILLWLLLGCQRAQDELAR ETLRASYAYPI PANGLDARKARILALQLALSNRAGRDEISA EVSTLAARGAI GSRYFRAGQARVLLAAAIATGQHPATL
GVSFGKYSNAVSGHDMTAESATTKAMHLL
SVSPVYARAGVVAGDMTTEAALTKLAYGLADPDSPETVAK
$P \square A E \square Y T G G G A V T G T \square R A A Q A R \square A \square A T L L A D G$
GVSQGTYATGSMGQDMTLEAAFCKLHWLIANGENYHSL
PVTGMYTGGGVPSGTLRAPQTRMAVLSALLHHTDPAE
PTARGTYGFVHMAGWLCPRKCRLLLWLLAGSGR QAELAQ EVLLGHYEAGVGSRDMTLEAAYAKVQFLLSQGLTGDDLAS PVVRDTYAAGVSGGGMTREAALGKLFALLGAGLDVEEEAER GADITHYEVGVSGGLLPDEALYARLMILLAETPEDKMIKA PLSSTYGFPGIRAGFLDPLKKR\LLWSLLATGHDGGSUAE $\square V L P H W E \square G V V P G Y D M T Q E A A F T K L C Y V L G K$
GVELDVYEAGVSGGGMTREAAVAKLQVLIGSGDAPEQVNH SVSQMYELGVISGHDMTAEAALGKLSYVLGKEDWDLEMKR PLNPALYRSGSTARRMTAETAVVKMMLCLAYTD PVVPTYGNGGDASGDLGAFQSRILAALVLSTTPGHAADRD EVLLGHYETG! GSGDMTDEAAYAKIMFLLSQGVDAADFGT TVSATYEDGVISGHDMTAEAALTKLCYVLG SVLSNTYDFGISGGGLEPRKARLLLLALLRSGAEDPETRD TVTLDYGAGVVSAFNMTSEAALAKLLYVLGQPDDREEVRA $K V Y P S Y G Y K G I L G E D Y D S K K A R I K L A V I L A S K S T V N Q$
$S V N P L Y A A G V V A G G M T S E A A L T K L S Y L A L G A S P E S V A K$ GLHPELYRTGSSGPMMTPECAVVKLMLCLA APDLP
SVSPVYAAGVVAGGDMTTEAALTKLAYLLAHDATPESVAR PVAARYEAGAVVVPNVRPAQARVLLMAALATGRSAAAV QVSPLYYECGVISGDMTTEAALTKLAYVLAKDLTLEDKKA LLSPLYGAGAIHARLLRPGQARILLAAMLANGCSEAEMAR SVSAAYEAGVVPGYDMSPECALTKLSYLLSKELSPAAVRE EVLLGHYEAGVGSRDMTLEATYAKVQFLLSQGLRGDELSQ AVAQDTYATGVSGGDMTLEAAFA
PVKPTYGNGGIPSGDLNAPQSRMLMALLLGRG
GVPVQPYADGILGGGLGVQKARILLMLALASKSSAADDED EISGTYGGVGGGSRYFRAGQSRILLAAAIASGRNPATF GAD RRYEVGVSGGSRPDEALYALLMQRLAEQPEGRPGRS SVSDAYEAGLMLGYDMTMEAAYTKMVYLLSCGLSPDEV RVPRNRGHGFLPAAGESPAKARDLLQYALASQRSPAQ1AE SVSDAYEVGVIPGGDMTPECALTKLSYLCCKELTVEDVRT SVSPVYARAGVVAGDMTTEAALTKLAFLLG
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KVESVYESSVISGYDMTTEAAFAKLVYVLGKSDNDEEKRK PTEPVYGTPGTFAGDLPAPKARVALSLGLAAGLDREGIDA TTARATYGFVHMAGQLCPRKCR!LLWLLLGTG PVSGLYADGGVVMGDLSPWQ
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HVEFGVYAAGVSAGGMTREAALGKLFALLGAGDNQAEVEH PI RPDYGAGAVLVPSLRPGQARVLLMAAIASGQPVSGL GVKAVYECGVI PGYDITTEAALTKLTYVLGK
EIVATYGGGGIISPWLRGPQARIALQALLAGGAGHADVAE EVAGHSYAVGAAGGRLTPEAVYTRLHCLLAESNTRPLAER AVAMGAYAASVAAGDMTPEAALARLTVLLATETDPQHVRQ TVSDAYEDGIIPGGDMTPECALTKLGYLLSKQLTDEKVRD SVSALYAAGVVFGQDLTSEAALTKLAYLLALNASPEEVAK EVRFDY
pTEAVYGTAGAYAGDLSTAKARVKLVLGLTAGLSRETVEA GTTHHYGYPGVMAGLLPAPKARLLLQVLLASGASADGIRA $T V \square G K A D Y E V V P A F D M T A E A A W A K L C Y V L T K T$
PLQPELYRSGSVAPQMTPESAVTKMMLCL
SVDMNVYSTGISAGDMVPEVAYVKAMFTLGN YGREEFTN NV GTAYATGVEVNKVK EADYPCLMCAAAQANDVPALEK EVFGAYGGAGVSSTYFRSGQARVLLATAMASGVHPATLEK PASPSDEEGTDVSEDLPVWKARI HLIVALTDTSDLEELRE RTEATYGYPGDPAGWLDARKARILTILALESGTKIEDVFS


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 KRIAMYFLGGTISMSSGDG AGVRPTLGADDLIAA
$\square Q V I Y S G G T \square G M V D S P H G V P G A D \square A G W \square E R V A$ $R \vee L V M T G G T \square C M Q P T P D G L Q P A A \square A P R P S F N D M S N R$ $\hat{N} V Y V L \quad G G T I T M A P G A K G I I T \quad P Q L T G D D L A A G$


TYTGGTTGSKVD Y TGGVSA LPKLATGTLGGTLSMLQSAVGE GGVTGLDSTQMLAE $1 L V I Y A G G T I G M K P G P A G L V S D P Q F V A \quad R L Q A A$ KRILWUQTGGTFSCEGT\|RGLAP QSSEEQAGKILAL

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 RIHVLSTGGTISCLHDENGDLGADTLSCADLINR

LVEFATGGTIGMRETDHGLAPDPDFPEV LEQLVAG $\square P R V A L V A T G G T I A G T L D E G S E T W A Y E S A Q R S G E S L V M N$
$S \square P K \ L V L Y T G G T \prod A S S \square Y G A \square D D T Q Y G Q \square Q \square T G E E \prod \square A R$ $H L L V A A D G G T I A S T A D G B S G G V A P A L S G A E I A A A$ MKNI CMLATGGTI ACRKGADGMR PSIAGQALAAH SAPGVHITYTGGTIGMDDSPHGLVPSAEDGERLFAHFKGT
 MSTYLII NTGGTI GMVTGPKGLTPHPDADSQAFTTMHS $K M K$ I AVLYTGGTI GMYAGENGLRP SQETVLQA $M G R L T V I A T G G T I$ G
 MARVYVLYTGGTI GCVTNSDGALAP
 LLI IYTGGTIGMKTDAAT GALVPFDFSGUYDE $K P D S L T T G G G T V V S R V D \quad Y K T G A V F P S L D D G E L T S K$ $\square P R I V Y L A D G G T I A S V T S S G D P R G S G A V P R I A A R D L L A G$ KPRVALVATGGTIASRREAD GASRPSLGGDSLLDA

$P P V T L L A T G G T I A C T S S$
-
$P R \square A V I A T G G T \prod A C T A D A T A G \quad G A L V P T \square S A A D L V E R$ PYLHILYTGGTI GMQATAAGLAPAAGFEAR DQALLAS $M V E V V V L A A G G T I A S R D D G S G T A V A A D S G A \quad D L V A S$ $M R Y L Q L I N A G G T I T S K S N D Q G V L E G A \quad G H S L L A G$ KNLLVLYTGGTIGMLETPEGLAPAGGFEARMREHFAQQ $M Q K \prod F V L Y T G G T \square G M K P S P D G L V P D A E L A E O A M Q P Y A E Q$ $R L L A V Y T G G T L G M R S E R G V L V P G T D L T A V D T L V L P L A$ M ID S PN GLI PGADMR KKNILT\HTGGTISMFEDKET GAVKPSEKNPLRAL HVSLLTTGGTiASSRDEHGVSRPVAGFGADVDG
$\square C \| L T$ T G GT\|GSSVD YKTGAVKPVKDDSYLYNY $R L L A D Y T G G T I G M R S E R G V L V P G Q G L A A V L R R L P M F H$ MARVTVFTLGGTI SARGGDAARMSGQEV

I LYTGGTI GGS $\begin{aligned} & \text { GYGALDDTQYGQLS QT GEQIIAR }\end{aligned}$
PHVALITTGGTIACTATD SGAGEPTRSAEELLAS

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V P E LT S L A D ${ }^{50} 1$

$G T A L A G Q \square R L \sqrt{H}$ Y E Y A K TPPSAYS R H I R Y E F S P L L D S S S I S S A G WT E V A Q T I R E N


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TQLGEGNVSITSLYE
VPELLKAFASLDDLRVAFNMDS VARRTPRAQLIRQDLGRAASANLDFPLVERLAGLI AEFAA
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 $\frac{L}{F D}$ KDKLTLDEKDDIAKLD APEFHKTGDMDGEFSPLLDSS
 YELENPI DSTNMNVFYYDDI AQAI K A A D NPYLLNHTQLAVSNWTSEEGSTGTNDALVMNMTRFAHCSE $A G L D R D W P D L D F T Q V A Q V S S$
$L P A M H E A A$
$L$

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



ARDAAGKDDCSPVDTSRDDSSSDTFADLDGLVAT TAREDA RPELGNPAWRLQELLPLIDSANMTPAAWERMAQAI LAAAT VPGGVGDVAVTVRDVATVDSSALTLEQLDADREAVAHADE $V N$ DD SLPLAVREKTVYRGLSEDLSLNQASAUAGAALDAVH ADAPQVQWSL MEMNPLLDSANMQQANWLAMRDAIVEAVE VSEVLQVAQLSYIDMSPSGSSNVNSSTFLNVSQAANRLLC AVFHWHICQ LEDAHMDSDLFTELDPLIDSSNATPSNWQTMIDDLKKAKM


VPNDSQF K【YHENDDNTLSENVNAEKWDKFARKARDAMK DEDYACACQVTGLHMCTPGFSLGRLLVTDWPECSCAPQRH LAELGGDHDIVLNDFRRVPSSTLTHADLAALAAETRATVA NPYLGNHTQLAVSNWTTRSDGSTGTNDALAMNMTVFAHDA APRLPELA


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 S S D A A DAD GPAN L R DA L IVA GDPAVRRDCGVLVVCFARRVV E AHGATGSDARGNLSDALRAAVKAAPGSPVAVAFGGALLP PSDADNADGPVNLSGALDFAVQCLPCDQPVYACMQGLFTA PADSPDADGPANI AAAI EVAADPASRGRGVVLALGGRVLP PCSSMRNDGFNNLLCSIVTVCGHYT MIPEVMVCFNDKLER NPTLPGADGPANVRAAALTALSPSARHLPATLVFNDEIHD SVEEVGSDAQQNLQDAAHAAVSGRA GVVFVAFGGQLDE SSDRPSSDASSNLMAAARFDVNGNRAGVFVCMHDTPALHA PISAPQTDATDNLNNALATLNSGRA GVEVMVAVGQQPLP PLGTENGDAETNLEAAVQ ALLQKAAPKQVSVVFANQMLA SADAPDSDGPANLRDAVAVAASPAARGLGVLVSFAGRVLQ PLSFTLSDALANLVGAIVVAGTDP VPEVCVYFDTKLLR $P$ PH HLWSDGRENLLGALLMAG QYVIPEVCLEFQNQL FR
 PMMHLSTDAKRNLAVSMMMAGYSQLTELVVIF GSRVLR SSDRPSSDSYDNLEAAVDFATTDFGEVGISMHHNTSDERR HASSPGADGPANLLAAVNVAAAPAAAGRGVLVVLDDEVHA TADHPEADGPGNLAAALAGGLDGGGAGRGVLLAFGGRVLP PLHYPHSDARRNLTMSVMCATS LA PEVCYSNNKLLR PLAEPFNDARRNLILSLMDASNPSTVCEVCVFFNDSLFR PMAEMRTDADDNLQGALVIAGT LIIPEVALYFNRRLFR PADSTDPDGPANLAHALAAAADRETR GGTVCGGHVVP PAGVPDSDADGNLADS FAAFSSGLAPGVQVQFHGERLP AADSPEADGPANLAEATAVAADPQHRGLGVLLSFAGHVQT APEHAGYDGHRNLLDALHLLAMPDAAAHGVTVVFAGEILA LDPGPGSDAWDNLSGALR QFEAGLEEGVQLYFHGQLLH PYHATDSDAPANLRTALAALQTPQL HSTVIAFGGRLYP P LGKTESDATANVTGALNAAMSE RMNGVGLFFGHHLFA SSNEIGFDGLHNFVSAIRVACCEQAHNKGVLVVLNDEIHT TADHPDPDGPSNAAAVAAAQS EHGVLIAFGGRLDA GADAPGAEGPANLLSAALVAASPQSRGLGTLVVLNYDIHA MKLAADPQSKGRGVLI AMNDMING SSDRPSSDAFLINIEGSIHFASMDFGEVGIAMHSGTSDDHR P IHALWNDGRENLLGLL MAGQYLILRVCLFFQNQLLR RPDLPGADGPANLAAALAVAADPACRDLGVLVVLADEVAA PFTHLSYEGDANFFNAVMLAASPASRDRGVMVAFNARIP


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GNRAOKTSA 170
170 V A A F S S P SYP
190
200 ARSVTKGDTSSLTTFVSPDCGPIGRVLEAHTHLFHRPARLD GNRSTKVSTSEFDAFRSYNYPPLAKVGTRLDVNWPSVQRQ GNRATKASSWSYEGFASPSAAPLARI GAPWHWDDAALAAH GNRTTKSSSFDFAAFSSPNLAPLAEVGTNFDVAWDLVTK GNRTTKNSAVNFDAFASPNCEPLAKMNGLGIDVNWPLVLR ACAVEKMHKGLISAFQSPNGGPLGYYMEGGLRILRDM GNRTDKNDAGSFSAFDSPNLPPIATLEDRDHVDWSAVFR GNRATKTSSWAFRGFESPSVSPVA RTGAPWRWYGTPHA ARFVRKAHTVSLAAFRSVGRAALGSVAEDEVRVSGCVGRV AKLVTKMHSTRVAAFGSPAAGPVGFVAEDRLELLLGPPPG
$G N R V K V D A R R F A A F C S P N D P P L A T V G A D V T V N Q E L V R V V$ GDSARKMHSTRRDAFKSTNEEPLARIYYPSGKLEIINKY AAHVRKTESLAMAAFSSAHFGCEGLVVEGHACYLKPVRPR GDAVRKDDAQSFAAFDSPNADWLGMFDGEMATLSAPLFEE GRDCKKMHTERRDAFRPCNKADLGKVYSNGKKIFSDCKSE ARDAVKNNPGLIDNFATEGRGIIGYVIGNQFVLQSKPIYK AVRVRKMHTSRRDAFRTLGGRPMAVYSSGTARFNETPRPA ARYVKKLHTTSVGAFASLIIGPVAYLQENQLIVYRDP AQEVTKAATYQLETFRSPDFGPLGMVEANRVFFGRTTGYR ARGARKNHTFHLNGFESMPVG
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AVGTTKWHTTDDEAF PLGLRKAATDD SGFAGELLG avRTTKHDSRALLAAFRA
AQCDEKQSTAGLDAFDGPYSMLSDSNWFSSGNTGAPLAPAA VRGAFKVSTIATEAFDTVHDAL
GNRCTKMDSNSMDSFDSPNYEPLAVFGTNTNTNWEK TLKK GYWVTKLHSTNPNAFGPTAGGDLGLFINSLPVFFNTPSQP PHHVRKAHVSSTAAFSSGPVGA 1 GWISEDVVRLPHAPHPR GARARKDCTEQFAAFASDGAPAAALFHGGRLHW SRAGEE GNRDTKTSSWAFDGFSSPGAEPLAAAGAPWRWAPSRASGA GTRVRKMHSSRRDAFQS DNDPPVAHLDRDGKDTFNTPGR GSRVTKASTLENNAFAAPGWDL A GSRKПSTQSLDGFANKHHPPLNEF QNADWLKSLCETN PLGMHKVATQDLSGFAGELVG TVAAGNVALTG VWGVVYKYSTEMADAF R R MARP GNRSSKVDANRFAGFDSPNFPPLATVGSVVARNYWLPMPD GNRTTKVDARRFAAFCSPNGPPLATVGADUTDNRELVRKV PWGLRKEN ANRTTKRSAEALSAFRSYNYPPLAEVGVNIAYNYPAILR GTRVSKVDCSRUDAFESPNFPALGCVGVDVVLHDELLLKP ARAVRKTHTSSTGAFTSPGSGPLGRVTEGSPVFHAPAARV AWSLYKRSADAPDAF GNRTTKVANMSVDAFHSPNFPSLAVTGVEADVDQPLILPY GNRCNKVR HNYAAFESTNYPALGVMEGSQFVLRERLLDP AYGVRKVHTTADGAFGNPG\|PRPGTLCGGTP GNRVMKTDAQDFHAFSSYNMVPLIKMGTEDNCNWDLIWRS AVGAMKRDTADLTTAFA
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 GNRVSKSSSWAFEGFSAPSTGPLARTGTPWHWYAGGTLAG AlNVTKTH
ARGAlKKHTSELDAFRSAAL
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| UniRe |  |
| UniRef90 | P A |
| UniRef90 U1R3Q4 | AFRGPQTATPKPYTRQDVM |
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| UniRef90-C2CNJ8 | R |
| UniRef90- YPIooos |  |
| UniRef90-L8BQ227 | $\checkmark \mathrm{ACL}$ |
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| ROESMO | F |
|  | PRVDPPVDVTN |
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| N6U73 | AKGALR M VHSRMDTRVLT RLVPGFDDAMUREMINHNL |
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| iRef90-UP100037FB | - |
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| UniR | FVPVIAGYPGATPELLEHAVDAGA |
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|  | A A M M |
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| ef90-H5U053 |  |
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|  | datot rVavLkLVPGASAELLRALVNTGY |
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$K A V I L R A F G V G N G P P G F T E L V A R V V K S G T V V V V S S Q C H Q A$ RGIVLETYGAGNAPDALLDVFRAAADRGVVIVNVTQCSRG RGLVLRTFGMGNVDGSLTKVIKAAVDRGIVVVNVSQCLDG EGVVVEAMGAGHTPEKWAPALEAAAAK MPVVLASRVMSG QGVVLQTYGAGNAPPDLLNVLKEASNDGVVII INTOCTKG DALILRAFGVGNDPPGFVGVLAELTEARVPIIVASQCYQA GGLVIEGAGGGHVSAGLVPAVRELATK MPVVLASRCPEG DAVVVAADGAGHVSPALGTALVRLADSGKPVVVTSRCPDG KGVVMETFGSGNTKPDLLQELRAAAERGLVIVNCTHCLQG RGII IAGTGMGHTSKELIPMLKELS KDLFI GITTQCIYG EGLVVAGFGAGHVSEGWAKSVGYILTR MPVIIASRTGSG RALVLLSYGVGNVRADLHQALQAAMARGVCVVNVSQCWRG RGFVVI RCYGAGGIPEKVRAALGRADAGGAKAIAVTQCLYG HGLVISGTGFGNLPKTVVSALKKAENNGMPVTITSQALYG SGIVSAGFGKGYQSNRISLALEKAVQLGIPVVRCSRSGCG QGLVIAGYGSGHVSEKVRDVLTP\|VAK MPVIMASRTGAG
AGLVIEGDGSGNMGAGMGEGVARALDAGПSVVVSTRVPYG KVLILQVFGSGTDFKQTDETLKRDRNNNTEIVIISQCISG AVVISGTGVGNAGPGFAEVVQ ASPQPVVLSTRVPWG RGLILETFGMGNVDGSLTKVIREAVERGIVIVNVSQCTNG QGIVLETFGAGNAPKKLEQAFKEASDRGVVIVNVTQCTKG EAVLLRAYGVGNVPPGLVDVIQCTDADGVPVIVASQCQQA KGMVLEAFGVGNMPDRWLPWLREQRKKGMLVYLGSQCAVG KGLVVMGPGAASLPSKAARAAARLESKGIPTVEVARPTTG AGLVVAGFGGGHVPAAFHPAFAQLDDS VPVVLASRANAG KGVVLESYGAGNAPEDLLSAFREAADRGVVIVNVSQCADG QGLVLQSYGAGNDPTNLLSVLKQAVERGVLIINITQCSKG RALVLQLYGTGNVKESFIQLLADASDKGILVVASTQCYTG RGI I SIGLAPGRPANGERAALQRAVAQGVVVVQAARAARG DALVLECYGSGNAPMARPGMLGTLREDGMPVVADTQCTSG RAVVIEAMGSGNAGAALIDGVRRHCRDGVVVVVSSRVPDG RGVVLETFGSGNTKPELLRELREAAARGLLVLNCTHCLQG RGLVNEGFGRGNVPAQLVPALARARDAGVLVGAATGClGG DGLVVAGFGDGSVPPSWIPFLRKILRDNIPIVITSRCIKG RGVVLQATGNGNANRGFVAVVGQAVAAGVPVIVSTRVQAG EGIVIEGMGAGNDGDELAQAMAKAAKKVPVVLTTRVDHG RGLII ETFGMGNAPSSVSTSTRSAVEKGITVVNISQCAHG EALVIEGMGAGNVGGDIAEGIVAAAEKNIPVVMTTRVDAG DGLVISALGSGNVPATMATALRALD DVPVLVSTRVPEG RAIVLEALGSGNAGAAVIDGVRRHCGNGVVIAVSTRVAGA DAVVLECYGSGNARPGMTAALREVCAE VPVVABSQCATG ASVVVAAPGHGNDPEFCVPVLRRLLLNGVSVVRASRVAAG SGIVLAATGSGNTHPDITAEVVAARRAGVAVVVTTRVPYG RAVIIETYGAGNTPPELLEMLNQAHQQGKILVNLSQCYRS QGIVIAGTGNGGVPSGGDEIPEAMEKGLQVVV AGLVLAGVGGGHVPEDLVPAVDRLGEQ MPVILASRPGSG RAVILEGFGAGGVPTDFIAALDYARSQGVAVIATTQCVYD EAIILRAFGVGNVPPGLTDVVVDA 1 DAGAAVVVASQCHEA
DATLINAYGNGNAADTARASLQAMQD $\square D \square \square P V R S Q C H E G$ DAVILQSFGHGNFSQADVQVMQAYQAQGGMI INVSQVFDG RAVVLEALGSGNAGAAVVDGVRRHCADGIVVAVSTRVPGG DGIVLAALGSGNANPQLVEAVRQCTARAVPVVVSSRVPNG ASTVVAMLGNGPTDPEFLDALSAAVKAGVVLMDNTQVQRA



#### Abstract

AVVLQLYGSGTAPKELLDTTKAATENGDNUVATQCRRG KGIILMGTGDGHTATKFLESISERVKDGMKAVITTQCDFG RGAVIEGFGGGHVAERTVDAV RALAAQMPVVLASR DGIVLAALGSGNATQAVVEAVGRAHARGVPVVVSSRVPEG KALVFALFGTGNCQDGFLRLVRLADASDIPVTVTSQCVRG EGLVLVVPGVGKLHGALAETLRPASQQKVVVALVVQDLRG HGLVIAGFGSGNAGGALTPGVRRALDAGLPVVLCTRVPGG RGVVFQSYGAGNGPSNREDIIREAIARGVFIVIIDQCQTG CGLVVEALGAGNMGDGMGKAVSAALDRGVPVAITSRVPDG QGLVLECYGSGTGPADFLAALAELLRDAGVPVVALSQGARG DGIVLIGTGSGNTTVALADAVRRADAGGVTVVVSTRVCSG SGLVLQTLGSGNVPASI AELIEAHGESDVVFASASHCAGG QGLLLECYGSGTGPHALLEVLQAARQRGVMIVABSQCPEG EAAILLSYGQGHAPAELLAAVQHFTQNGGLLLNDSQAHHG 


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$\mathrm{KPNVTLLGTGGT} \square$ ASRLD

GKMQ VIFSSEELLSR YRTGAVIPAFTPGE LYGA

# VLVLACGGT $\square$ GQREVDGRMVVVVPASDLLAPVLAHA $R V L I \quad$ NTGGT $\square G M E P S E T G \quad S \square G V K S N F \square A S M \square N R$ <br> S SPPPTVK LQAYRSGQLTFLAS LRT KPDVLFDHTGGTDS SRVSYEEG GVD P S A HE VEDMVEM APVLGGSALLH 

$M \square Y T G G T \square G M Q L G D Q G L T P A T G F E A R M R D R Q A R D$
$R V Q F L Y T G G T \prod G M V P S P R G F E P G G D \square H A Q V Q G A V H A$ $K L L V L Y T G G T I G M Q M T A A G D A P A S G F E A R L K A E Q L A H$ RI CII I TGGGTI ASVGAPLADMGAEAFAALI DPVLRAM MKNI LVVFTGGTI GSIATGGTDNTSDSTSFELTRQFQQH
 $M K S L Y I L Y T G G T I G M T Q T P Q G L T T A L Q P H T G S L K T S A A S$ $\begin{array}{lll}K L V L Y T G G T & A M Q M S E A G Q L A P A S G F E A R L R A E ~ Q A L D\end{array}$ MAKVFVVYTGGTVGMVPGPDGEHPGEAKKGDFTKELRR

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PTMVLLATGGTMAARSGAAG
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K TAALYYGGT\GCVGNPLSPMNTDDFSSAFKNLITPD $M K N I A L I Y \square G G T F G C V G D P B A D A M P A E S F I K$ $M K N V A L V F T G G T I G S E A S C G T \square A T S V N A P Y R L L Q Q F E R Q$

$M K R L L V L F T G G T A B S G Q G D G G K A P S K K R V D E D S V R G M E A$
MPKTLVLYTGGTLGMTYMNNVLSPEPNASTHTADPLFHG

$K P \square V A V L A T G G T A \square G K G G S P T D T S H Y V S G A S H \square D S V I D L$
NVLI I ITGGTF TMAPTPQGLQVQPGFLKSKMRADADY
$K K I A L I Y M G G T F G C V G E P L A P M P E A E F L P R L Q R I L P T H$
VGIUYAGGTFGSHGNPLQSLDNATFLPVLTDGLSQQH
 $M Q R L V V L F T G G T \square A S A F G E G G \quad G K G P D S T V V G A L R D H$

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

A GTVVARLNGAQLIAA LPTVAII GTGGTALGKGNSQTDTSHYLSGAYNDNDV DPI


 $M Q K I A L I Y M G G T F G C V G E P L A P M P Q H S F L P K L Q T L L P K Q$


## Q V VR G

K VLVLYSGGT】GMKTDKNGDLPSYAARAWNEKSEPLV
MKT TALIYMGGTFGC\GEPLMPMPEQDFLPLLAKVIPAH LLI HTGGTIGMVPGPDGLTPGEG\|VE

A A

$\square T L \square T$ T G GT $\square$ GSTSEED SVNVSRGEQLLQQHDSE $M G G T F G C 1 G E P L A P M P Y D Q F L P Q L E K V I P P H$ MGGTFGCIGEPLNPMPAEQ FIPKLQH




PNFDVVQVPTLHSADQTVNEWAELAYLIEKNYH MSALDTPADPMVDVLSVVARSGVYMGWDGLLALRDAVVTH
 SADQGVEEWIVLAELIEK H
 YPELAKEVNIHSEVIAEMLDEDMEPEHWQQDAETIHEV $G L A P D D D V R V V D A A A D S A T F T L A D M Q H \| V D A V A E A V A$
$G Q R L P S W Y F R E L L D P D D S A S M N Q R N W L E M A A S D R E E V D$ QRVVY TVLE CQP LFDS S DMT IAAEWVQDAQTIERHYA


 LDEKWHVCQ

$V P$ GAPQ HLQRR
HPERPAPAWQFRELSPPDDS ANMRQANWLAMRDADVQADD RHANAED DRFKTIQPMRI LS ENLAPPAWKILIAA I EAEQP HPELDCPAKLQVEEDNPIDSSKMTPNLWVYFANKILKENN

AAGAPDVP $\square R V R D L A A A D S A A D T P A D Q D A V R R A V A D A L V$ $D P N$ A GNVNFTPDAPLDNLDSENLVPTDWTALDAALEAAN



289B963

87594 C 3
MGEDQQRPE IVEYDELDDSSDMDGRDYMRDATDVAR N LPCQKGGKRVIVEYDPLLDSSNMKYDDYAKIDQNIRDNYS LQVECFAAT S TKDSSACTATDWLQLVQQ DQQLQ VGKRARVVSFD PLLDSADVGPSHWNNLLDLIEAENG

$\square C E R N Q L A \square K T R A A F N K N S E D L A P A D W L T L I N V I A D E D A$




-
R


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[^2] UniRef90_R7G308 UniRef90_Lowimo

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PAGTPDSDAWANLFGAMQALH QGLEPGVQVYFHGKLMH VCLFFQNQLER
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SAAQPGADGPANLDDACRVALAQNSRQRGVQVVMNGQ PLFYYNTDAFQNVCGAVASALAQSGVPEVGVYFQNQLYR PL LNAAGKQPRDALDNLCFADSVQQVEMGVYLAFNQELVH PLDHPEANGLNNFDAAVEFDRQRRETGVFVPYRNPGEYTQ PDTYTSPDGRSNFFQAVATAVSPDARDRGGLTAFNDRTTS PLGDVGSDAAGNVAGALRAAAS GRTKGVSLFFGHHLDA TLDYVPEDALVNLRG AARACCFAPGGVWVYFNWKLEP PIYEMRNDGRDNLLGALLIJAG QFVIPEVCLYFHHKLYR PAGVPGSDAWDNLFGALQALHD GAVAGVQLYFHDRLLH SADAPDADGPGNVRDALAVAAHPAARGLGVLLCFAGRVLQ PGHADWSDGRENLLGALLMAG QYVIPEVGLFFQNQLFR PGAEPGSDAAANLRGALDAVRLGCWREPVVVFAAGKVLL PLTAYGAEGPGNVLSALLTVATCHDNRGVVILMDNKIMLI QGRAGLKEGLVNLHCSVLAAISPMARDKGVLLCSSGELFG PLTREFTDADDNLNTALEAVINDP VGVYLAFFHQVMH PLLQPDSDASENLFQSCRLAVTGEA GVQACFTYEHWH TRNYMPEDGTVNLKGAVQVIC SNVRGVWVYFNWK LIQQ PLLHPSSDALDNLNHAIQY MENVSDGVYLCFNHQIFH TLDYMPEDVTVNLRGAAQVAF SDGLSGVWVYCNWKL PLMHISSDAKRNVGLSLLLAAYGALGEV VVLFGSQVLR
 PIFETRTDGKDNLMSALIIAGNY VIDPEVCVVFFNSKLFR $N P T L A G P D G P A N L L A A A R V A A A E S A C G L G A L V V F G D E V H A$
$P L L N L Q G D T A D A L D N L N T A L D A V T R P G V Y L A F Y L Q V I H$ PLSAHGAEGPGSILSATRV SVASQDNQILI DFNDLITL $P L L N A Q G N K Q R D A L D N L R F A D D S V S M C T G V Y L A F H H Q L M H$ PLTREFTDADDNLYALE QVQALDPGTYLAFHHQVFH PLTREFTDATGNLYLALEQVQVLPA GVYGGFNNQVFH PLLDPTSDAMDNLNTALKHILHVEA GVYLAFDQQLYH SQNFLTNGVSNLYDSVLVANSSDFVNQGTLVVSDKKITS PLVDANSDAWDNLTDALKLAAAGES GVKICFSGESWP PLTREFTDATDNLNSALEDQVVKVTNGVYLAFYHQVFH PLFDANSDAWGNLTQAVGLASH GDP PLFDANDDAWGNLSEALGLASHGEP

NGKAMDP
PLVEPYNDARRNDVISMMASNPSTR PIYEVRSDGRDNFLGALTLAGNYSI AHGGPVCLFFQNQLFR PLTREFTDATGNLYLALEQVLALPS GVYLAFHEQVFH
 PPDDPESDARNNVGSALVALRTLPRGVYLVFAGDPESVHLI CM RKSVDGLVPARGFLKAGLAPRPV
TLEHPESDVSANLLGALAAAENNDANGVYVSFLNEEKQVQ PLTREFTDAIENLYLALEQVI ALPVGAY LAFHHQVFH PLSREFTDAIDNLNFALDSAVQAPA GVYLAFHHQLDH
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GNRTKKVRARRFAAFCSPNLPPLATVGADVTVNRELVQKA ANRCIKVSRGSLRPYDSPHFPPLA VMEGAMRLLGPLLRP ARYVQKLDSQLI GSFSSLPAGPLGQIRNGRPLLYHRALPP ARWITKSHALSVQTFVSSDSGPLGYVYEETPVYUNTLSR GNRSMKVSSVEFDAFKSFNLEPEVKGGCNVEVRWDGISRP ANRTDKVSRASLLRPYSPHFPPLARMSGSLKLWGPLLRPQ PQKVRKMHTSRRDAFESVNTDQLGTVNIEGVTGEVSKN ALAGVKVHVYRTDAFGSGDAGPDGFMEEGVLRLVKAWPSH GARLTKLGAAELDAFAVLPRP GNRVTKVDTRRFAAFCSPNDPP【A VVGADVTDNRELVRRA AMRATKVSALDLLGFVNPYDG GARVSKQKSEAFDAFAESRRPDRG GNRVLKVNASDFCAFDTPNFAPLGQYGDTDELERSDMLPG GTRLACSLQLSGDFFSVQGKSYMQFENRQFSLENPPAQQT PVGSSKTSTEHDNGFA NTHFGTWQTENGQPENAPAPF AFYTTKNNANTLDTFSSTEAGQDGVFINQVPFFFFAPAR GARASK LK SEAFDAFVNMARPRHGQCLEQLPEADHYRRPR GVRLVSSPQLGGDFFSVRGESYL EFDGHRFSRTGLAP GNRVTKYDCDAFDAFNSPNVEPLVEMGVT IEVNARPFPVP GSRSSKDRTRSYNAFESTNYPY GGLVEGKVVYTEGDFAN ARGAYKAHTTAETAFRNALTDSGKHDDGSPSPDGTVLPPL GTRVTKVDTRRFAAFRSPNLPPGAVVGADVIDNRELVGRA ARGVRKCDTUNPAAFADRENGALGRVNYGKVTFNTKPDKR GHHDASSDQLSGDFDSVQHKSYMQHDGAFRLLHPRKPRQQ ACSVRKTDSLALQAFSSPVVGPAGLLLEDRVHYLRPPGPR
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GRRSYKHH NAFVPGDGSLLGSVVNFRPEVYNERRD
 GNRCTKMDPWHQNAFESPNLLPLALGGUDLEVEERLGFLPA ARTVLKTHSTALDAFKGQKADQEMNIDSQVINVQ
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GNRAHKARASHPDAFTAMGGFPGFNPEWGLANEPGIPAG ARTAVKTHRTALNAF CGEAFTNVIKP DSSSV GNRAHKAQALHPDAYVATNGQPMYFNPEWARKDRKGTVRQ GNRVTKLSSWAYNGFDSPAVPQLARTGAPWQWVENESTGC GPRCSKASCSSMEAFSSPNFPALGNDGVDLVIHDRDRAPP AQTVQKDHSHDLMAFTGHTRYPANSYVKSLPVGRRKNWDE GNRT1KISSAALDAFNSPNVTPRAKMGINVE:DYRSDFRP
 ARRSYKQNNVLFSGDRS LLGRGVDFGPEMIHRPSNS AQTALKSHTTELDAFSGTDATQECRTSSTATIVHT AQTTLKVHTTDLNAFAGVDANLDCKTATKMLVVQNEHDEK AATALKLHTTALKAFHGSQQGLDGQAYHEKLNQRPKAAF GFYSLPVSTNLGNSIDSSPQGLLGQUYEGKDQWFYESQDL AQTVQKIHSHDLMAFTGHSRAAYPANSYDRTLPDTRRQHW
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210
220
230
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 $P D P$ $V E R Q A F R V H Q \quad D M C E N V A V L R L F P S \square T P A S V R A F \square A P P \square$

 YENTQEDYSFEPGFNQDVGWLRVRPGMKPEELDLI LEQDY R D A A TVVP H L P G DV S R L R V DVV A L P P G A D DVVH R A S L A A G A Q A A M S L E K I A A A T T W P R V E VIV M N Y A G G S A A V V D A L L P P P



 Q H S D GL K P R L P N P E A K V S V R T P VGQV H F DVA NVT E L A QVVD L Y A H Q D M D P Y L F N A TVVD G G A R A VA F T A Q A ELLP P L K P E F S G R I L MLLK PYP G L N N WLP I CD W D S LIP DVRILRLFPGITENYVKCVLABGD

 | $Q \mathrm{~V} A G L Y V P D V$ |  |
| :--- | :--- |
| $R G$ | $V$ |

 $R P L A R M P V A P A D D A A H R V D I I A L D H G A D S A M L D W H A T Q Q A$

 $T \square T A K D L I K A Q Q F N C L S D M M Q P Q G L D Q Q L H N L K Q L A A S P P$
 P T GRPHFDVTNTTELPAVVVLYGH
PTAGPE
TYPRELDRLFNNPQRLNLVGER】RPVLCLPGCQPAFLGTE
$P K T R P Y L G D L G A A A A P R \square D \square V A T Y L G S D A V A L D A C \square A A G A$
$T \mathrm{~T} L \mathrm{GPPGD} \quad H D A K V A L V T A Y M G A D G H V I D C A A Q A S$

 $P$ VKRLQVHSTVFHDIVVLWLTPVFHHH

LSSHF EK A KT LDN I I NWMMLDPI E Q E Q L A S N L D L I L S K P P






 QVKAED DRKAAGFNCMS MMMQP DDLAQQLNNLHSLA ARPP

 LT Q HL E NLDD NTLKNLAN IGFLTPMSGD DLANLLQQNML K H K P EV V T TH L Q R A Q QL N L L N WML QP VEKA TLAKNLK QL SQTP P




 QPSGPLKVQSNMRGRVVVFALHAECD

HDFFESTKMCKKEKEENTFSDDIILVKPFPGMRYNVLPDGT A D GAPA GHPTVARFDARVLELRVDPGLPFAADEAAVAA GG S T DLLS P FT I Q T S LD TA HV ACL RVVPGITPVMVDAVL REGL
 ARHFNCMSLMMQPQAPELLFANLQA
DSYAE LDVSDDLGARVAIVTETFGALVGLPADSE
T L TKGKRQVFTQKPI I KRDD LLIDKTYPNQNYSFYAP QN A


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

UniRef90 H8GTW1 UniRef90-W4LJD4 UniRef90-UPIO0024846FF UniRef90_U5KMA5 UniRef90-X1PJK0 UniRef90-T1BG822
UniRef90 G3H390 UniRef90-'s9VSz9 UniRef90_L8GJ11 UniRef90-C9T3Q6 UniRef90-A0A058Z8W7 UniRef90- J3PME4 UniRef90-S9VF15 UniRef90-E9DS71 UniRef90_G0QH18 UniRef90-A0A031FLL4 UniRef90-K2DV82 UniRef90-I6ZAY6 UniRef90-UPIO003C84CBC UniRef90_UPIo0028A08E6 UniRef90-S6AED3 UniRef90_UPI0003B46155 UniRef90-G31X98 UniRef90-D3АЗ87 UniRef90-C4GLD4 UniRef90-Q0UHQ9 UniRef90- U3B2E4 UniRef90_UPIOOO37B5741 UniRef90-W5M392 UniRef90-UPI000375BF12 UniRef90-Q4JW83 UniRef90_UPI0003F10B60 UniRef90-K2BSP7 UniRef90-UPIO00476231A UniRef90_UPIO0037B596B UniRet90_J2SQ15 UniRef90-B9Z8W1 UniRef90-14ZVL3 UniRef90-G4SZ29 UniRef90_B2ASF5 UniRef90-DowJZ2 UniRef90-HOULI5
UniRef90 E9OCJ1 UniRef90-K5YLR4 UniRef90-V7M047 UniRef90-UPIOOO3315710 UniRef90-UPIO00477EAFE UniRef90-B5DZV2 UniRef90-X0C4K3 UniRef90-A0A010ZNF1 UniRef90 X6M1.J9 UniRef90-UPIO002487E04 UniRef90_UPIO0037414AF UniRef90-D1B5M2 UniRef90-A0AO31LYE9 UniRef90-D2Z582 UniRef90-W4U8U1 UniRef90-U6L5J4 UniRef90-F5ST67 UniRef90-O19Q38 UniRef90-UPIOOO3814601 UniRef90-N8SAK9 UniRef90-F9GAP6 UniRef90-N9M5C2 UniRef90-N9B302 UniRef90-G7G9RO UniRef90_L2F4V1
UniRef90-S3MRG7 UniRef90-KOK 884 UniRet90-UPI000289B963 UniRef90-N8YEP8 UniRef90-UPIOOO47594C3 UniRef90-A5WGS9 UniRef90-K4E7R8 UniRef90-R7U5Y2 UniRef90-UPIO00343FFDA UniRef90-S3YMK4 UniRef90_E3FOL1 UniRef90-UPIO003B67BE7 UniRet90 B2WHU5 UniRef90_F3KG30 UniRef90-B21368 UniRef90-N9DU60 UniRef90-B1K1X7
UniRef90-R6UEQ9 UniRef90-H6LBX2 UniRef90-R6ISK1 UniRef90_R7G308 UniRef90_Lowima
 DGLII QAFGSGNANPELINALKTAHDEGVVLVDVTQVLAG LGLIUQAFGSGNANPELVALKTAHDEGVVLVDVTQVLAGG PAVVLRCYGSGNGPTFMKRLLKQARTRDLVVVICTQNRYG

RGDILAGTGLGHVPESHD WDRTALARGVVVGMTTQCREG KGVVMETFGSGNTNPDLLRELREAAEQGLIIVNCTHCLQG KAVIMACYGSGNAPHFMPQLLQKAQARHLLVVVTTQNRYG DGLVLSGMGTGTDPDSY DGIVVAGFGAGHVSGDEADTIERYASR IPVVVASRTYGG
QGIVLETFGSGNAPPALLEAFKEAADRGVVIVNVTQCVVG RAL IVACYGSGNAPSFMKQTMDKAAEKKMLVVVTSQNQYG $R G L S R E T C G P G G E G G R L T Q V V E A A V R R G V V V V N V S Q C V S G$ KGL
DGLVLEALGSGNTTPTVVAAVRDAVTAGTPVVVSSRVPRG RGLVVAGTGNGTLHFDLAAALQRAELAGVRVLRASRCGEG RGLVLECYGSGTGPADDTALLATLTQRGVVLVADSQCPQG KGVVLETFGSGNTKPDLLQELRAAAERGLVIVNCTHCLQG AAVILRAYGAGCDEPGLEQALRNLVTGGTPVVVMSQCLHT QCVLLECYGSGTGPSDLLAVLKEAHAKGVVLAADSQCPEG KGMVLQSYGDGNFPSGHPDSLKQAREDGVTIVDSTQVIAG HSGTAYASPQWGENYSLIEFMKRCEKQGITVYLASADAYQ QALLLQSYGHGNAPSNFVRTVQAFTQQGKLLLNISQVPQG A LLESGGGNAPAHPALLTAIQRYTQAGKHLLNISQVPHG QGVLLECYGSGTGPADFLAALREARQRGVVLGADSQCPDG HS GTACTTERWGENHSLPEFIARCRQHGVEVYLASTDAYE GGVILETYGSGN
KGIVIEGFGMGGVPFKLDSKTED【MKDGMSIVVTTQCPYE DGLVLAAMGSGNIPTAVAEELEAWRAERTPVVVCSRVPTG KGVVMETFGSGNGPT KPDLLQEQERGLIILNCTHCLQG RGLVYAGVGNGNPSEEVLGVLASASADGITVVRATRVTDG RAVLQANGSGNTHPYIVGAVGRILTADGVVVVVSTRVPFG HSGTACVSPSTGKHHALDEFI AQCRMRNI AVYLASPDAYQ DGLVIGGFGAGHDSQRWATMIEHVAER IPVTIATRTGSG TGLVLESYGEGNFPSGTYQALANANAAGVVIVDCTQVLSG


## EFLILVGYGAGNADPAVLRQVAETYRDCQVIIACSQAEEG

## RAVVLEADGSGNAGPAVVDAVRRHCGTGVV

DAVVVAANGAGNLPVGMADAVVRQVRDGRLIVVGTRAHDS MGVVLESYGSGNDPSNWTE EGAVLGVYDDGYFPERLTKGLKKGTDQDGCVAAAVSYGHT

HFLIIQAYGVGNVNDQIIEKTKALQLNNCQVILATQVPLG NALMLLGFGAGNLPHNVEQALTDAHAQGCLVAISTQCPFG EILGVVGYGAGNIPQRVKGAILEAYARKPIILACSQAEGD HVLILQAYGTGNINADTTDILKQLRADGCHIVLSSQVMFG RVLALLGYGAGNAPSGALHAVERAFDPKPHVI ACSQAEGD EAVILRAFGVGNDPPGVVDAI LDVISAGTPVVVASQCMQA RAVVLQLFGAGTAPPRFLAAI RAAIAAGVAVVAATQCHKG TGVILMGFGAGNDPEQLENTLDKLYQHGHIVVCTTQCPYG


KGVVMETFGSGNTKPDLLRELQAAAQRGLIILNCSHCLQG DFLI LDGFGTGNVNDEILA\|FEQLYQKQCLP\| ISTQVTFG
$K A V \square H T T Y H S G T M C P D L K S F A D D A K K R N \square P \square Y \square Y G A A G E S$ LLLYPCATGPTGDDDSSLSRFAEFVTARGGVVVGTVSAAP KGLVLETFGAGNTPSAMTRCLADAVKRGIVIVNVTQCLSG CVIVNLYHSGTGPSTLEKNGLLEAIRSRPDLTRHDPKPYQ HFLVLQGFGTGNVNDEFLATLDELYRGCVPILATQVTFG DGIVVAGKGAGGFSAQSESFLSEAATH TPVVLSTRCAHG AAVVLYLYHSATACTVIIEFTKKCSSASTPVYLASSDKYA VRAVLHHCGSGNIDGENGTSLLAFIKNNPNVLISYKNDHG DAVLHRMYGSATVPEPATAFAHRCKEAGVPCLFVTPKPAA DAVIVESFGPDGEEFDFYDVIEKWRKKGKIAVMCTQVNEG

UniRef90 H8GTW1 UniRef90 W4LJD4 UniRef90-UPIOOO24846FF UniRet90_U5KMA5
UniRef90-X1PJK0 UniRef90-T1BG82 UniRef90-G3H390 UniRef90 s9VSz9 UniRef90 L8GJI1 UniRef90_C9T306 UniRef90-A0A058Z8W7 UniRef90 J3PME4 UniRef90-S9VF15 UniRef90-E9DS71 UniRef90 ${ }^{-}$A0A031FLL4 UniRef90-K2DV82 UniRef90-I6ZAY6 UniRef90 UPI0003C84CBC UniRef90 UPIO0028A08E6 UniRef90-S6AED3 UniRef90-UPI0003B46155 UniRef90 G31X98 UniRef90-D3А387 UniRef90-C4GLD4 UniRef90 QOUHQ9 UniRef90- U3в2Е4 UniRef90-UPIOOO37B5741 UniRef90 W5M392 UniRef90 UPI000375BF12 UniRef90-Q4JW83 UniRef90-UPIo003F10B60 UniRef90 K2BSP7 UniRee90-UPI000476231A UniRef90_UPIooo378596B UniRef90_J2SQ15 UniRef90 B9Z8W1 UniRef90-I4ZVL3 UniRef90-G4SZ29 UniRef90 B2ASF5 UniRef90-DoWJZ2 UniRef90-HOULI5 UniRef90-EEOCJ1 UniRef90-V7M047 UniRef90-UPIOOO3315710 UniRef90_UPI000477EAFE UniRef90-B5DZV2 UniRef90-XоС4К3 UniRef90-A0A010ZNF1 UniRef90 X6M1J9 UniRef90-UPI0002487E04 UniRef90-UPIO0037414AF UniRef90 D1B5M2 UniRef90 ${ }^{-}$A0A031LYE9 UniRef90-D2Z582 UniRet90-W4U8U1 UniRef90-U6L5J4 UniRef90-F5ST67 UniRef90-O19Q388 UniRef90-UPI0003814601 UniRef90_N8SAK9 UniRef90-F9GAP6 UniRef90-N9M5C2 UniRef90-N9B302 UniRef90-G7G9R0 UniRef90-L2F4V1 UniRef90_S3MRG7 UniRet90-K0KG84 UniRef90-UPIOOO289B963 UniRef90_N8YEP8 UniRef90-UPIO0047594C3 UniRef90-A5WGS9 UniRef90-W6TQW4 UniRef90_K4E7R8 UniRef90-R7U5Y2 UniRef90-UPIO00343FFDA UniRef90-S3YMK4 UniRef90_E3FOL1 UniRef90 UPI0003B67BE7 UniRef90-B2WHU5 UniRef90-F3KG30 UniRef90-B21368 UniRef90-N9DU60 UniRef90-B1K1X7 UniRef90-R6UEQ9
UniRef90 $\mathrm{H6LBX}$ UniRef90-R6ISK1 UniRef90-R7G308 UniRef90_Lowimo
 SVDLDAYAGAI SGYDMTPEAALTKLIYL


$R V D P Y V Y A T G R Y D E D L L P E V A Y V K L L W S L G Q S R D P T E D R R$ AVTSDYASGMAMAGDMTSEAALAKLSYVLGQGLTDDDRKK SVNDREYEGGVGAGNMTQEATFVKLKYLFGDGLSAETVRS QNYDDFYYRGSGYEDLNPLQARLKLIVALS RTTKTYGFHGMLAGWLSPRKARLLLWALLAAGKNDEETRA

TVSSD $\square$ YETGRAGRDMTTE
$K V N \square S T Y E \square G \square S A A E M T P Q T T Y V K L K Y$ TRGGGDSNAEVRA F A S PVY A A GVI F GLDDLTAEAALAKLSYLLA
LLVPSYAAGAMHSPTLRPGQARワLLAALLAAGADRDA DAA RVLPVAGSAFADSDGLSPVKARVALMLAL
HVEF GIY AAGVSAGGMTREAALGKLFALLGAGLDQAQVEH AVTSDYGAGAVSGFDMTSEAALAKLSYVLG RINLNKYAGAI GADDMSLEALYAKLQFLLSQETPPGRFST AVEFDDYAAGVSCAGMTREAALGKLFSLLGVGLPQGEVER RLASSSYAAGLSAADMTPVAALAKLTILLAAAWSRGQVEQ STQALIEQGAKIIWDVSIEAAYVKLLLAYGNFDDKQEIMD CAAAVYAAG\|INGGKCNLETATALMTLAVSHDWNADKV NAAAVYA
F V P
HVDFAVYAAGVSGGGMTREAALGKLFGLLGAGDPAAEVER STRFLLKEGARMDWNMSMEAAYVKLLLAYGNFNDPSRILE
GGDLTDYEVGDPGYDMTTEALVTKMMWALGQTTDPAEVAK GVSFVYGGTGRSGGAMRPSQARIELLYELARAR
SVTSHYAAGMVSGFDMTSEAALAKLSYVLGRGLSVDGRKE PVTDDAKYGFIVSDSLTPQKARILLMLALGKNLAKSEIDQ PVEAVYGGGGGAVD
STRQLDEQGVHVLWDLSDETAYAKLSLAYGNFTQQEEIVG TTARASYGFGSMAGFLCPRKARILLWLLLGCQRQQELAQ TVNDSAYAAGAWLPDMTPMAALAKVIILSTHGWSADTVKT STDQRYAGAEWVQD GOGARLLNDAYGHADLYAKALK STRELLEQGAEMLWNLSLECAYVKLLLAYGN

RKEPDGYADVGLAG

RTGQLAAADVPVVGGMTPHH TRVF पA $\square$ A $\square$ SQGRSATD
FDVRRRDDGVVPASDWTDRSLLMMMPFVLSSNMTREKRME HVHKTNDFEGMSGGRLNPFKARDRLSGGUSAGLTDNGLSL
GTDQRYAVSQWTKD SKILVSDALSQADLYAKDLK GVSDSYQAGAWLTGR $\square T \square P A \square F A R L L W L V A T V D N V K D R R K$ MKNPSQYAAVGMG
ELDQRYADSSWП KASD ILIDDTपSDADपYAK【LK MKNPGSYAGVGIA DVQLGQYQSAVSAHDMTLEALYAKLIFLLSQGLHGKELKR TANLLIYENGIWAKDMTPEAVVAKLYYLMGKGVTGRRLKE GVSEAYAAGपWSAGRLTVPAVYARLDWLHLAFDTPARRRQ
SVDLGTYAAGVS SRDMTDEA
SVLHTYGAlGLNAGLLDPYKARVLLRLLIASGADRGALAA GMDQRYADSQWIKD YNMRHRDDGVVPAGDWTDRDLMMLMPFLLASNMSREEISD ATDQRYAIAEWVNH CKILLNESYGHADLYAKALK Q DQRYAISGWVTHTGHGHADYAKLDQLYLKYATAEQWQQ QLDQRYALSSWVN ETDQRYAITQW ESLTANAAALINDCYGHADLYAKILK GSDSPNDLSTDAGGLLDSVKAKVLLQLCVNSKYDLDEVKH $G O S D S Y D Y H V I A G G R L T I P A D Y A R L L W L L L R Y D S P A R R R Q$
$G M D Q R Y S V S Q W I K N$ GVSDTYAAGSWSAGRLTLPAVYARLLWLHLAYDTPARRRQ GVSEAYAAGSWSAGRLTPAVYARLLWLHLAYDTPARRRQ SVELGMYMGVVSGYDMTFEATTTKLMYLMGQGLENSELVG

AVTSDYAAGMVSGFDMTSEAALAKLSYVLGHGLTLDDRKE QIDQRYAVSSWI QSAKVLVNDCHSHADLYAKVLDQ
VDY DSVKVFEKFGFEVLQVAA पMKПWПASVVFDSRNEDSE DVAGSYYLTGAG SVSALYAAGVVFGQDLTSEAALTKLAYLLADPDTPEEVAK ATMTLMKAGARLYQDUQPHLLYTLITLGLASGRDLDDLCD GMDQRYAVSQWDTD AKTAKILI SNCSSHADLYAKALLK AVTKYAYDRTAGYDGLNASKARIRLIVELGRANRSAK TTNETDKDNAMPLYNITKESAYIKKLLAYNQSLPPNED TTNEDDKLNAGPLYNTKESAYIKALLAYNQSLDPNEU SCQELDAAGG| PLENUSFEAAVTKLNFAYNQHECSPQSRE

| UniRef90_H8GTW1 | V F |
| :---: | :---: |
| UniRef90-W4LJD4 |  |
| UniRef90_UPIO0024846FF |  |
| UniRef90-U5KMA5 | S F |
| UniRef90-X1PJK0 |  |
| UniRef90_T1BG82 |  |
| UniRef90_G3H390 | LLA K |
| UniRef90-S9VSZ9 |  |
| UniRef90_L8GJI1 |  |
| UniRef90_C9T3Q6 | N F L L Y |
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| UniRef90_J3PME4 |  |
| UniRef90_S9VF15 | A M E S |
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| UniRef90-K2DV82 |  |
| UniRef90-I6ZAY6 | W F |
| UniRef90_UPI0003C84CBC |  |
| UniRef90-UPI00028A08E6 | WVR T |
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| UniRef90_UPI0003B46155 | LF Q |
| UniRef90-G31X98 |  |
| UniRef90_D3A387 |  |
| UniRef90-C4GLD4 |  |
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| UniRef90-U3B2E4 |  |
| UniRef90_UPI00037B5741 | E |
| UniRef90_W5M392 |  |
| UniRef90-UPI000375BF12 | $\square \mathrm{M} \mathrm{A} \mathrm{T}$ |
| UniRef90-Q4JW83 |  |
| UniRef90-UPIO003F10B60 |  |
| UniRef90-K2BSP7 | LYF E Y |
| UniRef90-UPI000476231A |  |
| UniRef90_UPI00037B596B |  |
| UniRef90-J2SQ15 | Y $\mathrm{L}^{\mathrm{N}}$ |
| UniRef90-B9Z8W1 | LVQS |
| UniRef90_14ZVL3 | L Q Y |
| UniRef90-G4SZ29 |  |
| UniRef90-B2ASF5 |  |
| UniRef90-D0WJZ2 |  |
| UniRef90-H0ULI5 |  |
| UniRef90-E9QCJ1 |  |
| UniRef90-K5YLR4 |  |
| UniRef90-V7M047 |  |
| UniRef90-UPIO003315710 |  |
| UniRef90-UPI000477EAFE |  |
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| UniRef90-X0C4K3 | $F \square \mathrm{~A}$ E |
| UniRef90-A0A010ZNF1 |  |
| UniRef90-X6M1J9 |  |
| UniRef90_UPI0002487E04 | 1 Y L Q |
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| UniRef90-D1B5M2 |  |
| UniRef90-A0A031LYE9 | M Y L Q Y |
| UniRef90-D2Z582 |  |
| UniRef90-W4U8U1 | WIE T |
| UniRef90-U6L5J4 | LMES |
| UniRef90-F5ST67 |  |
| UniRef90-Q19Q38 |  |
| UniRef90-Q5UCB3 |  |
| UniRef90-UPI0003814601 | H |
| UniRef90-N8SAK9 | Q Y |
| UniRef90-F9GAP6 | FI |
| UniRef90-N9M5C2 | M Y L Q Y |
| UniRef90-N9B302 | H WYD Y |
| UniRef90-G7G9R0 | M Y Lk Y |
| UniRef90-L2F4V1 | VWQK |
| UniRef90_S3MRG7 | 1 Y L E Y |
| UniRef90-K0KG84 | NFES |
| UniRef90-UPI000289B963 |  |
| UniRef90-N8YEP8 | $\square \mathrm{Y}$ LQ Y |
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| UniRef90-A5WGS9 | R WQ |
| UniRef90_W6TQW4 | L I E K |
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| UniRef90-R7U5Y2 |  |
| UniRef90_UPI000343FFDA | L L |
| UniRef90-S3YMK4 | M Y L K Y |
| UniRef90-E3F0L1 |  |
| UniRef90_R6M575 |  |
| UniRef90_UPI0003B67BE7 | $\square \mathrm{MR}$ |
| UniRef90-B2WHU5 | R M |
| UniRef90-F3KG30 |  |
| UniRef90-B21368 | $\square \mathrm{Y}$ LK Y |
| UniRef90-N9DU60 | $\bar{M} Y$ L Q Y |
| UniRef90-B1K1X7 |  |
| UniRef90-R6UEQ9 |  |
| UniRef90-H6LBX2 | F F Y E F |
| UniRef90-R6ISK1 |  |
| UniRef90_R7G308 | LF Y K |
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UniRef90 X6KTU0 UniRef90-W9BJA1 UniRef90-A0A024EZU9 UniRef90-R7BEY8 UniRef90- X0EVJ9 UniRef90-R5SQR1
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 KISIISTGGTUACKKDDNDHLDSPFKVVDYADE $N D A V L F T G G T D G S T L A G N V I G T K T G A \quad A D G L L D T$ $V Y \vee L S M G G A I S G R V G E D G A V E T G D E Q V L R D L L A A P L$



LS CVERDGHVEVYHPYT LLS ENSTGDTDAQLAQS DREVVS AAPLASPVRFES DDVGR\LSEEIIPSDWA ILIETIAEKLN T F DKEKP LD L LSENMTTGNWN LLS KMRT YD HPNLG VSFEVKQDCQKDSLDVDNDDREMLFSSDANDCT $\square A K F Y N N I D L R V T G L D Y K D S L Y M N D E D R A E L L K K L E L V Q T$

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170
190
AA G LVKQHSNGPDAFRT\PQAP
PD GARLVHAA A RLQPSTPLRHYVHSDGEVP【TGLDQLPHP VPQVRKNREKGTFESF NEIVSADSSDNF

LY LGKANEK PWATKKDNNQ F DPGPGS LLGDDKDFEPLERWWDGPC IHLLGTADHQPYSDEVYSVGGMEYGHYEKGTKCFGKMYYAW PLNL KFEHDGVDGFRNWNM EAPDFSDTPLLTGPLEAD GTRVRKNHTSRRDAFETVGATPLGHIEYEAASAAGADGSV HLLQCANRSENFYSPDMAEVSQENAVFEGKSSGGERMYLY ATNCARDKCSG
AEK $\| V K D R T S G K F \square F A$
ARRSYKQNNVLFSGDRS LLGR\|VDFGPEMDHRPSNS

 TP DK FD D S E LSPEPLPEVVIPQAHQDFPAYGIEVADSMGV



PKT FQFDEDQVYNKTKTKSKYFPSTSEQSDFD $\square$ AVKDGV

DAVVHETYHSGTACTVVLDFAGRCAAAGVPVFLGPVAAYE
DVVLHEMYHSATVPESAKAFAKKCAQKGVAFYFVTSKSSA $R G I V L V G Y G D G Y W P A A S A K E \square R K L V H E S G V V V V F A A E E E G$ QAILHHTYHAGTDCSETPEAFYEVANRK IPIVLCGMDADM KNFFLELYDTGTAGFREGPSLKRAFRRGARFYCSSQ QEG $A G V V V A G T G L G H V Q T S L I P R I T Q L T T E S G T T V A M T S Q C L A G$ STMAVTPYKDDESKRYTSQAIKRCDECKPPIPLCHRDAYN

KGAVLGVFEDGYWPGPLMKGLGTLMNEPDVIVATVSYGFS
lupas 21
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jnet conf sol25 sol5 sol0 jhmm
jpssm

UniRef90_X6KTU0 UniRef90 W9BJA1 UniRef90-A0A024EZU9 UniRef90_R7BEY8 UniRef90 ${ }^{-}$X0EVJ9 UniRef90_R5SQR1
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UniRef90 B0N151 UniRef90_B5YN53 UniRef90_Q7MS65 UniRef90-W9NSE4

S VT GFAAAGLIPFRWMRAETAYVKTSLGTGMGLTGDALVE
DYESASD $\square$ K DK $\square$ I Y N S T $\square E N A Y A K \square L L$ EV
VYESTYKYGMIVLPMASPVAMYMKDWLLLCSGYSAKE IVDFSGYDGAVPMGAYTTETAVARFLAASIIDADSEEELTQ RVCDRVYDTGVEAGDTLPGTATVKLMWAAANREDP Y ISTGUKYGA I PVWTMTSEMTYVKLLVGCAFGYEGEKLNE Y N M R HR $\square \mathrm{DGVVPAGDWT} D R D L M M L M P F L L A S N M S R E E \square S D$
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[^0]:    A

[^1]:    

[^2]:    पNGFQHFVI IHGTDT【SYAAATLARFQGHSCHAl!TGSQY P VVITHGTDTMAYTGAALAQALGWPHPVVLTGAMH
    
    Q GSDRDITHGTDTMAFSAAALACFGQQAVKIVLTGSCF
    
    

