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HS NGPVL
H K L Y V R

| $H$ |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| $H$ | $K$ | $L$ | $Y$ | $V$ |

    HGLLDRSLADRSELLK
    
HGLKALDQELLDAA PALESGKPVELTLPIRNVNRT


$H G G L D K A$





VV HGLEKCl|RRLHVRLDNKLI SEAEL
A E C A
H
H
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HGLAKSLDVTTL L
SE
A Q
A
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<br>7C0AA6046

B8${ }^{H}$KLDNVLHGD HL DHKLL
HKLH GLLE G A L L D H R|LLI LH G LHDL GMALD
HGLLEAAL
VHSNGPVL
HTNGNVL

HRDDDVL
HGLDKALD
HKLDRVL


H G L
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R
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$\mathrm{H} R$
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HADKLD
H GLLEKA K
HSNGAVL
V
HGLEKTLD
HRLEKTHLDSREL




LI DQA
KS ${ }^{\text {Vs }}$
K A A
$R H S$
$G E K$
$G Q E$
$R G E$
$G Q G$
$R G E$

TE A I E N E K T I I E K T I I K I Y

| D T |  |
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S A I A N H G TVVSK S
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$K V E E A S F B I T$
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 VGTMLSGKIAEKYGEEGLPDNI NCSFHGSAGQSFGAFLTK VGARIAGAI AKQYGNNGFEGEITHKFKGSAGQSFGAFNLP I GARVAGVIASKYGDNGFKGQVNLTFTGSVGQSFGAFNLP MGATLSYHVSKRYGDAGLQDTIHANDKGSAGQSFGAYLAP VGAMLSGEIAQRYGHQGLPENDQAKARGTAGQSFGAFLAH VGTVTGSEVTRKYGAKGLPDT:RIHFKGSAGQSFGAFMPP VGAMLGGE: SKRFGGEGLPDN:QCHFTGVAGQSFGCFNVA VGTVVGSE:SKRYGDKGLPDT:NDQLHGSAGQSLAAFLPT VGAMLSGE:AKRYGQAGLPDT:KAYFTGSAGQSFGAFLSK VGARLSGAVARRHGGQGLPDRLHVRMKGSAGQSFGAFVVK VGTMLSHRLVRRRGSKALPDDLRFRFTGSAGQSFGAFLAP VGTMLSHEVTKKYKMEGLPDT:HVKLTGNAGQSLGAFLCR VGGRVSGRIAKKYGDTGFAGEIGLTHEGSAGQSFGCFLP VGARIAGVIAKQHGDYGFEGQLNLNFKGASGQSFGAFNIIK TGAMLSGEI AKRHGHAGLPDTH HVKLKGTAGQSFGAWVAA VGTMLSGQVAARYGHAGLPDDI HIKAHGTGGQSFGAWLAK LGAMLSGEI ARRHGSAGLPDSIVVKCAGSAGQSFGAFASR VCGRLAGSIAKAYGDTGFAGQLNITFIGSAGQSFGCFLTP VGARISGAI ATKYGNSGFAGEIKLKFQGAAGQSFAAFNLP VGTILSHEIAKRHGQAGLPDDIHIDLTGSAGQSLGAFLAH VGTMVGSEVTRRHGPAGLPDD:RLHEQGSAGQSFGAFVPP HGTMLSNETTKVYGAKGLNDT:H1/KFTGTAGQSFGAFSVN VGAMTGSE: SKRYGEEGLPDDURLHFTGSAGQSFAAFVPK VGTMLGSETKRYGAEGLPDTMQLNEGSAGQSFAAYLPQ VGTMLGHELTKVYGGEGLPDNDDTFTGSAGNSFGAFVPK VGTULGSEVTRRYGAKGLHDTHRLHFTGSAGQSFGAFVPK VGTVVGSEVTKRYGEKGGPDTVNLHFSGSAGQSFGAFVPK VGARLAGQIAKRYGNDNFGGRIHLHFSGSAGQSFGAFTLP VGTMLGSAVTKKYGSEGLPDTVQLKFIGSAGQSFGAFLPK VGIDMLSGTVAKKYGSVGLPDTVTVNFKGSAGQSFGAFGVR VGTRLSGLIAKNYGNTGFKGLIKLNFYGSAGQSFGAFLAP LGTVLSHEVSKRWGEFGLPDDIH1RRCKGAGQTLGGWLAG VGTMLGSELTRRWGGEGLDDTVDVTFTGSAGQSFGAFLPQ VGTVLGSEVTKRFGEHGLPDTVRHHFTGSAGQSFGAFVPR VGALSNE:SKKYKADGLPDT:RYKFDGSAGQSFGAFLAQ AGAMLSGEVAKKYGHEGLEDTISVRLKGTAGQSFGAFLAR
 VGAMLSGEIAKRYGHAGLPDDIHIKAHGTAGQSFGAFLAA TGTMLSNEICKVYKDQGLPQPMQVKFNGSAGQSFGAFLTK VGAMLSGRVAEAHGHEGLPDTISVKLKGTAGQSFGAWVAR VGAMLSGEI AKRYGAKGLKDDVHIAMTGTAGQAFGAFVAK VGTWLGNEVIKRYGEEGLPDT:KIHFKGSAGQSFGAFIPK CGAMLSGEVSUAYGEEGLPNTINCSFAGSAGQSFGAFLVIS TGTMLGHEVTKKWKGAGLPDTMDUTHTGSAGQSFGCFLAK FGAMLSGEIAKRYGHAGLPDTIYIKVTGCAGQSFGAFVAQ VGTMLSHEVTKRYHIHGLPDT:HIKLNGSAGQSFGAFLCP FGAMLSGEVAKRYGHKGLPDTVALNVKGTAGQSFGAFLAQ LGTSLSYHVSKRHGESGLPDTI HTKLNGSAGQSLGAFLAS LGTMLGSEITRRYGEKGLPDT:RLTVKKGSAGQSFGAFIPR LGTTLSYRVSKTFGENGLHDT:HVNVTGSAGQSFGAFLAS AGAMLSGEVAKRYGHEGLPDTISTRDTGTAGQSFGAFLAC


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UniRef90_U9T5J8

IG NTCLYGATGGNLYANGRAGERFAVRNSVGKAVIDEAGB I GNVAFYGATS GEAY 1 R G GVA GERFCVRNSGVMAVVE GVGD




 $V G N V G L Y$ G A T G G E A Y DR GI A G E R F C V V R N S GVVYA V V E G V G D

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



 VGNVVL Y GAT G GQVV I R GLLA GERFA V R N S GA E TVV E GI G D I G N T C L Y G A T G G V L Y A N G R A G E R F A V R R N S L A K A V I E G A G D | 1 |  |  |
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 I G N TVVL Y G A DS G E C Y F H G V VA G E R F A $V$ V R N S G V
 IGNTCLYGATGGTLYALGQAGERFAVRNSMGRAVI EGAGD AGNTVLYGA DKGEAYFRGMVGERFAVRNSGAQAVVVGTGD IG N TTFYGATS GEAY DNGNAGERFAVVNSGASVVVVEGVGD



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H GCE Y M T G G 170.1

HGCEYMTGGRVVVLGKTGRNFAAGMSGGIAYVLNEDGNFE
HGCEYMTGGKVVVLGKTGRNFAAGMSGGVAYVLDQSGDFA




$H C C E Y M T G G R T V V L G R T G R N F A A G M S G G V A Y V Y N V D G D F D$
$H C C E Y M T G G T V V V$
HCCEYMTGGTVVVLGKVGRNVGAGMTGGLAYFDDEEGNFS



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UniRef90_L8N1Z2 UniRef90_UPI00040DC0C8 UniRef90_UPI0003457891 UniRef90-UPI0003779444 UniRef90_W6MSX6 UniRef90_A5N8N1 UniRef90_UPI0003706B36 UniRef90_-A0A023HQU0 UniRef90-C7PIN9 UniRef90_UPI00029A361A UniRef90_UPI000237899F UniRef90-E4RXL9

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 R R CN L L M M E L E GLLE E D D IIE T I H RMM QK HYEYYTN S SVA A K NHCNTEMSDLESSLTDPEEIDALRQLVQNHADYTGSPRAQE

 A HVNGE IVVKMQRVCTAA GEA QL KEVI EAQRDRTGSKKAEK

 Q R C N L E M V
 $E L V N H E Q V K L Q K V S S P A G E R Q L Q R Q L Q Q T H A E R T N S A K A B A$ S R CN L L E MV L L E P L E N E A E K D E VVR G M I E R H A E L T T G S GV A K L
 N R C N T D M V G L G P V D T E E D R $\ddagger$ Y L K D M I

 QRCCN ME M V E E L S GI E E E P S E I A F V V R G L I

 N KCNK E MVVLLEEVLT D DDDLS LL K SMM EKHQSYTNS QVAK S FFCNMEMVELSSLEDSMDSKEVQGLISNHYKYTNSKRAK Q A KVNPE DV T I QRVVCTSA GEEQQLK SLI RAHADR GSA KA QQ
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$\begin{array}{llllllllll}A & N & N & P & E & M & V & D & V & E \\ S & K & V & N & K & E & l & V & K & Q\end{array}$ $R$ T A P A GQQQL QRLL AKVNPEIVTIQRISSPEGEAQLKELITNHVEKTGSKKAKE QRCNLAMVDLEPVKEEHDDMERRRHI ENHAHYTNSSRAQA Q R C N L A M V
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 D R V N G E M V E L N Y L T E T E D E I M V K K M D NL L T E LV DL E DLDE GEDFL WL K GAI ERHRDETGSEVAAR
 S L C N K E MV L FE T L D E E Q E V S E V R E M I E RHY QY T E S T K A S F

 DKCNMEMVEI QENLDSDDMEMI DSLLLKEHYKYTDSAKAEK QRCNMSMVSLEKVLGQPDEVILLKGLI EQHLLATGSPRAKE



 T K CN K E L V H L H T L D D A E E I Q E L Y QL I E K HV S Y T N S G L G QR GNCCNK A MV S L E S P S E E D D TAE E L K S L I S Y H A Q S T G S Q K A K R AKCNMSMVELEGI DTHMDAERLFKLLENHARYTNSAKAKT

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 SRCNYE LVVDLYDVVEE DD I ITTLRMMI QQHRLLHTKS DUARY K R CN L A A MV ELE P IMM RYDA QRLLKHFI ENHKRYTNSAARA Q H
 K NVNMEMVELDTVND DERDAELRDLI EDHRHYTGSEIADR SKCNAE LVVHI QPI ENPEELKKDVYNMIEQHVAYTNS GHGKR
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UniRe UniRef90 R7G198
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UniRef90 F4KSX3 UniRef90-UPIO003B4AF54 UniRef90-V5UDD6 UniRef90-R6R594 UniRef90-U5QFC5 UniRef90-A6L8U7 UniRef90 UPIO0037A68BD UniRef90-A7ICJ2 UniRef90-R6BEP7 UniRet90-F1VV48 UniRef90_R5L5T9
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 HKLSDOLDRELISK HGMADILDWKLLEHA
$Q^{20}{ }^{20}$ QPAl|TKKEKVK ${ }^{20}{ }^{30}$ CKOATKKKKEAI RNTDRT C Lla A DRK PTAMNQFSIKNTDRA KPALDDQSPVFAAFDVKNTDRT HTNGYVLDDEMLLDAEDQSAI HNQTDLTKSYKIVNTDRS KLESTLDERECKEFAKVLAKGTKKKVEVNVKNTDRS
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KSFDWHMLQEA HRLYVRDDNKFIDEAE HGI AQSLDEREL AACQP EAI EKKEPVELSYKVRNSNRT HGVEGHIDNRLIAEAM PALEHQTPVSDELDVTLNRT HMIEESLDMKKLLRMCKPALESKKSIRAKLKINNVDRV HALEAVLDQDLI KAA QPALTNVESVFGEYKI TNIDRA VHSNGPVLDDEVLADPEVQAAIKEEGSVHRKVSIVNTDRA HGDDGLLDWQLIKNAD KEALKSKTPVFGTFKVKNTDRT HGLKSVLDWKFLEAA KPAAKGAAVKASFDIVNTDRA HGLENALDRKLI ADSQPALNRNMPVYVETSVFNVNRA HGLDRALDQELMQSA QRALDNGERVTLALPLRNVHRS HKGYMRLDNKLVDEAEDSAKTKGLPTRMECNVVNTDRA HGLEKALDNTLIQLIAE CRPALEGGEPVRFSRLI DNTNRT HGADRALDHSLIAKA KDALETGKPVVIESPVENVNRT

 HGLEKALDQQLI AACRDALDSGKPVEYTTTVITNVNRT HGLEDHLDRDLLEAAA DAVENREPVALETRVENVDRA HGGAGVLDRKLIYQAKLRALENGQKVSSIFPIQNTDRA HGLAGALDHALIEKAM PALEKGEHVSFIQPVRNDNRT ELLEKTIDEKVIMKKLGS ALKNKTKKSIDIDIINTDRS
 HAGLAHALDNTLI KAALEKQRRSIDVEVTNTDRS
 PAI EAGEPVRSTHAVRNVNRT $\square$
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 H GLL $P C L L$
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H H L E DVL D RK L I T L A E HGIS V HP S SVV
A
P A L T D R T P V Ql E M P I R S R D R S

 AL NNK T P V V T G E T A | $K$ | $Q$ | $A$ | $E$ | $K$ | $K$ | $K$ | $A$ | $V$ | $E$ | $F$ | $T$ | $T$ | $A$ | $I$ | $R$ | $N$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Q$ | $I$ | $N$ | $R$ | $V$ |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $A$ | $A$ | $R$ | $R$ | $E$ | $P$ | $V$ | $R$ | $A$ | $Q$ | $F$ | $Q$ | $R$ | $N$ | $V$ | $N$ |



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Q N
A

HGLSTVLDRTLI A QAT
A $T$
SA
$\left.\begin{array}{ll|lll|lll|l}H & E & L & V & K & A & L & D & N\end{array}\right)$

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 IGAMLSSEVSSRYGLEGLEDTIKIHLQGSAGQSFGAFLAH LGATLSYHVSKRYGEAGLPDTHRINMKGSAGQSMGAFLAP AGTVTGSEVTRKHGAEGLPDT:RLKFNGSAGQSFGAFVPK IVGTMLS WEVSKRHGAGGLPPHIDVRLRGSAGQSLGAWLTR
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 VGAMLAGEVAKKYGDKGLEDSVVHLNGTAGQSFGAFLTA UniRef90_UPI0003C7ECEA V G T L L G H E V V T K R Y G E G L P E N T\| \| DLLT F L G S A G Q S F G A F V V P

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GVTILELEGDANDYFGKGLISGARLVVYPPKQASYVPEENI G|SFYLEGEANDYRGKGLSGGKISLVPPKTVSFLPEEN: GLSFELEGEANDYVGKGLSGAQLAIYPSKEATFVPEDNI GMNLILIGEGNDYIGKGMHGGEITIKPKPDAVIDPAENV GLTLELVGDSNDYFGKGLSGGKLVVYPPKNSTFDAGNNI GVTFDLEGEGNDYVGKGLSGGRIVVKPPHNSGIVPEESII GITMEVTGDANDYVGKGLSGGHIVVKPPDSATFNAHES GIT EVTGDANDYVGKGLSGGHIVVKPPDSATFNAHESIV GUS SHE GVSMTVTGDANDYLGKGLS GMSLELEGDSNDYUGKGLS
GUKLREVGEANDYFGKGLS
GVSFELEGEANDYVGKGLSGGEVVIIPPPGSQFKAEEASL
GI THELEGDANDYFGKGLSGAKLAIYPDKNAGFVAEENS G GITHTELEGTTNDYAGKGLS GVTLELVGEGNDYVGKGLS GVSLLHLEGETANDYVGKGLS

## GLTLYLDGDANDYTGKGL

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GVSFELTAGEANDYVGKGLS
 GlT T RLEGDANDFVGKGLSGGRIVVRPHTADGFVAEDNI GMTMTLTGDANDYVGKGLSGGKIIVSVPTEEADGSAENVI
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1 GNVAFYGATA GGN T L L Y GA T S GEVVYINGQVGERFCVRNS GAIAVVVGVGD
 I GNVALVGATS GELFIRGMAGERFAVRNSGATAVVVGVGD I GN TVCLYGATGGYLFANGKAGERFGVRNSGAKAVI EGAGD

 IGNVAALYG TA GKAFFRGVAA ERFCVVNS GAQAVVVEGVGD I GNTVLYGADAGECYFRGVAGERFAVRNS GADAVVVGTGD

 $V G N V A F F G A S G G E A Y Y R G V A G E R F C V V N S G D H T V V V E T G D$

 $V G N V A F Y G A T S G E A Y$ R GQA GERFCVVNSGAKAVVEGVGD VGNTCLYGATGGRLFVNGRAGERFAVRNSLAEAVVEGTGD
 I GNVAFYGATSGQGF』RGKAGERFAVRNSGATVVTEGVGD I GNVALYGATGGEAYFNGMAAERFAVRNSGANAVVEGVGD $V G N T V L F G A T S G E A F F R G V A G E R F A V R D S G A S A V V V E G G D$


 $V G N T V M Y G A T E$ GECYFRGVAGERFAVRNSGADAVVEGTGD $V G N T V L Y G A T E G E V F F A G I G G E R F C V R N S G A T A V V E G V G D$ $V G N T V L Y G A \square S$ GECYFRGVAGERFCVRNSGASAVVEGVGD A G NVCGY G A TS G E MY LS GCVVSERFCVVRNSGA $\quad$ CAVV V G V G D $A G N V I G F G A T G G K D F L R G V V G E R F C V R N S G A T T V V V E G I G D$ $V G N V A L Y G A T S G K A F F N G I V G E R F C V R N S G A \square A V N E G C G A$ II GNVALYGATMGQLYVNGVAGERFAVRNSGAKAVVEGVGD
 $V G N T C L Y G A T A G E A Y F R G V A G E R F A V R L S G A K A V V E G T G D$ $V G N T V M 1 G A D E G E A F F N G V A G E R F C V R N S G A T A V V E G T G D$ I GNVALVGATS GKAFDS GVVAGERFCVVRNSGADAVAEGVGD


 1 GNVALYGATS GKAFDSGVA GERFCVVNSGASAVVVGVGD




 VGNTV LY GATE GESSFFA GVAAGERFAAVRNS GATAAVVEGVGB $V G N T V L Y G A \square T G E C Y F R G V A G E R F A V R N S G A D A V V E G T G D$ A GNTLMYGATS GEVY IN GCVGERFAVRNSGAIAVVEGVGD $A G N V I G F G A T A G H I F G R G V V G E R F C V R N S G V T A V V E G V G D$ VG NV A L Y G A S G G E A Y I N G R A G E R F F C V I $\quad$ G $N$ N $V$ V $A$

 A GNVDAYGATS GEVFLRGQVGERFCVRNS GALAVVVEGVGD
 $I G N V A F Y G A T K G E A Y D R G M A G E R F C V R N S G V E V V V V E G V G D$



 I G N T C L Y G A T G G E V F VV H G RA G E R F A V V R N S GARTVVV E GA G D



 $V G N T V L Y G A D A G E A F F N G V A G E R F A V V R N S G A A D V G B T G D$ I GNVALYGATS GKAF $\quad$ GNGVAGERFCVRNSGATAVVEGVGE

 $V G N T V L Y G G V E G E C Y F N G D A G E R F A V R N S G V A A V V E G V G D$
 $\square G N V A F Y G A T S G E A Y$ N G R A GERFAVVNSGVNVVVVGI GD TGNVCFYGATKGEAYIAGMAGERFCVRNSGVEAVIEGVGD
 VGNTVLYGADE GE CYFRGVAGERFAVRNSGAIAVVEGVGD
 $V G N T V L Y G A D A G E C Y V R G V A G E R F A V R N S G A V A V V E G V G D$


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UniRef90
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UniRef90 U5QFC5 UniRef90－A6L8U7 UniRef90＿UPI00037A68BD UniRef90－A7ICJ2 UniRef90－R6BEP7 UniRef90－F1VV48 UniRef90＿R5L5T9 UniRef90－14AJX2 UniRef90＿W9GQQ1 UniRef90－A4SB63
UniRef90＿R5SE37 UniRef90－C7RPC3 UniRef90－X5MKZ8 UniRet90＿R6MQTO UniRef90 HoR421 UniRef90－NOAY94 UniRef90－D4J2G0
UniRef9O＿R5WEY2 UniRef90－K9UMQ5 UniRef90－14X7F0 UniRef90－UPIO0036FDDD1 UniRef90OUPIOOO305C1A0 UniRef90－L8JTA7 UniRef90－E0XSZO UniRef90－UPIO00382A3D8 UniRef90 UP10004094BE5 UniRef90＿UPI00047A14D1 UniRet90＿A3Z8S2 UniRef90－D5EUD5 UniRef90－UPIOOO4720F87 UniRef90－C4ZLJ9 UniRef90－UPIOOO47DEA9D UniRef90－Q8ELW5 UniRef90－U3QMA8 UniRef90－R7IML7 UniRef90－F4NWZ9 UniRef90－A0A024KGS9 UniRet90＿F8EQ40 UniRef90＿J1JV02 UniRef90－A0A024Q6J9 UniRef90－C7QCB2 UniRet90＿P39812 UniRef90＿D5EKD8
UniRef90－U10W16 UniRef90－R6XPQ0 UniRef90－Q2W4UO UniRef90－C6WCCO
UniRef90 UPIOOO3E UniRef90－W6LVNO UniRef90－UPIOOO2555F80 UniRef90＿UPI0003C7ECEA
$\qquad$
 HCCEYMTGGRTVVLGKTGKNFAAGMSGGLAYVLDIN GKFD HAAEYMTGGRLVVLGAVGRNFAAGMSGGIAYVLNLDGNFE HGCEYMTGGRALILGTTGRNFAAGMSGGIAWVYDPENTFT HCCEYMTGGVIVVLGKTGRNVGAGMTGGIAYFLDEDDRFK HGCEYMTGGRVVVIGKTGKNFAAGMSGGVAYVLDEERDLY


H G
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H GCEY MTGGRVVV L GNVGRNFAAGMS GGVAYVYDPE GILA
$\stackrel{+}{H}$
H G

## H

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$\mathrm{H} G$
$H$ H
H

## H

UniRef90 UPIO00470F1C5 UniRef90 - B6YQV3
UniRef90-F5YDW9 UniRef90-H1Y3N8 UniRef90_K9SRK4 UniRef90-D4L4N9
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UniRef90 G7GK10 UniRef90-L1QLH7 UniRef90-M0LS63 UniRef90-F4KSX3 UniRee90-UPI0003B4AF54 UniRet90_V5UDD6 UniRef90-R6R594
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UniRef90-A6L8U7 UniRef90-UPI00037A68BD UniRef90-A7ICJ2 UniRef90-R6BEP7 UniRef90-F1VV48 UniRef90-R5L-5T9
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UniRefo-

YFCNMEMVELTLVGDKSDS LEELYGLVKKHFFHTQSPFAKR FF LDNKGMVELSGLDNEEDEGFVKDMVRKHVYWTGSAYAKN ENCNTEMVDLDP LSAKDKEQVVTLLRKHVQDTGSTVAKT EYLSKESLKVQRVATQAGEAQLKELI QLTGDRTGSPKAKT TKLNKEMVLFSEVTEKYDVIELKTLI EEHVAATGSQRGKK KRCNMAMVELEPILSEEMVNERAYHITRHAKLTGSARAQH NNCNRGEVDLYEIEDAEDSEVVLGLVGEHQARTGSTVAAE TRVNKEMVHIEHVTTKMDVGELKSMI EEHVANTNSELGKK TRCNLEMVDVEQITDEKDEAFMKHYI ERHVRYTGSRNGAR PKVNMGTVELGKVSDPHEDAELRSLIEEHRHYTGSEDADR EHCNQEMVLLESVSSQEDVEQLRTLLENHQNYTSSENATF QHCNLGMVELERIDGPDDAEELQHLIVEHARLTGSAVADK DNCNQSVVLLESVSSEEELKEVQAMI QKHAEYTGSPLGRK QRCNMEMVEFDEIGDADDKAELKSLI QNHFDFTGSAVAEG SKCNLEMLDLDPLTSK DEEDVKKLLQKHFQLTGSTVAER GNCNKEMVELDPVVENDDVLELQEFISKHYQYTKSPVAKF SRCNTVMVALERTLAKSDEEQLKALI AEHHRWTGSQRAAE ANCNQEMVDLEG LEAEDEVVLRGLLARHVQLTGSRRASF ARVNQEMVDLDELTED DQAFLHEVI DRHRRETESAVADL KLCNTDMVGLEAVESEEDVALLRGMVEAHLRWTSSAVARR KRCNMSMVELDTVLTMSDDALLRRLI ARHAAFSGSKRAAD ERCNPAQVALERVLGQCDETQLKALI ERHVALTGSGRAAA ARCNLAQVELEPLMTRFDADRLKQLI ANHLHYTNSEVARN FMVNPTMI DLDP MDDEEAQURLKQLINNHLAYYNSEVARN GNLNPELVDVEA DDVEDVRFVSDVREHLAETDSPVAKA SRVNKEMVIIEKPNNEDIEFLKDIITEHYTLTNSLKAKT DRANTGMVSLYEDLEDEDEQMLRRLVENHVAYTGSDRGER QRCNQSMVSLERVLPDDEQMHLRGLI EEHHRYTGSARAAY AKCNTAMVALDPVLPHTDEAQLRELIERHFQYTGSTRAKA MKMNKELVSIGGVKDKYDIGAELRDI QQHVDATGSPKGKE PLVNLDNKVVQRVPRGAGEAQLDGLI QAHYRKTDSDLACR YYCNMEMVELSLIEDSTSRKELHELI R
RVNREMVAVEE LSAADAEFLKEIVEKHFAETGSPVAKE KRCNLSMMDVQGDMSRADEERLHQLIAKHLAYTGSARAQA SRCNMAMVALDAVEGQTDEATLKGLIERHFKYTGSTRARN RKVNKSLVSTEELSNKYDVLELKAMI EDHVKYTNSVKGKE QKLNAEMATVEQ LNDEDKKILNDY! RVNGELVDLLP R R PDDETLRHLL SKVNGEIVAMQRVITPAGEAQLKGLISAHADETDSAVARA YYCNMDMI ELTLLEDDADREELRSLI AAHLKYTGSTLASM SRCNMAQVSLEPVEEEFDEVLLKGLIDKHYRFTGSRQAQR RRCNLSMVELEHIMTRFDAERLRQLVENHANHTGSTRARK YFCNMEMVELSLLEDSAARKELRELI ERHWKYTGSKLART DNLNRELVDVEEDEADDVEFLENGGQHRNETESPVAAA KRLNKSMVSLETVTDKYDVLELKETIKEHVKATGSVKGKE LKLNKTLVSSNSVTDKYDVMQLKQMI ADHVEATGSPRGKE AKINPEIVKWQRVQTAAGEKQLKDLVAAHGAKTGSQKAQE AHCNAEMVHLQPLADPAEDEELREMVQKHVHYTSSAKGTR TRVNQEMVDLDPV DGEDAEWLRHVVERHLELTGSPKAAR TLCNMEMVALEELEDD DLKKLRRLIKNHSMYTNSPRAGR KRCNAEALNLDEVKEDHDVKQLKDLIESHYNATLSPLAQR K LCNKGMVSLDP LDAEDQEKLETMI KKHVEYTESEVGKR GRCNLAMVDLEPTMTRFDAERLRQLI QNHAHYTASTRAQR
ERCNLSMVDLEPVMTRFDAERLKHLI SNHLRYTGSTRARA ERCNLSMVDLEPVMTRFDAERLKHLISNHLRYTGSTRARA
 SRCNTTMVTMDKVLSQTDEAQLKRLLADHLRWTGSKRARD
 NRCNTAMVALERVHSLADQQAVKKLIEDHHKWTGSLLRARH QRCNMAQVALEPLLTMGDEQILKGLI ERHVRFASSVRARE ERVNPEMVDLETLTDQDDAEFVRGLVERHHTETGSGTAKS NMVNNSLVQVERVTDANELLEELYASI EKHVEYTDSGHAAR KRCNTSMVALEAVLRQLDELILRNLI EQHFRYTGSERAKA SKCNGEMVDLEAVDGTEEAQWLKTMI SEHHKLTGSHRAKR SRCNLLMVDLEPVMTKHDDERLHQLIANHLHYTGSSRARF PKVNPEMVNLEALTEE DHGIIKEFVEKHFQYTTSNVAFM ARCNMAMVELEPVMTKHDEERLVQMISNHHHYTGSKRAKE DNVNKELVNVESLADEEEDQRLYRTIQQHVNETNSTHAER SRVNSEMVNVEA LDAEDRALLHTLVQEHQEETGSAVAEA RKCNDEMILFESLEDEKEDQQIKAMLERHTAYTNSQKAED QHLNPDMVNVYQLIECGDDEDVKAKI EKHVELTGSKRGQA DRANTGMVTVSNTLEESDRAMLTRLVENHAEYTDSERAAE YFCNMDMVEI NLVEDSTYRKELHELIRQHYLYTGSKLART KRCNLSMVDLEPVMTRDDASRI QALLRNHQHYTGSKRAHD KAVNKEMVELQRPSGDDLRWLREVVERHHQLTGSAVAAS KKHNADWVKIEKVKGETDIKNLMALI QNHAAYTGSQYAEN


250
260

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UniRef90-F7QFP5 UniRef90- Q2PYFo UniRef90_C1E4G5 UniRef90-B2IBG7 UniRef90 E1R1R6 UniRef90-J5TN70
UniRef90 I3BZ88 UniRef90 ${ }^{-}$W4QAK7 UniRef90 ${ }^{-}$IOIHP2 UniRef90_F0SXB5 UniRef90_UPI00047E9109 UniRef90 IOZ40 UniRef90-F0SDP6 UniRef90-W0F12 UniRef90-U5N815 UniRef90_UPI0003B3EE43 UniRef90_M7WY92 UniRef90 W7TD36 UniRef90_Q1AZ61 UniRef90-F5RCE3 UniRef90_UPI00037B66BA UniRef90_G2D916 UniRef90_A1AXR6
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V L D D F E Q L R N F V KVVF K D F K K Al
I L N N WE GY L K H F I K I T P DE Y K K V L Q
I I D N W A E Y K K P K F V
I L E N WS TY L PKFWQLVPPSEANSPEA
I L D NFDEY L PK FK KII I P H DYKRMMAA
I L A N WK D Y L P K F R K V M P V E Y R R A L K
VLKRWHQNSRHFKKVMPKDYRRVLEA
I L A D WS K A K S K F VKVVY R D Y K K V ME
I L D Q WD A Y K A K F R K V M P V E Y R R A $L$ Q
I L DNF TEEYLPKFKKI I P I DYERML

VLRNFHHFLPMFVRIMPLDYKRV
I L E N W W D K S L A A S F V
V L Q N WE K SVK L F K K V MP $\square \mathrm{D}$ Y R R V L E
I L E D WK T Y GRK F T K V $\operatorname{I}$ VP K D Y K R MLL E
L L G D WD NAV Q H F WK V V M P S D Y K V V L L K R R R
L L K N WK E ESAAKF $\quad$ K V FP K E Y K R V L S
I L D D F D N Q L K N F I K V F P A E Y K K I
VLNHFEALLPKFIKVYPRDFKRV
LLADWGNSLRKFVKVFPHEYRRAL

| $L$ | $L$ | $D$ | $N$ | $W$ | $A$ | $A$ | $E$ | $A$ | $R$ | $K$ | $F$ | $I$ | $K$ | $V$ | $F$ | $P$ | $I$ | $E$ | $Y$ | $K$ | $R$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $I$ | $V$ | $L$ | $Q$ | $A$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

L L A D WE LAAVGRFTKVMPKD YKRVLAAR
VLEEWEALLP KFVKVMPHD
I L A D WA NAR G K F V K K V MP T E Y R R A L
I LA D WS LDWRSRFVKVYPNEYRRALK
L D N WE A Y L P K F V K V M P VEYRRALKA
L D N WNDE IMHFI KI MPKDFKRVL
L D DWDNTQKDFVKVMPRDFKRVLLADE
L D D F D L Y I T K F K K V 1 P K D Y K E V L E
L E NWERTLERFVKVMPDAYRDA
MLENWD DQRQFFTK V MPRDYKA VLAK RT
LL D H WD A A LKHFVKVMPHEYQRAL
L L E D WD GA R R K F V K V V F P N E Y K R A L
L L D N F E Y Y


I L D NF SE Y L P K F K K V DP Y D Y N R ML M A
L L D D WSNARSKFVKVEPTEYKRAL

LLADWDEARHRFTLVLPAAYQRVLDVR
I L A D WA NY LDPK F WQLVVPPS EANTPE AT N
I L D D WD L Y ARQF LKVTPVEYK K I L S
L L N D WE RYR GRFVVKIMPHE YRRVL
VLDNWETY L P K FVKVMPVDYRRALE
L L D N WQQHVDEFIQVTPIEYK
I LAD FENTKAAFRKVMPRDYKRVLLADE
V L N H WD DFVQKF VKVIPKDFKRMMD
V YENFSEYLPKFKRIVPFDYKKMMQT
I LD H F S E Y L P K F K K I I P H D Y Q A MLLQ
I L S RWT EYLLPKFWQLVPPSEAETPEAS
L L A NWD $\square$ Y TAK F VRV I P K A Y
LLDEWETQVGHFTKVMPTDYQRVLDA
I L E DWENQQKHF IKVMPKDYK $\mathcal{A} L \mathrm{~L}$ Q
I L E NWEAYLP K F V KV LP E E Y R Q AL


L D N WS N E S V H F $\quad$ K V V F P K E Y K R V L
I L T D WT R RAEMFTKI MPVVYARVLQASR

ML D D WHRY DEDF I QVVP DEYKRVLE
IL D H WA ES RAK F V K V FP NEYKRAL
I L N N W G L WR K K F V K KVFP H E Y R R A L
I L E N W SLLY LP K F V K I MP T E Y R K A L E

L L A D WT TARRKF VKVFPTEYKRAL
V L D NF GEY LP K F KK I M S Y D Y A T M L K
CLL D TWE K VL P L F VKVMMPRDYRAVL
IL E N WE A MRPKFVKVMPVEYRRA
ML Q H WD T Y $\quad$ S QF V K V M P GD F K K A L
IL D H WE E F R S K F V K V M M V E Y R R AL Q
I L T Y WD K Y V S Q F V K I DP KA F
L L A DWGAHVGRFAKI MPVDYKRVL
L L D Q WE D SVKK F V K V I P K N Y K Q ML
1 LA D WP A $\triangle$ A G K F L K I MP Q D Y E R V L Q A
L L A D WETEIIE QFTRVMPDA Y A EV I E
MLD D WN H Y VEDF TQQVVP IE Y K
I L L N WE Y Y M P K F V K V M P V D Y R R A L
LL GD WPRRSAVVFTVVMPRDYQRVLEA
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V L E H WREAVPKF IKI MP LD YRRALQ
I L
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UniRef90-D0KWX8
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UniRef90_U2FT94
UniRef90_B8GPV6
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UniRef90_4EZK2

 K A L Q

 P L A D
A A V K A L D D G T P|V|QHE|L|E\|IFNYNRS GALEDAHPVTLELPVRNVNRT
 Q P A L E G G E HVVA A EF A V R N V N R T
 H GLLANQLD H SII I G L D KLI DNKLI EQA

 | $\square$ |  |
| :--- | :--- |
| $K$ | $C$ | R P A L D N S E P V E V E F P I A N T N R A

 HELLE KALESKTPVVFGETTLKNTDRT H GLL E K A L L D V K G A I EN G E T L L I I D R P I


 H QLE K T L L D Y Q I E D A H P I H G L L H K $\begin{array}{lll}L & N & K \\ \text { I } & \text { Q } \\ \text { S }\end{array}$ D MVEI L
DEGALAEADI DP SIEAKKGGEFSYNISNCDRS
 HEVDEQLDHEI I A DAE EAI E E GQPVSLNYDI SNVDRA NEPWDKGLLAERMVEPAI ENLAGGEFSFALTNCDRS
 H HLE EVLDRDLI AA AL PAI DTGEPVVI EREIISRNRS

 KLERTMDRQLLLEA IRPALENKQVVCGEFDIINTDRA H GLLTHVLDHQLI A A A QPAIMNNEPVVASFNVKNTDRS




## VQR N E

 P FDKGVLADA $\stackrel{R}{\mathrm{R}}$DRPLDEIILQQA E EAVE S
 SA A R T K S G GS F H Y T I T N C D R S A R R R P V K HKV K T N R S N P S F D K GELLA EKMVVADA I K A G T R I IVEL D Y A I R N I N R S
$\qquad$
$\square$ K L E K K R A D N N E L I K K Q S M
 EANPVKGTFKIKNTDRS
 H G I E R S LD Y T T L V P LA A P A L E N GEPDVRAQLDPI R NVNRT
エエ
$\qquad$
H NLLD NVLL
SDA Q A

$S D V K D$ | A S A |  |
| :--- | :--- | :--- |
| A |  |

 H GLD A A L D N T L I
 HGLEKALDHQLI A I SRRALSDGTPVTGSIAIRNVNRT
 HGGENALDNALI EASA DALLEKREAVRDEKPIDNVNRT
 $H K L D Q S L D R E L L E Q A Q L$ A I E K G E TV V Y Q T T I R N TD RV D S LD GEVVLED H GLLE A A A L D A A H D Q ELL I R $\square$ C

$\qquad$ GID ELLD WD L A E E I V R

$\qquad$ GA ED GAPVARLTRDVDNVDRA GALEDAHPVVLDDVIRNVNRT VHPANKPFDK GELAEKDDLPABEGKLGGGESYLVRNVNRS HKIN TTVDMSKLVRMCRPALEEQKHIRARLRIIKNTDRV


 VE P H N A P F D K G E L

P A








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 I GNV AFYGATS GEGYMRGRAGERFCVVNSGMTAVVEGI GE $V G N V V L Y G A T S G E L F D R G Q A G E R F A V R N S G A T A V V E G V G D$ I GNVAFYGADDGEAYINGMAGERFCVRNSGDSAVVEGIGH $V G N T V L Y G A D A G E A Y L N G V A G E R F A V R N S G A I A V V V E G T G D$ AGNTLLYGATSGEVYIAGGAAQRFGVRNSGAVAVVEGIGD VGNVALYGATSGQAFLNGVTGERFCVRNSGADAVVEGVGD
 $T G N V S F Y G A T S G E A Y I N G \square A G E R F A V R N S G A T A V V E G I G D$ AGNTCYGATGGILSVNGRAGERFGVRNSQGKAII EGAGD
 IGNAAFYGATS GKAF $\square R G K A G E R F C V R N S G A L V V V E G T G D$ A GNTVLYGADEGEAYFAGVAGERFAVRNSGAVAVVEGVGD $A G N T L L Y G A T S$ GEAY L R G RVVGERFCVVRNS GA VA A V TVEGVGD
 $V G N T C L Y G A T G G T L Y A A G C A G E R F G V R N S G A H A V V V G A G D$
 I GNVALVGATE GEAY NGKA GERFAVRNS GVTGVVVSVGB $V G N T C L Y G A T G G K L F A S G C A G E R F G V R N S G A F A V V E G A G D$
 $V G N T V L Y G A I E G E C Y F R G V A G E R F A V R N S G A I A V V E G A G D$ $V G N V A L Y G A T S G K A F \square N G V A G E R F C V R N S G A R A V V E G V G D$ $V G N T V L F G A V S$ GECYFNGVA GERFGV$R N S G A V A V V V E G V G D$ 1 G NVAL F GATS GKAFDNGIA GERFCVRNS GATVVVEGVGB $\overline{C G N V} N \mathrm{~L} Y \mathrm{GATNGEAFINGRAGTRFAVRNSGANIVVVGIT}$ I GNVALLYGATS GELYARGKAGERFAVRNS GATAVVVEGVGD
 AGNTVLYGATEGEAYFNGVAGERFAVRNSGASAVVEGVGD
 $1 G N T C L Y G A T G G K L F A A G T A G E R F G V R N S G S H A V V E G A G D$ CGNTVLYGATGGRFYGCGKAGERFAVRNSGAVAVIVGDGD A GNVI GY GATS GEDLLDRGVVGERFCVVRNSGATAVVAGGIGD


1
A
A
 GGNTIAYGATS GQLYLRGGVGERCCVRNSGATVVTEGVGD
 A G N TCLY G A TGGEVVYDSGSDGERFAVRNSGAKAVI E GAGD
 $M G N T C L Y G A T G G R L H A A G T V G E R F A V R N S G A T A V V E G A G D$
 AGNVI GYGATS GEI F L R GRVGERFCVRNSGATAVVEGVGD 1 GN TCLLYGATGGYLFVVSGQAGERFAVRNSLAHAVVVEGVGD $V G N T V L Y G A D S G E A F F N G V G G E R F A V R N S G A D A V V G E C G D$ $A G N V I C Y G A T R G E D F D R G U V G E R F C V R N S G V T A V V E G G V G D$ $1 G N T S F Y G A T S G K A F \| A G Q A G E R F G V R N S G A Q V V I V G M G D$
 I GNTALYGATS GALEASGKAGERFAVRNSGATAVVEGCGA A GNVI GYGATS GE $I F L R G Q V G E R F C V R N S G A T A V V E G L G D$ IGNVALYGATQ GECYVN GLA GERFAVRNSGVKAVVVGVGD I GNTCLYGATGGQLFAAGQAGERFAVRNSGAVAVIVECGD A GNVCLYGATS GELYVNGVAGERFGVRNSGVKAVVEGVGD AGNTLL Y GATS GEAYFRGRVGERFAVRNSGACAVVDSVGD
 I GNVAFYGATSGEAYDNGTAGERFCVRNSGDSAVVVGVGN I $G N V A F Y G A T S G E A F V N G K G G E R F C V R N S G V K T V V E G G I G D$


 I GNVAFYGATS GSAY DRGKA GERFCVRNSGVEAVVEGIGB $L G N V A L Y G A T G G E A Y F R G \square A A E R F C V R N S G A K V V V E G I G D$ I GNTCLYGATGGYLFANGQA GERFAVRNSLAQAVVEGVGD I GNTCLYGAT G GKLFAA GTA GERFGVRNS GAHAVIDEGAGA $V G N V A L Y G A T S G K A F \square N G V A G E R F C V R N S G A V A V C E G T G D$ $V G N V C L Y G A T S G R A Y F R G I A S E R F C V R N S G C T A V V E G V G D$





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 AHCNKDMVALTPLESKEEFTEVRAII ERHTAYTGSTI GQLL DNCNMEMVDLDP LDDKDEEQI DKLLRKHNQLTGSAVAKY SRCNKSGLLL EEMVEDKD DAELKKKLIENHLKYTNSKRAKA K LCNPA QVDLEKDVPYHDAERLK LLVERHKLHTGSARAAE DNYNREMVDVEPLINAQDDQRVKDLI NLHLQYTGSVQAKR LRLNKELVSMGPVTEEGDIEALKGLI QAHAEATGSPKAGR

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 $K N L N K E M V L M E K V D N K A D E E E L D H M I E N H T K A T G S L K G A E$
$A G S N G E M I V E F E S L V D E K E D E F L N E M V Q N H F H Y T N S P K A R F$
 TRVNPELVQVQRVQSKAGEQQLKSLI EAHAERTNSEKAQR SKVNHGMVSTSRDLDRKDETMLRRRLVENHVAYTDSERGAA DKCNHELI ELGRRDSSEEYQSHLREVVI EEFVVAETGSAWGVAE



 ERINREMVLTESLENAQEEAAVKALI ASHVQWTGSPLATS RKCNKEMVDLDP LQAEDEERILLALLKTHLRLDTASKVAEF


 DCCNMQMV RLAERFSESDEEDKDLQQQLLYYYHLEKTGSSTAKK ENVNGDMVEI EE TTEEDRTFLTDDLERHHAETGSAVAER SKANKEMIELTRVETEPYRDFLRGQVERHLADTGSARARE SKVNPGMVELLGLEDDEDRQTVKDLLQEFVNETGSEVAKE QRVNKDMVTLESVVEHKYDVSLLKDLI REHVEATGSPRGKE
 HLVNQEMVDLDPLNED DFVTI REALDKHVAWTNSELGKA DRLNNLMVEAEQVELEEDIETIKRLVENHVQYTGSKRGQE RRYNNELVDIQLI TSEAYGHFLRDRI E EHVELTGSERGRD $R V N P E L V E L G A V E G K F$ AEELQQTVRSHHEETGSEVAAA AHCNTSMVALERVMGQSDEEILRRLI GNHDKYTGSALAEE

 VNGELVEDE EV S A DQVDTLHTULA RHSEDTSSSTAAA
 VNGELVDITPLREA DRARVRDLLERHLKWTESAVAAN SKINSQUVKYQRI KTYEGEKQLKNFI ELGYEIKTKSGKAKY K LCNTAMVDLEKI MLRHDAERI R VLLERHHLHTGSKRARA TNLNDELVEI EQLLTE DVVEFLHRGVEQHATETDSARARE
 DQVNGELVNCHR LTESMRGYARRHVETHVAQTGSSYAAS RMANPGSIVWQRIATDYWHDHLRGLI ERHVEQTGSDFART GRLDNTEVDPHEPSEA DLEVIHELVTRHVEETESPVGQR AKANTEMVTLESSLADVDEAMLTRLVENHLAYTDSDRAAE
 NVNLGMV TLQEP DSSDLEELHDALRDHQRWTASPVAAA
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250
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ML A D WPRRSRKFTKVMPTDYQRVLDA
LLAD WQAARARFSLVLPRAYQRVLDDRE
L L D NWAASRAKFVKV FPTEYKRALS
L L DEGEA GLDRFSLVLPRDYQRVLDVR
ILS DWNRSRRAFVKKVMPTEYYRAMK
ML E E WERYAPQFI KVTPVEYRHYLESRK
LLAD WDNTLSHFI KVMPREYREALK
I L A N WNE Y S S QFVVKV DP VEYRRAL

LV E N WK DESSKFI KVVPKEFKRVLAEKK
I LENWDTEYKKFVKV DP QAYKEM

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L E Q F T K Y L S K F K K I I P N D Y K K ML
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I L D NF DA MSRKFWLVKPKA
I L E NWK ERKQFFWKV DP
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$L L A D F D A T V A R F V V V L P R D Y A A V L Q$
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E
$M Q A$
$P$ D
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NPPFDPG L A EKMAEA ETLDA DMI R D A M ETLDADMIRDAM PLLFERGEKGMQYDLD CNCDRS D TLD A QMI A DA R P L F ELGEK T QL T Y S I RNTHRA HELEKAL D N K LI E L A A $\qquad$
 H P I D HVL D R R L I A A L ADCKEAVQAG口S CFMFS NNTDRA

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 N RPFD QGEL A E RMVADA K GKTGGEFHYTVVNNNRS HE V V

LD H H F DV P L I E R A | $Q$ | $D$ |
| :--- | :--- |
| $E$ | V |
| A | $A$ |

LE Q F P D K GL L A E RMVEPAI EA GE GGSFEFIVGNCDRS


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$N$ \& $A$ <br>
$P$ \& $L$ <br>
$F$ \& $D$ <br>
\hline

 A 

$\square$ \& $A$ <br>
$M$ \& $V$ \& $R$ <br>
\hline
\end{tabular} AVIDARTPMRI TRRII R

$\qquad$


 EKRLDNELIAK IQPIFNGTENVTVKMRI HNEERA HK NQPFDKALLNQKETQAAVEAKSGGSFYFDI RNTDRS

 HE L E R T L D M S KL LR M CRPA I E D Q K P DR AK LAA I T N DN RV H E L D D T L G Q R L V ELLA A $\quad$ P A L T S G D P I K L E T T L D S TQQL $\quad$ P G F K P Y M D S K I S H T I N V N L S S S T D R S
 ED SLLDAQUI KDA SAVFSRGEKMQLTYSVRNTHRA


 $N V P G D Q A L L A E E M L Q A V I E A K K G G E F S F K V T N C D R S$ EDNPSFD Q GUL N K N I I KK Q AV K N S Q S K K L Y F DI Q N T D R S HLEKTVVEATLLDKFKDAMDKCEHHEEKVVKVSSTNRT NEPFDKGDLAE QMVRPADTAKTGGEFQYAVKNDHRS
 E E S L N D R M MA DAAKALA A D GPVRL H Y QI N NCDRS
 NEPYDK GE LA EA DlVK T IV VNKTGGEFSYQVRNVNRS HELDKALDNELI AQA QPAL EH GERVQDAMDI RNVNRT

 N K P L A A MMRDA $\qquad$ | $A$ |  |
| :--- | :--- |
|  | $F$ | GLDDK T LD K K V L A K K A L K E A S L E A K A P L N L Y Y D V K N T D R S H DLLD K H F D V

 HELLEKHFDVALI EQA QPAI RHGRHVRLERKVRNNTVRTM LE A D LA EAI A NKA G GDYSYKI RNTDRS A A V K D T V E EK E G G E F E F N $V$ V $\operatorname{T} N \mathrm{~N}$ C D R S
 L S D Al EANRSASIYRSVRNTDRS

NAPFDKGLTAER D T L D Q Q I W P E I E Q
EFEKRLDNKMIAQAM E TLD A QMI K DA E P F F K S G E K M QLL Q Y N I R N TH R A PFDQAKLAHKECQNADDHDKAFTQSYKI ENTDRS NPAFDKGKLNQMLIQQAVDQQQPQQLQFTISNDDRS D S LDA Q I E D A KPFFDVGEKMQLLINVVRNTHRA


UniRef90_V4XH49 UniRef90-M2U1K2 UniRef90_R4W9U4 UniRef90_X5KY19
UniRef90_UPI00037978BF UniRef90-A3WHB2 UniRef90_UPI00029A7AC8 UniRef90_V2QA65 UniRef90_Q12KF7 UniRef90_S5NZT3 UniRef90_UPIO004630A25 UniRef90_UPI000475637E UniRef90_V4GV66 UniRef90_UPI00029AD6AF UniRef90_S6BPP9 UniRef90-UPI000311DE33 UniRef90_UPI0003F4DE1A UniRef90_E8MI50 UniRef90_B0U8G8 UniRef90_A8H1A3
UniRef90-E7C1Q6 UniRef90_L8J787 UniRef90_J4KRK4 UniRef90-R6G281
UniRef90-W7DWH5 UniRef90_E8RDK2 UniRef90_A4BPL7 UniRef90-A0A011SJ08 UniRef90_UPIO0047B60E5 UniRef90_UPI0002246393 UniRef90_UPI000381396F UniRef90_L2F8T0 UniRef90_UPIO0045E5B2B UniRef90_C5BV81 UniRef90-R2PT99 UniRef90_A0A017T2D6 UniRef90_UPI0002659C3D UniRef90_A4X9M7 UniRef90_UPIO0037C0D73 UniRef90_G4KUB5 UniRef90_I3C808 UniRef90-W7TEE5 UniRef90-B2GGV7 UniRef90_A6D3M0 UniRef90_S5KRM9 UniRef90_N1V6Z5 UniRef90_A3SKG2 UniRef90_W1WGW8 UniRef90_D3PYN0 UniRef90_UPI0003B36694 UniRef90_E6RLH0 UniRef90_A0A024PLX3 UniRef90_UPI0003B5410E UniRef90_A0A024TFY6 UniRef90-R8AMS8 UniRef90_B4SRP9 UniRef90_E1V8I1 UniRef90_R4YUE5 UniRef90_D3V5P1 UniRef90_W6LRK7 UniRef90-R2S2E0 UniRef90_UPIO003104CBC UniRef90_A9WIY7 UniRef90_Q0BUA0 UniRef90_UPIO00262CF61 UniRef90_F5SYX4 UniRef90_UPI000479D6FD UniRef90_UPI00047EF04F
UniRef90_F6EUC4 UniRef90_UPI0002DB2CE1 UniRef90_UPI00047D1CAE UniRef90_UPI00047B937B UniRef90_W0JXA7 UniRef90_A6WC86 UniRef90_UPIO00255CD3F UniRef90-A0A021WBU1 UniRef90_F2JYU3 UniRef90-UPI00039569B9 UniRef90_UPI0002888C99 UniRef90-A0A031MHR4 UniRef90_W9DXE8 UniRef90_UPIO003596ACC UniRef90_UPI000174615D UniRef90_K5Z148 UniRef90_UPI00036CB589 UniRef90-UPI0004636D8D UniRef90_UPI00036B4F1E UniRef90_UPI0004677D03 UniRef90_R5IHC1
UniRef90_B6GAW6 V G T R L S H H I V K R F G M G G L P G HVVHVRRLR G S A G Q S L G A F A V Q


 $V$ G T M L VGTELSHNVAKKYGLKGLNDTINVNFRGCAGQSFGAFLSH
 $1 G A R I S G E I A K R H G N Q G M A D N I T L K L T G V A G Q S L G V W N A G$ I GARLSGEIARHHGNSGMSDNITLKKLSGTGGQSFGVWNAG $V$ GA TLLSNRVSKTHGGDGLPDTVTLDF E GTVVGQSF GAF LA P
 I GARIS GEI ARRHGNQGMKDPVTFRFRGTAGQSFGVWNAG I GTKTSSRIVVRQFGMTGLQGHLTVRLRGSAGQSLGAFAVQ $V G T R M S A M I T R K F G M T G L Q Q G H V V R M R G N A G Q S L G A W A V Q$ $V G T M V G Y E I T R R Y G E E G L P D D D I D M T L H G S$ G G Q S S I G A F I P P R AGAMLS GLLVAKAHGHEGLPDDI TVVRLGTA GQSFGAWLAA VGASLS GY AT H A GRD GAK API TLK FNGSAGQSF GVVNAP FGT TI SNEVAKSWGAA GLNDTLRFNLSGSAGQSFGAWAT K IG A RLS GEI A LDRYGNQGMANPINLYLTGTA GQSFGDWNA G VGANIS GY A EKYGEMGLKKDI E K K FKGSAGQSF GCWNA N

 I G A R L S G E I A LLH H G S L L M M A E P I I L K L T G TA G Q S F GVVWNA G V G T M L G N R V T L A H GE H G LP G T I EI N L T G S A G Q S F GA A LP S 1 GARVVSGIA KRYGNDGMIAPVVVHLTGTAGQSLGVWNAG FGSTLSYHI SKKYGEEGLPENINI KLKGSAGQSFCAFMTK






 TGA

 FASTLSYHI ACKYGEAGLPKTMDIFLEGSAGQSFCAFLPH



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





 $V G A L A S G T I A K R Y G E A G L E D P V T A R F R G V A G Q S F G V W N A R$ $V$ GARLS GEI A K RYGNQGMSAPI K LDS LT GTVGQS WGVVNA G
 1 G A R L S G E I A R R H G D L GMTAPV K L R L T GTA G Q S F GVVWNA G
 V GARLS GTI GQLY GDK GLPD TIITITFHGHAGQSFGAFNAP


 IG A R L S G EIA K RYGNA GVA GP I CL N L N G TA G Q S L G VVWNA G
 V GTLL GHELTRKWGEEGLPGTIDVTLTGSAGQSLGAFLPR V G T M L G H E I T T K A L L G K T L D D P D T V E V D D L R G E A G Q S L G A F L P H

 I G A RVV GE I A RVVH GNQGMSAP I TFRRS GTA GQS F GVVWNA G VGTRI SHHLYKKYGEK LDENFLVLNFKGSA GQSFGAFSSK






UniRef90 V4XH49 UniRef90_M2U1K2
UniRet90_R4W9U4 UniRef90-X5KY19 UniRef90 UPI00037978BF UniRef90-AзWHB2 UniRef90-UPI00029A7AC8 UniRef90-V2QA65 UniRef90-Q12KF7 UniRef90-S5NZT3 UniRef90-UPIOO04630A25 UniRef90-UPIO00475637E UniRef90-V4GV66 UniRef90-UPI00029AD6AF UniRef90 S6BPP9 UniRef90 UPIO00311DE33 UniRef90-UPIo003F4DE1A UniRef90-E8M150
UniRef90-B0U8G8 UniRef90-A8H1A3 UniRef90-E7C1Q6
UniRef90-L8J787
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UniRef90 L2F8T0 UniRef90-UPIo0045E5B2B UniRef90-C5BV81 UniRef90-R2PT99 UniRef90-A0A017T2D6 UniRef90-UPIO002659C3D UniRet90_A4X9M7 UniRef90-UPIO0037C0D73 UniRef90-G4KUB5 UniRef90-13C808
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UniRefgo-UPIOOO47EF04F UniRet90-UPIOO047EF04F
UniRet90- F6EUC4 UniRef90-UP10002DB2CE1 UniRef90-UP100047DDCAE UniRef90-UP100047B937B UniRef90_WOJXA7
UniRef90-A6WC86
UniRef90-UP1000255CD3F UniRef90-A0A021 WBU1 UniRef90-F2JYU3 UniRef90-UPIIOOO39569B9 UniRef90-UP10002888C99 UniRef90-A0A031MHR4 UniRef90_W9DXE8 UniRef90-UPIO003596ACC UniRef90-UP10000174615D UniRef90-K5Z148 UniRef90 UPIO0036CB559 UniRef90_UPIOOO463688D
UniRef90 UPIOOO36B4F1E UniRef90-UPIO004677D03 UniRef90_-_5IHC1
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G|V|TMR|LTGAANDYV|GKG|LSGGK|LVV|RTPENAAYEADENVL GVTLEVLGDANDYVGKGLSGAEIIVRPLVSSTLKTNENVI
 GLTMILE GDANDYFGKGLSGAKLA GLK LIELEGDANDYFGKGLCGAQLIVYPDRTATFQPEENSI









 GMTVLS L E G D A N D Y V G K G L S G G K L I I Y P P P A D S S F V P N E E N
GLNLYLTGDANDYVGKGMTGGKVVIXPPVGSAFKSNEA


 GLHI RLE GDANDYVGKGMAGGQVAIFPPKGSPFKTQETAI $G V H V T L E G D A N D Y V G K G L C G G E I V I \quad Y P P K E S E F N S E A N V I$

 GVTVTLE GDANDYVGKGLS
 GLLTLAL E GDCND GF GK G L S G G K L F L Y P P K S S V F KP G E N I I GLTLKVNGNTNDYFGKGLSGAKLIVKVPEKATFKPEENVI
 $G V N V T L K G D A N D Y V G K G L C G G N I V I T P P D T V P F E S H L N V I$

 GLKLEVSGDANDYVGKGLSGGTIVVRPAMMSPLEASENT

## 






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





 GI T L R L F G D A N D YV GK GL S G GTVVVRPDRSSGGSRERDIV





 GL K L E V VG DAN D Y V G K GLLS G GTVVV RT GPSSKLK TN EN T GLTLNLTGESNDYVGKSASGGTIII KPPKNALFDPHMSP




## UniRef90 V4XH49 UniRef90_M2U1K2 UniRef90-R4W9U4

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UniRef90_J4KRK4 UniRef90-R6G281 UniRef90-W7DWH5 UniRef90_A4BPL7 UniRef90_A0A011SJ08 UniRef90_UPI00047B60E5 UniRef90_UPIO002246393 UniRef90_UPIO00381396F UniRef90_L2F8T0 UniRef90_UPIO0045E5B2B UniRef90_C5BV81 UniRef90_R2PT99 UniRef90_A0A017T2D6 UniRef90_UPIO002659C3D UniRef90_A4X9M7 UniRef90_UPI00037C0D73 UniRef90_G4KUB5 UniRef90_I3C808 UniRef90_W7TEE5 UniRef90-B2GGV7 UniRet90_T1PDG1 UniRef90_A6D3MO
UniRef90_S5KRM9 UniRef90_N1V6Z5 UniRef90_A3SKG2 UniRef90-W1WGW8 UniRef90_D3PYN0 UniRef90_UPI0003B36694 UniRef90_E6RLH0 UniRef90_A0A024PLX3 UniRef90_UPI0003B5410E UniRef90_A0A024TFY6 UniRef90_R8AMS8 UniRef90_B4SRP9 UniRef90_E1V8l1 UniRef90_R4YUE5 UniRef90-D3V5P1 UniRef90_W3ARI0
UniRef90_W6LRK7 UniRef90_R2S2E0 UniRef90_UPIO003104CBC UniRef90_A9WIY7 UniRef90_Q0BUA0 UniRef90_UPI000262CF61 UniRef90_F5SYX4 UniRef90_UPIO00479D6FD UniRef90_UPI00047EF04F
UniRef90 F6EUC4 UniRef90_UPI0002DB2CE1 UniRef90_UPI00047D1CAE UniRef90_UPI00047B937B UniRef90_W0JXA7
UniRef90_A6WC86
UniRef90_UPI000255CD3F UniRef90_A0A021 WBU1 UniRef90_F2JYU3 UniRef90_UPI00039569B9 UniRef90-UPIO002888C99 UniRef90_A0A031MHR4 UniRef90_W9DXE8 UniRef90_UPIO003596ACC UniRef90_UPI000174615D UniRef90_K5Z148 UniRef90_UPI00036CB589 UniRef90_UPIO004636D8D UniRef90-UPI00036B4F1E UniRef90-UPIO004677D03 UniRef90_R5IHC1
UniRef90_B6GAW6
 I GNTVLYGATSGTLYAAGRAGERFAVRNSGATVVVEGCGA II GNVALYGATQGEAYVNGVAGERFAVRNSGVRAVVEGVGD I GNVALYGATSGKAFI NGMAGERFCVRNSGATAVVEGVGD $V G N V S F Y G A T S G E A F I R G M A G E R F C V R N S G A K V V V E G V G D$ I GNTVLYGADAGEAYFNGVAGERFAVRNSGAVAVVEGAGD


 AGNVCCLYGATCGKAFFRGDAAERFCVVNSGVVTVVEGVGBD $M G N T C L Y G A T G G K V F A A G Q A G E R C G V R N S G A H V V V E G A G D$ MGNTCLYGATGGKLFASGRAGERFAVRNSGCHAVIEGAGD $V G N V A L Y G A T S G E A Y V N G V A G E R F A V R N S G V K A V V E G V G D$ $V G N V A C F G A T G G E A F F N G R A G E R F C V R N S G A Q V V V E G I G D$ $V G N T C L Y G A T G G K L F A A G T A G E R F A V R N S G A H T V V E G T G D$ $V G N T C L Y G A T A G E L Y A A G Q A G E R F A V R N S G A T T V V E G V G A$ | $V G N T V L Y G A T A G K L F A A G Q A G E R F A V R N S G A T V V V$ |
| :--- |
| $A G N V T G F G A T S G Q M F V A G R A G E R F G V R N G G A T F V V E G V G D$ |

 LGNTCLYGASGGKLFASGKAGERFAVRNSGALAVVEGLGD L GNVALYGATDGEAYFRGDAAERFCVRNSGAKVVVEGUGD $V G N T C L Y G A T G G K F F A A G T S G E R F A V R N S G T I A V V E G A G D$ VGNTCLYGATGGEПFVSGSAGERFGVRNSGAKAVIEGAGD $V G N V S L Y G A T S G E A Y L N G 1 A G E R F A V R N S G A E S V V E G C G A$ 1 G N TVVLY GATS G R L Y A A GIA G E R F A V V R N S GA VGNTCLYGATGGTLYAAGLAGERFAVRNSGASAVVEGVGD AGNVIGYGATQGTLFLRGVVGERFLVRNSGATAVVEGVGD 1G N TCLLYGATGGKLLAAAGTAGERFAVRNSGSFAVI E GAGD $V G N V C L Y G A T S G R A Y F R G \square A A E R F S V R N S G A V V V V E G V G D$ I GNTCLYGATGGKLFAAGTAGERFAVRNSGSLAVVEGAGD 1 GNTCLYGATGGRLFASGTAGERFAVRNSGCHAVIEGVGD $A G N V V G Y G A T S G E I Y L R G V V G E R F A V R N S G A T L V V E G V G D$
 VGNTVLYGATSGRAFFNGRAGERFGVRNSGALAVVEGVGD AGNVCLYGATRGKAFFRGGAAERFAVRNSGATAVIEFVGD AGNTLLYGATAGEVFDRGRVGERFAVRNSGAAAVVEGVGD 1 GNTCLYGATGGTLYAAGRAGERDGVRNSGASVVVEGAGD VGNVALYGATAGRAFINGMAGERFCVRNSGAVAVVEGVGD IGNVAMYGAVTGEAYINGDAGERFLVRNSGAKAVVEGIGD AGNTCLYGATGGTLYALGRAGERFAVRNSGAVAVVEGAGD AGNVIGYGATSGEMFFNGVVGERFLVRNSGATAVVEGIGD VGNVCLYGATEGRAYFRGIAAERFCVRNSGVTAVVEGVGD I GNTCLYGATGGKDFAAGTAGERFGVRNSGTDAVI EGAGD VGNVTLYGATGGYAYMHGKAGARFAVRNSGATAVVEGDGD

 1 GNVAFYGATSGTSYDNGVAGERFAVRNSGDTAVVEGVGD AGNTLLYGATSGELYYCRGRAGERFAVRNSGAVAVVEGVGD 1 GNVALYGATSGKAF 1 RGKAGERFCVRNSGATAIVVGCGD I GNTCLYGATGGKLFAAGCAGERFAVRNSGVQAVVEGVGD I GNVALYGATTGEAYDNGYAGERFAVRNSGANAVVEGIGD LGNTVLYGATSGKLFAAGQAGERFAVRNSGATVVVEGCGA VGNAVLYGATSGKAFFRGKAGERFAVRNSGVHAVVEGVGD 1 GNTCLYGATGGKLFAAGRGGERFAVRNSGAIAVVEGIGD I GNTCLYGATGGELFAAGRAGERFAVRNSGALAVVEGAGD I GNTCLYGATGGKLFASGTAGERFGVRNSGAQAVIEGAGD VGNTCLYGATGGKLLAAGRAGERFAVRNSGAHAVVEGAGD I GNTCLYGATGGKLFAAGNAGERFAVRNSGADTVIEGDGD I GNVALYGATSGKCYVEGVAGERFCVRNSGATAVAEGCGD I GNTCLYGATGGTLYAAGTAGERFAVRNSGALTIVEGVGD | $V G N V A C F G A S R G E A F F R G L A G E R F C V R N S G A K V V V$ | $G$ |
| :--- | :--- |
| $A$ | $G V$ | $A G N V C L Y G A T S G Y A F I N G R A G H R F A V R N S G A N I V V V G I V G N$

$A G N T I L Y G A T G G E L Y A A G R V G E R F A V R N S G A T A V V E G V G D$ 1 GNTCLYGATSGRLFAAGRAGERFAVRNSGASTVVEGCGS I GNTCLYGATGGTLYAAGRAGERFAVRNSGATAVVEGAGD 1 GNTCLYGATGGALYAAGRAGERFAVRNSGATAVVEGVGD A GNVLGFGATTGEMFVAGRAGERFGVRNGGATFVVEGVGD 1 GNVAFYGATAGEAYINGYAGERFAVVNSGADVVVEGVGD I GNTVLYGATSGK LVAA GQA GERFAVVRNSGAQVVVVEGGA I GNCLYGATGGKLFAAGRAGERFAVRNSGTVAVVEGAGD
IGNVALYGATAGTAYVCGVAGERFCVRNSGAVAVSEGCGD AGNVIGYGATSGEMFLRGVVGERFLVRNSGATAVVEGIGD VGNVALYGATDGECYVNGVAGERFAVRNSGANAVVEGVGD A GNVIGYGATSGSLFLRGEVGERFCVRNSGATAVVEGVGD A GNVI GYGATSGE LLRGQVGERFLVRNSGATAVVEGIGD
 $M G N T C L Y G A T G G K L F A A G K A G E R F A V R N S G V H A V V E G A G D$
 LGNTVLYGATGGKLIFAAGVAGERFAVRNSGCHAVVEGTGD $V G N V C L Y G A T A G K A F F R G Q T A E R F C V R N S G A T A I A E G C G D$ LGNTVMYGATSGSLYAAGRAGERFCVRNSGGTAVVEGDGD I GNTCLYGATGGALFAAGLAGERFAVRNSGANAVIEGAGS I GNTCLYGATGGRLFAYGQAGERFAVRNSGAIAISEGAGD VGNTCLYGATGGKLFAAGSAGERFAVRNSGALAVVEGDGD I GNTVLYGATAGKLDAA GQAGERFAVRNSGADVVVEGCGS I GNTCLYGATGGKLFANGTGGERFGVRNSGADAVVEGLGD $V G N V A F M G A T S G R G F V N G L L A G Q R F A V V R N G A T V V V E G V V A$
UniRef90_V4XH49 UniRef90_M2U1K2 UniRef90_R4W9U4 UniRef90_X5KY19 UniRef90_UPI00037978BF UniRef90_A3WHB2 UniRef90_UPI00029A7AC8 UniRef90_V2QA65 UniRef90_Q12KF7 UniRef90_S5NZT3 UniRef90_UPIO004630A25 UniRef90_UPI000475637E UniRef90_V4GV66 UniRef90_UPI00029AD6AF UniRef90 S6BPP9 UniRef90-UPIO00311DE33 UniRef90_UPI0003F4DE1A UniRef90_E8MI50 UniRef90_B0U8G8 UniRef90_A8H1A3 UniRef90-E7C1Q6
UniRef90_L8J787
UniRef90_J4KRK4 UniRef90_R6G281
UniRef90 W7DWH5 UniRef90_E8RDK2 UniRef90_A4BPL7 UniRef90_A0A011SJ08 UniRef90_UPI00047B60E5 UniRef90-UPI0002246393 UniRef90_UPI000381396F UniRef90_L2F8T0 UniRef90_C5BV81
UniRef90_R2PT99 UniRef90_A0A017T2D6 UniRef90_UPIO002659C3D UniRef90-A4X9M7 UniRef90-UP100037COD73 UniRef90-G4KUB5 UniRef90-I3C808 UniRef90 WTTEE5
UniRef90 B2GGV7 UniRef90-T1PDG1 UniRef90-A6D3M0 UniRef90-S5KRM9 UniRef90-N1V6Z5 UniRef90 A3SKG2 UniRef90-W1WGW8
UniRef90-D3PYN0 UniRef90-UPI0003B36694 UniRef90-E6RLHO UniRef90-A0A024PLX3 UniRef90_UPIO003B5410E UniRef90-A0A024TFY6 UniRef90-R8AMS8 UniRef90-B4SRP9 UniRef90-E1V811 UniRef90-RYYUE5 UniRef90-D3V5P1 1 UniRef90-W3ARIO
UniRef90 ${ }^{-}$WELRK UniRef90-R2S2E0 UniRef90-UPIOOO3104CBC UniRet9o-AgWYY UniRef90_QOBUAO
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UniRef90-A6WC86
UniRef90-UP1000255CD3F UniRef90-A0A021 WBU1 UniRef90-F2JYU3 UniRef90-UPIIOOO39569B9 UniRef90 UPI0002888C99 UniRef90-A0A031MHR4 UniRef90-W9DXE8 UniRef90-UPIO003596ACC UniRef90-UP10000174615D UniRef90-K5Z148 UniRef90-UP100036CB589 UniRef90-UPIOOO4636D8D
UniRef90 UPIOOO36B4F1E UniRef90—UPIO004677D03 UniRef90_-_5IHC1
UniRef9O_B6GAW6

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UniRef90_V4XH49 UniRef90-M2U1K2 UniRef90-R4W9U4 UniRef90- X5KY19 UniRef90_UPIO0037978BF UniRef90-A3WHB2 UniRef90-UP100029A7AC8 UniRef90-V2QA65 UniRef90-Q12KF7
UniRef90 S5NZT3 UniRef90_S5NZT3
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UniRef90- W7DWH5 UniRef90-E8RDK2 UniRef90-A4BPL7 UniRef90-A0A011SJ08 UniRef90-UP100047B60E5 UniRef90-UPIOOO2246393
UniRet90_UPIO00381396F UniRef90-L2F8T0 UniRef90-UP100045E5B2B UniRef90-C5BV81 UniRef90-R2PT99 UniRef90-A0A017T2D6 UniRef90-UP10002659C3D UniRef90-A4X9M7 UniRef90-UPIOOO37C0D73 UniRef90-G4KUB5 UniRef90-I3C808 UniRef90 W7TEE5 UniRef90-B2GGV7 UniRef90-A6D3M0 UniRef90_S5KRM9 UniRef90-N1V6Z5 UniRef90-A3SKG2 UniRef90-W1 WGW8 UniRef90-D3PYNO
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UniRef90_B6GAW6



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QKANTGMVITHGGELEESDRRMLRRLVENHREYTDSSRAAD ARVNSESLVWQPVRSAHWEGVLRSTVEDYAARTESTWARS DRLNTGMVELDRDLSERDEAMLRRLVENHAAYTGSDRADE SKVNPEMVALEPDLNAEDSTLLREYIDKHFQYTTSNVADA ALVNHAQVDLLPVTARHDGERLRULVERHQLHTGSAVASE LRCNTNSVDLENTENSDDEKELLSLLNEHTKETDSTVAGK RRVNTELVDTHKLDAPDMQQHLLKLIESHVSETGSEHGKK SKCNKEMVELLPLNDPKDLDYVKDLLDEFESKTGSLITAKN DRYNHELVDURVDGESHRNYLRRVIAEFTEETESEWGQN AKVNREMVSTSGDLSEADERMLERLVENHATHTDSERAAA EECNPEMI ERFKDNETGDDRLLLELI KKHYHYTASEKAKY RRVNHELVEWRLSNESYRSHLHSVLVEYVKETASDWGAH RRLNPETLLWGRLESAHWEGVLRETIARHARETGSRLIAAR KKVNPGAVKLFKSLDAETSKLVYALVKQHAEETGSQFAAA RRVNTEMVDTHKVQSPDQQQHLRGLI EQHVKETNSEHAKM KNCNMSTFDLEKMVIKEDKEELKTLI SNHFKYTKSDVAEK DKCNRSLVGLERITTQPHRKHLKEUIKKHFENTQSKKAKN SKINREMVGLVEGLDEEDKKFVKEKVGNHYRLTKSARGKM DRVNSDSVQWQRVIDSKWEEVLRNHI EQHVKETESRYAAS DRYNHELVETQRVHSGYYRNHLHRVI EEFCRETNSDWGWR DRYNHELIDI HRI LQEPHRHYLRGLI EQFTEETASPWGRE NREALASGELELLMGSGDVEILRDLLQRHVTETDSVLAAA SKCNPEMVELNPLNGKKDLDYVQKLMEDHVRETGSAWGQT GRVNPELVEALSLDDTVHQEHLRGLI DQHLEKTTGSARAQE NKPGLASGELDRPLEQADVAIVERLLADHHTETGSPRAAE RRMNSAALATGELLDADDAERIEALLRRHVEETSSPVGAA GNCNMEMVELFKVDETGDDSALKELLEKHLVFTDSQKAEK ARCHPEASDAlEPLAPGDADAIAAVLREHVARTGSPKAAS TRCNTEMCDLLPLESQEDLSLVKNLIEEFASKTGSNVAKG RRVNTELVDLTP LSEQEQATLYDLVQRHFTETDSAVAKD -
 GRVVN T E L SVV E L L L P L E L L A G DVVA QV K E L L E D F I I E K T
 R VVNRQSLDLLDQQLDSSDREAVAGLLKRHAEETGSDLAEH

 A R V N Q T L V D L D D D L A S D I A E L H K L L R Q H R DE T G S A VA A R K NVNKELVSIEEIISSKS KEKLYEI LHEHYKETSSAVARH

 R K CN Q S M G GLLE A L D E A H WE E DG R GL: A EHAVAT D S R WS R G
 DRYNHELI DI HRVSAENYRQHLHRLI GRHRELTGS DWAQQ DKYNHELVEI HRVNTEAHRRHLREVI E EFVAETGSQRGRD K R V N P E L V V $\operatorname{E}$ V L S L K L N K D M V S L Q EVVTERYD I K E L K D I L K D Y V L E T G S E L G T E
D RYNHE LI DI HRLA TENMRNYLLDLLEDYVAETGSVVGQE



 DKVNPESAARFGPLDETSEPVVRALVERHAQETGSGFAQS S LCN D G M ILEFES L Q D K E EME ELLKRRLVRNHY LIHTGGSLLKA S R
 GRVNQESVVEADSLELVVIHQEHLXRGLI A EHLEETASSHAEA LRMN K D MA S L C E L T E K Y Y D I A E L R D D I L E D Y V A E T G S E Y G A E
 RVNRDMVDVVPLDDEA A ARVHDLLVAHRDHTDSTTAAK NRAND DLMLEEP DEEDRQDI LDDLLRRHLEETGSELAR H D RYN H EL I D L L R I S A D H H R S HL H D L L E T H V A LTTGSVVARR DKYNHELVELQRVLTEEYRSHLRSVVI QEYVNETGSEWGQE A H $\square$ N A E L V E A L S L E A T $\square H Q E H L R G G I A C H F E D T G S D R A K Q$
 KKVNTESVVWQNVGT DYWKEYRSGVGTEYVAETGSAWGAE DRCNKESVVELLPLNNETDLDFVHGLLMEFVEKTGSTLARGB
 K RMNKETLHWQRVNSSHWAGVLKSSVERHVAETESRYAAT DRYNNEFI K LYYRI QS QDYQDMLYKL MQSYFEHTESKTAKS




| UniRef90_V4XH49 | L L D D WETA $\mathrm{L}^{250}$ A F TK\|VIMPDAYAEVI A GRT |
| :---: | :---: |
| UniRef90-M2U1K2 | L L D D WDEKRAHFVQVVPKE |
| UniRef90-R4W9U4 | L L A D WETVVDQFVKVMPEAYSRVLVEND |
| UniRef90-X5KY19 | LL S DFEQAL GYFVKVYPRDYKKAL |
| UniRef90_UPI00037978BF | LI QDWDNKLGQFVKVLPTDFSQALLASR |
| UniRef90-A3WHB2 | L L A D WDKALGAFVKVMP |
| UniRef90-UPI00029A7AC8 | LLA DWPAAADRFSRVTPTAYKAVLAARD |
| UniRef90-V2QA65 | 1 TA D WENYRDMFVKVFPVDYKKALQ |
| UniRef90_Q12KF7 | LS D F N W W C |
| UniRef90-S5NZT3 | LI ENWPAAAEKFVKVFPFEYQRALLK |
| UniRef90_UPI0004630A25 | L L D NFDDYVGKFWLVKM K |
| UniRef90-UPI000475637E |  |
| UniRef90-V4GV66 | L L D D WANAVGDFVRVLPDAYADV |
| UniRef90-UPI00029AD6AF | L L D NWETEQQHFVKVYPKEYRK |
| UniRef90_S6BPP9 | LLENLDDYLRKFWL |
| UniRef90-UPI000311DE33 | LL NDWAVERNAFWHIVPKDYAKLLS |
| UniRef90-UPI0003F4DE1A | 1 L H D WP I ERAKFWQVVPKEMVSRLQ |
| UniRef90-E8M150 | L L EDWNETVKRFTHVVPKQFVAMTKA |
| UniRef90-B0U8G8 | I I D N WD T Y R T K F VKVMPVEYRRAL |
| UniRef90-A8H1A3 | L S D F E WL |
| UniRef90-E7C1Q6 |  |
| UniRef90-L8J787 | LA DFDQWIP K F Y A K P K |
| UniRef90-J4KRK4 | LDDFDKYEPHFWLIVPAASQDLLKAT T |
| UniRef90-R6G281 | 1 NDDFNNNVAKFKKVIP |
| UniRef90-W7DWH5 | LLHEWQNTLQHFWHIVPTEYAKA |
| UniRef90-E8RDK2 | L L D D P D Fi GRFWLVKPK |
| UniRef90_A4BPL7 | L ENFRDYVGKFWLVKPKDLQEVLDT |
| UniRef90-A0A011SJ08 | L L D DLEAEAANFVRVLPRDYAAVLQTR |
| UniRef90_UPI00047B60E5 | 1 I DEFDSYSRKFWL |
| UniRef90-UPI0002246393 | LL Q $\square \mathrm{WPEPT}$ P RFFKVFPYEYQRA $\square \mathrm{K}$ |
| UniRef90-UPI000381396F | L A DFEQWlS K F Y LVKPKA |
| UniRef90-L2F8T0 | L GDFEHYVRKFYL |
| UniRef90-UPI00045E5B2B | LLADLPAVLDRFTRVVPVEYER |
| UniRef90-C5BV81 | LLS DLE GTLARVTRVLPAEYARVRD |
| UniRef90-R2PT99 | L L A WWEEEKQHFVKVYPSEYHEMIRVTE |
| UniRef90-A0A017T2D6 | L L D L W S DLLPRLVKLVPREYRRALEARR |
| UniRef90_UPI0002659C3D | LLAEWPASAKKFLKVEPHEYQRA |
| UniRef90-A4X9M7 | L L K R WS EAVEEFTAVVP |
| UniRef90-UPI00037C0D73 | L I D DFY |
| UniRef90-G4KUB5 |  |
| UniRef90-13C808 | I MEDWGKNSKKFVKVMP |
| UniRef90-W7TEE5 | I LTKNWNAHVGKFHQVVPPAESSVPEVKD |
| UniRef90-B2GGV7 |  |
| UniRef90-T1PDG1 | L D W WDQEQAKFVKVFPLDYQRA |
| UniRef90-A6D3M0 |  |
| UniRef90_S5KRM9 | I L Q WWEAEKANFITVVIPNEYEMML |
| UniRef90-N1V6Z5 |  |
| UniRef90-A3SKG2 | I L Q H WDVEKSKFVQVVPKEMLNKL |
| UniRef90-W1WGW8 | 1 L ENWN NFVNRFTKVVPVAYEEM |
| UniRef90-D3PYN0 | L L S D WPRAAGGFT |
| UniRef90-UPI0003B36694 | I L D HFDDELQHFKKI I P NDYKKMLK |
| UniRef90-E6RLH0 | 1 L ANFEDYLPMFKLVKPKS |
| UniRef90-A0A024PLX3 | VLSHWNGSMQKLVKVIPRDFRHDQE |
| UniRef90-UPI0003B5410E | LL D D WD R TVGAFWQVIPREMLS RLS |
| UniRef90-A0A024TFY6 | 1 L A D WDATKHAFVKLMPHDYKHVMAT T |
| UniRef90-R8AMS8 | L A HWES WADK |
| UniRef90-B4SRP9 |  |
| UniRef90-E1V811 | I LEDFSDFI RHFWLVKPKA |
| UniRef90-R4YUE5 | 1 LEDFDGFI GKFWLVKPKA |
| UniRef90-D3V5P1 | L ESWS QWVNKFALVKPKS |
| UniRef90-W3ARI0 | 1 LENFDRFLPSFKKIVPNDYQKVLAAVN |
| UniRef90-W6LRK7 | L D DFRYYASRFWLVKP |
| UniRef90-R2S2E0 | L L D NWEVAQKEFVKVYPREYHADHDA |
| UniRef90-UPI0003104CBC | $V L E N W E Q M V S R F V R V V P S D$ |
| UniRef90-A9WIY7 | I L A R WD Y Y R T VFLTVRPPRDAVA Q |
| UniRef90-Q0BUA0 | L L H D WDENVGDF WMVVPKDYVKY L |
| UniRef90-UPI000262CF61 | I LSDFESFVSQFWLVKPKA |
| UniRef90-F5SYX4 | L L D A F E Q I K EFWL |
| UniRef90-UPI000479D6FD | LLDDWDNAKTRFTHMVPKQ |
| UniRef90-UPI00047EF04F | L L S T WE T SVA PFVKVIP K D F KEML |
| UniRef90-F6EUC4 | L D D WD R WRRYF WQV CP K E M |
| UniRef90-UPI0002DB2CE1 | LANFDHW\PRFYLI KPKA |
| UniRef90-UPI00047D1CAE | $1 \mathrm{LANFESYIPDFKK।} \mathrm{VPNDYQKML}$ |
| UniRef90-UPI00047B937B | L L T D WA SAQRRFTKVLPRNYATVLDVR |
| UniRef90-W0JXA7 | LLDDWDAA ${ }^{\text {de E F A AV MPEAYRDA }}$ |
| UniRef90-A6WC86 | L L S DWGAA RQRFSTIVPRDYRRVLEVR |
| UniRef90_UPI000255CD3F |  |
| UniRef90-A0A021WBU1 | I L DEMRDYLGKFWLVKPKA |
| UniRef90-F2JYU3 | I L D DFYDFI GKFWLVKPKA |
| UniRef90-UPI00039569B9 | LLDEFDHWVHRFYLVKPKA |
| UniRef90-UPI0002888C99 | ML N NFSHYMERCUKVVPS D Y K VMme |
| UniRef90-A0A031MHR4 | VLEDLDNHTRRFWLVKPK |
| UniRef90-W9DXE8 | I ENFEDEVNNFVQVCPKEMLDK |
| UniRef90-UPI0003596ACC | L D NWNTEQGHFIKVYPHE |
| UniRef90-UPI000174615D | I L D R WD HFRPLFVKVTP |
| UniRef90-K5Z148 |  |
| UniRef90-UPI00036CB589 | L D NFNDY $\mathrm{L}^{\text {R H F W }}$ L |
| UniRef90-UPI0004636D8D | L A NWA HYRTQFVLVKPK |
| UniRef90-UPI00036B4F1E | L L NDWQR\KGDFWQV $\square$ PKEMLARL |
| UniRef90-UPI0004677D03 | VLANFSQMIP NFWLVKSRA |
| UniRef90-R5IHC1 | L EHFNERLADFKKI 1 PY Y Y S HMDQ |
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UniRef90 UPIO001CB9A21 UniRef90_UPIO00161DB5F UniRef90-UPIO00371090E UniRef90-K6ZU20
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UniRef90-S1NNA6
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UniRef90-C8WFS2
UniRet90-R7D581
UniReftoo-D3R586
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UniRef90-WODF31
UniRet90-J5KRU4 UniRef90_UPI00037D3F69 UniRef90-M2YH84
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UniRef90 D1AZUY UniRef90-E2MX32

LEKRDIKAA KDLFDEGHRKNKKN VNA NPPFDNGDLNKQMLQDAVDNKTGGVYRYSVRNTDRS TNGYVDLINQLLLADLASAVKNKSGGIFNYSIRNTDRS HTNGYVLEDQFLSDNEFMNSIKNHGKVIKEПEIKNTDRS
 DTLDAElIRDAE


DSLDAQMLQDA

$\qquad$ ■T A Q A A V ${ }^{\text {R }}$ KALKGKSSMALSYLVRNTNRT ADAREAVLARRGGTFSYPI VNTDRA ETLDAQMTMDA A NVFNKGGEKRQLAYSI RNTHRA HKLAAQLDHVLIEPALA ALARGECYTHRLAITNRDRS HKLSDIIDRELI RRSKI ALLDNCTPVNTKMPIKNTDRA HELEGVLDQQLIRDLMQEKA R R
 K TYDFKLVDEAAEAAVAAKQDFVMKEAVNNEHRA

 HEVSEADDWDLIEEAE PAIESAEPVAISTDVDNTNRA
 DRRLDHKLIDAPENDELSPSESVVYVTESINNSDRT पPQTLDATLFV PYTEQARQHLEDITFHADIANDNRC VEPKNKPWDKGLLAKKIQKAYi DDQVPFNAEYTIKNTDRS A LIN QKML
 QDCLPALQSQSGGITFRYTI, KNTDRS HELDDQHFDVHLIQQQ TLQAVEQQKSQTYYFDIRNTDRS
 VERNDP YDAGGLNKKMAESALERGEKMELTHEVRNTMRA
 EDGPLLDDQLGYATFAPALRQRAPRFARFAVRNRERA

ADNKHAVKHLKGAQFTYNVRNTDRS KDПKPSI $\square K N \square S S E F T Y D I T N R D R S$
$\qquad$ HEVD $\qquad$ KTA FKDAVVDGESLELKYPVRNTDRS HGLDASLDRELI ALAAPALRSGEKATGQVRVRNTDRT HGLADALDVELIAGAE PALERGEPVVLSARVRNVHRT ELAKTKDESGLASKDDRKADDKGGKAAVSVKVSSVDRS HELDKSLDVDLINQAV DALDEGRPVAIQGTVRNVNRS HD DDKADDSKFLNE ELVMPTLEDSKPVVINKEVSNLNRS PTLDENIVKKAGA VWERREKMQLTYTVRNTHRA KLEETLDKRMI IPHFTQN NSQLEVAVNCTNRS HGLERSLDRTLI ETPESTPDDATQSVVTFTGEITNEDRA NLE: KQ FT
$\qquad$
EGRDDNLITAEVY H H VS HGLEGAFEKERLLDE VQRNERRFDERNL

PALDEQLLKDAE HSDEKADEAFLDKAET HHLDVGFDLTKLYE DAKAAAGVETSVVIDSSISNVNRS HSLLDGFDNTLREDAKASUDHGEKFVGSYNVRNTERD HSLEKALDNQVRKDAQRRAAAGEDASVDLSYPITNVNRT HRDDEHFDARIAEAA DSHRARTEVLNHTVTNVDRS

UniRef90 UPIO001CB9A21 UniRef90-UPIO00161DB5F UniRef90_UPI000371090E UniRef90-K6ZU20
UniRet90_-_Z7ZZY3 UniRef90-S1NNA6 UniRef90_UPIO003823F17 UniRef90_S5YY09 UniRef90-C1A0C1 UniRef90-UP100035DA6AA UniRef90 B8KJZ7 UniRef90-C8WFS2 UniRet90-R7D581 UniRef90-D3R5866 UniRef90_H7F7G4 UniRef90_A0A023D707 UniRef90-S3FV61 UniRef90-Q04UK7 UniRef90-UPIOOO4776674 UniRet90_G2SRSO UniRef90-UPIOOO4711766 UniRef90-UPIO0036B60F3 UniRef90_B3LBE1 UniRef90-M7NOB5
UniRef90-A0A016SIl UniRef90-E9C413 UniRef90-Q7VA01 UniRef90-D81HL2 UniRef90-UPI0004661EBF UniRet90_UPIO0039A28D2 UniRef90 C1DXW0
UniRef90 U1MNN3 UniRef90-U1MNN3
UniRef90-A0A016P8F3 UniRef90_UPIO00400627F UniRef90-E6QUQ1 UniRef90-MoCHL1 UniRef90_R5CK05 UniRef90-T2BCY8
UniRef90-D5AL70 UniRef90-UPI0001A642B5 UniRef90-R5FZL5 UniReffo-WODF31 UniRef90-J5KRU4 UniRef90_UPIoo037D3F69 UniRef90_COAZD1 UniRef90_A0A022LYX2 UniRef90OUPIOOO4258729 UniRef90-UPIO00255A64A
UniRef90- V4NMK6 UniRef90 V4NMK6 UniRef90-UPIo00426FB1A UniRef90-E4U8E5 UniRef90_G4QJX3
UniRef90_K6GG03 UniRef90-AOAO59MPC0 UniRef90-DONTI8 UniRef90-F5ZAC2 UniRef90_COQLL1 UniRef90-UPI000478C1F2 UniRe90-C7R418 UniRef90_UPIO0040E589F UniRef90-UPIOOO2490898 UniRef90-K4J127 UniRet90-A6Q8Q6 UniRef90-E8LKB6
UniRef90 EOTCV7 UniRef90-R6ZV86 UniRef90-G7YC94 UniRef90-U1RMS6 UniRef90-M1PAG4 UniRef90_U3ASS1
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UniRef90 D1AZU9 UniRef90-E2MX32 UniRef90_UPI0002192A01 UniRef90-K9AL17 UniRef90-UPIO0028902B1 UniRef90_D3SLI9 UniRef90_A6Q4A1
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FATTLSYYVISKSFEEGLPDK\|N\|IKTGTAGQSFCAFMAK FGVRLSYH:SKQFGETGLSND:R1VNVGHAGQSFGAFLVK VGAIS SLI AKHHGNKGMEDPIKLNFTGTAGQSFGVWNAG VCAKISGE:AGLLYGNNGFNGELNLNFKGYAGQSFGAFLLK VGARMGGWIAERFGNYALPGLLKYEYQGDAGQSFGAFTTQ
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 GVSLYLEGDANDCVGKGLSGGKIVIYPNRNATFPSEENS GLNLILTGDANDYVGKGMAGGKVVVRPPKGVSYKSHESS GMEMTLIGDANDYVGKGMADGKLVIHPPRGVSFKSNESVI GMELKLIGEANDYVAKGLSGGRLIIVPPTDAAYDTNESP GMELTLIGEANDYVAKSMSGGRLIVKPPHDAAYDVENSP G|SLVVVGDANDYVGKGLSGGRIALRPSEDAPFVAEDQVI GLILNDGDANDYVGKGMNGGRIVVKNNNPYASYENNPS GLHMYLEGDSNDYVGKGMAGGKLVIYSPANSRYASQETT GITLNVRGDANDYFGKGLSGGIVSVRPNESATYKFDENDI, GMT RII GDANDYFGKGLSGGKLIVAPGEETPDDPHDSAV GIVTHSVIGDANDYVGKGLSGAGKLAV1DAEKHAPFDEQENALI GVHIETGEANDGVGKGMAGGRIIVRPPADSPFASQDAA GLELKLIGEANDYVGKGLSGGRLIVQAPAKAKKDYSNAP GLKLEVLGDANDYCGKGLSGGTIVVRPMTSSPDTWNENTI GI SLHLTGDANDHVGKGLSGGRIVVATPADAGYPAAGNII GVNFELEGDANDFVGKGLSGGIISVHFPKTSLFDCQKNMI GVTVELEGDANDYVGKCLSGGTVIVYPPKKAAYKSEENSI GMNVRLTGEANDYVGKGINGGALTLDPPDTDNENASNQVI GMTLRLEGDANDGLGKGLSGGKIVVVPPKKAKFKASENDI GMILSLTGQANDYVGKGMAGGMI IIKPPKEFKGESHKNVI GVTLELEGDSNDYVGKGLSGGRLIIYPPRSAVFKSEENIL GLEMRLIGDANDYVGKGMAGGKLVI YPPAGVDYDPHTSAI। GVTMDLVGSANDYVGKGLSGGKLTVRTPDNANYDAAENVV GLTHRLTGDANDGFGKGLSGGKLVVVPAGNSPFRASENII

 GMSLTLLGDANDYVGKGMYGGR|VLKPLDNVEDTQNHVI| GLNLHLTGDCNDYVGKGMSGGKLSI HPPKGVSFQTNASAI


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 GVVTM R L V G D V N D $\operatorname{C}$ GLHMTLIGDANDYVGKGMAGGKLVI HPPLGVTYKSHKAA1 GLKKIELDGEANDYVGKGLS GAEIVVRP GL RI E L T GEANDYV GK GLS GATIVI K PAR GLA
 $G M T D N V S G D A N D Y V G K G L S G G V I$ AVRPQAKS G 1 GVTI KLEGDANDFVGKGLCGGKIVVRPSRSAPADVA
 $G V T M F L T G D A N D Y V G K G L S G G K V V I K S T E V V G V P M D S Q A M$ GMS LTTLIGDANDYVGKGMYGGRIVI KPSD
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GNTCLYGATGGCFFRGVAAERFAVRNSGATAVVEGVGD MGNTCLYGATGGKLFAAGRAGERFAVRNSGATAVVEGTGD 1 GNTCLYGATGGELYAAGLAGERFAVRNSGGFATVEGVGD I GNVALYGATQGEAYVNGVAGERFAVRNSGVKGVVEGVGD VGNVALYGATAGKAYICGI AGERFCVRNSGAVAVAEGCGD AGNACLYGATEGEVYLDGIAGERFCVRNSGAKAVVLGTGV 1 GNTVLYGATDGYLFAAGRAGERFAVRNSGAKVVVEGCGS VGNVCLYGADEGRLFLRGQAAERFCVRNSGATVVVEGVGD VGNVAFYGATEGKGYVNGLAGQRFAVRNSGAELVVEGVGE AGNTCLYGATGGELYDAGSVGERFAVRNSGAKAVIEGAGD IGNTCLYGATGGSLFAAGCAGERFAVRNSGATAVVEGVGD AGNVIGYGATSGE LLRGQVGERFLVRNSGATAVAEGIGD MGNTCLYGATGGKLYASGLAGERFAVRNSGADAVVEGVGD MGNTCLYGATGGELYAAGRAGERFAVRNSGAVAVVEGVGD MGNTCLYGATNGKLFAAGRAGERFGVRNSGCHAVI GGAGD AGNT LYGATSGQLY AGNTLYGGTGGKMFAAGRAGERFAVRNSGVHAVIEGAGD AGNTVLYGATGGALYVAGRVGERFAVRNSGARAVVEGVGE MGNTCLYGATGGKLFAAGRAGERFAVRNSGAVAVIEGMGD AGNTALYGATGGELFDGSVGERFAVRNSGASAVIEGAGD AGNTVLYGATSGELFLHGRVGERFAVRNSGADAVCEGTGD MGNTCLYGATGGKLFAAGRAGERFGVRNSGA!AVVEGIGD VGNTCLYGATGGRLYVAGMAGERFAVRNSGAKAVVEGI GD AGNVIGYGATSGEIFLRGQVGRFCVRNSGATAVVEGVGD VGNACLYGATGGRLFVNGQAGDRFAVRNSGAVAVVEGCGD AGNVALYGATSGEAYUAGMAGERFAVRNSGASAVVEGVGE VGNVACFGATSGEAYFNGRAGERFCVRNSGAKVVVEGVGN CGNVAGFGATSGDMFVAGRAGERFAVRNGGGRFVVEGLGD GGNTCLYGATGGTLYYSGQVGERFAVRNSGATTVVEGTGD 1 GNTCLYGATDGRDFVAGKAGERFAVRNSGAVAVVEGVGS IGNVALYGATSGKAFIQGVAGERFGVRNSGATIVCEGCGD VGNVCLYGATSGRLFLRGQAERFCVRNSGAVVVAEGVGD AGNVIGYGATSGRIYGAGQAGERFAVRNSGATLVAEGAGD VGNTCLYGATSGALYAAGMAGERFGVRNSGATAVI EGCGA IGNTVLFGATSGRLFAAGQAGERFAVRNSGATTVVEGCGA AGNTCLYGATGGKLFVAGEVGERFGVRNSGALAIVEGTGD VGNICFYGATSGKAFISGSAGERFAVRNSGAEICI EAVTG IGNVALYGATSGELYVNGQAGERFAVRNSGATAVVEGLGN AGNTCLYGATGGKLFVAGNVGRFCVRNSGATAVVEGTGD AGNVIGFGATSGEIFVRGTVGERFCVRNSGATAVVEGIGN AGNVLGFGGVTGEMYIRGTVGERFCVRNSGVTAVVEGIGN VGNVCLYGATKGDVY NGRAGERFCIRNSGANVVVEGVGD IGNVAFFGATSGEAYIRGTAGGRFCVRNSGANAVVEGVGE MGNTCLYGATGGELYAAGRAGERFAVRNSGAlAVIEGAGM AGNTCLYGATGGTLFVAGEVGERFAVRNSGALAVVEGTGD DGNTVLYGATSGRLFAAGAGQRFAVRNSGATVVVEGCGA AGNVLGYGATSGELFTRGQVGERFCVRNSGATAVVEGTGN VGNVCFYGATS GTSYVNGRAGERFCVRNSGVNVVVEGVGD AGNVLGFGGVQGEMFIRGTVGERFCVRNSGLTAVVEGVGN VGNTCLYGATGGKLFVAGTAGERFGVRNSGALAVVEGSGD


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 ANCNQEMVELYPVDAQ DTVVKEMI EKHLEYTDSPKACE DKVNREMVDLYAVGETRGDEILKEMI EQHLAYTGSQKAAR EKVNGDMVVLERPSAEDCSQLVEILGEHLDATGSPVAAK DNCNRGLVNLERTTTQSHRKHLKEIIGRHYKYTNSQKAKE DRYNSELVEIHRVSSEYYRTHLGDILAQHVAETGSEWGRE RHANPDNI IWQKLASSHWETVLRSMI ADHAVKTDSPWAHR SRCNQESVELKAPTDA ELEQIRTLIEEHVRYTASPRGDK NPQAASGALQIEPLDEHASAVVRELVERHAAETGSVFAKE KKTNHELVSVRGVVSLREKNRLKDMLDRHAAYTGSESAKQ SRTNPDTLHWNRLAADRYAAELRELVERHAQETGSAYAAE QLVNTELVAVERELTDEDTEQUYSLLEMHQFHTDSVKAGR SLLNKEYVKTV DLENGDYEIIKNLISEHSKLTGSDLSEG DCYNHELVDTLRISPEHYMQHLRGLVMRHVEYTGSAWGRQ ENCNMDMI ELFKLNEKGNDSVLKEILEKHVKFTGSEKAKS TNDNAESVVYQRLQSSYWEEDLKALVQEHYEKTGSPMAER KRVNGSDLCAELVPDETRDHPRLHRLLARHAQFTGSALLARE NQYNPDMVALEQP DCDDLAWL LQKLQEHLRLTGSERARQ HRITNVATVDLDPPSED DLVFI RDRIKKFVELTGSELGQH HRCNREMVLLERVAASSDETELLELI REHVTRTDSAVAKA NRVNTE VVELHSLLTTEQEDVVKPLIKEHYQKTKSFKAQK RRMNKEMVSLEELSEKYDDAELKDILEDYEKETGSELAKE NYVNPASVIWQRVETDYWSKFLLDLI QLHANETQSAYSKK KKINKSYVEVMPLEEE D DDQ EKKLTKHKAYTOSKMAEK RLNGEMVETSGDEDEAEIKWVVRGKI SEFHVEETGSEVGKD NRVNKELVELDIGDKLSEHLRGLI NQHYEETGSEHALQ
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VNTEALASGAI EEPADLDVLQTIMRTHAELTGSAVASR ERYNPTLVGMARLSPGVDDELLRAMLERHLKLTGSPRART NRVNEDLVDIMSVDDKILSEHLRGLINRHYEETGSDHSGA $G R V N T A S V Q L Q P V D D G \quad D L A P L R D L I A R H H A R T G S A V A G E$
$E K C N M G M V$ NRVNQDLIETMPVDGKDLVEHLRGLI NQHYEETGSDHSDG QRTNKELTDLVSLEDQPLQEHLRGVISDHYDETGSHHAER RNLNSELVDAVELEAEDIAVITDLLRRHHAETGSQSAQD
CVNPAAVDLLEGLDEGDAARVVALLEEHVRILTGSVMAST
HCNKQTVYLDPLDAREDKVALKALLSEHLKRTGSPQAAK KNVNKQLVSMESLTFKEDUDELRRMI ERHAAATGSLKAAE KQLNPELVDTFKLETSDDTTVLKDLLQKHYYFTNSFTAKK PQAWNDGSLLALEPDQDQAAMLKELIAEHVRELTGSKAAAG EKLNPELVEALR DDTDFEMFGLKRLLQDYIEKT SYCNEDSKH PGGDF
GRTNP KRILNKEMVTMNEVEKKTHEKACRTLIEQHLLETGSPKARD KKCNRELVDLEMMTDNPYAEWHALMKEHQNIGSQIAKQ RKCNRELVVDLEMMTDNPYASWLLSLLLKEFTHETSSEVGQK SRVNPELVEVLSGDNQPLQEHLRGII DKHFLLETGSQAAGK AHVNADSVVLGPVVGASMDALKALVERHALETGSPKARR DHVNQELI EIKRIDTDELRHYLKKLLKQHINETGSEKAKN VSINKDTIELEAELDHEDAQYVEQMI QEHLEKTGSPRAQE ARINRELVVTGAVSDPEEATRLKTFI ERHVARTNSEQGHA DKLNQELVVAERIDTDDMRHFLKRLLRTHINETVSFKATH ANINTELVDAVP LDDEDISWLEATLSKHRKLTGSKT DRVNPGLVDVETVDDPQELEWLERTVATHRRLTGSTV AHTNRELVNTEQLTGKTEQADVYTLLSRHLDLTGSPKAKK KKI NPHYVTVRRLKED EVAELRGLI EKHHRYTESPWAALL EKINQELIEARRIDDEFDRHYLKKLLQSFYDETGSKKAKF QKINGELVDVVPGLSADDLTWADELI ARHRELLTGSERAQD KKDNLDTLEFETGKDPDELANLRHMLEEHDRYTNSKKAKA DRDNTELVDIEKITDAEELRWVEETLQTHRDLTGSTV ARLNAAGRFHDRGLSGEDTHELEVLLREHLEWTSSPLVAS


|  |  |
| :---: | :---: |
| UniRef90_UPI0001CB9A21 |  |
| UniRef90-UPI000161DB5F | I L N D WNDESENFI KVFP P D Y K R ALLE |
| UniRef90-UPI000371090E | I LSNFNAYLAKFKLVKPKA |
| UniRef90-K6ZU20 | I L S NFAA Y L P K F R L VKPK |
| UniRef90-Q7UZY3 | I I N N WS NFKG DF K I V VPP S EEE |
| UniRef90-S1NNA6 | I L A N WETAVK D F VKVYPKEFHAVNDA |
| UniRef90-UPI0003823F17 | L L D D WD NQVRKFVKVYPTEF |
| UniRef90-S5YY09 | I L Q NWAEEKANFLQVC |
| UniRef90_C1A0C1 | LLDDWVCQSPRFTKVLPVDYRKVVEENE |
| UniRef90_UPI00035DA6AA | LVEDFDRFEPYFWLVL |
| UniRef90_B8KJZ7 | I QENFEDYVGKFWLV |
| UniRef90-C8WFS2 | $V L D E W D L W S Q K F W Q I C P K E M L G R L$ |
| UniRef90_R7D581 | L L Y R F A ALS R HFVKV IP T E Y ERVLQ |
| UniRef90-D3R586 | LLEHWSESAKRFTHLVPKQFVAMTAA |
| UniRef90-H7F7G4 | I L NQFEEELIA H F VYVI P N E Y EVIL |
| UniRef90-A0A023D707 | L L H R WD DVLP K F WhVV P T D Y A L V |
| UniRef90-S3FV61 | I L E S F D D R K R F VKIV PR D Y A NVLDV |
| UniRef90-Q04UK7 | I LKDFETNQNYFVKVVPK |
| UniRef90_UPI0004776674 | 1 L R DFRGLQQYKFWLV K P K A |
| UniRef90-G2SRS0 | LLNNWKKEQENFVKVYPKEY |
| UniRef90-UPI0004711766 |  |
| UniRef90_UPI00036B60F3 | LLA A WP GTAA RF LKL 1 P A A Y A A |
| UniRef90_B3LBE1 | LLQDFDANLHRFTKI I PR D $\quad$ CKRVL |
| UniRef90-M7N0B5 | L V Q W WEMQQ HHF RKL MPYDLKRVLQA |
| UniRef90-A0A016SIK0 | 1 L D NWQTEHAK I I V V F PRDYKRVL |
| UniRef90-E9C4I3 | 1 L S D WES $\square$ R P K FVKVVFPHDYKRVL |
| UniRef90_Q7VA01 | I I NEWA Y YKQKFKILVPPSEKLRL |
| UniRef90-D8IHL2 | I L A NWGQEAANFVKVYPKDFRAI NEA |
| UniRef90-UPI0004661EBF | VLDNFEEY LP HFKRIVPHDYQKVIS A |
| UniRef90-UPI00039A28D2 | I I QQWTS EKS NFYQVCPKEMLD KL K |
| UniRef90_C1DXW0 |  |
| UniRef90_U1MNN3 | 1 L N NWQKEHASFVKI FPKDYKRA |
| UniRef90-A0A016P8 |  |
| UniRef90-UPI000400627F | LLTNFGELLTTRFKLI KPK |
| UniRef90-E6QUQ1 | L L D Q F A DVVGQFWLVK |
| UniRef90-M0CHL1 | LLA D WD DAL D DFTKVMPDAYAEVIA ERE |
| UniRef90_R5CK05 | I L ENFGSAVSDFKKIVPNDYQKMLA A |
| UniRef90-T2BCY8 | I L EKFD K K D F F K V MPRDYEKML E |
| UniRef90-D5AL70 | I L S N WEAERKNF LQQVCPKEM |
| UniRef90_UPI0001A642B5 | I L A D W K S $\quad$ N H FVLVVPPRDYRNALK A S T |
| UniRef90-R5FZL5 |  |
| UniRef90-W0DF31 | ILENFEEFAEKFYKVVP |
| UniRef90-J5KRU4 | I YEEFDRYEPYFWLVSPAAA Q L L LKA T T |
| UniRef90-UPI00037D3F69 | L LTNFLK NLSHFRLVKPK |
| UniRef90-M2YH84 | L L D DLLETT CARLLTKVLPRDYSTVL |
| UniRef90_C0AZD1 | LL S QWE Y WSQHFKLVKPK S |
| UniRef90-A0A022LYX2 |  |
| UniRef90_UPI0004258729 | LLEDFRDVA GRFWLVKAKA |
| UniRef90_UPI000255A64A | 1 L D NFYD F CGKFWLVKPKA |
| UniRef90_V4NMK6 | I L D D WEHSLA A FVEVMPNE |
| UniRef90-S6GEQ2 | L Y E N L E D Y L R Y F WLVKP K A |
| UniRef90_UPI000426FB1A | L LA D GELLASRFTRVLDPRHYAAV |
| UniRef90-E4U8E5 | I L EDWEEHRGDFWKVAP |
| UniRef90-G4QJX3 | L L T NFAEESKNFRLI K P K |
| UniRef90_K6GG03 | I LEEFDRFEPSFWLVSPAALQDLLKAT T |
| UniRef90-A0A059MPC0 | I L A E WP GS AVRFTAVVPEDLIRVRAA |
| UniRef90-D0NTI8 | $V L D N W D A S V H K \square M R V M P S D Y K R V L$ |
| UniRef90_F5ZAC2 | LL T DFAA TLK R F K L I K P K |
| UniRef90_C0QLL1 | I L S GFEDYATMFKLVKPK |
| UniRef90_UPI000478C1F2 |  |
| UniRef90-C7R418 | LLA DVPA SLGRFTKVVPRDFVRMRAA |
| UniRef90_C5L5Y0 | LLA DWANSI KRFTKVEPHEYKRVLK |
| UniRef90_UPI00040E589F | I L E HFEDY 1 GHFKKI DP T D Y K El L |
| UniRef90-UPI0002490898 | I L D N WDEEKD T F $\square$ KV Y P R D Y H K M |
| UniRef90_K4J127 | LLED WPSALARETHLVPRRYLAMKKA |
| UniRef90-A6Q8Q6 | I L D NARECVRKFWLVVPRGARPSLDANK |
| UniRef90-E8LKB6 | I L N D F D HELENFAKVLPQEYLK ALQ S $\square$ N |
| UniRef90-E0TCV7 | L L S NWD QVMPKFRFVLPKSLADKLD |
| UniRef90-R6ZV86 | LLDNFEESLKDFKVI I P Y D Y |
| UniRef90_G7YC94 | I L E D WENALKRRFILVMPRDYRRA L K |
| UniRef90_U1RMS6 | ILASRD L SRFTKLVPEAFARMRAA |
| UniRef90-M1PAG4 | 1 L T GFDD Y V E $\square$ F K L V KP K |
| UniRef90_U3ASS1 | LLENWP TALK RFVEI LP A E |
| UniRef90_B0T667 | L I R D WD R VR D L F WQV CPKEM |
| UniRef90-Q7M948 | I L A Y FRDEVRNFWIVLP K N M K K A P |
| UniRef90-J7S624 | LLS DLLASHI GNFVKVI P T D Y K K A L |
| UniRef90-B1YHK3 | I L A N WD HVLSS F I RVI P S T Y Q AV |
| UniRef90-D1AZU9 | ILEENFRDVLR D F WMVRPK M M T NVP |
| UniRef90-E2MX32 | RFPAA QFIIKIMPRDYARILDVV |
| UniRef90-UPI0002192A01 | DVDLTS LVVKVMPRDYKRVL |
| UniRef90-K9ALI7 | LLA Q F D ALLAVQLVVKVIP T D Y K L M |
| UniRef90-UPI00028902B1 | AL D N WQD TARRMI KII I PRDYEAIL |
| UniRef90-D3SLI9 | IL N NWPEFSQRF YKVI P |
| UniRef90_A6Q4A1 |  |
| UniRef90-A3UF54 | I L NDWETRKL A \R HI VP |
| UniRef90-R9SQC9 |  |
| UniRef90-A0A033UTL7 |  |
| UniRef90_Q4JY81 | EVNA A DLI K V M P R D Y A RVLK T |
| UniRef90-Q1K2F4 | VLD NFREELA Y F WMVVPKDMKA PL |
| UniRef90_UPI0003165E38 | $L L A R L E D V F G R F T K L V P V D Y Q A V L A L D R T$ |
| UniRef90-Q3A4H9 | I CDNFHEELA Y F WMVTPKDMKAPL |
| UniRef90_Q49UY1 |  |

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UniRef90_S2XDP2
UniRef90 A8EVU4 UniRef90_G0HH91 UniRef90-Q5C3P4 UniRef90-M1RTT9 UniRef90 D3QGP0 UniRef90-MOTUA3
UniRef90-D9QPE4
UniRef90- F9L418 UniRef90-UPI000377F234 UniRef90-E8T4G5 UniRef90_F0Y5X4 UniRef90 UPI00039F8162 UniRef90-UPI00047A5C35 UniRef90-W0FN29 UniRef90_C1F4F4 UniRef90 UPI000370F60C UniRef90-A0A012YWY6 UniRef90-T1GHA0 UniRef90 W5Y2U1 UniRef90_A0A018QAK4 UniRef90_E6WIJ1 UniRef90-A9NSR4 UniRef90_I3ZFJ8 UniRef90-15C774 UniRef90-UPI0003B6E261 UniRef90 T1CBW1 UniRef90-UPI000360DA34 UniRef90-D8MXM1 UniRef90_IYFRO UniRef90 E3F589 UniRef90_UPIO0036A2E2D UniRef90_UPI0002F46275 UniRef90 A6GJF6 UniRef90 UPI00035E61B3 UniRef90-W8H4W9 UniRef90-UPIO003828E2A UniRef90 V5XAR0 UniRef90-Q40601 UniRef90_S4XE37 UniRef90 UPI000369356D UniRef90-B1MBE6 UniRef90_V9GD82 UniRef90_G7GRH4 UniRef90-UPI00028A1BD5 UniRef90_UPIO002
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UniRef90 S7TZ13 UniRef90-E3IF20
UniRef90_UPI000287A949 UniRef90-UPI0003742BF9 UniRef90 Q8RBJ8 UniRef90-I3RCK3 UniRef90_D7CNN9 UniRef90 UPI00037966A2 UniRef90 A1ALZO UniRef90_UPI00046E6FDB UniRef90_J9E0A4 UniRef90 F4A053 UniRef90-C8WZQ9 UniRef90-UPIO0047245C9 UniRef90 UPI0003729178 UniRef90_B8DYI5
UniRef90_F6BDL8

1
H HLLDUGFDLLNYLLYKEAKQSUENGETFKGQYT\| NNTQRN PSLDELILQHAA PVFSRGEKMELVFDI QNTERT
 $L E P P I D E K W \| A P A D$ EAIEAGKPYVVHSEIANCDRS
 HGLEHGFDNQLL PAAKSHDEAGTHFVGQFEVNEQRN

 $H H D E Q G F D L S S L Y Y$ DAQ $\square$ AI KEGQHFEGTYVI HNEQRD VREIMAQLGFQTVNEMDGRYCI QKQDHGLDDTPI YNVNRT

 LNEQUV KDVLPHLKKGERVFKEYPI KNTDRS DPTLDADLMDEAA PLFETGKPVRIERRVSTGHRT ERSEIDDAWVSPAVKDGKPFEINATITNENRT HAALDDAWLEPGLAEAYRAGLGLGTDDTRVSNEDRT PLLNRQUVDDDLSEADDNNEDISSKEYEI YNTDRS HNLEHGFDLTNLYE VTKPY IAEGRRYTGSFTVNNEQRD
 D $\square \mathrm{ERMLNHE} \mathrm{\square SAEQKAA} \mathrm{\square}$

EPADDDAWVAPAVA AFEKGEAYSVSGMTANKDRA $G L K K V L D R Q L L K V A V A P A L E Q A T A V K G S F E I K N T D R T$ EEDLNGRIVKDAWEK LEKGNKVSLKYKINNSHRS

A TD D L IFARVKSALEKGQKQVVEFKLNNRNKT LDNGWVDQLKLELVDQGQTDUQFGDTLNNRNKS DVERYLNYELTPEQRRANHPA AVDDLLLDQAAFQRGDRQIVLRPNDPLGNRNKS



 DDERLLNHGTD GAGLHLSDAEVDA DDAFAAQFDARGAVLKPVTLTNQNKS
HGLEHTLDMRSLLDS AAAALENGAAVVGT

D $\square$ S LT QS DVS
LEKRSDNELDAKAQFSGADDN VTVKMRIHNEERA

NPPFDKGLLAEKMVEPA $\square E S L S G G E F E \square D \square C N C D R S$ QEGPVGSTDRA HVLRKP LTNRT $\square$ TEVVMAAYAEGSKRLVFQEGPVDSTDRA HDQPI QQNFAI $\llcorner$ S GERV



A GAEYDDAVDEELHQSREFAVTAEQRV MQDAA GAEYLDASVDQLLSSREFSVTSEQRV DSLTERIIAAQATVEVAAGSETVVQQVDQVTAHDRV VNDA IE DEGEDE IVYRVASAERA RLISDLAMQRFRESSEVVYYDEGVRSMDRA VEGDTAVIDAKGLTHKELNDAVVEKGVSRLKLLNVMGQRY


TKVNQY LREKlLEGE HYKEVNKKi KEGVKKGA NEQDRQAVADGV
 PSSD $\square$ R $\square$ AA GAETQDS $\square$ SF DAPDERTWRVSAETRI KT\NASGПHYRALNEII KELVRSGEDITN INARDLTHKEVNDLIRERGAKK I ILDNVFGQRF E VRLLSAKDLKYRELNRA
$K \square I D D L S E R F A A G S G L V Q F V D E V H S T D R A$ $K V I D A S G M H Y K D L N A M \square K Q L I K G N A E \| L V K N V Q$
 E $\square$ TIDAKGMDYRELNEKI HEALRENPDLEKIVLKNV

## UniRef90 E5CIZ1 UniRef90_UPI000361D2FB UniRef90-E4TWH1 UniRef90_UPI0003B52D0F UniRef90-U6I8Y2 UniRef90-S2XDP2 UniRef90-A8EVU4 UniRef90_G0HH91 UniRef90 ${ }^{\text {Q5C3P4 }}$ UniRef90-M1RTT9 UniRef90-D3QGP0 UniRef90-MOTUA3 UniRef90 D9QPE4 <br> UniRef90-F9L418 UniRef90-UPI000377F234 UniRef90_E8T4G5 UniRef90_FOY5X4 UniRef90-UPIO0039F8162 UniRef90_UPI00047A5C35 UniRef90-W0FN29 UniRef90-C1F4F4 UniRef90_UPIO00370F60C UniRef90-A0A012YWY6 UniRef90-T1GHAO UniRef90_A5YO18QAK4

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VGARDA GEMT DKAESPMPDPDVTDKDTGTAGQSFGAFADE VGAMLSHEVSKЏYGSPGLPDTIQIKFRGSAGQSYGSFLTK VGATLA GLIAKKWGDGLKPRTVEIEFEGVAGQSFGAFLTK

VGGQLT YELTNQHGRRYLDDT IVRTHGSAGQSYAAFNND VGGQLADDVLSKDPAALLDDRVNVSTSGSAGQSFGVFCND I DTLQNGRVVLR R WNADEDSLVVKTYNSAGQSYAAFNNS VGGMLAYELTNQHGRRYLPDSVIIRTHGSAGQSYAAFMND


 V GGQLLADDVAEMMLNHPGPPDSVLITTDGSAGQSYGAFCND





ПGAR\SGEПAK LHGNQGMNAP TTFRFKGTAGQSFGVWNAG
LGTHLAGEI ARRRLGKGWDAKVEDRFDSVAGNGVAAFNVE L GAHLAGEIARRRLGKGFDAEVELRFDSVAGNGLAAFNVE L G S RWS GARVKPYLDGSYMSSLSYDHGSVPGNGLAAYNAE
LGTHLAGEVARRRLGKGFEAQVELRFDAGSGNGLAAFCVE


 LGSFLAGSVTRGRFRGEMKANLDFNGGSIAGNGLGAYNAP
GTYLAGAMARDRGRPGADKQVLLHFRRNAGNGLAAFNNA I GTYLAGDMVRAFGMHGRRADLRLSHSVPGNGLCAFTIQQ I GTRLY LDPDRK I GSRVACHRVRGKLDGSYRQDLKYTKGS ILGNGLGAYNSD


 LGSVVSCHRVRGRLDGSYKKTLHYKNGSIPGNGLGAYNTH 1 GSRYSSHRVRGHLDGSHDSKLQLVDGSVPGNGLAAFNAR $L G T H L V G T L T P R T A R Q A R R V K L H F E A G S U P G N G L G A F N N S$
 $\square \mathrm{D} T \mathrm{R} \mathrm{L}$ A DA LVDEVNGQYYLGAGMKGKLRLVVNGUPGNDLACYLDD MGGKESCYRTRKLYENRVLEPI TLKYTNGSGNGLGAYNSE
 L L T RVSGE SVRAGQGGDVGPIVVAHEGVAGAGFAAYHTT


## LE NVN

I GAGLLTFP GQRY 1 GDGDQGNSKI 11 EGTPG

L G Q R F I

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 GLRLDLEGDANDYVGKGLSGAVI TI RPFGGSHQDGPGDVI GVSIRLEGVANDYIGKGMHGGKIVIK VGSKNQGERFSA GMQLTLEGEANDYVGKGLSGGEITVRPFRLARYASHDNMT GTK TLDGQANDFVGKGLSGGEVVIRPRGLAAKDSGQHVI GVYVMLTGDANDYVAKGLSGGKVTVIVPAGTDKFRSEDH:I GLTLQHTGDANDYVGKGLSGGKIVINAPQQNVARENEII GMTLTLVGDANDYVGKGLSGGT:AIRPDARDGAVGPHOTT GVH RLEGDGNDYVGKGLSGGQI TIVPPQKEGFISENNI G| NLFLKGMANDYVGKGMHGGI: Sil RP GLTLELEGDSNDYVGKGLSGGKVVVYPPRESKFDPKENVV GLKLELTGEGNDYVGKGLSGADIVVKPDE GMTLDLVGDANDFVGKGLSGGRVVVRPHPDAPTQDEPDI: GVLLEVVGEANDYVAKGLGGGIVVLHFPEEFRGNPTENVI GLTLDLTGEANDYVGKGLSGAHI HIRPAYAPPEKGSPALI GMTLTLDGVANDFVGKGLCGGEI ILRGQGRAAVESERHVI

 RMN GMKLELTGEANDFVGKGLSGGEIVI RARGLAKTKSGAHVL

 GMRMEHTGTCNDGVGKTACGGTVVIKSPGGGSKDPGENVL GMQLKHYGTCNDGVGKGQCGGEIVVMSPGGGSQDAEGNVL
GDTMDHTGTCNDGVGKGASGGRIVVRNPGGGADADEGNVL GITMDHTGTCNDGVGKGASGGRIVVRNPGGGADADEGNVL $G M R M E H T G T C N D G V G K S A C G G T L I V E S P G G G T K T P G N N V L$
$G M T R R L E G D A N D T G K G L S G G R V V R P R D A S F A T H E N V I ~$ GTVTRLEGDANDYTGKGLSGGRIVVRPPRDASFATHENVII GMTLTHTGTCNDGVGKSACGGTIAVRSPGGGSDAPGGNVL GMTLVHTGTANDGVAKGANGGSVVVRSPGGGSDLHGGNVL GMTMSHTGTCNDGVGKSQCGGTITVHSPGGGSELPGGNVL GVRDEVEGDSNDYVGKSLSGGCIVVYPEREAGFVAEENVI GVVMDHTGTCNDGVGKSMNGGTVIVRSPGGGSPEAGGNVL GMVLTHTGTCNDGVGKSACGGTVTVRSPGGGSSEPGGNVL GMRMVHTGTCNDGVGKSMSGGTVIVRSPGGGSPAAGGNVL GMRLEHHGTCNDGVGKSMCGGTVVVRSPGGGSPALIGGVL
保
GLNMYLEGDANDYVGKGMTAGKLVIVPPKGSPFKTNESAD GIEVVVEGAQDGIAKNAYGGKVAILKGRN PFGQYVDGS GMKVVVEGGAQDGVAKSAFGGTVAVLKGKN PFGAYVDGS GVKIRVQGGAQDGVGKTSFGGVVSILKSKGAHGHYINGS GLEVFVEGGAQDGVAKNAYGGKVAVLKGRN PYGQYVDGS GIEITVNGGGQDGVGKTSFGGNIQULKSKG KNGHYYNGS
 GIE:TVNGGGQDGVGKTSFGGNI HVLKSKG KNGLMLNGS PVEVQDGGAQDGVGKSALGGRVVILKGRN HQGERVDGS

 GHKIVVYGNAQDGVGNTMDDGEIIVHG GVNGINGGAQDGVGKTSFGGSFKIFKAKGGYGQYLNGS NLF HVNGGAQDGIGKTSFGGGTYITKAKGKKNGDYYNGS GPTI TVNEDAQDGIGNTMSSGEIIIHGNA | $G P E$ | $Y V Y G N V Q D A C G N T M E E G K I V V Y G$ |
| :--- | :--- |
| $G P E$ | EVGGNAQDGVGNTMMAGKIIVRGHA | GPRLRVEGNAQDGVGNTMDEGRIVI NGL GDHVVGGGQDGVGKTAFGGSI FI FKAKGKNGKF YNGS GVDITVFGGAEDGVGKMANGGKIA! LK AQNKHKTFINGS PVD HVDGGAQDGVGKSALGGKIVILKGRN HQGTRVDGS GLTIEVFGNGQDAI GNTMNDGNIIIHGHA

GHRVVVYGNAQDGVGNTMDSGEIIVHG
GSEIRVKGNAQDGVGNTMNSGRVIVEGS
NLFIHVNGGAQDGI GKTAFGGGIYITKTKG KDDKYYNGS RISLHVEGGAQDGVGKSTSGGEIVI LK GENRNGVRVGGS
 GPMIVVKGNTQDAVGNTMNAGKVVI A DTVVSGGAQDGTGKGSFGGKVAVLK GSNLQGSRVDGS GATIVVHGNAQDGVANTMNDGKVVIHGN GPHLRISGNAQDGIGNTMDSGKI AI
GLKKKVYGNSQDGVGNTMNDGEVVIYGSA
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UniRef90_UPI00047D0D55 UniRef90_V6T1Q1 UniRef90_K6DS92 UniRef90_D5WQ84 UniRef90_E8U965 UniRef90_Q3A0C8 UniRef90_F3Z2V7
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UniRef90_C8WZQ9 UniRef90_UPI00047245C9 UniRef90_UPI0003729178 UniRef90_B8DYI5

A G N|V|CFYGASSGKAY\|\|NGAGERFC|I|RNSG|V|DVVV|EG|IGD $\square G N T V L Y G A T S G Q L F A A G G A G Q R F A V R N S G A D V V V E G C G A$
 LG G TVVLYGATD GILCAA GQAGDRFGVRNSGACAVVVGVGN $L G N V A L Y G A T S G K L F A A G R A G E R F A V R N S G A D S V V E G I G D$



 A GNTILYGATGGELYIAGSVGERFAVRNSGAKAVVEGVGH

 I G N T T L Y G A T S G R LIF VA G S A G E R F A V V R N S G A E A V V A GNVIGF GATS G DLY IA GEVVGERFCVRNSGATAVVEGIGN
 $\square G N T C L Y G A T S G R F F A N G Q S G D R F G V R N S G V Q A V I V E G G D$ $\bar{M} G N A C L Y G A T S G R L F A A G A A G P R F A V R N S G A T T V V E G C G A$ $L G N V A L Y G A T S$ GRLLAAA GRAGERFAVANSGADAVVVEGGD
 1 G NCA L Y G A T G G R F Y V $V$ G G Q A G D R F A V



 LGNVA YGATAGKLFVAGQAGERFAVRNSGATAVVAAVGB
 I G NV CDYGGTS GY LVVVK GRA GERFAV R N S GVVFAVI E GAGD I $G N V G L Y G A T A G E V Y V C G M A G E R F A V R N S G A D A V V E A V G D$ I GNFALE GAS GGKTFIVNGEA GDRFAVRNSGAMAVVVAVGD I GNFALLG GATGGRLFVQGQAGDRFAVRNSGATAVVEGVGD $V G N F A L F G A S G G E L F V R G Q A G D R F G V R N S G A V A V V E G V G D$ $V G N F A L F G A T G G R C F I E G Q A G D R F A V R N S G A T A V V E G V G D$ I GNFALVGASGGKAFINGEAGDRFAV$R N S G A M A V V E G G V G D$ AGNVI GYGATS GEMFFS GTVGERFLVVNSGATAVVVEGGD

 I GNFALVGATGGQAFINGEAGDRFAVRNSGAMAVVVGVGD V GNFALFGASGGRLFVAGEAGDRFAVRNSGATAVVEGVGE
 I GNFA L F G A T G G R L I GNFA L L GAS G GRDFVQGQAGDRFAVRNSGATAVVVETGE
 I GNFALIFGATGGRLFVEGEAGDRFAVRNSGATAVVEGLGE $V G N T C L Y G A T G G E L Y V S G R A G E R F A V R N S G A N A V L E G A G D$
 $I L F G A T S G E V F L R G V V G E R F A V R N S G A H V V V E G V G D$ IG NTCLYGATGGKLFPAG
$V$ GK SFA Y GA $\square G G G L L V E G Q A D S R F C D R L S G A \square A A R A Q A K G$

 $V G K S F A Y G A \square G G T L I V E G F A D S R F C D R L S G A D V V L G Q A K G$ $V G K S F A Y G A Q D G I L I V Q G N A D S R A C V R L S G A K V I F G N L K G$ V GK GF GY GA QK GLL I A Q GNADARA GI R L S G A DL I I G N I K G
 $V$ GK GF G Y G A Q K G L L V A Q G N A D A R A G I

 A G DVVAMAMRGGRIMIRDDVGYRTAIMMKEYKIVGGTAQD VGK GA GYGA QK G LF:l Q G NA DARA GI R LIS GA DMI F GN LIK G $V$ GK GA GY G A QR GTTVI $Q$ Q G N A D S R A G

 G DV C GY GMRGGK I Y I E G DV GY RVVGIMMK GYKIVGGKA GN
 $V G K S F G Y G A Q K G L V F V Q G N A D T A R A C V R F S G A D V V F G N L K G$ $V G K S F A Y G A D G G K F F V Q G S A D S R F C V R D L G A D V V L G N A K G$
 V G DV L G Y GMR G GE I F V R D DVV GY RA G I HMK E F EVVI G G S S G A V GK GF GYGAQK GALYVQGNADARAGI RLSGADMII GGRMG $V G K G L A Y G A Q G G S F I I Q G D A D S R A C D R L D G A D V V L G G R D G$
 A GD T I GYAMR G GTIFVVRDDVGYRVGIMMKEYEVVGBKAGD
 A GDVLGGYAMRGGSIFVRSDVGYRCGIHMKAYKVVGGKAGD


## UniRef90 E5CIZ1

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UniRef90 G7GRH4 UniRef90-G7GRH4
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UniRef90-E8N5D8
UniRef90-UPIOOO47DOD55 UniRef90-V6T1Q1 UniRef90-K6DS92
UniRef90-D5WQ84 UniRef90-E8U965 UniReffo-O3AOC8 UniRef90-O29308 UniRef90-E6U214 UniRef90-D6XYF1 UniRef90-C2W3T3 UniRef90-WOJJS7 UniRef90-UPIO003B6FF73 UniRet90-FOS2V5 UniRef90_S7TZ13 UniRef90-E31F20 UniRef90_UPIOOO287A949 UniRet90-Q8RBJ8 UniRef90-13RCK3 UniRef90-D7CNN9 UniRef90-UPIO0037966A2 UniRef90-A1ALZO UniRef90-UPIO0046E6FDB UniRef90-J9E0A4 UniRef90-F4A053 UniRef90-C8WZQ9 UniRef90-UPIO0047245C9 UniRef90-UPIO003729178 UniRef90-B8DY15
UniRef90-F6BDL8

170
180
190
200
H G|LIE Y M T G G HVVVI L|GD|V|GKNF GQGMS GG|V|SY|IFPSD\|EAF NGCEYMTGGTAVILGKVGDNFAAGMTGGEAFVLDDDERLD NACEYMTGGVAVILGKTGDNFGAGMTGGFAFVYDQDHSFV HACEYMTGGTVVVLGGTGLNFGAGMTGGLAWVYDADESFE HGCEYMTGGRVILLGRSGRNFAAGMSGGLAFVYDVDHVLR HGLEYMTGGRVVILGDVGKNFGQGMSGGVSYVFPSDATFK
NPCEYMTGGIVVIVGNTGINFGAGMTGGLAFVYDPEKHFIV NGCEYMTGGRVIVLGPVGENFGAGMSGGLAYLLDTGEDGY HALEYMTGGVVVNIGNFGYNVGAGMTGGIAYFYDKEGVLE HGCEYMT
HACEYMTGGRVAILGPVGWNDAAGMSGGELFVLDEAGRTG
 HGCEYMTGGRVVVLGPVGENFGAGMSGGVAYLAPPQENLG
 HGCEYMTGGEAVILGTVGDNFAAGMTGGRAFVYDPARRLE HGCEYMTGGTAVILGSTGDNFGAGMTGGLAWVFDEDGKFQ
H
|


## $\stackrel{5}{5}$

## H

## F

F
F
F

HVCEYMTGGVVAVLGPVGGNVGAGMSGGRLYDRASEAEAV FLCEYMTNGAVFNI GGFGKGVANGMSGGFLYQYDPSGQLS

 H G
F GAEYMTNGTVLNLGTVGKGLGNGMSGGFLYQYDPEGIVP FAAEYMTGGAILNLGGFGKGVCNGMSGGFFYQYDPNRLLP $F L C E Y M T N G A V L N L G D F G K G V A N G M S G G F L Y Q Y D P H G Q L P$
Y GCE Y M T N GA VF N L G GY GK GLA N GMS G GF L Y Q Y D PACA L E $F G C E Y M T G G A V F N L G G Y G N G L G N G M S G G F L Y Q Y D P G C E L A$
 H G
HGCEYMTGGRVVILGQTGRNFAAGMSGG】AYVYDPDGELP
FAFEYMTRGRAVVLGDPGPWDCSGMTGGRVYLRYWEEAMQ FAFEYMTRGRALVLGDPGPWICSGMTGGRVYLRHWEAAMK FAFEYMTNGRAVVLGDPGPWICAGMTGGTVYVRFDEDALK
 FAFEYMTNGRGLVLGDPGPWDCA GMTGGVVYIRQQPEALQQ
 FAFEYMTNGRALVLGDPGPWI CSGMTGGVVYMGLTEEALG







 F LIGEYMA GGCDIVLNDVGEYCGTGMHGGVIVLRGDVED F G G Y M A G G R V V V FR H RAR Y $\quad$ G T G M H G G R FAFEYMTNGRALVLGDPGPWDCAGMTGGVVYLRHHEQSLR FACEYMTAGRVVVLGDPGPWLCS GMTGGTLYCHLDEAMGM
 FFGEYMA GGULI L L SVVGNYC GTGMHGGVI Y I R GEVDKYR FAFEYMTGGRVVVLGDPGPWDCAGMTGGVVYQC
$F$ L GE Y MA G G I I I L L K $\square$ VG N Y CG T GM H G GVI Y S R $\square P \square D S Y$


UniRef90 E5CIZ1 UniRef90-UPIO00361D2FB UniRefefo-E4TWH1 UniRef90-C1AC96 UniRef90 UPI0003B52DOF UniRef90-U618Y2 UniRef90-S2XDP2 UniRef90-A8EVU4 UniRef90_GOHH91 UniReffo-05C3P4 4 UniRef90-M1RTT9
UniRef90
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UniRef90-D9QPE4
UniRef90-F9L418 UniRef90-UPI000377F234 UniRef90-E8T4G5 UniRef90-FOY5X4 UniRef90-UPIO0039F8162 UniRef90-UPIO0047A5C35 UniRef90-WOFN29 UniRef90 ${ }^{-}$C1F4F4 UniRef90_UPI000370F60C UniRef90-A0A012YWY6 UniRef90-T1GHAO UniRef90 ${ }^{-}$W5Y2U1 UniRef90-A0A018QAK4 UniRef90-E6WIJ1 UniRef90-A9NSR4 UniRef90-13ZFJ8 UniRef90-15C774
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UniRef90-Q40601
UniRef90 S $4 \times E 37$ UniRef90-UPI000369356D UniRef90 B1MBE6 UniRef90-V9GD82 UniRef90-G7GRH4 UniRef90-H6MW30 UniRef90-UPI00028A1BD5 UniRef90-O24DC7 UniRef90-UniRef90-X8FPC5
UniRef90_S6UUH9 UniRef90-D3PSX9 UniRef90 Q5SIA6 UniRef90-U4WMOO UniRef90-D7BFN3
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UniRef90_C2W3T3 UniRef90_WOJJS7 UniRef90-UPIO003B6FF73 UniRef90-FOS2V5 UniRef90_S7TZ13 UniRef90-E31F20 UniRef90-UPIO00287A949 UniRef90_UPIO003742BF9 UniRef90_Q8RBJ8 UniReffol-I3RCK3
UniRef90 D7CNN UniRef90-D7CNN9
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KKANQSTLLAFKRVVHDEEKHLLKIKMLIEEHYRYTESTKAKD IRLNRESVTLLALSGEAEARCKALI EAHVAATGSRHGQA ENVNRESVIDALARSDTEAERARCKALGEAHVAATGSRHGQA SRLNHEMVLLAFPDDAEDNTLLYLLLERLHHLARTESSARARW
 TQNQLDSLLDFDEVVDEEEKEMLKKMI QRHLKYTGSQKAAT RRDNPELVDVEDVTDAEEDDWLDETI SKHRRDTGSTV KKCNMELVDLETMNSQNYSGWLKE ILVEFVKETDSQVGSK KHDNTSYYVVQDDTEE D DE LI RSMLESHVKYTDSPKAKE ATHALETLAFKQVVHQEEQALI RQMLEAHLAYTNSTKARD
 L A LiNGDLAAFAPVTYAA AERLKALVEAHDAATGSPLARR ARVNHGLVDFEE LDAKD\KFLEEIVAKHKKLTGSQD EKINRDYVEVRRDLNRQDIDVLTSLLMKHYKFTKSPTAAR
 KRYHDDLAELCSTLDAAAQQELRRDLI ALLHAEKTGSTRAKW RHDNNAMVEVYDLSEKEYAAELKEMLTGLHAEDTRSPKAGR EKQRFHTSFLHPELDAEAQASIHNLVSLHAEKTGSTRAYR KVNREY IDAVT LSEKDEQKLKTII QDYQKETGSTKADY



 $S G S R Y H A D F L Q A L T D E A A Q A E L K S L L E E H G A K S E S T R A A R$

KLINAEWTFLKNTDEEEEFKVLERLIYGHADQTGSDKPKE ACLNP QMVALEPLQDPRQDEHVRAMIERHQEYTGSARARY DLYDDTSVSIHSLTDDTDEQFI LYMLEQHVEHTDSEKAQA GSAAGDSVLFGCI A DDNEMARVHKMLNWHLEATHSPRAA W KRCSHDSVRATALAEDSEDMQLRYHLEMHLQHTGSKLVKN GAVSRDSVLT GHLDDDDHGDAVRQLLEWHAAATGSARAQR NLYDKS SVELHRLTEDTDTACAHEMLEQHADYANSSKARR

DAASVEAHALAGDEDAELELQTLLE EHFERTGSRTAGA SKVSADAALVAP DIEPFHEVAARTMLEWHRDATGSVKAQA
 AKVSADSVLIAPLAEPFHEVAAKTMLQWHVEATGSTKAAA
DDA S H D S L VTF P LTP D P F H E VT V R T L L E WH TEATGSALAT R
 SKVSHDSVLVLDITDPFHEAAAH LLLQWHVAATGSTKGQA
SRTSSDSVIVGATTAPFHQHAARTLLHMHAEATGSALATR ERISNDSVLVGAI LAPDHHHAAFTLLQMHAEATGSALATR DNCNRGLVNLERITTQSHRKHLKEII ARHYKYTNSEKAKD KNVGKRFLSLEEHSDARD DFKRLVENCYKETQSKEAKH

DNLNTEMVDVET LDDDDSEFVHG\|VQAHVDATDSAVGQR
RRLAKGARVVIQKLDERGTADVRELMSAYLDALRADKAER RRLAKGAKVAVKPLDARGVEDVRELLSAYIEAKREEKAKR RRIAKGAKVFI YKLDAKGI SDVSELVAKYKEELQYEEAGL RRLAKGAKVVI QKLDERGVADVRELMGVYMAALRHDKVER



 $R R L A R A A V D L Y D L D D T D V E A V E R L L G A Y H R E L L Y S H Q A Q E$
$R R L A T G A K V A L R D L G D K G L V D V N L L L G R Y L E S F Q D A E A D S$
$L G K E V G I V D M E E E$ ARIAKGAKVSLENLSDTGGSDVKELLVTYYLEELQDEEVAV
 RRIAKGANVTLRPLSKNGKSDVTELLSSDYGEHEQYEEGA  QRYNLKK I LGPKLKCVVMVF LRTMAKGAQVREESLNDADMEVITCNVAAFAREFD E TVPEL RRIAKGAKVSIEALDEKADADLNELLGDYRQEDQSEAAAA RRLAKASVVQLPLSAQGAADIRDLLGEYHELLLKSEQARR
 TRISPHVQVSAP TENDRAFLWEYFLRYCTYFGFKP



$K$ KGKE VK QT QA E D GDME IIGLYVKKFSDYFGF DY R S LGPN LDHTK


| UniRef90_E5 | I L N Q F E NVITE HJVIKVI PKDYELMMQ |
| :---: | :---: |
| UniRef90-UPIO00361D2FB | I LSDWARYHTLIRRHIVP M T D S P AKD |
| UniRef90-E4TWH1 |  |
| UniRef90-C1AC96 | LL D D WD HQ HV H WRKVKPR |
| UniRef90-UPI0003B52D0F | ML A D WEKTSKAFVQL |
| UniRef90-U618Y2 | IVKKHWDEVKNFVLVFPNDYRRALQ |
| UniRef90-S2XDP2 |  |
| UniRef90-A8EVU4 | ILQNFRAEIRNFWMVKPKNM |
| UniRef90_G0HH91 | NVID PA A LIKVMPRDYR |
| UniRef90-Q5C3P4 | LLA D WDES $\square$ K H F V LVFPRRDYKNAL |
| UniRef90-M1RTT9 | MLENGFEA FKK MP |
| UniRef90-D3QGP0 | VLKQFDQ |
| UniRef90-MOTUA3 | 1 L S NFNNLLCKFVKVFPRDYKGVLQ |
| UniRef90_D9QPE4 | LLSAWPDSVKRFVRIVP |
| UniRef90-F9L418 | 1 L N Q E EVVSQYVVKVIP K D Y K M M |
| UniRef90-UPI000377F234 | D I DVT TVVKVMPRDYRKVL |
| UniRef90-E8T4G5 | VLEN R ALLESURKVV |
| UniRef90_F0Y5X4 | LLEDFDH T QFVQVVPPSEDDQ |
| UniRef90-UPI00039F8162 | LLDDWDEESRNDRFVAPRETEGAKAAR |
| UniRef90-UPI00047A5C35 | L L S EWERFSERF R L T P K |
| UniRef90-W0FN29 | 1 L E S F D A WLP F F RMVIP T EYRRLLERR |
| UniRef90-C1F4F4 | LLA SWDELAPRFVRMTPK |
| UniRef90_UPI000370F60C | L S D WENVK S QFKKY\PVSM |
| UniRef90-A0A012YWY6 | VLK KFDRIEDVVVKVIPKDYQ |
| UniRef90-T1GHAO | Y D N WCDYQSKFIKVEPYEYQKALLK |
| UniRef90_W5Y2 | PTTMVKI LP A P Y R KVLDVI |
| UniRef90_A0A018QAK4 | L L R WS S S S T A ALV |
| UniRef90_E6WIJ1 | LLANWETECHHFVYVMPRS |
| UniRef90-A9N | V L K E WEK Y LP L F WQLVPPSEEDTPEAN |
| UniRef90_13ZFJ8 | FLS D WD THSKKFLRMV |
| UniRef90_15C774 |  |
| UniRef90_UPIO003B6E261 | L L Q ${ }^{\text {d }}$ D MLR VVVPKEFQK |
| UniRef90-T1CBW1 | VLENWARLIGRFVTVMPKDYKRA |
| UniRef90-UPI000360DA34 | L A NWTNERQHFKFAL |
| UniRef90-D8MXM1 | L L EHWETECQHFVFVMPRS |
| UniRef90-I1YFR0 | LL D NWQESRKHFYVL |
| UniRef90-E3F589 | LL S D WA QVRGDFA WVMPKA Y Q A |
| UniRef90_UPI00036A2E2D | LLDNWATERVHFKFAL |
| ef90_UPI0002F46275 |  |
| UniRef90_A6GJF6 | LLA D WEQTRREFVLVAARGAKRA |
| UniRef90_UPI00035E61B3 | LLA D WD HVRNQ\\|RYVMPRA |
| UniRef90-W8H4W9 | LLENWETEQHHFVYGMPRA |
| UniRef90-UPI0003828E2A | L L N NWQQERVHFKFAL |
| UniRef90-V5XAR0 | LLD D WD T T REHVKY M M R A Y Q A L A A K |
| UniRef90_Q40601 |  |
| UniRef90_S4XE37 | LLEDWDTTRRHVVCGMPRAYQDA |
| UniRef90-UPI000369356D | L L Q W Wevequr iv |
| UniRef90-B1MBE6 | LLDDWQSARDHMVYTM |
| UniRef90_V9GD82 |  |
| UniRef90_G7GRH4 | LI Q N WETERHYVSY |
| UniRef90-H6MW30 | LLENWETERHYVSYALLPRALLAHQ |
| UniRef90_UPI00028A1BD5 | LMDDFDKYEPYFWLVLPAASQD |
| UniRef90-Q24DC7 | V LD N WQES V |
| UniRef90-B4HK69 |  |
| UniRef90-X8FPC5 | V L A D WP Q Q Q H F VK VMP R D Y K R VLQ A |
| UniRef90_S6UUH9 |  |
| UniRef90-D3PSX9 | L LRLLADPAAHFRMVLPVNQQVAQEV |
| UniRef90_Q5SIA6 | L EKLLENPAEHFRMVEPVSQQVDQGV |
| UniRef90_U4WM00 | I QKLLEHPEAHFVQI TPKRE |
| UniRef90-D7BFN3 | LERLLLDPGSHFRMVVPANQQVAQEVS |
| UniRef90-E8N5D8 | I L Q D D L L I H F VKI |
| UniRef90-UPI00047D0D55 | L RALLT NVENHFVQVIPVKEQADPSVST |
| UniRef90-V6T1Q1 | LALLLEHPEDHFI QVVPVKEQADPAV |
| UniRef90_K6DS92 | L LSLL A DPENHFVQ1 LPVKEQAD |
| UniRef90-D5WQ84 | V R R L D H S ENHFVM |
| UniRef90-E8U965 | I A ELLVDPAAHFRMVLPAA Q SVDQSVA |
| UniRef90-Q3A0C8 | VEQLKDKCRTRFVRI宜P |
| UniRef90-F3Z2V7 | $V A L L L E Q A E E R F V K V$ |
| UniRef90-O29308 | I L G G G L K K K P V T K R |
| UniRef90-E6U214 | I EKLLADPTAHFKQVVPVKLQADPSVS |
| UniRef90-D6XYF1 | V Q ELLKDPEQHFMQVVPEKQ |
| UniRef90-C2W3T3 | L T PLLD D $\square$ QLHFYEI IPKKEQADPS IS |
| UniRef90-W0JJS7 | 1 KDE F VKI TPKSKR |
| UniRef90-UPI0003B6FF73 | MDENLES I I NRFSKI TPVSHR |
| UniRef90-FOS2V5 | L S EPFVKIVPVSAR |
| UniRef90_S7TZ13 | I LS ERFYKVSPFSHR |
| UniRef90-E3IF20 | L QP LLEKPEDHFFQVIPTKEQADPSTS |
| UniRef90-UPI000287A949 | I D RLL S N L T A NFVRI APVQLQADQSVA |
| UniRef90-UPI0003742BF9 | I AELLVNPAGHFRMVLPASQTVDQSVAT |
| UniRef90-Q8RBJ8 | I MDH S F VKLY Y P |
| UniRef90_I3RCK3 | -E G W K V VAPK K R |
| UniRef90-D7CNN9 | DMWDDLS F VKLI PR |
| UniRef90-UPI00037966A2 | LSPLLT NLL S HFYEVIPTKEQADPSVS |
| UniRef90-A1ALZ0 | LA GVI ARCRSGFVKVVP |
| UniRef90_UPI00046E6FDB |  |
| UniRef90-J9E0A4 | LQRFIDNPALHFLMIEP |
| UniRef90-F4A053 | $\mathrm{L} \mathrm{N} \quad \mathrm{GTFTKLVP}$ |
| UniRef90-C8WZQ9 |  |
| UniRef90_UPI00047245C9 | MD SQFVK\YPYNHR |
| UniRef90-UPI0003729178 | D A ETVMNENFVKI R P F S HR |
| UniRef90-B8DYI5 | DFDF】MEKFVKV $\mathrm{D}^{\text {P P Y K R }}$ |
| UniRef90_F6BDL8 | $K L I] N \mathrm{~N}$ |

FEYRE $\square$ NEK $\square$ HT $\square L$ NEYPN
T $\square$ D A H G $\square$ K H K E $\square$ ND LLETVQRGSTELVINNVQRY QT $\square D A T N \square D Y K A V N K A L R E A E T D Y \square$
$\square R$ S A P R V
E VVIDAKDMHYRE $\square$ NEK $\square$ HE $\square \mathrm{L}$ RENPD $\square$ K K $\square$

HENGVRपESR【LEE
VS S S DRA
$R \square Q N A \square R Q$
$\square N T C P D$
$A$
$A$
 KMANEVIRGYGA EHQNEQI RNTADT
$\square D$ AKNMPAKELCAR $\square R E S T D T A \square A D E H V N G Q R Y$ पDAAS LS PRELNS QVKESAKDYDK\|LIKNPN DMEIRDINRK

 IEA GLLERYEKVNELIK DELVKKN

E $\square R$ S A VRG
$D V L D A S A Y G V L D L A P E V R R L L Q T R G R V D V V N V$


ENGLRVDSRILEER VQAAVRDGHR R DEDS AHGQHG
$P$ VFD $\square A T T E \square R A L N Q A L H D K S G A S E D F E D T N$
$\square D A S G L G Y K D V N K A \ M E N K S G K K E V T V I N D$

ENGHRDESR DLEER DQKAVESGCRY
$V F D L A E M S L R E L N Q A L H D L A P G S N E T A$
HYSPGNK Q
$\square E A Q G \square R A L N E T L Q A Q S Q Q T N E T A W E L$

## $\square E N G Q R V Q S R \square L E E H \square Q R A$ 

$N Q K V R V D E L F D \square S G T D \square A$
$\square$ DAS S VTPRE $\square$ NRK $\square R K Y G K D Y D K \| I I K N$
MEDGKR】ELEERLQGVVRD


$\square E A Q G \square R A L N S T L H E Q A G S S N Q T Q W E V$
ETLHALKGQPTNQTVWE IVNTKGA KT $\square \mathrm{D} \square \mathrm{STATVRELNQALHDQVNSVEEREWVVT}$

GTPDREDNSALHGD DS $M M R V L N L A E \square G K R E V N A R L H D R D$
$\square \mathrm{DATA} \square \mathrm{GY}$ K D L K E $\square \mathrm{L}$ R T GKK
EA NSQVQSEDAT



UniRef90 S2YLH2 UniRef90-M1WNR7 UniRef90-COGDH1 UniRef90-B8DKS2 UniRef90 T2GD12 UniRef90-JON883
UniRef90-ToZJL3 UniRef90 R9J5R8 UniRef90 LORFHO UniRef90-A6UWK6 UniRef90 WOFM86 UniRef9-R4F23 UniRef90-N2ABL4 UniRef90_UPIO0047AF9BE UniRet90-C0EAG6 UniRef90-O58745 UniRef90-E3GWD3 UniRef90_R5QE03 UniRef90-D6SS85 UniRef90-D6E6J UniRef90 FOJH42 UniRef90-D4LA42 UniRef90-R7IG17 UniRef90-Q2FQ43 UniRef90_AbUR72 UniRef90-H2JCN1 UniRef90-UPIO0037E7211 UniRet90-E6MDP5 UniRef90-D8K109 UniRef90-G9RNM7 UniRef90_UPIO0037E079B UniRef90 A5UK46 UniRef90-B3TB80 UniRef90-E1QNA7 UniRef90 C8X2L8 UniRef90-R5XDK6 UniRef90-U6EBF1 UniRef90-R5AB09 UniRef90-D4JW89
UniRef90 F4LO99 UniRef90-UPI00037C5938 UniRef90_FOTA03 UniRef90-B1YDA4 UniRef90-R6MYW1 UniRef90-F2L2A4 UniRef90_E4RPO3
UniRef90 C9RBBO UniRef90-Q2LXW5 UniRef90 UPIO00380D463 UniRef90-K2M2T9 UniRef90-F4B3T2 UniRet90_E1 RE58 UniRef90- J6J088 UniRef90-A0LJO8 UniRef90-X5R595 UniRet90_W9DYE0 UniRef90_A6FR77 UniRef90-UPIO00466F9AO Unireigo lohezs UniRef90 UPIO00463F5D9 UniRef90_UPIO0025580EB UniRef90 A9DGS9 UniRef90_CON5C9 UniRe90_-_8DIN2 UniRef90_D5MJV4 UniRef90 UPIOO035CD846 UniRef90-M7PSR2 UniRef90-UPIOO025593B2 UniRef90 F4FZS UniRef90-KONAY7 UniRet90_K4MC25 UniRef90_A4EYI2 UniRef90-M7P416
UniRef90 J9ZOR5 UniRef90-A0A017HHS6 UniRef90 - 14KK99 UniRef90_V9VXAO UniRef90_UPIO0036EAB6D UniRef90 J9SJo3 UniRef90 19WG14 UniRef90-TOJU86 UniRef90- ${ }^{-} 4$ YН UniRef90-W6RK64 UniRef90-UPIO003754575 UniRef90-X1B1B3 UniRef90_G8TY09
UniRef90_D3L4W6

ПGDAAGYAMRGGKI YVVGNAGYRAGIHMKAYKIIGGCAGS AGDVLGYAMRGGEIFVHGDVGYRVGIHMKAY\|VIGGKAGD GDTVGYAMRGGEVFVRGNVGYRVGI HMKEFREQVGKTGD AGDVLGYAMRDGRILVRGDVGYRVGI HMKAYMVVGGKAGD VGDVLGYAMRGGRIFVKGDAGYRCGIHMKAYMVIGGKAGD CGDATGYGMRGGEIYIKGNVGFRAGI HMKAYMVVGGKAGS VGKSLAYGAQGGRFF QGDCDSRAG\|RLSGAEMVIGNMKG IGDAAGYAMRGGKIFVKGNAGYRAGI HMKAYKVIGGTAGS AGDVLGYAMRGGAIYVHGDVGYRVGI HMKSYMVIGGKAGD GDATGHSMRGGKLFVRDNVGYRSGIHMKEYKVIGGEDKD AGDVTAMSMRGGQIFIRDNVGYRTAIHMKEYRVVGGTAQD VGDAVGYAMRGGRIYVQGNAGYRAGI HMKAYKVI GGKAGS IGDAAGYAMRGGKIYVQGNAGYRAG1 HMKAYKIIGGCAGS ginadaragirlis gadvvignilag GDATGYAMRGGRIYVKGDAGYRAGIHMKAYRVIGGAAGS GDVTAHSMRGGKVFVRGDVGYRSGLHMKAYKVI GGRAKD GDGVGQGDYGGTVIVKGDAGSRTGEDMKNGTII DGGNSG GDAAGYAMRGGKI YVRDHAGYRAGIHMKEYKII GGCAGS TGKSFAYGADDGLLMIQNMADSRACVRLSGADVVFGHLKG CGDAAGYGMRGGQLFVRDGCGWRVG』HMKPADVIGGDAGS
 GDALGYAMRGGEIYVKGSAGYRAGIHMKEYIVIGGSTGS GDATAHSMRGGKVF RDDI GYRGGI HMKQYLIIGGTAKA GDVTGHSMRGGKLYVKNDVGYRSGIHMKEYLVIGGTSKD CGDTTGYGMRGGKILIKGNAGYRVGIHMKEYKVVGGKTGD AGADAGDALRGGDIIHGNMGSRSGQVMKKGTLFCAGSSS GDTLGYGMRGGSIYVQGDAGYRVGIHMKAYRVIGGKVGA GD\|CGMAARGGKIFVRDYVGYRAGIHMKEYMVIGGTGQD GDATGYAMRGGKIYVRGNAGYRAGI HMKAYRII GGEAGS D DLGLSMRGGKIWVRGNVGYRVGIHMKSYEVIGGETGD GDGAGQGTYGGTVVVRKSVGSRTGEDMKNGTIVIGGNSG GAAIRGGDLVCMGDVGARTGIDMKGGTILVGGRTG AYRGDWRGMSGGTITVEGNAGSELGEFMKGGLIHIGNVDD QGRVAVAGSIGARGMTMTKHNPRFAPPE GDALGYGMRDGNTYTKDNVACRGGПHMKEFEQMGQNAGS GDGVGQGDYGGTVVVRKDVGSRTGEIMKNGTVIIGGNSG CGDTTGYAMRSGKIFVKGNAGYRVGIHMKEYHII GGKVGD GDATGYAMRGGG|YVRGNTGYRAG1HMKAAVVIGGKAGS GDGVGQGDYGGTVTVKRDVGSRTGEDMKGGTIIVGGNSG VGDAVGQAKRGGEI YI YGNANNRAGIQHRGGVVIGGSAGD GDATGYAMRGGKI LI QGDTGYRAGVHMKEYKVVGGVAGS
GDALGQAKRGGEIVVGGDGTRAAIMHGGVIIGGSAGK GDALGQAKRGGE VYGDAGTAAAQHRGGV GGSAGK
 AGATAHGGLLVIDGNAAARCG円SMKGVDTVVGGNTG AGATAHGGLLVIEGNASSRCGISMKGVDIVVKGNIG $D V L A Q T F Q G G Y V Y V K G N A G N R V G I Q M R E Y M V I G G M V D D$
$G D A T A H S M R G G E V F V K D T G Y R G G M M K Y S V G G K A G S$ GKAGVALRGGEVVIKGNLGSRAGQVMKAGTLLCCGNAS QGKUYVAGNTGARGMTMTKRNPRFEPPE LWVLGSVGD AGATGRGGLLVIEGNASSRCGMSMKGDDIVVHGNDG GDAVAHSMRGGKVFVEGNDGYRGGI HMKEYEVI GGTSHA AGATGHGGLLVIKGNASSRCGISMKGMDIVVQGNVG AGATGRGGLLVIEGNASSRCGISMKGIDIVVHGNVG GDAVAHSMRGGRIYVRDNПGYRGGINMKEYLVVGGAARA QGKVMVAGNUGSRGMTMTKQNPKYAAPE LFVLGSAGD AAGATAHGGLLVIEGNAGARCGTSMKGVDIVVKGS ${ }^{\text {G }}$ AGATGHGGLLVIKGNAASRCGISMKGIDIVVYGNIG YKNGMTGGTVIITGNSGERTGDHMRRGMILI GNAGN GDGAGQGIYGGTVVVREGVGSRTGEDMKNGTIIIGGDSG QGRVFVAGNDGSRGMTMTKQNPRFSAPERGWVLGGVGD AYRGSKYGMQGGTILVDGNVGHEVGAYMRRGLLVI GNAED AGATGRGGLLVIEGNASSRCG\|SMKGIDIVVKGNIG AGATAHGGLLIIEGDAGSRCGISMKGVDIVVKGSVG AGATGHGGLLVIKGNASSRCGISMKGIDIVVHGSIG DVLA GA A GDAVAHGMRGRGMTMTKRNPRFEPPEKEVWVLGSAGD
 MKGGQ1 KGNAGDFVGAARPGYK AGATGHGGTLVIDGDASSRCGISMKGIDIIVKGSVG AGATGRGGLLVIKGNASSRCGISMKGIDIVVHGSIG
 AAATAHGGLLIIEGDASSRCGISMKGVNIVVGGNI G AGATAHGGFLVVEGDAAARCGISMKGVDIVVGGNVG AGATAHGGLLVIDGDASARCGISMKGIDDVVKGSIG GDTTAHCAAAGTIVVGGRAGTRSGSLMKHDPWVLKNVGS DVLAQTLQGGKVFVGGNAGNRVG|QMREYLVIGGRVDD GDVLAQTFQGGKI FVKGNAGNRVGIQMREYKII GGLVDD VSHCAGASAHGGLLIVEGDASARCGISMKGTDIVVAGSVG
PGNS KGMRGGMIMVFGSVGNRVGEGMRRGLI AVGDAGD

|  |  |
| :---: | :---: |
| UniReego－S2YLL2 |  |
| UniRee90－M1 WNR7 | GEYMAGGUVVAGMAGNYCGTGMHGG |
| UniRef90－B8DKS2 | FLGEYMAGGAIILLPITGRNLGTGMHGGVIYLRGRVPEYQ |
| UniRef90－T2GD12 | FLGEYMAGGAIILLPITGRSLGTGMHGGVIYVRGEVPAHQ |
| UniRef90－JoN | YQAGGTIIVLGPVGAQCCTGMHGGCIFLRCDPEDLP |
| UniRet90－ToZJL3 |  |
| UniRef90－R9J5R8 | GEYQAGGV |
| UniRef90－LORF | LGEMAGGVILLLGMAGMSLGTGMHGGV |
| UniRet90＿A6UWK6 | MAGG |
| UniRef90 WOFM86 | FLGEYQAGGMVVLNVGYFPCTGMHGGKMYL |
| UniRef90－E9S | AGGIIIVLPVVGNFPTTGMHGGKMFLR |
| UniRet90－N2AB | LGEYQAGGMIIVLRIVGNFPCTGMHGGKMFLR |
| UniRef90 UPI00047AF9BE | YMTAGRAlVVLGDPGPWICSGMTGGSV |
|  | G |
| UniRef90 Q58745 |  |
| UniRef90＇${ }^{\text {R } 50 E 1}$ | G $G$ |
|  | MT GGRAVVVGDPGP |
|  | GGVIVLLGKPGRHLATG |
| UniRef90－FoJH | M A |
| UniRef90－D4LA42 |  |
| UniRet90－R71G17 | QAGGYl VLGPVGRFP |
| UniRet90＿Q2FQ43 | YMAGGLV MFRMQDEEPA |
| UniRef90 AGUR72 UniRef90 H2JCN1 |  |
| UniRef90－पPIIO0037 | MAGYMMGGRII I GDSGEKTGENMAGGE |
| UniRef90－E6MDP5 | FLGEYQAGGTIVVLGDMGPYCGTGMHGGEMFI疗CD |
| UniRef90－D8k109 | FLGEYMAGGVLVVLKHRANFIGTGIHAGVIYICGG GFEP |
| UniRet90－G9RNM7 | G G |
| UniRef90＿UP10003 | MAGGFIVV |
|  | FMGIIFMMGGRIVI |
| UniRef90＿B3TE | MMQRGRMVVGGDAKNLGDSMYDGT |
| UniRef90－F8AME9 |  |
| UniRef90－C8X2L8 | AEFMAGGI AVVCNVLGYRPCVGMVGGKIFFRGPYEGFS |
| UniRet90－R5XDK6 | FLGEYMAGGTIVLLKLFGTHCASGMHGGK1 |
| UniRef90＿U6EBF1 | GLIFMMGGRIIVLGDISDDAGESUIURG |
|  | FLGEYQAGGI LVLGIVGNFCGTGMHGGR |
| UniRef90－D4JW89 | FLGEYQAGGIVEAPIGSFCGTGMHGGHMY RSDEAPKG |
| UniRef90－44LO99 | GEYMAGGALVEGVGASLATGMHGGA |
| UniRef90－F0TA03 | FMGLFMMGGRIIILGDVSQDAGESIIRGAIYVRG |
| UniRef90－B1YD． | YLGEYMGGGVILVLRHTGRRDGAGMVGGAI YIIRGEV |
| UniRef90＿R6MYW1 | QAGGVIVVLPIAGYFCGTGM |
| UniRef90－F2L2A4 | LGEYMGGGTVVVLREVGDMIARGMVGGELY RGEV |
| UniRet90 C9RBB | FAEFMAGGIAVI晨NVLGFRPCVGMVGGKIFFRGP |
| UniRef90－Q2LX | SFAEFMAGGTAVI CGHLGYRPCVGMVGGK YFRGL |
| UniRef90－UPIooo3i | HMSAFMQAGRLVVCGDAGEALGDSL |
| UniRet90－K2M2 | 㑑 |
| 4B | MAGGV |
|  | EYMAGGLLILGIUKKGIGSGIHGGK1 RGD |
| UniRef90－J6JO | MMGG |
| UniRet90－A0LJ08 |  |
|  |  |
| W9DYE0 | GSGMGE |
| A6FR77 | MAQGNLVVCGDAGDALGDSIYEARL |
| $\begin{aligned} & \text { UniRef90-UPIO00466F9A0 } \\ & \text { UniRef90_LHE } \end{aligned}$ | HMSAFMAQGNLVVLGDAGDALGDSMYEARL |
| Un | YFAEFMAGG |
| UniRet90－UPI0002558 | HMCFMGQSGSLVVCGDAGEAL |
| UniRef90－A9DG | HMSAFMQSGHMVVLGDAGEALGDSLYEAKLFVRGSVKSLG |
| con |  |
|  | FMGILFMGGRMIILGDLGADAAESIIRGEIYVLGEVTSLG |
| UniRet90＿B8DIN2 | YFAEFMAGGTAVVCNVLGYRPCVGMVGGRIFVHGPHQGFS |
|  | GM |
| UniRef90 UPIOOO35CD846 | HMSAFMAQGSLVVLGNAGDALGDSHYERLYVRGSV |
| UniRef90－UPIO0025593B2 | HMSAFMAQGNLVVLGDAGDALGDSL |
| UniRef90－UP100036BB0A1 | FMMQRGRI। ILGDVGPNLGDSMYDGTIFVGGK |
| UniRef90－F4FZ： | Y㑑EYMAGGVIVVLEKVGNFVGTGMVGGRIFIRGRV |
| UniRef90－KONAY7 | MAGG！AVI CGGLGYRPLVGMVGGK |
| UniRet90＿K4MC25 | YMAGG |
| UniRef90＿A4E | A FMAQGNL |
|  | GGT |
| $\begin{aligned} & \text { UniRef90-J9ZOR5 } \\ & \text { UniRef90 A0A017HHS6 } \end{aligned}$ | MAQGNV |
| UniRef90－ 14 KK 99 | HMCFMGQAGRLVVCGDAGDALGDSLYETHIYVKGNV |
| UniRef90－V9VXA0 | MQAGNLVVLGDAGDALGDS |
| UniRet90＿UPIO0036EAB6 | MAQGCLVVCGDAGDALGDSVYETKIYV |
| UniRef90＿JgS | HNSAFMAQGRLVVRGNAGDGLGDSIYETRIVYV |
| UniRef90－TOJU86 | FAFEFMGGGTAVVCSVLGDRACTGMVGGI |
| UniRet90－W5Y8F0 | HMSAFMAQGT |
| UniRef90＿A4YHX3 | AGGVIMVLGMTGNFVGTGMVGGKIYVRGRVD |
| UniRef90－W6RK64 |  |
| UniRef90－UP10003754575 | YLGEYMAGGV MVLGIVGNY GSGMVGGR Y RGK |
|  | YMSAFMMQGRMVVCGDAGDFGGGSMYAGR Y |
|  |  |



| UniRef90_S2YLH2 | $D E \square{ }^{250} \text { S A P F T V } \square \mathrm{T} \text { P D S K N }$ |
| :---: | :---: |
| UniRef90_M1WNR7 | LLD S K E ILS ENFVKIVRPFSHR |
| UniRef90_C0GDH1 |  |
| UniRef90_B8DKS2 | EALT S A $\quad \mathrm{L}$ S E P F V K I R P F S H R |
| UniRef90_T2GD12 | 1 L D A P FLLRVK P Y T H R |
| UniRef90_J0N883 | 1 L E |
| UniRef90-T0ZJL3 |  |
| UniRef90_R9J5R8 | LM S P F T V IT P D S K N |
| UniRef90_L0RFH0 | 1 MA ( S D T R L L P R S HR |
| UniRef90-A6UWK6 |  |
| UniRef90_W0FM86 | $\square \mathrm{N} \square \mathrm{E}$ DVLS T P F TVVTP P ( S K N |
| UniRef90_R4KF23 | L K GRFQKL P P V L R |
| UniRef90_E9SFV8 | LLD H P F TVVMPDSYRQMYVAN |
| UniRef90_N2ABL4 | MDVLLSEP F TVVTP D S Y K Q M |
| UniRef90_UPI00047AF9BE | $Q L A L L A R P A E F F V M \\| R P$ |
| UniRef90_C0EAG6 | LSHHF |
| UniRef90_Q58745 | KLL N ( S K W T K $\$ AP $\square$ S K R |
| UniRef90_E3GWD3 | D E F K K I VP K S K R |
| UniRef90_R5QE03 | 1 L S S P F T LVTP N S Y K Q M Y VA N |
| UniRef90_D6SS85 | $V \mathrm{~K} D \mathrm{~L}$ L H A Q T R F A Al VP K |
| UniRef90_D6E6J1 | $L G A P V D A T G E G F F R L / R P$ |
| UniRef90_F0JH42 | RLLT R R E E WQ |
| UniRef90_D4LA42 |  |
| UniRef90_R7IG17 | $\square \mathrm{L} A \mathrm{D}$ ( R F V V L V P |
| UniRef90_Q2FQ43 | M N S S Y T R $\square$ A P |
| UniRef90_A6UR72 | NLI N ( S K Y T K $\square$ A P $\square \mathrm{S}$ K R |
| UniRef90-H2JCN1 | LK S N F |
| UniRef90_UPI00037E7211 - |  |
| UniRef90_E6MDP5 |  |
| UniRef90_D8K109 | G N A E A $\square \mathrm{K}$ A R F K K L Y P K E LR |
| UniRef90_G9RNM7 |  |
| UniRef90_UPI00037E079B | $\square \quad \mathrm{P}$ P F GRQ D F $\square \mathrm{K}$ M F P R T T R |
| UniRef90_A5UK46 | DLK EDEYEEFKKIVPESAR |
| UniRef90_B3TB80 | QLWNY D NLE P M E K K I V |
| UniRef90_E1QNA7UniRef90 F8AME9 |  |
|  |  |
| UniRef90_C8X2L8 | T L A R R E E WQ |
| UniRef90_R5XDK6 | 1 G GEFK K L V P A T S R P Y A N |
| UniRef90_U6EBF1 | K F R K 1 VPRSAR |
| UniRef90_R5AB09 | L |
| UniRef90_D4JW89 | $L \quad K$ GRFYKLS P |
| UniRef90-F4LQ99 L |  |
| UniRef90_UPI00037C5938 | H D W S D $\square$ R K $\square$ A P T S S R |
| UniRef90_F0TA03 |  |
| UniRef90_B1YDA4 |  |
| UniRef90_R6MYW1 |  |
| UniRef90-F2L2A4 |  |
| UniRef90-E4RP03 |  |
| UniRef90-C9RBB0 | L L A R R E E WQ |
| UniRef90_Q2LXW5 | $L \mathrm{~L}$ A |
| UniRef90_UPI000380D463 | L |
| UniRef90_K2M2T9 |  |
| UniRef90_F4B3T2 |  |
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| UniRef90_UPI000463F5D9 | T L A V R D D WQ |
| UniRef90_UPI00025580EB | L |
| UniRef90-A9DGS9 |  |
| UniRef90_C0N5C9 |  |
| UniRef90_R9SJP9 | D DY N K F T K V V E S S R P V |
| UniRef90-B8DIN2UniRef90-D5MJV4 | VR E D WQC |
|  | UniRef90_D5MJV4 |
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| UniRef90_UPI00025593B2 |  |
| UniRef90_UPI00036BB0A1 |  |
| UniRef90_F4FZS7 |  |
| UniRef90-KONAY7 |  |
| UniRef90_K4MC25 | $\square \mathrm{D}$ T N Y T R $\quad$ I P |
| UniRef90-A4EYI2 |  |
| UniRef90-M7P416 $\quad \square$ S A N F N D C G S H |  |
| UniRef90-J9Z0R5 |  |
| UniRef90_A0A017HHS6 |  |
| UniRef90-14KK99 | L |
| UniRef90_V9VXA0 |  |
| UniRef90_UPI00036EAB6D |  |
| UniRef90_J9SJ03 | L |
| UniRef90_19WG14 |  |
| UniRef90_T0JU86 | $E L T$ D WR Q WQ ${ }^{\text {E V VP L A Y E E R P K K A }}$ |

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

VVNENDD
KDEQNAQNAEAALVIEDAVPWDDRL $E K T V R D L N A A L H$ $M N Q \square D \square A T A S T R D L N A Q L H Q L D G N R E R Q$ DEKR $\square$ S S R VLEE $\square I$ QHAKKGNRK $\square E \square Q A G Q H G$ VNQY $\square H Q Q A R A G L R V L I V N P D G A$
$\square D A A C Y K S S E L N E \square I K A K M R G \square Q D \square V I R N S H$

$\qquad$ G $\square E N R \square D S R \square L E E R \quad \square Q R A V T Q G \quad A R E L L V E A D G Q H G$


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UniR Refo-DIYYX1 UniRef90_D2R089 UniRef90-A5UN41 UniRef90_-B8ITW6 UniRef90-A4FZW4 UniRef90 J7Q3M6 UniRef90_UPIO00364685D UniRef90_UPIO003A01FE2 UniRef90-M5TRJO UniRef90_UPI00035E7F57 UniRef90-R9SJN8 UniRef90-F2NH59 UniRef90-UPIO00376A231 UniRef90 A6UST3 UniRef90-F4BV66 UniRef90_D5VT85 UniRef90_D8JYG3 UniRef90-Q2FRL8 | UniRef90- 1 IG525 |
| :--- |
| UniRef90 |
| $16 P E B 7$ | UniRef90-O27002 UniRef90-A2SQZ3 UniRef90_14C758 UniRef90 O26209 UniRet90_LODAE1 UniRef90-LODN72 UniRef90-E4TJ49 UniRef90_E1REG7 UniRef90_U2V4X2

50
60
De ${ }^{70}$
70
80
 IVNPRGAHADAVGLDAPDDVAVRGSTGQRVGSMCLE RVVDTLSRHNLGVGLPDGADITFEGSVGYYCGGLNT TVHGHAGDHAGAKMLGGALHI HGDAGA FAACEMQ KY GTEMTGGTVTDNGNTGDRDGS SMK YWHVL_NPNGQHALAVGLDAPDTVEVDGHAGYYCAGMNK TVENPGGKHSGSNMSSGKIVTVNGGNVGGMQLGGYEMR GWQMA $R V A H P R G A H A V A C G D V G H T V D D E G H V G Y C A G M N Q R$
 SSPKLKYIGSKMTKGEIVVEGDAGMYVGA EMK【GTRLALTVADLLTLAG DDPSELRFEGGSERFVGANLAS RGMPDGEEVKGGVGAHCGAFMMS
VTSPNGAHNTAVGVDADVTVTDEGHAGYYAGGMNKA R】GEKMTVGEIVVN GDAGMYVGAEMKK
VK■SEFFDVSGKTSENPNEDRTVIDGDANRTKRTGEEMKS IEHPDGAHNVAVGLNAPVRVTVEGHVGYYAAGMNQ Q QPQGQHSIACGLDAPLVVEIKGHVGFYCGGMN K GDATLSSMKLKRIGEKMDGGEIIVNGDAGMYVGAEMKS VTNPGGKHADACGVDAP GARMTQGHLVR GSAGDHSGFQLRIDGDAG HFTACEMR APTAKSYHVTNPQGVHGTKDETDVEVDGDVGYFCGGMHQK WRVLHPNGKHALAVGLDTLVDVTVEGHVGYYCAGMNQ
ПGGRL WESA
PDTMEVRIDGHSGQRTGSLGTP HA $\square A A G \square D A P V E V T Z A G H A G Y Y A A G M N Q$
EVTGNGGSSAAETLTRTKGDAMRTKRIGESMSA SMHNMCVGLTGQGNITGEDSTGLYTASFME TTNPQGAHNVAVGVNSPVEITVHGHVGYYAAGMNQ FGVELSGDSGQKAACMRWSKSVRVRAVGDLGDFAFAW FD LKGQRFHGCGLGPDSGGVRIDVYGSSGDYGGSGGDD $\square \mathrm{GGR} \square$

FVSRNEPITVRVTGAPGQRTGSMGFP VDAFGQHGTGGRDWKAG SEAVVFRNASNKMDYVGAMMSS AKLVLEGDFSKVKWVGTRMDEGEIVVKGNDGDHCGAYMT VGDTDTDEGATSETDGMNTQEVVIANATDKLDFIGKEGLD TVEGNVGNHAGRGMKGGKIVI AGDAGSYGABLMT GGDRVEGECGAYAGSGMRGGTLTVAGNCGA FAAAEMS CKGDVDMYCGAWMK $\square R G D F S R G H S$ GGGMTQGT $\square R A E G N L G R H A G Q S M R$ GSDRDDRVGAGLAQGS LVE GDVGQRLGA GMT $\square V E G D A G F H V G R E M K G G E I L V N G N A K P W A G M E M E$ GGTRESVTVGDTFKVK GGPLESVTVGDINKVKLGDVSSVRFDGGSDRFLGAKLLP IGGPL DVDCRSNADGKTLHFHVTNAGGQRVGUSMCLP GTADSPAEVKMTFNGDCGRKYIGTKMS ULYSYRGQRFTGCGFTDGVRLDVYDSSGDYLASGDD NMVIKLGNAGNKLIGYQMT GGRVGRLENPSIKIKHIGSKMSR GGGRVVGDVGSYAGRKMKGGKLEIR GNAGHYL ASGST


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| :--- |
| UniRef90 $\times 1 G 525$ | UniRef90-R6PEB7 UniRef90_O27002 UniRef90-A2SQZ3

UniRef90 14 C 758 UniRef90 O26209 UniRet90_LODAE1 UniRef90-LODN72 Unine UniRef90_U2V4X2

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QATVRVDGSAGPGVAENMMSGTVVIEGDASQY
GSRLTIERNSGWATGEGMAKGHIEVVGGR GGRLI HGDAGDFAAEGMTGGTLTIHGNAGARLADRMAGH GGS TINGNAGSWTGMEMKGGSITINGNAGGRDDYGGC LATVLVCGNAGVGVGENMMSGKVHVRGDASQ GGEVTVNGNADRFVGSEMKGGKIHIKGNAE BS DYDGC GGEVTVNGNAGVGLAENDMSGKVHVKGDASQSAGCEMRGIT
DTEVLVEGSASADVGWLNAGGRITVRGDA



G K VIEGSAGTGVAENMMSGKVHVKGFAS



 GGRLTVAGDCGDFAAEGMTGGTMLTIMGNAGAR QAHITIHGNAGPGLAENDMSGRVRVTGNTSQYAAASGH GGDVVVKGSAGAFCGTGMKRGRIEVTGDAGAADPGDMKGM RGSLII DGDAGAYVGMHMKGGRLCVSGSAGLYAACELKGD LASVCI TGSAGTGVAENMMSGKVHVKGFAS

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 KAELTVNGNAGQGLAENMMSGVVHVTGDASQS GVDVHLE GNVGDGACEGMRRGVVRITGNAGC GLSIHVHGNAQDQLGQDMKAGKMVIYGD GMQ HVHGNAQDQLGQIMKRGKFVVHGD GTKI II DAPTSDDVGWLNAGAEIVVL GNAGNGAANGMA G NiTM EGNAGAYLGFTMKSGE HCTGSAESYAACNMVGA NTRIEMGPASDDVGWLNGGAEILVRGHAGNGLA NAMA GGKIVVEGNADDWLGAEMKGGEIVVKGNARNYVGCAYYGD
 GGLVHVKGSAGDFLGFGLLGGTVVVEGNIGQRAGERMRGK GGRLRVAGDAGEFLGRGMSGGSVVVMGNA
GGSIIVKGNTDAFAGDQMEGGQLIVEGNAGNYDGASYRGD


 $G T E V I V E G S S S A D V G W L N A G G R I V V K G D G$
 GMEI HVHGNAQDQLGQDMKRGKLVVHGD
GGVLRINGDVGMNAGRLLEGGTLVIAGSAGHYAGSRMKGH
 G





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


UniRef90 UPI00037BDEA4 UniRef90_-19MAUO UniRef90-A3SQ32 UniRef90-UPIO0046912D9 UniRef90-G8MDP6 UniRef90-A6UT54 UniRef90-WOAESO UniRef90-M9RLT4 UniRef90-F8AP00 UniReffo-HOQNL5 UniRef90-10HWJ1 UniRef90_UPI000287E25E UniRef90-B81ZY4
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GDTAAHCAASGNIFGGRAGTRSGSLMKHDPWVLKNCGS AGATGHGGTLVIKGNASSRCGISMKGDDVVVHGNVG AGMSCGAAMDGGTIHVKGDAGPRCGVAMKGGNIVVEGT】G AGDFAASRLVAGTVCI GGEVGAHTGYGMRRGTVLLTHAPS AYRGSWEGMTGGTI TI NNAGKNVATGLLKGGTITIGDVDE AAGATAHGGLLVIDGNASARCGMSMKGVSIVVKGSIG AYRGDWRGMRGGL AYRGDWRGMRGGUVEGDAGNNGGGLKGEG KGNVQ AAATGHGGLVVIDGNAGARCGDSMKGVDVVGGNDG HGNVGDFGMRGGTLVVRGDAGARDADRMRRGTLVVGNAGD AGATAHGGLLVIDGDAAARCGDSMKGVDIVVGGNAG GDTAGHCAAAGVIYGGRAGARSGSLMKHDPWVLKSVGS AAGATAHGGTLDEGNAAARCGDSMKGVDTIVKGSVG AYRGDWRGMSGGTIIVEGNAGNEIGEFMSKGLIHIGNVGI GPFAGAGATEGRIVIHGDAGEKAG LEGMKGGKILIEGNAGNYDGEKMAGGEDEDGNAGD GGRVMIGGSDGARGLTMTKWNPDY QRPEMWVLGSVGD GGNVSMDGMRGGTLLVRGSAGARFGDRMRRGSALVGDAGD NGAGASAHGGLLVIEGDAGLRCGDSLKGGDIVVGGSVG
 AGATGHGGLLVIEGNAAARCGDSMKGDVVGGDIG AGATAHGGLLVIEGNASSRCGISMKGVDIVVGGSVG AYRGDWRGMNGGKITINGNVGTEIGEYMKKGLIVIGNCKI SYDGEWRGMSGGVI KVHGNAGKQLADCMSGGEIYVGDCDI AGDFAASRLVAGTI GIAGRLGAHYAYGMRRGT AAATAHGGLLVVDGNASTRCGlSLKGGDTVVKGNTG GGLVVIEGDASARCGISMKGVDVVGGSVG AGGLLLVGMRRGQILVSGNAGDYCGARMDAGTIAVAGKVG QGKVFVGGCDGARGMTMTKRNPRFEPPE LWVLGAAGD CGNAGKKGMSEGVVIVRGDAGDRVGDHMRRGSILI GNAGM NAAGATAQGGLLVIDGDAGDRCADSLKGADVVVGGSVG KGNAGWHGMKGGRIVIEGSARHQLGGGMDGGEILVGDVKS KGNAGWHGMGGTVIYGSTGSRVGYGMKGGSIIVGGNAG TGDGLVQGMSGGFVHVRGNCAPRAGERQRRGII VVGNAGS AGATGRGGLLVIDGNAAARCGDSLKGLDIVVGGSVG TGQGLGAAMTGGTVAYGAAGPRVGAAMRGGSIFVGDVGD VGQTFMYGAKGGEVYILGNAAGRPLINATGGPRVVGTCLD QGKVMVAGNLGARGMTMTKRNPKYAAPE MWVLGSVGD DANVGDFGMRGGTVLIKGNAGDRVGDQMRRGLILIGNVGD QGKLYVAGNDGARGMTMTKHNPRFAPPE VWVL GSVGD MTGMSGGKDTVDGNVGNYDGEKMGGGEIEIGSAGD AGDFDGQGMKGGTVLVKGNVGQRAGDHMRRGQILI GNAGD VATGDRFGMLGGTVVIEGNIGARAGDKMRRGVIVVKGKTG FGPAAGSRMVGGTLWTEAGFGPRPGPLLRRGTLIGPSVDE GDRVGERMRRGLI AVHGRAGSLCGARMIAGTVVGAGCG PGST WRGMKGGVITVNGNAGCDLGEYMMGGTVTVGNVDID DGDTEWRGMTGGKIVVKGNAGKQCGECLTGGRI HVGNCDD ALHGAMGGLDGATLVIGGRAGDRLGDRMRAGLIVAGAAGD GNNVGDGMVDGKIVVNGNVRAFCGDRLNGGLVYVGGNAD GGDVGDFGMAGGRVIVRGKAGERAGDRLRRGVLVIEGDAG YGDAGDFGMSGGRVVVRGSVGARAGDRLRRGIIIVEGDAG GDTAGHCSSGGRI YIGGRAGTRTGSLMKHDPWILKNVGS N YGNTEWRGMSGGQIVVHGNAGKQCGECLVGGHIHVGDCDI $Y G N T E W R G M S G G Q V V H G N A G K Q C G E C L V G G H I$
$V G Q T F M Y G A K G G E V Y V L G N A A G R P L I N M A G D V F D G G F V I V$
$V$ AGDFПGHGMEGGLLIVRGSAGHRAADRLRRGTIIVGDAGD FGNGRWEGMLNGTIVVEGDAGYHVGDGLVNGKI IVGNVGG A YRGSWRGMTGGQ1 I QGDARSQLGGG AGGSITVGNVEN TYKGEWRGMSGGRIVVEGNARHELGLY(LRGGEITVGDAGM TGEGAGSRMIGGTI WAEGGIGPRPGFMMRRGTLI GPSVES AYRGDWRGMSGGLIRVKGKAGNDDGTAMTGGTIIDEDAD AYRGYWQGMKNGT KVKGKVGVESMLWNKWPTLYCGSADS AYRGEWRGMKGGEIYIGGDAGNFCGDRMNGGETTVRGDAG VGDYCAECLFGGLVHVKGNAGDHAGCNMKGGKLLIEGDCL VGQCFMYGAKGGTTFVLGNAAGRPLINAAGHPRVVGTACD VGDWAGAEMRGGVLKIRGGAGRFLGAGMREGVILVEGAIG EGLAYAQQGGTVLATRGAGARAGLNQRGGVAILGPVGR GDTTAHCAATGKIYVGGSVGSRSGALMKYDPWVLKNTGS


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HMSAFMAQGNLVVICDAGDALGDSLYEAKILIVRGKVKS LG FSFEFMSGGDAVVCSVLGDRSCVGMVGGTLYFRGNASGIS
 RLPPTFTEG
F C G $\square R Q N G G L I V I N G N V T R T V G V E M T K G T L V V C G N D R G F$ MASAMAGALVVLGDAGDALGDSGYEARLYVRGSVKSLG FCG $\square$ N $\square R G G K I F V G G N A E R N V G A E M V K G E V I I C G T I D K F H$ HMSAFMAQGRLVVCGDAGDALGDSIYEARIYVKGTVAS LGG WA A SRLVAGTVAVAGRVGAHAGYGMRRGSVVVLGDPD HMSAFMQAGRLVVCGDAGDGLGDSLYEARIYVRGTVKSLG HMSAFMAQGSMVVFGDAGEADGDSIYEAKLFVRGSVQSLG MA Gl H QNGGUI I D GDVDVRVGGEMKAGAIVVYGKVEE FVGTEMKNGTIIVHGDCG FVGGDMKGGTVKIGGKFDLLP TFAEFNCGGLGVVCGLGYRPCVGMVGGKI FFRGKTDGSY SFSAFMAQGRMVI CGDAGDADGDSDYEAVLYVKGDVKS LG MPGVHQNGGII IIEGDVEGRAGGEMMAGAIIIYGK $M P G D H M N N G L L I I E G D V V A R V G A E M L G G T I V V K G V I E E F$ HMSAFMAQGRLVVRGDAGEALGDSVYEARLYVRGSVAS LGG MPGVHQNGGIIMLNGEVEGRAGGEMLKGAIVINGP

$G L S A F M A Q G R M V I C G D A G E A L G D S D F E A R \square Y V R G T V A S L G$ HMSAFMAQGREVVCGDAGQHLGDSIYEAVLYVRGRVASLG A YPGYLMKRGTLILN
YFGEFMAGGDAVI CGVLGYRPLVGMVGGKVFVRGQAQSYS Y L G A RMTAGTIAVRGRIGACAGYAMKRGTLLVYG SFSAFMAQGNLVVLGDAGQALGDSLYEARIFVRGTVKSLG FSFEFMGGGVAVVCSVLGDRACVGMVGGTVYVRGPIQNLS F CGRRQNGGL WA A QMSMGGNLIILGELGQQAGESMYKGAVFTRD ELGAGMDAGTLIVLGETGDHPGREMRRGTLLLDHMPKSDP HMSAFMAQGRIVIRGDAGDADGDSTYEARLYVRGEVKSLG DTGAGALAGTIVVGGDAGANLGDGLNNVTVFLRGNAQSL Y LGESFMGGGFVVLNGMGSNLFSWASGGAI YVRDPHHLIDD
 YCGSRMDAGTI GVLGNVGSYTAFNMHRGTL
$Y F G E F M A G G D A V V C G D L G Y H P L V G M V G G Q V L F R G P N K$ F $\quad$ GTEMK TGGVIVIHGDCG FVGGDMKGGTIVIIKGN
 PAGSRMIGGTI WAEGGFGAEPGLMMRRGTLIVPSVESLLP LLPTFADCGRIVILR\|LSRYVA
PDPGQAMRRGSILLPQAPDAVPSGFVDG
NAG $\square H A V G G K I V I H G D S P G R V G A Q M \square R G N \prod Y M \square G R \square E T M M$ YA GFRMLAGTIVLGSGGGMGHGSGMKRGTI LA G $\square \mathrm{HM}$ MK GDI EI DGDVNRWPGGQMKNGNIVIHGF $\square G R L L$ HAGSRM ${ }^{\text {HA GTLVAGTDGDHPGGMRRGTL }}$
RAVGVEMKKGTIVVAGK 1 KNFAPGF
ELGARVIA GTILVLGEAKGRVGYLNKRGST

 FSFEFMSGGVAVVCGVDVEALGDRSCVGMVGGVVYVRGPL LA G DHMRKGLDEDDGNVNRWPGGQMKNGNIVIHGKLGRL NGMEFDERGRFRRLPYPGSNLFSLASGGAVYIRDPYG WPASR IVAGTLVVAGQSG $\square$ NPGYLMRRGTL FCGVKQNGGLI YVGGNAFRTLGVEMKGGTIVVCGKVMNF FCAI RQAGGLLII KGNAVRGLGAEMSGGTVVILGEVVNF FAGLHQQGGYIIVEGNTDVRLGGEMEAGAIIVYGKVKE LLPTFVDCGK
HVLTHAEGGTVIIKGDVEGRVGGQMVKGDAYVLGN $F L G D H N H G G T I V V E G D V D R C V G A D Q A W G N D V I K G K V S R L$ FSFEFMGGGTAVI CSII GSRSCVGMVGGTIVVRGNVNGLS RAPGAEMVSGDIKIHGRISSLLPGFKE ISTFKEDGSLM MPCGDMFDGEAMVYGHVTDFL
F LAAESFMAGDFRNRPYPGSNLFSLASGGALYMRDPNR D A GLYMLS GDLIIT GDSGEDTGDWIIGGNI YVG G DFD EAGLAMRRGDIAVAGSAGDGLGRGMIAGSIFAFGPVGDFP LA GERQSGGLLFFRDQLGPYVGRGWRGGRLL FSFEFMGGGI AVVCSVLGYRSCVGMVGGVVYVRGNVKDDS HVSTHGEGGTVIVKGNVEGRVGGQMVKGDVYVFGDIK A AYE
$S V L G A R S C V G M V G G C V Y V R G P I G T H P$

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A DCEKKEMRPEHLELLEQLLADAECDAKPEEFTRYGSARK
 A DCEKEMR H LE ELAA ELLER GGCDAKPEEFKRY GSAA VDVNVIEPTAEEVAE

A D C
A DCEKKEMRAEH $\square E \square L Q G L L N E A G F D A D P S D F T R Y G S A R T$ A D C

A DCVEKEMRGEHLAELTELLKTAERDEEPGEFRRYGSARE $A P P B D V R V C A L N D D \quad D V T W L E T G L E A F L A A \square D R P R L R K$

S
SATNAK LI PPSDEDWQWLSERMPEF LAK $\square G R P D L L A$
A DAQFE
ATFN
A DCAKEMREEHHEELGRLLKAAGFEDDDTAAYTRYGSARE A D C

ADC E GFEPEGVYTNPE

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

DKDAKEV D LDD KEWEWLT LGGKDF LKK $\quad$ K Q P D LF K



A D C



E G F VQE D $\square$ I E N P E $\square$ D G K D F
T F V D

E G F VLE G VVDD PE $\square \mathrm{D}$

GDVRPHALAQE D $\quad \mathrm{D}$ D F LA GGMDKF LAA VGHEELAA SR H G V S A K D VK V R A LE A A D $\square$ D Y LS S H M D D F L Q S VE R K E LQ A


G G T N T R V V ME

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| :---: | :---: | :---: |
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AD $\square \quad \square$ AEELT QA D $\square$ D F LAA G ME D F L A H $\square E R E E L M E$

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L LS N WS E W
Y K V I P L K Y E ERSKTS

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LL\S\WKH WQ
    K| |P
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VLSVREEW
$E \square A \ R K A W R$

ELTDLSQWK K $\quad$ UVAKSYEER QASE

| $L L L$ |  |
| :--- | :--- |
| $L$ | $T D N G K Q D P$ | FNKV YRKVM

TLAVREEWQ

ELSDWSQWQ
K LVPQAEKKAL
K $\square$ VP $\square$ T Y E E R P K

T LT D F S Q WR
K I IAKTFEER

| $K \square L K R E E W K$ | $K \square V A K S H$ |
| :--- | :--- |
| $G \square T K W S E W K$ | $K \square R P P E E K K A$ |

lupas_21
lupas_14
lupas_28
jnet
conf
sol 25
sol5

| jhmm | 1 | - | 10 | 20 |
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|  |  | 70 | 80 |
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| jhmm jpssm | - - |  |  |

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jhmm
jpssm
jhmm
jpssm
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[^0]:    

[^1]:    

