## QUERY

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S N M WVIGGKSKA QDAKA $\square \mathrm{M}$ VN GP QF GWYAPAY TYGワGLHGA S N $\square W V V G G K S K A D G A N A I L L N G P Q F G W F N P A Y T Y G I G G H G A$ SNMWVI GKQRARDAKA IMLN GPQFGWFNP GYTY GUGGLH GA SNNWAVSGEKSAS GKPI LADDDPHLS LATPS ITWYQTRLEMK S N NWAAA GSKTASGKPI LADDPHLSLLSTPSIWYQMHLQSP
 SNNWVVSGDKTKS GFPILADDDPHLGLSTPSIWYQMHLQSP S N N WVVGGSK S GS GKP L L A D DP HLLSLATPSIWYQMQLKTD

SNSWTI S GKRTSTGKPI I ADDPHLAVQMPS $\quad$ WWYETGLHCC
SNMWVVGREHAKDARSILLNGPQFGWWNPAYTYGDGLHGA
SNNWVVSGEKTESGDPLLADDPHLGLATPSDWYETHLQNN





SNNWVLSGARTATGAPLLANDPHLGGQAPALWYFABLSAP
SNSWVLSSGTKTTTTGKPILANDPHLDFTQPARWYEMHLKGG
S N N WVVVSGDKT K S G F P L L A D D P H L G L L S T P S I WY Q M H L Q S P

S N N WVV S GALLSES GKPGLAANDPHLGGLTAPALWWY FA HV S A P
SNSWV A GP HK TK S GKVI FANDPHI GF SQPA TWYEAHLITP
SNSWVVSGEHTVVGKPLLANDPHLSASLPSVWYQMGLHCC

S N S WAVV S GK R S A T G K P II A N D P H L A F S A P G K WY F A L I I R S K
$S N N W V V S G E L T K S G K P L L A D D P H L G L S T P S V W Y Q M H L Q S P$


S N S WVII A P QK TA T G K V L F A N D P H I A G F S Q P S
S N N WAV S A EK S $\square T G Y P$ G LA N D P H L E LT LDP S I WY Q VQL H S P
SNNWVVSGKKTKS GK P L LAADDP H L GLLATPSVVWYQMNLLNTP


SNSWVVDGSHTDTGKPLLANDPHLSASLPSVWYQMGLHCC
S N N WAV G A E K S V T GYP I LA N D P HLL E L S L P S I WY QVQL H S P
S N S WVV A G K H T I T G K K P L L A N N D P H L T A A S L P S S V WY Q M G L H C C
S N S WVVV S G D K T A S G K P L L L A D D D P H
S N N WVVVSGEKTMK GK P L L A D D P P H L G L A T TP S V W W Q M Q L E A P

SNAWAVAGSRTASGKPLLAGDPHIRFAAPAVWYEAHLSYP
SNNWVI GGERTTTGRPDLANDPHRSHGAPS L R Y DSHLNA P
S N N WVV S GDKT A S GMP L LA D DP HLGGLTTPSIWYEMHLESP
SNSWVVSGGEYTTTGGKPLLANDPHLADPQLPSVWYQMGLHCC


S N N WV L A GKK T A T G L L P L L A N D P H L F T S A P A A W Y Q T H L E G E
S N S WV I A G R Y T T T G K P L L A N D D P H L A P P Q L P S V W W Y Q M G L H C C
S N S WVV S GKYTTTNKP L LANDPHLAP QLPSVVYQMGLHCC
S N A WVVVK G DK TVEG Q TVVYNGPQQGWYTPAITYAVGLHGA
SNNWVVVAGERTAS GHPVMANDPHRRDSVPSLRYMVHLVAP
SNEWVVSGEMTGTGKPI LANDDPHLQLGAP LLWYLARI EAP
S N A WAVVS GSHT AS GKPL LA GDPH\|RFAVPAVWYEAQLS YP

SWVLS GKKSKNGKPMLAANPNFAI GTPAIWYQMHLKS S
SNSWVVSGELTTTEKPLLANDPHLSAQLPSVWYQMGLQCC
S N N WV I G G S R T A S G K P L L VN D P H L A N Rll P S I WY L A Hil Q G S
S N S WVV G GKH T GSSGKPLLLANDPHLLSANMPSVVWYQA GL HCCC
SNNWVVAGSRTAS GKPMLASDPHLGHQDPSVWYLAHVEGG

SNSWVVA GEHTTT GKPLLANDPHLAPS DPSVWYQMGLHCC
SNNWVVDGSKTESGKPVLAD DPHLDLATPSIWYQVHLDSP

S NS WVV A G S R T T T G K P L L A N DP HLLSPSLDPSVWY QMGL HCC

SNNWALSGKLTAS GKPLLANDPHLGLSAPS IWWFAHLDAP
S N N WA V G GEKK S A T G L P L L A N D P H L Q L T L P S ill WY QMQ L C T P
S N N WII S GKRSAS GFPMLANDPHRAQSVVSLRYWVHLHAP
S N S WVI S GKYTTTGKPLLANDPHLSPQLPSVWYQMGLHCC


S N A WVV G GRHTRSGKPLLAAGDPHI RYAAPAVWYEA QLL A A P
S N NWVLS GDRTAS GQPMLADDPHLLGLATPSSIWYETHLLS S P
S NA WLL GPAKT THGHAVLYNGPQQGWYTPSVTYSVGLBGA
SNNWVIGSGAKSASGYPMLANDPHRSQATPSLRYWVHLDAP
SNSWV MAPAKTKS GKVILANDPHDGFA QPSVVYEAHVNVP
S N S WV VS GE H T T S G K PL L A N D P H L G A T M P G V WT Q W G L H C C

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GYDVT GNTPFAYPGLVFGHNGVISWGSTAGFGDDVD\|FAE GFDLVGNTPFAYPAILFGHNGNIAWGSTAGFGDGVDIFAE


 S I N V V S GV I F A GII P G I I L G H N D H I A W G V T N T G P D V Q D L Y i

 GYDVVGNTPFAYPSILFGHNAHVTWGSTAGFGDDVDI YAE

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

 $P$ Y N V






 QHELYGCYLAGTPFPLLAHNRNYAYGLTMFENDDIDFYQE RYDVTGYTFAGMPGVI I GHNQDIAWGLTNSGVDVTDLYLE
 $E L N V S G V I F A G V P G I I \quad L G H N D T$
 Q Y DV A GY T F A GLP GVVI GHNKDI A
 TYEMYGYHLA GTPFPMLGHNRKIA YGMTMFENDDIDDFYWE

## - <br> 

## P

## D






 GFELYGHHQA LNPYASLGHNQQFAWSLTMFQNDDLDLIAE $G L S V I G A G E P F L P G D S G G H N D Q!G F G L T R F Y M D Q E D M Y Q Y$
 N Y D V
 $T N H V S G V I D A G V P G I \quad L G H N D T I A W G V T N T G P D V Q Q L Y L E$ $G L N V L G V A F A G M P G I V V G R N Q H I A W G L T N L R A D V Q D L Y$



 GWNVVGAGEPSLPGVSVGHNDVASWGLTDFETDNEDLVYY


 NFNAIGATLPGLPGFP T L N V I G V T L P G V P GV V



 GF DMEGSGFDGYPG, MFGANNHFALSATAGYGNVTDDIE
 $G W N V V G A G E P T \quad L P G V S I G H N D Y G A W G L T I F E T D N E D L Y V Y$ $K Y D V A G Y T F S G M P G V V$ I TMNVYGATMPGAPGVII
 GFELYGHHQALSPFAL

GWHVVGA GEPTL
GYEKY GYHMA Gl
$T Y$ K K S G F S F F S G L

## QUERY

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UniRef90-I6ZSL0
UniRef90_S9ULK2
UniRef90_F2F6C0 UniRef90_UPIO004054874 UniRef90_F3NSA4 UniRef90_W9FSJ2 UniRef90-A9DWV3 UniRef90_UPIO00420DECE UniRef90_E5V3K9 UniRef90_M3C5E0 UniRef90-F3A6D5 UniRef90_H8MFL1 UniRef90_B5HKW0 UniRef90_UPI00038001DF UniRef90_UPI0002888CA7 UniRef90_-14X406 UniRef90_Q82H71 UniRef90_UPI0002F36E59 UniRef90_G2NHU5 UniRef90_UPI00047577E9 UniRef90_U3ATI3 UniRef90_I3U7K8 UniRef90_UPI0002EC88A8 UniRef90-J1RMH4 UniRef90_UPI000471DAC8 UniRef90_A0A024Q9J0 UniRef90_UPI000304E442 UniRef90_D7BU35

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UniRef90 D2B0S7
UniRef90_D2B0S7
UniRef90_Q7NJ44
UniRef90_M8DDR1
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90
100
110
120
RLS A EK PGYY LHNGKWVK MLS REETDTVKN GQAETATVWR KLDPKRPNYYQHQGQWKKMLSRQEVINVKDASPVTVDVYR
 K R N P A N K N E F L F N E K WE K A E I I E E P I K V

 KI NPENPNQYE LD GK WVDMQQVESEVQQASQESVNQUVRY

 KRNPNKPDEFLYDGQWEKAQVIDNTIVK KGKKNKVLDVMI

 KVSGDT YQYGNEQKKFKTRQETMVKVAGGKSQTDTVRS
 $K V S S G G G Y Q Y G G K T V P F E T R R E T I V V A G G K S R T I T V R E$ RLDPDDPTRYETPGGFEPFEERLEVI RVRGQEDVVVRVRE KIHPNNPNKYRYGDEWRD IIIREETVPRKNAGDTTIVI RE

 QINPENPEQYRTPDGWAGFTVYKEDIVKVKGQPDVDLVVRE


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

 $K$ VSPD G TYQYGGKE LK LDDTRKETVVKVAGGKDREFTI RE $R$ RQSDNPYKFEYDGEYYDAQVDKYSIVKVKGQDDEQFEVVN
 KLSGDG $\quad$ GLYDGRTKPFTTREETIVVAGGTSKK\|VVRE KFKNEYRNFYWHDDQWKPTHKREEVI HI K GQKPY HEQV DY $K \square T G D G G Y E Y D G K V R P F T T R E E T I$ TPNPEDPTQFRYEGEWEQAEVRKEP

 RRNPEDPYQFEYEGSYEEATVIEEEIVKVAGGQDPETHEEIRE QVNPDNPNQVS $\quad$ DNGQWVDLQSREETI RVKGGEDVSDTLRR EINPENKNEYKYQGRWEPMETVEEEI EVKGGPAQKVTMRF QPNPDDPT QF LY D GE WEQADVRDEPI RVVD GETVDFRVVT K V S D GK
$K \bigvee N A D G$
RFRDETQSEYWHDNQWKRTQFREE
K QHPERENQFYYEGKWEKATVIIEEP $K P N P E N P Y E F L Y D E R Y E P A Q V L V E T$
$K$ V $T$ D Q
K V T S D G
SLNPSNSKQYRYDGGSY K F FRSRKET
SLNPSNSK QYRYQGSY ■PFEHQQ■KI KVRNQPDHVLDVY D TDP P E D P D R Y RYR E G WE E ME T DRES I P V K GREAEDVV T K K


 K VEDDG

RI D A RNYAE S Y LF MG D WK P LT T RIE TITVK D SEPVTTLTVRD QLID P D G R H Y R A N G R Q R P K F N S D N P H E V Y Q E G K WE DV T V V V R EVI EVVK G E A S I P M E V R I
 RRHEDNPHRFLYD DKWYEADVIEETI HVDGEDPDEYEV DE

 Q I D S K N P G M Y R GP D GP LP F K VRQE I ID I K D S T P LT F LVV E RFKDNTKKEYWYNGAWKATTI RVEEFVVKGAESIIKDTVVS

 K I E S G K $\quad Y$ LIY D G K R V A FT T R R E VI K V A G G T S R E I T V R K KVNPENPEQVWY Q G R WV DLESRREET:KVKDGEPDVTLRLRR QRHPENPHEFLY DDEWVEAEVITEEEI IVS GEEPVVMHEIVI RLKEGDPHRYWYNNAWRPMEHKQVRI KVRGQDDVMLDVYR ETNPANRNQYRYKGTWVSMTTVSETIPVKGGQPVKAMLKY ETNPADSTKYKTKEGWENYEIVSRLIVIIKDSTDVAFSYRK K F S
ETNPKDTTGYKTENGWRKYNYKHKIIGVKGEDDVKFTVKS

## QUERY

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UniRef90_S9ULK2
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130

150
160
$T V H G N V V K Q D N S A N D A Y S K A R A W D G K E V S S L M A W D K Q A Q S$
$T V H G Q V M Q R D D A T H T A Y A K A R A W S G K E V Q S L G A W T R R Q A Q A$
T RHG PVVIS DK GKEKTKTVFS LIKWTA LIE PS A ELLA VL N M NK A


TRHGP MT D L A FKDTEPSASMQWTA LQSTAEELAMLIGFNKA
TRHGP IS EA G DS GKNVRDS LRRWTALDDPS GLDEAVL NMNKA

TVVGGMVVK S DPA R GVA Y AK QRT WD GL E LQQS LMA WTR K G Q S

TRHGGPI IS EFTHEDHKA TAKARA WE GFGELQS L M A WT HK T Q A

TRHGPVIS EFASDGKDTVFSLQWTALQPTTLLEAVLVABAA
TRHGPIVSNVITYKKPEALFSMQWTALEPTTLEAVMKMNKA
T RHGPVVSEAKDTGKDNVLS LKWWTAL E P T T L E A I LIE I N R A

TEHGPVVSDAPDRGDGYAVVLQWTADLEPKSMDAVFALENA

TNNGPLVSDAPDRGDGYGVSLRWTALTPRSMDAVFALNKA
SRHGPVISDVAFSGEAYVLTLAWTALRDRTFQAGLALLNRA
THHGPLI S DP LMMKNRNTAVSSLAWTGHKDTNMNAFMKLNTM
TRHGPIVSNDVVEPTAQFSMQWTALEPTRELQAVLDMNKA
TEHGPLVSDAPDRGTGYGVSLQWTALQPRSMDAI FADDRA
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T R H GP I I T GA LP DARKY A VA FA WTA L R PDTLQA GMKMNRA

T N NGPLLSDAPDRGDGYAVALLRTALDPRTMDAVFAIVRA
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TRHGP I I S EFAHDQRQTALLAMKWTADDATTLEAAVMMAKA


TNNGPLLSDAPDRGDGYGLALRWTALDPNSMDAVFEIDKA
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TKHGPIIDDKPDLGNENTSFSMQWTAL ETQELEAALLNI DKA

TNNGPLLSDAPDRGDGYGVALRWTALDPTSMDAVFAMDRA
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TEDGGVTSSSAPDRGD GYGVALLKWTALEPT TMDADFALLNRA
TRHGPVVSN ILDYDDAGAVFSMQWTALVATLELAVLNFNKA
T NNGPLLSDAPDRGDGYGIALKWTALAPNSMDAVFELDKA
TRHGP I I S EA GESGSNTVL S L R R WTALLDPSALEAVLNMNKA
TNNGPLVSDAPDRGDGYAIALKWTALDPKSMDAVFELNRA
T RHGPLI S EFAYPEPDTALSMKWTAHDPTTMEAFYQMNAA
SPHGPIVNDALANPTP $\quad$ LAMWWAFLETENP LDDAFYQLNRA
RHGP I LY QDEGSHTAWALRAA WLDDLGMAPYFGSMDYMRA
RRGPVI S DLLEDTGAGAVLSMQWTALEPTRLEAVLTYNKA NNGPVISDAPDRADGYAVSLRWTALEPRTMDAVFELNSA
GNGPIVVDAPDRGDGYAVSLDRWTALNPKSMDAVGELNRA
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 H H GPVVVFEDAKN HKAYAVRAGWLDRGCAPYLASLRMNQA NNGPLVSDAPDRGDGYA!ALRWTALDPRTMDAVVKLNQA

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 S GDGLVPVPGWTGDYDWTGFIPFEELPHALNPPSGQLMTA EGHSLIPRPGHDPNFDWSGYVPFEEMPYIFNPESGYIATA
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 K GD G GF PAP GWD P K Y R WT GY L P Q K S L P Y E Y N P K R GYY V T A
 Q G N G T 1
 ENQH $\ Q L P A Q G D G S M E W Q G F Y D F S H N P K A Y N P E K G Y$ I $\operatorname{S}$ S S W

 K N WT G L V PV V G D GRY E WA GY L P DQ L LP HK K DPVE GY V V T A
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 K GD GLVVPVPGWTNEFEWNGFIPPFEKCPEVVNPEEGFI VAA
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 $N$ Y T GLVVPVP GD GRF DWN GY L P DR QLDN KL N P S E GYY V T A DSAQTKLIMDGS GAYEPLRFLEFSENPSAVNPPWNYVYSA V GVG D WPVV P G W D S RYM WK GY

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#### Abstract

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QUERY
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NK LIPKELRAEGDC $\square N V R S D S A Q P D G G D R W Y E V V R P L L K Q E$
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QD $\mathrm{D}_{\mathrm{P}} \mathrm{D}$ D NMMD $\mathrm{L} F$ GSRGQT T
DNAS DELIRKSV PTAGMKLLPKMVLT FDIITDHLIVNASQGQVAS ILPEDGL NKLPKELRRPADDSGPADDLNGKARLVRECRWYEVLRKII QKLPKEVRVKDECLNVEPAGTTGPVDEDTRVWYEVVRKLV PNLSENLYARYTDTLYPVNND PRSTQPANASKLI WNALL QFVPEA AKPHDGSL
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 DEF EVKG $\square P M R Y P S R D R T V E M I L$
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DEDLGEFFSETYGRDWFE
$D E L G A D L A G K Y L L R G G G M \square G K V L P G A L A G$
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AKVPEVARPY $\square R S V P M K R V V D W \square T H$
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 RGDESGVPQTTDFFNGADRMSVLRSTFGQAMDRLRTEQGP KDEDNEWWQAPKTGPAKTRDELLLRALTDARWELTAELGK QQPNSNWWDNRQTSQVENRDQVFRAFTKAVDELERLQGK EKEDSEWWQSPATDATKTRDQLFERAMEDARWELTAKLGK LARSERWCDDVRTPRRETCDELAARALTEASVRLRERYGA KNGNSSWFDNIETPKQETMKDIDKKSIDEGVKKVDKEHGL QNQEGAWVK KSDWWVTPGNRTDQATETRDQLLARAMKDARWELTAKLGK DNDWWSTPKARTQKAANTRDELFKRAMRDARWELTAKLGK QGRWCADVSKPQGAKAQDCGELLAASLETADDDLERRYGA ANENSVWWDNDKTKNKETRKDIVSRSFHDAISALQNQLGN ADEDSEWWTRGTRPAAENRDQLFKRALIDARWELTAKLGK KGKPGPWMK EAGGLQRVAEKSFKHTVAAIEKMQGT GEDSNPDFDDVTTPRKENKNDI LRK SLVDALSYLETNYGK

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 DKPDDGWWKTSGRKGAKNRDDLLARAMKDARWELTSK GK
 DDENSDWWKVGDRPAATNRDELFKRAMIDARWELTAKLGK KQPNEKWFDNVNTPEKET DPDLAYTTFNAADDTLTARKGA K SAWWTTPRSGTRPGAVDRDGLFKRALDDARWELTAKLGK AGNDGVWDTEYDGAEK NNDWWTSPKSRTDEATDTRDELFARAMKDARWELTAKLGK DKNPGPWDNDQG GVEKLDEKSLKKTQADDTDMQGK DNEWWKVPAQGREEADDNRDQLFARAMEDARWELTAKLGK A GEEGAWMEAGGGFST VALTSFERAVDRGSELQGN ADAASPWWDRRGSEAVESRADTVKAAWQASLAHLRQRFGT EKPDGWFTE AERNQ MMLDSLGQAVAEVREKLGD AGNPGAWV SGYGGVDAWITDSFKRAVMSIADAYGD KDPASDWWKTRNTSGDKNRDELLRHAMKDARWELTAKLGK DDPNNAWWDRPGRPGDKNRDQLLAHAMADARYELTSKLGK NEPDASWFDDRRTPQKETMNDIVLNSFRASLETLTHAHGP EGKDA $\square W V E N A G G \square Q$ A G L A KDPKNHWWKTTGSPAATNRDELDKRSHKALKNKKRLGL KDPKSDWWSSPKTSATATRDGLFARAMKDARWELTAKLGK QGKQASVAQTVDFLKGQSADDVVLTALENTLDQLSKQYHS QWVREPGQRFGNPSA RSAFLKEAFESAVEGLEQRLGA ADPASPWWDDRKTPQREGCAD TVVKASFNRTVQELRQRHGD PAFGADPVKARNELLVSSLGKALQALTARLGS KEPNASWYDNDNTPKKETLTDLVNESFKYSCDSLERRFGP KKSESVWVT
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 EGRPNGWI E A A G G LDKLAADSLQAAVDRAVALQGS ELLDEATTKAVDEIVEIQGA TSPESPWWN ISKNPGSTTRDGLLHKAMTEAKKDLTSRLGK LNKESTNYKWVN QNPDSPWCDDPKTTQDESCLDSSSNAFDKALTYGSKEYGN KEPTAKWFDNDSTPNKETLKD VKKLSFKASVDSLTAKYGS

GEVPA GLLIVSLERAVVTLTQRLGA
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$Q G P A A G V P Q T \square D F \square Q$ KAGGMEALTTSSFKEAVARATELQGD QKKESVWWDNA LETENKKDIVLSSFVMALESLKEELGE TQPNSTWWDN LGTPQRESRDDI LVRALVNGRSEITTKMAR

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 DI GE WK WGDYHQLAFTHPlSPVPIGGSQVTVQAASYGENG NLSEWKWGDYHQLAFSHPLGRIPVGGSSVTVQAAANKEDG $D P A N W K L P V V P M R F F T N N F L G M P Q A G K G E E K Q T H D A M N R G$ KPAKWQWGDFHQLTFFDHT L GSVPQAGGSKVTVQAADDDLDG NSEKWKWGEAHQMSFDHWAKPIPAGGSAVTVQAASYNKTG APANWKVPVARLRYFTNNFMGIPQALEDEGAQTHVVMNRG NPEKWTWGKLHAIEKLFNRGTYPTSGNGETVNANRWKANQ DPAAWR】PAPPMVFAPKNFLGVPQADDKAVLSFSATQNRG NPREWNWGEFHNVLFEHPLSAVPMGGSGDTVAAASFNNSG SFKKWQWGDYHQLTFNHPLSPVPDGGSKFTVQAAANKENG NATKWKWGDHHKVAFEHPLDPIPVGGSSTTVKAAGYDDQG KPGKWQWGDFHQLTFPHPLASQPVGGSNDTVQAAAFKDDG DMKNWQWGDYHQVFFFNNQDPVPVDGSAVTPMAASYEENG DPKNWNWGKLHTVTFLFNRGAFATAGNGETVNANRWR DPAGWTMPVGANRFDYKNY LGGVPQAGSDEVLSLSPYMNRG DVSTWSWGRLHQLNDENQRGPWNLGGGEAAVNATGWNAAG NPQSWNWGKLHTTFRNATLGKSGVAPDEALFNRGAFTTSG DMDSWNWGRLHQLT LK K Q RGPWDLGGGEATVNATGWNA DPDRWRWGEVHYADHDHLVFRDPNGGDAFTVNAARYGAAQ $\square K K S W A W G K S H T L T H P H L L G P F M S G G S D K T V R A A G F S Y$ NSDDWKWGDYHQLTFDHPLAGVPDGGSNDTVQAAGFAADG DVT T WSWGRLHQLTLQNQRGPWNLGGGEAAVDATGWNAAG DIDTWSWGRLHRLFLKNQRGPWKLGGGEAAVNATGWNAAG DMGKWKWGKAHMARSEHRPFRVESPGDTYTVNVGRYNPFT TIS DWNWGKVHTVEHEHPDGKVAAPGSNEVINNLFFGFNE Di DTWSWGRLHRLF LDNQRGPWKLGGGEATVNATGWNAAG DLDKWQWGEYHVARFTHPLAPYAVGGSRVTVGAAGWDETG NPVDWQWGK IHSVTFKHMFGPFPIGGGGTTVFNTEYSFVT HPDKWQWGKFHQVDFAHPLGSVPMGGGRVTVGAAGWDASG SVSK WK WGSYNQLTEDHPLASLPVGGSSVTVQAASEDGSG ELTAMSWGEFHRVEFYHPLSPVPSDGSAVTVMAASHNEEG DVDSWSWGRLHQLNLKNQRGPWKLSGGEATVNATGWNAAG NI STWSWGRLHRLTLKNQRGPWNLGGGEAAVNATGWNA DMNAWTWNKVHTVEHPHPDGPYEVPGTREVINNDGYHYDN $M S Q S W Q W A K V K G T E D R H N A P P D K V G G G R S I V N A D T K R N G P$
$D \Pi N S W K W G A N H K L G F R H P D S E Y P I S G S K V T V Q A A K Q T D D G$ DVS S WS WGRLHQLNLKNQRGPWNLAGGEAAVNAAGWNAAG DVNKWKWGNGHTLGFRHPLSEYPISGSKVTVQAAKQNEEG KPEA WA WGQVHQLTYAHQMLGGPAGP $\square R$ RVFNSGPVPARG D $\square \mathrm{D} T \mathrm{WS}$ WGRL HRLE $\square K N Q R G P W K \square S G G E A T V N A T G W N A A G$ MSPEWQWSKIRHLSRSDKPFNAPPGGGSSIVNAMTKRKGP DMDTWSWGRLHRLF LKNQRGPWKDSGGEAAVNATGWNAAG D LA DWNWGENHQLTFPHPLDPVPMGGSNVTVQAAASTPE G
 D $\square$ S T WNWGRLHQLT LRNQRGPWNLGGGEAAVNATGWNAAG DPESWEWGAFHQUWPLDHFFNVPAHGSSVTVKAAGFDETG DSRQWAWGKGHTLTHEHPLLGPFAVPGGHEVPNNLSHRV G
$D P Q A W K W G T L H Q A V F L H P L N A L P I G G S G Y T P M A A S Y G Y N I L$ DADNWKWGDYHQLVFPHPVGGTPVGGSHVTVQAAGFNYDG DIDTWSWGRLHQLTLRNQRGPWNLSGGESAVDATGWNAAG NIDNWSWGRLHQMFLKNQRGPWNVGGGEAAVDATGWNAAG LSPEWAWSKVKATHLSKQLGPFDSGGGGSSIVNADTTTHG KMNDWQWGDYHQVFFFNNEAPLPVGGSKVTPMAAAYKTTG K $\$ A D WQWGKLHTVTFNHPLGPIPI GGGFATVNNQSFERNK DI NSWSWGRLHRLTLKNQRGPWNLSGGEAAVNATGWNAAG DID TWSWGRLHQLTLKNQRGPYKLGGGEAAVDATGWNAAG DPNDWK $\square$ PVATMGFSNKNSVGDPWADQAHQQQLSTYGNTG DMSQWRHPLSGLLPDRRDLGPLPRGGNGYTPGSTGNNMNQ DPTDWRWGMEHRAPDAHQVLGIETDGGNQTVNRGGSAIRD DTTQWQWGKGHSDTHAHPLGPFAAPGGHEVPNNLSHRVG
 NMKE WK WGDYHRLYFEHPFSPLPVGGSQVTVQSAGFNEAG D $\square \mathrm{D}$ T WS WGRLHQLMLRNQRGPWNLSGGEAAVNATGWNAAG DPTRWRWDRVHQAVFPHNPFRVPTGGDSFTVNFAPMRLA DVKAWRWGDLHALTLLFNRGPLPVSGNDDAVNAAGWDDYA NPQAWRWGEYHRIRYTHPLAAVPMGGSRQTVCLMGFDGSG DVSTWSWGRLHQVKFLLNRGPWNLSGGEAAVNATGWNAAG DI STWSWGRLHVVKWLFNRGPYQLGGGEAAVDATGWNAAG NVDDWNWGEFHRVYFAHPLDPKPVDGSNVTVMAASFGDDG DPGRWSWGRYHRLQPPHPVGSYPIGGSGVTVGAMSFGGDG D DDTWSWGRLHTLT LRNQTLGTE GPGVKYMLNRGPYRMSG KAEKWRMPIKTMTFGEKSLIGQPHGYGSMTP $I I E M N R G$

 DQSTWSWGRLHQLNLKNQRGPWNVGGGEATVNATGWNA
 $D P G Q W T W G R V H T L T H G H P L G P L A A P G G R E D P N N D S H R D G G$ DPNEWVWGEFHQVLFNHPLTPLPADGSR\|TVKAASYNSTG QPAQWRAPAVSMLVAARNADGVPWSDPAYEHRVTPYLNTG DMANWRYGVDGAMQKR $\square N G Q V A R G G Y G E T V N A T S F D L N Q$ SSSKWTWDKVHTLEHGHPIGPFPVEGTREVINNMFFTYTA EPSSWKWGRLHKLTMTNQRGPYELGGGSSLVNATAWDASK



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SNNWVI A P AKSATGRA\|MANDPHRAYSAPSLRYIAHLNAP
 SNS WVI AP SRRSTTGGAILAANDPHDAYSNP GTWYEVVHLKA G SNNWALSPSRTTTGRPILANDPHRGDGVPSSRYVAHLNAP SNAMIVGAKKSKSGNALLFSGPQVGFVAPGFLYEVGLHSPB


$S N N W V$
$S N L A$
S L GPERLD GARAVL $\square N G P Q F G W Y R P A Y T W S V G L H G A$


S N NWV I G GARTAS GKPL LVNDP HLLGNRUP S I WY L A A M M G G
SNLWWILGPKKTTDGGTMLMNGPQFGNFNPSYVYSIGGHGA
SNNWVIA PGKSTTGGAVMANDPHRAYSAPS LRY@AHVSTP

SNNWVI APDKSATGRAI MANDPHRAYAAPSLRYYQQQI A P
S NA WAI A GSRTKSGKPLLAGDPHDRFSVPAVWYEAQLSAP
S N NWAL S GAKTRSGYP I LA NDPHLDDSLPSSIWYQDQLHAP




S N N WAI S S Q K S S T GYPP ILLANDP H L S N S WVV S GE H T A S G L P V L A N D P H L G P QMP S I WY Q T G L M C C

 S N S WVV I A P E K T K N G K V I FAANDPP H I G F S Q P S SVVWY W A A H I S T P
S
S

SNNWVV
SNNWVVAPERTS
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S NS WVVVA GSRTTT GKPLLAANDPHLAP HMPSI WY QA GL HCC
SNNWUVSGNHTQSGYPMLANDPHRAVSTPSLRYMTHLVGP S N A WAVAGSHTRS GKPLLA GDPHDRFSAPSVWYEAHLSAP S N A WAV S G S R T A S GK P L L A G D P H I R F S L P A V WY E A H L Q A P SNS WVI GGA HTAASGK P L L A N D P H L G A A L P S V WY Q M G L H C C
S NS WVV D GEHS AT GQP L LA N DP H L G DSQP G I WMQT G L H C C




S N S WVV S GTYTTTGKPMLANDPHLAP QMPS LWYQMGGLHCC

S N S WAV A A HRA $\square$ G G GPLLAS DPH LDA DTMP S LDWYENHL S G G
S S DWAl GP QRSRS GK SLLLAND DHQP IGVPSAWSYVQI RAP



SNNWAI A A QKSATGYPILANDPHLSLNLPSIWWU1QQLHTP
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SNSWVIA PSRTATGHPILANDPHLAFGAPGPRHVIHLTAP
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S N NWA I A P Q R S R S G K S L L A S D S H GP L A A P S L W W F

S N S W V V A G S R T T T G K P ML A N D P H L L S P QM P S l W W Q Q GL L C C
SNAWAVSGEHTESGEPLLANNDPHLLGASMPSTWYQMGLHCT

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S N N WVV G G E L T R S G E P L L A D D D P H HL G L G V P S L W W L A A H L Q S P
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S N S WVVSGELTTATGAPLLANDPHLSPAMPSVWYQVGLRCC S N S WV V S G S R T T T G K P L L A N D P H L A L SNNWVLSGERTASGKPLLANDPHLKFGDPSAWY LARMVKTP
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S N S WVI A A DKTKNGKVI FANDPHI GFSQPSVWYQSHI K T P
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UniRef 90 - A 4 C 2 FF 9

90
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ELINPANPHEYRYKGRWEPMRIVREQIAVGGGAPVTAEVAF KVNPDNPNQVRYHDQWVDLISSEQQI AVKGQAPVTLVLRQ KFKDDSHQNYWYNNKWNKTRSRVEKIKIRGTSTELDTVFY RLRPGNDTQYQTPDGWAAFETRTETIRVKGAPDVVLKVRA KVNPENPNQVWYQGRWVFLQSRVETILVKGGEPVKLTLRR KLRQGNGLSYEVAGKWQPVTVRNETYFVKGQRPIREAVYE KLNPDNINQVWYQGQWVELDSRTEQ VEVKGEDPVTLTLRR ENKVDDANSYLTPKGYQKYTDQDKIIKVKDSSSVNLKVKD KLNPANPDETIYGEEFRPDQ\REEQIPVKGQDPUKFEIRE QLTAPGADTYETPDGPLAFTTRSETIQUKGAEPESFTVRE TFKDKKRDFYLVDNEWKKTTKRDEKINVRSGATVFDTVYY R向EDGAA VVDGEPEPDETREETVRVADGEPVEFTVRS KTNPENPNQVWYQGKWVDMTSTEQQI KVKGQPDVTLTLRQ QLDASGNRYRGGNRWLPDTRDAERIKVKGADDTVLTVRGL ESHATDYLKYRKGSSWGNYETVHKTIKVKDAEDVQFSYKK ETHPTEKEKYKGKNGWAAYETVTKKIKIKDSIEYEFSYKK NFKDSTDREYYYDDKWKTTTLRDDTIKVKNKSTVYDSTYF KVNPANPEQVWYHGQWVDDTHEEQNI AVKGQAPVKLVLRS KTNPENPDQVWYHGQWVDMTSTEQQI AVKGQAPVSLTLRQ QLDPKNPGAYRGPEGSLSFKVRQEII DIKGEPPLRFLVKE RLNPDNPNQVWYRGQWVELQSREELI EVKGAEPVKLILRR ELDPADHDRYRYGDGWERVEVEEQRI EVAGEDAVTVETRH KPDPQDPSRYLTPDGSEPFETRAETIAAAGEASQTLTVRS K DTGD AYEYKGSREPLQTRVEEIKVAGSDPVRITVRA ETHPTNPNLYKAGGEWRKMTVVKDTIKVKGKAPIIVELKY KVNPNNPEQVWYRDKWVDMTHSEQQI AVKGQAPVTLVLRQ RVNPDNANQVWYQGNWVDLQQRTETI RVKDAEPVQITLRR KVTGDT
QVEGATWIDQ YEYDGQQVPLEKRTERIRVAGGKDVTITVRS NTHPDHPDRYWHDGAWREMTRRRETI AIRGAAPREIVLRY DTNPANPDQYRYRGGWETMRTVDETIPVRGQPAAVRQLKF ELNPANPHEYKYKGRWEPMETITEEIVVKGSTPRKVTIDF KLNPANPNEILVGDSIIFPISSRKELI QVKGQAAVDFEI RE $K T N P E D P Q Q V W E N G Q W Q A L T S Q T Q W I V V K D Q E P E Q L I L R N$
$R T R G D T$
$V E V G G E W K P M E V R T E Q I K V A G G P A V E L K V R T$ KVTAD SYLYDGKQVPFRTRQETIKVAGGSSRVITVRE
 KFDPTDPTRYEYQGQWEDAELVRE EVVVRGQEVVIEEVRD KVDGD KVVQVDGEWQPLITRTETMKVKGQEDVSETVVA DTNPARPDEYRYKGRWEKMRQVDESI PVRGQSAAVRQLKF KFKDGQMNEYWYNNRWNKTSRRVEKIDDLGQKPIYDTVIY KTNPDNPNQVWYHGQWVDMTSSEQQI AVKGQEPVTDTLRR QLDD NNPNQTVYGDEFKPLKTRLERISVKDKDPIDFEVKE KFKDDSRQEYWHGGQWKKVTRRIETVKVKGKPDVDDTVLY EQVPEDSLYRTPEGWARFETFEETVRVRGGAEVKFTVRA
 RTRANDSSQYWHAGQWRKMEEETVSUAVRNAEEQSVTLRF ETRPDDPESYRYGEGWERMRRVEERFAVKGAPEQVRTLRF K TRRQGSSTYEVNGKWQPVAVRNETYFVKGQRPIREAVYE DUHPDNPTQYFYKGNWVDMTMVQDTDKVKGRADEIVTHYY RLDGDTMEYMYDGSRLPDSSRRETI QVKDOPSVEVVVRS REVDGT YMYDGSRLPLSSRRETVQVKDQPSVEEVVRS QI KPDDASRYRTPEGWAPFQSFAETIRVKGQADVSLTVRA DLKPGDPTKYRYRGRWASMKTVEEDIPVAGGEARKASLPF KLKQEDSDYY EEAGGG EETPDGEG YRYKGQVRPYRVREERDRVKGGREEVFKVRE DLDPADPDRYRYKDGYEKMHTVTEQIAIKGEAARNVDLKF KLD STRQYYFLDGRWQPFEDIKDT:KVKNQKTEVFE:RK KI RDAN
ovsGDG
QVSGDG YL RDGLDKPLETRQEV KV DEDGKAYLTPDGSEPFERREEMIAKKGEAPVVMTVRS RFDPADPLRYQWRGTWEQAEVRRETHVVDADDVLTKE
 KTNPDHPNQVWYHGQWVEMTRSEEQUAVKGQAPVT TLLR KLDGDSA

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T RHGP|VI|FAD R QRAFAVVRSCWLEPGMSPYFGS $T$ GYMHA THHGPIVYEDATHQHDYAVRAGWQEVGCAPYLASLRMNQA TRHGPVIKVDAAHHRAYAVRAA WLEPGMSPYYGSLRYLRA
TVHGPVISMEKEKNVAYSKSWSFRGTGAQS $\quad$ QAYMKANWA TRHGPVLRVDGEHHVAYALRTTWTEPGTAPYLGSLRYLRA TPNGPVINDDSLGATPMSMWWAFLTTENPVQQAFYELNRA ShHGPVVFEDAKHHKAYADRSGGDEQGSAYYGASDRMNA TVHGPVVARDEDANLAYAQQRAWSGNELGTLTA WVVEMNKA
 TRHGPLINGFIRRAMGTWLALQWTGHFPGTVLTSLKLNRA TRHGPIISDVSGTGETLAFRWTSDDEEDATI RAFLNUNAA
SDYGVVSEDDPQSHTAYAFNRTWKGREDQTLLAWVNSTKA
T R H GPVIVI DAEKHRAYAVRSAWLSPGMSPYFGSVGYMRA
T RHGPVVI DSHARAKA LALRWTALDVENQSVAGLLEMNRA

SPHGPIVNDALGANTP DAMWWAFLETPNP LEEGFYQLNRA THHGPVVYDEKPNNDPTGSALRWIIAHEQSNELTFYLLNRS



SVHGPIMNNVLPTSNPVASWWVYILEPSRALEATWKMARS
SRNGPIVTDVVNGGGVLAFRWVALTDDDPTLRAAFAANTA
THHGPI SVTEEPNNDPTGAALKWVAHDPSNDLDTYELNRA
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TRHGPLISDAGSQERPLALRWSALDDEDRTDEAFLELATA
TTHGPVI HEDP DENDAFAVRTVVWTDPGTTAYFGGI GYMRA
THRGPILNDQDAGDRPVSMWWVYTEAKNKVLNALYGMSHA


SPHGPIINDVLGGNTPIAMWWGFLETKNPILEGFYQLNRAA


T R H GPV I S D G GSA GPVLAALSFP GLADDDTSAEALYRLNHA
T R H G P I V S D EP P A G E GTA A A L R W V A L
THHGPVVHEDPKLKTACAVRCAWLEVGGSPYDASLRMGQA SPHGPIVNDVLGANAGHAMWWGFLESRNP LDEAFYQLNRA S PHGP I NDALGGN TPDAMWWAFLETDDNPTLEAFYQLERA



 T DHG G I MNSVSKTSNPVASWWVFVLEPTKALEA IVKLDNA S SHGPIINDDGQTSDTPVAMWWAFLETENPDLDAFYELNRA
T A HGP I I S DVLGGDARGMEVALRWTADLPRTADA LLLLNRA
TRDGPVGQTAPDRRDGYAVALRWTALTPKTMEAVFELDRA
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T R HG P VVVVDKKHNKA YAVRTVWSEPGTSAY LGSLNFQRA
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T RHGPLLNSAVGTPTA LDNSSLTPDLKGDKTLDAFFDLLSRA
S GHGP L L S DDDEQRD GYA DAL S WTALLAPRTAADAFT L NTA
T R H G P V I HVVDPVRHKA Y A L R A A Y L E P G TAA A Y L A S L R R L N A A SPHGPVINNVLGDNTGIAMWWAFLDTNDRSLLEGFYELNRA SVVHGPI MNEVVQLTTTNPVASWWVY LDEPTRALEAVYRMNHA

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S DYGPVVSDDEETAPP LAALRWTTLLDEEDPTIEAFRRI GLAA RHGPVVYADLRNNRAFALRS $\square$ RWFEPGSSAYFSSFGLMKA
T
T R H G P V I Y V D A D K H I A Y A I I R S V W W Q P G T A P Y L
TKHGPIVSDEGLGGVRYRLALEWTALQPRTATAIFALNRA TV $V$ GP I MS D V VP A DDA YA V S L A WTA L T P T TA DA I FA L NRA TRHGPVIS DVPSADHVLSLQATWWGSEDTSPEAAWGLSRA
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## UniRef90-B7A530

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K S F N S F K R A 1 VN WD A P V V L L VY A D V K G N|I
180 K N WE EFRKA CTESR DP ENMI WADKK GH I S S LQQE CS K VVV E LDPSP L NVSYYA D A N G N I
 RDFGEFAAA LDRHWGPPEN HVLYA D T G G N DTLEKARNAASKTHAPLNTVWANAKGD KNVLDFRKHVALIAAPLNVMYGDAAGN RNWTEFRKACLYSRVPENMLWADKTGT
QDFDAFRAAVANSAVNVNHYADAQGN
GNWSEFRAAAAKFEVPQNIVYADVDGN EDWQEFRKALALDTPPQNVTYADARGN
$H N W E E T T A L R D Y K A P Q N F V Y A D V E G N$ QSYEDWLKGAKNVATTGNWYYADKDGN
RTFAQFRQSMMNWAPENQVYADTKGN ADLDQFKQALRKNYAPQNVVMADTEGN: SDDAGFEQAVGLIHAPLNVMYGDARGN DTDAKARSAASKVQAPLNDVWANARGD HNYADYRKALSYTAPAQNFVFASKDND RDWAGFTAALRDFHSPQNIVYADVDGN NTLEKARNAASKMHAPLNVVWASASGDI

 TDFPSFREGLRDFYWPQNDVFADTGGRI
NNYGDYRKALVFFTAPQNFIFADNQDN SDFEEFRDAARSFEVPQNLIYADTEGT NTLEKMRNAAEKDQSPLNIVWANHQGD QNWQAFTRALSLYNAPQNFIYADRDGH: RDRTEFENSLKDIHAPLNTMYGDVEGNV LDNDDEFKSELPKIHAPLNDMYGDAEGNV

190
200
G WA P G G L A PKR P
GWQAVGISP门R

| $A W W G V$ | $R F$ | $P$ | $R$ | $K$ |
| :--- | :--- | :--- | :--- | :--- |
| $G W V V$ | $G$ | $L$ | $V$ | $K$ |
| $G$ | $V$ |  |  |  |
| $A$ | $Y$ | $H V$ | $K$ | $Y$ |

A Y Y HV G KYP $\quad$ I R
G WVT A G L A P K R
G WVT A GLLA P K R
$A W W A ~ A ~ G L L P ~ Q R ~ P ~$
S WT T S GKLLY QH Q
GWQSVGLAP $\quad \mathrm{L} R$
$\begin{array}{llll}G Y V F G G F & Y & P K R A \\ G Y Q A & G R D P & V & G\end{array}$

 GYYAP GALP IRR | $G$ | $Y$ | $V$ | $P$ | $G$ | $Y$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $P$ | $V$ | $R$ | $R$ |  |  |
| $P$ | $G$ | $A$ | $A$ | $P$ | $R$ | $P$ | A Y Q A A GVAP KRLL

 G WWA A A L L P K R P A $\square$ T A N GKFP LK W G F Y A P GRVP L R R G WWA A A KLLP IR P G WQVT GRFPNRR | $G$ | $W W A$ | $A$ | $A$ | $Q$ | $L$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $A$ | $L$ | $R$ | $P$ |  |  |
| $Y$ | $K$ |  |  |  |  |

## A WWA T AKLLP IR P

 A Y LA P A RVP I R A $A D T P N G Y F P D V S$ GWWA A A QL P I R P GYHA A GA $\mathrm{P} \vee \mathrm{R}$ A D T LD KARAAAQKKIQAPINVVWANAKGD A WTPKGKFP IR W DSLSKARTAATLI QAPLNLLWANTQGD GWWAAA QLPVRP



 D T LA K A R GASAK IHAP L NVVWANAKGDI NTLGKARAAAEK I EAPL NVVWANAS G D I $R D W P S F R A A A Q Q F Q V P Q N L V Y A D V D G N$ GDWDEFRAAASDFAVPQNMVYADRDGH
 RNWDQFRAAMNRWGAPENQVYADTSGN I HS IDEVVADAA GLIHAPLNIMYGBSAGNDI NTLDKARHAASQIHAPLNVVWANTQGD
 QNWDEFRAALQD WDPPQNVVYA D $\square D G H$ $K N Y P E F A S A M R T W K T P S N L V V F A G G D G D$
$R D W E S F R D A D A D W T P ~ P ~ Q N F T Y A ~ D V E G N$
 TNWADFRAAAALFEVPQNLVYADDDGN I Q N WN E F VA GME K H Y T P E N M V Y A DVV D G N K NYDDYRKALHYFSAPANFVFA SKTDI D T LDKARAASSKVSAPLNVVWANAKGB Q NIGQEVESAVVRLIWAPLNVMY GDKTGN KNHAD YRDAL T Y Y GAP QNFVFA DVNKD S SVPPAF DEAAAN DAPMQNMVVADRDGR K NWAEFKAA LTSHYNAPQNEVYA DVDGN G G WE EF NE A L R LLYKAP QNFVYA DEEGN I $H$ DWTS S C D A L RAHTSPTN FTYA D Q Q G N
$R S L D E F R A A M R R W G A P V N Q V Y A D T A G T$
 K T WE EFREACGFNHIPAANMVWA DK E G N I

 $G S V G E F V N A A E K Y$ K AP Q N M V V A D V D G N KNFDAFSEAAREWKAPSNLVYADKKGD
 R D WR E F N E ALL E S Y VA P Q N F V Y A DVV G
 ASFEQFKDALAHWGAPVNQVYADVHGT T NWEEFRDAAELFDVPQNLVYADTEGN T NWSDFRKAAALFSVPQNLVYADTAGH
 GYYAPALVPVRK
 K S L H D F K E G A K L L H A P L N M M Y G D A K D N I A W I A S G K L Y K Y R



UniRef90_A1WNoo UniRef90-I2ESN9 UniRef90-M6CZS5 UniRef90-K0K8K7
UniRef90 Q45TR7 UniRef90_UPIO0047DFAE3 UniRef90_C9YFP2 UniRef90-G2Z756 UniRef90-D2QBD0 UniRef90-K2H9B8 UniRef90_UPI00037B1D37 UniRef90_I015D8 UniRef90-A7NJ94 UniRef90_A0A021WYW5 UniRef90_B2U195 UniRef90-B1XUE3 UniRef90-A4CKW7 UniRef90-W4NYG7 UniRef90_S6JEG5 UniRef90-A6E789 UniRef90_G0EX63 UniRef90_Q21Y74 UniRef90-A0A010SUW4 UniRef90-K6YTD3 UniRef90-UPI00046881EE UniRef90-S2D9A9 UniRef90-I3TL14 UniRef90-F4C9E8 UniRef90-UPI0003472924 UniRef90-W0HFJ8 UniRef90-U5QHE1 UniRef90-D8JBQ2 UniRef90_G0L492 UniRef90-A4ASG0 UniRef90-A1ZXD3 UniRef90-A0A024HQK8 UniRef90 S6J2Y7 UniRef90-M1SUD9 UniRef90_UPIO0046B0198 UniRef90_UPI00047EA23E UniRef90-G7ZGA9 UniRef90-D1ABA8 UniRef90-F4L7J0 UniRef90-UPI000467E4A0 UniRef90-F4DPW0 UniRef90-UPIOOO4764366 UniRef90-R7XSI1 UniRef90-V8A8C6 UniRef90_UPI00047E6CD6 UniRef90-F8GMB7 UniRef90-UPI000407017F UniRef90-UPI0003B43793 UniRef90-D2B301
UniRef90_F8JX84 UniRef90-A9WGJ9 UniRef90_UPIO0036792D4 UniRef90-A7NJS5 UniRef90-S6JAD4 UniRef90_A4XD25 UniRef90-E3HEP8 UniRef90_UPIO003B61CF8 UniRef90_M4K636 UniRef90-I3Z7L7 UniRef90-IOK4L7 UniRef90_UPI000475D3D8 UniRef90_D7BBE1 UniRef90-Q1AUIO UniRef90_K7TC85 UniRef90_UPIO0042279ED UniRef90_Q3KH00 UniRef90_K1L6R5 UniRef90-UPI00037CE1B9 UniRef90-UPIO0035E2D03 UniRef90-UPI0004779952 UniRef90-W0SHV4 UniRef90_S3ZYM2 UniRef90-V4EPC0 UniRef90-B7A530 UniRef90_A0A023X3N0 UniRef90_S5S5G8 UniRef90-IOAHI3 UniRef90-FOBCN6 UniRef90-K9AKI5 UniRef90-UPIO003644B0F UniRef90-H0S412 UniRef90_UPIO0038136F7 UniRef90-E1IBQ9 UniRef90_UPIO003A3A7C9 UniRef90_UPIO002890BB3 UniRef90-Q47PE0 UniRef90_U1IJJ2
UniRef90_A4C2F9



 $K N F T G L V P V P G D G R F E W S G F L P D D Q D P N K L N P P E G Y V A T A$
$D G H D G R L P V S G E G D M D W L G D M P F E T N P Q V L N P S T H R I D N W$ KGDGRWPAPGWDSAYDWKSFIPFEELPSEYNPQRGYVVTA VNLGLVPAPGWSPDFDWQGWIPVEELPHLYNPESGVIVTA NGDGRLPVPGWTDEYEWAGYVPFEELPHVYNPPQGYIVTAA PAQDQRVPARGDGSMDWQGDRAFADVPKTYNPEQGWUANW LH HGLYGVAPWEKQYDWNGYVPYEQLPSSNNPDQGWIATA

 $K D Q G K F V L D G A D P K N D W R G W I P A E Q N P T V K N P S R N F V S S A A$
$A D N D L A P A P G W D A R Y D W T G F I P F E A L P H R Y N P A D G V I V T A$ A DNDLAPAPGWDARYDWTGFIPFEADPHRYNPADGVIVTA
$D G V N P S F D D G S T A A A D K L G F Y R F S D N P H E E N P Q R G Y I V S A$ EGEGGLPSPGWEGRYDWDGYADPMDHPYDQDPAQGWI GTA


 KGDGRWPAPGWDSSYDWEGYLDFEDDPSVRNPDSGVIVTA EGVNPYILDGSTAQADKLGFYPFSANPQEENPARGYI I SA $E G D G S V P V P G W Q G R Y D W Q R Y V P F A G L P H T F D P P E G W I V T A$
$N$ DSVNTKFIYPNQGLPTQKQYLDFSNNPHAINPESRYVYSA NSANTKVVLKDSSDNAPERYLDFSENPQAI NPPWKYVYSA $K E Q G K F I L D G S N P D H E W Q G W I P N K Y N P T D K N P E R G F V S S A$
$Q G V N P N F I D G S T P A A D K G A F Y P F G E N P Q E E N P A R G Y I V S A$ AGVNPAFIDGSTNAADKDGFYPFSANPQEENPARGYIVSA
 AGVNPSFIDDGSNGEAEKSGYYPFTDNPQEENPPRGYIVSAA $\begin{array}{ll}K G D G S V P V P G W T G E Y D W T G F & L P Y Y A\end{array}$ $K G D G T W P V P G W T G E Y E W T G Y Z D F D E L P S V Y N P R S G Y I V T A$
$Q$ AGVPGFLPDGSSPEAEKEGFYPFSNNPQEENPARGYIVSA EGVNPTFIDGASGDADKDGYHPFSANPQEENPQRGYILSA GGDGTMPMPGWSSGYGWTGTDPFEELPSVFDPPAGYIVTA SGNTGAMPAGWLSANDWTGFIPFDGLPNVLDPEEGFIVTA PHHDGLMPAPGDGSFDWLGLRPDEDLPHQFNPAKGWFSTS
$P D W S G L L P V P G H G D F E W N G F L P T S S L P K A F N P P E G Y D A T A$ N WDGLTPVAGDGRYEWAGYRNMDELPWAFNPAPGYIVTA ETVHSUFADGSDPETGPKGWYPFADNPQS VNPEDGFVASA

 QSDGSDPVPGWSGEYEWAGY I PFVELPSQLDPPAGALVTA
 EGLGLFPSPGWDSRYDWEGYADPMLHPYDQDPAQGWLGTA KGDGRWMAPGWDSAYDWQGFDPFAELPSVLNPPAGYLVTA RADWGMLPVPGNGDFEWRGVLPGNALPRAYNPPEGYVATA KDQGKFILDGTDPANDWHGFIPFEHDPTDKNPARGFVSSA PGVKGLI LDGSTHEGDKDGFYPFSANPQEENPARGYVVSA AHVNSKVFLDGTSNDEPTGWMPFEENPMSDNPESGFVASA KGQGKFLLDGTDPNDDWRAFDPAEHNPHVKNPARGFVSSA PDNDLKGQVPWEARYDWVGYLDTS LTPREIDPARGWI ATA $P G H S G L M P V P G D G N W D W Q G Y L P Q E E W P Q V Y N P K E G F I V T A$ EGHSGLAPVPGDGRWDWEGSVPFESWPRALNPREGFVVTA N WRGLAPVPGDGSHEWDGMMDPALMPLRANPPEGFVATA EGEGLLPSPGWEGRYDWDGYADPMLHPYDQDPAQGWLGTA SHSGLVVSLG DGSMDWEGYQPDTERPHDTNPATGFFVTA $R R Q G D F L M Q G T D S S Y M W K G F I P S K E N P T V Y N P A L G F V S S A$ GSTGEWPVPGWSSRFEWTGWVPFDQLPSAFDPSEGYIVTA $E G D G R F P A P G W D P D H A W E D Y L P F E E L P S V L N P E S G L V I T A A$
$A D N D L R P A P G W E A R Y D W D G F L V A D K T P R E I N P P R G W I A T A$ K GYDGLLPVPGDGRHEWTGFSNSDDFPSKLNPKTGLVSSA K GRGLCPSPGWTGEYDWKGF LDPSDHPSLKNPERGYIGTA A GHTGMVPVPGNGDWDWLGYRRPEEWPQVLDPPRGYIVTA EGHTGLYPARGDGSQDWEGYVPAAEWPRVLNPERGYIVSA

 TAD GMMPRQGWESAQDWQGWIGFDELPSLFNPERGWIVTA SATPAAPPPGWDSQWDWKGYVPFDDLPNTFDPAEGFIVTA K GDGWLPVPGWDGKHDWSAVVPFDDLPASFNPSNGVIVTA PGNGRLPSPGWDAKYDWEGYVSYDDLPTRYNPDGGUI ATA QHDGTLPVPGWDGAHEWREFIPAEAMPSALNPPDGMVVTA



UniRef90_A1wnoo UniRef90_12ESN9 UniRef90-M6CZS55 UniRef90_KOK8K7
UniRef90_Q45TR7 UniRef90-UPIO0047DFAE3 Uniinefoo CcyYFP2 UniRef90-G2Z756 UniRef90-D2QBDO UniRef90-K2H9B8 UniRef90-UP100037B1D37 UniRef90-1015D8 UniRef90-A7NJ94 UniRef90-A0A021WYW5 UniRef90-B2U195 UniRef90-B1XUE3 UniRef90-A4CKW7 UniRef90_W4NYG7 UniRef90-S6JEG5 UniRef90-A6E789 UniRef90-G0EX63 UniRef90-Q21Y74 UniRef90-A0A010SUW4 UniRef90-K6YTD3 UniRef90-UPIO0046881EE UniRef90-S2D9A9 UniRef90-I3TL14 UniRef90-F4C9E8 UniRef90-UPIOOO3472924 UniRef90_WOHFJ8 UniRef90-U5QHE1
UniRef90
D8JBO2 UniRef90-D8JBQ2
UniRef90-GoL492 UniRef90-A4ASGO UniRef90-A1ZXD3 UniRef90-A0A024HQK8 UniRef90-S6J2Y7 UniRef90_M1SUD9 UniRet90-UPIOOO46B0198 UniRef90-UPIO0047EA23E UniRef90-G7ZGA9 UniRef90-D1ABA8 UniRef90-F4L7JO UniRef90-UPIIO00467E4A0 UniRef90 F4DPW0 UniRef90-UPIOOOO4764366 UniRef90-R7XSI1 UniRef90-V8A8C6 UniRef90-UP100047E6CD6 UniRef90-F8GMB7 UniRef90_UPIO00407017F UniRef90-UP10003B43793 UniRef90-D2B301
UniRef90-F8JX84 UniRef90-A9WG.J9 UniRef90 UPIOOO36792D4 UniRef90-A7NJS5 UniRef90_S6JAD4 UniRef90-A4XD25 UniRef90-E3HEP8 UniRef90-UP10003B61CF8 UniRef90 M4K6336 UniRef90-13Z7L7
UniRef90 10 K 4 L 7 UniRef90-UPIO00475D3D8 UniRef90 D7BBE1
UniRef90-Q1AUIO UniRef90-K7TC85 UniRef90 UPIOOO42279ED UniRef90_O3KH00
UniRef90 K1L6R5 UniRef90-UPI00037CE1B9 UniRef90-UPIIOOO35E2DO3 UniRef90-UPIO004779952 UniRef90-WOSHV4 UniRef90-S3ZYM2 UniRef90-V4EPCO

## UniRef90-B7A530

 UniRef90-A0AO23X3NO UniRef90_S5S5G8 UniRef90-IOAHI3 UniRef90-FOBCN6 UniRet90-K9AK15 UniRef90-UPIO003644B0F UniRef90-HOS412 UniRef90-UPIIO0038136F7 UniRef90_E1IBQ9 UniRef90-UP10003A3A7C9 UniRef90-UP10002890BB3 UniRef90-Q47PE0UniRef90_U1IJJ2
UniRef90_A4C2F9
 NNNLTPANPNRNAIGWRWATPVRAHRIEEVLASGKKHTLE NNNLDPANPNGGKPGGYWQESDRGRRVYELESGKKNWSVD NNKPAK YWRNGEYSTVWGKDNRVQQFINGMEARDKVDLN NDYNVPA GHPFQVGYEWEPPYRRQRIDDVLSAGRRQSVD
 NNNDTSNYPHRDALGWTWASPSRAHRIEEVLNDGTRKTMV NNRPAEGFPNPDQYWYSWMPADRVSVLDRAFDGSDTFTPQ NQAVIGGTAYSHFLTRDWAMGYRSQRIVTLLEGAGKLDVA NNRVIGD DYPYFLGLEFDPGWRAAR:EQMI AEKERFTVR NNRSAHGE VANFEATPWGASDRVDEVVALITGKDKLTPQ NEMNLPDYPYRRKLGFEWTNGSRHVRIDEVLSKLDKVSDE
 NEMNLPDYPYARKLGFEWTNGSRHQRIDEVLKASPKVSAE NFQPVDSPSGMEVPGYYNLSDRGQQLDRQLSDKTVKWDI NQSSTDPSYPYY: NWEFSAYDRGKRINDRLSVMTKATAD
 NQRVIP HGYGMQLSNSWAAPERGERIAELASTGKHDSRS NYQPVPDSG MEVPGYYNLPARGIRLAEQRLSDNSVQWNV

 NQSPV DQSYPYYLNWEYAPYDRGHRIVERLAKDEHATAD NFQPL SPTGMQUPGYYNPADRGQYL NRQLSDPAGKWDL
$N$ SKPVPDSYPYFLGSNWAPYRAERIVEQLRSRARLSAD NNKPVPDSYYYFLGSNWAPPYRAERIVEQLRSRARLSAD



 NQRULASNDPNPLTGDWDLPTRHDRLVELIKSKSVHDLLA NEMNLPDFPHEEYLGYEWTNPFRFQRITEVLAQDTDHGLA NNAVV GRDYPYRLATEWPDPSRARRI VEMLGAGRHSVED NNAVIGGSQYRHLLTKDWAYGYRAARIVQLITAAPKVDQA

NNVTPKDYKYWETIGYKWADPYRGDRCAEVLSSGRKFTLQ | $N F Q P V S S S G$ |
| :--- | :--- | :--- |
| $N Y Q P V P A S G G E G Y Y N P D R G Q Q L N L Q L S D K Q A K W D U$ | NYQPVPASG

NNAAV GPGF P R E
 NEYNLPDYPYKDMAARTWSEPYRALRI REVLADRSGLDLE NNNDPPEHPAAKLVGYEWSDSSRARRLKALVGANARSSVQ NNQPDTMR NGVLFPGYYFPGERWNRIAKTITSRDDWDQE NNAFLPASPKQVPLPGYYNLADRGAQLIEQLSQADDKWDT NNAVTRPGEDLFLTTDWSYGYRSQRIVDRLKQE GKGKV NAR DDEYKYPYLLTDDWGYGTRSQRI NDLI ASKIAGGGK NHRITDEYPTSAPIRGLWLINYRAQRIQALLDEHKQHDVR NNR\|VGDS YPYPFPAEWLNGYRAERIRQLIEQTPRHDAE NQRTA AYGYGMQLSNSWLSPERSERLAQLAGSGKQDARS NEAVIGPS YPYLLTTDWAYGYRSQRIHELDDSARGAGKD NEYNLPDYRYKDMSARTWAEPYRVQRIREVLADSKGQTVQ NAQPV SPTGMEDPGYYNDPDRGQQLNMQLSDNSVKWNV

 NNKVTAPGYPHT SLEWEEPYRAERI RQMLLAKDKLSPE NNKAVPDS YPYRI SLE WAEPYRAERIRRMI LSAGRLGVK NQMNLPASQKKYKVSYEWSEPFRYNRVAQVLDATQHASVQ NNLPPDWPHDERPVGFEWLEDSRAVRIREVLAGQDRHTVA NQRVIP HGYGMQLSNSWAAPERGERLAELAGSGKHDSRS NNVTPEDYPYQHTLGYEWADPFRGDRIVEVLAEGRKFSME NQAVAPPS YPYRLADHWSGGYRSDR TADLIRAQGKLDVA
NQASVDDE YAHMLTDDWDYGYRGQRINDLAEEALADGPV

NEYNF
NHRTVPA
NHKVTPE
NNRATPE
NAMNDPEH
NNNLFPNFK
NLPGGDP
NQAVTAS
NNKLQEGN
RGEEALGYEWAERYRKDR

NEKIVDEDYPHFITRDWALPYRGNR
NHLVGPDYPFHAYLK
 SPYGMVIPGYNLADRGQQLN NQMNLPDYPNERRVGF
NNQP

## UniRef90 A1WN00 <br> UniRef90_I2ESN9 UniRef90-M6CZS5 UniRef90_Q45TR7 UniRef90_UPI00047DFAE3 UniRef90-C9YFP2 UniRef90_G2Z756 UniRef90_D2QBD0 UniRef90_K2H9B8 UniRef90_UPI00037B1D37 UniRef90-1015D8 UniRef90-A7NJ94 UniRef90_A0A021WYW5 UniRef90_B2U195 UniRef90-B1XUE3

 UniRef90_A4CKW7 UniRef90-W4NYG7 UniRef90_S6JEG5 UniRef90-A6E789 UniRef90_G0EX63 UniRef90_Q21Y74 UniRef90_A0A010SUW4 UniRef90-K6YTD3 UniRef90_UPI00046881EE UniRef90-S2D9A9 UniRef90-13TL14 UniRef90-F4C9E8 UniRef90-UPIO003472924 UniRef90-W0HFJ8 UniRef90-U5QHE1UniRef9O D8JBQ2 UniRef90_D8JBQ2
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UniRef90_UPIO00467E4A0
UniRef90-F4DPW0
UniRef90_UPIO004764366
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UniRef90-V8A8C6
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UniRef90-F8GMB7
UniRef90-UPI000407017F
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UniRef90-D2B301
UniRef90_F8JX84
UniRef90-A9WGJ9
UniRef90_UPIO0036792D4
UniRef90_A7NJS5
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UniRef90-13Z7L7
UniRef90- 10 K 4 L 7
UniRef90_UPI000475D3D8
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UniRef90-K7TC85
UniRef90_UPIO0042279ED
UniRef90-Q3KH00
UniRef90-K1L6R5
UniRef90_UPI00037CE1B9
UniRef90_UPIO0035E2D03
UniRef90_UPIO004779952
UniRef90-WOSHV4
UniRef90-S3ZYM2
UniRef90-V4EPC0
UniRef90-B7A530
UniRef90_A0A023X3N0
UniRef90_S5S5G8
UniRef90-IOAHI3
UniRef90-FOBCN6
UniRef90-K9AKI5
UniRef90-UPIO003644B0F
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UniRef90_UPIO0038136F7
UniRef90_E1IBQ9
UniRef90_UPI0003A3A7C9
UniRef90_UPIO002890BB3
UniRef90-Q47PE0
UniRef90_U1 IJJ2
UniRef90_A4C2F9


|  |  |
| :---: | :---: |
| UniRef90-I2ESN9 | SKLGE WN TFELSSPESTTATMYVEWENLLQKAVHK |
| UniRef90-M6CZS5 |  |
| UniRef90-K0K8K7 | A MLR GWDGVEHPDS A A A ALFEVWLANHLGPGFV |
| UniRef90-Q45TR7 | EQLQKWNNLKEDKNNDGYYDAGDAAFFFDEWWNNAHNKLLFN |
| UniRef90_UPI00047DFAE3 | $D L L R G Y D G V A Q V D S$ |
| UniRef90_C9YFP2 | E PLTKWDGAYTEDSTA A T L F T QMMYELSKAAFS |
| UniRef90_G2Z756 | D ILQKWDGNHDKESIAA P T L Y NKWVYQYMKNTFE |
| UniRef90_D2QBD0 | S YLRR R WD Y K LT P N SVAA A A S Y VA WEGQLKQAVYQ |
| UniRef90-K2H9B8 | DAVA D WNRMLEDRDGDGRYDHPGAAI M A W WLGALLEQAFS |
| UniRef90-UPI00037B1D37 | ALLRGWDLQQPENS APAAFYNATWRALMARTF |
| UniRef90-I015D8 | QALRKWNWRMDTDS A A ALIFHYLLENVLDMTFG |
| UniRef90-A7NJ94 | ELLR GWDGAMRGDS A A A SVYQGYYYAAIEATFA |
| UniRef90-A0A021WYW5 | TVLKK D WD GRMVRGEDGRATAPADA L F Q R WVK |
| UniRef90-B2UI95 | NLFKGWNATMLADS P Q A ALHEVWFTHHLGRAFK |
| UniRef90-B1XUE3 | EIGRSFDGDMKINSAGGALIANAWADQLTRNL |
| UniRef90-A4CKW7 | DAL N W A E Y GVV E ALLYHRWVYHFLRETFA |
| UniRef90_W4NYG7 | ALLLKGWDAQMSANS A Q A A EEVWLSRHLGRAFK |
| UniRef90_S6JEG5 |  |
| UniRef90-A6E789 | R ITS EWNKF Y E A T A LGA T I F L WAKRLT D N I W |
| UniRef90_G0EX63 | E ALRRKWDGTMDPA RAEPLVVTAWLRELSRRLFE |
| UniRef90_Q21Y74 | ESLA GWD G S Y Q L N S |
| UniRef90-A0A010SU |  |
| UniRef90_K6YTD3 | NLLSNWDGDHKTDEVAAT I F N QLVYQLAFEAMS |
| UniRef90-UPI00046881EE | TILMDWKGDSNLNQVAA P T I Y N K W |
| UniRef90_S2D9A9 | $E$ QLK NWD G D H GLESILA |
| UniRef90-13TL14 |  |
| UniRef90-F4C9E8 | ALLRNWDHCYEATS@A A T I F EQWYKEI ENA |
| UniRef90-UPI000347 | EVLADWDMDQDADSAGGA A F Y AVWPRLLG |
| UniRef90-W0HFJ8 | E RLA Q WKGDYPLDS VGA T LTFSQFLFDLTEETFH |
| UniRef90-U5QHE1 | AEL GRWDGRADAESAGAS $\square$ F WA WY |
| UniRef90-D8JBQ2 |  |
| UniRef90_G0L492 | GKLKDWK G Y P L S $\quad$ DEA TVYHRWLYLVLR N I F Q |
| UniRef90_A4ASG0 | DKLKA WNGEYKL N NV EPAIYHRWIFFFLKM T F S |
| UniRef90_A1ZXD3 |  |
| UniRef90-A0A024HQk |  |
| UniRef90_S6J2Y7 |  |
| UniRef90 M1SUD9 | ELSKNFDGDMKTDSTGGALINNAWADQLSRKLLF |
| UniRef90-UPI00046B0198 | EQLA RWNGDHDLDDSS VA SLFNQLVYQLSERAMR |
| UniRef90 ${ }^{\text {U }}$ UPI00047EA23E | DLLVGWDHVETADSGG PAALFEVWLSRHLGPEFV |
| UniRef90_G7ZGA9 | ALLRS WDGRMDR ERPEPLI F T M WLRELVRAVFA |
| UniRef90-D1ABA8 | ELLRGWDFQHSRDS APAAYFNAlWRHLLIGTM N |
| UniRef90-F4L7J0 | $R T L L Q W D F Q L E K L S \\| G A T \quad L Y D A W E R Q L R T E L E Q ~$ |
| UniRef90_UPI000467E4A0 |  |
| UniRef90_F4DPW0 |  |
| UniRef90-UPI0004764366 | RLLA D W D YRDDADSAAAAYFAVFWRELLHDMFA |
| UniRef90-R7XSI1 | ELLADWDFTQPADS A A A A Y M A V WS NLLRLTTFH |
| UniRef90-V8A8C6 | PLLKNWDGH VTA S S A A A L Y EVWVTRLGKALHE |
| UniRef90_UPI00047E6CD6 | RLLKKDWDYRTEDDSEAAT V Y Y F WLPEVIKRVS D |
| UniRef90_F8GMB7 | DLLRNWDGNERADS A A A A F EVWFSKHLRQAVV |
| UniRef90-UPI000407017F | D ALQNWDGYHHLKAVA P P T I Y K K WQ Y H L K VA MQ |
| UniRef90-UPI0003B43793 | K QLS TWQGNYPIDS $\quad$ Y LP TLLFTEFSYQLLKASML |
| UniRef90-D2B301 |  |
| UniRef90-F8JX84 | QLLEGWDFNQDGDS A A A Y N AVWRNVLKLAF G |
| UniRef90_A9WGJ9 |  |
| UniRef90_UPI0003679 | ELLRDFDGMIGKDS APAALYETWLMRF |
| UniRef90-A7NJS5 | D ALA T WN GELSADS $\square$ G G T $\square \mathrm{Y}$ S |
| UniRef90_S6JAD4 | ARLMAFDAKLSPTSSD A ALYELFLQESTRQLEFL |
| UniRef90_A4XD25 | DLWA EWDYQQPAEGEPGTDDSAAAAYYNAVWRHLLLA T F |
| UniRef90-E3HEP8 | SLLKDWDARVGTESRAAT VYEFWLPEVVVRVTE |
| UniRef90_UPI0003B61CF8 |  |
| UniRef90_M4K636 | EQLAVWKGDYPLDSTSAT L F W Q L |
| UniRef90-I3Z7L7 |  |
| UniRef90-IOK4L7 | A TVVA WRYNNATSEVGG P TIIFTEWEKRFMDALWA |
| UniRef90-UPI000475D3D8 |  |
| UniRef90-D7BBE1 | AKLLAWDGV ARPEQQEPSVFEAWYTELTRGPKK |
| UniRef90-Q1AUI0 | ERLLRWDGDARPGSR EAALTEAWYTELTRLPAR |
| UniRef90_K7TC85 | QLLKSWNGRVDRDS P PAAALYEVWWTHIGAALTYA |
| UniRef90-UPI00042279ED | GLLRGWDARLDAGS A A A ALFELWWTKHLLKPLFA |
| UniRef90-Q3KH00 | TRLMAFDGKLSPTS A A A A Y L L L E SMKQIF L |
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| UniRef90-UPI0004779952 | EQLADWDLYTGADSAGGA A AFYQATWRHLLP T L F |
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| UniRef90-A0A023X3N0 | ERLLRWDG DADEGSEEAALFAAWYAELSR LAA |
| UniRef90_S5S5G8 | KLLKDWDGHTSVSS A A A A L A EVWLSKHLGKGVV |
| UniRef90_10^ | ELLE NWD F EM S P F N Q VT SI Y Q V F L K Y L L R N I Y L |
| UniRef90-F0BCN6 | ALLRKWDG NVSASSAAAALEEVWFSNYLGAAYK |
| UniRef90-K9AKI5 | ELLRTTWDGRDAANSAG A A Y F VVVSTVLDEVFA |
| UniRef90-UPI0003644B0F | RLL R D WDGNQPND K T R DAASAAYYNAVWKHLLEYTG |
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| UniRef90-E1IBQ9 |  |
| UniRef90-UPI0003A3A7C9 |  |
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| UniRef90_Q47PE0 | GWDF QQDADSAAAAFYNATYRHLLPPLVF |
| UniRef90_U1IJJ2 | DLLKAWDARDAEDS A A A AVYEVWTANHLGPVLL |
|  |  |



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LS KEAAAAMGAPDVA|VIMLNMLL
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A ERWNAYKS L L
A LVLPA
T REI
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$R \square \mathrm{P}$
MGTH $\square$ MK QVI A T I P

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DELGKA A
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DELGDAF
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$M L \operatorname{PANVRTLVNDQTYRLFLLLPDGKFGTDPTRGVNDLLL}$
DELGDGF FDTALSTRVIDAALPRLA

DELREGIWPDGGDRWF
RFI PSALDDLLAAELSPVT QLGLLENARNF
$\square Y V P P Q G R A V F G E \quad D S T R K A D D K L$ RAALP P EAARLVGAGDAARVLAVREQPGPRM
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T $\square Y A D A A A T F D A V V G L G A F A T D P A R D M A H R A F P R L L R R L I$
DELGPEGSAGWKAFIGNSNLS
DELPSDHRLDGNDQSYE
LYVPANGRAAFG
DEFADKNLQENYPSADRTEQL
PK GDALFK
DELGDADFESF
DDLPESDS
DEVGPEF
EVGQEFWEEPRY $\square L S A \square K S N D$
ATDPSELHDLLPGPLSPSVQLA

DELGPQNSPAWKAF $\square A N G D \square S Y A A Q A \quad D V A G \square L A A L$
$\square \backslash \mathrm{A}$ V D E VQD L V G A
DEFSKTDLP
VK WP
D Q $\square$ PK K A WPS G GDRWYE
DE पDPVGMGDGSRGMYVVRDLM
DEMGGD
RAMLD KEAAQY LT QGK $\square$ MQD
EELGGTESQAY
KEVGEAYWD
EETGEPFWD
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DEMGEDLINKF DNGDLD
A LVLRPAEAATFGMP
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DELPPDIAPDGGSRW
PRLGPLYQSYGS FMVVMEQLL
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K T


D E M G K

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E Q P G
410
420
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440 ANPKS DPPFFGANPVVSRDSILITCFKQAIDNLQTRLGK ENPESDFWDDLSTPRRETRRDILI RSFAQTVRYLSKELGG R WF GPDAREVRDGLLLATLSSAYEEVEYRLGG SGE PTNYQWKTKEEAEKIILDSANEALDALHEEKGT

 $L V P T P G R D S L L L T C M D R A V A E L T K R L G A$
S G D GPD D F G G D S T GA $\checkmark L R A D D T A R E R L T D A H G P$ S QPESPWWDDKRTPAVETRDTVLGAAMTAADKELRDRGGG EHDASFWYNDVASGRTRDRDELLQEALTRSMKMIRRTYGD LD GHN EWCDNVVTTVATEDCATTTLAKAALTQGLEAMAKAQGEE LGDKA G $\square$ A QRHDFFNGVDRNE IMLLAALGKAAAALTEEHGS Q Q A A AKRDAVLLDSLKNAWTDMVKRQGP QNPNSPWCDDTKTEKTETCLESSNLALDKALDYLSKEYGB SRENSVWWWDDVRTEDTETK TEEISSRSTRRMAMASVVEADF GA EHPDARFGDN A A A SPWWDNR R

 GREDSPFWDDI RTPQKEDKPTILARSLAAAI TAGESQMGA
 QTESSPWWNNDNTNNQESRSDILSAADKKSLEELKGQFGN LT R D P V WCCD D R R T T E T E S C A V V Q I A R A L D D A I A L L DR T Q G E
 A DADSPWWNNRNSPHTESRANTVVVAWRASVSHLKSMYGN A WCDDVRTPARE DCPTTLQRALAA GLA DMAHR QS D
E E P E E Y LE D D KAESVWWDNTLTEDKESKSQIVNGSFDEALESLEKDYGP
 ADADSPWWDDRSTPAKESRADIVKAAWQASLRHLRETLGQ ATPDSPWWDNRTTPQKETRADTVKAAWLAAIAQLKTTLGD QNPNSPWCDDPQTQQTESCADASNAAFDKALEQLSGQFGN A DADSSWWD DRSSTAVE GRSETVVKAA WRASSIA HLR QTLGBD ENPGRWLD

 K A LS TAMQNLTTRFQG $\square P R S Q W H Y G Q E K Y K H V L L R H P L S S$ ASVDS P WWD DRTTLSKETRSDIVKTAWSKSLAHLKATMGD ANADSPWWNRQGSEQRESRVQIVAEAWRASLKHLHSVLGD GQPESSWWWADSD LGGTSDRDSMI A YAA GQAWKETA HQLGGG T DPAGPWWDDSETVVTESRD D LLSQAMRDARDELTMRQS L ATPDAAFGPRPD HREAFMLEQLDRAYAECVSLMGP

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 S DAESVWWNDHRNGEQQTRQQVVAQAWQATLMHLRTTLGS
 P DATNPWWNTSTT GAGTDRDQLLAKAMKDARWELTSSKLGK DQPDAWLGQ GRSWGGVLRAALGRTVAELTERLGB ADPDRWFGEN GAAKRDALLLDTLGRAYQDVQEKLGAA ERDDH FFGGQRTTDDILLAAAWNATLAELRAELGD GREDSPFWDD $\quad$ R T P QKEDK P AI LARSLAGAISSTGDRLMGN S QPDALLWWDRTETEVVEVRDDILIRAAAEAAASELSRDQGB
 K E A N S K WF D DVRTPEKETAADDSKAFNTAVK QLADKQGK ASADSPWWD QTEDSPWWDDSSTEKVVE ETPTARWVDDVRTPAR MRDDA WWCDDKRTPETESGLDIVTLSSFRATVDTLTRRHGB RGDRS CNCDGPETTMAE Q T P DRTFGNNGKT EAPDARFGAD
N PA V V DNMLTECLQKAVAELTERIGP PAAARDALLLETLAEAVRDATRRLGE GREDSPFWDDARTPQKEDKPA L LARSLAAAI SAGDS QLGG ETPEKLFSEK $\qquad$ K D S A YKF VD DVT T P QVE K D P R NL WWD DVRTKGVE D EDPDSPWWE GEDAD G ERNDAWWCDDKATPAVE TDSFAEPEEWFGEGGAQA RCKDSPFWR GKG EGDKN F CDQPETEYKETCLQQYLARTVLDVVALLEKRCGE REGDPNCEPATEE GCLLAFAAEAFAA GLLDRFEGGPPEWGEE
 EHPGAAF GPDPAARRDQLLLESLRSAYQSLVDRQGP T QP D S P WWQE GE VVENDEALARALGSAWNRTEDLLGP KDPKNDWWDDKTTPGTEGSGEDLKRALVEARLDLARELGGK



 S LVESPESEWWRGEEVSSRDEALRVAMERAAAELTELLGE SKPESPESEW
K R Q K S VWWD N I LTT D K VE T K Q E\| V R N S F K K A F V F L E N Q|L G A

## UniRef90 A1WNoo

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NTANWQWGAVHTLTHEHPLGQFAVPGGHETPNNLSHKTGG NVASWTWNKVHTVEHQHPLGPFEIAGTNEVINNLMFGLNA NPEDWQWKKAVVLEHPHPLGAQPVMANEESVNKLAFKLNP DTSTWTWGKAHPAVSENRVLSHPI GGDPFTVNAQRWAADA LDETWAWGTVNERRVLHLAFKFPVNGSGRTVNAGKEK SG NPDGWTWGKVHTLTHGHPLGPFAAPGSHEVPNNLSSRLR DPARWRWQQVHQAIFPHNPFDTGNGGDSFTVNVATVSALD DSSKWEWHRVHTLEHAHPI GPFPVNGSREVINNMYFPYTE NLNDWTWDKVHTIEHPHPLGPYPIHGTREVI NNLAFPYDE
 DPGQWRWGRAHTLTHEHPLGPFAAPGSHEVPNNLSAKLGG
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DATQWQWGNAHTLTHGHPDGPFAAPGTHEVPNNDSARD DVESWAWGRGHTLTHNHPLGPGAAPGGHETPNNLSHK G DVSSWRWDRLHTLTLKNNRGPWHVGGGSSVVDAAGW DA DADDWTWGHLHQLDLHHNRDGRGVGGGPSIVDATSWNGYG DPAAWQWGRLHSLTLHHALENDPAGGDHYTVMARWYDPGH DSKQWEWGRLHHIQFEHGLAGMPVSGDNDTVHRATFRFRQ DPRAWQWGKLHTAVFTHPMDPIPVGGSAFTPMNTSYRNRIL


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 $P E G Q M F R S T H G P G Y R A D Y D M F I Q S T G Q S G$
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K LDVTGASLVG|LITIMQGKNANTGWSSTNMMADTMDLYYE GWNVIGAGEPSLPGVSLGHNDRVAFGLITIAFGDEEDLYVY GLNVIGAGEPGVPGILLGRNDQVAWAFTNTNPDSQDVFVE KYQVAGVSIAGVPAVVAGFNGKLGWGMTMVMGDNQDLFLE GLEGAGVALAGVPGIIAGYNGHMAVGMTMVMADNQDVFLE GFDVAGFSFAGFPGVVIGHNAQLAWGLTNMGADVTDFFVE RFQAAGVSVAGVPAVVAGYNGKLA WGMTMVMGDNQDLFLE KFSAAGVSUAGVPGVVAGFNGKLAWGMTMVMGDNQDLFLE
 EDNVRGVTFPGUPVII:GMNDHVAWGVTNVGADVDDFYYY ELQFYGNHLAGVPFGLVGHSRTHAFGLTMFENDDQDFFVE GGWVKGAGVPGVPMILLGQNESTAWGTTAAMSDVQDLFVE DFIWWGATAPGVPLMVLGHNGHI AWGFTTTHGDTQDLFI E KYQAAGVSIAGLPGVVAGFNGKLAWGMTMVLGDNQDLYL
 GYDVAGYTFAGMPGVVIGHNKDVAWGFTNDGADVTDLYLE GIDAIGAGEPALDGISIGHNGRIAFGLTDFPDDQEDLYVY GLNVYGASLPGSPNVIIGFNDHVAWSVTNALRDVVDWYKL DWQVSGATVPGVPFHLI GHNGRI GWGTTTTHADTKDLF

r

 PFDVSGFSFSGLPGVVIGHNQNIAWGLT PFDVSGFGFS GLPGIVIGQNESIAWGFTNLGPDVADLVVE

 EFDVIGAGEPACLP $K Y Q A A G V S V A G L P$ GQNVY GVTIP GAP Y GVTIPGAPAVI I GFNEQVAWGVTNVGGDVLDWY Q L L


 GFHLYGYHQALNPFASLGHNREFGWSLDMFQNDDVDLIAE $K F Q A A G V S \square A G D P A V V A G F N G K L G W G M T M V M G D N Q D L E L E$
 T


PFEVVSGYS FA GMPGVVVI

 GlDVI GA GDPAAPGVII GHSEFAAWCLTXYGADQQDVVY
 $K L A V S G A S L V G L P D V M L G R N R N I A W A A T N M M A D A Q D L Y F E$ P F DVVA GYTFAGFPGVII GHND ALA WGLTNLGADVTD FY L E



 GTDVI GA GEPSMPGLALGHNGTAAFGLTYMSADQEDLYTY
 NHNAFGATLD GALAVI SGFNQYI A WGETNATRDVDDWYK I $K Y Q A A G V S L A G D P A V V A G Y N G K L A W G M T M V M G D N Q D D Y$ LD
 E G GVV G A T I P G M P L V L L G R S K D L G W G L T T T T Y L D D Q D V H I GWDVVGAGEPALPGVEVGHNRAGAWGLTDFGLDMEDVYVY K Y QAAGASLAGLPAILSGFNGKVAWSMAAVLGDDQDLELE $T G G V I G A T I P G G P V I L A G R S A D L G W G L T S S S Y L D D Q D D V Y V E$
 $T L R A D G A S D P G L P G I V I$ GRNDRDAWGVTNMNPDVQDLYAB

A A DVVGA T LP GLP F V V L

 DFSVKGATLPGALGVIS E G G V 1 S G GlV I G GTMP GMPIV LT
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 $R \vee R D D T$ QVRR Q GRLY
QVKR QGKYYLADGQWLPARERQE

 QVD GEK TLHPENPLEVRY GEAWEPLRVREVALAVKDADSVHPGVRS


 K L N P N NPNETI YGTGFSPDKSRMDTIIKIKDKDHVLFEI RE



 RV R D D T W L A DRS A E R WE P M D VR T E T I
 ETDPA QPKSYRYRGRWEPMET DTEKI AVVRAEPRTVTID F $K \square N P A N P D E Y Q T P E G F R P F E K K R V E I M V K G S E T V S F D R R \square$ RTDKDDPERYWHK GQWKRFETFEDEEI AVKDGPMQRVTRRY K V K RE G GRYYMADGKWQPARERQETFFI K GQRP DRETI WE

 KVRQGNALYYENNGKWLPA V VRNETYFAKGQRPDREAVYE RIIEGD S Y WRD GELVVPLEESTETVEVAGGDDIEVTIIRS
 KI R R GNGLSYEVNGKWQPATVRNETYFIKGQRSDREAVYE KL R D N T K REYWHD GRWKPVRRVVERIVVRGLPDRLDTVLY $R \vee E G D$
EFNA NRTQ S Y WR D G QLL L L V E T TE T I KVAGA D D I DLDT R S RDEAD G T Q Y K F D N Q WK DVVSVR VEE EI K I K G K E T Y K D S V L Y AGGDPVDLEIRA KI D P A D A GRYYLAPEGSVPFESREEII KL R G GEEVVVVTIRA RI HEDGRGHYLAD GKWLPVSERQETFLVKGAPAIRETLYE $K V N P D N P G Q V M V H G Q W Q E L V R S E Q Q I K V K G E P T Q A V T L L R$ QLNPENPQEYRTPDGFRTFRTQQSVIRIIKDAAPITITMRW RI RREGSRMYQADGKWLAARERHE TFFI KGQRPVREII Y E
 ETHPEDPDLYRYGEDWERMDIVEETVPMQGHPDQVLRLRF $R \square E G D A A \square V D G E E E P L E T R T E T V A V A G G E D V E F T V R S$
 E E TE DK Q G YVVY Q N EVVVPYNTRTETMIKVKGEADQTFIVGE

 QVRGE
 K TN P A D A N Q VMVV G R WQ A L E K T E Q Q A A V K G Q A P V T I T L R R K V D P D D P QRLLTTPEGYRPMRTRSSIIDRVKDSAPVVVTVLRW

 RLFTD G TY L R D GERVPVVERTETVEVNGADPIQLTVRS K F K DE TK Q Q Y L F N G N WV NTELDH DD TI K I K GA LP FY DT V A Y



 ELHPDDPGLYRHHGSWRPFERTTERIPVRGGPVHEAELVV QF K N E K R T E Y L Y K D E W
 QL NPENPNEYLTPNGFQPFRSRDTIVLVKDAPAVTLKLQW


 $R T N P A D A N Q V M V D G K W Q A L E K T E Q Q I A V K G E A P V T L S L R R$ P A T A
$K L \operatorname{T}$ ELLPDDPGRYRHRDGWRALETVTERVPVRGGPDREVRLEF
 QIDPGNPGRYRTPDGWAPFTERSERIRVKGRADVQLTLRS ETHPDDPGLYRYGTGWATMERTVERIPVCGGPDEAVTMSTV ETHQDDPDL TFNSNG QFKDASRKE

 RLHPDDPHLYRYGGGWERMASVHERIPVVGAAPAAAELLF ELHPPENKDEYRTPS GFKK LTTSRKS II NI K DEPPDVTDTMHW


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TEYGP\|TS DVDVF K QPVVSLRWA GNEEKDTSYEAFFALNYA T R H GPVLYEDVAHHKAYALRAAYLEPGTAAYLASLRLDQA
 TRHGPLLNS VLGERKGYGLALQTAQENDVSLDAFFDLSRA TRHGPLLNSVLGERKGYGLALQTTQEADKTLDAFFDLSRA TANGVLMNDVNNSPDGDAVKWAVMEP DQSMETFFSIMRS

T RHGPLLNSVLGERKGLALRRAPVDD DRSLDAFFELSRA
TRHGPLLNSAL GERKGYGIAYQSI GESDRTLDAFFDLSRA
$T V Y G P V V I S D V V G A P E G Q A L A D R W L E P S S D E T M A A F Y G G G K A$

TVHGPIMSDVVPTSNRYAVSLAWTALTPNTADAIFALNTA
S RHGPLMQEVLPTEQPVSTWWDYTKQETRALEALFRMNHA
S R H GP V L S DAVVPRLAA VA LS F S GGLGACDRTAAEAFLLK LINRA

T R H GPL L N S PLP L L K S GYGLA YRSI QQEDKTLDDGFFDLSRA
S RHGP I I S A VPDAPEN CAMQWAA L DE KP WDI H GLLDAMNRA
TNHGP ILNAVGMTDNPVASWWVYVLEPTRADEATWKMGHA
$T Q D G P A G N A A P D R A A G Y G V A L R W T A L V P R T M D A V F K D D R A$
TRHGPVIHEDPERGTAFAVRAAWLGPGMAPYLGSTEYMTA
TKWGPV MYDDSFRPSNYALRWVVAHDKSKEA KAFY LLNRA
TRHGPV IS DADRTAAGYAVA LRWAGLVPHT $\square D A V F A M D A A$
TRHGPVVTDVAGGTDVVALAATGLMEGDRTAEAIMRLNRA


T RHGPVLHADDASHRAWALRAAWLDAGMAPYFGSMDYMRA
T R H G P V L P A D Y R G LDD H Y S L S WT V L G G D D K T $\square$ S A G FK L WD F
A Q GRPIVAAQDAKKQRASAFATVSMLPGANMRFA\|IAAINLA
T RHGPLLNSPLPLRSGYGLALRNDAEADRS DDAFFDLSRA
TSNGPLISDLEGPYRGYQLALQWTALQPNTASADFGLNAA
THRGP L L S DTEEVD DAP Y A V S S L R WTA L E P T TA DA V FA L NRA
A A Q GPVVVADPARRRATAVVAT WLYPGANGLLVNDGLNLA
TRHGPLLNSAQSLTSGYGLALTADFKDDKSLDAFFDLSRA


TRHGPLLNSVQGPATANGFGLAPGLDTDDKTVDAFFDLSRA
THHGPVVYDHDEKPTPT QHAMRWTAHEADEVLAFVKLNHA
TVHGPI I S GPGDDDTEYAVS LR WTA LDDPTAATAAFALSTA
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TENGPVLPGQHFTPPGHVVSLGFTALNDTTMTGWRRRMEA

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T R H GPVIWSEG A L A VAVETVVSAPGSAPYVKSLASMRA
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S RYGVVIDTEDAPKTKP LAALRWT GHDPDDTTASAYYAAINKA
THYGPVVYDKSFKAKDANFALKWTAHEGSNEQGFLELNRA
T D NGPI LP GAHHTPA GDVATLSSWTALSDTSMTAALLHLMQA

HH GPVSYD GDNERAGYAMKWDG HLGGNSQLTFLELNKA
SKHGPLLSDAWKDREAYAVSLAWTGLQPRTMDALL RINVA

S PHGPIVNSDTA GPAPIAMWWAFLETENPLLEGFYQINRAA
SENGP L LPGSHFTPP GHVASLAAWTVLSPT SMTAAMDLMQS
TRHGPV MLLEEPDANRAYADRSVWSDAGTSPYMASLSVMRA
TRHGPVI S D LIAAS DLAVAFSSTALGDNDTGVQTLMRMNLA

TEHGPLVDEPRPAREGYGVALAWTALEPRSADAVFAMNLA

SPRGPVISGVGVRRERVALSWTADQEGDTTMDAFVGLNYA


TRHGPVVLRDEDAGTAYAVRTTWNWPGTAAYFGAIRRLMRA
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THHGPVVVDKKSNNELLSGYAMQWTGHDPGNGQTFLDELNKA
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RHGPVVMEDPA RHLA Y A L R A A WLEP G T A P Y L A S S L R L L D Q A
T R H GPLLNSDTPLANGYGLALTPSLKDDKSLDAFFDLSRA
T DNGPVLPGSHYTPPGHVASVAWTVLRDTTMQAAMELMRA
SPHGPIVNDVLGGPTP IAMWWAFLETENPLLDGFYHLNRA
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TEHGPLISDPAPGPDGYAVALS WTALQPRTMMDAVFAFATA
RHGPVI S DVDKRRYAVAL RWAADDTDNLTVQAGLRANEA
T R H GPVICEDVTGRQAFAVRTVWSEPGTAAYLGSLAYLGA

TRHGPIV T DLVPGETRKIAVKWTAADPNADLPFFDVNSA
THHGPVVFDKSFNRQDVNFSLKWTAHMESNEQQFLSLNKG
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T DNGPVLPGGDVMQPGHAI S L S WTLPNDT SMMAAALRLMEA


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## UniRef90-J2VUN2

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 KNDQEVEDGARLIHAPLNIMYGDKTGNI TDFASFRSAAQDFADPQNLLYADTKGNI EGPDAFVAALRRWGAPENQVYAAPDGTI QNYNDYREALKYHCPAQNFVFASTSGD
TDWTGFRAAAALLVAPQNMVYADVRND GNRAEFLEAMRLFHAPQNVFFAATDGDT
 TDADDIARVARLFDVPQNVFATTDGHV
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RDWDGFRAASKEVPQNLI YADNEGN
 HDWDSFREADRVHTSPTNFTYADTAGN: QDFEDFRRAASLFDVPQNLIYADVDGN
VDGAAFASSLDPWRAPVNHVFADVDGR QNAEKASDASREDRMAVNLVFADAN HI RNYQDYDRALRTYASPQNFIFASNQND:
QDFDDFRLAASLFDVPQNLIYADTEGN

 STLEAMRSAVQKVQAPLNFVWANARGDI HSVKDALQAGRWFSVPQNLTLADRH SVG T

 TNHKDYLEALAHFSSPQNFVFASVEGDi GSVUQAlEAGSLIVAPQNLMLADAQG QNAEEFRQALRRYVAPQNFVYADVEGT1 GNFAQFRAAAKLLGAPQNLVYADDHGT
QTWEEFRDACTYNHVPANMVWADKAGN DTVGKREAAAKVQAPLNLVWANARGD KSVEEYRNALVGWGAPMNHMWADTEGN RDWPSFAAVQRDVQAPLNVGYADVGGTV
 KNDGDYHEALKFFCPGQNFVFADKSGD
RNWDFVTSRAYVAPQNFVYADVDGNN TSWSDFEAAMRRFVGPQNIFYADRSGT
 QDLGSFREAAESWGPPLTFVYADASGTV RDGRGFREALRVWGTPENQVYADTEGD KNYDEYEAALQYWVAPQNDVFASTEGD RSVQELLAAETYIAPSQNLTLADRN T
 QTMEKASDASREIRVALNMIFADA GHI KTVADGGGAAEKFIAPQNLI LVDRETH DTLGKMREAAAKVHAPLNLVWANARGDU
$R N W G D F T A A L E K Y V A P Q N F V Y A D V D G N T$ RNGRDFRDALRVWGAPENQVYADAEG AGPEDTASAAEVFEVPQNTVYATTDGDI TTVTEFGDARRHWSAPTNQLYADAGGA DSPEAFGAALRHWSAPVNHLYADVSGR GNWQQFLDGFSKFGGPQNVVYADVDGHI KNHADYLEALDFYTSPQNFVFASRGGDi ENHSDYNLALDHFTSPQNFVFASKSGD QSVNEANGATGLYDAPSQMLSVIDADH1 RDLDGFRAAAEGWGPPLTFVYADTGGTV QSVEEGFALMEDYMAPQNLMLVDAEN N

GNGABPR

190
00
GQLIGA GRIVPDRG $Y Q A P B G I P R B$ $\begin{array}{llll}A & \text { W W A A A } & L & Y \\ G & E & R & P \\ \text { G } & \text { S } L & G & R \\ P & V & R & K\end{array}$ A LA A A G R V P L R R $G W Q V T$ G $R$ Y P NRK
 $G Y Q A P G L P V R G$ $G W Q P A G R V P A R P$

 $G F \| S A G R V P \vee R K$ Y QAPGRVPI RA $G Y Q A P G B / I D B V R A$ GMIAPGRIPVRD GWQVTGRYPNRK GYQAPGKПPKRG | $G Y Q S P G L V P V R G$ |
| :--- |
| $G W Q A A G L P S R V$ | G GYQTPGRILPDRG GWCPRALVPVRP A DRPNGHYPLKW

 GMVTAGKVPVRR GWQVTGRYPNRR
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GYQLG GAIPPR R GWQSTGLSP R RLD GWWAAARLPDRP AWQSVGWSP TRP ALTTVGR\|PIRR GYQAPGRIPVRT GYYAPGRVPLR GFYTPGLVPIRN AMALVGALPARD arvisagalplor GWIAAGRVPVRT AMKVQGKFPLK ALW GQGQFPNKW AMKTIGAMPRRN AMQMI GWllPKRD A WQAA GDAP VR
$G W Q V T G R Y P R R$ AMKTIGAAPKRD GWWAAAQLP R P GYyAPGRVPIRR GWDAAGRVPVRP GYQAPGTIPVRA GFKAAGRVPLRA AWFMAGKAPVR GWFVAGKAPRR GYHTTGKVPTRA AMKVQGRFPLKW AMRIQGKFPLKW $G L K L V G A M P R R D$
GRVSAGAVPVRP GMKM ${ }^{\text {GAMPRRD }}$

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K GQGSTPVVPGWDLEYAWQGY\|P ${ }^{210}$ DDQMPQSFNPPQGYLTSA
K GQGSTPVVPGWDLEYAWQGY\|P ${ }^{210}$ DDQMPQSFNPPQGYLTSA


240 EADWGVLPVPGDGRYEWAGLTEGDALPRSLNPAAGYIATA QGHGALPAPGWDPQYDWQGTDPFEQLPQQSVGGDGKIDTA EGQGLVPSPGWNSRYEWDGFADPMLHPYDQDPQQGWL GSA EGLGLLPSPGWDSRYEWDGFADPMLHPYDQDPPQGWL GTA | $K G R G L C P S P G W T G E Y G W E G Y Y D P A L H P S V K N P D T G Y V G T A$ |
| :--- |
| $P S D G T W P R D G S D E R Y D W Q G Y I P S E Q M P R V V D P A E G F V$ |

 EGRGLLPSPGWDGRYDWDGYAEP ILHPSDQDPAQGWLGTA PGHSGKYPVPGTGEWDWVGFVPAEALPRTYNPPEGY VTA T G N I I F N G S A GE G E WK WE G F I P P F E E I P P H L I N P P D D Y V A T A A TPGAPP G EGVDSIFRDGSTPEEAAHEYLPFSGNPQSINPPSGYVISAA DGDGRYPAFGATDDYDWTGFVPDSARPQSVNPSNGKLVTA EGRGLLPSPGWDGRYDWDGYADP ILHPSDQDPQQGWLGTA SGGGALPDLGWTGRHEWTGFDPFEKLPFDVNPEKGYTASF AHVNSIFLDGTNPLDEHTGWI PFEENPMSDNPESGFVATS KGDGRYPAPGWDSSYAWKSYLPFKS LPPYAYNPPEGYIVTA N WDGTLPVPGDGRYEWAGFHPVGTLPSVRDPGRGWFATA PNQGKYLMDGTKSANGWQKFDPAEHNVFALNPDRNFVSSA AGDGRVPVPGAGGSHDWTGFVPFEDLPQAFAPASGTLLNA PSDGTWPRPGWDPRYDWQGYVDPDDMPRADDPASGYVVAA PSDGTWPRPGWDSAYDWQGYVDPEDMPAVLDPPSGILVAA N WDGLFPVPGDGRYEWAGYRNMDELPWAYNPSAGHIVTA PANGRTPSPGWDATYDWKGYПPYEELPRVYNPAENVFATA K HDGLFPAPGDGDFDWTGDLPVEEMPSVHNPKEGWFASA
 K GDGMLPRHGWK T D E NWQGY L D F F K DLP S L Y NPERGWIVTA EGDGRWPVPGWVSGHDWEEYLPFDELPSVFNPESGVIVTA E GEGLVPSPGWDGRFDWDGYADAMLHPYDQDPAQGWIGTA A GD G WMP QPGWD S S Y D WT GY IPP F E E L P V S Y N P R S GY V V A $N$ WD G L L P V V G D GR Y E WA GFRREARRELLPTVVVNPARGWVATA E GE GLLPS SPGWDGRYDWEGYADPMAHPYDDDPNQGWLGNA $P E Q G K F I L D G T D A R T D W Q G W I P M T Q T P R V Q N P A R G F V S S A$
 A G D G W L P Q P G W D S A F D WQ G A i P F E E LAP TA Y N P E S G VI VTA FGDGFLPAP P G GWTGEYDWASFLPFEELPQHFNPPSGRVMNA

 E G LGLMPSPGWDGRYDWDGFADPMLHPYDQDPAQGWLGTA SSTHATPPPGWEEQYAWQGWVDFEDLPSSYNPEDGDVVAA E GD GR WP A P GWD S D Y D WD GTVVP F E E L P Y A E N P A S G M I V T A SATHGTPPPGWDEAYAWQGFVDFEDLPSVLNPEDGVIVAA A GHS GLYPVLLNGDWDWQGFI PFEELPRRYNPPE GYIITA PKQGKYLMDGNNPAFEWAGYIPSDQNPATLNPERGFVSSA PAHQTQGRMPW $\square$ A GNRWQGMLPYADNPSVVNPGTGULGNT

DWD GRFPASASKGQQWKGYLPFERLPQVVNPKEGFVASAA K GQGKF LMDGSKSYNDWQSFIPMEFNAHTKNPERGFVSSA R GDGDTVAPGWDPAYDWK GLI P F A E LDP WA ENPADGYI VTA
 EAHQ GRDPTP GWPQNRWDGRLDPADNPEFVVDPEGGGILGN T
 S GN GLLDPAR GWT GA G DWW GGWI P P T K M P Q TVVNPRRS GUL I N A E GK GQYPLPGWEETAQWQGMIPKSLMPEEFNPARGFIVSA PSNGTWPQPGWDSRYDWQGTVPAEEMPAETDPEEGFIVAA


 D HDGLLPVPGDGRYEWSGPADGALLPWEADPEEGFVAAA $R G \quad D G S M P V P G D G G H E W A G S R S G P D L P T A R R P A S G W F A S A$
 DGRGGLLPSSPGWDERRYAWD GFADPAMLHPPYDQDPPRQGWL G TAA VDHQSK GRLP TQGANRWSGNLPYSMNPEFVEPSGGILGNT P N N DTQ GRMP WLPR DRWDGHFPYSDDPS FI NPASGULGNT H GWTGLVVPVPGDGRYEWSGF LP DAELDHVVNPPNGFVATA E GEGLFPSPGWDGRFDWDGYADAMLHPYDQDPRQGWLGTA PAHQSQGRMPSPGWNRWQGMLPYTSNPGFVAPEGGULGNT D GVDP F L L G A S A QA DK LGFYPFSVNPQQENPARGYIV S A GWD G S L PVP G D GSHE WT GY $\square P$ F A RLP H TV NPA D GLVVV A A $N$ WD GSLLPVPGDGSHEWAGFHSGGDLPAVHGPEQGWFASA P A D GTWPRPGWDPAYDWQGFDPFEDLPAEVNPPEGDIVAA A DNDLR GVAP WEARY DWQGWLPYDQAPQDDGTALGYL ATA SNWD GLLDPVPGDGRYEWAGFHDP VLPHSVNPECGFVFSA $P N W D G L M P V P G D G R Y E W D G F V A P E D L P R R \| D P P E G F V A S A$


 GHDGLLLPVPGDGRYPWAGTAAGSLLDPWRADPPEGFTAAA ARHET QGRLPSYGENRWQGTFPYASNPEF\|APAGG\|LGNT PANGRAPAPGWNA $\quad$ Y D DWRGYAPYAA LPRRTNPES GVI A T A
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UniRef90_M4ZET3
UniRef90_UPI0003604FAA
UniRef90_Q9I4U2
UniRef90_B8FN1
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 $N Q R S V P R$

 NHRTVQP
NNRSTPE
$N Q R V V F D Y G Y$
$N Q A V T A S N T$
$N N Q P D T \square A$
NGRPA WC
NNRLVGPN
NHRTVQP
N NEP
GYGMQL SNSWYAPERYER

N N Q P DT慮 NQAVVDQN YKPLLTTDWEYGTRAKEIADQIQAKDKNGGK NEMNLPGYPNARRITYDWYAPDRHDRVAAELDARTGWTVA NQHPV DQSYPYYVFADGYEYYRNRRINEDLDSMDQ TAAK
 NNRVVGDGGYPHLITAHWPPPWRALRGEALLAGREAHTVAA


 NNPVTPPGGDSVQLSNDFDDGDRARRITKLVQDTMADGDV NQSVV DEDYEHFLTSDWDYGYRSQRINDLLAEADAQGPV NEMNLPGYPAQRRVSFEWRDRFRHDRVAHVLEETPRATDA NQRTI PRGYGMQLSNSWAAPERAERIAQLAGSGKHDSRS

 NQSAGPDYPY YI GWDYAPWDRGHRINQQLAKMRRATAD NNAIVTD DYDHFLSRDWDYGYRAARI ADLLERRSAAAPD NQHPV DETYPYYVFNDGYETYRNRVI NDFFNSKDKFSVQQ NNDVT G NQRTVP PDYPYL

 $R G Y G M Q L$
$S P T G V P I$

RDWDT $N H R$
$N O A$
$N$ RPFPEHV GFY RGYGMQLSSTWYAPERFERLAELAGRGKHDTRS
 NQAAV GSEYPRMLTADWDYGYRAARI RDLLQEAAAEGGL NQAVVRGST PFFLTSEPDKGYRSTRGLDLLTEQDEAGTP
 NNKTV DRPFPQHVSFTWGDTQRDQRWLT LIMKTREVHTRE NNRVLP HGGPDISSYTTEVFRAQRIRELILATPRANLE NQHPVDENYPFYVFNDGYETYRNRVI NDFLGSKNNITVVE N N Q I I GQERYPRKLGSTYSYGWRSQTIVDALRANPRISV NNQVDTNYPHPEALGFTWADSFRGDRI KEVLATNKKFTVE $N$ YQP NNKMD DRPFPGHVSFAWGDTQRIQQRWRRLMQTREVMTRE NNLTEEWQRTGPPI GNEWDDGSRAQRVHEVLFSRDSHS LAA NNRPSPD KYPYMIAAADWPETYRAERLREELEAPRKGMSVA NNNMLP NDYPYFVSSDWAPDARARRINQLIASKDSAKLT NQAVTEP GVGPFLTNDWDYGFRSARIRALLQAEIDAGRP NQTPA

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| :---: | :---: |
| UniRef90-UPI00016A9B2C |  |
| UniRef90-UP1000373A866 | RNLREWDYRMAAD |
| UniRef90-F6ABQ5 | DRLPEPQRRLMAFDGKLSASSADAA YGA |
| UnRef90-UP10004 | SRLLAFDGKLATNS ADAALYGA |
| UniRef90 A8 | DLLSGFDGRMAVDSPGAMYAA |
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| UniRef90-E4UA82 | RKLLAWD |
| NO |  |
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|  | WD G |
| UniRef90-M4Z | ALLSKWDGTMHKDW PEPLIF |
| UniRef90 UPIO003604 | EKLAQWDGDMKPDUNKTI SSSEPVLL |
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| UniRef90 U5C257 | NALGDWSGEHGLEEDA |
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| UniRef90 UPI00047 | dLLRRGWDGNVRADSV PAA |
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| UniRef90-UPIOO | ALLKRWDCGLEADSGA |
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|  | A EWD |
| UniRef90 D5QC1 | ARLRGWDGHVADS ASTSADAALY |
| Uni | ELLRG |
|  |  |
| UniRef90-UP10004 | PAADRRLMAFDGRपSP■SADAA Y ELL |
|  | RALAKWD |
| UniRef90 - S7VXZ2 | DEI KTWQFNNDTNEVG ASSAPATFRQWYGKL |
| UniRef90-UPIO0046830CO | ELLADWDG |
| - | QLLSGWDGQMLRD RPEPLLYHGWL |
| UniRefo-L1M | SRLLA |
| ef90-A3JTN7 | NLLAKWNGQMN EHLPEPLIYAAW |
|  | RRLLAFDGRLAASSADAALL YGAFLIHESARHTFLD |
|  |  |
|  | ALFEGWDHRLTTDS AAAALFEVWWARHLRPGLF |
| UP1000 | DLLADWDFQQDAGS |
| UniRef90-I3C | QRLLA WKGEMSPTS |
| UniRef90-UPIOOO3775 |  |
| z32 | D WNGE |
|  | L |
|  |  |
| UniRef90-F5XE61 | Q |
| Q11 | EQLAAWRGDYPLDSTSAT AGLFNQFLYELAFAALH |
| Uni | WNGEMN |
| UniRef90-UP1000464B | EHILGWDCWLSAESSAG ALEELWLMAHLIPALY |
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| UniRef90 K7RN56 | GYL R E |
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| UniRef90 LOA3 | Q\| R R WDGRHTPDSVAST |
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| iRef90-UPl000348281F | GLLHGWDRTAAE |
| UniRef90-J7KWD9 | R |
| UniRef90- A0A024FBS3 | DQLKNWNFY PNEMG QTEPAL |
| UniRef90 ${ }^{-}$A4XS63 | A |
| Uni | N EHLPEPLLY |
| UniRef90_A0A059 | WNGDMN |
| RE | A A |
| UniRef90 UPI00 | ${ }_{\text {A }}$ |
| f90-LOFTF4 | EQLAAWSGDYPLDSTSAT LFNQ |
| iRef90-UP10003 | EMLRGWDGN |
|  | E |
| IiRet90_UP10003 | D |
| UniRer90-A9BM89 UniRef90 UPIO0047D77D5 | RVMAQFDGRMDAASAAA QAAPLI FAAW |
|  | ALLAGFDGRLREESAA |
| ef90-Q11179 | DLMRGWDGDVNKDSVA PTIETYSRRWI WRKMIQ |
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|  | QELKNWDYYAD |
| UniRef90-UPI000349EFAF | RLLARWDRVAAEDSAG EHMPEALLFACWT |
| UniRef90-Q16509 | SLLAEWSGEMN EHMPEPLIYSAWVR |
| f90 A9D | A |
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DEFF YSAGLDDSDYYKKWVLQN
DELPPD $\square$ APDGGARW MVVMEQLL
DELGPDFFESY
DK
QLPSDSESFQSPD LLRDTRLAKVRLEYVGGCAASLLRKLI DELGPEDGPAWKAFVETANLSYSAQA DHLL
$D E V G D Q D W$ SEELSQP
DELGEEDFQNY
QKFPADLRVEGDCLLVRQKRDNT DPDDGTM
ERADARLLPPDRRAAALARVLPAAEAATTDPRDDLGLLLTT
STIWDEFKNAKVELEWPDPFTT
SRLRTAGDV
DELGDRAGDWREN ETFGAGGGGRWFDVVRTML

| $D D L$ | $P E S M R P S G N S R W L V$ |
| :--- | :--- | :--- |
| $D E L$ | PE GARPDGGSRWLL |

RAALDEDAARLVGAGDAARVLA
$\begin{array}{ll}D D L & \text { GA A P S Y WQGR } \\ L D V & \text { PA A R E Y }\end{array}$
AGGGGRWF
GERFI AAVV

ELGPQTSPAWQALVDTANNSYSAQA
PKLPDAVPPGGGS RWYL
DEMGEVTMNS

## S

P GP

## NATVQKTLLHAPD

## PS VNLAF EMLDRMLG

ITKN
LL IPA RLHDLLPGP\NATVQKTLLHAPDARFGM
DELGPENSATWKAFIGNANLS
E
EQPLP IDGQGRLFF
RDALRP
LVPHHRL
D D
ER

D E F
$D E L G P D D S P A W Q A L L Q M S G L S Y S A Q A$
DELGDAWFQA
DELGPLSDTFKRPNPLFDERVYRNT
DELGPDDSQAWKALLQVSGLSYSAQA
$\qquad$
NRLLLT SL

DELPPD
A AVTDDPDVL

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

D 1 G
DELG
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QLPEAVAPSGGAQW
KMPQ $\frac{\square}{5} \mathrm{EVVRRL} L$
EQQDGWNNPVF $\square A Q Q \square R S G G K Y C A N R A Q E T L V H C L$
SLSPHFQEMRG WNPRAVKTVLKEER

SRVPRRARPLVGLTTTETVVREVRALGP
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GUWSKWEREGDSUVLPNNYETTKLAK
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THVEPLFDERVFRDV
$D E L G P A A K D F R P$
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$G K G D E P H D Y D W M M N A D W$

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UniRef90-NOBK43
UniRef90_W9GM41
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Q DSLFDDTSTPQVFESAKDHIASSFQQYDSIRQSNPEM RNTDGAWCDIIQSSPIETCTD IARVALDEALLRLTESYGP REEGRWCQDAR AGURNCAQFMAQALEKAGAELERRLGP NDSENEFMDVVSTPERETAKDLFDTTFKATAQELDE WES DDPDNAWWDDTRTPDVERRDDILRAAMTDARKELTSLISR RNSDHQALDNDLTERFGSDWNDWKYGQTGYKHALIRHPLGS ADANSPWWNTRGGNERTDRAA IVRQAWQRSLKHLRETLGK DGAAA WCDVIQSAAVESCLDMARLDALDDALIDWAEEYGT ERPEA WCDGDPMEFRQA I A STLESAWGDMVSRDGS
 E EPENLWWDDATTVAVETRDEVLHDALVDARRQLTAALGA
 DWCRSLETSCKT ILQEESLATALALLKKIASSTGDFKEKTWGN DGASAWCDVKQSAPVETCDDMARESLDDALLLIGERYGT AREDSPFWDDVHTAQKEDKPT LLARSLAAAVNEGERQLGP
ES GE TG DEREELLVSTLTDAYGEVSYRLGG NEPLLDLLFDDPETPDVEVATDVATKSVEAMVAEVEA WEK ETPETETAKDLTLLAFKAAAKRLTEDKAEEGDYMWVNYKA GRADSPFWNDVRTPEQEDKPTTLARSLAASTTLLESRLGA NGASAWCDVLQSAPVETCADI ASLALDDALLWVNEHHGD
 GREDSPFWDDSRTPQKEDKPALLARSLAAAI TAGDSQLGV QGASAWCDVFQSAPDETCADMARLALDDALLTDSNTYGT ADADSPWWNTRGANQRTDRNAVVRMAWQNSLKHLRETLGN DGQQ QDCAGELRSSLGRAVEKLAARLGP $\square$ SERGRALVARSLGAAHRDLAERLGP EDEDSPWWDDRATLNVVVEQRDELLEQALEEARAQSVTLGK ERRDGWWC GRSAVSA DRALVRLQSMQGS RDRILGRTLAEAFRDAAARLGA
ENVLAHQPDRWLPPGYANYNELFAAAVEDTVKRDDAPH EPFSTVLDDPKTETDETAQ\LVEDSFGKMVAEDEK WDA QGE I FDLKSTSGKETASTHVKQSFGAMLEEMKTWEA E GGAGAWCDVVRSVATESCTD MARMSUDDAMLDWVVEHYGT



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 DRRAWQWGKLHTYEWLSDRGPYPAGGDHTTLNVSAYH H GVMTH QP QL R R F F D DA H G G D R F T V N M GA Y D F VYGDYNRGKMNHPFNLDF LNNNLPMNGSEYTVVNFRVNDKG EPVT WR WGRLHQQDLEH QRG GIVELGG GNS VVNASAP GYDV A ET WT WGRAVSLEHP H P L G A V A V P A NEEAVNK L A F D L N G $D$ LTK WQWGDEHIST LDS HVFLGVGSGGDDLTMWS G GA QPH H HP PY DR R DPVLD RLFRLL EVVATA GSHDTIINRGSPSLRE ERKAWQWGKL HTYEWYLDRGPYPAGGDHTTDDVSAYG
DPA QWQWGRV H QMHFNHP LGGPIPTQQSHHTN NSGFWDWD P NSRKWQWHPL GAKKP LDRLIGNVPMAANEESVNKLAFTLNG $D \square S T W S W G R L H Q V H K L L N R G P Y K L S G G S A A V D A T G W N A A A$ DRARWTWGALHQAEPRHPLGPVPRGGSGDTVNATSYGTDF NWANFKSTTAQHLARRLAPFPNIPNGGNHNVI NATSEKH D P K H WR WGALH TLE L RNQRGPYQLGGGTDLVDAT GWDGYG DMDGWRWGDVVEAALDNRLGRIPVGGGNHTLLRAGYWNGG

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 DHKAWQWGKLHSYAWKNVRGPLSAGGDATTLNTAAF Q GPKWGWANQKSTDDNHLAQLPGAGSRGTVNATTSRNGP TTARWNWGDLDA ITTLLFNRGPFPVGGGASVVNAT GWQYAT $K$ GDYTWLTVYKATHASHLLDQGLPAFGGDRSIVNATSEDH G RPERWNWGELHALP LTTHNRGPVPTGGGSGVVNATGWNGYA EMMAWRWGDAHRARFSGMVLGVETDGSNTTVNRGTSRLD
 $N \square E S W R W G D A H V A H D H Q V L G E V P \square S G G D H T L Q R G R T S G K V$ D RS G WQ WGK LHALLHGYLDRGPYPAGGDHSTLNVSAYHWGD DPGDWSWGQLHRAHLRHQRGPYPVAGSSAMVNAMNWDA
T PS D WK WGHL HR GRFRNPDPEVAVPGSDDSTPMNALYSAD F D P A D WR WGDLHTFTPVVHPSFPVPASGGSSTVNATGWER
 D DP K WGHP LL T H TP L A P L F DRVVD G G E R FTVVNVGWVNP K T DWAKFK HTSINHLFKAFSRQGIYTGGGRS VNATSER H G A $\square E S W R W G D A H Q A P L L R Y F V N L R Q S T S G G D Q T L M R G Q T K G$ D PS GWQWGRLH QA SLLTSPLRTMIPTPGSMHTVNVANYNQDH K H GD YNWQA YKATYAGHLLFNLPDGGGRSIVNATS ENHG ETT GWEWGKLHRVT LTRHQRGDWPVGGGGPEVVNAMSF GYRV V V S D WR DPASWQWGKAHTLTHNHPLGNVGPFAAPGTHEVPNNLSAK S LE S LR W W DAH QI R GLG WLVNI RQSTS GGDNTLLRGRTKG NHSHWQWGK DH QLTMKHPI GPI P LGGGSGSTPANA IYRGDF DMS R WR WG DAHKARFAHPVLGIRTMDGDNATMSRGTYR DDG DLDHWFWGKLQNVYLSHQPFRFPSGGSPNTVNAVDGRFDL D P T R WR WG NLHRAAPE HAVLG $\square E V G G G S S D V D A T G W D A W G$ QKANDNWGKYK DAG GR H L L RREPLSGGGENMINATN QFHG DLGMWRWERVHRTRSNHWNRSVSAPGGLFTVNVGGYDL HRT QMDHP LYGRLP LLGRLLFNLATVGGDFTVNRGTPSTRE
 DHTAWQWGNLHRYQWAT QGTQLPAGGDHTT LNAAA Y DPS L W R WG DL Q WT LFE H H IG P L P R G G A WD TVVDVS S YR P G Q LGPAWNWGEHHFARLDHPLRRVPRPGGADTVNLTAYDSSG ENGEYNWASFKGTFKSFSAENVYTGGGRGVVNATSERHGA TYA GH LLLQGLPAFSRVDIP DGGGRNIVNATS ENWG ERRNWQWGKLHTYEWY LDDRGPYPAGGDHSTLNVAAYQNFD A LIESLRWWGDAHQTHDHPVLGKAPVSGGDNTLQRGRTRGGG DMKNWRWGDAHQVPVLHYFVNLRISGGDNTLNRGETSAS G D P QR WRYPAYHHALI RHPLGPAPRGGYASTVNATGNTDNQ D HK A WQWGKLHRYEWKNIRGPIQAGGDHTTLNTAAY LWG S LE S L R WG DV H QTHDHPVLGSVVVS GGDNTLMRGGRTKG D P A S WQWGKA HT LTHNHPLGP FAAPGTHEVPNNLSAK $\quad$ G $N P A D W T Y G K V H T V A S N H R A F G T P T N G G T N T V N V A R P D P R Q$ PGPAWHWGEHHFARLDHPLAALPRPGSADTVDLTASDSSG E P T D WR WG R L H QLTPS H D Y V N L P S G G G A S IVVNAT GWD A S D $V L G R W R W G T A H A A L S S H R P L G V P S G G D S Y T V N V G Q Y \quad L P G$ DPAFWQWGGFHHGLFAHPLGPLPVGGSAASVMHADYRPDD D PA GWA WGRLH HA HLVVH PLA P L P L L G G S GVTVVMYAGYRPRV
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T $T \mathrm{~W} L P S$

## SGQSD

$\qquad$ SGGAG
WIMPM $N$
$N$
N
N
SSWRMFV
TAGPSMRMVVDLSNLDOKACVNPGGNSGHAMAD
TGAFSVRSGPAMRGDVEEAWSVLPTGQSG
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V VD WVP SMRMVVDLGGRLDDSRWUNLTGAS GS FAVRTGPSMRMVVDLGVTVTGVS TSAPSMRMVVDLGDLDSSTWVTLTGTSGH TAGASFRMVLDVG NWDQGRVINTPGQSG THGSSYRGLFDLADDNRSTY QTTGQSGNV
 QSEN

NP
PASR
DPANPH SHGASYLLVADVGA WDNSRFLLLPGQSGNV ADPRSSR
SWGNDFDVWLIPAMRIVVDFGLPEPGLNSSGQSGNPASRH GFETNWVPSIVDLKDFNHSQWINLTGASGH TAVPSMRMVVDLADRDASTW WMLHTGNSGH AFHRN SWGQSFDTTQVPALRMIVDFGLAEPGQSGIGQSGNPASPN SYATTTVPMVVDLADFDGSTWIHLTGASGH AFHAH GVTGASVRFVVDVGNWDASVAVNTPGQSG DPRSSH A WGLDFNTTQAPDMRFTVDFGQPEPVQGGSGQSGNAASPY SWRMVVALGP $Q V K A Y G I F P G G Q S G$ NPASAY

520
H
P
R WS P NPASPH
PASGH
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GQLSRH
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TTVPSMRMVVDLDADLDASTWNHLTGASGH PSWRMIVEMTSPBPPTAFG\|YPGGQSG TSTVPSMRMVLDLADWDASTWQNLTGASGH NDDAPYRHVHGAGLRAVFDLSTQAPGQS NFDAPAMRIVVDFAREEPMLGLNGTGQSG PAPWPVNYGPSTRRLIDFALSINPVGQSGVL GMPFANVHAAGYRADPDSSVFVTATGQSGH TWLTPAMRILVDFNRAEPMLGLNSSGQSG STGSFDVSSAPSMRMVVDLWVNQTGTSGH TEGYAVSTVPSMRMDFDAARWI DLTGPSGH AFHPQ
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TD
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AFHEH
PGSKY
AFHPN
ANPFSPH
NPASPH
FDR
PLSRF
NPASH

NPGSRY
$\qquad$
D
S

NAMSSH
NA SVN
NPGSKY
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GASFRAVIDVGAWDR
SFA SFAASAPGQSG
SVFVTSTGQSGHF NDDDPYANTNASSYRGDFDLSIQTTGQSGNV $\qquad$ SR
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SNAWVLSGQKTKKGQVIFCNDAHMGVGQPGFWYEVHLNYP SNNWAVAGEKTENGHPILANDPHLGLNLPSLWYAMQLSTP SNNWVVAGSKTSDGRAMLANDMHLALNVPNIWYRADLNYD SNNWAVAPSKTKNGHPTLANDPHLSLNLPSLWYADQLTTP SNAWAANATRSATGSTLLANDPHLGLTAPSI WFLARLEDE SNNWVLAGSRTVSGKPLLANDPHLGLSAPAI WYFARLQAP SNNWAVAGKKTKNGNPILANDPHLSLNDPSLWYSMQLTTP SNAWAAAPKRSAAGGTI MANDPHFALSAPALWYLARLELS SNSWTVSPGLTDTDRPILAGDPHRPVTAPSLRYVVHLSS PDRSAGGGTLLAGDPHLGFTAP
NLATAPQRSRTGRSLLAADSHL
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 SNNWUVAPGKSASGKPMLADDPHESLATPSVWYQTRLEMK SNAWVVSGTHTVTGYPLMSNDPHLKLQQPSPWYVVSQNGS SNNWVVGPTRTETGRPILASDPHRIYLQPSLRYAVHLTAP SNNWAVAPKKTKNGHALIANDPHLSLNLPSLWYAMQLSTP
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SNDWVLGPSRTTTGGPLLADDPHLKLSAPMLWYLADVRGP
SNNWVLGSSDTYNNGSI LANDPHLSFSAPSVWYLDHLEGP SNGWAVDRSKTADGRAIVANDMHLRLSDPNTWYRASLRYG TTGSTLLANDPHLLGLTAPSDWYLARLELE
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UniRef90 B3ORW7 UniRef90－B3QRW
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 TVKPGEPSQYKEDNKWLPFTQRTESIRRVRSGKDDTLNVKE S D S L E G GY

RTNAQG EYWDGSGWHAMERDHETI QLNPDNPEEYLTPDGYKSFETRRVI
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 EI NPNNPGQYKTNGHWQNFTHRQETDAVKNAPSTQLDVKT QLNPSNKQQYKVGDSFVPFNTNKEII KIHGSKSKTINLLW
 VWNGDK Y $\quad$ YYKGE WLEPEKVVKVKTVKGDE ERQVVVEK ELINPENPQEYRTPDGWKRFQTRRSUVEDRGEAPVTVTLRW D R S A
QTSPDHPGDY LFNGSWVPFKVENETVLVKGEKPVHI EI EV E $\square$ NPDNPDQY RVGDKWQHFEQTLESI RVKDNEPVQI TVQR DRRDGG YVYEGDVRAFETETEVIEVAGGDDVELTVKK
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$\qquad$ N D Q W $\square \mathrm{P}$ SVVRVER RVRGGEDVQLTLEQ NSAGEKIVQRVEE QI NPADATQYRTPEGWAPFTVRSETIRVKGEADQVIRLRS
 LNHPTDKSKY $\quad$ S S TGTHTY $\quad$ Y R SK I I KVKGEDDVKVNLKE KLQRDNGKHYYYEGQWDPTRERLENI RVRDGETEQLVVHE KLNPDNPEEYLSPTGYQAFAKRPS\|IKIKDAPPVTLTLRW TVKSENGQY LKSDNTWAPVRETTEHFKVRFGKDRDVKLRF KLNSSKDMYWNYDG $\qquad$
EEAGLD
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 KLNPDNPEEYLSPDGYRGFTTRPSIINIKGSPPVTLKLRW RATPDGRVE RAGSDPEP LLSRDERI PVVKDAEPVELAVRR E I NPDDAGQYRVGDRWQPFDQRQEVI KIKGGASKAVAVRE KI QNNTYFYNNEWHPLKESPESIKVRLGQTFNFTLQE
 $T L R P G G K Q E V L I D N Q W K P V T K R V E T L R V K G Q P D V Q R T F R S$ ELINSSNPNLYKTEEGWKNLK LDKQYI KI KNDSD DEDKRKW EID EDGRRYRYDGEWREFDTEKREI PVAGGQNRTKTDRK

 K RHPQDSTGYFNGHKWYRCQTLVDTIY SGEDPY LGRYKQ

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TVHGPVIEREGAR $G V G V A W T G H T A E S T Q A D Y E F S R S$
SQYGPVINNVTPHHEKDTIRWTADQPGDTTPEAFYKLQYA
T DFGPVVY DQPEDEYYNLALRWAAHDAPNVEVFLNLADA
TENGPVLPSNLFTPPGHVVSLAWNALRDTSMTAATAALMRS
TSHGVIVNGILGDATDSPMLRQNNDLPDLSFAAIHRLARS
TVWGPVALKPLQGQPVAVHWVADDPDAVNVD VLDELEQS
TVHGPVLEREGRTMDYVGVAWTGHTARTTEATYEYERS
TRHGNVILSPLYPKETRQIALRWNVYDPAVIRSPFALNSA
TPHGPILNDGLDGLEAFTLALKSTAGQPWKVDGYFEMPAA
TANGPVLPETAFTPKNHVATLS WDALKDTTDSAADNLMFS





## UniRef90 F8A6M4 UniRef90-UPIOOO464A3EC UniRef90-D2VJM6 UniRef90 LoG614 UniRef90-UPI00039F7C6D

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200 KNYADYASALEGWCPSVNHIYADTTNTI AWKPSGATPVRN KDWNSFVDVVSLFVSPQNFVFADKSGNVGYYGAGLVPVRK RDHGDYGAALDHYTAPQNFVFASSQGD RNTQQAVADMNRFGPPQNVVIADRDDH: DTLAKARQAASKLHVPLNIVWANAAGDI WTYMGRFPKRR TNHEDYNVALDNFTAPQNFVFASKNGDIAMRAQAKFALKW $R N V D Q A \prod A A G E L H D A P Q N L T L A D R N R V A M Q T I G A D P M R D$ QSVDALFQALEPYHSPQSVVAADVQGNIRFKAMGKVPVRH KNHADYNAALDHYAAPQNFVFAAKNGDIALRMQGKFPLKW RTVQDADAAIEPHVAPFNLVLVDG VQIAMKTIGHAPRRD
 QNWESAVVGALADFHAPQNFAYADASTGNGGFQVAGRVP VRVV KTVEEGITAGAYDAPSQNLTLVDVNTI RSVQQAVDILNR』APPQNVVIADKEGH|
 RGAEAFGAALADWGPPGTYLYADASGS
$E N W P Q F L Q A A F G V P P Q N M V Y G T A G N$

## R

 H D WP S F Q S A V R WL V A P L N W L L Y A D T Q $N$ N N
$\qquad$

GWTYMGARPPQR Q $R F Q A M G R V P V R A$ $A$ L K T V G V M P D R D $A L A A G G R V P V R$ G Y V S A G RVV $P$ V $K$
 AS SDDEA DEAGRLFVAPQNLMLADTQG V

 K D WN S F LLEAIS YFIVS QNFVY A DKE G NI

 GHQAS GRI P V R R | $G M L S A$ | $G A$ | $P$ | $R$ | $R$ |
| :--- | :--- | :--- | :--- | :--- |
| $G Y$ | $G$ |  |  |  |
| $G$ | $A$ | $G L$ | $P$ | $I$ |
| $R$ | $D$ |  |  |  | A WF MA GKAPVRP




 RTWSEAKA A LTTYAHMP LDNWI WADTSGTVIGWQTAGUAP VR A SVVEALSAGELLYDAPQNVLLVDSDDTIAMKTRGAMPRRN
 QKVVHAF DNTREDGAA LNFVVA DAS NI GWQVSGRFPNRR





 $E T L E Q A M A V V N R T G G P Q N F L L A D N Q G R \| G T V M G Q \square P R R V$
 E GWE QF LDDAAAD FVPP QNMVYA DVEGNDGYVSAGRVPDRG



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

 Q N WQE F V D A L K L F D PP Q NFVVYAD K E G N I G Y Y LLS G K I P I R A KTMEELKTAVSMAKSPMNILYADKE GNI GHFIILGSLLFKRN

 A D L D G Y I S A L R A F D N P S S N V V Y Y A N Q N N N D
 RTLSEAREASTGFRQALNLMLAHRDGGIAWQVTGLLDRRG

 QSFP QFKA A A L K Q S DG WN F FA D T H G H G Y Q NS S L A P QR Q QNVQK GLES LEEDFHAP LN F L LVDNEKMVL KTVGKMPRRS

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UniRet90 FOQBF1 UniRef90-Q3EK40 UniRef90-UPI00036F1C3E UniRet90_V3TOK8 UniRef90-B3QRW7 UniRef90-19X024 UniRef90-S2D9W5 UniRef90-UPI00036D3DCE UniRet90 A3PJP2 UniRef90-A0A037ZL17 UniRef90-E8U4P4 UniRef90_O25548 UniRef90_UPIOO037F1449 UniRef90 A4EM85 UniRef90-A1ZPV5 UniRef90_17ELT0 UniRef90_Q2CJE9 UniRef90-V9VQD3 UniRef90-UPIO0045E83DA UniRef90_UPIO004786AB1 UniRet90_A6FNR3 UniRef90-S9QFU8 UniRef90_G4SVQ2 UniRef90_UPIOOO29B3E36 UniRef90-N2JC37 UniRef90_UPIO003620371 UniRef90 Q0FAH8 UniRet90-A0A021VLZ9 UniRef90-H6NDI7 UniRef90-O29763 UniRef90-_DODOY1 UniRef90-UPIOO03B34284 UniRef90-Q9H183 UniRef90-UP100036ECC3F UniRef90-M013Q5 UniRef90_UPIO0047A06B0 UniRet90_G4LDX4 UniRef90_FORPJ8 UniRef90-UPIO0037F3BF9 UniRef90_R7ZNX4 UniRef90_UPI00029AA2AF UniRef90-UPIO00237854E UniRef90-K2JC10 UniRef90_C1CXM0 UniRe990 UPIOOO255A7FB UniRef90_B5JT11 UniRef90-A3XAS8 UniRef90_14B6D3 UniRef90-x1FIL4 UniRef90-UPI0003B51059 UniRet90_MOMQG9 UniRef90-A9KFE9 UniRef90-UPIO003621EF2 URR90-A4ER83 UniRef90-UPIOOO45E5A9E UniRef90_17MIY2 UniRef90-L9X9H2 UniRef90_S4XUT3 UniRef90-UPIOOO38225E5 UniRef90 Wo.JQH9 UniRef90-MOMPJ55
UniRef90 D5RR62 UniRef90_17MB89 UniRef90-H1XNF7 UniRef90_F9UCT9

PS DGTWPRPGWDPAYDWQGYVVPEEMPRVQDPAEGFLVAA N WD GLLPVPGDGRYEWQGYLSPETGPYEIDNSRGFVATA E GHNGRFPVDGDGSYDWQGFMPAAEKPSVYNPKKDYY A S A A PGQGKYLMDGNDPAFEWNGYIPSEHNPSTLNPARGFVSSA
 PEQGKFFMDGADPRMEWQKFDPNEQNPSTLNPNRGFVASA ANHQSQGRYPSFGENRWQGVSAYVDNPRFVDPDGGUVGNT
 A EHGRMPAPGWQDRNRWKGLSPYGSNPEYIQPPGGULGST EG DGLLPVPGDGTHEWDGFMDG LDPSVHNPDEGFFSTA P R HQS RPA PGWDA EN R WQ GR LP YA D NPEFVAPEGGGVGNT E GE GLLDPSPGWD GRYDWDGYADPMLDPYDQDPPQGWWATA $\begin{array}{ll}K & \text { G G S S P A A M }\end{array}$ GF D G L A A R S WVD G E VA WQ Q F L A P D A L P R L I D P P E G FI V T A

 P GN GKF APGWEAKYD WT GYYPGSAKPT QFNPAS GY AT A

 $G G G G T F P Y V V K D G T D N W R G W i A P D K M P G Q \| N P G K N W V G T C$
 A HDGLLPVPGDGRYDWAGFHDPGALPRRIDPPEGYLATA E GQGKFLMDGNDPKYEWQGFDPSAHNPATLNPARGFV S SA $G G L V G V P \square T D Q T \quad H E W Q G V L P F A S L P S S F D P P G G I L A T A$ PAHGRMPSPGW\AGNRWQGTFPYEENPRVVDPETGILGNT ANHQSRGRMPSQGQNRWQGMLPFSANPNFVAPEGGLVGNT
 GF D GS S T K SWA E G D $\square$ G WE GY IPPPSELPRVISPPEGFI ATA ANHQSQGRLPAF GENRWQGRFPYSENPEFLDPPGGDLGNT
 ARHQSQGRMPSQGENQWQGRAPYAANPEFVSPDGGDLGNT A GWNGLLPDP GDGRYEWRGMLSLDELPHALNPERGFLATA A AHQSKGRMPWRPENRWQGRAPYADNPEFISPAGGILGNT P S D GTWPRPGWDSRYDWQGFVDPAVMPAVVDPAVGYVVAA K NWD GLMPVPGDGRYEWDGFLP LAQLPSETNPSRGFVGTA A QHES QGRMPSRGQNRWQG ISPYSANPEF $\square A P A G G V L G N T$
 E GQGLLPSPGWDGRYDWDGYADPMLHPYDQDPPQGWLGNA E GRGLLLPSPGWT DRYEWDGFADPMLHPYDQDPSQGWLGNA GMDGSVSRSWADGKAGWDGYVDEHQLPREDDPAEGFLVSA TNHFGEGR】PSQGRNHWNGYYSYQENPGTMNPNNG\|VANT PSDGSWPRPGWDSRYDWQGWVPAEEMPAVVDPAEGFLVAA E GTKPW LPMPGS GEHDRTG WVPYEQNPQSHNPPDGVI S S A PAHQSQGRMPSPGANRWQGVFPDSENPVWTDPDGGUVGNT DES GEWT GFIPP F E ELP RVVRNPEGGFI A S G RGN PRG GLP GNGSYDWTGFVPYSDLPYLYDPSRGFVFSA GFDGSVS RSWAD GSA GWDGYV EAEQLPREIDPPS GWLVSA T GEGEWPGYEPYGRSSWDGFVPFESIPHVDNP DVL ASA
 A D D D L HP P P GWES R Y D WVGYV P E S A K P R S L N P R E GFI A T A GWD GSLPAPADAQHRWTGWVPFGQLPQTFNPADGLVVTA

 A AND DRGVAPWEARYDWQGWDAPGKTPRD DGAKGWL ATA
 K GWD GSLPVS GDGRREWQGY IP HARLPHTYNPADGLI VSA
 S GLGGLLPSPGWVDDYEWTGVVDAEQHPNAQNPERGFIGTA S RHHSKGR LP S Q G WN Q WLGRAP YAANPEF $\square$ SPRGG L GN T K GTGGQLPS $\quad$ GAAEGYRWKSF LPFEQQPHRENPEKGFLVTA EKAALFPYPGWKEDGRWQGFLKEEEKPNFYNPENGLIVTA ANTPSTA A TK D E S G E F D F G G L Y D
$P G D R \square F D G S A S E G E W Q W E G F V P F E E T$ QGWSGEDFASTNDRWTGYIPFKKMPHVMP NYI GTA
 AKHQSQGRMPSQGENRWQGRAPYAANPEFINPRGG\|LGNT K GS GAFPSPGWLPEYAWRGFVPQRLNPAQTDPSGGALITA
 ID S GNRVFDGS A GE GE WE GFVPFEEKPHAIDP DVL ATA H A S G LTPVVPVT S G TY E WS GY IPP F D MLP QV F D P P G GI L A T A S PLN ALLYPVP GT GGHE WTGYATNAELDPSVY DPPSHVLVTA PLNQTQGRMPWKSENKWRGYWGYEVNPII ESSPGDIL GNT A GE A EWD GFE P Y GAS S WD GFVP F DEK P HVVVDP DVV A T A




## UniRef90 F8A6M4 UniRef90-UPIOOO464A3EC UniRef90-D2VJM6 UniRef90-A1ZPV

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260
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 NQYSVGES YPYY!FDNTFEDYRNRRINGRLREMEGTTMA NNRTLGRDYPYVIGHNWSLSYRAHRI EELLKSRNGLTEQ
 NNKMI DRPFPRHVSFDWGDTQRVIRWRRLMQAREVHTRD NQRVTAP GYPHYLTQDWVLPYRHDRDAQLDAATPRHDAA NQHPDPSYPYYVFDNSY EHYRNRRINNSLREMEQDTVE NNK DVRPFPLHVSFDWGDTQRVQRWTRLMQSRQVHTRD
 NNKVI DRPFPNHMSYAWGDSQRDMRWQAMMQGRAVHTRD NQRVIS QGYGMQLSNSWHAPERAERMAGLASSGKQDNRS $\begin{array}{lll}N N Q V V & G A K Y P Y R L T T R W P E P Y R A R R F D E L L E D Q T K L D G T \\ N N K T V & D R P F P N H V S F L W G D T Q R \square Q R W R N L M Q R R Q V H T R D\end{array}$ NNRTL GRDFPHTIAHNWALGYRAFRDAELLRGQNRLTEA NQRVTPP GYPHYLTQDWALPYRYERIAQLIEARPKHTAA
 NNRDVPDN YPFNFGHDWVLPYRYDRIMDLLKGRAPHTDQ NQQPTGSH YPYYYNGYYSENRANRIGRLLANDNNFTPE NNRPAEDYPYE $\square$ GKFFFPYRAERLDELIQQQDASGDA
 NNKTVVDTGFPHYYSSYFAPSFRYARLKELMAGKAEQTPL NNEVGSNLTYPHFDSHDWADPTRKERI DELLGNRDAKSGN NNKIVDDR YKYYI SSDWEPDSRADRI SELLDAKEKLSAE NEMNLPDFPAARKLGFEWAEPWRARRI RAVLDGQSRHTLD

 N NK K V
N NK V
N NNRVAP
 NNKTV N N Q
N N GKDYPY IVGYNFANSHRAYRINKRLREMDQVTEQ

5E83DA
 NANVAPSYTRFDALARSWAEPFRHDRLQEVLDDSTRAATVVQ


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NDRRLG

 NQRTGAAYPHYYGTSAYFDPGYRAGRMYKELAEAGKVDSD NNKIIDRPFPAHVSFDWGDSQRVMRWSQLMQGRQVHTRQ NNLVAP $D Y P Y P D P G S Y$
$P N Y P Y$
NQITVVS
NDRRI GKEYPHVIGRQF AS GYRA YR I NQRTID DPPFYMGTPATYADPYRGQRIGQRLGQMPS DNEW



 NQKHVSE DYPYF IS MDWAPSYRAERI A S LI E GKR GHK L S


 N N K UL ERPFPSHVM YT WGDTGQR DNRWRRLMQSREDVHTRD NNK I I P DN F P HYMGFEWEAPFRRE ERI K ELLLLQLEK H S V E




 NNRT』PA DYPVAVSRAWMAPYRAQRDAELLAGGPPLTPAA



 NNK S S EAKFPKHV SHVWGDTQRQLRWRKLMQNREVVHTRE
 NNRMQPREGDAPF LGRDWYGDWRFQRI HDLLARRPRHDAG N NK $\square$ S P NSAK GFA S $V$ N M H P T

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UniRef90_UPIO00464A3EC UniRef90-D2VJM6 UniRef90-A1ZPV6 UniRef90_L0G6I4 UniRef90_UPI00039F7C6D UniRef90-F3KRJ3 UniRef90-A311W6 UniRef90_A3V660 UniRef90_UPI00040808D7 UniRef90-UPI00042937A1 UniRef90-UPI0004666D23 UniRef90-UPI0003464953 UniRef90-X7FAN7 UniRef90-Q4KH86 UniRef90_A4U1F5 UniRef90-A3SW04 UniRef90_F9ZW05 UniRef90_JOU3L4 UniRef90_Q1GGX9 UniRef90_UPI00034B31DF UniRef90-S6HPM9 UniRef90_G8TKJ1 UniRef90-C0GKT7 UniRef90-FOQBF1 UniRef90-Q3EK40 UniRef90_UPIO0036F1C3E UniRef90-V3TOK8
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UniRef90_UPIO0045E5A9E
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UniRef90_L9X9H2
UniRef90_E8V554
UniRef90_S4XUT3
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UniRef90_17MB89
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$D M W Q Y Q R D T G N \square M A R R \square A P \square M A R \square I L A N E N T \quad R D \square G$ KVTMMA $V Q R D T H D Q N \square E A F R Q A V V K$ K KTRENTSERQQMMAG $D F Q H I Q D V V S P Q A R N L M P Y L M N A L Q S D T A Q Q A H R R A$


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$\square \mathrm{D}$ D E F VK
QTDVVSGWATDALP HL

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S

TDEFHRQNDVYDGRA

DMAVI QRDAVSLFAREMLPALRGITR
$D V K K M Q Y$ DAVDVYARQVAPYVINLYEKQKQTGK
DMQ NFQMDRVDRYHQRWQKILLGVLRQNG


UniRef90-UPI000464A3EC UniRef90-D2VJM6 UniRef90_A1ZPV6 UniRef90_L0G6I4 UniRef90_UPI00039F7C6D UniRef90-F3KRJ3 UniRef90-A311W6 UniRef90 A3V660 UniRef90_UPI00040808D7 UniRef90-UPI00042937A1 UniRef90-UPI0004666D23 UniRef90-UPI0003464953
UniRef90-X7FAN7
UniRef90-Q4KH86
UniRef90-A4U1F5
UniRef90-A3SW04
UniRef90_F9ZW05
UniRef90-J0U3L4
UniRef90-Q1GGX9
UniRef90_UPIO0034B31DF UniRef90-S6HPM9
UniRef90_G8TKJ1
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UniRef90-FOQBF1
UniRef90 Q3EK40
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UniRef90-V3TOK8
UniRef90-19X024
UniRef90-S2D9W5
UniRef90_UPI00036D3DCE
UniRet90 A3PJP2
UniRef90-A0A037ZL17
UniRef90_E8U4P4
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UniRef90-A1ZPV5
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UniRef90_UPIO00255A7FB
UniRef90-B5JTII
UniRef90_A3XAS8
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UniRef90-A9KFE9
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UniRef90-17MIY2
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UniRef90_F9UCT9


LLIRTWDHVASEDSAAAAYFA
$K L L Q N W D G N L S A D S A A A A L L$
$E K L I D N W D G$
$D E I L Y$
QLLRKWDGSHGLRAQA
SVLEKWDYYADPDVKGPVA
NAI A A WD GYMQTDSLGAP
NQLSEWDGRHEAGSUAAT KQLKEWDYYADPNQKA
ELLAAWNGEMN
A L L R D F D GVMMAN KELSDWNYKAAPNQKAQS TLLADWNGEMN DLLESWDGDHPVDS
ELLADWNGEMN
SRL $\square$ AF D GKVSAGS
KMI AAWDGGMGQD
TLLAGWS GEMN
QAL DA WD GHMRTDSVG
ALLKDFDGVMD
SLLAEWNGEMN
AVLGAWDGSAAEDSAG SILKA WRFDSDP VQFSRWKGAYDKNDEQAKL NLLQGWDYVEDAAS $A Q L Q G F D G A M R A D$

R LLAD WDFKDDPEKAG NRLVEWNGDM
EYLKNWPFDFSKSS $\square$ GAT
TLLTPFDGADHEDSAAA EYLKEWNFNTFPN
D IL R S WN GVMHTTE
ALLAEWNGEMN
ellan wngem n
DLLARAWDGQMRTDS
QRIVKWNG
$K Q \mid A A W D G K V E D D S V V_{G}^{D E V}$ NLL SAWNGEMN
$\begin{array}{lll}N L L S A W N G E M N \\ Q & L & \text { Q SWK GD H P LD T K G }\end{array}$
SLLSEWNGEMN
HLLA A WDAQAR
T LLS GWNGEMN
DLLRDWDQVQGADS
D TLLA WNYELSAASRAG
DLLSDWNGEMN
ALMAEWNGEM
GHLQAWDGNADRDSLGF
TRLMAFDGRLSSTS
TRLMAFDGRLSSTS ADAALYELFLLQESAKLTFLL EALPAEQRRLGTFDGRLLATSADAAVYEAFLQATARLTFA DYL $\square A$ WNGRADADS $\square G F$
NLLANWNGEMN

YFA A

EHMPEP
ANFQKFIR

VWS T TLE TA F ${ }^{360}$
$E \| W F S K H L G G L D A A$
$E M W Y K D M G N L T K V$
 F E L WWDAFKGGVWK

PTLYYVWWGKLYNQI
EHDPEPALIVAAWARAFQARVIR
EHLPEPLI YS AWLARALQDRLIR
EH AQAALYQT WFHRHLGPAFY EHRPEPLI FNAWVDKLWTRILA A ALLAEFRRRLADEVFA A GRAAPLI MAA WTDELVRGLVV

SAA
D

| D |  |
| :--- | :--- | :--- |
| $A E M K L V$ |  |

RAAPLVFAA WVDELLARATHEG

I SQFFVRLMHNTFA
QEAPTLFQVWWNNLYKSVWT AAPAIVTAARDALWPLLLE
E H LPEPLI YMAWMRALQDRLIR

LLVRFREI LAAEDVFE
EHDP P P I V F Y QLFY QLLK YTME AESSPALLFELWVTRHLKPA F
EHLDPEPLI YA AWLRA LLQTRLIT T A A A AYFSSVWANI LELLTFW
EHDPA YAAWERRLLSHTAD
 ALLVEFRKQLAHSVFA
 DLLRGWDRTNAADSAAAAYFAAVW AT LGLETGW AELQRWNYKAEEGSSA
EKLRNWDFRMQKDSEA
ELLADWNGEMN
A RLEAWDGA L D MD
SALSSWNGNMD $\square$ NSTAAT
D TLLAWNGRADTDSLGAF
 ALLQGWNHQAAAD ARAASLI AGYWVRAFTRELL DRLS GWDGELGTDS ASATVVEWWLAE E
DELRRWDY LMSRDSVA
GLEDWDYSAGANQLGAT
GELLHWDG AD FDGVMD ALLAEWNGEMN
ALLRGWDGNETVDSV DALVKWKGNHGLL

## 

## D Y K

S Y P D V $G$ A
 A GQAAPLLFSAWVDELVRGLIA DKWKGNHATLFEAWLMQLHG LAE RFLA HYRA $\square \mathrm{NGDLH}$
S LLASEWNGEMN
QNDEPVI YYKWTNKLLHKTFS

DI LAKFDNVMHKDSQG
 DILKNWDLR
EALKA WN GESEDSS $\square$ GAT
RRLRGWNGEMRRGW DALDEWDHRMDRDSLDA
DLLKWNGVGT
SLLKE WD FVVYR
D SLLDWNGVMDGDS
DYLLSWNGRADTASLGFP
ETLADWNYRMDADSRG

SMLASWNGEM
DLLEEWSFRMERESRG
DALDSWNHRMERDSLA
DLLLSWDGEMA $\square$ D
$D L L L S W D G E M A \square D$
$D H L K N W T F S Y E K E L V G G T \square F S$
$\bar{D} R L K K W D G S M E S D S R$
$E E L L D W D G D M A G S S R$
$\qquad$
NILKKWNGDFSRNSKGAT ALVFARWFEQYRERVFG

ENLYKWDFKMTKESIGGT $\quad$ YY $\square \mathrm{S}$

A EAPQ
E H L P
P
$\square \mathrm{Y} \square \mathrm{S}$
$\square \mathrm{F}$ A Y WVIK Q
$\square \mathrm{Y}$ NHFNY LV M
PEPLIFAEWMKELSRA
ALVFARWFEQYRERVFG


UniRef90-UPI000464A3EC UniRef90-D2VJM6 UniRef90-A1ZPV6 UniRef90 LOG6I4 UniRef90_UPI00039F7C6D UniRef90-F3KRJ3 UniRef90 A311W6 UniRef90 ${ }^{-}$A3V660 UniRef90_UPI00040808D7 UniRef90_UPI00042937A1 UniRef90 UPI0004666D23 UniRef90-UPI0003464953 UniRef90-X7FAN7 UniRe90-Q4KH8 UniRef90-A3SW04 UniRef90_F9ZW05
UniRet90_JOU3L4 UniRef90-Q1GGX9 UniRef90_UPIO0034B31DF UniRef90-S6HPM9 UniRef90_G8TKJ1 UniRef90-C0GKT7 UniRef90-F0QBF1 UniRef90 Q3EK40 UniRef90-UPI00036F1C3E UniRef90-V3T0K8 UniRef90-B3QRW7 UniRef90-19X024 UniRef90-S2D9W5 UniRef90_UPI00036D3DCE UniRef90 A3PJP2 UniRef90-A0A037ZL17 UniRef90_E8U4P4 UniRef90 Q25548
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UniRef90- O29763
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UniRef90-UPI000237854E
UniRef90_K2JC10
UniRef90 C1CXM0
UniRef90 UPI000255A7FB
UniRef90 B5JTI1
UniRef90_A3XAS8
UniRef90 14B6D3
UniRef90-X1FIL4
UniRef90-TORCL5
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UniRef90-A9KFE9
UniRef90_UPI0003621EF2
UniRef90 A4ER83
UniRef90- 3 YYEC3
UniRef90_UPI00045E5A9E
UniRef90_17MIY2
UniRef90 L9X9H2
UniRef90-E8V554
UniRef90-S4XUT3
UniRef90-UPI00038225E5
UniRef90-W0JQH9
UniRef90-MOMPJ5
UniRef90-D5RR62
UniRef90-17MB89
UniRef90-H1XNF7
UniRef90 F9UCT9

D D LP DGDSPNGGSRWLE VVRS LLD D P D S P WWD DRSTPGVV TSQGAVPGVMPLLVPFDAPS IASWLE NRWSFGPY ETV DELGEQLFK WDDMPNPGFMNEVLSRTYPTLLF

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

DELG

| D | E | L |
| :--- | :--- | :--- |
| V | G |  |
| G |  |  |

D DRFKA

DELGPLARDW
TH $\dagger$ EP $\square$ F $\square$ E
EEAVSPLARDF GASHDEPLFDERVFRDVG
E AVSPE PDAGASFTEHTQDAGALLDAL

DELGEDMASMRAVRPTTLGE
DELGADAEEF
K IVAAGQAHDPDFRYTWREMETPLR
PRI GEARFAA
DDLGPLADAF DRVEPLFGERVFRNGL
EAALPPSPLPDPGADPEA $\square$ A A A $\square R S$
QKIGKELLAAG WNQRNYDAFLNLV
SKLPDDY।
EMLGFPWNNFLVIHHVLVEADQDPGNVLFAFDPQGYHLSL
ARLGAERFA ATYGRRDYRAGLEGI

D D L
D SLPKSWG
 ALVADPATRRLLPPG

FMERDS LP $\square$ TYPNKYQTVRLLREEP PKLGKDWK LYEWPESAYVEEQMV
DELGPLADEF
DDLGG PLAEAFTHVNPDFGERVFRND
DELGA
ETVGA
PFLGRCYKADKRFSYSWRNMET NRWSFGPYLYNALL
PF L GRCYKADKRFSYSWRNMETPLRVLLKERDAATLPDPT


DELLG G

$D P \vee F$ DERVYRW

 $\begin{array}{ll}D E L G G S N S P A M Q A L N R D A P L S \\ P F & G A C K T A D K N F S Y A W L Y A D T P L Q A L L A A K \square P Q Q L D\end{array}$

 DEFYSAGDESSFYPHLYVLQNLPS
DELGPLADAY SHVEPDFDERVYRDV
$D E L D T L A S A F N Q P R R$
$P W F S Y Y G D N A T D G M G Q T S F F D G T D D Y Y H G P L I A F L V E E V L$
$P W T M$
PWFSYYGDNATDGMGQTSFFLGTDDYYHGPDIEDLVNWTM PF L AA A SRNDDKNFNYAWTY DDTPLQAMLTEKVPRLLPDPV DEFEPA
$P K$ L $G E D W Q$
$\square Y Q W A E S A F A Q E E \square D M H A P A Q W L$
QLLAS GWNQRNYDGFLDRLL
KAQGRQTFGQEPSTRGVAVALAAGGALCGG

$S Q S L A T Q F G G G L T A S S L T D K Q L L L A L$
PR\|GLERFAATYG
DEI LERFAATY
DELETQTQMNS LSVLNQLRRNGALCAVN
DELPKAYFDDF
DELGGTESEGWHA
D DLG
DELLDGSGLWKG

PEDT DEM
D DLGEAF $\square V Y$ HRPR
PTHSD
NEKERFQYCTTTSSWYF QR L

DEVYA LNSEERPVLFPET
DELGPLVAEFLHP
DELGEDLAA LMEMAMVAYNP
PFLSACKQADKDFVYAWNYADTP $\square Q S L L D A K P A A L L Q E D T G$ HEVSDNEDLR IILNMSYMFDHFFM
PEFEEA
PHFGEA

PEFGDA
AKLYTW WGEKS F VLEEAT

PEFGDA
GLDESYYPSDWILAT
ANGGVPEGAWPATGEF $\square R F V L S P D G R G A H W C R P A$
$\square K V G E K L F N K Y S S D K K Q R N E A V F Y Y H M E P F \square M N Q \square D Q W S E$

$D E L G E D L \mid D A M T A M$

## UniRef90 F8A6M4 UniRef90-UPIO00464A3EC

 UniRef90_D2VJM6UniRef90_A17PV6 UniRef90-LOG6I4 UniRef90_UPI00039F7C6D UniRef90-F3KRJ3 UniRef90 A311W6 UniRef90 A3V660 UniRef90-UPI00040808D7 UniRef90-UPI00042937A1 UniRef90 UPI0004666D23 UniRef90-UPI0003464953
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UniRef90-A3SW04
UniRef90_F9ZW05
UniRef90_JOU3L4
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UniRef90-M0MPJ5
UniRef90-D5RR62
UniRef90_17MB89
UniRef90_H1XNF7
UniRef90_F9UCT9
 NSAQTAEHMDAVLQS LADAWAECVSLMGT
KNGDSACENYHNT
FKDKSIWWNDVT TNEGESRKDIFAKSYDQTIQELTKQLBP
N DSIFDLPSTTGLHETVVDHLQTSFKRASQEWQALKAE QDD WQAMDVAT LRQTVQALVEKYPAVEPDQLTWGMTH TDENSPWWDDRGTLADETRADUVAQAWEATLAHGVKLHGS NEPNDSDFDLEKTQEDENAKSHVLKSFEMMVKEI SD WEQ DGAS WWCDVIQSAPVETCAD IARQALDEALDWI AENHGT

 HHPE EWIDGDAETVRDEVLADSLAAALEDVSGSLGT DGAAAWCDVRQSAAEETCTDTARQALDDALVWIDETFGT
 DGAAAWCDVLQSAPKETCPDMARMALDDALI WWI NETWGT R D D
ARNDTWWCQP
STCAEQSAAALGRALDRLQAGYGA DGAAAWCDVAQSAPTESCTDMARLALDDALVYUSENYGS
 QQPDSYLFDKPETPEKEDARDIVTNAFLSAGREYLKL K ERNDAWWCQP

A GCE
$\square A G E S \square F F D D \square R T A G T E T M S D \square F D R A A H V A R K E L S \square H D G D$ NRDHGTCQTFGRQVSWHNCQDVLEKSLDQALDELGRMRGD MTKYNAWFDDDATPEMETRDDI I RKSFAEAIQULRSHDGH DTQSLIERLESGLDPATRGALLTGTLGAAFRECRTRMGP




NYPD
WK QFILAKLEQSIKQLLKKHDK
 EGASAWCDDRQSAPTETCSELARMAADDAEFGSWDEETYGN ERPEHWLGS DGGAA WCNVRHSAPQENCTEMARLALCDDALLIWMEERYGD EEPDNAWWDDRRTNVVESRDE LLSRSLTTARLELTVELGGK TAPDSLGDRRQSSPVDARNF ARAFEAVSWRRRGD

 GREDSPFWDDQKTAQKEDKPT LLARSLAAAVSAGEAQLGN TRDDSPFWNDTQTTAGHDKPA LLAQALASAIAECEQVMGN
 GDPDNPWWDDRRTNVVESRDEI LSSRALESARLRLTVDLGK NDPGNPYFSNPVTGEKREAPQVMRTAFRQAVEELRGKLGG DGASAWCDVI RSVAVESCSDIARMADDDALVWISERYGT

$\qquad$ LDADSQWYDNRRTDRTERREAVAAQAMNRTAARIEREGWD PKNYATWDDFLAACVSEGDKEDHAPA
DGQADLRFWCG QEQGCDLKKLQSLRSALDELRAAHGS
PTASQTVGSSCTGLLARTLEAAVQQAARRPYGEVHQALST ERPESKWF GGDLSVAARRADRTAVDRLSDALGS PASEDFD DP ETS $\square R E S A V E L A M \square S G Q K A V D R L E E D K T E$ ERNDGWWCQPL SSAPVESCAGQSAAAFDRALDRLQRAYGA

H $\square R N A A W W D D V N T A \square K E T Y K D I A M Q T F K E S V A A L K K Q L G N$ ERSASPFWDNI LSPQRESKADV DAQSLA SAAQWLSEMYGD GREESPYFDNVKTPEKETKADMLALALADA YEFCGDEMGA

K S P N N P WWD $\square$ STTTEVEKRSDVVLKVFKSTVADLSQK LGG SGEAPGWCDDSRTELRESCTDI AGPALDRAVAVLAEQYGP LGPNSRW FEGRSRAEVMLDALDAALERIENAEYD YGENWLSALIFVKNYLKKE DSN FLANTLSKAMHNLVDERGY DKPEDLIFDHQASEVQETAQDLILQAYQQAMAAPI DDAGT NGASSWCDVAQSAPKESCTDMSRLALDDAVVWIEERYGD RSGQSSFWDD DRTPRVETPAE IWARA LDAATADLKARSGE
 LPADSRFFDDRS RDETMVAALEDALDEDDDAGWERYGD ARTPA QW LPAD KSDWNELLTSALDDGLDQASAP S ENPRAPF G DSE GVVP GVARDEAVRRA L G E A DA M L R GA L G S EGGASS WCDIKKHDSYE ETCNE IAS NS L DEADS WL Q DKYGK
 GQEGPAPATAPFAEGGACHALDATA LRQAVEQLSQAHGP GKDQSSAWDSCCSEHQQKCVKLFFQAIKDTYNYLQRRLGQ UniRef90_F9UCT9

## UniRef90 F8A6M4 UniRef90-UPIO00464A3EC UniRef90-D2VJM6 UniRef90_A1ZPV6 UniRef90_L0G6I4

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UniRef90_UPI00034B31DF UniRef90 S6HPM9 UniRef90_G8TKJ1 UniRef90_C0GKT7
UniRef90 F0QBF1 UniRef90-F0QBF1
UniRef90
Q3EK40 UniRef90_UPI00036F1C3E UniRef90_V3T0K8 UniRef90-B3QRW7 UniRef90-19X024 UniRef90-S2D9W5 UniRef90_UPI00036D3DCE UniRef90_A3PJP2 UniRef90-A0A037ZL17 UniRef90_E8U4P4 UniRef90_Q25548 UniRef90_UPI00037F1449 UniRef90_A4EM85 UniRef90-A1ZPV5
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UniRef90-A9KFE9
UniRef90_UPI0003621EF2
UniRef90_A4ER83
UniRef90-I3YEC3
UniRef90_UPIO0045E5A9E
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UniRef90_L9X9H2
UniRef90-E8V554
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460


480
 QGEDVVWTVQHLVPNFQSFGGIFTGGGRSIVNATSERHGA PVNLRHPFSKVAAVLSGVLDMPAFDSDGCASVCVKVMDN A $\triangle$ NHWAWSANHQLTHNHPLVPYPVSGGRELPNNLNFPDG NEGDYAWANFKQTFKSFSETNVYTGGGAGVVNATSER HG A $\square E A V R W G D A H A T H D H P V L G A T P \square S G G D N T L M R G R T R G T G$ DPARWRWGDAHPALSSHKPLGVPSPGDAYTVNVGQY NPG
EEGDYSWQHLVPTFKSFSVSNIVTGGGSGIVNATGSR H G EEGDYSWQHLVPTFKSFSVSNIYTGGGSGVVNATGSR HG DPSQWRWGDLQHTPVGDDLGPFERQGSTHTVNRSPAEYRH A LES LLRWGDAHATHDHPVLGEVPTSGGDFTLQRGRTAGRG DRKAWQWGKLHSYQWTNIRGPLQAGGDHNTINSAAYR SATEWRWGDVHQARFAHPVLSVPSDGDDFTINRGTFPGQF

 DPAAWRWGDAHPAVSGHRPFGVPSNGDSYTVNVGQY NPG TLESLRWGDAHQVPFLRYFVNIRQSTSGGDNTLQRGLTSG DPARWRWGDLQQTWFAHHLGPFPRGGAPHSVDATGFTHHT DVSDWKWGRAHTAVAEHVPLDRNTMGGDNFTVNVGRYNYSD RKGSVRWGDLNRVAVIHMRQDLPGAGNPQAINAMSSK TG | NPDRWEWGKWHRLTVVRHPDGSVGLGGSGNTPKALFADETGG |
| :--- |
| $D P A R W Q W G R A H P A L S V H R P F G V P S P G D A Y T V N V G Q Y D L$ |

NPAQWRWGDLHTLELVNPLFRMPMGGAGETLYRGWYDFDA NMDSWQWGSLHSSYYAHSLFRDENGGSPNAI NVADMNFDL NEAAWRWDAI HTDSVQHVFGQAGQAGTSTTINNGEFNYDK DSETWSWGRLHHAQFAHPLGPMAVGGAAASVMHAEYRTDT TWATYKSTSINHLFESFSRKGDYTGGGSGULNATGSRHGA
LK NWRYGDKHTIADPHPDYGMIPFFGWTGI SAHPQSGDT NVESWRWGDAHQTHDHPTLGQVPVSGGDQTLMRGVTRGTG TLESLRWGDAHVAHDHPVLGDIPVSGGDNTLNRGKTAGAG DPNGWTWGRVHVSRSDHGAFGVSAPGGTNTVNVAR
VPTWGSDDHEAQFPN LVLDNTMIVGGTSTVNVGETKYPA SLDRLTWGTMHRTQDSHPL GFDP LGG KDLNMPQKP DPG AVEAVRWGDAHVTHDHPVLGNTPISGGDHTLQRA KTSG $V H Q Q F N D P A A F T G Q T E G N L G P Y P F K G G D N T L N K G N Y S V A K$
$A L E S L R W G D A H Q T Q N H E V L G D V P S G G D N T L Q R G R T S G A G$ ADADWRWGAALHRLQMLEHPLADVVGDGGGDNTLQRGRTSGAG A LES SLRWGDAHQAADHPVLGEVV PVSGSGNTDQRGKSSGRD EAQEWQWGRLLHTAAPTHNPRPLPVPGGSSIVNATSWDAAS TISTWHYGDARLHHRVLSPGPVPRGGNGNTLLASGNTDNQ ALESLRWGDAHQTHDHPVLGDVPVSGGDNTLQRGRTRGAG NIESWRWGDAHATHDHQVLGSIPTSGGDNTLLRGRTSGKG
$N$ RAQYRHPFSRVLPWVGRFLDMPTDPLSGCPYRVAGPDFG DHRAWQWGKLHQLGDTVSRGPLASGGDHSTLNLAPY
DRNSWQWGRLHTYTRYPARRAYPAGGDFSTLDRSAYG KLADLTWGKFNKSHFMHPFGSDPLLGDLLNMPETELSGCG SLENWQWGEAHIAHKHKDFGSIPVVGGDNTDMRAKTKNHG NPEEWRWGAVHVAAPQHNPTPQAVSGGSADVDATSWDAAS DPHQWAWSRLHTRHFPDPSDGYGPQGSGGNLYSLDSVGVR VYGDYNRLEIKHAFSFFDYPSMPMNGSTYTVFNFRRAVDW ALESLRWGDAHQLHRHMVLGDIPVSGGDFTLERG RTSG DMNSWRWGDMHVADFDHPFDRVPVPGDGATV NVAHFSYDS YS SAWEWGNDHKRYDSSFFGEVPAAGDGNTVNAGTDSDFG NKAQDSHPFSRAVPLLGFLLDMPADAGCATCVRVTRSGFG $T Y G D F N R L E L A H P F D F L N Y P E R P M D G S R F T V F N F R A S G E T$
$D L N T W R Y G A H P V E L M H P L Y R L P W F K S W T G T G V Q P Q S G D T$ A PDGWKWGEAHAALAEHVPFHKTPGGDNFSVNVGRFDYSD HGAFGEIQALAPLFNDPAPGGSDTVNVARPDRE DVGGWKWGTVHRLRIGHSIGPLPHDGSSGTLLNAGFPYDV K GSLEWHVYKNTQISHLVPNFGSFGGGKGIVNATDSRHG RP WS WGELAPRTFAHQPFSITGAGSLDTVNAAGYRFDS $D P A R W R W G V A H A D S V H R P M G S V P V P G G P Y T V N V G Q Y N P G B$
$N D E S L R W G D A H A Q H N H P V L G N V P F S G G D N T L M R G$
$V$ EPQDWTYGRLHRVASDHRAFGAPTPGGTNTVNVARPQYAQ D IS QWHWGKVHTVEHEHALAKVNVLGGNETINNTMFDFTL
 A LEES LRWGDAHQTQDHET LGKG
 DLENWSWGEAHPAYFAHYPFRVPAPGDGTTVNVAHYSYDF TYGGYNTTGAMTHPDGLAFLNYPVDGSRETVNNYAVENPT QENHWRWGVHHAVFNELGVGKVPAPGGNYTLNVGSENMQQ TWSEHRGTRIRHLARIPGFDSIHSDGARETPNALS SNFG ALESLRWGDAHQTHDHEVLGDVPTSGGDNTLRRGLTSGEG RI RTLTFPHDPVLGPWFSVGPIGVGGGTDTVDVMKATPDK $N$ VGHAHPFSKALP LLSAADDMPVAGCGGYCVRVTGPDFG DINKWQWGVHRHRFDHKPFSQTPGEGNRRTINVGGVPDKW WNSTR IVHPFGAEAPF LNYPELPADGSRATVKNYRVDSAV NLEKWHWGDQNRLAENHP I G RPDVGRNTGAPSLPLAGDI DVSAWTWGGDHELTYNHPLGTFPATGDVETVNDGGWEAAG NLNALRWGDAHAlURHETMGNDPDSGGDNTIMRGKTAGKG WNTTRADDHPLGVEAGFLDYEELAADGSRAT RYGDYNTTGAMDHPLGLEFLGYPADGSRATVNNAVENPTG DPTA WRWGNAHQARFEHPLLR $\square$ ASPGDEHTVNRG NDFEWQWQKVHEKQDPHDSFSYPASGNKRTVGAQAENFKE F L T LTMAHPFARVPLLSNYGPDPWGGSEATLNAAFFWEDK



QK NMVVEDFMDGSVRYWWFSDAA DKA HAKNTLT LVPK Y R D MV K P F N T F $\quad$ I F F E $\square$
Y H D QFP LWWLE GKLLRTFVTEPKVFVQQKFDLTELNPK Y A D LAP I WGR R DHVVPMLYGRAAVEAA TA T I IGT L S PA Y D N F $\square \mathrm{K} \|$ WA N G E Y V N F D F
$Y R D Q W P A W Y G A S T V A L P F T P A A V D R A T E H T L R L T P$ Y D NLGELWWRRGEYIPMSLDPGLARAAAVGITHLEPA

 YKDQFSYWLRGEPLPFD
Y D NLGE L WWRRGEYYIPMSLDPDLARAAAVGVTVLTPA Y Q D Q V E L Y N N GLL L RA MLLMD REDIDE K
Y D DMS QL WR R GEY DPMSLDD E DLARAASVGVTRLVPA YA D LA QD WQA G $\square Y H P L L Y S R E A V D A A T E T L L R L V P$




 Y G K G I E P W L K G Q Y S S F P F Q P H N L D R V G T R R L T T T P A YRDQQAYWVQGRAMPLL A GATQQTLVLRPA
 YTN QLDA WAS GETFPWPFSRSAVEEAS GHELTLLRPA Y L N RMNP WWEGQYNEFLLLFDQA
Y Y D Q L E MWAN GQYKS F DFN
Y D D L G T L WWR R GEY $\square$ PMS LDE D LAARAAS $\square G V T R$ L
$H G D L A P R W A A G E Y F E D R B D D W A V T A P E H V L T L L T P Q$ Y D NTF $\square$ D WNN GVVYFTLLINTEA
 YHD QLDD S WAD GRYKPL TLDRPE
 $F D D L N E L W A R G A Y D R I A A D A P D A T D R Q L V L R P S$ ARDQLRGWAAGEYLPMSTDPADWGR TRVLVLKMP Y S DFFGGDWY GCRLYP LDPAKPDEV GNPAFTLDTFSGSR YGNLIPDWAS GDYVDFGLMKRVDAKPFLFETRLDPR Y D D M I DL Y E S N QLV
 ADDQQGGRWIAGEYLPMSTDPMDWGR TRTLQLTP YKNQAT D YVK GVYHKMLLNEKE VRK S K
Y D D G DEAFVVEGRYVE F PGLDS EQARAR YQLQTQFVP $Y$ D D M A Q L WR R G E Y V P M S L D E D L A R A A A V G I T T I T P R Y R D Q $\square K L G L S G S Q N A L P F G P Q A K Q Q Q Y T S V L K L E$

Y D NQRERF LK GEYR LQQLMKEAD DEKNK AFELLI K Y R D L A E P WA DGEYFE $\ R Y D W P Q N A P E S T E T L V L R P A R$ Y D DQLRMWADVE YKSMSR EDQGETTLTGE
 Y T E GI E E WS K GEYF ELLS LYRKAE EVPARERLVVE Y D D MA QLDWRRGEYVPMSLDEELARAAAVGVTLITPR R T D QLD DWLA GDSHPWPWNGP VD GNVVGQLLLMP
 $Y D D Q M K L H Q \mid G K A L P M K F A N Q K D N K N L K \quad T L N I T F K$
$Y G D Q L E G W L A N D A Q T P M$


 Y D D Q L Q M WA D GE Y K S M

Y S D QL KL Y Q Q GE Y VEI KRDL NKLKENNKDMLLL


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SNGFATAPAKSATKNALLLINPHTSFYFRS


SNGlAA S GKLLTQS GNALL LIDNPHTSFYFRGEVHVV SEE
S N S WVV S GDHTESSGSP IVAYDPHLS LMTPP LWYEQAVETP
S N A W A I A P E R S A S G K A ML L A N P H L M W S D F Y L W W E A Q L S A P


 S NGFA I A P A I T K N GHA L L M I N P HTS FY F RP S NGWAI A PSHSTS GKAML LA NPHLP WSD LIF LWYEA QI TAP SNGVAIGGERSFNGRGLLLGNPHFPWVGGMDFYQMHLTMP
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 SNAVAV GRERSFNGRGMLLANPHFPWVGGMRFYQMHLDDP
 S N GF A L A P SVVTA S G H A L L L I N P H T S F Y F R P E V H A V V
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S NGWAI APSKSKS GQAMLLANPHLPWGDFY LDWYEAQLN SP


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 GMNVDGVVFPGFPGVILGHNSYDAWGATNGQTQETYFYAE QGSVVGATLPGTPFVTLGRTDEDAWGFTNTGPDVGDLHAV GLNAYGAVTWGQFFVYQGFNEKTGWMHTSTGTDI DDEFEE KYQVAGLSLPGLPVVLAGYNGKLAWSSSAVMADNQDLF
T
 GLNAYGAVTWGQFFVYQGFNEKTGWMHTSTYTDVMDEFRE GLDNAYGAVTWGQFFVYQGFNEKTGWMHTSTYTDVMDEFVE ETSVRGATFPGVPFVITGANETGTWSFTNVGADVLDCYEY NVRLTGFTLPGVPLMVVGSNGKMAWGFTNIEGDFVDLVVL GLNAYGAVTWGQFFVYQGFNEKTGWMHTSTYTDVMDEFKE DFDVAGVTVAGYPFIMFGHNRNGAMTSTAGDDNCDQMFTE ERTLTGATFPGVPLTVIGTNERVAWGLTTTHSDTMDLFVE GLNAYGAVTWGQFFVYQGFNEKTGWMHTSTYTDVMDEFKE GLNAYGAVTWGQFFIYQGFNEKMGWMHTSAYADVIDEFEE GLNAYGAVTWGQFFVYQGFNEKTGWMHTSTYTDIIDDFVE GYDVTGNTPFAHPTILGGTNKHDSWGSTAGPDDVNDVYQE $G \square Q V A G V A A A G M P V P V I G F N G N V A W G A T M V M A D A Q D L F L E$ $G Q N V V G V V F P G F P G I V L G H N P Y I A W G A T N G Q D Q Q T Y F Y A E$
 GUDAYGATLVGDPVLADAFNDS LGWTHTVNTHDGWDAYELD GLNAYGAVTWGQFFVYQGFNEYCGWMHTSSAVDVADTYEE GLNAYGAVTWGQFFVYQGFNDRDGWMHTSGGGDVDDEYDE QGRASDGTPVAADDVDGARTAEVAWGFTNTAPDVQDLYY E GVNARGVGLPGAPGMMIGFNDHMAFGETNVGHDVTDWFS
 GLNAYGAVTWGQFFVYQGFNEHCGWMHTSSYADSMDEYLE
 GLDAYGATLVGVPVLADAFNDNLGWTHTVNTHDGWDAYEL GLNAYGAVTWGQFFI YQGFNEYCGWMHTSSGADSMDEYLE GLNAYGAVTWGQFFIYQGFNEKTGWMHTSTYTDVIDEFKQ GLDVMGAALPGLPVVNIGFNQHVAWTHTVDTSKHFTLYRL GLNTYGAVTWGQFFVYQGFNEKTGWMHTSTYTDVMDEFKE
$E T S V R G A T F P G V P F I V T G A N E T G T W S F T N V G A D V D D C Y E Y ~$ GMNAYGATLVGMPVLADAFNDNDGWTVTVNPDDGADIYQL GLDNAYGAVTWGQLFVYQGFNEHCGWMHTSGYSDVSDLYAE GLNAYGAVTWGQFFIYQGFNEYNGWMHTSSRADADDHFAL SRRVEGLTLPGLPMVTTGTNGRVAWGLTSVEGDFADLARL DVALEGLTYPGAPLVVVGSNGRVAWGLTNLDADFTDLVRL GLNAYGAVTWGQFFVYQGFNDRLGWMHTSGGGDVIDEYLE GI DAYGATLVGMPVLATAFNNNLGWTHTVNTYDGWDVYEL GLDVMGAALPGLPLINGFNQHLAWTHTVDTSKHFTLYRL DASVRGATFPGVPFVIAGTNDSGVWSFTNVGADVLDCYEY RHNTYGVNLVGLPG:ADGFNQHDGWSHTDNTDDNADTYELL
 GLNAYGAVTWGQFFVYQGFNEKTGWILHTSTFVDFADEFQL GVNSYGAALVGMPVLAAGANGAHLGWGFVNTGGDWGDLIP EINAYGATLVGFPVLTIAFNDNLGWTHTVNTHDGWDAYFL GFMAYGASLVGQPVLNIAFNNHLGWTHTVNTDDAADRYLL GLNAYGAVTRGQFFVYQGFNEKTGWMHTSTYTDDMDEFME G|VATGSSTSGDPLIQNGRTDYAAWGTTVLFADTSDVYKE GLNAYGAVTWGQFFVYQGFNEKTGWMHTSTYTDVMDEFKE DVDVRGATFPGDPFVIVGENTHGAWGFTNTGADVVDFYTY GLNAYGAVTWGQFFVYQGFNEKNGWMHTSTHVDFMDEYLE GLDVMGAALPGLPMINTGFSQHLAWTHTVDTSKHFTLYRL GLHVAGVTLPGMPLVVAGHNEHIAWGFTALYADVQDLYVE ERSVRGATFPGVPFVIAGANDRGTWSFTNVGADVLDCYRY GLNAYGAVTWGQFFVYQGFNERMGWMHTSGGADVIDEWCE
$\qquad$保 EDWVRGVTFPGVPAAAGSNGKLSWSCDPAASDDSDLFIE DGWVRGVTFPGVPFVIDGENRAGAWGF GFELYGHFPALNPFALLGHNMDFGWSLTMFQNDDVDFILL GLLNAYGAVTWGQFFVYQGFNEHTGWMHTSTGVDFMDEFVE GMDVGGVTLPGMPGVTMGYTRSFAWSFTNTGADVMDFWRE EVNSYGATLVGTPVLGLAFNDHLGWTDTVNPTDGADIYQL GLNAYGAVTWGQFFIYQGFNEHCGWMHTSSYADSMDEYQE

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EVVNADNPTEYRTEAGWTKFRTRQSTINVVADTPKTLTLLRW HLRGSGPTTEFADGAWHSLLHQTEVIHVRGKPDVELDVTS
 EI NPANPDQYRVGEQWQRFDEYPETI IVKGSAAKQIVVKQ ELD EDGSRYRYQGEWREFDTEEHEI AVADGEDRTVTVRK
 TIVKKDGKFYKYGEELRPVDSVEVTLNYNGDKDKTFMMYR QLRRQGSQSY DADGKWLPARARSETYFVRGQRPVREVMYD ELDPENNERYRTPDGWKRFRTRRSVVEIVKAAPVTVTLRW T
 VFVEEKKDFYVYGEELRPVTQTE VVLKFKDKEGDKFPVYS EMRGDDGDEYRYGDEWRAFETEERAIPVADGEDRTFTIKK
 TTNSSGPDTYTFQGAEYEVETAERTVTVADGEDVTYTERF RVVDAD HY DTENGPEPWLRRTETLAVRGAPSETDEVRA TIVKNDGKFYQYGEELRPVDSSKVTLKYKDGESDTFSMYR TI KEGDKDFY LYGEEKRPLSSQEVTLAYKEGDEKTFTTYR TVKNKDGLHYKYGDELRPVETLGVALKYKEGGEVKFEMYR

 ETSPSHPGQY FWNGEWVNFSVTNETIYVKGSAPYHLQQVLR
 KLVDNG YRFDNQVRAFETKTLSLKVKQKDGTLQTVKR
 Ti SEKDGFYYQYGQELRPLKVVDITLPYKGTASKVVKVYY AI HPDDPTRYRTPEGWQGFEQREHVIRVKGRPDVRHTVRS TMEEEGKYHYRFGEDWRPDKEKTDTLKYKDGDGKKIVAYY EWTDENRTHYLLDGKEVAARDQYDTLLIKGRAPIIVETPW
 T I EKKNGAFYRHGGQUKPVPSQKVKLPYKGQQYKEFTMYW
 $K$ K AKGGYRFDGQDRPFQTKTISLKDKQKDGTLREVKS ILS DDKKNYKVNGEWRDDTSRREVIVIVKGEDPYULDVKE EVQPGDPNRYRGANGWTEFTTRRETLRIRGADPQTUTLRE TVKKGDAYVYKSGSLLKPVRMQRVRLPYKSGNR\|QYTMYW VI ERDGKKMYKYGDEWREVEEKEVTLKYKEGDTITFPIYR TI DRDGQYFYQYGDEQRPLKAVDVALPYKGMASKTVKVYY TVVKNGENFYQYGEELRPVKSSEIILKKYGAKEKKYPAYR ELRETDADEYRYGEEWREFETEARTIMPVADGPDRTITIKK TLKDGG Y LDFDGKVRPFESETQTIKIKQKNGKFLEIER TI SKQGRFYYQYEKTQLPVKQRAVTLSYKDGDQDKTTTWY QIS GD QFRGADGAMHPLAHEHETI NVKRGKSVSFDVSL KVEQRNGYHYLFGEEWRPLTAKNDSLKYKEGDEREDTAFY RRDAAEPSKYLTSDGAREFSARVERIGVRGAPEVVLQVKE

 TLAGKGYYRFDNKVRNFDTKTLSLKDKQKDGSLQEVKT QLDPKDPTRYLLDGQSTAMDKRQVTVQVKQADPMSRWVYS EFDEAGERYRYEDEWREFETEERELAVAGGKNRTDTVRK K $\square$ KK G DKYFYEYDK QLKPVTEKK $\square$ SI SYKDGDGRVFTTYY ELKDGG YVMDGAVKPFVKTRTTI R DKTKEGKTDDLLA

 ELN EGATLYRTPDGWRDFTFEKETIUADKGKEDETGEI RK
 PLANDG YRFDGEVRSFDREEKVLKVKEKRSESLVVRR TVQDDG YVLDGVKQPFEKKPVTFKIVRQDGQTITFRY TI KQDDEFYYVYGEELRPVKRTDVILKYKQDGVIKKHTYR EIK GNTYLVDGQWKEI KVIKENIKDKGKDPHVLEVKY KLDKKNKWYYTYDNTQKPVIERKDNLGVKGGEQKSFDALF T VVS GK LLYQYGEEDRPVDSDK K K K YKEGDAKEFPMYR ETVAGSRYNYRGEWREFETETRTVEVADGENRAVDVRK QLEDREDVYY LYDGDELKFDVSTVSLKYRDGDSYTFATYR

 TVVRKGGRYYRYGDTGRPFRTKRDTLKYRDGKEATVTAYY
 $K$ L D DSQQQYWRDDRWKRDEEAVEHFRIKGGDQETRRGADC ETVRDGERYRYEGEWREFDTEDHSDEVADGEDVTVTKRK
 E V VA DGALMYRYGDEDRPVEVSEVTLRYKGMAERTFPRYR TVNDARPTTYELDGAQQPLETRVEQYRDKSGRVITTDTVYF QLDPKDPTRYLLDGKSLPLSKQAVTVQVKQADPVKRDIYS TLKDEG



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UniRef90 QOAPE2 UniRef90-UPIOOO40F7406 UniRef90-Q88NU6 UniRef90-S9Q3z9 UniRef90-UPI0003B38DAD UniRet90-A4AW22 UniRef90-D3SSR5 UniRef90_UPI000368069B UniRef90-MOLDH7
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S DNGPILP ${ }^{130}$
140
150
160
SDNGPILPVDMFTPRGHVVALLSFSALISDTTMTAAFNMIKA
T LHNPIISPLLPSEKRALSLCWTDYDPSTLSAFLHVNAA
TRHGPVLSDVQKVHAVLAGMWSALDADNQTVLAGLQTNQA
TVHGPFLEREGEH
ADNGVVVDNDSGTK
TATGPVLDPKHFNYPVFALIAMDWTGLS
THHGPI THAYDDKWVSTALMWS P

TRHGTLLAQPENASLGLALNAPQFKGDRSLDALFDLTRA
TDNGPVLP DAGDTPPGHVVSLAWTADTDTSMSAAIGLMKA
AHWGPVIEPPDSMQAG AVALQWTAHRSRTLQALWGMLHA THHGPITHMVNGNWTASAMMW WPVKALEQSFVRTKK


$T V H G P V L E R E G Q T V G V A T G H T A R T T E A D Y E F E R S$ THHGPI THMVDGQWTASAMMW SVAVKADEQSYURTKQ
TRHGVVTQWDPDSGEALAQTKSYAGRHMNCWRAYYECQFA
TRHGPVIAGDPDEGAALTLRSVQFAETDLSFDCLTRMPGA
SRHGPVISDVLPEGEALTLAATALRPDDQTADALRALNRA

THHGPITHKNGDKWVATALMWKP DVEALDQSYTRTKL
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ARNGVVIQT SPVTIAMDWVGLQPTYEDTFFRVDRA

THHGPITHKSDGKWTASAMMW EPVKALEQSYDRTKQ
SVHGPVVSEKGGKAVADKV VGDDKPGVLQQWWDMARS

SHHGPIVRAKDGKWDAVRLM NEPLKALTQSYDRTKA
SHHGPVI REENGKWIGAISLMVSALDADNKALTAGLYSNQA
T $\mid F G P V P E T K G P Y A N H A M R Y L A H D E P R P H S M V G F G G L T Q A$
SVHGPLI KQEEGKALAL RVVGLDRPGVLEQWWDMAKA
TGHGPVVGEKNGKWIAAIAMM

$S$ VHGPVVSEKDGKVLAL RVVGLDRPGVLEQWWDMARA
THRGPI MESVPPIDKGAHYSLAWTGHEDNTIE IIRALFKT
TENGPVVPAAHLDPAGHVAALSWTGGYDRSMTALIGLMRA
TQHGPVVGEKDGKWISVAMM NTPLNALEQSYLRTKA
THHGPITHMDDGQWVATAMMW EPVKALEQSYTRTKK
SHHGPIVRAKDGKWVAVKLM NEPLKALTQSFDRTKA
SQFGPVVQWDWNGQYAFSLRDANLGN DRVLHQWYAMNQA
THHGPITHVADGQWTASAMMW EPVKALEQSFDRTKQ
TVHGPVLEREGQT $V$ VGVATGHTARTTEADYEYERS
$S L Q G V V V A R Q G K K A F V L R V A G L D R P N G D E Q L L Q M A K A$
TQHGPVMGS RNGKWLSVKANNRSMSSLIQSWQRTKA
TSHGPI LSPLYPHETRNLALRWPVYDAGTASLPMYRVCSA
SHHGPVIREEDGKWVADSLMV ERVKASTQSYSRTKT
$T \square W G P V L P E P L L G E E \quad V A L R W T M L D P D A T N D D D L M D M$ TVFGPVLP DRLLGDETALRWT MLDPAATNLDLMNMDRA
THHGPVTHQLDDKWVATKINW DPVNALIQSFTRTKL
SHHGPIVRAQDGRWVAVRLM NEPLKALTQSYTRTKA
$S V H G P V V T E G N G K A L A L R V A G D D R \quad P G V L Q Q W W D M A R S$ SVVGPVVQWDWNRQVAFSLRDA NQDNDRVLQQWSEMNRA
TVHGPVLEREGQT
THHGPI MA KRNDQWI SLKSYNRSMTSLIQSWKRTKA
SEHGPVVKM SKRRALAIVKMAGTNAPNMALQWWKMATA THHGPTAGQQGDKWDAVAMM N T A P LINALSQSYLRTKA $S \square H G \square I D E Q Q K D I G Y A L R D A G L E H T Q S L E Q D W R M G Q A$ THHGPI THKGENGWVATKINW


SVHGPILTE KQGKA ALLRVVGL DKPAALQQWWDMARS
SKHGPVMESKDGKTYAF RFAGLDSSSPAQHHYMAKA

THRGPIVSTNPLIDLGFSASLCWNGEDRKSTLVSLKLYRA
THHGPIMA $\quad$ KRNGQWLSMKANNRSMVGLIQSWQRTKT
THHGPVTHKVDGQWTASSMMW
$T H H G P V T H K V D G Q W T A S S M M W$
$T V H G A Y L D R E V N G E T R H V G V A W T G M S G V K A L E Q S Y D R T K Q$
$T$
THHGPVTHMDNGQWVTTVGNW GTMSGTREAEADYEFSRA
SQFGPLVQWDWDNRFAYSLRDA NDENDRVLQQWYAMNQA

SHRGPVVVEADGRW VGLRLMQDPVHALMQSYRRTKA
ANNGVVM
TRHGALLNASATPPVGLSLALVPNFKDDKSLDAFFDLSRA
TETGPIVSD $\quad$ H K KSCALSLLRWTGRDGTSLECMFALNRA


SPHGPIVNNVMGKNTP■AMWWSFLASSANPVLDGFYEANRA
THHGPITHMLDGQWVATRDNW DPVTALEQSYVRSKK

THHGPVVGE
S QF GPVVVQWD WDSHHAR S|L|RDANVLGN DRVL|QQWYAMNRA

## UniRef90 U4UZE3

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UniRef90_D3SSR5
UniRef90 UPIO00368069B UniRef90-M0LDH7 UniRef90-UPIO0035F1FAC UniRef90-E6X519 UniRef90-MOJBN7 UniRet90-P15558 UniRef90-G2TAE7
UniRef90 G2PLI4 UniRef90-G2PL14
UniRef90 M7N2O9 UniRef90-UPIo00463C483 UniRef90-N1UYG7 UniRef90-FOQYV7 UniRef90_K2GSF5 UniRet90-A4YFY3 UniRef90-UPIO00368EFA3 UniRef90-FORD21 UniRef90-UP1000364E215 UniRef90-UPIOOO4230C4E UniRef90-L9PBK6 UniRef90-B9MIN7 UniRef90-M7XYN6 UniRef90_UPIO0036D1971 UniRef90-G8DB27 UniRef90-K9XVU5 UniRef90-UPIO00368B3A2 UniRef90-L9VNIO UniRef90-K6YSR8 UniRef90-UPIOOO4748711 UniRef90_-J9HU38 UniRef90-A1B974 UniRef90-UPIO00375D4E8 UniRef90 UPIO00478292F UniRef90_UPIO00370B9E1 UniRet90-W2DEP2 UniRef90-UPIOOO47A6A17 UniRef90-MOLBS7 UniRef90-K9T3X4 UniRef90-G8TF60 UniRef90-I3ZDC5 UniRef90-K1LUR1 UniRef90-UPIO00463BCFE UniRef90-UP10001D2D707 UniRef90-S7V7E3 UniRef90-A0A031G112 UniRef90-UP100035D16EF UniRef90-UP10004752CD9 UniRef90-MOAQZ1
UniRef90-I2EU91
UniRef90-A1ZT56
UniRef90-UPIO003649AF4 UniRef90-T2J6D6 UniRef90-UPIO00425492C UniRef90-UP100037ACC6A UniRef90-C7QN26 UniRef90-B6IMU7 UniRef90-K9VPG2 UniRef90-12GT35 UniRef90-UPIO0047E7DBC UniRef90-UP100006CDODA UniRef90 UPIOOO47B3776 UniRef90-UP1000255AFB8 UniRef90 J3JE53 UniRef90-K6YD30 UniRef90-l4XU93 UniRefotobelin UniRef90_UPIO003F9F007 UniRef90-Q6KYV6 UniRef90-F3J5G7 UniRef90-14CA54 UniRef90_WOK2V0
UniRef90_UP100047B8442 UniRef90-F3GlIO UniRef90-A4A4Z5
UniRef90-UPI00047C50DC UniRef90_V8R700 UniRef90-EOU7K1 UniRef90_UPIO0036912D8 Uniref90_UPI0002E9666B

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 T DWPSF TAASGFGGPANAVYADDQGH GYHAVGAMP R S

 HTVSQFRDNLTQYFADQNWAVAGSKGNDGIFPYGDYPVYE
DDWDGFVSALRGFVAPQQMVFADSDGDIGFYAPARMPVR SNHDEFYKMMDRTNSSNNTVYADADGTVAYYHGNFIPKRN
 DSLAAFQEALRFWDTPQNDLYAGRDGHVALRSTGYVPTRA NGYKGFREMMDRTNSSNNTVYADAEGNDAYFHGNFVPKRD
DGLDEVLESTRKFDDPQNLVYADADGRTMYYATGKLP SSYGGFRKMMDRTNSSNNTVYADADGNDAYFHGNFVPVRD DGLEDLLESTRKFDLDQNLVYADADGRTMYYVTGKLPLRR TGYKGFREMMDRTNSSNNTVYADAEGNGAYTYSGKVPKRF
 STVAQLYDATRGWGDDHNLVAGDVAGS:GHLVRARVPSRP
 TTLEEFNDMMKMRTNSSNTVYADADGN:AYYHGNFFPDRD DNHKEFREMMDRTNSSNTVYADAEGN AYYHGNFIPKRN QNLTEFLEGLSYFKVGQNFAYADRYGNIGGIFAWGLYPVVN TSVLEFQS IAEQYFATQNWAVADSRGNTGDFSYGLFPIDS SNHDEFYKMMDRTNSSNNTVYADADGTIAYYHGNFIPKRN NGYKGFREMMNRTNSSNNTVYADAGGNIAYFHGNFVPVRD QNLKQFETALKRSQLPFTVIYADRDGHI MHLDNGDVPVRQ KGLDDYKKVMELKNTSNNTVFADNKGNI AYWHGNFIPKRN RSYKDFYKAMERTNSSNNTVYADVDGNI AYFHGNFIPRRD KNHQEFRSTMDKYNSSNNTVYADRDGNIAYYAGNFIPKRN RGYDDYVNALKGYDDPQNFIFADKTGTVADRPNGGLPGRG NNFKQFEAVLQRLQLPFTVMYADREGHIMHLFNGQVP RS TNYASFKDVMKNGNASNNTVYADADGTI AYWHGNFMPKRN ENDDEFQDAMEWGAPPENQVAADTDGNGGFPGGRTPVRP KNLSEFETALKRLQLPFTVMYADRAGNIMHEHGNGVPVHD TSVKEAFDMIDYKSVPQNMVVAYNNGDIGYMLGALMPKRK QDRQAAAGTLREMIAPAMVVLADAQGVGQVLAGAVPHRP KGYTSYKEVMKNGNASNNTVFADRDGNIAYWHGNFMPKRD SNHDEFREMMDKTNSSNNTVYADADGNIAYYHGNFTPVRD RNYKEFYRSMDRTNSSNNTVYADADGNIAYFHGNFIPRRN RSLK DLQASVHQGDPWVNTLAADDQGQSLYMNLSVVPDPR NGYKGFLDMMDRTNSSNNTVYADAEGNDAYFHGNFVPKRD DGVEDVLESTEKFDLPQNLVYADADGRTMYFVGNKLPKRT NGFEAFKKNMELLSNSNNTVFADDKGNIAYWHGNFIPRRD EDGAALIEAFRNYGAPQNLVWGDDHGHVGYHLVGRIPLRG

 RDYAAFYQTMERTNSSNNTVYADADGN AYFHGNF PVRD QNLKQFETALKRLQLSFTVMYADREGHMMHDFNGQVPVRS DGLDDVLESTRKFDLPQNLVYADAEGRTMYYATGKLPIRE KGFEEYKQTMDLDANTSNTVFADNKGNTAFWHGNFIPVRD KNLRQFEKALKMQQDPFNVMYADKKGN|FYYFNGRVPRS


R SVVA F A R F A L K QLAQ P P F N F L Y A D Q K G Q
K N F S E F E A A L K R LAEDP F TVVMY A D R E G H I M M M




 SSHDEFRNMMDRTNSSNNTVYADADGNIAYYHGNFIPBRD H S L K E LQ A S VH QLQQ PWVNTV AVD D Q G Q ALLYMNQSVVVNVS A NWQQFSSALEAWCWP QNVVYADDAGHQGYQAVGKVPR R P D GLDDALAAARKFDLPQNLVYADADGRTMYYATGQLPGRE RTYAEFVKVLDRTNSSNNTVYADADGNIALFYGNFVPRRD



 S GLE GFNEMMDRTNSSNNTVYADSSGNIAYYHGNGIPRRN
 S N L K D L Q D A V H T I QP WVN TL AVDD K G Q T L Y M N L S V V P NV S
 ASLK E LQASVHQG\PWVNTLAADDTGQSLYMNLSVVPDPR

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UniRef90_Q0APE2 UniRef90_UPI00040F7406 UniRef90_Q88NU6 UniRef90_S9Q3Z9 UniRef90_UPI0003B38DAD UniRef90_A4AW22
UniRef90_D3SSR5
UniRef90_UPI000368069B UniRef90_UPI00036
UniRef90_MOLDH7 UniRef90-UPI00035F1FAC UniRef90_E6X519 UniRef90_M0JBN7 UniRef90_P15558 UniRef90_G2TAE7 UniRef90_G2PLI4
UniRef90-M7N2Q9 UniRef90_UPI000463C483 UniRef90-N1UYG7
UniRef90 F0QYV7 UniRef90-F0QYV7 UniRef90_A4YFY3 UniRef90_UPI000368EFA3 UniRef90 F0RD21 UniRef90-UPI000364E215 UniRef90_UPI0004230C4E UniRef90_L9PBK6 UniRef90_B9MIN7 UniRef90-M7XYN6 UniRef90_UPI00036D1971 UniRef90_G8DB27 UniRef90-K9XVU5 UniRef90_UPI000368B3A2 UniRef90_L9VNIO UniRef90_K6YSR8 UniRef90_UPI0004748711 UniRef90_J9HU38 UniRef90_A1B974 UniRef90_UPI000375D4E8 UniRef90-UPI000478292F UniRef90_UPI000370B9E1 UniRef90_W2DEP2 UniRef90_UPI00047A6A17 UniRef90_MOLBS7 UniRef90_K9T3X4 UniRef90_G8TF60 UniRef90_I3ZDC5 UniRef90_K1LUR1 UniRef90_UPI000463BCFE UniRef90_UPI0001D2D707 UniRef90_S7V7E3 UniRef90_A0A031GI12 UniRef90_UPI00035D16EF UniRef90_UPI0004752CD9 UniRef90-M0AQZ1 UniRef90_I2EU91 UniRef90-A1ZT56 UniRef90_UPI0003649AF4 UniRef90_T2J6D6 UniRef90_UPI000425492C UniRef90_UPI00037ACC6A UniRef90_C7QN26 UniRef90_B6IMU7 UniRef90-K9VPG2 UniRef90_I2GT35 UniRef90_UPI00047E7DBC UniRef90_UPI00006CD0DA UniRef90_UPI00047B3776 UniRef90_UPI000255AFB8 UniRef90_J3JE53 UniRef90_K6YD30 UniRef90_14XU93 UniRef90_E6QIN5 UniRef90_UPI0003F9F007 UniRef90_Q6KYV6 UniRef90_F3J5G7 UniRef90_I4CA54 UniRef90-WOK2V0 UniRef90_UPIO0047B8442 UniRef90_F3GIIO UniRef90-A4A4Z5 UniRef90_UPIO0047C50DC UniRef90_V8R700 UniRef90_E0U7K1 UniRef90_UPI00036912D8 UniRef90_UPI0002E9666B

## 210 <br> 220 <br> $\square$ NHQTQGRMP WVVRDNQWDGRILPYSDNPKV1

240
INHQTQGRMPVVDNQWDGRLPYSDNPKVINPETGTI GNT NPLAPAPVDAVTGHYGWTGYIPFAQLPQSFDPANGVLATA $P A N D D R G V A P W D A R Y D W T G W L P Y A Q T P E D$ D GAK GWV A TA
 DDGDPRVFDGSAGEAEWAGYVPFDEKPHAIDPDR LATA


## EKFDYTKPVGSN

## E A A A



 A GE GEWS GFTP F GESSWDGFVVPFEEKPHAI DP GLD G S VS R S WA D GAK GWA GY I LDP E E L P R L L N P KA G F A A A
 S DWDTRRLPADGT QYE LTA E DY LDRA DVPYAI NPDPGYSAQ W RENGWLPVPGWS GEHEWRGWIPHEAMPRVIDDPPGGLIVTA



 Q GT GQFPDSPGWD GVYDWTGFADFDQHPNDFTLEKGFVVGAA Q G D P R G L L P GT G QY D WE GFVVPDQY QPS L Y DPP T GF V F S A



 A GNDLRGVAPWEARYDWQGWLPLAQTPQDDGGARGWI ATA

 Q GDFA YWI S GDTSTT LDWT KI HP Y QDLPRIVDP TS GWL QNA

 E GDFEYWIPGNTSKTLDWTKIHPYQD LPRVLNPKS GWLQNA NNSGCR ILD GSNTENDWDGYHSTKDMPRVSNPKK GFFIVTA SGHGRMPAPGWLA QNRWQGLSPAPAELAELDPESG\|VA PKFDWQPVDGSNPATDWKGMHTVDELVQVHNPASGWIQNC D N ID Y T K P V G S D P A A D WQ GLLHP V DEA I T L L N P GNGWWI QN S

 | $V$ |  |
| :---: | :--- |
| $V$ | $F$ |
| $T$ | $N$ |

 TA Y D WQPVVDGSTKA TIDWK GLDHILDNETIDHLYNPASSGFI QN C A GS GLTPVPVNTGTYEWAGWIPYDALPQVTDPEGGVVATA $P$ QF DWRVVDGSNPATDWKGLHEVEEMIYI ENPENGWI QNC $G L S G L F A E F W D D G S V G W D G Y Y$ S Q Q E L P P S I V D P A S GY I V S A GFSGRFAEFWDDGGHGWDGYFSREELPVVVDPPEGFIVSA
 Q GDFA Y WI P G D T S K T L L WTKI HPYQ D LPRIVDP K S A D QLRRQCSDPRAGQAEQKGIFPADRLPQLEARGDYVQNS A GNRDF DGSAGE GEWDWDGFVP F E EK P H V I D D P G D D L A T A




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NGF D G R L P P VA A E A G R WT G F VVP F E A L P Q A V G GFKYWI A GNTSETLWSKNHPYADLPRVVDPPSGWLQNT

 TKFDWSKPVGTTSATEWKGLHKVDESVHVYNPSNGWLQNC


 GGGMGVP LT DTPRHEWQGYIPFDQMPHAYDPPS GLLATA A GEGEWA GFEPF GRSSWDGFVPFEEKPHADDP DVVLSTA PRFDFTKPVGSNPATEWQGLHPVREADQVVNPKHGWIQNT
 E GQGLLP SPGWDGKYDWDGFADSMLHPYDQDPRQGWLAAA PGSDGGVPLPAWTAHDWSGYFSPSEMPAVTNPKDGLLIVS A GE GEWAGFTPY GESSWEGFVPFEEKPGALNA GYVATA $G$ LDG LVSRSWA D GAR GWKGYVPAEDKPRDVNPPEGYMVNA QGVNPIFIDGSTAQADKLGFYPFSANPHEENPARGYIVSA

 T G DWN YWV PGDTANTLDWTEYHPYQDLPRLVNPPTGWLQNT
 A G L Q M $\square \mathrm{M}|\mathrm{L}| \mathrm{D}$ G A H S A C A WD G $\|$ F P A D Q|L P Q|L|E

UniRef90_U4UZE3 UniRef90_UPIO0047C8BDF
UniRef90_H0BVQ1 UniRef90-HOBVQ1
UniRef90 G3IY24 UniRef90-LOIDM5 UniRef90-S0AN88
UniRef90 QOAPE2 UniRef90_UPI00040F7406 UniRef90-Q88NU6 UniRef90-S9Q3Z9 UniRef90_UPIO003B38DAD UniRef90-A4AW22 UniRef90-D3SSR5 UniRef90_UPI000368069B UniRef90-MOLDH7 UniRef90_UPI00035F1FAC UniRef90-E6X519 UniRef90-M0JBN7 UniRef90-P15558 UniRef90-G2TAE7
UniRef90-G2PLI4 UniRef90-G2PLI4
UniRef90-M7N2Q9 UniRef90_UPI000463C483 UniRef90-N1UYG7
UniRef9- F0QYV7 UniRef90-FOQYV7 UniRef90-K2GSF5 UniRef90-A4YFY3 UniRef90_UPIO00368EFA3 UniRef90-FORD21 UniRef90_UPIO00364E215 UniRef90_UPIO004230C4E UniRef90_L9PBKK
UniRef90_B9MIN7 UniRef90-M7XYN6 UniRef90_UPI00036D1971 UniRef90-G8DB27 UniRef90-K9XVU5 UniRef90_UPIO00368B3A2 UniRef90-L9VNIO UniRef90_K6YSR8 UniRef90-UPIO004748711 UniRef90-J9HU38 UniRef90-A1B974 UniRef90_UPI000375D4E8 UniRef90-UPI000478292F UniRef90_UPI000370B9E1 UniRef90-W2DEP2 UniRef90-UPIO0047A6A17 UniRef90-M0LBS7 UniRef90-K9T3X4 UniRef90-G8TF60 UniRef90-I3ZDC5 UniRef90-K1LUR1 UniRef90_UPI000463BCFE UniRef90_UPI0001D2D707 UniRef90_S7V7E3 UniRef90_A0A031GI12 UniRef90_UPI00035D16EF UniRef90_UPI0004752CD9 UniRef90-MOAQZ1
UniRef90-I2EU91 UniRef90-A1ZT56 UniRef90_UPIO003649AF4 UniRef90-T2J6D6 UniRef90_UPIO00425492C UniRef90_UP100037ACC6A UniRef90-C7QN26 UniRef90-B6IMU7 UniRef90-K9VPG2 UniRef90-I2GT35 UniRef90_UPI00047E7DBC UniRef90_UPI00006CDODA UniRef90_UP100047B3776 UniRef90-UPI000255AFB8 UniRef90-J3JE53 UniRef90_-K6YD30 UniRef90_I4XU93 UniRef90-E6QIN5 UniRef90-MOP4K6 UniRef90_UPI0003F9F007 UniRef90-Q6KYV6 UniRef90-F3J5G7 UniRef90_14CA54 UniRef90-W0K2V0 UniRef90_UPIO0047B8442 UniRef90-F3GIIO UniRef90-A4A4Z5 UniRef90-UPI00047C50DC UniRef90_V8R700 UniRef90-E0U7K1 UniRef90_UPI00036912D8 UniRef90_UPI0002E9666B
 NARVTPD GYPHPI TLNWAAPYRNERI WKVLLNREHLTAS
 NDRRFGKN

 NSTPFSSAANYPNYMSSYPENFRGDHADALLKKAENLTLD NQRSVP RGYGMQLSSTWYYPERAERLAQLAGNGRHDSRS
NNKVI DRPFPRHI
SYDWGDSQRVQRWSAMMQGRAVH TR D NQKPTGPN YPHYLNHDWRDGWRSLRLDTLLHRTPHSPAD NSTPYENYPNYMSI DRE N NFRGIHADDLLKDRKGYTLD



 NNRVVAD DHPDYLCTDCHPPYRAERIMERLVASPAFAVD NSAIVGEDYPHYLIDAWPGEDRAARLARLLAYRDDHGPR NSTPFPKQEDYPNYMSRDQENFRGIHAIRLLTGRSGYTLD NSTPGPYSPKPEDYPSYMAPNFRGVHAI RLLEKANGLTLD NSTPFPKTEDYPRYMSRNSENFRGIHALRLLKKANGLTLE NNQSAAGFNTG NGNWSPVDRVNEVI ERLEDQQKLSRD
 NQDTV NSTPFSSAADYPEYMSSYPENFRGMHAIPLLKKAEDLTLE NSTPSPKRKNYPKYMSKDQENFRGVHAIRLLTDKKEYTLD NEPPWTTTDNYPPYMAPRFMDFRAQRSARMLAEDEK DTFD NSTPFTAAGAYPPYMAPDGENFRGDNAVNVLQKQNRFTDD N NWPYTA A GAYPAYMSMNPENPRGIHAVRVLENKKNFTLDD NSTPFTAAGNFPAYMAWDLENARGLNAVRVLEDQKNLTLE NQTTGPNYPYAYHGGFD EYGRGRYINRQLGREKTMNQR NDPPWSPEDYPYYL APQWGPMDFRAEKIENMINNMNKMTDK NSTPFPNKSDYPAYMAPDAENYRGDNAARVLSQKSVFTLD NNDPDDYPVDDPP GGFEWVAPYRYQRDAEVLSEENTHSLE NNWPWPKAEDYPKYMENFPENYRGDHADEVLDGKQGFTLD
 ATGAALPGSGGLGHDWGDAYRQNRLRHLVDSREVHSRD NSTPSPAQSAYPAYMAPDAENYRG\|NAVRVLSQKSIFTLD NSTPFTAAADYPSYMSRDPENFRGLHSRRLLPEVENLTLD
 NSTPYEDYPYYM GY NQRDTEDESTY
NDPPWKNYPSY Y NDPPWKNYPSY $\square A P G S$ NSTPFTASGNYPAYMSTEPENFRGDTAARLLAKAQKFTDE NARTTP TGYPYGTSLDWAAPYRNERIWKLLEGRNGLSAA NSTPSPKRENYPAYMAWDLENARGLNAVRVL TGQKGFTLE
 NSTPFEDYPYYMAPD A AENYRGMHAVDLLSEVENLTLE
 NDSAWMVNPAAPLKGFSPPDGPRARFALDQLERDKQNGPDV
 NDPPWSVTFPPLLIPKNYPPYFRPQRSARMLAEDTSDTFD NATPGPSSPNKANFPAYMAPNYRGDNAVRVLSRKSVFTDD NDPPWTSTDPSQLKPEDFPPYFRSQRSIQLLSEADKLSLE

 NDPPWDNYPAYMAPRGPMDL RSQRSAKMLDEDEKISFD

 NATPYKDFPKYMAPDGE NFRGINAVRVLNSYQDYTLD
 NSTPAKDYPTYMAPDSE N S K RGDHAVQVLTDQSDFTDD NDSAWMVNPAAPLQGFSPPDGQRARFALNRLIGTGQAQPLD
 N NWPGPDSPDYPAYMWSQPENPRGDHAVKVLQGRTGVTDD



 NSTPFTAAGAYPVYMAPDKENFRGDHAQQVLEGVSDLTDE





UniRef90 U4UZE3 UniRef90_UPI00047C8BDF UniRef90-HOBVQ1 UniRef90_G3IY24 UniRef90_LOIDM5 UniRef90-SOAN88 UniRef90-Q0APE2 UniRef90-UPI00040F7406 UniRef90-Q88NU6 UniRef90-S9Q3Z9 UniRef90_UPI0003B38DAD UniRef90-A4AW22 UniRef90-D3SSR5 UniRef90_UPIO00368069B UniRef90-MOLDH7
UniRef90-UPI00035F1FAC
UniRef90_E6X519
UniRef90-M0JBN7
UniRef90-P15558
UniRef90-G2TAE7
UniRef90_G2PLI4
UniRef90-M7N2Q9
UniRef90-UPI000463C483
UniRef90-N1UYG7
UniRef90-F0QYV7
UniRef90-K2GSF5
UniRef90-A4YFY3
UniRef90_UPI000368EFA3
UniRef90-FORD21
UniRef90 UPI000364E215
UniRef90_UPIO004230C4E
UniRef90_L9PBK6
UniRef90-B9MIN7
UniRef90 ${ }^{-}$M7XYN6
UniRef90_UPIO0036D1971
UniRef90_G8DB27
UniRef90-K9XVU5
UniRef90_UPIO00368B3A2
UniRef90-L9VNIO
UniRef90 ${ }^{-}$K6YSR8
UniRef90_UPI0004748711
UniRef90-J9HU38
UniRef90-A1B974
UniRef90 UPI000375D4E8
UniRef90_UPI000478292F
UniRef90_UPIO00370B9E1
UniRef90 ${ }^{-}$W2DEP2
UniRef90-UPI00047A6A17
UniRef90-M0LBS7
UniRef90_K9T3X4
UniRef90_G8TF60
UniRef90-I3ZDC5
UniRef90-K1LUR1
UniRef90_UPI000463BCFE
UniRef90-UPI0001D2D707
UniRef90_S7V7E3
UniRef90-A0A031GI12
UniRef90-UPI00035D16EF
UniRef90_UPI0004752CD9
UniRef90-M0AQZ1
UniRef90 I2EU91
UniRef90_A1ZT56
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UniRef90-T2J6D6
UniRef90-UPIO00425492C
UniRef90_UPI00037ACC6A
UniRef90-C7QN26
UniRef90-B6IMU7
UniRef90-K9VPG2
UniRef90-I2GT35
UniRef90_UPI00047E7DBC
UniRef90 ${ }^{-}$UPI00006CDODA
UniRef90_UPIO0047B3776
UniRef90_UPI000255AFB8
UniRef90-J3JE53
UniRef90_K6YD30
UniRef90_I4XU93
UniRef90-E6QIN5
UniRef90-M0P4K6
UniRef90_UPI0003F9F007
UniRef90-Q6KYV6
UniRef90_F3J5G7
UniRef90_14CA54
UniRef90_WOK2V0
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UniRef90-F3GIIO
UniRef90-A4A4Z5
UniRef90_UPIO0047C50DC
UniRef90_V8R700
UniRef90-E0U7K1
UniRef90_UPI00036912D8
UniRef90_UPI0002E9666B

D ELG 370

PELGEDQTD DEGQSVP DWKLYRWGEKSYA A RI MM TA
PRIGEDRFAA
PLLSASRDADKNFSYSWTYDDTPLQALLNEKPPRALPDA
PRFEDAGLDDSDYPSDWAVATDPADS PLFESMSR
PYME Y YGIT SQDGGYNDSFFLGSDVTYHGPLMEDLVNWTD
DEGGELLPAWHGDRRVF $\operatorname{SSGKIPTMTGNKRITQLGSFDMSKTSTPEERDEVMMDVL}$ DDLGPESGPAWQAFVGNARLSFSAQA DD LGPESGPAWQAFVGNARLSFSAQA
EPVFA
EGEYEKGLTPMERVT FWGS
DGFEDA
PAPMNNMELISYFGSESP $\square$ DER $\square$ S
PAFEDA
AVMAPFMAKCRNYDAAFRF $\square$ SPM $\square$ D T P
EVPKDFSDMERLNYFGTDTPFEERL


ETFGSAYGPASYFLGYD YGRGVFKARV
RSGLLE AA
PAMGPAFAAW ERLDPAVLHRAL
AERPEGMYSMQWVAYWGDEWENQKKD
PKGLNLIDERFRYY
ATEAPEGERLE
ERI
NYFGSESPEEER\AQFKEAMV

 | $D E L G P E D G P V W Q S F T R M T L L S$ |
| :--- |
| $P W L L Y Y N D T P S E G L G S V S F F L G P D D Y Y H G P L V S A D Q D H L L$ |

P WLLYYNDTPSEGLGSVSFFLGPDDYYHGPGVEDGENWTV
EAM
D DDKVFS DPWSEQSPRTTPDGDADPKNAVAKLEVVRAVI
QKLSPA IRTVYDEQGEADQVEKTKQFAKTASAEQLLDAVL
AAAKAREVQVL DY DQAA ATPQQRLQALERAS


SQPWQPNSPLNTPNGLADPQQA
LARSRVQPGQPLDNLSFTAFT $\square$ SSTSPQEKVTA $\square$ ADA $L$
$\square \mathrm{D}$ E
DEAARVNAAERG $\square S F S Q Y V A E Y T A \quad Q \square G V V T \square S E A K$

| D | E QAFSQPWNDKSPRTTP $\quad$ PFNDFVQRMFRELESNPE |
| :--- | :--- | :--- |


D DLGPLADEL



PENDSDMERM VAFDPRSAQT TYFGTHTEEAVKVFEEVA

SKPWNENEALSTPTGLADVNNALADLEQVAAQVK LLYGSG

PKLGSNWD $\quad$ E
$P L L A R C R A L E P G F V Y E W S N A D V P V Q R \| I D S G R A E L L P D$
P LLERCRALDPTFRYFWSNVDTSVRAMDDARRAESDREEW K SIGSSSALDALIPFNQENGKTLE YDASEVVVAMEAAII $Q A \quad R E Q G V P V V D F L A T E K V T A A Q R L A A L A T A A$ D $\square D K T F S K P W S E K S P R T \quad$ T
HD D DWR IS FDPANPRHTPRGL
PAFDDAGLDDSYYPNDWVVATDPADGEFFAERSRA
DD QVANVKRFAATATPEQVLPPLLTVV
TPWNAAQPRTTPDGLAQPKKAVKMLNA
RAAADTRFDN $\frac{1}{G L S D F G L K N T S}$ ESKKLFSKPWNPENPDETPTGDADDNTAVAVLE

FINPTGATAPKPVEILEVLEETL

D E L $G$
ESKGLFSRPWTPENPLETPAGLADDNTALAVVEELHL
DADRLFAKPWSEDAPLTTPDGLANPAEAVRVLE

GVLPHEMSDMEAMVYFGTKSP
$D R Y T L T M G P Q F E H F Y F N Q D K K W ~ S K E Q N E K E R L E Q F W C K T V$
$D$ VQVADEEKADQVGK TTQFAATASPNDLLG


TWTDDFEASGLSEDWWPQEWVLVTL
QRQLEAVDDRWRVAFDARDPQHTPRGLLR SERLS IFEQAV

PTFDAVDLGETYRPSDWVLATDPDGD
PARAKGVPVY


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

AA $\quad$ SPFFARCREL DPDFEYNWRNMDEPLGWEEYWPGDWVTVT
DELGDAMFE

 ESPDI WRVAFNPADAQHTPHGL
EPSGLFSKPWNQQNYUTTPTGGADFNTALAVLEGVAB
LARPRARPGQPLDQLALIRFA $\square K S T T A P Q K V N A L Q E T L$
$A H L Q Q \square P D A W R V A F D P A Q P L T T P N G L A \square D R E$

UniRef90 U4UZE3 UniRef90_UPI00047C8BDF UniRef90-H0BVQ1 UniRef90-G3IY24 UniRef90-LOIDM5 UniRef90_Q0APE2 UniRef90-UPI00040F7406 UniRef90_Q88NU6 UniRef90-S9Q3Z9 UniRef90_UPI0003B38DAD UniRef90-A4AW22 UniRef90-D3SSR5 UniRef90_UPIO00368069B UniRef90 ${ }^{-}$MOLDH7 UniRef90-UPI00035F1FAC UniRef90_E6X519 UniRef90-M0JBN7 UniRef90_P15558 UniRef90-G2TAE7 UniRef90_G2PLI4 UniRef90-M7N2Q9 UniRef90-UPI000463C483 UniRef90-N1UYG7 UniRef90-F0QYV7 UniRef90-K2GSF5 UniRef90-A4YFY3 UniRef90_UPI000368EFA3 UniRef90 FORD21 UniRef90-UPI000364E215 UniRef90_UPI0004230C4E UniRef90_L9PBK6 UniRef90-B9MIN7 UniRef90 ${ }^{-}$M7XYN6 UniRef90_UPIO0036D1971 UniRef90-G8DB27 UniRef90-K9XVU5 UniRef90_UPIO00368B3A2 UniRef90_L9VNIO UniRef90 ${ }^{-}$K6YSR8 UniRef90_UPI0004748711 UniRef90-J9HU38 UniRef90-A1B974 UniRef90 UPI000375D4E8 UniRef90-UPI000478292F UniRef90_UPI000370B9E1 UniRef90 ${ }^{-}$W2DEP2 UniRef90-UPI00047A6A17 UniRef90-M0LBS7 UniRef90_K9T3X4 UniRef90-G8TF60 UniRef90-I3ZDC5 UniRef90-K1LUR1 UniRef90-UPI000463BCFE UniRef90 UPI0001D2D707 UniRef90_S7V7E3 UniRef90-A0A031GI12 UniRef90_UPI00035D16EF UniRef90_UPI0004752CD9 UniRef90-M0AQZ1 UniRef90-I2EU91 UniRef90_A1ZT56 UniRef90-UPIO003649AF4 UniRef90-T2J6D6 UniRef90-UPIO00425492C UniRef90_UP100037ACC6A UniRef90-C7QN26 UniRef90-B6IMU7 UniRef90-K9VPG2 UniRef90-I2GT35 UniRef90-UPI00047E7DBC UniRef90 ${ }^{-}$UPI00006CDODA UniRef90_UPI00047B3776 UniRef90_UPI000255AFB8 UniRef90-J3JE53 UniRef90 K6YD30 UniRef90-I4XU93 UniRef90-E6QIN5 UniRef90_UPI0003F9F007 UniRef90-Q6KYV6 UniRef90_F3J5G7 UniRef90-14CA54 UniRef90-W0K2V0 UniRef90_UPI00047B8442 UniRef90-F3Gllo UniRef90 A4A4Z5 UniRef90_UPI00047C50DC UniRef90_V8R700 UniRef90-E0U7K1 UniRef90_UPIO0036912D8 UniRef90_UPIO002E9666B

GASVWC ${ }^{410}$ (CEQLIASRALDDALVWLSDNFNR D HWLDP GFTNWNELLTAAVARGLTNAHAPGNLAHWKHGEA ERNDPWWCQPT TCAEQSAAALGRALDRLQAAYGA A HYRNWDDF LLGQLKHGLQQVQAQHGV TATLIGALEATLSELDGAEWETYGD NSPDSAYFNNPLNGNVENFSSLALHAFNQT@NELNKKYGT TGDLGHWCDNEADARTVTCQELTGPALDQAMAETMAAYGA EKDTEDFGSWETTWGEFNRYQRNDGEIVNEFDDSKPSLAVV GRDDSPFWDDRNTPQKEDKPA LLARSLAGAMEAGDAQLGA DGASAWCDVVRSAPTETCTDIVARLALDDALVWMDERYGS DQLNEDVGSWNTTWGEVNRYQRLNGDIVRAFDDSK
DPEDSEVFDD QSKAEAMLGALENARSEDDAEGWE SQLESDFGNWNDPWGEVNRYQRLNGDIRQAFDDEK LPADSDWFDGSRP ERMVDALEAALAEDDEEGWETYGD PDKRHYRDWDEFLLNLLMQASHKLSANDSAGFSESLLAWGA EKLEEDFGTWNMPWGEVNRYQRLDGADHQAF NSAETADSTQAEYADGDITTDALVVSAFRTAVDEDAERYDG GMLKGWSWDEALSEALSVATQNLTG RGWGEEHRPRFT DGAGSWCDPAADAEGLTGCDRLKARALDEALGLVESLGGA DRLETDFGTWKMPWGEVNRYQRLNGDIRQAFDDAK A QLERDFGKWNTPWGEINRFQRLTGDIKQ
SRLTDDFGSWNDPWGEINRYQRLNGDIKQ
 QREDSPFWDNAGTPETETKWDIFAQTLADAWAFNTQALGD NYPNDTWFSNPDTKVRGNASYDMVQAYLETVKNLTSTLGN QK TVDF GS WKTP WGEFNRYQRNDGKDIQDFNDNK KKLESDFGTWN【PWGEVNRYQR\NGDIKQAFNDDE
 QELQTK $L$ GK WQVAWGE $\quad$ NRYQRLTANLDQQYDDAK AKLTADFGTWQTPWGDINRFQRLSGDIVQPFDDSK ERGDTWWCPPHGCAAH AGAALERTVQRDAARYGN

 ANLTRDFGTWKTPWGNDNRYQRDTGKIQETFDD
AKLIADFGSAETPWGQ $\square$ NRFQR $\square T G D \square V Q P F D D A A$ K GLAANPTSAAATDEAAAVKVEKAYGKLDVPWGEVFRLKYG DEDFNKLCKNSTYQGKSPCIYNLATSLAQTHDFLTTEVSP TGGASAWCDDRQSAPAETCTQUARQALDAALLDLGARFGP AELTRDFGTWKTPWGDПNRYQRLTGHIQESYDD
DQIEEDFGTWN $\square$ AWGEVNRFQRLDGSIQPHFDDNQ
DKLTADFGTWQTAWGEINRFQRLTGDLAQPFDDSKSSDP D MLASVVQVTELGLLKAG
$N E L T A D F G T W K M P W G E V N R Y Q R T T G D \| \square Q H F D D T K$
LLDDSDWFD VVR GSRTDRMLEALDATGEEDDAEGWQ
S D $\square K K K Y G S W F T R W G T \square N R Y Q R \square T G N L E E T Y D D N K$ ETRPSRW DPEQFADWNELLVAALDRGMKEGEAP A NK LDNKDFGSWNTPWGEDNRFQRVTNE IQGKFFDE

RDTHRDWPHFLDRAVLRESARRLAQSNGRRPVDDLRWGEA NGVVVAALRRAAARLTAASGETSIDGL RWGE VKLEEDFGAWNDPWGEVNRFQR LSGALDLPYDDNKASLPD DKLQRDFGNWQTPWGEINRFQREGTGMVQPFDDVQASLPVV



V A T Y L K QK H GK L TV VA WGK $S D L S R Q F G T W R M P W G E V N R Y Q R L T G K I T E T Y D D$ GIAA QVKLLYGSLDIAWGEVVRM A QMDADFGTWKTPWGEINRFQRLSGDIDLKYDDNQ QQLLNPDFESWTALK AA LNQVLDKMAATGSPDQQQTWGA LRDRPDWCDDTGTPVREDCAAGVRRALRSTDETLKERHGP ATASKVEATYGALDVAWGEVFRLPGE QQVRQRYGK LDVAWGDVNRFTFN GK SQLENDFGTWNIPWGEVNRYQRLNGD』EQ ENKN QKYSCDYNLLIAA A QVEDYMTNEFGS TELKTKFGTWQVAWGE INRFQRI SSDDDQQYDDTK DQLVSDFGTWKIPWGEVNRYQRLNGDIVRQAFDDAK
 DRPQVAKALREAMLASVQQVAESGLKADSRWGDDQVVSSG MNGESANGAPSAWLPHGYRNWDALLTDAVRQGMDQGRATG EK LQQKDFGTWKTPWGE DNRFQRLSGA DDAYDDAK NDPYSRYFDNPDNGETRNFYTIALTAFNQTDMY DNERYGG GRDDSPYWDDVKTPQKEDKPAILARSLAAAITSGDSLLGS $\square P E D A A W F D R E A T P A S A S G A E M L S A S F R K A V A H G K N L M G L$
$M$ EREVYPDWDAF LLLAKLKKATRRAMANCSAGSLDDLTWGCDV

KRDENDFGQWNTPWGEDNRFQRLSGD\NLSFDDDKPSDPV DSGSAWWDDRRTTGVVEDRDMLLAGALVAAYDTVVVDLPGD EQPAVAKADREAMLASVELAGKMGLKPDMRWGDUQVVSSG $D E L T A S F G N W R Q P W G D I N R F Q R \square T G R \square E E V Y D D K K$

UniRef90_U4UZE3 UniRef90OUPIOOO47C8BDF UniRef90-HOBVQ1 UniRef90-G3IY24 UniRef90_LOIDM5
UniRef90_SOAN88 UniRef90-Q0АРЕ2 UniRef90 UPI00040F7406 UniRef90_Q88NU6 UniRef90-S9Q3z9 UniRef90-UPI0003B38DAD UniRef90-A4AW22 UniRef90-D3SSR5 UniRet90-UPIO00368069B UniRef90-MOLDH7 UniRee90 ${ }^{-}$UPI00035F1FAC UniRef90-E6X519 UniRef90-MOJBN7 UniRef90-P15558 UniRet90_G2TAE7
UniRef90-G2PLI4
UniRef90-M7N2Q9
UniRef90_UPIO00463C483
UniRef90-N1UYG7
UniRef90
FOQYV7
UniRef90-K2GSF5
UniRef90-A4YFY3
UniRef90-UPIO00368EFA3 UniRef90 ${ }^{-}$FORD21 UniRef90-UPIO00364E215 UniRef90-UPIOOO4230C4E UniRef90-L9PBK6
UniRef90-B9MIN7 UniRef90-M7XYN6 UniRef90_UPIOOO36D1971 UniRef90-G8DB27 UniRef90-K9XVU5 UniRef90-UPIO00368B3A2 UniRef90-L9VNIO UniRef90-K6YSR8 UniRef90_UPIO004748711 UniRef90_-J9HU38 UniRef90-A1B974 UniRef90-UPI000375D4E8 UniRef90-UPIO00478292F UniRef90-UPIOO0370B9E1 UniRef90-W2DEP2 UniRef90-UPI00047A6A17 UniRef90-MOLBS7 UniRef90-K9T3X4 UniRef90-G87F60 UniRef90-13ZDC5
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$N D S L P S D P D G F A S G R W G A L A A Y G V S Y T$
$N D T K G Y G$ DPRTWRRAAALHEFDNGALFGMPMGVSAG NTALMNRG HPLSAQFPAWAALLN PVSRPIGGDGDTVLANGLVPSA DPFTVTWGEVHRAHFRHPLFRYATGGDDFTLSRGSWGGDR


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DVD पPANGGDGSLGDFRVLKFAPTSNERFRA PSLPSGFAASTWGALPSFVSRTYPKGTTKRYG QPERWTWGAAHPALSVHKPLGVPSGGDAYSVNVGQYNAAQ TWAEMRNTSFPVGMNSSMWGSLAAYGSRPYPNTKKW YG TWAEMRNTTDRALGAVPGFGSUTGGGARFPRALSSGHGA NTEKWKWGR】HQAKF NLD DPANGGPGDFGDFRVV NFDPMENSKHFQA QKPS $\square P \mathrm{VGFTSSNWGSLAFGARTHPN} \mathrm{TKKRYG}$

PSTPVGFTSARWGSLAAYGQRT
FNDTKRDYG
NVD\PANGGYGELGMFRVVDFVP VAANWQWKNVHVNEYPNMPWSLAVGGNGNTVKVSKYTMRH DLASWRWGDLHRARHVHPALGQPTSGGEMTVAHAGFLGHG QKPSIPVAFTPSVWGSLAAYGARTAPN TKKRYG PSLPVGFASGRWGALASYGARTY DTKKLYG PYASANWGALAAYGM
$\square Q \mathrm{~V} S \mathrm{GNTPMHGGPQE} \mathrm{\square}$ RYGAGASGRWAMAAYGRYSVPADGKREV RYGDWNTHPFGVEAPFLDYEARPADGSEATVKNYRVDSA I Q DLPASGAPGELGSFRVLDLDATKDE KRGSV D LRDWTWGSRHELDLASHPVGPQPMPGSGLTVRASNGKHSA WPPSLPVGYNSSLWGSLAAYGSRAYPNTKKW YG $N R V E \square R H P L A A A T P L L A D V L N M P R V P V A G C R Q C V R F A D A G$ NRVQMFHPLSGVSSLLAPFLDMPKAEVAGCPECVRFHAVS GLASGRWGA PYASGNWGADAAYGQSSKS

TTKKRUYG
T
RLGNVDLPGNGGDGNLGIFRTTNFAPGEKGQFQA H P

FGVEAPFLDYETEPADGSRATVKNYRVDSAV PSYPVGFASALWGMLPSYNSRYY YGTQKRYG MHRKYGKYNLPANGSAGG\|GVFRVAWEGYTDKQGDNYVGG QKPSLPVGFTSSAWGSLAAYGARSYP GTQKRYG $R V G E Q D V P A R G A P G K \square G S F Q V L G D Q A T P D K K F Q V$

PYDPVGYASGNWGALAAYGART FEGTKRDYG NTATDRHPLARA DPADNFAAMPSDAAGDTHMPRFQSPTH $R V G D Q N D P A S G G P G K L G S F R V L N I Q A T A D E K F Q V V F$
HLVA WNWGWEHRVETGHALLRVPVDGGFYTVNRAGGSGTG ANLIPANGADGALGVFRSVWFAPRKDDRFQA DFPGNGGSEQYGDYRTIYFAPE GRDAKQNRA DPFNDELPSDPUGYASGRWGALAAYGARYNNNNTKKVYG
 YHRTTDDHQFGGQLPALNYPRYPTDGTAYTVNVGDGANHG PSDPRGLASGRWGALAAFGARSVVNGSKKLYG GRQTPПHGGPASLGVYNADQSVPAADGKREV
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DPA WGNIHKRYLVSFFGDVPAAGDGNTDNAAYGSDFG
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NKAR

GLASGDWGALA SYRAVGNTKRDYG PAKTWTWPRHLLRLDGFSAPNMPDDGGRGTLNPSVGSRFA GRQTP THGGPGTLGIYNAMQSVPREDGKLEV K


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$L G D Q L S L Y G Q G K M R P I W R D R S D V E Q H L E S K E R ~$
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Y D DQLAA WAAGDYYAF
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S

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 TFELDGASFPGLPSVGIGRSAFUSWSGTLSFSDWQDWYVL NYETYGYHLPIFPFPIIAHNAKKAWALTMLENDDMDFYEE GLDVYGAATWGQFFIYQGFNANAGWMHTSSGGDNDDEFAE NYQAVGПMVPGDPFVAVGRNPEMAWGGTHMRAASSDLYDV ALRLAGVSLPGTPGIIVGSNGHMAWGFTNSYGDWSDVIAL EYDVIGDAVPGDPGIHFGHAGDVAWADTNAMADYQDLYRE GLNAYGAATWGQFFLYQGFNPTAGWMHTSSTVDAVDEFGE

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GTDFAGATLPGGPILVAGSNGKVAWGFTNTTADWGDLTPL DFDMLGFAFAGDPGVHFAQGPEIAWGTTNAMADYQDLYIE EGGVIGATVPGMPVIFAGRSPSLSWSLSPAAVDDADIAVE EFDVVGLAVPGVPGIHFGHAGHVAWADTNAMADYQDGYRE GLNAYGASTWGQFFIYQGFNAKAGWMHTSSTVDNVDAFAE QTKLYGAALVGMPMLAIAFNQHLGWTATVNTYNGRTFYEJL GLDAVGVSLPGAPALVVGSNGHI AWGLTNSYGDWLDHVVL
 GLDVMGAALPGLPVVNGGNQHLAWTHTVDTSKHFTLYRLC DRKLTGVSLPGLPLMIAGSNTHIAWGFTNSMGDWSDLLR1 GMNVTGVSFVGVPGVLDGFNEHVAWTHTVSQSKRLTVYRL GLDVYGAALTGMPIINTGFNEHIA WTHTVSPANHFTVYRL
 GWHVMGGAFPGSPVITVGANEHVAWGATVNKPDLVDDYVL GLNVYGAATWGQFFIYQGFNADAGWMHASSGVDNVDEFAE

## UniRef90 B1WVG4

 UniRef90-U5BZT4 UniRef90-M0E177 UniRef90 UPIO0042A62A5 UniRef90-17M2R8 UniRef90-K9TL21 UniRef90_J2WIF9 UniRef90_Q2YAF7 UniRef90_UPIOOO2376239 UniRef90 A0BIP0 UniRef90-A0A059F9G0 UniRef90-R7ZRD9 UniRef90_B3PGL1 UniRef90_UPI00034ADD99 UniRef90-MONH99 UniRef90-Q82VG5 UniRef90_N9SJR1 UniRef90-ROCXN9UniRef90 J2FOD7 UniRef90_J2F0D7
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UniRef90 $14 W 3 . J 5$ UniRef90-14W3J5 UniRef90_UPIO004779C20 UniRef90_UPIO003B73700 UniRef90_UPI000362CE5B UniRef90-D2PYP2 UniRef90-TOHMB4
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KLLQEEN
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100
110
120


EVVEENGYF KVEEGNK TVENEG T IVPGDRDFYRFDGEVRKFEAQEQTLWVKQEDGYPLRVKH MRDPDDPLRYRTADGWKRI EVVHEVLRVRGAADETDEVYS Q 1 NPEDATQYRTPEGWARFTLRTERI RVVKAADVLHTVRS EI KDDDK LIF YKFDNEWIPCNKTVE IIKI KGQEDQSITI F H TLRDNG Y LFD GKVLPFDVRETSYKLLQDDDVPVTURS TVVRQEGRHEYLHGDSWLPLREKTVRMAYNMRGEETVTAFY
 EI DDAGD RYRYEGEWRDFETXEETI PVAGGEDRELRVRR NPDPENPARYDSQGEWKSVKDWRETLHVRGAPDETLELRE SVNPNNSKQYLYKGSYDPFEHKQVKIKVHSQADHVLDVYK TIVEKDGQRYKYGSELRPLKSQTITVPYRAADGKTFTVFK QLDPKDPTRY LIDGKSVPMSQQTVAVEVKQADGQLKTVYG
 YMFDGKTMPFKTAQKSY NLDPGDKNRYRTAEGWQADAKSTEDIKVHNGADEKLEVRD

 TLVPTGAKGYRYGGQDRPLAENTDTLRYRRPDGRDFTTWA QLDRKDPTRYLLDGKSLPLTPQTLNVQVRGADGVTRTVYS KL NQEKSTEYFYEGEWRKLNII QETIVIIKGKENGEQLLIIRN
 TLKEGDPTKYLYDGDYRDFEKRDVTINVRGKGEQTATIWK SDLPAD

## TLADGG

$\qquad$ $\stackrel{E}{P}$ QLDPARPGSYLTPNGEYPLETVVETIDVKGAPARRLAIIEK TVKKDGKYSYRYNGQELRGMEKQTLSVVNVKQADGVSRVVYS QRDPNDASHYKVADGWASIETHGEII RIKDAPSHTLKVEM QLDPKDSTRYLLDGQSVAMGKQQVSVDVKQADGVPRIVYS KLRREDGDFALGVSGFEPVSSHHETIEVRGQDSLEVEVLE

$\qquad$
 KEQAG $\qquad$ YLYDGKVLQYETSQYPFRVKQKDGSFTTVQK K $\square N K K G K \square F Y E F D N K L L P V I E K E \square T D N Y T E N G K K K F K T Y F$ TRHPEQQDTF LIYDGEWVAAEVQTRTLTLADGSRVAHTRKD T IVTKDGPFYRYGQE LRPDVTSQVRIAYRKPDGRSFTBYR QVK NDSLY $\quad$ KYEGKW $\square P \mathrm{FQDKNYTIKVKGKPDFDEKYRS}$ KVRQNNQWVYAYEEKQKPVRTKNVLLHYKGMVAVPVEAFY QLDPKDPTHYLLDGESDPMHKQTLTVDLKQSDGVSHVVYS TEDTAEKAEVMIGGEAKAVESRTETIEYRGGTERKEVVIR T I NPNNPAQYRFDGQWKNFERKVVYFPVKVFNKDPREILF TLDAEDPTRYLYEGEY LDMTSQEFTVSVKNGDGVLKTLYS TPCPDQPDHYMVDGKPEEYKDRKVNI KVAGEENVELVVKE VLHPTKPNFVKEKGSWVPVQVFKELI PVKGEEAREITVQV
 S DLPA
 KTRHDNS EY LTPSGWKP LLTRQEAA EVANADAETDTIRE
 TVRPDGALTYYRYAEQRPVRASTVTIAYRGRADRGVTVYR DADQQLP E LDP K K P T RYLLDGKS LALLTHQRLSVTVKGEDPVTRDVYS KCR GGKYLDHDKKWKAFS DRREII KRKKK LPGEAVFYE
 TVKPS GRWAYLDGKRWRPMERCQITI KYRLQADRAFTVYK

ELSADKR QYRTPDGWQEF\|VESEATAVKGKPDEALQVQK QLTRDDSGALLPGGERVPARTRSEQIDVRDAEPVAVQVDT EVQPGNSDRYRGDGGWTGFDTRSETI RVLDDAPRTI TLRE QWVDEDSY YYRGEVLDQE ESSVETYVWRSYRVEEI RVAR RLRPDGSVEALGPDGWYRAHAHTETVEVAGAEPERVEVDE RIVRAGGWAYRYGKEMRPVAARVVTLRYRKPDGRRFTTWR $N L A G E G$ YQWE GGVRPFDRVEKHLKDKQPDGHFRTVER ELDPSDPNRYLTPDGWRRLERRTEWIRVAGEDPVRLEIQQ

 PADRGQ ELVTHVTQHI DVKDAEPVEYVVD T LDDPADPTRY LY DGEYKQMTSQDYSVSVQNEDGVKKTLYS TVVRKDGPFYRYGSEDRPVTSRQ LTVPYRRADGRSFTAYF SLDPDDPTAYVYEGETRAMERREHTIDVLGDDGVSRVMFR ELDPENPMRYRYGDDWRDDEARVVTFPLRDANGEEHTVYV EVVEVEGQRYRYGEELRPVEVGELSLAYRRGDGRSFPTYR EI NPDNENQYRLDNEWLNFEVKQAAI RVKFYWTVTQDLFY T IVADGSRSYRYGNALRPVKTET $\square T L S Y R T A D G R R F T T F A$ PANAAG
$T L Q D G G$

UniRef90_B1WVG4 UniRef90_U5BZT4 UniRef90-M0E177 UniRef90-A4CHA5 UniRef90 UPI00042A62A5 UniRef90-17M2R88 UniRef90-K9TL21 UniRef90_J2WIF9 UniRef90_Q2YAF7 UniRef90-UPIOO02376239 UniRef90-A0BIP0 UniRef90-A0A059F9G0 UniRef90-R7ZRD9 UniRef90-B3PGL1 UniRef90_UPI00034ADD99 UniRef90-MONH99 UniRef90-Q82VG5 UniRef90-N9SJR1
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UniRef90_C6G3Z6
UniRef90-B4VHJ5
UniRef90_A0A011RHV7
UniRef90-J2TA18
UniRef90-F8EB86
UniRef90_A0A023NTZ7
UniRef90_Q4ZV08
UniRef90_UPI0003750A76
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UniRef90_Q58HM3
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THQGPI THKLGDNWVATRINW

THHGPIVRTEGDKWDAFALMMNKMDPALEQSYLRTKT


$T V H G P V F E R P D G K F V A L D R V A G L D R P G M D N Q Y F D M V T S$
SHHGPVTRAEGEKWIA QLMVA R REKALTQSYDRTKT
SEYGPVVVIPGMKNTAFALRDA NRDNTRVLSQWYSINQV TNNGPIMA KRDGKWISLKSNNRSMTSLIQSWVRTKS
TVHGPLIEREGRT VGVAWTGHTARTTAA IEAYGRS
TEWGPI LAQD FDGTPLALVWTAHQPGANFDVVELEQA
SKQGFVSAWDEKNHTAYAQKRSWEGVEVETLLGWANAAKA
THHGPIVREDGGKWDAFALM NKPVAALEQSFDRTKA SRFGPIVQWDWDNRFAYSLRDA NDENDRVLAQWYAMNRA
T 1 HGPIMA KRDGKWI SLKSKNRNMESLVQSWVRTKS
$T V Q G P V F \quad D \square P G G K T T V A V K V A G L D R P G V L Q Q Y L D M G K A$ TQWGPI LADDAD GTPLALAWTALQPGSNDELLNDDSV

TEWGPILAQDHDK TPLALDATALRPEANLRLIDLEQV
SHHGPIVREEGGKW $\square$ AFALM
SQFGPVVQWDWDRQYAYSLRDANNLENDRVLQQWYAMNQA
S I H GPVTFVDEKRNRAYAVKCGWLEVGGSPYLASLRMNQS
 TVHGPLLEREGRT
SHHGPIVA MRNGKAYAAAMAYAEEVEVTEAWTTFNTA
TPHGPIITDAE ILPNGATLALRWVGHEPSNELAFDRANRA $S \square H G C V V S S Q E G N A \square A L$ R RVVGLDQPQLMAQLWDMMRS
T I WGPVAETGADGRKFVFKWLAHDVTQADDF GULALETT SKFGPVVQWDWDQQYAYSLRDA NLDNDRVLQQWYAMNRA THHGPVVAVRDKKW VTLKSTDANDELLGVHWKKMKS TRWGPI MGKD TDGTPDALAWVGDRPRGYNI NVMQLEHAP S $\square F G P V V Q W D W D S K F A F S L R D A N N L Q N D R V L Q Q W Y A M D K A$
 VPYGVIVPETPVSAPGRQLLVNWTGFQATAEECFFEMGDAA TERGPVI ITTDDGSEAVSLRCPVRAGAGLGFGALPALLRA TNNGPIMA KRDGKWlSLKSMNRSMNSLIQSWVRTKS
SRHGPLISEDPP I S FAWTGHHPKGLGALLAINRA
THHGPIVRSEGGKWDAEALMWRPTA HPKGLGQSFLRTKQ TVHGKVI KEEGNGQYYAQHWYAAEKSNSVKAMYEVMKS THHGPVMGS RNGKWLSLKENNRSDNALDQSWVSTKA SQFGPI VQWPWDNQFAYSLRDA NLDNDRVLQQWYAMNRA SVPGVILPAPRALIAGGCLLDGWTGFEPTMEIAYLGMDRA CEYGPAI RAPHALGGYALRYAGYGKNDKQVEQWYRMDKA SHYGPMI GWYPDGTAVSRDANANNGNMVSQWDAMDRA SRFGPVINDDVKTQKPMALKWTAHLPNDTSVMGLQQMTNA
 THWGP MGQDAGDGTPAALAWLAGRPHGYNLD TPHGPIITDAD LDPNGATLALRWVGHEPSDELALLQANRA TQWGPILPAEKTATPNKLYAYRWVAHDLAGDNTVFDLTQA THHGPVVYATATRW IAALTYEPNIELLGMHWLKMKA TARGPVIAGGPDDDHAVSLRYPPRVSGQIGFDADPKLLQA THHGPII GDQDGKWVAFAMM DKPDPADEQSFLRTKA
SGSTGCVELEVAALGGRRCALFWSGYWPSSIDGSLDTWRA SVFGPIVQWPGRWNRQYAFSLRANLDNTRVLQQWDALNRA NHRGTLEGDASGAAEKY LLNTWAATGAASLKGAMAIVFA

TVGP MGAMDGKWПAVGLM GARMEADOQS NRTKA
T RWGPV DGRD HRGRELALHWVAHEHVPMD LGLLGLERV SKQGFVSTWDENNHTAYAQKRSWEGVEIETLLGWANAAKA T $\square W G P V \square G E D H N G K P$ W TPNGTVVFGGPDETFAMSLR SPLLSEEVTFDAPLDLLFA TANGPVVPSRDVTP $\quad$ GHVVPA LDRTGRKDASMSALI GVVRA $T \square H G P V T E R W G E K F A V A Y T S A R P T F E M V F$ V $T D R G P V I D G G D P G T G E V S L R H P P R V T G D L G F D V L P A L L R A$ THHGPIVAAKDGRWDATALMWRP DPA E ASFLRTKA SLHGVI LEKNDQKAIADKVA GGDRPHULAQFLQMAEA

 S Q F GP V V Q WP GW D A Q A A Y S SVAR DA N L E N S R V L Q Q WY Q I N R A

 S H Y G P M I

 THHGP LIPA DA GDA A GR WVA T K I N W D PAARAALE Q S Y L R T K T



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UniRef90-J2FOD7 UniRef90_J2F0D7
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180

200 KNHHEYKSVMNKTNSSNNTVYADRDGNVVYYHGNFVPIRN




 K DLK KSMELLKNDCYPNNMVFDSHDNHI GY K S T GRLVVIKE


UniRef90_B1WVG4 UniRef90-U5BZT4 UniRef90-M0E177 UniRef90 UPIO0042A62A5 UniRef90-17M2R8 UniRef90-K9TL21 UniRef90_J2WIF9 UniRef90-Q2YAF7 UniRef90_UPI0002376239 UniRef90-A0BIP0 UniRef90-A0A059F9G0 UniRef90-R7ZRD9 UniRef90_B3PGL1 UniRef90_UPI00034ADD99 UniRef90-MONH99 UniRef90_Q82VG5 UniRef90_N9SJR1 UniRef90-R0CXN9 UniRef90-J2F0D7 UniRef90_UPI0004690446 UniRef90-N1MMG7 UniRef90-UPI000377A255 UniRef90-Q486P9 UniRef90-E8X319
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UniRef90-A8CF99 UniRef90_UPIO0029B416B UniRef90-14B3A0 UniRef90_UPIO004788718 UniRef90-M7XGJ4 UniRef90-V4PD75 UniRef90-UPI0003B6E8C4 UniRef90-D0C6U9 UniRef90_UPI000255B791 UniRef90-M3USE4 UniRef90-UPIO003B67F21 UniRef90-U3TCN3 UniRef90-G0Q0L7 UniRef90_UPIO002631678 UniRef90_UPI0004752EFD UniRef90-W9V6B0 UniRef90-14WU41 UniRef90-Q88IU8 UniRef90-F3DJLO UniRef90-UPI00036CE4D4 UniRef90_B1KL96 UniRef90-G7UUF7 UniRef90_S4Y8T3 UniRef90_A4ADI9 UniRef90-A6GGZ3 UniRef90-AOYAE2 UniRef90-D2BDN2 UniRef90_UPIO00474F76A UniRef90_Q58HM3

210
220

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 S G D WK G L V P G D T S E Y L LWT E I H D F E D L P R V T D P E S G F I Q N S PSFDWSVVDGSNPETDWKGLHPDEDLVYIANPATGWLQNC
 AGEGEWRGFEPFGESSWEGFVPFEEKPHAIDPDA LSTA GNYDPGLPADWSKQTGWNGWLAPADYPLVINPPDMRLWNG DNQH $\square Q L P A Q G D G S M E W Q G F Y D F S Q N P K A Y N P E K G Y I S S W$ DRFDYTKPVGADPATDWKGLTPLDKAPHVLNPPNGWVFNT
 KSNWAKVVDGTTSKTQWKGLHPVSETVHVYNPSNGWLQNC DGDWSRPVPGDTSRTLWTDVHSYDEMPKVLDPASGFVQNA GDCDPQLPCDWSRANGWDGWLDRADYPHVINPPAARI WTA GMDGETPKSWASGENSWQGYLSSAQYPKIINPENHRLWTA PARNPSDPDTPTAASEWSGYI PFDKDPQVFDPADGVIATA GAYDPHIPADWTTADAWSGWLEPERYPLI NNPATQRLWSA TRFDYTKPVGSDPATDWRGLHALDTMPSVLNPKNGWAFNT $A G T Q M V V L D G S R S A C A W D N T P P G A A Q P G I F A A R Q D F V Q N S$
$T H S G L V P V L G D G N Y E W D G Y L P G T D K P H V V N P P E N F F A S A$ NNQGAFLKNGTTADSDWDRYNNENEDPLLI NPQKGYIDTA A GNRDFDGSAGEGEWEWDGFVPFAEKPHAIDA NVLATA PGYDWSMPVGSSSATQWQGVHPASDHVQLLNPPQGYMQNC VFPPPN LVDPEDPDTHWQGLHRTSDLPFLLNPEKGFLASA QGDWQYWVPGDTSETLWTRYHPYPDLPRILDPETGWLQNA GCDGEEPVSFADGSCSWQGYLADDEYPLLLNPPEGRLWNA A GLQM ILDGSNSACAWDGDYASDKLPQLL RKDFVQHS ( $K G F D P R G P A D W T P D T G W M G C A D A S Q Y P R M E D P S D G R L W T A$
$A$ S KNYFR IVVPA WD DE H Q WQ GU EANRTRLVPAWEPGHDWHGWHEP PRVEPAADGIAVMA
 GD WWTKPVDGST SATMPHGDLLSYDELPKQDDPASGYVVNS K T F N WS KVVD GS S S T Q WK GL HEVDETVHLYNPVNGWLQNC
 SYDYGQVLDGGSPATDWKGLHSLAASLPQAVNPSTGWAFNT P K L D WT L P P V D G T S S NE WK GT H P L D E E V V H L Y N P A S G WI Q N C $\square G L Q M \square V L D G S N S A C A W D G \square Y A A N K L P Q L L \quad R K D F V Q H S$ DPSSRPMPWKVLPANDWSGYLPPEKMPRWRDPERGYLVTA

 Q GHT GMMFAMP GD SK Y E Y K GY A T G D Q $\square$ T V NKTNTRKILLGAS GED DVIGYYLP FAANNPK LI NPPEGUI L TA A G $\square D P$ LLLPSDWSP GS GWQGWA A A ERYPRR ENPAD GRLWTA DPR N RKPVGSDPATDWRGEHSLRSLPQAVNPKNGWAFNT
 PLLDWRRPVGTTSATEWQGTHELSELPHYINPTNGWLQNC PANRLRVVPAWDSAHAWRGW EDDLPRA AVDG\|AVMA DRF D Y R PVVDGSDPA T DWK G L T P P L D A L P A L R R P A G G WI Q N T P GS G L R P A GFDEEVARSWRGFLDEFDELPEVVDPDEGY LVSA A GQEMUVLDGSRSACNWKG FPA QLQPSLLS RSDFAQHS NGWK GFVVPVPAFKKNDWQGFVPPE QLPRRFNPKE GY ITTA

D RFDTRPVDGSDAATHWKGLHADETLPHVYSPKSGYVGNT
 ENQH $\square Q \mathrm{~L}$ LPAK GD GSME WQGFYDFSHNPKEYNPQKGYVTS W G LD GSRS V S WA D GSA Y WD GY LS LDEQP QVVYNPPSHRI WTA
 GNTGFLPFNGSMGEGEWKGFKPYSGLP■LLNPPEGFVATA Y A NRLRVVPAEDPAYAWREGETVPLPRTEADGPGG』AVMA DRFDTRPVDGSDPATDWKGLDHTLLSLPSVLDPKVGWAHNT QGNWED WI PGGHQANT LWTHYHPYQD LPQLLNPAT GWLQNT GLDGPRPRSWADGRTGWLGWLEPNEVPRRIGSREARLWTA A GID RLLPS DWSPGS GWQGWAAPAQYPRIENPADGRLWTA
 A HS SVWAPI DYDNKEYDWSGYLT T DKYP K R RVNP E S GF I F T A A GRGQLVLDGGMSLFEWPGVVPFERAPKVM R $\operatorname{L}$ G S D YVVFNA D RFDYTKPVGANPATN WHGLVTPLDQLPQVVNPPN GWAFNT ASSG IVLLDGSKERDEWVETQGAGALVPWGD】PSDFVMNA DGRRMVLLNARDPRNTWAGTVPFAERPLIERRRDYVFNS P KHDYRPVDGS DPSTDWQGLHAVDETVTLLNPAT GWLQNC E GF D WK GY L P N R S D L I WN E Y L P F A D L P QVVVNPNS GF L L S T D R F D Y R K PVGS DPATDWRGLHSLESLPQAVNPKNGWVFNT


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UniRef90_M0E177 UniRef90-A4CHA5 UniRef90 UPI00042A62A5 UniRef90-17M2R8 UniRef90-K9TL21 UniRef90_J2WIF9 UniRef90_Q2YAF7 UniRef90_UPIOOO2376239 UniRef90 A0BIP0 UniRef90-A0A059F9G0 UniRef90-R7ZRD9 UniRef90_B3PGL1 UniRef90_UPI00034ADD99 UniRef90-MONH99 UniRef90-Q82VG5 UniRef90_N9SJR1 UniRet90_ROCXN9
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N N WPWADSPKREAF PRYMDENPRGPHAQUVLSAND RFTGD NARTVEGLMLERLGDGGFDLGARAKQDRDSLYQHDYFTPA NQRVTAPDDSPHYLTQDWALPYRYERIVQLI EATEKHDTA NNKFIPDN ELLSWNSQPTSRGRRINDLINEMDNKGQK NDPPWEATDYPSYFAPRTPDSMRAQNSLKMMTEHDNDSFD

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N N K
A Y A GL $\quad$ R SDSSNFSHVDRVNELIQPL
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 NNRPTD AGPEMGYFFSPDERVDRLQQFVGERRDITLD NDPPWTTTDDYPPYMAPQSMNFRAQRSAKMLMGENSISFE NNRVASGEMDRRDGDGGYDLGARARQDRDDLEARESFAEH NSTPLYGAGTKPAYMLPDGHTPRAMNAVRLLNKLQNATDD NNRTVDGTELEMVGNGGHDLGARAQQURDDLRGRNSFTPG
 NQR
N N DPGD $\square$ T

NAR
NEPPWDDRSAYPAYISSFFPDFRSDRALRMLSEDKKDSF NSTPGENSPKEENYIPYMAPNFRGDNAVRIFSKDEKYTDD NARVHAAGEMP VVSADNAAPYRGARDQSQLAAAEAMTPA NNEPWPDSPKKADFPRYMDENDRGRHATRRLTSQHGFTHD NQQPDQNNVYFGAHGS KDDYRAKRDYSVLEEKKNWSVP
 NDSAWMANPAQPLTGYSPLISQRARFALDRLGKLAKSGPI
NNDPGTVENDPYYYGAFYANGFRASRIEQMI NSTPGDDNPNPNDFSKTFHMTNRALRLLELLGGEDDSDTKE NSSHWDNNVEEPLEGYSUVYSPRTRMNATMLQEKGUSGAD NNRTVDGDALTLLGNGGHDLGARAQQDRDDLHARPSFTPG NNRDTPGGFPYIVSNDNEFDYRAKRIDEMI RENRKDTQK NHLPTYEDKGYGRPEGYWQESDRGRRIYELLSQKK
NNRTVDGDALALLGNGGHDLGARAQQURDDLRARPSFTPG NNWPWPDAADYPRYFDQAGENPRGPQADRVLTARNDFTPR NNEPTQSGP PMGYFYSPDERVRRLEQFVAGQRNDTDD NSRVVAGEAFSK $\operatorname{NGNGGHADGARAQQURDLLAQQEQFTET}$ NSTPLYGAGKLPSYMLPDGHTPRAVHAVKVLTPLKNATMD NARGPWSAAGRDPRYMDMMGENPRGEHAVMLLSAGRDFTDD NNKLLPEDD PRHLGVDWAGAYRAPRIDELLDATDAVTDQ NDSAWMVNPAKPLQGYSPPLGPRSRFADQRLASDSEKGKD NN RTDNSWGKQKPDNMPMGDYRARRDSQVLGSAKNHNVA NHSPFRASAWSDNLGFVDRDNNRSLRFRELMPEEGSISYE N N WP WS DSPRAKDYPRYMDENPRGLHVVKLLQNADKVPLE NARAVSGDAYARDGNGGYYLGARAAQI RDDLRAGEHFAEA NNK AYAGLRSDSSNFSYVDRVNELDEPLESQAKLSQQ NSRTMDGEFLRVMGDGGYALGARQQQURDGLEAKDTFTEQ
 NSKPFSGS CWEGLGWDYADRFRTERIYKLLREKAREGPD NER GGAAPLGVEFAPAHRARRIRELLGADTGWTPD NDWPWPDSPRARDYPRYMDGNARGVHADLLLGGKRGWTAE NDPPWEDYPAYFAPNSLTGNDFRTQRSLKMLLNSPSWTLQ $N N R T V D G D A L A L L L G N G G H D V G A R A Q Q I R D D L R A R A S F T P G$ NDPAWMANPAQPLTGYSPPGGMRGRFALQRGQGKARGGVD NDSAWMVNPAAPLKGFSPPLGQRARFALDRLGSLQQAGKV NARVVSGDELDII GRENYALGARAQQIHNGL RVMHEPS NSSHWLTHGTEPLEGYSLVYSPRTRMNATMLEEQGISGAD $N D W P Y S A A G P N P R Y M D T F G E N P R G L H A T R L L T G A R D V T R S$
$N D T A W L A N P Y P R L F G V P G S P D S A R T R M N L V L G E D G D F S R M D$ NDSYWLSSPRQPTTGHS LLYGPRTRMNVRMLENDYGDAGD NSTPFTAAGAYPAYMAPDAENFRAVHALGLLDDVEGDTGD NQSPVKRSDYSETFGFPTRMTNRATRGLELFSALELITAD N N WPWADSPKAADYPRYFDENPRGPQAIRLLNARSDFTPQ NGRVLDGDA $\operatorname{LADA}$ GNGGYDLGARGRQURDGLLAKERFTEA

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




 GL R D MA Y D SWLPTFDRLLPSLDSAFDALATTDPRRARL
 E WWE I NKT A A WS D L N AR Y F VVP Y MVVKAA Q S P K A T P LAA K K V A










E L K D A D GLLFA I HE $\square S N$ N
D F K K l K F D N
T LIAAA F
$\begin{array}{lllll}\mathrm{D} & \mathrm{L} & \mathrm{L} & A & A \\ \mathrm{R} & \mathrm{F} & \mathrm{M} & \mathrm{A} & \mathrm{L}\end{array}$
$R F M A L \quad Q L D D$

|  |  |  |
| :---: | :---: | :---: |
| UniRer90 BIWVG4 | EVLEQWDRQTNPDSRG |  |
| UniRef90-M0E177 | DALDPWDYRMGRDSRA ALLFARYLPAFRERVF |  |
| UniRef90-A4CHA5 | DHLEAWDRTADAESTG |  |
| UniRet90-UPIO0042A62 | E $\$ KAWDFKTSKESEAMTDAHFYGINYQRQFRDL NDLVE  \hline UniRef90-17M2R8 & KQLQNWDYRFDANSKQAPYFAAWEFLYSDKSMHSFNTSAE  \hline UniRef90-K9TL21 & EVLSRWDRHANADSRG  \hline UniRef90-J2Wlay & EALKDWDGHASTDSAAY QTSVVRAFRQAV  \hline UniRef90_UPIO002376239 & QGFDGVMDAD  \hline UniRef90-A0BIP0 & VILENWTCKWDSYSSGALLYG VVFEYFYSYKFHS  \hline UniRef90-A0AO59F9G0 & ELLS GWDRTF  \hline UniRef90-R72 & ( VAHYWGT  \hline UniRef90-B3PGL1 & AKLDQWDSKANVNSG  \hline UniRei90-MONH99 & NDLLDWDYRMERDSRA ALLAARYLPKFRERVF  \hline UniRef90-Q82VG5 & QVLDD WNGHAS可SSAY R\\|VRSFRLEVMKQVLS  \hline UniRef90 RoCXN9 & AALKAWDRKWSAKST ETS可AVFWGEAMWAKAAP  \hline & WDRTA  \hline UniRef90-UPIO00469 & QVFKNWNYYSNANSVATTLANEWA FKLNPL  \hline UniRef90 N1MMG7 & DLLKAWDHRDTADSRAALLFETWA  \hline UniRef90_UPI000377A255 UniRef90-Q486P9 & KYTDDWNGHADPNSVGYRLARAFRLL  \hline UniRef90-E8×319 & DLL RNFDGQMTADSSAAAIVASAHAI  \hline UniRef90-F9ZH23 & T  \hline UniRef90-F1ZDD0 & KGWDKRWSAGS  \hline iRef90-S6IYN5 & KA WDRSANL  \hline UniRef90 UP1000371534C & T WN  \hline UniRef90 $19 \times \mathrm{N} 25$ | NV |
| UniRef90 L9XN25 |  |  |
| UniRef90- UPI30047B704E | APLEDWNGDYAAEARA |  |
|  | ANWDRQANADSRG ${ }^{\text {a }}$ (VLIFATWVQ |  |
| UniRef90-A0A011RHV7 | VRLKSEEARARRDSVIYRVVRAY RYML |  |
| UniRef90 J2TA18 | SLK A WDRTANLIN |  |
| 8EA | ALRNWDFRTAT |  |
| UniRef90 O4ZVO8 | dWDGRAA |  |
| UniRee90 ${ }^{\text {UPI0003750A76 }}$ | DQLCRWDLNMDGDS QEAALFASL |  |
| UniRef90_UP100037CF | DRLLT WDRRMDADSTDAAAYAAVRGAVVRRLAAHPAFAAL |  |
| UniRet90 A6GC | AELEGWDQRMDRDSSA |  |
| UniRe90_BSH | a |  |
| UniRet90-3 3 HNO | k |  |
| UniRef90 K4KPX2 | AQW |  |
| UniRef90-UPIOO | GWDDRWAIDSEATS LAVFWGD |  |
|  | NWDGNMKGD |  |
| UniRef90_UPIod | A WNKTADEHSVAT TLI ${ }^{\text {a }}$ D WA |  |
| UniRef90_J2XK81 | VM |  |
| UniRet90_A0A017 | D |  |
| UniRef90 D4ZDJ9 | EVLANWDGLYTNTSQGAHDFREFLKVFDV |  |
| UniRef90-14WYR8 | RLTAAWRGRAAVDS |  |
| ef90-D2V7M8 | GLLNDWDGKLRESTHETHFEFGTNLIK LIPE |  |

## UniRef90-M6S784

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 LERPENAYVF DFLAEHASDEMK ISALEKAL PAFADA GPYRGSNYAVAWDEEAPTTTPDGLADPARAVQLLEASA NET LESHSQADVQKQ SK OY WS GVNTNF MVQVFEETLL NRAILTKGRQFWHFQFSKDYDWSSGVNTNFNEKWCHSEKN ELSSELDVVPWNPDAPLDTPTELANSDRAVEVLE
 GFEAVVREKYPEFEDPPLNQAEHAVWKLIEERPPHLL AR 1 GQARFASYGKRDYRAALEG LLERDDRWWCQPM
QAVIKQWNNFY IFDSF HFKNLIDMSKAQ GARMSGQEGFA $I P$ WSDDDP $\square$ NTPSG $\square R D P E G A V D L L R Q A D$
 $M G F A Q \square E N R W R V P F N P K N P L H T P Y G \square$
AYVDEGEPDQVENTRKFATNATAVQMLPQ


## A AKAAGLNTYDYMADKLTPAEKLT ALAEAS

 LQAAPD $\square W R V P F D P K D P Q H T P R G L A D R P S V L K A L R E A M$ D E PNNFTDQRNYAVKWT IDDPLQTPRGLKDPVAA GMLKQAV TVLGGFAAAVRAKVPDFKFPAQFQSEHQVEATLQGRPLYL ELUNKSLNKIDEAFNFKS DRHQ IEVVDWQLINEQPENFMM P HLGKNGLTAQVRQYDAA
AKRGDHPDPAD F S LIPRLSQAEVIVWQLI EQQPQHLL ERDD DWRVAFDRQDPRHTPRGLIDRPAVAQALLREAM
$K Y$ VP D
PQYSENQQEKQKVTHSFVFDHFK $\square$ NS $\square$ VRWAQ P QFADADDDESHYPGDWAVATLDDDSDLYDDRSRAETMVA DA $\square R D A A S R \square D Y L Y N P V V N E P I P P D D L A$ WPG!QGVDKESDLADAVNGWNY LLAYLEEDLAA
LMPNTNQFATGWNPQSPLTTPDSLADPVAAVEVLAEAA DTLFTA WLSAAYAA QPDLK G S LSNQWE GVLWEVIVEKKPA LEPVPDVWRVAFDPDDPQYTPRGL
 $D K V K E A T L A P F V A Q V K A R Y D D F A W P G M A E A A V W A M L R D R P$
$S M Q A V A S R W R V A F D P Q D P V H T P S G L A D E N P S V A T A L R A A$

 AELLPA DE S R L GEDYDALIK Q NYVLN

GPFAKQERINVPDYDATRVSPEAKLAALQQAV KEAKQFAKNRLQVKQEPSLQNFLKYLNDKKY
GLLLPKARTQEEASNALGRFQEMVNHTTAQQKLEVLIQTL
LIEQMPDVWRVAFDPLDPQHTPRG

```
                A AKEVFASDEAYTSLLFDAVQEYKPTVFLGGTLYNLL
```

$D S G F E L A F D V K K P V S T P S Q \square A K H T G S V T S D P V L Q A L A S T V$ PFVARVKQRYADFGWPGENSAEAAVWTLLQQQPAQLLDPA HEVGK KYWNDFFY LDRALSSNGD】ACTVH

FS WPGENSAEAAVWTLIHARPPQLLDPRYPDWHALLVDAA A ARDAGMSMWDYLAERATDAQRLT AENSDDLAGAVNEWNY $A L R E A A$
$\square L A Y Q$
 APAKDDDTTECPDEQYSTWNGAAVTTEFLSPKEQVTALAQVV HSQGAPRTLYDRMMAAASPDVQLTLLAD V $S R L G K E L A A A M P D S P L Q L D H L V V D A R A R V A L G V P$ KDIWRVGFDAADPLHTPRG
 PFAAEVSERYKDFSWPRPSHTEAAVWAMVRDRPMHLDDPR AKAGRSFDTILTEEEA 1 QGGUKAKSHFETHFGKSLVP PAATSRISVWDYMEQRSSPEDRLD PFAAACVKADPTEDWSADPQTEGP $\square W R M V S M R P P H L L N$ PNLSENIYKRYTDTLYPVNND PR R SAQPASASK LI WNAD

 $K G V T G A D D P W R S T A Y P A L F R P W L A A V P R I G Y A L E S L L T V G$ GSFAQAERMNVPDFIAAKVDAPTRLAALSAVV STPWNPADPLNTPHGLSNPQQAVSILENSTLQLKL ADLPRTEDAVVSILRRDPA WVPPGYDGWSELQNRCLDQVL P LAA RVQQRYADFSWPRETSAEAAVWALVRQQPMAWLDPK NALAAEHPESWRVAFNPADPQHTPRGLAVEQAAVSRGVHQA
SMQGVASRWRVVFDPQNPTHTPSGLAVENPQVASALRAA G L LS NPD LDVVFDYFSLTSQWEGPLWKLVNEHPDHLLNTHF SKGFNVKRP
ADTADG $\quad \square S \square Y E V M A E K A G P Q Q R L A A D A E A V$ PDMTDAGKLYAQPFDPEDPLETPRDLVEPPAEGADPILVA E PFDASQPAMTPTALGDAELALQSLKDAV GMAVLERQAGEPGSRMAKLTAFASEATPAEQLELLAEVA PAKDAGLSVWDHMAGHATDARRDAALEAAAERL
$E G L L A P A K A Q L G E D Y L E P R D G Q L E G V L W P L V S E R P A H L L P$

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UniRef90＿U5BZT4 UniRef90－M0E177 UniRef90－A4CHA5 UniRef90＿UPI00042A62A5 UniRef90－17M2R88 UniRef90－K9TL21 UniRef90－J2WIF9 UniRef90＿Q2YAF7 UniRef90＿UPIOOO2376239 UniRef90－A0BIP0 UniRef90 A0A059F9G0 UniRef90－R7ZRD9 UniRef90－B3PGL1 UniRef90－UPI00034ADD99 UniRef90－MONH99 UniRef90－Q82VG5 UniRef90－N9SJR1 UniRef90－ROCXN9 UniRef90－J2F0D7 UniRef90＿UPIOOO4690446 UniRef90－N1MMG7 UniRef90＿UPI000377A255 UniRef90＿Q486P9 UniRef90－E8X319 UniRef90－F9ZH23 UniRef90－F1ZDD0 UniRef90－S6IYN5 UniRef90＿UPIO00371534C UniRef90－G0QW67 UniRef90＿L9XN25 UniRef90－C6G3Z6 UniRef90－UPI00047B704E UniRef90－B4VHJ5 UniRef90＿A0A011RHV7 UniRef90＿J2TA18 UniRef90＿F8EB86
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DVPWGD ${ }^{410}$ V R M R｜V｜GE ERDENDFGTWKTPWGEDNRFQR TTGNDASEFDDSKA LDPDDDP LFD GRSRGDLADVASLRDALAEDDEEGWETYGD EEDTGKYGTDEVPWGDYYRINYN EQLKEDFGTWNLAWGQVNRFQRLSGD DD DKY DDDKPF DP $\square$ KKTGHACLHNVFMALAETEQQLLDKKYSESGNPARTWGN ERDTADFGS DAVPWGATE ESDRUGS LDVPWGD DFRF LDVGADWDDLLGKCAHRVAERFRR

QPGGDAARTWGE
PNDQLLNQPYCNGSAQDKCAQNLVDSLREARQYDHEKFGN
STRKKYGMIDPLYGD $N$ LDDNPEVVQAVVTVLRAANDKLDNM
KELNSKWGTWKVAWGEINRFQRSTGDIDLKYDDAQ
DDDPLIFDGRSRGDLADVAALQDADDEDGAAGSEDWDRYGDY PADDSDWDSMLAACARR】AEQMQA QPGGUVARNWGE
DRLTADFGS WKTPWGQ $\square$ NRFQRNDGS 1 VQTFDDNK LASVEAVNKMGLQNNSQWRDVQVTSS

G
QELQAKFGKWE IPWGD $\square N R F Q R P S G A D D L T Y D D N Q E S L A M$ AK ARPPGYADWDDLL ROCAKERVYGAVDRPYGEVSRFRVG L GESSWQDLDF KALEVTVADMTVAAKLDAQPGGLAARNWG EQ I MM T P PPRWLPP P YASWDDLLAAALDQGLQKAKAP A A PALYKNWEELLYLCAQQSAEQM QQQDGGDTERSWGE $A R L K G D F G D W R V P W G D M N R Y Q R N D G A D D Q V F S D A K$
$L T S V A E V A E A G L G A D T R W G D G Q V A S S G E R Q$


 ARVKAGYGRLDVPWGERARDKY
HLLPAPFASWGDFEREVLKATLLSLGADNKERLAELTWGA DRPDVAQALRAAMLASVEQVSAAGLKPDSRWGDDQVVSSG EELKKEFGTWEVPWGSINRFQRIKE

 A RE LYGIDRTETVRAAVEEVAASPDSTWGD AREAMMTGGYSTDNLDQTSQAEVARAAGLEERAASWLTSETFGD ERLLSPGALPGLDAEAAVREAVEEVAVSA AQDPSAWGD DETVK LYGALDRPWGDVMK DE INGQS DGD DKAVRGP KELKSKWGTWQVAWGDVNRFQRSSGDワD LIKYDDNKT

 A ID R PPVAQALRQAMLASVEQVNASGLKK ETRWGD ADRFEAGSTFVSDPRV $L V L D A L A E T A T W L T A R F G S$

$K Q V T$ TE $\square G R Q P G G L A A R S W G E R N R A D \prod R H P \square S A A L P R W$
D RLT QDFGS WQVPWGE $\square$ NRFQRNDGA VQTFDDTK
EDLAA LLPEERRQALS ESLEAAEEDAEAYPRWGDMHRLKA
 D D DDLL RGALEDVAAKAPRG RRLDRDFGTWRTPWGD DNRDQRLTGADTQNFSDAA

EQLRDSVPAAFTRAVARLVEKWGD AVDQADVANALREAALASILAEVTKAGFAEDARWGQDQQAA QAKKSVW FKGLSREHAYKEALDKDKAHTFRPWGE YA DWNALLQDAARQVVDELGKQPGGLAARSWGEDNRTGVR
AK L E T DFGT WRVAWGD $\square$ NRFQRNDGE $\square E Q T F D D T K$
PRFASWRELLS DAAQAVIAAA EAAPQKYTWGAYNT QGKQASVPQNVDFLKGQTADEVVLKAELENAQTELSNQYHS $\square G G D D E A V A L S A L D A V V T R V E A L G G A P E W G T V H V L A P D G G$ $G A S R W C D V V Q S A V T E D C T T$
$G$
$G$ RGEDW PPAPWGE DRLTRDFGTWRAPWGQ】NRFQRLDDDALQPHFDDAKASVAVV ACGKIDVEWGDCVRLKH G
ERWGAPEDWPSHTWGARNTTA
YPDWHALLIDAAKRVADE LGQQSGG LAARSWGEHNRAGDR A $\square A S L K Q V S E S G V A G A A R W G Q V Q Q A L D$

> MLLAAVVEV AKAGLD

ES WQA LYADALTF LNDDHN NTHGSDANAKWGD K HEGSSNSDP LLQALAGT VQHLASVNDPLSAPLGS
$D R L Q R D F G H W G V P W G E V N R F Q R L T G A D G Q P F D D$
$L A E A T L A L A Q A G L D P T T P L G E A Q F T M K D K A D P M H G G T N R E$ AVMNAA GMPLNASLRDTQFAWRAGKAUPVHGGNGFE ARLEADFGEPAPPWGSINRLQQ VNEALNGGPDVLRAIVPGR
GRVDVAWGETNRLIRGS GRVDVAWGETNRLIRGS VNEADNGGPDVLRA
$T Q G F G S W Q V P W G E I N R F Q R I D G A I V Q K F D D A K$
P PYSSWDA LLVDTAKALEEDLSSQGPLDARWGERNTAA DC

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UniRef90-D2BDN2
UniRef90_UPIOO0474F76A
UniRef90_UPI000474
UniRef90_Q58HM3
$D V A A R G G P G K \square G S F Q V \square G \square^{46} A A P$
DKKFQ|V NTTRAMDHPVGGEAPFLNYGDLCADGSPATVKNYRVESAV $D L P A N G T D G S L G V F R V A W \quad P G S G D E D H L Y V G G$ GLASGRWGALASYGASQKEG TKALYG LHVNAHFPFSKT LLKK\FHRSFPGFGNARTVAVADPNYHA RLDEDDLPANGGYGFLGLFRNDWFDEAED GRFEA DG RNTAR $\square R H P$ PS QA
QTKEWKWESLHNQFFPHAFRRIPYHSNRRSVAVSQYELDG QLEDVDVPGHSGYGNLGSFDVITWSEPNGDGVRTP $P S \| P V P F A P A T W G S L A S Y V G R S P G V P T K K \square Y G$
 $N T T R A M A H P L G G E A P F L N Y E E L P A D G S P A T V K N Y R V E S A D$
$N T A D Q R H P F S R A L P W I A A W L N M P A D P G D H H M P R V Q A D G$ NTAD $\square R H P F S R A D P W \square A A W L N M P A D P G D H H M P R V Q A P D F G$ PS $\square P \mathrm{VPFTSAQWGSLASFGAKRYP} \mathrm{\quad GTKKYYG}$

 EVTNIAHPLSAAVPLLGKLIDMPSPGDSNMPRVQGATFGA QNSSIKHPLSSALPFLNHWLDMPALAGDSYMPRVQGKSFG DLTKWHYGADHTVDLESP I STRRLGDPTGTGSKPQSGDT NAARDRHPLSQKLPLWARWLDMPSDPGDHNMPRVQSPNFG


Q $\square$ ND WKYGK $\square$ HSHRHPHVPFSWESKGSKHTPNDKNDNWEG NTTRADEHPFAVEAPFFDYDERPLDGSRATVNNYRVASGV DDKSWPLGGGGGRMGTTTDRND GYGRENGDKTRWG N
$G D V D L P G S G A S G Q L G S F Q V I D F A P M D E T M P B C K$ NTAAIEHPLSRFDPLVGSFLNAPVEAGDANMPRVAAPSFG SQQTP $\square H G G P G T L G V Y N A T Q S V P R S D G K R E V$ TFSDSR PSWAVTAAPGPLGSLNAYSTRKVPQAKA RYG NRTQ $\quad$ RNP LSRALPRAGDMPDEPVAGDHNMPRVVSPGFGA QDPQHGGPAGLGVYNAMQ WADLHRVT P WKALESNDDSSWPGTGGDQDTVMSSPGDAHII THRLTPWRALAGTPTPGP G G L S GDHDCVLCTSSVPGL DPSGYSWGDMHGTYFANPFGGVATNGGEDTLNVSSSNFYA
THRLLAPWQALPASPPE W W SVVSDHDCVLSTASVPGIT DR $T H R G A P W Q A D P A S P P E E W P S V S G D H D C V L S T A S V P G D T D R$
$A L N G V S L P G N G G Y G N L G V F R V F T W G P L L E G K K T P D H$ ALNGVSLPGNGGYGNLGVFRVFTWGPLLEGKKTPIH

SLP DGFGPGSWGSLPSFKSNYQNN SKKRYG $N V A Q W R \square D R L Q R A Q A P H E L Q P A P W G G T P A A V G R A N Y R Y D R$
 $N Q F D D K H P S L P S S L A S S R W G T L P A F E S R S A A N ~ T K K R Y G$
$V Q V V S S G G V V$
$V$ VDATYAWGDLHVATFPAAYGPFGVDGGDDTVNVSPAPFGA

##  $H P \square S A A \square P S W$ $\square P$ $\square$

 PSVPVPGRHDDMPDQP DPGDNNMPHVAAPGFGA AHS $\square A N \square P V I G S F F$ NQAHFAHPLSAALGP口SRYGDYPVGGSRET IMKTAHDRHA DKLS WGVPATP LG PWGETHQLSPDGMGSLNAYVSRKT A ATHKRYG PS DAVPFSSARWGSLASFGARAYPDTRKW YG DPRRWRNDTAHRIADSHLLGRTPVGASLFSVRLMQPDATG

 DPNDWKIPVATMGFSSKNSVGIPWADPSHEQHLSTYGNTG NTAVIRHPLGRAVPAVNWFTAMPEDPDPGDSHMPRFQSSK FDLVGASPDHPELFARLRPTPDPDAGDTECVNASAVGTHV DVESWRWGDQHQARHDHPDGAVPVAGGGDFTVARSATKGRG KPEEWVYGEDHYYNPEHDFGECPAPGGPFTVNVAPPGSVS PFTSAQWGSLASFGAKTWPG
SLERPASGASGQLGSS SVLD

 SPES KWGDIQVSSLSGKP DPI HGGPAGLGVYNAMQT IAG

 | $\square Q Y H M K N D E K L A D P G G G T D D G V F N D N T G S S A K V A A Y G Y P V$ |
| :--- | :--- |


 GLED

DGY L T A S H PVSRALPAFARSWLCMPA DRLP GDRDMPRATQGPAFG $I L N D V N V P G A A G Y G N L G S F R V F T W S D P D E N G \square R T P V$


UniRef90 B1WVG4 UniRef90_U5BZT4 UniRef90-MOE177 UniRef90 UPI00042A62A5 UniRef90-17M2R8 UniRef90-K9TL21 UniRef90_J2WIF9 UniRef90 Q2YAF7 UniRef90-UPIOOO2376239 UniRef90-AOBIP0 UniRet90 A0A059F9GO UniRef90-R7ZRD9 UniRef90-B3PGL1 UniRef90 UPI00034ADD99 UniRef90- MONH99 UniRef90-Q82VG5 UniRef90 N9SJR1
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FDDQAEMYSKGVFKDVNFYRNDVEKHTAFQY
YDDQLRRWLANDQRPMPL
FGDQLELFSRKEFRDAWFTDSATESNTARVEKDE
F DDQAQRYADANFKDVAFYREEVEKRMEEIY QPGR YDDQLKMHEDFVFIEMKSGFKNFMQNKKHVFDLVYK RTDQLELFATQQLRPVWRSRTEVLSHLEYQETLK FADQVDLYARGDLRPVYFYPEDUKAHAVRSYR YGSGHEDWVTGRLTPFLPGPS EQT回LLPA
YTNQMD TWKQNKYVKMMF
YSDQLELLSQKAFRELWLQREQVEEHLERRTTDNP FYDQAGMYAAGEFKDVNYYLEDILKHATKNYR $F V D Q T Q L F S Q Q S W P E L P F T D V Q$ ESGVLKRGTDFPQ FNDQSEMYRKGSFKEVLFYKDDVIKNAEKTY YDDQLRRWLDNDQRPMPL
$Y G S G H S D W V A G \quad R R D S F M P \quad G A A Q Q \square L Y \square H P A$
F NDQALRYSLGNLRDVYFYPEDVKAHAVKTYR
SADQTRAFSQKQWSVLPFTEQQIKADPHYQ
FFDQAKMYQNVQFKDVLFYKEDVQKNAEKYY
$R T D Q L Q Y \square S E G K \square R T L W I D R K D V E A H V E E T T R F$ Y GVGHEDWAQGK PTPFLPD

ATKYK L AF $\quad \mathrm{LPK}$
YGMGHSDWENG
YMDQFP TWYHVTTY品FPFTQTE ATHTLTLTPA
YGRGHANWVNGNLTPF L
FADQVDRYATGDLRPVHFWPDDLAAHTTSTRGL
SRDQTEAFSNKQWHALPFTEAQUKAD
$Y T D Q L K \square Y K N G Q Y$ LVMDRQDFEKY ENVLVLK
Y GDQLDRW
YTSYAEAFSKRQLQPTWWQAEDLAKH $\quad$ ES S TVL
FMDQVPLWRQGDYDRMPLTRERIVEDFPRRMQLR
 $Y L A G H E A W V K G E A T P F L$
$S R D Q T Q A F S N K Q L S V L P F T E Q Q T P$
FTDQVKGYIN GQFKEI FFYKKDVMNNAERDYR
HGAGEEDWVNGRPTPLLPGPDQ MTLTMPA
SSDQTEAFSKKQWQALDFTEQQDKADPAYE
YADQYNKWRHGELLPVVTNWQQLQQ LEQTVITP HRDQLP LWLKGDLVPV
WDDTLEDWVEGVYSPLPFGRAEVESAMESSYTLSP LR D QL P L WLA GELVPVIT DWD
HTDELPLAEKKQWRDVWRTRPEILANLSSR FYDQAEIYQKGQFKDVLFYKEDVIKNAERTY
YADQWPHWLAGDLLPIVRAEANVDGTVFRQLILEPA FDDQAERYATGNLLRPVYFWPDELQAHVERRY Y K DQ QE S WRKGEYKKSQFNPAKLEK FTDQAAMFDTGRFKDVFFYKEDI SQHKEQEY ARDQTDAFSKKQLSVLPFTEQQIKSDA
FDDQDAA WVAGEYGKLLFRKADVEAGVTDRMTLEAAK
FADQTR $\square F S K G E W R P V L F T E Q Q \square K D D L V E T D E L T L K$ F GA GHADWLQGRPTPLL

FGAGHADWANGRPTP LL $\quad$ PGAASHT LT $\square R P$
FNDQARRYASGNLRPVYFYPQDLKGHDERSYR
FMDQVP $\square$ WRQGDY $\square R M P L T R D R I$
YRSHHQDWLEGRATPLL
Y LDDVKGYI DGTYKEI YFYKDDVYKHAEK IV
HHDQLPLWLRGELAPIVTDWDQL
FNDQSALYAQGMLRPVYFHPDELAGHVERRYR
YEDQTAAHAEGRLYRV
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FADQLSDFESYKCKDDAVSQKEDDQSTQQSITLNY
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FQDQAADWAAGRLLPVERDWDVLRGPTTD
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REGDYREWLSGEPVPLLPGPSEIEDHLEERQELRRPA
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ASDQTKAFAAKQLALI PFTEAQDKADPEYREVVIDER
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FNDQAERYTTGNLREVYFWPEQLKGHTERSY
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## UniRef90_UPIO002F45121

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UniRef90_U1KJ17 UniRef90-F3L235 UniRef90-K7A177 UniRef90-V4RL95
UniRef90 F2LEC1 UniRef90-NGUUR1 UniRef90_D2UEE5
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SRCLVVVGPSRSANGRVLMLEATADGPGGGMRFEDHLHGG SNAVA GSELSANGRGMLLANPHFPWVGGMRFYQMHLTIP SNNWAVAGADTADGRAIVADDMHLGLRAPNDWFRVRLRYP
 SNGDALAPSNTAGKHALLLINPHTSFFFRS E ELQMTSD SNAFAVGGALTQDGRALIANDMHDTLRVPTVWYPVRLQRT SNAWAVGGSRSESGHGLLLANPHLYWGDAHTFFEAHLNDP SNNFAVSGALTADGRALVADDMHLGLRAPGDWFRARLRYP SNNMAVMGRLTSHGKAVVANDMHLTVRAPGTWYKVQLNWR SNEWVVSGNRTATGKP:LVGGPVLGFSMPSMWFQVQLVDP SNAWAVAPSRTASGGALLCSDPHLENNLPAGWYEAVLRWD SNNWAVAGSRTQSGKPLLANDPHVPLLAPTFWQHVHLKSP SNGWALGRDRSATGHGMVVANPHFPWEGELKLUWESHLTVP SNAWVVSGRHTQDGYPGLCNDPHLPFMLPAMFHQARLRCT SNNWALAGSRTASGAATVGDDMHLDSFGLPNDWYRAMFKLG SNQWAISRSRSVNGR\|I HVEHTHMPWANRFQNYEAQLITP SNAWAVAGRFTNDGAGLLASDMHLGDRLPNDWYRMAAKVG
 SNSWALSGAKTSHGGALLSNDPHLGMAILHMWYRVQLNYP SNNWAVTGDLTATGSAMLSDDMHLSFAVPII WYRAQLNYP SNGFAVAPARSDTGAALVSDDMHDGIQLRATWYRAADQD SNNWAVAGARSDTGAALVSDDMHLGGVQLPAVWYRAALQFP SNNFAVAGSLTAHGGALLADDMHLSSRVPGIWYKAQLNWR SNGWALGRERTSGGGGMLVANPHFPWEGALRFYESHLTLP
 VANDMHRDLRVPNTWFRTRLITP
SNNWAVTGQHTKTGAAMLSDDMHLGLNTPAI WYRAQLNYD SNGWADGRERSATGHGMVVANPHFPWEGELKLWESHLTVP SQGTATAPKRSADNSTYLLVNSHQPLTGPVAWYEARLHAE SNGWAFGKDVTANGRGLVVGNPHFPWNGPSRFYEMHLTLP SNNWAVDGAHGASGAALFASDMHLGLSGPNDWYRLSVQGK SNGWALGRQYTENGRGMLLANPHYPWYGESRFWEKHLTDP SNGLALAPKLTTDGHALLLINPHTSFYFRSELQMSRSDE SNNWAVAGARSDTGGAIVSDDMHLGIQQPAIWYRAALQFP SNGWALGAERTANGRGMVLANPHFPWEGELRLWESHLTVP SNAWAAAGSLTDSGSPLIAGDPHRLMEGPGVYQQVRLACP
SNGWGLGKDKTANGKGMLLGNPHFPHTGNLRFWQSHTIP
 SNAVAVGAQRSANGRGLLLANPHFPWMGGMRFYQMQLTDP SNSFAI DAKHSKNGQAI LANDMHLSLMLPNTWYRASLNYE SNSFAVSGQLTANGAAIVANDMHLGLGVPNTWYRAELRYP SNGWLVTGARTETGAPLIAGDPHRFI EDPGVYQQDHLVCP SNNFAVAGALTADGRAIVADDMHLGLRAPGLWFRVRLRYP SNAWAFGKDVTANGSGML LGNPHFPWSGPN RFYEMHLTIP SNNWADAAGRSATGHALLANDPHLQLTLPSDWYEAHLVVK SNGWMVPGDRTATGAAIIAGDPHRFIEDPGVYQQDRLSCP SNA $\square$ AVAPSRSTDGHTRLLINSHQPFAGPVAWYEARLKSE SNATAISPLNSTDGATRLAINSHQPTTGPVAWYEAHIQGE SNGWAFGSEATANGRGLLLGNPHFPWQTTNRFYQMHLTMP SNGWAFGSEATESGKGALLANPHYPWYGTSRFWEKHETVDP SNAFAVAPSRSADGSTRLVVDPHQPWTGPVAWYEAHVRSE SNS IAVTGAHTATGAALLGNDPHLNLGVPNVWYRVVMQWP
 SNNWAVTADLTNTQAAMLSDDMHLLSMAVPVIWYRAQLNYQ SNNFAVAGSLT IDGRAIVANDMHLGLRAPNVWFRARLRWP SNGWVVDGAHSAHGGALLASDMHLGLSLDPNIWYRVSLMWP SNNWAVAGALTADGRAIVADDMHLGLRAPNIWFRVRLRWP S NE WAVSARLTADGRPLVANDPHLSLGLPSNLYDQHLSAD SNGWALGRERTRSGRGMLVANPHFPWEGELRLWESHLSVP SNGWAFGSEATTNGRGLLLGNPHFPWETSNRFYQLHLTLP SNGWGLGKDKTENGKGMVLGNPHFPHTGNLRFWQSHLTDP SNNFAVDGSLTADGRADVADDMHLGDRAPNIWFRARLRYP SNNWAVTGTLTKTGAGMVSDDMHLSMAVPVIWYRTQLNYA SNATAI APSRTDDGSTYLIIDNSHQPLTGPVAWYEAHIESE
 SNAVALGSEVTQSARGLLFGNPHYPWSGSSRFHMDHTTIP SNGWA SGKLTKTGMPLLAGDPHVEVNAPGFWMPMWLKSD SNGWALGEDKVENAKSALLGNPHFPWDGELRFYEQHLTDP SNNWAVTGALTESGKAMLSDDMHLGLAVPSDWYRAQLNYQ SQGIAAIAPSRSDDGHTRLLVNSHQPLTGPVAWYEARVKTE SNAYAVSGARTAGGKP LAGDPHLPLQRPNMWLIAGMKSP

SNNWAVSGHLTNDGRADENDMHLNLTVPNDFRARLRYA

GLDQAGFSFNGYGPPFMGRGVQHGWLLTSGVAQANSVFAE $G L D V M G A S$
$R F E A V G T$
$L$
 GYNAYGAGLDGTPGVAIGFNDAVGWSHTVSNSKRTVMYQL GLNAYGAATWGQFFIYQGFNEHAGWMHTSSGVDAVDEYLE GLDAVGVSLPGAPALVVGSNGHDAWGLTNSYGDWLDHVVL D L NLYGVAQVGWPVLRYGFNEHL GWAHTVNTGKGWDAFAL RVDVSGFTLPGLPAVVVGSNTRVAWGFTNSYGDFDDWRRV

 DDYVMGATLPGCPLVAVGRTSKLSWGVTYMKGDTVDDFVE T $L$ NVQGGMYPGFPAFGFGHNAQLAWGVTTAFRDAWDLFRI

 G LDVMGAALPGLPVVNIGFGQQLAWTHTVDTSAHFTLYRL

 EFDVVGLAVPGVPGIHFAHTGKVAWADTNAMADYQDLYRE A GNAVGVSFPGMPAMADGTNGKVAWSMTNSAGDWADYIVL GVNTYGVSMGFPALTMAFNATAGYSQTVNTNDGQDFYELC $M Q Q \square T G V S L P G A P A V V V G T N N K D A W G F T N G Y D D T A D W D A L C$
$G L D A Y G A V T W G Q F F V Y Q G F N H H I G W M H T S T G A D V V D E F A E$ DRRVVGVTLPGAPVVVVGSNGHVAWGFTNSYGDYLDLIAL EYDVVGLAVPGVPGLHFGHTGTVAWADTNAMADYQDLYRE DGDVTGLTLPGAPAVVVGSNGKLAWGFTNSTADWHDLVAL GLDVYGGSLLGMPVI NI GFNRDVAWTHTVTSSSHFVVYRL KVQVTGVSLPGAPAVVVGTNGLLAWGFTNAYDDTADWVALC DNDDAGASDPGTPADAVGSNRKIGWSYTNSYGDSADWDRV T 1 QV S GVTLPGAPAVVVGSNNQVAWGFTNGYGDTADWIKL GLDVYGVGLDGVPAVLIGFNKDIAWTHTFSSGQRMTVYGL $E F D A I G F A F P G V P G P H F A H T G S T A W A D T N A M A D Y Q D L F D E E$
$G W D V V G S T F P G A P V I I H G H N R N D G W S N T V N K P D L V D F Y K L$ GYDAMGVGIAGAPVVTLGFNKDVAWTHTVTAAQHFTVFQL SRRITGVSLPGTPAIVAGSNGKIAWGFTNSYGNFLDVDDL GWHVAGGFFPGSPFMLHGHNAHLGWANTVNEPDLVDVYQL GLDI YGAQLLGSPGVSIGFNSALGWTHTVSASQRIVLYRLL GLDAYGAVTWGQFFVYQGFNQHVGWMHTSTGMDAVDEFAE DRRVVGVTLPGAPVVVVGSNGHVAWGFTNSYGDYLDLIKL $G L D V Y G V S L D G V P G V V I G F N Q D V A W T H T F S S G S R L T A Y L L$
$E F D V V G L A F P G V P G P H F G H T G T A A W A V T N A M A D Y Q D L Y A E$ GHDVMGGSLVGMP FPN GFNKDVA WTHT FS TA EHFVVLYNL SRQVTGLSLPGTPAVVVGSNGHIAWGFTNTTADWHDLVKV GLDVMGAALPGLPVVNI GFNRHLAWTHTVDTSKHFTLYRL TLSLSGLTLPGVPVI II GCNEHI SWGFTHSYADTLDWV
 DVDVTGFSLPGLP GMDVMGVGIGTYPMVSI
 DYDVLGLAVPGIP GLNAMGGLFPGSAVI LH
 GLDVYGAGLDGTPGVAIGFNDAVAWTHTVSDSKRVTLYRLC
 EFDAVGLAFPGVP GLNVYGVGLDGVPAVLTGHTGTAAWAVINAMADYQDLYRE A YQVTGGV GLPGAPAIVVGSNNKIAWGFTNGYGDTADWVAGL ERNI QGVSMPGLP

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UniRef90_M4NP13
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UniRef90_U2U349 UniRef90_UPI00031A6C90 UniRef90-Q1MY58 UniRef90_UPI00026C976C UniRef90_UPI0003634CBB UniRef90-A7HRM7 UniRef90_B8KFE1 UniRef90_I4WJF6 UniRef90_UPI000363EABC UniRef90_UPI0004764338 UniRef90_S9Q1Q6 UniRef90_A0A024GXW1 UniRef90_B8CK48 UniRef90_C9TBS2 UniRef90-J2ICC3 UniRef90-C4TWA4 UniRef90-T1D118 UniRef90_UPI00035FEC4A UniRef90_B4SQ39 UniRef90 ${ }^{-}$KOI177 UniRef90_V4J502 UniRef90_A0A024YIL1 UniRef90_X5MA94 UniRef90_Q1YU80 UniRef90_UPI00034C935F UniRef90_D5WM35 UniRef90_F3L0A9 UniRef90_D0LX31
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UniRef90 F2LEC1 UniRef90_N9UUR1 UniRef90_D2UEE5
UniRef90_A5PCH9

R|L N P K N R Y Q Y
 $R P C A E G Q A \quad G D C D P V M R H E E T$ L HVVAGKDVRDEVLE ALNPD DPSQYRFEDDWRSLTSTDVSITIKTPEGKATHVWF TVVKS GDGYTYKF GAE QRPVVTASEIVVVPRGMAEKKFTVYR ELDPSSDPSRYRTPDGWRNLERRTEWIPVAGQDPVRFEEQQQ $T P N G D G G \quad Y L L D G E K R A F T V R H E T L L V R A P D G A L R T T V L E$
 $V Q N V V N G \quad T Y L W N G T Y Q P$ EAKGGK $\square$ RSEDQFTA $\square$ MTRKE $\square$ KRKKHHPEEVVI RE DCRPT GQWQYRRGEKWHDFQDRQEEI GRKGGESETVMVLE ERDPGAPSRYRDPA GVGEDVSHKEVLYGRWSAKESVVEWES

 DSSTAA GLLYPAFEPG E LDP K DPTRYRDNGRTEKLNKTRLQVQVRDAAGRSHDLYE ERDARDPSRFRLGGAWQRARETVVETIVRVGAAPVEVTVLD

 RLRRTPDGNGNPDGTWRPAARHTETVEVAGGDPVEVEVDE
 T $\square H Q G G K \square F Y R Y G K G B M$ G DTDAAKPGQVRTQTGWETPVLHEETI LIGGEPAAKLAVRE RLRPD GTAEALLGPDGWRPARAHTETVVEVRGADPVAVVELDE $K L S$ D DGKRYL T A D GWQNLQYYYETIVKVAGGADQTVELAE TLPEGDPTSYEYDGRTRKMTREEHTIVRVREADGVKRTBWR T PAD
TFDDATPLHYRFDGAYRE IL HPEDATRYRSAKGWSS AVQWTEVVNVVQSGQRLITTRRK
 E L R R GERDEARGA E GWE PVVVS SETVRVRDGEAVSVEIDE II NPDNSNQYKLDDQWHDFETKQAEMIVKFWGPLRWTIKL KLDPADPTKY LV D GK SEAMRRQVIDSVPMPD GPP VERTTYA
 QLDPKNPMRYRYGEEWDDDEARSVD, PVAAE GVA HT V Q T L D P K N P M R Y Y R Y G E E WL $R L R R T G A G V Q A P D G E W H R A V R H T E S I E V A G E S P V E D E I I E$




 LRDPADPLRYRVPGGWA LRVHHE RL R R A D GLIEAE GP D GWH P V YRTEPANAAVTVHEERIAVAGQADVVFPVRE T A E G DP T T Y L V D GK P EKMTARK


 L R A P D D P L L R Y RVIPGGWQ TA Q VI H E R L D

 QLRRDGATQALGPDGWEPVVAHQEEILVRGAATETVMVVE
 $E \square \quad$ T G E R C L R D GE Y CEQS I REEVI LIRKKSS DFKF KI Y E TPCAASGAARPGATACAAVDVHRERIAVARGESVELEVRE HRNAADRLQYRTPGAWARATVYHERIDDVKGESVVDLDVAE $P A A S P D D E V D E Q V V E E T L Q V K G G D P V V L R V R E$ $R$ RVPA K GLLASVYYGANEADVPIPDTFKVNALDPSRSDALD
 $T L V P G D P L S Y V K D G Q Q R R L Q R R T A V I V E V K G P R L H T R T V Y F$ DEN
ELVAGDRLQYMYDNSPMPINKETVSVLVNAGPAAQKDI Y T
 EMNPDNPNQYR\DGEWQDLEVGEVTLKLKDWWSVKREVLVR TLNPENEDEYLLD GEWVALEKRSADILVRLFGPFRWTLYA RVVDDHPTKYMLD GVVWRPLETRVETVRAPN GSALTDDTLYG TL N P D NPMQY LTYGDAYR DI E SVVAVTVDVLDENGEDHPVYR DLNEEG THYEYGGKQYPLKLIEHNIVVKGRPPDRHDARY
 E I N P D N E D Q Y R LD G Q WLDLLEVS EA S L R V K L W G P L Y WTV YR

 E H E G S D P L A F R V N G V S E R A R A Y T E T


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UniRef90_E1VPS3 UniRef90_Q1D8A6 UniRef90_UPI00042486C4 UniRef90_A3N9X7 UniRef90_U3HGG6 UniRef90_Q3JVN7 UniRef90_UPI00036E2F96 UniRef90_K2INJ5
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UniRef90_M4NP13
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UniRef90 B1ZVM2 UniRef90_L8TQP6 UniRef90_L7U9Y8 UniRef90_G7FJJ0 UniRef90_E1X1E3 UniRef90_UPI00047E3584 UniRef90_W6XAW6 UniRef90-UPIO004676F0C UniRef90_IOHTY5 UniRef90_S9PCD4 UniRef90_Q9RYQ4 UniRef90_D4ZHK8 UniRef90_Q087D8 UniRef90_F0B7Z3 UniRef90-G7G2H3 UniRef90_H3NRV6 UniRef90_A4ADL6
UniRef90_W0RJA2 UniRef90-A0Y8U4 UniRef90_U6H5X2 UniRef90_S6LBT3 UniRef90_U1KJ17 UniRef90_F3L235 UniRef90_K7A177 UniRef90_V4RL95
UniRef90 F2LEC1 UniRef90_N9UUR1 UniRef90_D2UEE5
UniRef90_A5PCH9

TVVHGP|VПA WEPGANVVAFSHA IGMRGHE\|DNWVG\|IEMGRA SEFGPIVQWDWNREYAYSLRDA NQTNDRVLQQWYSMNQA
 SHHGPLMALPGLSDDPMTVVRDANAENIHTFAQWQAMGSA TQHGP V R EL N GK WVA DRL M Q E P I K A LTQSYTRTKA

 NPQGTL EADPAADGYQFSDNWTGTSPGSIGA RLELLNC
 SHYGPIISSDPDWTEQSVLTYYRDANLENDTLLAQBLGGMNQA SKYGP TVV $\square$ TKKGTYSDRLGAQED DR GLEEWYRMNKA

 TSHGPIVVSDREHNRAYSVKLPNFEGVNYATGLYRDMK S $T Q W G P$ I M GELDPD GRPYAQLWWEA HRK GGVNLLKLMQMVHC TARGPVVGVTGSGDDPDSLRYPPRVTEDLGFSALLPDLRAA




 SHHGPMLNGPGAEWTAYTIRRANEGNHYFA EQWLRMNEA S R F GP V THHGPIVS KENDTTFLAVQLAGLFD VKRVDQGMGMILA




 TQ QWG MLKTG A ATYADRWVAHDARANLGLARLADA
 $T V H G P I L T M P G M A W D A Y A A R D A N V G N H E S L L A Q W K A M A E A$

 SHHGPLLALDPGLGWTGSVAVRDANLDNTSFFTQFLRMGRAB TARGPVMS GGPDGGALSLDRTPSRFAGTLGFEALLDPLLRT TPKGPI AEAPWDDGQAFMLQDANMANKDPVDHWLAMNRA T R H G P L L L G S P E E G K G $\square$ I L K S V Q L L P P G D R S L D C L L P M L T A
 S QFGPVVVQWD WDA HVA YSLRRDA NLDNTRVLRQQWYQQ NRA

 TA WGPI LHT HVD GS GDALLRWVAHLP GAVRLD FGDLARA T R WGPLVVVPWNAKTAYALRDANTGNTRMMMDAALAFARA THRG P LL PTSSSAVVPSPVSMRWLDALEHGASPSSFAGAASAAD

 $T$ P D GPLVVNLPA WTP QVAFALDRDANRNNTRMIA TWLAA FA GA $T R W G P$ QIVVGPNAYALDWVAQDLQADNLN LVQLESV SHHGPMVQMPGLTWTAYAARDA NSENTQVLGQWLAMGQA SEHGPVVQQRPHGT YA DRLAASYGE VGAIGQWYGMNKA AVWGPIVVGED QRGRPLAHRWVAHDPTATNLKFFNLENAA TARGPVIS G GPDGGALSLRAPSRAGGQLGFEALLPLLRS
 $\begin{array}{lll}\text { S E Y G P V } & \text { K Y } \\ \text { N D C G N Q P Y A }\end{array}$

T R WG P E L T $\square$ G A

TAWGPVV HE

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G
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$\qquad$
 TRHGPVVQLDTAAGSA DT Q Q W DGAGPT RELDAYRLLNRA

 A A WGP DL H E N P D G S L L A L R WA A QLDP GA L D FAQMS SA

SEYGPV K K Y $\square$ NEKP Y AL S WA A HQP YAVN M Q L L K LE Q A
SAHGPALRTDH
SRHGPVLK LDDG T
THRGPMRREGGRW
THYGP VVELPWDES
TH Y G P V V E LIP WD E SHA Y A V VR DA N V Y N N T Q S A V T Y D A L H K A SHKGPLFS DVVPPLRKGIGKNQALVYASVACEFQKMLFG

SKHGPVMKTDH
SVHGPVFKTE
SVHGPVFKTE

KGAFALRWAGMDEM RTLEEMLAMNRA

$\qquad$ GRPYAVH WVAQAPEA

KNAKGAFAl RYA GMDQSAMV T QYYR N K K A


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UniRef90_W0RJA2 UniRef90-A0Y8U4 UniRef90_U6H5X2 UniRef90_S6LBT3
UniRef90_U1KJ17 UniRef90_F3L235 UniRef90_K7A177 UniRef90_V4RL95 UniRef90_F2LEC1 UniRef90-N9UUR1 UniRef90-A5PCH9

R S LEEFAK GVS RMGWNLGU|CYGGED GQ\|AFWEA GRJP ULA T S L A A LQ A S L Q K L Q P WV NTVVAVD D R G Q A L Y M N Y A VV P NV T $K$ DV E R AF E L A R D L R A S WN LV F A D A E H I G WQVTGRMPNR R A DLD Q A LAA IA ETVADP QNLV DA D R G GR I A WRILGBPLPARE Q S M D A FI D A HRQYMPWVNTI A A S A D GRAVY IDNSNVGA LDS
 TS A E S A L Q LAP S C GVP Q N L V VA S D S G EVGWT L L GRVVRRR





 R DWS S FR H A L A D Q S S L N FMF A A R G G D GF K TVGRV PRRR

 R N L P E F K A A L A L Q L DP WN FL Y S D P K $\quad$ N I F WV H N G NV A R R A

 K D LAA A F E A A V S R L Q P P M T L MF A D N K G N IVF N LIF N A E V P V R P

 TTTEQALA LAPSFGIPQNLLAA DSKGA IGWRLTNRIPMRQ


 GSVDEALERAA Q $\square A D P Q N M V V V D A Q G N A A W R P T A A L P A R A$ TS MA DFKS VVYEREQPWVNTMAADREGNTWYTDATPTANDW RNVSEVEAAFDAWVEPVNVVAADVHGSVRHFDAGLVPQRN K DKDEFEAALAMNAMPINYVYADIDGNIAHYYNAMFPKR】



 D T L E Q A L A A A P TM G DP Q N F V G G D D K G N I G WT IA G A L P R R P $T S L Q Q F Q E V F A T V Q P W V N T M A A D R E G N V W Y T D A S S T P N D S$
 S S $\square$ T E FY D M M E P WG I D H N L V S A D K K G N I G V L V R A K I P V R D








 Q S MDEFVIEAHRT FMPWVNTISTSSAEGRAVYFDNTNVGHLS
 $T V A D A V A V A H E S G I P A H N F L V A D A A G S I G W T I V G R V P R R V$

 D DVVYT MK E ALDS K I S I S C N WL L G D S L G N I A Y QQS GMAPPKRN A DLD Q A L A LA D RTGIM Q N LV L G D R H GRI A WR L L G P L P VR A





 $K N V D D A D A V A S D V G I P Q N L M V V D S L G S A A W K N M G G D P A R K$
 TSMAEFEAALA $\square G$ S QP $\square$ NQVYA DREGNI AHYYNAMLDPR Q

 K S WKD Y $\square E M$ GQQAQMNFVCVWATKEGA $\quad$ G GSVVTGAVPVRP KSKQEFFDAFA DNQPWVNTLMDSDEGTASY I DGTQVPQWQ
 RTQADFEAALSMTASP INYVYADKDGNI AHYYNAMMPKRP




UniRef90_UPIOOO2F45121 UniRef90_S6HBJO UniRef90-HOJ811
UniRef90 E6WRN8 UniRef90-H3NU22 UniRef90-C01WT4 UniRef90-G2E282 UniRef90_K9ZYD0 UniRef90-UPIIOOO464BEC4 UniRef90_UPIO004779460 UniRef90-Q9HKC5 UniRet90-TORU20 UniRef90-A3ZMB1 UniRet90-E1VPS3 UniRef90-Q1D8A6 UniRef90_UPI00042486C4 UniRef90-A3N9X7 UniRef90_U3HGG6 UniRef90-Q3JVN7 UniRef90_UPIOOO36E2F96 UniRef90-K2INJ5 UniRef90-Q82FT1 UniRef90-UPIO00255ACC4 UniRef90-F8ED88 UniRef90-Z5XN94 UniRef90-M4NP13 UniRef90-L9PCD7 UniRef90-UPI00029A8DCA UniRef90_11DWT2 UniRef90-s9P3J5 UniRef90-B1KPU7 UniRef90-UPI00029AFDDF UniRef90-M5DK85 UniRef90_U1KW41 UniRef90-UPIo0031A6C90 UniRef90-Q1MY58 UniRef90-UP100026C976C UniRef90-UPIooo3634CBB UniRef90-A7HRM7 UniRef90-B8KFE1 UniRef90-14WJF6 UniRef90-UPIo00363EABC UniRef90-UPIO004764338 UniRef90_S9Q1Q6 UniRef90-A0A024GXW1 UniRef90_B8CK48 UniRet90_C9TBS2 UniRef90-J2ICC3 UniRef90-R9V475 UniRef90-C4TWA4 UniRef90 T1D118 UniRef90-UPIO0035FEC4A UniRef90-B4SQ39 UniRef90-K01177 UniRef90-V4J502 UniRef90-A0A024YIL1 UniRef90-X5MA94 UniRef90-Q1YU80 UniRef90-UPIo0034C935F UniRef90-D5WM35 UniRef90-F3LOA9 UniRef90_DoLX31
UniRef90 B1ZVM2 UniRef90 L8TMP6 UniRef90-L7U9Y8 UniRef90-G7FJJO UniRef90-E1X1E3 UniRef90-UPIO0047E3584 UniRef90-W6XAW6 UniRef90-UPIO004676F0C UniRef90_10HTY5 UniRef90-S9PCD4 UniRef90_O9RYQ4 UniRef90-D4ZHK8 UniRef90-Q087D8 UniRef90-FOB7Z3
UniRef90
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UniRef90 F2LEC1 UniRef90-NGUUR1 UniRef90-D2UEE5
UniRef90_A5PCH9
 AGPDMIVLDGSRSVCAWDGIFPASALPSLAARNDYQNS SGPGMLPSPGWDERYTWDGYADPMAHPYDQDPVNGWHGAA
 TSFDWTKPVGSNPATEYKGLLEVNEAPNLLNPKVGWLYNT GLDGPRPQRWADGQTGWFGWLEPDEVPRIGPDRAARLWTA GGHWSDWASGDRRELIWHEVHDFSELPRLVDPPSGWLQNA AGCGGFDPDDATAPCA PWPIATDASPLLRSPAADRLWTA LSDWDTAQDWSDGSNFWSTNLSAEQYPQVYNPEAGVLWTA SPYNPNADMPGNGTQYDSGSIPYSMVPHAVNPSDGFVSS SHSGLYPRFGYDKEQQWQGIHEDTQLAHEENPDCGFITTA SGATGLAPLAAWDENHWDGFLPPEYLPSTYNPECGFVATAA QQMGLVLLDGSNSQNEWQGARSPGLVPFSKVPRTDFVFNA SAYNWI GTLPNTSKTLWTTYHPVADLPQVLNPPSGYLFNS AGLTHTLIPAASNDWDGFDEFDALPEVLNPPSGUIVNC AP GEAGARGDGAPSWRAALPPDAHPRIVDPAGGOV WTA PGYDWSKPVPGWTKNEWGPYLPFKEYPQVENPASGFLQNC GYEGMAPVDMSQPGLA WQDRLPPSAYPVR $\ N P P G G R I W S A$ RDNRTRLVPAWEPGHEWHGWHEMPRGTV EDGLAVMA SVPSERLVPWQQVDDTWRGWLQPADYPMITSKQLDYIWTA LGDWKYWVKGDTSATLWTKTHPYKDLPKVRNPATGWLQNT VPHQLAVVGSEQDYSPKWHDNETDRPFVKNPESGRLWTG
NRFDYTKPVGSDPATDWQGLHALDEAPHLLNPRNGWIMNT AGVAATYPLTADDQAGWTGWLK PDEYPKVVNPAGGQLATA RDNMLRVVPAWDPAHTWRGRFE LDDFDTAQDWSDGRQGWF GLIDEAQQLSVS ETDRLWTA AAQHILLLDGSTSRDEWRGLMPVENAPHLVNRTDFVMNA NPSNTAQKANRFQDNAW MEDEAVLPQVYNPESQRLWSA
$P Q F N W T Q P V G S D P R T E W K G H T F D Q L P Q L L N P K S G F V Q S C$ $P Q F N W T Q P V G S D P R T E W K G D H T F D Q L P Q L L N P K S G F V Q S C$
$S G Y D P T L P A D W S P D T G W N G W L M P A Q Y P L L V D P P E R G L W A$ VPSDTAIPSQAYS DDWQ RNEVQRPVVKNPTHGKIWTA QQMGLVLLDGSNSQNEWQGARSPGLVPFSKVPRTDFVFNA PANRALPALAFSARHTWDGQYVI LLPRTEV QQFAVSA SGWQWDKVLPGDSELIWQGYWDFDMMPKTINPQSGFVYNA ADKVRACGMPGSSACDWTGTPVAGLMPQAVLERQDYVANS PTHASTFPVRSNEYRGWNGYLNPPEYPRLVGPPGGRIWTA EGVDWSILPGDDSSLIWRDYLPFDDVPMIVNPNSGYVFNA AGRRMLLLDGSDPQNSWAGTVPFANRPII ENREDYVFNS EANRYRLVVASNEAGDWHGLLTPLDQLPQAVNPPNGWAMNT AGVAATYPLSADDQAGWTGWLKPEEYPKVVNPAGGQLATA AA QGFVLLDGSTAVNEWPGARSPGLVPFARVPRRDFVFNA PENRVRPVPAWSPGHQWTGAW VDLPASTVTSLA QQAGFTILPGNTSMFAFDKPMAYEYAPKLENPRSDFVQNS VADWDTAQVWHQGSNFWGETLPADAYPSILNPDSGHLWSA QQLLGACSTPQRSACQWPGIFPARLLPSLE REDFVQNS KGDVNTFPVDESNQWQ DDALSAAQHPRILNPSSG\|LWNA KGFDPNRPADFQPGAGWTGWLAPADYPRIVDPPDGRLWTA EANRLRVVPAWEPGHEWRGWH ETPRAEVGDFAVMANA PGCAPAGFNAASNQDCAPWPTRSDASPALIDPPNHRLWTA AAQLARCAPGSRAECDWPGLIPTGRMPVAF RTDWVHNS DGDGRSDRDGSTTQSDWПGYWPLELYPQS DDPAQHYLASA PANRLRPVPAWEPEHAWRGWAPTPA DGWDWQKYLPGDSEL!WSEYHDFDALPQLTNPPSGFVFNA GGYDWQYLPGDDSSLIWQDYMAFDKLPQVINPESGFIMSA
$A A Q Q R A C T P P S R S A C D W Q N D A S R V P G L R S P R T D F V A N S ~$
 QEA $\backslash A A W Q D G S S A R D E W A G T T P F D Q R P L E E S N T V F S$ EGYEWALLPGERAEVVWDEFLPFDRLPMVENPAAGFVQNC PENRVRPVPAESPQHRWSGTW VDLPASRVDADA ASNMAGTPDGSNPENEWRGARGPGLVPYAGIPRRDFVFNA APSELADRNENEYSATWQQNEVIRPFVKNPQSGRLWTG DGCNPVAPTPYDGAGEAAGCTPWPASPLAASPGHDRLWTA PADVQNGPDSDTPYDGWQHYLPPASYPKRVDPPLGRLWTA AGDASELPAPAVGEPDCAWT RADGAPRLVSPEVDRVWTA AGAPPYLVRNGQGGNEWLETLPFAEMPQLIDPPEGFFVNA QSSGAVLLDGSDPSNEWPGVIPFARSPQLSARNDFVFNS
 AQAGFTILPGNTSVFSYDSPMPYERAPKLE RTDFVQNS PGCGPTGINDPQASGCTPWPVRSDAAPALDDPSSHRLWTA TPSELGVNADDYSA $L W Q Q N E D Q R P F V K N P Q G R L W T G$ TGWDWQQYAPGDSELIWDSYHSTSSLPQVTNPDSGFVHSA EGWDWTKDLPDDSSLIWTNYLPFSAVPATRNPPSGFVFNA
 YSSLLPQFRNGSDPEQDWKGTVPQEQDPFVMNPKNGFVVAG DGSGNVLLPGNSSVYEWPGLVPFANAP QQTRTDYEYNA NPSDDAMESDNYSK QWQDNDSSRAVLKNPENGKLWTA PGYDWSQYLPGDSDLIWDSYDPFQQLPQVVRPKYGYLAST EGDWQGLVAGDRSDLIWQGYYPFERMPRTVNPPSGLVYNA HARADDLISQPEALDHWRSLATTRGLPHRLDPEEGYVASA GVGAGPGWRGVLPPEAVPRVVDPSGGQLWTA
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UniRef9O_UP100042486C4 UniRef90-A3N9X7 UniRef90_U3HGG6 UniRef90-Q3JVN7 UniRef90-UPIOOO36E2F96 UniRef90-K2INJ5 UniRef90 ${ }^{\text {O82FT1 }}$ UniRef90-UPIO00255ACC4 UniRef90-F8ED88 UniRef90-Z5XN94 UniRef90-M4NP13 UniRef90_L9PCD7 UniRef90-UPIO0029A8DCA UniRef90-I1DWT2 UniRef90-s9P3J5 UniRef90-B1KPU7 UniRef90-UPI00029AFDDF UniRef90-M5DK85 UniRef90-U1KW41 UniRef90-UPI00031A6C90 UniRef90 Q1MY58 UniRef90-UP100026C976C UniRef90-UPIooo3634CBB UniRef90-A7HRM7 UniRef90-B8KFE1 UniRef90-14WJF6 UniRef90-UPIo00363EABC UniRef90-UP100004764338 UniRef90_S9Q1Q6 UniRef90-A0A024GXW1 UniRet90-B8CK48 UniRef90_C9TBS2 UniRef90-J2ICC3 UniRef90-C4TWA4 UniRef90-T1D118 UniRef90-UPIO0035FEC4A UniRef90-B4SQ39 UniRef90-K01177 UniRef90-V4J502 UniRef90-A0A024YIL1 UniRef90-X5MA94 UniRef90_Q1YU80 UniRef90-UPIo0034C935F UniRef90-D5WM35 UniRef90 F3LOA9 UniRef90-DOLX31 UniRef90 B1ZMM2 UniRef90-L7U9Y8 UniRef90-G7FJJO UniRef90-E1X1E3 UniRef90-UPIOO047E3584 UniRef90-W6XAW6 UniRef90-UPXOOO4676FOC UniRef90_IOHTY5 UniRef90-S9PCD4 UniRef90_O9RYQ4 UniRef90-D4ZHK8 UniRef90_O087D8 UniRef90-FOB7Z3

UniRef90-G7G2H3 UniRef90-H3NRV6 UniRef90-A4ADL6 UniRef90- WORJA2 | UniRef90-AOY8U4 |
| :--- |
| UniRef90_U6H5X2 | UniRef90-S6LBT3 UniRef90_U1KJ17 UniRef90-F3L235 UniRef90 K7A177 UniRef90-V4RL95

UniRef90 F2LEC1 UniRef90-NGUUR1 UniRef90-D2UEE5
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NSKATGWSPEGGLAFRTWAGTGLVAKRRDILTTLDMRAFNE NDSAWMTNPVQPLTGFSPPLGMRARFAVARLGEVRQAGKV NQRVVPRGYGMQLSSNWSGPERQERLAQLAGRSARLDGR
NARTLDGDALARVGDAGYAHGIRAWQIRKRLHGAGRDEQ NDSYWLSDPENPALSPLYGPTMTPRSVRTRMNDALLRPDS NNWPWSAAGPDPAYVESGGESARGLHALRVLQNRKDFTLD NARVIDANEQHLLGDGGYDLGARARRIRDRLMERDFFDES NSRVVDGADYARIGDGGAALGARARQIRDALAAMERFAER NARSVGGEAYRLLGNGGYDLGARGQQIRNNLLSQGQLNEQ NQRVGPAYPYWFGDTMTPSPGFRAMLEESYLRTHTDLTDT N N NEQPVVD NSTTDAAQHA NDSYWLTNPARACLTVGHCEA保 NNPLADERDDA ALTLEWNPSFRAWRVDALLKAKDKYSYS NDSAWLSNPDSPLAGYSPERSPRARFALGRLQGDATGSE NNRQLAGDAYRGLGDGGADLGARARQLRDGL TALERETD
 NQR GPATPLGVEFAPPHRAARI RELLEERPTWSAP NNRDVGDKMRDQDGRGTYADGTRGWLI EQDLDATEQFDEL NEPPWKDFPAYMAPAPTMS FRTQRSVRMLMESGKMSLD NSRVVSAADHARFGNGAYAMGARSAQIRDRLFEKQQFNEQ NNWPYSAAGAYPRYMDTFGENPRGDHATRVLDRVRDFSKA NSRQLANAGAELLGDGGFDLGARTHQVRDDLTAGAKTDV NAR GLAAPLGVEFAPPHRAERITRLLEASEEWTAP NARMIGGEFYQLIGSGGYDLGARGWQIEQGLNALVQADEQ NDSPIYSNPAEPLRNDPFPYEPRAHMNLTLLTEQGKASPT NSRVMSSQAATRFGDGGYALGARAQQDRDRLEESTSATEA
NSSPYPENVPKYMLEDHDVDRASKMSRLLLGKAKDLT NARAVDGLLLDRDGDGGYDLGARAMQIRDRLREYERFSPP NSRVVSAQQHQRFGDGGYALGARAVQIRDRLMAQNQFDEA NDSYWLANPAAPLTGFSPVPQSPRTRLNAVMREGGASGAD NDRAA NNPPVDLADYPASMGMETFDTNRAYRIIEEIAKSGDAISFQ NDSYWLSNPKVPALITRSPTESERTLRI DRRLSGSDGLPVD NNRQLUGVEQAKGGDSGSDVGARATQURDALFARDRFSEH NDSYWLSSPREPLTGYSVLYGPRTRMNITRMDENEYGDAGD NDWPYSAAGKYPRYMDTFGENPRGDHATQMLADASGFSVP NQR GLATPLGVEFAAPHRADRIHALLQEHRVWSAA NSRQLAGAGAELLGDGGFDLGARTHQVRDDLTALGPKTDV NDSYWLANPAQPLEGFSPLHGFERVPQTARVREGGASGAD VNANDRDSGGGDRTSLEFAPAHRARRDRSLLEAGSGLDAD NNSFWSTNDEAPLEGYSAMYGPRTRMALKLMSEAGKFTDD NNRTVPD DWPDYICTDCHPATRAKRIRSRLESETPFSPS NARTVGGDAYRLIGNGGYDQGARGHQUASSLQQLNDADEN NNRQSFSSDYDNIGDGGADIGVRAWEIKQRLIEETKLNAD NNRVVGGAWLALEGNGGFDLGARAQQLRDDLNARQRYTPQ RG| ATPLGVEFAPPHRADR1AVLLRESTSWTAP NGRVLDGEALATVGNGGYDLGARAQQIRDLLATQDRFDEH NDSFVYTHPGQKFEGTSPASLTRPRTRAGLAEIPEMLSRG NQQPIAASQQPLYLGSNWPSPWRALHDNGLLRASPTVSLE NAR GDASPLGVEFAPPHRADRIRELLSGSADWSPT NNTPFEATDDADDLGLETQMTNRGYRGLELLRPDTQTSAE NQSPPKDADYRPEDGFPTRMTNRAVRGLEMFAELSPISED NNSAWLANPAAPQTGLDPSPRTRMGAIARRLNGTDGLTFD NNRTLPPDEAARDGDAGADLGARATQIRDDLLALPHATER NDSYWLSDPDNPRTGYSYGATETPRSURTRMNFRGDDGKF NSTPGADNPARDAYPASFGQTNRAMRARALLEQDQDDTAD NNRLVGGDALARLGDGGYMAPMRAQQVRDDLLADKRATPA VNANDRESGGGSLTGLEFAPAHRAHRIRQLLEAGDNLDVE NDSYWLANPAAPLTNFSPMHPRTRMNAVLLTEQNGASGAD NSRVVSAEDNARFGNGGYALGARATQDRDRLEEKQRFNES NNLCDFANESSPLTDNGPMGPYRVDRINHLLSEKEKFSGE
 NARVLAGDALALAGDGGYALGARARQi RDALLAGARFDER NNDPADNNPLNYYGAPGFDFGTRAGRITQRLRAADAAGPV NDSHWLTHPAAPLEGFSPPQMPRTRMNLTLLTEVREGGAS NNSAWLANPAAPQTGGDPAPQSPRTR GRRLSGTDGLTFD NNSFWSTNLAAPLENYSPLYGPERGQLSDRTRMGDTLMED NSRVVDTQQLATLGNAGYDLGARAQQIRDDLFAKQRFNER
 NNS PYLSSDGPGQPQPEDFSDTMGDETGVTNR NQQP TDPKQAGWYIGGSYDPW RADRTNALLRADSQMTPD NDSYWLSNPHEPLEGYSP IGEERTARTLRLIANGKVAPAD N NSSYWLSNLDAPLEGFSLMYSPRTRYNAQLISADGRFSLE
 NNTPGEGQPKPKDYESSMGMTNRALRIEALFGADKAISRE NNAPPRSD NNRQLAGDAYQLIGDGGADHGSRASQLRDDLTALGQTSEP NARTVDGSKLRRLGDGGYALGARAQQIRNDLLASDHFVES

UniRef90_UPIO002F45121
UniRef90-S6HBJO UniRefe90-HOJBII UniRef90-H3NU22 UniRef90-Q01WT4 UniRef90-G2E282 UniRef90 ${ }^{-}$K9ZYD0 UniRef90_UPIO00464BFC4 UniRef90-UPIO004779460 UniRef90-Q9HKC5 UniRef90-TORU20 UniRef90-A3ZMB1 UniRet90-E1VPS3 UniRef90-Q1D8A6 UniRef90_UPI00042486C4 UniRef90-A3N9X7 UniRef90_U3HGG6 UniRef90-Q3JVN7 UniRef90 UPIOOO36E2F96 UniRef90-K2INJ5
UniRef90-O82FT1
UniRef90-UPIO00255ACC4 UniRef90-F8ED88 UniRef90-Z5XN94 UniRef90-M4NP13 UniRef90-L9PCD7 UniRef90-UPIO0029A8DCA UniRef90_11DWT2 UniRef90_S9P3J5 UniRef90-B1KPU7 UniRef90-UPIO0029AFDDF UniRef90-M5DK85 UniRef90-U2U349 UniRef90-UPIooo31A6C90 UniRef90-Q1MY58 UniRef90-UPIO0026C976C UniRef90-UPIooo3634CBB UniRef90-A7HRM7 UniRef90-B8KFE1 UniRef90-14WJF6 UniRef90-UPIo00363EABC UniRef90_UPI0004764338 UniRef90_S9Q1Q6 UniRef90-A0A024GXW1 UniRef90-B8CK48 UniRet90_C9TBS2 UniRef90-J2ICC3 UniRef90-R9V475 UniRef90-C4TWA4 UniRef90 T1D118 UniRef90-UPIO0035FEC4A UniRef90-B4SQ39 UniRef90-K01177 UniRef90-V4J502 UniRef90-A0A024YIL1 UniRef90-X5MA94 UniRef90-Q1YU80 UniRef90-UPIo0034C935F UniRef90-D5WM35 UniRef90-F3LOA9 UniRef90_DoLX31
UniRef90 B1ZVM2 UniRef90_B1ZVM2
UniRef90_L8TQP6 UniRef90-L7U9Y8 UniRef90-G7FJJo UniRef90-E1X1E3 UniRef90-UPIOO047E3584 UniRef90-W6XAW6 UniRef90-UP10004676FOC UniRef90_10HTY5 UniRef90_S9PCD4 UniRef90_O9RYQ4 UniRef90-D4ZHK8 UniRef90-Q087D8 UniRef90-FOB7Z3 UniRef90-G7G2H3 UniRef90-H3NRV6 UniRef90-A4ADL6
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UniRef90 U1KJ17 UniRef90-F3L235 UniRef90-K7A177 UniRef90-V4RL95 UniRef90-F2LEC1 UniRef90-N9UUR1 UniRef90_D2UEE5
UniRef9O_A5PCE

T IF HAMGARDRTQTDPALFAPYFRAAMASS SDPEVVREAA GIA D L Q A M M D NRVYMAEA L LD DVLQ F CAGYSGA D VVKA VC

 S L DAA A A Y G D S Y L L P WF E K P M P A L I K A WD E A T A T D P L K K A Q I
 DL MACVNDTRSETA E R LVVP PLLLEA A ERS GS ELLAR QAA
 $D M M N L Q S H N$ Y T D YEAVMAVPYML K YMA GYQNATVE RMREI Q Q CDLVSIQARQYLEEI RDEDTN YSE
EMQALQY

$K T V V V$
$G Q Q A V$ $\mathrm{K} N \mathrm{~V} V$
$\mathrm{~L} Q \mathrm{Q} \mathrm{A}$,


 ERAAYRLDLD DRAL FMS L WRDRALRRVLDEAALAPARAEFR EMT DL GFDTWVVPS DVIVP LLDERAWANANRHDPRMAAM GFF ALQ Y DNKVPDY DF WAKLLSNEDAQMPPSPDPVKAR D M A A IHMDT HLLASAGA L L D H L A A LD GLTTP Q A SA LR RMTEM LQ N N RAETVVSGWRDHLLDWME PLT DLLSADE HS ALL

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

 Q L Q V L A F DTTTLYYWP LTTE
 DFMRL QLLDNEARFMAPWHQQLLSTLLLAS QQGDSYARDR
 DLLKNLK F DLLNYSNEQSNQUQLKYWLKAVDTSVLSS QEK QA W

 DGRFQRAALFSN RGLGAELLLPELVQQVCRG PETPELLAKAC
 K K VY A VT LD DRAIIFMTA WRERAI A A LDDKAVE GNASRAEAL
 DMQGI HMDT LL GSWPAFRTL




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

 EFKD YKFDKTYSKDSELAKLI EVVWLAEDFSGEPDMEAA EFSQQDKHDKKYSNSRADRFLDGA\|NLPLADSAQQSYDDA Q
 S I A E I Q QLFDNS GLTAH LIMDELLEACATGPETVSSLKEAC


 $A L K N M$ QSDLLYS IQGHYFMEEL RADLSSSDKVSKE $D L L A D Q Q D D R A V L M N R W R E L L R A L A D \quad E G P T L D M L A$ EHAMLS DQTD DRAQWIEVWRRVALEA LDDAGALEGHPQRAR
 A RREMASQADTVLVDAQVFVPLLLRAYDALAADARVAEAA GADGKFTQPENRAFTAELLREELAARCQAHPSATVEGQAC GATGLQATGLLRESNNLTGEMYAADAAAKRLCQSAGGAEVEQQPAC


 A LRLLRRLLQETETLSREDFYR
AMRRMQTD
DQAMLYAQ RNFGAELLLDDVLKDCDSTENAMAANDAC EVVEDIKMQEDHFSENGCEFRDFVLALCAREGLTPYVARLL ELKSVAA THNGS LIFSREFRNEVVSRCTGYPS QQVDGQAC DFNQL QHDND ALLF LTT PWHQHLTTALLDSHNEASKARK DDL DFWTIUKHDKAYAVSSRAGHYDRAADAAELTAALDBHLAAAQ DLHRYKYDNRYAESVVDLVLKRLLAM SFEPDSELQAGB GI
A AY QV DLD D RALLDT PWRDRALDRLLDDAALDAGHPARAEF RLKTI KYDTAYASGYAKVWDDRLLA

|  |  |
| :---: | :---: |
| UniRef90_UPI0002F45121 |  |
| UniRef90_S6HBJ0 |  |
| UniRef90_H0J8I1 | $R \mathrm{RLQGFDGRLLAAGS}$ A A DAALYEAFLQALAE Q T F A |
| UniRef90_E6WRN8 | D A SD D WNGHAAP ESVA YRIVR S L R L A V H T R I A NGLAA A P A L |
| UniRef90_H3NU22 | AVLT R WD R R F NSES R GAVLVREWIT R Y P Y DETYLGS L L F |
| UniRef90_Q01WT4 | ELL R K WD Y R W NVNSVA T S L A VFW ${ }^{\text {V }}$ |
| UniRef90_G2E282 | KL L S D WD GR A S I D SVA Y RLT R E WRTAVSA AVL |
| UniRef90_K9ZYD0 | GVLA GWDHRFDSAS A A A HLFSRWLVGLANRTLS |
| UniRef90_UPI000464BFC4 | EAARDWSGRAEPGSVAYR |
| UniRef90_UPI0004779460 |  |
| UniRef90_Q9HKC5 | S MLS SWNYSMDVNSRA A A V WFFTYMYLFNEI F H |
| UniRef90_T0RU20 | K ELS E WDLR Y NKES $\quad$ Q A N K F E D F Y H NLLLEEI F T |
| UniRef90_A3ZMB1 | H RLENWNLDYTPDSH EAVLFQRLYRNTLLLEIFG |
| UniRef90_E1VPS3 |  |
| UniRef90_Q1D8A6 | SLI A Q WD R RY DVV SVVGA VVWREFA GT F TM GELQA SPALYA |
| UniRef90_UPI00042486C4 | NLL N S WD K K A D TLLS A GA TVVF |
| UniRef90_A3N9X7 | ALLRAWDCRDERAS PAALVWHRFFKA |
| UniRef90_U3HGG6 |  |
| UniRef90_Q3JVN7 |  |
| UniRef90_UPI00036E2F96 | DLI K K WD R R S K E S A A Y T Y I Y F WGMSY R DL F S |
| UniRef90_K2INJ5 | $R L V E A W D G T A S A G S Q A F G$ |
| UniRef90_Q82FT1 | D RLLSWDRRM |
| UniRef90_UPI000255ACC4 |  |
| UniRef90-F8ED88 | VVLT QWDHNTDNDSKG AFLFDRFVR |
| UniRef90_Z5XN94 | TAL N NWQACACSDS $\quad$ GGYT L V K |
| UniRef90_M4NP13 | ALL R S WD Y R WG I A S M P T L A VF WGDMLDW KV H |
| UniRef90_L9PCD7 | KLLKDWT GK A SVIS SVGY |
| UniRef90_UPI00029A8DCA |  |
| UniRef90_I1DWT2 |  |
| UniRef90_S9P3J5 | QALA A WDGRMELDRTGA VVWREFL GQFSR |
| UniRef90_B1KPU7 | QLLR D WQK CACADSVGY T LVRGFR T Q LID TVFA |
| UniRef90_UPI00029AFDDF |  |
| UniRef90-M5DK85 | HALLDWNGHASTDSVAY RVVRAFRQEVTKSVLG |
| UniRef90_U1KW41 | GYLSDWQACACPESVGYT LVRRFRDHTLDLLSA |
| UniRef90_U2U349 | ALLAE WD R R D DVD SVGA $\quad$ V VWREFTGAYTM |
| UniRef90_UPI00031A6C90 | LLL LD WDS LMEAGSH R A A VFA A WRGALVQRLAR |
| UniRef90_Q1MY58 | K DLHEWD Y S T DKHNELLA A |
| UniRef90_UPI00026C976C |  |
| UniRef90_UPI0003634CBB | RLI E Q WN GRA DAD AVGY TLVRA F Y S A F |
| UniRef90_A7HRM7 | A I L R A WD R VA NVE S R G A A |
| UniRef90_B8KFE1 | $N V L A A Y D G S L N L D S P G A P L F R E W \square T R Y D P L D T V T T G K L F A$ |
| UniRef90-14WJF6 | ELLR H WD D R WG\\|A S M M T S LAVVFWGD TLW WETYA |
| UniRef90_UPI000363EABC | D QL LA WD R HMDADSTE A A Y A A L R A L VR |
| UniRef90_UPI0004764338 |  |
| UniRef90_S9Q1Q6 | AVLAA WNGRYDTSSVGAPLWRELMGIVYGAALQNA GTLFA |
| UniRef90_A0A024GXW1 | GQLLGWDGHMRADSKDAAVFSAWRA A L M L L |
| UniRef90_B8CK48 | A AL K Q WNGKQDNDS IGGALVREFAHQFDQATMLTVPF DYE |
| UniRef90_C9TBS2 | S MLA GWQ G D M P NKLAAPTA Y Y M $\square$ R Q EMTR $\quad \square$ |
| UniRef90_J2ICC3 | L S D F R Q Y $\square$ A ES S DY A A P D A $\square$ G Y T L L R Q F R L S M L E LT F A |
| UniRef90_R9V475 | SSLAAWNGKADLDS G I GLVMHQNLFTA |
| UniRef90_C4TWA4 |  |
| UniRef90_T1D118 | A ATRTWS GRAS $\square$ D SVA Y H A A R A F |
| UniRef90_UPI00035FEC4A | KRLLGWDRRMTADSTI EAALLFA A VRSAVVRRFAA |
| UniRef90_B4SQ39 | SVSHQWGGRASASSVSYRVVRE FRTQVMDTLS |
| UniRef90_K01177 | A ALK GWDRRNNVDARSAHVFREF |
| UniRef90_V4J502 | $A V L Q D W D Y R Y T S D A Q A ~ P L L F E R A L D R L E A L L W$ |
| UniRef90-A0A024YIL1 |  |
| UniRef90_X5MA94 | QKLLA DFDMSADMNDRNAAVAVLA GEPVVWAQDQGTPMP |
| UniRef90_Q1YU80 | AVI R D WDLS T D $\square$ E NRGAA |
| UniRef90_UPI00034C935F | A AL A A WDRRSSQESRGA ALWREFWKRAR |
| UniRef90_D5WM35 | R RLE S WD GHA DVT AVVGYRLVRAHYSLLYDAWF GALDEKQMTA |
| UniRef90_F3L0A9 |  |
| UniRef90_D0LX31 | TMLGA WDLDAS G D S E |
| UniRef90_B1ZVM2 |  |
| UniRef90_L8TQP6 | D RL LA WDGSMHAASTDAAA FTAWRSALVVELA G |
| UniRef90_L7U9Y8 | A AL A A WDLRYDA GSKGAALWREFSGAFS M M L L STGVS G |
| UniRef90_G7FJJ0 |  |
| UniRef90_E1X1E3 |  |
| UniRef90_UPI00047E3584 | $E V A E D W E G R A S P G S A G Y R V V R A W R L A V H E R L R D G L L A P A R ~$ |
| UniRef90_W6XAW6 | Q QLVA WNGRA DVDAVGY R L T R F F F S L Y A A WFGRLDA E L A G |
| UniRef90_UPI0004676F0C |  |
| UniRef90-IOHTY5 |  |
| UniRef90_S9PCD4 | A TLA GWEGRFDLGSTGAVLWREFLLGTFSFSQTEDAGALFA |
| UniRef90_Q9RYQ4 | NALAAWDRRSSQESRG A ALWREFWRR |
| UniRef90_D4ZHK8 | Q F I R D WQACACADSVGYT LVRSFRAKLLDASFA |
| UniRef90_Q087D8 | A ALKA WNGKQDNDSKGGALLREFAHQFNQNTMLTEAFDYM |
| UniRef90_F0B7Z3 | QATRRQWDGHASTTSASYRIVREFRSKVEAGLLAPAQAALG |
| UniRef90_G7G2H3 | TALENWQQCACSNS |
| UniRef90_H3NRV6 | D ILA T WD R G T DK D NRGAALVVCV |
| UniRef90-A4ADL6 <br> UniRef90 WORJA2 | QQLR RF $\quad$ RANGKDA LPP S L H A A |

AALQTWDRRQTNESRGAQ VWTEFWRNVRK KAMESWDCSMDASSYG ASUYEVWLQMTLQEVFA NALSAWDGTYNLDQSTGAQTMREFLASFMVSGHRSLNDELF QHLA A WQACACADSVGYTLVKRFRTSF
$A L L A Q W D L V A D \square Q S R E A A L G V C$ VIVRAEWRAEQDAVAP ELLQNWDLLGSDAESRVAALGVMTGSPFVMAVMR NAL RGWDGRYSEDSAGALLAFE LLVFHLVRRLHEGQVR KRLES WT GHASVDSVGY RLARGFLYRLSGDVFG TAAANWNGAASIDSVSYWUVS NWRNAVNSRDA $N L L L A W D F K \quad A D N \| G R G D S L A L L M \square R E F M S C R Y Q N K P C P$

UniRef90_UPI0002F45121 UniRef90-S6HBJO UniRef90-HOJ8I1 UniRef90-H3NU22 UniRef90_Q01WT4 UniRef90_G2E282 UniRef90-K9ZYD0 UniRef90_UPIO00464BFC4 UniRef90-UPI0004779460 UniRef90-Q9HKC5 UniRef90-TORU20 UniRef90-A3ZMB1 UniRef90-EVVPS3 UniRef90-Q1D8A6 UniRef90-UPIO0042486C4 UniRef90-A3N9X7 UniRef90_U3HGG6 UniRef90-Q3JVN7 UniRef90_UPIO0036E2F96 UniRef90-K2INJ5 UniRef90-Q82FT1 UniRef90_UPI000255ACC4 UniRef90-F8ED88 UniRef90-Z5XN94 UniRef90_M4NP13 UniRef90-L9PCD7 UniRef90_UPI00029A8DCA UniRef90-I1DWT2 UniRef90_S9P3J5 UniRef90-B1KPU7 UniRef9O-UPI00029AFDDF UniRef90_M5DK85 UniRef90_U1KW41 UniRef90_U2U349 UniRef90_UPI00031A6C90 UniRef90 Q1MY58 UniRef90_UPI00026C976C UniRef90_UPI0003634CBB UniRef90-A7HRM7 UniRef90_B8KFE1
UniRef90 $14 \mathrm{WJF6}$ UniRef90-UPIO00363EABC
UniRef90_UPI0004764338
UniRef90-S9Q1Q6
UniRef90_A0A024GXW1
UniRef90-B8CK48
UniRef90-C9TBS2
UniRef90-J2ICC3
UniRef90_R9V475
UniRef90 C4TWA4
UniRef90-T1D118
UniRef90-UPIO0035FEC4A
UniRef90-B4SQ39
UniRef90-KOI177
UniRef90-V4J502
UniRef90-A0A024YIL1
UniRef90-X5MA94
UniRef90 Q1YU80
UniRef90_UPI00034C935F
UniRef90-D5WM35
UniRef90_F3LOA9
UniRef90-D0LX31
UniRef90-B1ZVM2
UniRef90_L8TQP6
UniRef90-L7U9Y8
UniRef90-G7FJJO
UniRef90 UPIO0047E3584
UniRef90-W6XAW6
UniRef90_UPI0004676F0C
UniRef90-IOHTY5
UniRef90-S9PCD4
UniRef90-Q9RYQ4
UniRef90-D4ZHK8
UniRef90-Q087D8
UniRef90-F0B7Z3
UniRef90 G7G2H3
UniRet90-G7G2H3
UniRef90-H3NRV6
UniRef90-A4ADL6
UniRef90-WORJA2
UniRef90-AOYYU44
UniRef90_U6H5X2
UniRef90_S6LBT3
UniRef90_U1KJ17
UniRef90-F3L235
UniRef90_K7A177
UniRef90_V4RL95
UniRef90-F2LEC1
UniRef90-N9UUR1
UniRef90-D2UEE5
UniRef90_A5PCH9
$\mathrm{PG} T \mathrm{~B} \quad 370$
390
400
RYQTSLLDRAlL L QKAPNAWRDAFDPANPLHTPRG口 D DSQPAVVEAL DELGGTGSPAWQAF T T L LS D
 FELPGFPQLDGVAWPLLRERPAHLL QNSFNPAQAATTPS GLANSDT
 DALNQPLTRLSNDYRLADLL

LD TPRGLADEGAALSAL
PDFVAPDWPNLEGVVWPLVQRRPAHLLPRRYACAEREDAP
 EEF
 TPFDAADPDATPGTLAPAPAQGTDPVLKLAQAVTALTRAG

PRF EPYRAYFENGA LATT $\quad$ R V VSRA L GFAEDEDGWREPFDPQRPTVTPRG DNPAAKDKVIVA VVA GLDARLKQQQHDADYALANRRWPVVI
$E A K F G R F M D Y N R K R E V N D D S P E$
$P F L$
$H$ HPAFTALTDPPAYPEVVRPWLALLPRVGFALENLLKADEL ETLVNNEVISAEHDEVWLFNSNSEGALAKDRDQQPTHWLP


 SANEEMAKVDPKASMAAVTSRWPV HPVFAALRRLPAYPALFAPWMAPVP RVAYADETLDTSG PLSAYLEQHGAKSQDLKYSLETPLWAMLLQQRRTDTLPDAY | $Q E L V D K G A L F A Q P F A P D Q P L S T P S G L A P A P A S G P D P L L E K$ |
| :--- | :--- |
| $P L E T E L N E ~$ | AET LTKVKYT DRQQWFTALKI AA GFATAIRR IDPNFEDPK $\quad$ ENQA EAVWRLIEHRP $P V$

$P Q L S G G P T L Y A T D E H T L Q Q V D G S L S P L K R Y L E P A A W Q L I H$
$H$ HS ALLAP LN EPTGYSPLFGPWLS VASR $\square G F A \square E T L L I R G S E$

YEAWFGGLDAE LDKTQPDLNYRHATSRS $\square A$ VMEA
ED FDVDRPAATPAGLGDQDLALQSLR
KA RALGVSPYAYMAGAAGAQERLHALDEAVDRLV
 SANEEMAK DDPKSTMAAVT SRWPVVVARVLDQQP TAFSPAQPMETPNTLVPAPATGADPLLDLAEAVLRLGDAS $A L T G S P A D E P L T G A H R R S P L F S P W L H L T A R V G F A V$
$N A A T T P N T L T T D G S A L V A L A K A A L N V E A A G F D V A A A M G T V$ ARVSDLAGVADTEDSRLPPGVSAFTHLWWADPDQLRRNDT $P \square A A L L E Q A G A R S S D L K Y S M E T P F W L L W Q Q Q R P D T L P A A Y$

LA EHPES WRVAFDPADPQHTPRGLAVEQAAVR
KFDNQLEAQWPSANYLT ANTRWDETVMALINSAQYTEWV
HPA LEP $\square S G S F G Y P E V F L P W L Y L P A K \prod G Y A L E T L L T T D R L$ DALLAPANAQLGD DYLDPRLAQLEGVAWPMLQQRPANLL DELQFEFTELRELRTPPGPERVPFDPAQPVATPAGLKMDD D PVVADLA GAPAGPAVFHPWLHLVPKDGYALEEGLLNSAL
 $\square A P G L D P N V Y A V P F E A G D P V N T P R G L N V A D P T T Q A A L L G A$
$L$ GDFDPSNPATTPSGLADTNRALTALAEAV
DMVFEPTFARCVA QTPQFNWRNFHYEPADWTLLHEKP DPLLARLTASAGHSALFAPWLNPVSRVGFALETVI AKGAG A GTTSLYSELFDVARPIQTPRGLKAAPTDGSADSVLVADAA K DFYPTDAWKF $\square A N R S S \| L V D$ F AAMGE MPGRFEAPSLRQFEGVAWPLVRQRPAHLL AALGE MPGGGNGNPPLGLRVANSRYEAVMETLAE A A L E HFAMPDFPQLEGVVWPLLQERPAHLL
 ARA $\square P N V Y A V P F D P A D P V N T P R G L N T A D P A A Q T A L L G A$
P $\square$
SAATTPNKLNTDGSALVALAHAALNLEAAGFAVDVALGDV EQF LAPARAALEGDVWPLLQQRPANLLPPTFAS
DE LNKQQGTLL MDLLAS WDLGTQADNPAAALGVLTLTTLIDSRQ
TPDLYQQAFNPDDPVNTPRGD AL A N N WT D E ALF S LA GGWVHPTWLPRTEALNYWRDNLLSAL EVPFNP LTMSTMPSGLKADDTNDVDNDPILQALATATNRL
P E A G
DEPEPDLVDVFQNALTLLQDHFGRDDPKWGEVNRLVRGDK D VY L A S WDP W
$P$ LL H R DL D T DP
GLDD T Q $\square H Q L D P D A D Y E H V N S R W S \square T M$
DALALLVLRPANGSHYQRKADPDPMTV
$D G L T A P A Q V A L G K N Y D E P D L S Q L E G V T W P L L Q Q R P M N L L P$

UniRef90_UPI0002F45121 UniRef90_S6HBJ0 UniRef90_H0J8I1 UniRef90-H3NU22 UniRef90_Q01WT4
UniRef90_G2E282
UniRef90 K9ZYD0 UniRef90_UPI000464BFC4 UniRef90_UPI0004779460 UniRef90-Q9HKC5 UniRef90-T0RU20 UniRef90_A3ZMB1
UniRef90_E1VPS3 UniRef90-Q1D8A6 UniRef90-UPI00042486C4 UniRef90_A3N9X7 UniRef90_U3HGG6 UniRef90_Q3JVN7 UniRef90_UPI00036E2F96 UniRef90_K2INJ5 UniRef90-Q82FT1 UniRef90_UPI000255ACC4 UniRef90_F8ED88 UniRef90-Z5XN94 UniRef90-M4NP13 UniRef90- L9PCD7 UniRef90_UPI00029A8DCA UniRef90_I1DWT2
UniRef90_S9P3J5 UniRef90_B1KPU7 UniRef90_UPI00029AFDDF UniRef90_M5DK85 UniRef90_U1KW41 UniRef90_U2U349 UniRef90_UPI00031A6C90 UniRef90 Q1MY58 UniRef90_UPI00026C976C UniRef90_UPIO003634CBB UniRef90 A7HRM7 UniRef90_B8KFE1 UniRef90-14WJF6 UniRef90_UPI000363EABC
UniRef90_UPI0004764338
UniRef90_S9Q1Q6
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UniRef90_D4ZHK8
UniRef90_Q087D8
UniRef90_F0B7Z3
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UniRef90_U1KJ17
UniRef90_F3L235
UniRef90_K7A177
UniRef90_V4RL95
UniRef90_F2LEC1
UniRef90_N9UUR1
UniRef90_D2UEE5
UniRef90_A5PCH9
 HGA LLAS A E QLEKAGLGSDSHWRDVQVSTVG A R D D S P Y WD DVS TA A HEDK PA DF A RA LAAA AVATACEARLGS $P$ A GFAS WEA LL E DAA DEVRDG LVEA GPLPERRWGE Q GEG GALD T ALGNLQI GHRLDRQY
$P$ L H G G N R H E G $\square A$ E K IA A D F G GWQTK WG D I N R Y Q R LT G D V Q
DPPDWVPPGYGD WTELENRLERVIAH LGTAERWSEHTWGA
ARCRDDAHGWAALFEDAATEVRAELEALGPDRERTWWE
 DMAHMIINDSAYPFSNQSMTN LTAASAMID AMDYLES EYPS NFDRDI FSNNE $\square W F A K T S R E Q F L K R A L T K T N N F L K E N W G E$ K K ED SL WWK GRN KGDLIDRAAA EK L S L E A DKP WSDVVNNFY

$R G E P S P W \quad \square P A P A A V G S \square V A A A F D D T L E S L R A L A$ A GEEVA $\square P$ A P A A VG S V A A A F D D T L LE S L R A L ARLLDE QPPGWLPADAASWRDVQLAADDRTIDALSANGGA E Q E M A L K A L D K A L A H I Q K T Y G EK P Q A MLLPANY DSWEA LLTTEQTAARQVAKTAEAGWPTWGSR $Y G \square D R A A V V R E A V A E V A A E T A G K A A A E T V K A A G A S G T W G D$ QG F DNWLAFQRVVLQSVLADLVEKHGALAAQANWGK

D R LQQQDF GSWGVPWGEVNRYQRNDGAVVQKFDDAR
$D Q Q P A G W$ L P P QYASWQA LQQLAALDRAVADLTKDDGK $P V P P D D R A G A V R A A L D E T A A A P P A G P W G A T H R L L A P W A A G D P$ A SWDALLLDAV LHS KTQLDEQQYGSLND SHWGN





$T S$ GAK GAK LL A A LLKAAAA T LA K Q G $\square A D D A R W G D V Q F A V R G$ LA QHRA WVP WRF D GWHAFALDDRDDRA LESVTQNGTT LDEA

GA $\square$ A A LLEA A E LPPLDAT LRRDTQFA WRA GQA $\square A V H G G N G F E$ HDFGS WGVA WGQINRFQRLD DA IA SHFDD S R
AEE LVGGIDRDEAVRAALEETAAAPPA
A GWLP P QY A S WQA L QLAA LDD RVIA DLTTRDGKPLAKAT WGE $\square A V D A P G G Q V Q F T P R G G S R T A L D H G G V$ $L Q K G H L F G L D V R A A A R Q A L E E V A A A P P R R T W G T S H T L L P H$ QFVEKSLLPD GTPSGTKLPWPGTHNAEGGFNVFSTMLSG
 S S WQELLLSSAARDSQQK LAAQYGSLQQANWGKR
PHGFS GWDDF $\square \quad \square$ QQLD T VLTALLTQEGQLFEAT WGK $K R V R D A A L A S L K Q V N D S G V A$
$P G \square D R$ A A LVRDAVDEVVAEAASAGGAETTWGE P PA A DS WDALLLLDAARRTESE




## GGPDT

LREAASALT TA GVP LDDA P LGEVV Q GVMRGGD DRDD HS IAAQK GT KLE DA RWGE RNRSADAHPFARDVPS WLP $N L L T A N T \square P L D A P L G E L Q L A H R A G K A L P V H G G N R F E G \square A N$
LHLLLAPEHDSWDTLMLLAAADRVVDEDEKTGTPLEKATVGR HGI DVAAAA GRA L E A A A A S P S S A A WGESHTVVLPLHALD S
 WFKERSKMDCFRNALAKKTQKKYSRKDDPSWGELRRRVKMNN




 QFVEKSLPD GTASGVKLPWP GSHNAEGGF
 WQLINNKPNTWUNP QFKSWDAQLHGAFS QT\|TKLTEQFGN R R D D VELGGE E LAAEARDYLQSHFGR
SKPAVKTAVHEALVKA QNTLDDAG $\square$ ALDDSPWGEVQF K N K N S GI L P E GYSMSRLLCKS SYET LMM L VGR LG P
 EQQPQSW LNQHGSWQLLQLSAYEAAKQKLSA EF GP
$S W P L S G A P D V L R$

ARLLDA QPA GWLLPA GAGSWRELQLKADDQVIAELDTRD GA
L R D S A A HL L TYFGT
R H Y A N WQ A L LE D A A M Q VR D T L R R LGP LD Q S S Y N K A A DC

UniRef90＿UPIOOO2F45121 UniRef90＿S6HBJI
UniRef90－HOJ811 UniRef90－E6WRN8 UniRef90 H3NU22 UniRef90＿Q01WT4
UniRef90 G2E282 UniRef90－ $\mathrm{K} 9 Z \mathrm{YDD}$ UniRef90＿UPIO00464BFC4 UniRef90－UPIO004779460 UniRef90－Q9HKC5 UniRef90－TORU20 UniRef90－A3ZMB1
UniRef90－E1VPS3
UniRef90－Q1D8A6
UniRef90－UPIO0042486C4 UniRef90－A3N9X7 UniRef90＿U3HGG6 UniRef90－Q3JVN7 UniRef90－UPIOO036E2F96 UniRef90－K21NJ5
UniRef90－O82FT1
UniRef90－UPI000255ACC4
UniRef90－F8ED88
UniRef90－Z5XN94
UniRef90－M4NP13
UniRef90－L9PCD7
UniRef90－UPIO0029A8DCA UniRef90＿11DWT2
UniRef90－s9P3J5
UniRef90－B1KPU7
UniRef90－UPI00029AFDDF
UniRef90－M5DK85
UniRef90－U1KW41
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UniRef90＿B8CK48
UniRef90－C9TBS2
UniRef90－J2ICC3
UniRef90－R9V475
UniRef90－C4TWA4
UniRef90－T1D118
UniRef90－UPIO0035FEC4A UniRef90－B4SQ39 UniRef90＿KO1177 UniRef90－V4J502 UniRef90－AOA024YIL1 UniRef90－X5MA94 UniRef90－Q1YU80 UniRef90－UPIo0034C935F UniRef90－D5WM35 UniRef90－F3LOA9 UniRef90－DOLX31
UniRef90
B1ZVM2 UniRef90－L8TQP6 UniRef90－L7U9Y8 UniRef90－G7FJJo UniRef90－E1X1E3 UniRef90＿UPIO0047E3584 UniRef90＿W6XAW6 UniRef90＿UPIO004676F0C UniRef90－10HTY5 UniRef90＿S9PCD4 UniRef90－Q9RYQ4 UniRef90－D4ZHK8 UniRef90－Q087D8 UniRef90－FOB7Z3 UniRef90－G7G2H3 UniRef90－H3NRV6 UniRef90－A4ADL6
UniRef90－WORJA2 UniRef90 ${ }^{-}$A0Y8U4 UniRef90－U6H5X2 UniRet90＿S6LBT3 UniReffo－U1KJ17 UniRef90－F3L235 UniRef90－K7A177 UniRef90－V4RL95
UniRef90 F2LEC1 UniRef90－NgUUR1 UniRef90－D2UEE5 UniRef90＿A5PCH9
 AQQTPDHGGPSVLGDYNAMTAIPRNDGKREV
DRAS WQWGRLHRQ DGNAGGDGSTLDLTASHWGG RNTARDCHPLSGAMPAALARRLCMRAGDTTVPRVQGPGFG NLQVTNTPGNNPTETPVFSGSDAFVADSNSLSETGYNVVH PFNDAGPSDPVGFTSSQWGSLASFGARAYP GTKKWYG NRTADRHPFSPLLPPWLDLPPRPVPGDSNVPRVAS PTH LTHARR GEYSVPGHGHLDPFGVFRVSGFQPAAEGMFDM NTAA CHPLAGAI PLLGRRLPPDPLPGDGMMPRVQGPAFG NQAKIRHPLSSAIPLI GDWLNMPASAGDRHMPRVQLPSFG GNYTWGHPSLLGISQLS VGPLPRGGDYNTPNDASWPSGG KQTAFMTNDFFDGFLGFDYGPIQDEGNRAT VQGAYRAHG FTDRFFGGISGGRLLGFESRPYPMPGNFATIFQGHQTAKR
$V V A T W R W G R I T V L R I A A A A G E L V P A A H A F T A L E V G F P G E N$ LKSTTPNAEVGSATRTVVNGRTALANGGYVINNGS
DRPTWGQHHSAA LGPDRRWTDDPAAGSEMTVS DNAGSPRV

PLADAAWGRRNTLRDAHPFRSVPLVGRWLTAPADPVPGDA RAEVRWGDTNVVVRDGTF PLGGTGLYGVLHPDEGDE HQSAIRHPDSGWLGRYLDAPVVPQSGDGFAVHVTGPAFGA THRLAPWRALPTAAYAAPASPAGLSGDHDCVSAVPGLTDD HNALQMHHASALPGFLGERLNMPASEAGDSYMPLAQRPKH EVEVPGNGGPGPMGVFRTMTLGPPSGGKYFP
NLHSWEWGKVNQLVIEHPFLNMPTAPGGDTFMPAVQGRSF PLAAATWGQRNTAASAHPFASVAPVLAKYWPKVGTKRYYG
 NRARISHPGASAVPVLGDWLDNMPATPLKGDSHMPRVQRPG LDEGVANVVGYTSANSTLLPRTERQQVLSASTGLTTEGYPV $N D E R-S D P I A G A P G P L G I I H T V Y S T P E D P L D R P Q R Y A V V G$ NTARDRHPLSRADFVANWLDMRKDALDGDIHMPRVQAPDF

 GVANDQMSGNPSASPTSGVQTTKVADSRY五TDNGYAVVHG PSDPVAFVSSRWGSLASFGAH RRPGTKRYYG GTWSDTHRLAPWRALPDGPSDE PGLAGDHDCV NTAASAHPFAAVVPVLGKYDKVAPSGDQHMPRVAGPSFGQ AVDGTMNVVSYRVLQSTLDGPTPRGTTNSTSGLTTDGYVI ALADYPSTGASTPALDPSTALSGDTNCVLSTESLPGVTDGS DDTLVPQHSYAAVMDAVTGDPLASGLSEDCVLATPGYGD NSARDEHPLASADPLLGRWDNMPATPGDSHMPRVQHAAFG EGTRWGQVQQALDG TPVPGGPQALGVYNAMYSVPH NKAA $\square$ MHPFAKN【PA LR LF $\square$ AAPADSGDHNMPHVCRPDFG NTAALCHPVTRARHRDAPWQA乌PAPGGEDWPGLPGDHDCV EEAAALHGGEEFEGVAKRWLCMPADPGDRDMPRUAPNFG PVRSWRWGNHRRANUNHLALFPGLGGGAPGNDNPSSGDG DPAGPEWPGL

FTSLPGGPEFEGVLNKVEFAPLAQGGYREVVGTSS WVRSWLSTPADGFSGANDRV
 DFPGAGAAAPAVPATALSGDTSCVLCTESDPGVTDASFRG TANGVSWGTLKSTTPDSDYSAVRGTNIINSRNLTDTGYVI ILFDGKLPSI LGFDYGPTSTEGSRATIVQGALYESH NTAA ICHPLARSTPLGRRLLCMPPDPGDSMVPRVQGPAFG RNRAAIEHPFARIVPAWLPWVRGWLGAPHDPLPGDPRVQA DCHPLSGALPGLLARRLCMRAEPLPGDGAMP RVQGPAFG NQADWRWGKLHRIVLAGVFPGLSVDGGLGTVDVANHAARA DTE GTANTVGRNGSMDSMEPRAPQGTVNLTTQGYVI F S DPGGAEFEGVLDKDDFNPLAPGGYRGVVGNAS
DSLNWQHPFSKQMPLLSTLLDMPVTGFGDSFMPAVQRSSF NVFSTS $\square$ SGDDTMIPQHKYSPVMVSGNATASGLTAEGYQV NTAA CHP $N V Q S W Q W G K V N E L V I E H P F L N M P T A G F G D S Y M P A V Q G R S F$
$D G Q H W$ DDPPYGEVVRHVRGDQSW

EHNGQR\P\PGGQGWAGMFSMIVADLEKG
KGYTP $\mathrm{K}_{\mathrm{K}}$ EVKEWQWGKLRSRYDDHLFGPLKWGGNFGTDKAHDFSNDP $N M A E S S V P S R S T S E L A T V V V G A P R S D S P G T G S G S T A R Y R G$
$N M A S W Q W P F S K Q D P G S Q F L D M P T S A F G D T F M P S V Q G R D F$

GHALSR DPLVGGRYLVEER PDGGSNETDMKSR HG $K L D Q A T W G R H N T L R L A H P F A S V P L D G R W L A A P A E Q V P G D S$ LDPALGTVLRLRHGEGVHRVDLPLDGGNDTVRASTLWDVE


|  |  |
| :---: | :---: |
| UniRef90_UPIO002F4512 <br> UniRef90- S6HBJO | NGGEGWVGLMEIIVPGKPALYSVVAA |
| UniRef90-H0J811 | NDQ VWLAPALRLVVDFGLAEPLQASQVGT |
| UniRet90 | A |
| nRef90-H3N | GS SFIMTLGWTENGPEAEALLSY |
| UniRef90-001WT4 | TSGNSFVAVVEFGKTVRARAVTAGGESG DPKSP |
| UniRet90_G2E28 | GASERLVVA |
| UniRef90-K9ZYD0 | AFGTTYIAADEFS RPVRARVLLAYGNS SQPNSPA |
| UniRef90-UPIO00464BFC4 | ASQRMVVAPGHEAEGMAH ${ }^{\text {a }}$ APGGQSGH |
| UniRef90-UPIO004779460 | QSQRMVVAPGQEQDGULT DPAGQSGH |
| UniRet90-Q9HKC5 | QSFTMILNFANLSD SYGVYPGGQ |
| UniRef90-TOF | RSSFCPSWRYIT DMGNDKTYSILAG |
| UniRef90-A3ZMB1 ${ }^{\text {den }}$ | SSTFAPSYHFVADMATSEAWSNLPGGPS WFAHSESRFSA |
| UniRef90-Q1D8A6 | SFIMAMEFTPTGVQASALLTYSES SAPASPY |
| UniRef90 A3N9X7 | Degavwsmansfoals ifsrtithpagsg dirshw |
| UniRet90-U3HGG6 | A |
| UniRef90-Q3JVN7 | NMPRVAAPRFGQSERLVVSLFNMPGGQSGH |
| UniRef90 UPIOOO36E2F96 | QSNGQUQCNDGWGHNPKQVWSLLPYGESQ NPSSP |
| UniRet90-K2INJ5 | SARGPAVRYVGDEDRGELSRWVVPGGQSGH |
| UniRef90-UPIOOO255ACC4 | GQSMRFVVSPG KEQDGFLIMPGGQSGH |
| UniRef90-F8ED88 | AHGDTYVAADEFS KP |
| UniRet90-Z5X | SQRFIVQPGYLENA |
| UniRet90_M4NP13 | GNSFVAVVEFGPKVSARADTAGGESGH PGSK |
| UniRef90-L9PCD7 |  |
| UniRef90-11DWT2 | F GQSQRMVVAPGQEQLGILTIIPAGQSGH PLSP |
| UniRef90-S9P3J5 | NNGSSFLMVMEFTEAGPRASALLTYSQ TTDPLSPR |
| UniRet90_B1KPU7 | GASQRFIILPGLLEEAVM MVPGGQSGH PL |
| UniRet90_UPI00029AFL | ASYMSAVEFADP VRSVSVMPFGTSG ERKSR |
| UniRef90-M5DK85 | GASQRAAVAPGDEEKATMGYFEMPGGQSGH |
| UniRef90-U2U34 | NSGSSFIMAMEFTPSGVQASALLTYSES SNPASP |
| UniRef90-UPIO0031A6C90 | LCTESLPGVDDRSFRGPVAWDLADRQNSRWDAPFGPGHKH |
| UniRef90 UPI00026C976C | KHGSSYVQIVTFDTVGPVADALLSYSQS TDPASP |
| UniRef90-UPI0003634CBB | NMPR $\square$ QSPSFGASERMVQADFEMPGGESG NPASP |
| UniRef90-A7HRM UniRet90 B8KFE1 | SS FTYTDSFEERGPVAEALTTYSQSG NPNSRH |
| UniRer90_B8KFE1 |  |
| UniRet90-14WJF6 |  |
| UniRef90_UPI0004764338 | RLTVSPGHE EQGDFNMPGGQSGH PLCSP |
| UniRef90-S9Q106 | NYGTSFLMAMHYTDSGLEAQALLTYGESEDPSHLN |
| UniRef90-A0AO24G | GPVARYVWDLSDRTKSRWVVPFGA |
| UniRe | T Y S Q |
| UniRet90_C9TBS2 | AAYGPVAKYLWDLADWDASSWVVFHGASG DPASP |
| UniRe90_J2ICC3 | QSQRMVV APGQEQSGL |
| UniRet90_R9V475 | GQGKRLVVVGTSYLILVSFTDK |
| UniRet90-C4TWA4 |  |
| UniRef90-UPI00035FEC4A | SSVPGVTDLSARGPAAWDLARREDSLWVVPLGPGD |
| UniRef90-B4SQ | ERMVVSPGHEADG\\|VH MPGGQ |
| UniRef90-Kol177 | DYGTSYVQTVTFDAKGPVAQAILTYGQS TNPASPH |
| UniRef90-V4J502 | GAS WRMVVELAGAQTQARAVYPGGQSG NP |
| UniRef90-A0A024Y UniRef90 - 5 MA94 |  |
| UniRef90- Q1YU̇ |  |
| UniRef90-Q1Y ${ }^{\text {U }}$ |  |
| UniRef90 UPIOOO34C93 | SYIQQTVGFTDSGVQAEAV |
| UniRef90-D5WM | SERFAVSPGHEQDGIFE MPGG |
| UniRef90-F3L0A9 | GS SF $\square$ MAMSFTDQGPKAQA $\square$ LSYSESGA PQSA |
| UniRef90 B1ZVM2 | GASmRTAV |
| UniRet90-L8TOP6 | GARYVWDLISDRSKSRW VVPFGASGQAD |
| UniRef90-L7U9Y8 | NNGSSFTMAMEFTEKGVNGRAVLTYSQS |
| UniRef90-G7FJJo | GASQRFIAQPGHLESAlLT ${ }^{\text {L }}$ VPGGQS |
| UniRef90-E1X1E3 | GSTFCPSMRFVTDLSTRESHTVLAGGV |
| UniRef90-UPIOOO47E3584 | ASERMVVAPGHETDGILH |
| UniRef90-W6XAW6 | PAFGASERMVSPGREQSGIFEMPGGQSG |
| UniRef90_UPIO004676F0C | ASERMVVAPGHEAEGVVHARSMPGGQSGH |
| UniRef90-S9PCD4 | SMGTSFLMALEYTENGVRAEGLLSYGESGL EDAQS |
| UniRef90-O9F | SYIQTVGFTDSGVQAEAV |
| UniRef90-D4Z | QRFIVQPGLESQA |
| UniRef90-0087D8 | GSSWMMVSFTDDGPKAKGILTYSES SNVLSP |
| UniRef90-FOB7Z3 | ERMVVSPGH |
| UniRef90-G7G2H3 |  |
| UniRef90 A4ADL |  |
| UniRef90 W0RJA2 |  |
| UniRef90-A0Y8 | GNSYDQVIA WDEAGKDDARGILT Y S S Q |
| UniRef90-U6H5X2 | G |
| UniRef90-S6LBT3 |  |
| UniRet90_U1KJ17 | QPGALSNA呂T VAGGQSGH P LSPF |
| UniRet90_-3L235 |  |
| UniRet90_K7A |  |
| UniRef90-V4RL95 | SGGRHTVTFGSQARHTFDMFVLLGGQDGWL |
| UniRef90 F2LEC1 | GMPR |
| iRef90 D2UEE5 | GASERMVVSPGHEEQGD TEMPGGOSG |
| UniRef90-A5PC. 9 | EWLPGER VTSRSTQPYGAA |

UniRef90 UPIO002F45121 UniRef90－S6HBJO UniRef90－HOJ811 UniRef90－E6WRN8 UniRet90＿H3NU22 UniRef90－＿01WT4 UniRef90－G2E282 UniRef90 K9ZYDO UniRef90 UPIO00464BFC4 UniRef90＿UPIOOO4779460 UniRet90＿Q9HKC5 UniRef90 TORU20 UniRef90－A3ZMB1 UniRef90－E1VPS3 UniRef90－Q1D8A6 UniRef90－UPIO0042486C4 UniRef90－A3N9X7 UniRef90＿U3HGG6 UniRef90 Q3JVN7 UniRef90－UPI00036E2F96 UniRef90－K21NJ5 UniRef90 ${ }^{\text {O82FT1 }}$ UniRee90 ${ }^{-}$UPI000255ACC4 UniRef90－F8ED88 UniRef90－Z5XN94 UniRef90－M4NP13 UniRef90－L9PCD7 UniRef90－UPIO0029A8DCA UniRef90 I1DWT2 UniRef90 S9P3J5 UniRef90－B1KPU7 UniRef90－UPI00029AFDDF UniRet90 M5DK85 UniRef90－U1KW41 UniRef90－U2U349 UniRef90 UPI00031A6C90 UniRet90 Q1MY58 UniRef90－UPI00026C976C UniRef90＿UPIooo3634CBB UniRef90 A7HRM7 UniRef90－B8KFE1 UniRef90－14WJF6 UniRef90－UPI000363EABC UniRef90 UPI0004764338 UniRef90－S9Q1Q6 UniRef90－A0A024GXW1 UniRef90－B8CK48 UniRef90 ${ }^{-}$c9TBS2 UniRef90－J2ICC3 UniRef90－R9V475 UniRef90 C4TWA4 UniRef90－T1D118 UniRef90－UPIo0035FEC4A UniRef90 B4SQ39 UniRef90 Kol177 UniRef90－V4J502 UniRef90－A0A024YIL1 UniRef90 X5MA94 UniRef90 Q1YU80 UniRef90－UPIOOO34C935F UniRef90＿D5WM35 UniRef90 F3LOA9 UniRef90－DOLX31 UniRef90－B1ZVM2 UniRef90 L8TQP6 UniRef90 LL7U9Y8 UniRef90－G7FJJO UniRef90－E1X1E3 UniRef90 UPIO0047E3584 UniRef90－W6XAW6 UniRef90＿UPIO004676F0C UniRef90－10HTY5 UniRef90－S9PCD4 UniRef90－Q9RYQ4 UniRef90－D4ZHK8 UniRef90 Q087D8 UniRef90－F0B7Z3 UniRef90－G7G2H3 UniRef90－A4ADL6 UniRef90－WORJA2 UniRef90－A0Y8U4 UniRef90 U6H5X2 UniRef90－S6LBT3 UniRef90－U1KJ17 UniRef90－F3L235 UniRef90 K7A177 UniRef90－V4RL95 UniRef90－F2LEC1 UniRef90－N9UUR1 UniRef90＿D2UEE5 UniRef90＿А5РСН9

DT DOTMMHETNGKKJIMA 540 VRASAS 550
TQTI
SNDQTRAFSDKRWGVLPFTEQQIEQDPQYR
WTRGQYQSLPDQPQNLERVGRDRLLLDPQK WGAGHDDWVHGRPTPFLPGP ALHTLTLQPA FDDQTQLYAEKVWRPTRYTPVDTEENAVSTRI

VGDQLPLFARGELRPAWLTRPEVEAHLARR
WGAGHADWVQGRPAPFLPGEAA HRLRLTPA YRADHQYWLNEVALPFLPGPK KYQLRLVP YSNYMNYWI NGEYLPLIFYPSA YTTDIEKWLNFEYKEI SL
YKSDVPRWFDGHYKRLSWEE
FRGLAQQWADFRWF
YADQTRDFSQKQWRP\｜LFTSEE DAAAPAEQ $\square \mathbf{T}$
YADQFDA
HSDQTELFARQQWQKLPFTNAEDDADALERKVLKVK
FLAGHEAWVKGEPLPLDPGPTE
YNDQTKLHSQRKVKRFWFTPEEILDHTESV TITP Y LKGHQAWQDGQPQP MPQESRWQ
HRDQLPLWLKGDLAPVVTDWEHLTK
YSAGHADWVNAENTPLL $P G A V I H T प T L S P Q$ RNDQLPDLSEKKMRPVWFTREEAEQHLIAEKTVFK YRAGFNDYVSSELTPLLTWPEQLKGHTERVY F LDGRNDWVTGRETPLL

 YRSGFDDYAKQKSTALLPSEEDATHAKFSLELN FFDQAEDYSSHRFKPAWFTKEEVATHAKFSQELN YRAGFSAYAQGEAVPLL PGADN HRITFTP YADQTRLFSQKQWRPLLFTPEEI AAAPAEQUSLT FADQLPLWTAGELAPVVTDWSLLAKDT

FGDQTREFSAKRFHHDPFTEAQ\LADGGHR FLAGHENWVHGNASPFLPGPARLADHRLVLMP

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FLDGRGDWLSGRESPLLPGPA
DQLQ AQKQWRP LFSEQEDASSPVLETT
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HRDQDP पWLRGDFVPV
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YDDRLAAWQTGELEPVPESPEQFDARALARLRLVP
HHDQLPLWARCELVPVVTDW
FSDQTRDFSRSEWVNDPFTQPEDEADPARTVV
F LAGHDTWVRGDATPFLPGPA
FADQTEQYANKAWRDVKFTQDE $\square A \square S A \square S R R S R$
YRAGHAAWVHGERTPLLPGE TRHT品品P
FLSQLPLWAAGELLPVVTDWDQLTKET
FADQTELFSNKQWRPIVFTEEA】TAAKVDEVTD YRAGFDEYVEGKHTPLL YTSEVEDWLNFRYK
WGAGHDDWVQGRATPFLPGP PRHTLALRP FLAGHEAWVRGEKTSFL PGAPVHRLTL WGAGHDDWVHGRPTPFLPGPAQ GAPGTVLTPA YANFLGRWLSNETYPFRVTAAETQRAAVSRTLYRPAR YSDQTERF SAKQWRPMRTDWQDI IDHA
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YRAGFDEYANHESTPRL

WGAGHEDWVHGRPTPFLPT
YLAQAEDYTNEVLHEPLYTSDSRKGRITRRYT
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FSDQTH पYSQGEWLDपPFTEEE $\square Q A D$
FGDTAEFLEDGKLFPMP

YRAGFHDYAQGNATPLL
FADQAR $\square W R E G R H \square R V P \square R P E T V R A E F P H V T E \square R P A$
F LiAGHEAWVKGEPTPFL
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UniRef90_Q4USS9 UniRef90-A3WA44 UniRef90-12NBK5 UniRef90-B4V535
UniRef90- F3NK17 UniRef90-T1BPM0 UniRef90-UPI00037B3D01 UniRef90-F8EBY1 UniRef90-U1JKB1 UniRef90-BOSXX8 UniRef90-UPI0002F30FC7 UniRef90-E6UY79 UniRef90_C7LXV8
UniRef90- J2LF22
UniRef90-J2LE22
UniRef90 NOCOB6 UniRef90-Q6SGZ9 UniRef90_UPIo0038088D7 UniRef90-E1SLP5 UniRef90-A1SBI6 UniRef90-M9T109 UniRef90-UPI00037C99E7 UniRef90-UPI0002D48038 UniRef90-A0Z672 UniRef90-UPIO0036DCCOC UniRef90-D6Y9W6 UniRef90-L1KYI8 UniRef90-UPI0002E58A84 UniRef90-D6B0R1 UniRef90-A0A021 W3W6 UniRef90-D6PCG0 UniRef90_UPIOOO476D350 UniRef90-COQH53 UniRef90_J2JSK6 UniRef90-A4X800 UniRef90-COBNO5 UniRef90-K4QYB4 UniRef90-H1S833 UniRef90-F3ES44
UniRef90
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UniRef90_AOLOM1 UniRef90-S4AM67 UniRef90-F4FHH3 UniRef90-GMUPY2 UniRef90-L8PA93 UniRef90-TOMZQ7 UniRef90_UPIO0035E84F3 UniRef90-A6GMG7 UniRef90-UPI0003729FAE UniRef90_UPIO003797477 UniRef90-ROEG82 UniRef90-Том2U9 UniRef90-UPIOOO335FCB27 UniRef90-K9D4P3 UniRef90-C9ZDM1 UniRef90-UPIO00475EE34 UniRef90 A0AO10P5A1 UniRef90 W5W2A1 UniRef90-D8HT09 UniRef90-K7A1U5 UniRef90-D6R1Q1 1 1
UniRef90 Q08Y87 UniRef90_UPI000372E963 UniRef90-UP1000375518E UniRef90-UPIOOO479FEE1
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SNNFAVVDGSLTADGRA\|VADDMHLGLRAPNDWFRAR|LRYP







SNNWAVGGALTRDGRAML SDDMHLGDQVPIIDWYRAQLNY D
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S N G WA L G R DAT RT GNAMVLANP HLDPWE GNFRFYQVQLTP

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S N NFAVAGSLTADRRAIVADDMHLGLRAPNLWFRAR L R Y A
S NGFAFNSLKTTVGKSYLNDNTHQPLEGPFAWYEABVNSE



SNGWLVGGERTHT GQPII A GDPHRFIEDAGVYQQ DHLS CP

SNAVAVGHELSANGRGMLLANPHFPWGGGMRFYQMHLTID
S N A F G L G T QAT R N GK G ML L A N N P H F P W WE G S E R F Y E A H H L

SNAFAVSPARS GDGVTRLI IN SHQPDTGPVAWYEA HIASE
SNAVAFSGRATANGRGLLL GNPHYPWHGGRRFWQSQQTIP


SNNFAVVDGSLTRDGRAIVADDMHLGLRAPNIWFRARLRYP


S N GWGL GKDKT ENGRGMVLGNPHFPHTGNLRFWQSHM DP
SNALLVVSGKHTESGHPVAVFGPQTGYFAPQLLMQQELQGP
SNGWLLA GERTATGTALIAGDPHRFDEAPGI YQQIRLACP
SNNFAVAGRLTGDGRA VAD DMHLALRVPNLWFRVR HYA
SNGFAVAPSRSDDRHTRLAVNSHQPMNGLYAWYEAHMVSE
SNGWLV S GERTGGSGHA IIAGGDPHRF DEEP GVYQQDHLSCP
SNSWVI TSSHSSDSDPMMANDPHLPL LDAPSLWWEFQL KDP

SNSLVVVHTRT QS GKPL MVNDPHLGQHLPNVWMMVGLRTP
SNGWLVAPGRTAT GAALIAGDPHRFIEAPGVYQQIHLACP
SNAFAVSAERSGDD\TRLFTNSHQPLNGPVAWYEAHISGE
S N GLLATAAPSRSADGATRRLLVNSHQPYTGPVAWYEAVVVEGE
SNSWIVTSNYSSLHSPILANDPHLTWLAPSLWDPVQLEAP


SNNWALA GSRSQDGAAII ADDMHLNI QLPNTWYRVALQFP



SNAWAFAPSRTKSGHS ILLDRNPHLLNWN S GYYEA QL T VP

$S N A F A V G P E R S$ GDGVTRRVVNSHQPMTGPVAWWEAQLVSE
SNGDAI GSDGTAA GKSVLLGNPHYPWHDGRRFWQS QL TVP
SNALVVGGEHTAS GHPVAVFGPQTGYFAPQQLMLQEEQQPB
S N QWV GPQLTTKSGSPLQCY DPHLD ALPA DWYEFAYETP

SNNWVI A GARSANGAA VVGNDMHLGDALPNTWYRAALVTP
S N GWAL GSEMTASGQGMLLANPHFPHVGNQRFWRFG!E $\square P$
SNALVVAGSRSDSGSALVAGDPHLG LMLPNFWVIIGGBAP
S NNWLY K N P NGDVI HACDPHLEVVNLPSVWYEAS INNG
S NAVAFRGSTTANGRGLLLGNPHYPWDGGRRFWQSQQTDP SNNWAVTGNLTDTDSAMVSD DMHLGLRVPPDWYRAQLNYD SNSWAVSGKYTASGFPILAGDPHLEAHAPGFWHAAGTNE E SNALVVSGKYTASGHPVAVFGPQTGYFAPQLLMLQEDQGP S N N WAVTGQVT DTGHAMLAD DMHLS LGVP IVWYRS Q F NLT SNGWAMGHEVTENGRGRLDANPHFPFNGNLRFWANHASVE S NGWLV S GERTVT GHA V A GDPHRFDEEPGVYQQDHLS CP SNAFAVTAAARSGDATATL I I NS SHQPWAGGVTWWELVVGSE
S N N WV S NLK
$S N A I A A G S G$

0


















## UniRef90_Q4USS9 UniRef90-A3WA44 UniRef90-I2NBK5 UniRef90_F3NKI7 UniRef90-T1BPM0 UniRef90_UPI00037B3D01 UniRef90_F8EBY1 UniRef90_U1JKB1 UniRef90-BOSXX8 UniRef90_UPIO002F30FC7 UniRef90_E6UY79 UniRef90_C7LXV8 UniRef90_J2LE22 <br> UniRef90-J2LE22 UniRef90 N0CQB6 UniRef90_Q6SGZ9 UniRef90_UPIO0038088D7 UniRef90_E1SLP5 UniRef90-A1SBI6 UniRef90-M9T109 UniRef90_UPI00037C99E7 UniRef90_UPI0002D48038 UniRef90-A0Z672

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PPA

90

ADDDKTAL VSESI PTQKGE HKYLLEM
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TTSPSHPGAYRFDGQWRPYTYRHYTIAAMHGGAPVQHTFYA
PLDPADPTRYLVDGKSQAMSKTSVAVEVLGKDGQLSTVYM
QVRRDGGAEALGPDGWYRVHAHTETVEVAGGEPETVEIVE
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K
K V P G DP T S Y D G
 RLRRTGTGVEAPDGAWHRATRHTELIDVLGAGTVEVEVYE SDKDKTALD
DVDPEDENRYRLDGQWLELEQKPVKIKVLIWWSVTETVY RLRRGDGVEALGPDGWEPAAAHSETVEAAGAEPTVIEVVVE RLRRRAGREALGPDGWRPAEAHVEVI EVAGGDRVEVEVIE TLDPADPTTYLVDGKPERMTERTVTVAVKDGSPVTRTQWW ALDPADPTRYMVDGTSEAMTPQTVTVPMPGTPALSRTLYS RLRRTGGAVEAYPGGWEEVAAHTETYQVAGGEPVTVEVVE PGCASTAK VINPKNKNQYK LDGQWEDFE $\operatorname{VKNVSLKVKSFLGDK\square RVDW}$ TLAPGGRTTYLVDGKPEPMGRQDVQVVVREPGGVPREVHT SPDSV ELCNADGTSYRYHGGCVPMEKDERTNSWKPAGSYRMQVFR RLRRRDGVEAYGPDGWQPTRTHSETITVAGGEPVEVEVVE EMDPDKKDHYMVDAVSYPDEKFKAKVFLK LVGGGVKKKFYR KLAEGDPTVYLVDGAPRKMTPRTVSYAAKGPDGRTHEFYM QLDPKDSTRYLLDGKSDAMVQQQVSVEVKQPDGVPR\|IYS K DPGFPTKYGYDGQWRDMTTRQVTVGAKAADPRQHTFYR
$E L H P G E P T R Y R F G D E V R D M T S A W Y S V D V L A P D P V E R T D W R ~$
 TRNPDNRNQYLLDGDWQDFETSTAILLHVKGWGPVKRPVLR TLDPADPTAYLVDGKSEPMTRRTVTVPVAGGEPVTRTQWW LLDPADPTRYIVDGKPRPMLRREISIVDVRQPDGSKHLFWL APA TPGHPQADTTHDETIVVAGAAPVSFPVRE QWVDENRYFYKG RAFGVEKSSI EAYVWDPQEDSVAR RIDLEN EKVET DNGWEPLTKRTHTIGLTSKRQHTFVTYD ELVSGDRDQYLFDGQPMPINKETVSILVNAGPAAEKDIYT ELCAKDATHYLYRGTCTPMEKDERKNAWKPAGSYRMQVFR RLRRDDGVQAYGPQGWQPVHRHVETDEVAGADPVEVEVIE TPCAA GPAPGCAALTVQHERIAVAGAADDLLEVRQ ETHRDKPTQYRLDGEWRDFEITKSKFRVKLFGPDTRDVLW RLRRTGAEALDPDGVWRRAARHTEVVEVAGEEPVEVEVIE FLK GD S YLY NGTY PPMK S CSYT QAGIDYK』YM TLDTRDPTTYLSDGQPVKMSAKTVTVDVLQNNGRSKTFYF D $R \square R R E G R \square E A L G P G G W E P V H T H T E T I E V A G G D P V T V E V A E$

 RLRRTGAGVEAPDGTWRRVARHTELVRVAGEETVEVEVLE RIDPARPNQVGLPGGWETPREHVEAIAVKGAAAERMVVRE RLRRANGEALDPDGVWRPAHRHVEVVEVAGGEPVEVEVDE GRDPAQPGQVRTPAGWERPAAYQETILI KGAPAQQLLVRE
 QLCDKDSNYYTYQGKCVPMDTVEVKNAWKPAGSYTLRSYR KLNDDT KTKMVTEVIKLK DGERVL DIEM DVDSTQTDHYLLDGAS DPLQRQLTSVEFRNGSSETRETWR KIVPGKPTAYLYDGQERAMTARAITLQVRQPDDVTRTYYS PTVPGDPRSYLVNGKPERMRATRVTVPVREGKPISKTVYR EVN ETGDQYRLDGAWRDFEEETVKI RVGLIFGPFAFKAKR
 RVTTDEQGNKVVRQEWHEFQVRKE ILKQKEGADVELVFYE
 R EHDGGNPLALRVGGRHETARRYDEAI RVHGAASVTLPVTE ELDESDGLTYLVDGKQHQ LEPETYQI QVATGPDLEKTFYH DLSGDNDTSY EVK SNKFREGSSFDNFTVRREKIIRDKHEDVDLLIRE TLDPADPTVYLVDGKPQRMTQRTVTVPVKDAAPVTRTQWW NESTKTRVVREVIKLKNSEEVL EQI EM $K$ KDRSGKN Y $\square Y$ DGQWDP LHTRVEEIFVKGANP IKRLLRF ELCSKDSTYYRYHGDCVPMDKLERRNAWKPAGSYRMQVYR SDDT E LNP TNPDQYKFDGQWVDiEKHQVNVEVLTPMGVKKDYFT RLRRTGAGVEAPDGTWHRAARHTETI HVAGEDSVEVEVIE VLNDDGTQYRFDGKWLPDESKRVWLRVKFGPPVPRTVYR EVRDNK YRFESNDFDFKVRRDVI K RKKKEDVELYIRE

UniRef90_Q4USS9 UniRef90_A3WA44
UniRef90_I2NBK5 UniRef90-B4V535 UniRef90-F3NKI7 UniRef90-T1BPM0 UniRef90_UPI00037B3D01 UniRef90_F8EBY1 UniRef90-U1JKB1 UniRef90-B0SXX8 UniRef90_UPIO002F30FC7 UniRef90_E6UY79 UniRef90-C7LXV8
UniRef90 J2LE22
UniRef90-J2LE22
UniRef90 N0CQB6 UniRef90_Q6SGZ9 UniRef90_UPIO0038088D7 UniRef90-E1SLP5 UniRef90-A1SBI6 UniRef90-M9T109 UniRef90_UPI00037C99E7 UniRef90-UPI0002D48038 UniRef90-A0Z672 UniRef90_UPIO0036DCC0C UniRef90-D6Y9W6 UniRef90-L1KYI8 UniRef90-UPIO002E58A84 UniRef90-D6B0R1 UniRef90-A0A021W3W6 UniRef90-D6PCG0 UniRef90_UPIO00476D350 UniRef90_C0QH53
UniRef90_J2JSK6 UniRef90-A4X800 UniRef90-C0BN05 UniRef90-K4QYB4 UniRef90_H1S833 UniRef90-F3ES44
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UniRef90 S4AM67 UniRef90-F4FHH3 UniRef90-G7UPY2 UniRef90_UPI00040B0665 UniRef90_L8PA93 UniRef90-TOMZQ7 UniRef90_UPI00035E84F3 UniRef90-A6GMG7 UniRef90_UPI0003729FAE UniRef90-UPI0003797477 UniRef90-R0EG82 UniRef90-T0M2U9 UniRef90_UPI00035FCB27 UniRef90-K9D4P3 UniRef90-C9ZDM1 UniRef90_UPI000475EE34 UniRef90-A0A010P5A1 UniRef90-W5W2A1 UniRef90-D8HT09 UniRef90-K7A1U5 UniRef90_D6R1Q1
UniRef90_Q08Y87 UniRef90_UPI000372E963 UniRef90_UPI000375F18E UniRef90_UPIO00479FEE1
UniRef90_UPI0003168654 UniRef90_UPIOOO3168654 UniRef90_L8GZI2 UniRef90-B4UFS4 UniRef90 AOYAEE UniRef90_C5A8L7 UniRef90-F7RXH7 UniRef90-V4L7M5 UniRef90-TORUD2 UniRef90-NOCQK4 UniRef90_G4QLC2 UniRef90-G2P8C4 UniRef90-UPIO0040F260B UniRef90-V4HNM2 UniRef90_UPIO003675F16 UniRef90_UPI0003B6E923 UniRef90_TOCE75
UniRef90_UPI000416F090

T A WGP\|L|HE
NADGS LLAL SAHGPVIRND NGNGYFADRYGGMGSDDQLDAYYRMNKA TARGPVI IRDDVDGGGLALRYPPRVRRDLGFATLPALLRA TARGPVVIGSPPPHAPLALRHPPRVTGDLGFGALLPLLRA
 $T E R G P V V P E P G E P P L A V A L R Y P P R D T G D L G F G A L L P L L R A$
$S K Y G A T V$

SEFGPV K I VNGEKFALLSWVAHQDYA VNLLNLLNLETA TDWGPVISLPWTAQKAYAI RDANT LNVRSAESWMRMARA

 SAHGPALRTDH GVYAI RYAGIDEMKQV EQWLAMNKA

 TEDGlVVTHTVDGTPVAYTQLDRTYGHEADSUIGGQMLINP TDRGPVVAGGPETPAALS LRHPPRVTGDLGFGALLPLLRA SHFGPVRR@DNEK YALTWVGYQDYA NDN LDNLLEVA $S V H G P V L K T S H G T \quad Y A V R Y A G M G E L K Q V E Q W R A M N R A$ TARGPVVADVPGEWEGLSLAYPPRVYGDLGFPALPALLEA TERGPVVQDGLPPGEALSLRYPPRVRHDLGFDALPALLRA TRWGPVFVVPWSAQTAFALKDANRGNQ RGDETWLRMGEA TGRGTVVVGGPDAGPADALRHHPRVSGRDGFETLPALLAA TAWGPLMHD NADGSALALDWSAHLPGALMGLSELTRA SKFGPV1 KNKKGYFAFFSQSDNNDSAlUQWLKMNKA SRYGPVLGMDWTETNAFA LADANAANLRFADEWLALAAAR TSHGPVVNPMPFDPTTYAWKYVHWGYEFDTDGGFLKLGKA TDRGPVVVGGPKSAEA S S LRYPPRVTGELGFAALPALLRA S DFGPTL K K K K SGVYAVRTASLFGMGADEQWWRMNKA TEYGPVLSMPWSAQKAYTLRDA NRNNTRSVDTWLDIGRA SKFGPVVQWDWDDKFAFSLRDA NDENDRVLQQWYSMDKA SHLGPMMEYPWNGLTGYAFHDANASNDRLLDAFFAMDRA ASFGPLVDPNDPKQKRDALRDDVLLKTDKSTQTFFDLPYT SAHGPVI EAPTGT YAGRYAGMGEDRQ DEQYYRLNRS TRYGPVVTSFGGDPLPWTATTAYALHDPNAADTSLALAKA TEYGPVI QSPWTTTKAYALA DGNARDTRYDRQLI GMGEA TERGPVIAGGPEGPAALALRYPPRVTEDLGFSALLPLLRA AVWGPILHE NADGSLLALRWAAQLPGA LLDFAQMSSA TIHGPVIEWQGEKFAVSYTSARPTFE MI FDWLLNKA YSQGRLMSE KAGYGLFLRWPADNPSGDITFYQLAKC TAKGPMVEAPPWDDGSAFMIQDANMATMDPVDHWDAMNDA TNYG VTHTVDGKPVAYVALRSTYRHEADSIDGFQMLNDP TERGPVISSDEPPEVTVSLRYPPRVTGDLGFAVLPALLRA TQAGPLVRD LDPGGALALRWVGHLPGALLGLSDFARA S EHGPVLE TARGPLVIGGPEGPSGFYALRFAGLQEVRAVEQWYEMGKA TNNGPLIGRIGN IGGIMNWDASSPSTLIAEILLDQA SKQGAVMAGVVWNTTEATVLGDPNRTNTRMLEQWI AI GRA SPHGPVLTDCAADGRLCGLSLDRWAGHWPTDEDTSFLLMQA TERGPVITTAPAGASAIGLLRHPPRVTGDLGFSALPALLAA SDHGAVIDT SDGPIAVRFAG HDEVRQLDQYVALGRA SVHGPVLETDH GVFAI RYAGMGEWRQPVVQYWRLNHA TNNGPII ARSGD LGI SMNWTAS IPPSPDLAEDKLDMS TERGPVIAGDDGTPLALTLRHPPRDTADLGFRALLPLLRA

 SEYGPVREVAGRLGKRYAVNWVAHAAEA NLNPAL ESAD S E YGPV
S K E K TRYGPVQSTVGGKPVAYTALRSSYFHEVDSLIGFQELNDP SKYGPVRT $\square N G K R Y A L A W V A H Q D Y A V N M S D M E M A E A$
 TRYGPVVTAMPWGSTAYSVHDVNAANM RALNTWFGLD TVHGPVIEAEHGT YAIRYAGRGEIGQ LEQYYRLNKA TRYGPVLNDVGGFPVPWTAKSAYNATNLRGLNTWDELDQA

 SDRGPILESSTPTTRQYTTSLNWVMKDGPTSAGTLALMPM
 SSFGPLMTIPGAFEWGMDLLHDANDPNWDIFDHWLGLNDAA
 TRYGPVVPLPWTATTAYALN DPNAVNLRSADTSLGLSRA SQYGPV KTMNGSRYALA WVAHQDYAVNM SIMEMAEA THHGPLDSDVYKEDRALALAFASVAARAHPADNFDKLNSA TKYGLVTHTVDGKPVAYTMLLRSTYRHEADSIVGFQMLNDP

## S E

 TP $\square G Y V V E D Q R W D S K N A Y V V R D T N L N N L E G \square D H W L A M N R A$ T DRGPVI A GDDGTPAALSLRYPPRVTADLGFGALLDLLRAA K GAFA I R H A GI GEVAQV E QYYR L NKA THAGFLEADSENKNDGHYLSMAWSCRKAKTLKADIDLLYA
## UniRef90_Q4USS9 UniRef90-A3WA44 UniRef90-I2NBK5 UniRef90_F3NKI7 UniRef90-T1BPM0 UniRef90_UPI00037B3D01 UniRef90_F8EBY1 UniRef90_U1JKB1 UniRef90 B0SXX8 UniRef90_UPIO002F30FC7 UniRef90_E6UY79 UniRef90_C7LXV8 UniRef90_J2LE22 UniRef90-J2LE22 UniRef90 N0CQB6 UniRef90_Q6SGZ9 UniRef90_UPIO0038088D7 UniRef90_E1SLP5 UniRef90-A1SBI6 UniRef90-M9T109 UniRef90_UPI00037C99E7 UniRef90_UPI0002D48038 UniRef90 A0Z672

 UniRef90_UPIO0036DCC0C UniRef90-D6Y9W6UniRef90-L1KYI8 UniRef90_UPI0002E58A84 UniRef90_D6B0R1 UniRef90-A0A021W3W6 UniRef90-D6PCG0 UniRef90_UPIO00476D350 UniRef90_C0QH53 UniRef90-J2JSK6 UniRef90_A4X800 UniRef90-C0BN05 UniRef90-K4QYB4 UniRef90_H1S833 UniRef90-F3ES44
UniRef90-H8MXN9 UniRef90-R4Z2D5 UniRef90-D2VR61 UniRef90_A0A059FDI5 UniRef90_UPI0003C74AE1 UniRef90-A0A023NRH0 UniRef90-V6K8E3 UniRef90-V7ZDQ2 UniRef90-Q9YFA5 UniRef90-V6MK44 UniRef90-A0LOM1
UniRef90 S4AM67 UniRef90-F4FHH3 UniRef90-G7UPY2 UniRef90_UPI00040B0665 UniRef90_L8PA93 UniRef90-TOMZQ7 UniRef90-UPI00035E84F3 UniRef90-A6GMG7 UniRef90_UPI0003729FAE UniRef90_UPI0003797477 UniRef90-R0EG82 UniRef90-TOM2U9 UniRef90_UPI00035FCB27 UniRef90-K9D4P3 UniRef90_C9ZDM1 UniRef90_UPI000475EE34 UniRef90-A0A010P5A1 UniRef90-W5W2A1 UniRef90-D8HT09 UniRef90-K7A1U5 UniRef90-D6R1Q1
UniRef90 Q08Y87 UniRef90_UPI000372E963 UniRef90-UPIO00375F18E UniRef90_UPIO00479FEE1
UniRef90_UPI0003168654 UniRef90_L8GZI2 UniRef90_B4UFS4 UniRef90_AOYAE6 UniRef90_C5A8L7 UniRef90-F7RXH7 UniRef90-V4L7M5 UniRef90-TORUD2 UniRef90-NOCQK4 UniRef90_V5B6D1 UniRef90-G2P8C4 UniRef90-UPIO0040F260B UniRef90-V4HNM2 UniRef90-UPIO003675F16 UniRef90_UPIO003B6E923 UniRef90_TOCE75
UniRef90_UPI000416F090
170
180
190
200





 D TVVD D A LAA LAASNVGIPQNLMVVDS LGNAA WKNDGGUPAR T
 $R N V T E L D A A M G N Q M P W D N T I A A A R D G N A M Y A D L G V V P D V B$ T S V $V$ P R L R E S L RTVADLDTALDGWVEPVNVVAADTTGATLHRVAGHVPVRP K N F E Q WRAAVANHIGSFNFVYANRHGDIHFIMNAQLPIRA
 T DLES FQQAFR DYDGVIDNTMYADAEGNAFY THVDE GLKLT RHTGUP QNMLIVDEAGNAAWRLTGAISARD T DVASF QEAAQH $\quad$ SNYAFNWFYADSR DTAYYNSGGNPVRA $R R V R D V D R A D D A$ WA EPDVVVAA DTEGGGLDRRVAGRVPVRA
 RSFEAWQDAMANHIQSFNFVFAGEAGNIHF\|HNAQMPKRV

 RSTADVLKTLARYQPWVNTVAADSAGHTLFTQSQVVPRIT $K$ N V G E V RTVA DVSAAVD H WVEPVVNVLAAADTEGGLLHRAAGYVPRRP Q S V D D A M S I A R DVA L P Q NLVVGDRNGKI GWRLLGMPIPERE T N F K E F E D ALLK L L G I P F NIVVYA D K E D N I F Y M S N A R L S VR D $D V A A L R R A Q A A H Q G M P F V T L A A D A A G Q A Y F A D T S V V P H V T$
 $R T V A D D V A A D V E W V E P V N V V A A D T T G G L D H R V A G A B V P V R A$
 RRTADVDRAFDHWTEPVNVVAADTEGGLLHRVAGKVPQRA R DVA G\|RTADRLGDPWVNTIAT DREGRAMFADVSVAPNVS



 GSVRELKRTLA QTMVWVNTIAADAGGEVLYADYNABPNVP RTVAADID RALD H WA EPVNVVAA DTTGATLHRVAGRVPVRA A DLQAAFAVAADRSGDPQNLVLA DRS GRIA WRLIGARPARN S S V R D A LS A QRYF YPP QNMVVA DSA GNI A YS PVGAYPERA H N WT S F REA L R QVK NSPMMVVA D DH G D IGLQQSMGY IP KR H
 $R T V G D L D T A L D D W V E P V N V V A A D T A G G L L H R V A G R V P R R H$ GDLDAALGMAET IALDRNLVIADAGGRMAWRVLGPLPRRT ANMQEWREALEQNGVSFNI TYADKE GNI GEVYNARMPKR $R R$ VA D VDR A V D L W A E P VN V L A A D T E G GLL L H RVVA GRVP VR S N Y S QML NALK YWGPAPPQNFA LVSHHAGY DTAGGYPLIR GSATE L KAAALDKYAPWVNTVAA DRA GNALYAADASVVVPMVR ENVEQLQQAMHGVVTPDNVLGADDSGNDGHVLAATLPKRP $R T V D D V D R A F D R W V E P V N V V A A D T A G G L L H R V A G R V P D R D$ TNVE EFMAAMK DHALPI NYI YGDKDGNV GF IMNAQYPNRK RDMAE WRAADATHA DLNYVYADKA GNIGGVMNGQYPNRA $T N Y S Q M D N A L R L W E P P Q N F V L A G A H \quad N T G Y I T A G L Y P T D N$ $R R V A D V D R A F D L W V E P V N V V A A D T E G G L L H R V A G R V P L R A$
 $R V V A D V D R A F D A W A E P V N V V A A D T R G G V L H R V A G R V P R R G$ SMADALAVAAAMGVPA QNFVAGDDQGNLGWTIAGPLPRRQ
 K SAA DF QRAA QD DNFTFN WFYADSK D DA YFNSGANP VRP

 RSTTE LQQA $\square$ A Q G $\square P W V H T M A T D A E G S V W Y A D A A A T P N R P$ R NTK GVAQALRRQSPWVNTDASDSQGHALYSDAQASPNVT RS LDDFMAAMAMNADP N Y I YA DRAGNDAFVHNAQYPDRM
 K TVAA E F H D IAARNVVPLSAN WLNA DR Q GNDGYQQS GRDPAR D TGGIDDEFVTAMRH F DVVS Q N F C Y A D D A G N I A Y F T H S A V P V V R E S NSEEF GNSLDDVCPLVVNNIICVDQD DNLRRFIAAATIQKRP


 RSTA GIGERALHRSQPWVNTIAADRSGNSFFSQSQVLPRDT $K N L T E A F A D A D R V R \square P Q N F M L A D S Q G N A G W R P D G A V A A R T$




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

UniRef90_Q4USS9 UniRef90_A3WA44 UniRef90-I2NBK5 UniRef90-F3NK17 UniRef90-T1BPM0 UniRef90-UPI00037B3D01 UniRef90_F8EBY1 UniRef90_U1JKB1 UniRef90-B0SXX8 UniRef90_UPIO002F30FC7 UniRef90_E6UY79 UniRef90_C7LXV8
UniRef90-J2LE22
UniRef90-NOCQB6 UniRef90-Q6SGZ9 UniRef90_UPI00038088D7 UniRef90_E1SLP5 UniRef90-A1SBI6 UniRef90-M9T109 UniRef90_UPI00037C99E7 UniRef90_UPI0002D48038 UniRef90-A0Z672 UniRef90_UPIO0036DCC0C UniRef90_D6Y9W6
UniRef90-L1KYI8 UniRef90_UPI0002E58A84 UniRef90_D6B0R1 UniRef90-A0A021W3W6 UniRef90-D6PCG0 UniRef90_UPIO00476D350 UniRef90_C0QH53
UniRef90-J2JSK6 UniRef90_A4X800 UniRef90-C0BNO5 UniRef90-K4QYB4 UniRef90_H1S833 UniRef90-F3ES44
UniRef90 H8MXN9 UniRef90-R4Z2D5 UniRef90-D2VR61 UniRef90_A0A059FDI5 UniRef90_UPI0003C74AE1 UniRef90-A0A023NRH0 UniRef90-V6K8E3 UniRef90-V7ZDQ2 UniRef90-Q9YFA5 UniRef90_V6MK44 UniRef90-AOLOM1 UniRef90-S4AM67
UniRef90 F4FHH3 UniRef90-G7UPY2 UniRef90_UPI00040B0665 UniRef90-L8PA93 UniRef90-TOMZQ7 UniRef90_UPI00035E84F3 UniRef90-A6GMG7 UniRef90_UPI0003729FAE UniRef90_UPI0003797477 UniRef90-R0EG82 UniRef90-TOM2U9 UniRef90_UPIO0035FCB27 UniRef90-K9D4P3 UniRef90-C9ZDM1 UniRef90_UPI000475EE34 UniRef90-A0A010P5A1 UniRef90-W5W2A1 UniRef90-D8HT09 UniRef90-K7A1U5 UniRef90-D6R1Q1 UniRef90-Q08Y87 UniRef90_UPI000372E963 UniRef90-UPIO00375F18E UniRef90_UPIO00479FEE1
UniRef90_UPI0003168654 UniRef90-UPIOO03168654 UniRef90_L8GZI2 UniRef90-B4UFS4 UniRef90-A0YAE6 UniRef90_C5A8L7 UniRef90-F7RXH7 UniRef90-V4L7M5 UniRef90-TORUD2 UniRef90-NOCQK4 UniRet90-G4QLC2 UniRef90-G2P8C4 UniRef90-UPIO0040F260B UniRef90-V4HNM2 UniRef90_UPI0003675F16 UniRef90_UPIO003B6E923 UniRef90-TOCE75
UniRef90_UPI000416F090

210
220
230
240
A GCSPSGIIAAAASEPAPTGCLIPWDEAPALIIDPPSHRLWTA KANWRG LLDGTRSDLIWNGPVEYERDPKLI NPPSGWI YNA RENLLRTVPAWEPRYAWRGWRPPP RAAVGADAVMA PANRLRPVPAWEPRHEWQGWARTPA EPVQGFAVMA A ANRVRPVPAWEPGHEWTGWHE TPYGDLDDGLAVMA GDCHPVWPSWARGQCRWQGYLKPRSYPR ILDPKGGFIWTA DANRVRLVPAWEPGHEWRGWH ETPRAGDDDGVAVMA PAYNWKSTLPNTSKTLWTAYHPLKELPQYVNPAGGYLFNM
 E GVDWSKVLPGDSDLIWQQGRPASTIPQLWNPKSGYVYNS KPAQDP LP SFRYDKAWGQQARDVPFIINPKRSMVWTG ADAGLPVLDGSRSACAWPGVIAPARMPVVVTP DYVQNS RADPWLVMNG NGTEQPDGAIPFDAVPESNNPARGFVFSA A GARSQCALQQSAANTPQPGDFAGKQMPQLEARRDYVHNS YENRLRVVPAHDPAYAWREGGEP LPRTEVDTATGTAVMA PGWDWQQYLPGDSDLIWNAYYPTNALPQVTNPRSGFIHSA DGQLKRCLDGSTSACAW GSDPDALVPGLYGPAHDYVANS E QA GFT IL P GYDSTY GFDGAVPYEEAPKLL R R D F FVQNS NPTQTAQSADGWQADRWA VPAEDVPVVSNPANQRLWSA E GVDPA LVVRGEPEYEWRGYDPADQTPPAEHPQQDYYISW
 KPSD V P V V S SRFDDA WLQQARDLDSRVNPKDQRI WTA

 D GSRGDCALGSDADADVPG $\square$ FGPAKMPTLKDAP YVENS AEKAKTCATPDAGACDWDGTPVPGLMPQAATTVRSWLTNS AANRLGPVPAWEADHAWQDPEPLPEAPAASWAEPGDAVMA GDCATT LAVVAVTPPTCPPWT $\square Q T Q D A P H L I A P P S G R L W T A$
 DEQARRCRAADDSACLWPG $\square F G P A A Q P R L A R T D Y V A N A$ A G EWRDPQGAAGDPLEWDADVLIQRSTDRNAARGFYGGW PDVDPALPVKADDAYEWKGYDPADYTPPAQHPDQDYY I S W PANGVRVVPAWEPRYAWSGWRSMPRATVT DVVAVMA
$\begin{array}{ll}K G Y D W Q K I V P N T K K T L W K D F Y S D K D M P Q Q L Q P S S G Y V Y N T \\ E A N R T R L V N W E P G H D W R G W H E T P Y G G F T & D\end{array}$ A GTGMVLLDGT RASCNWTGGTAPNAMPVLV RDDVVANS A GTELIVVLDGSRRSENNWDGGVPSSRRQPQLL R S S DFVVQHS



 HANRLHPDVA WHP GHDWHGWHK TPYAPDV H D G I AVMA A GCSPS GTAAVVASEPAPT GCVPWDNAPALIDPPAAHRDWTA TNTGF LPP F DGSAGEGEWRGFKPYSSLPVLVNPPQGFVATA
 DG GDP SFPVK A QQAYEWRDFDPKDQTPPAE HPNQDYYIS W $P D N G L R V V P A W E P A Y A W Q G W H S M P K R P V D Q Q \quad V A V M A$ PGCGAEHHVLPGASPAATACVPWSEVAALADPAD GRLLWSA E GPDWSKALP GDSKLIDWQDYREVSELPQQUWNPDC GWL F S A AANRTRLVPAWEP GHDWQGWHE PPPRGGLTDGDAAMA ETLPD SLLNGSNP QYRENGYVPFNY LPRAVNPSRGYMFAP

 A GWDYS GDLP GDSDLIDWT DYRPYSDTPMLFNPPSGFDYNA V Q A D WS GI L P G D S DL I WQ G Y L P VE K TP QL WN P K S GLLV F N S EPN GQKVDVGSNPAYRDTGQVPFKY LPQQENPARGFAFAP E A N GT RLVPA WE P G H E WT G WH F EMP R A GLT D G V A V M A A EGQGFPDLA A GS A A Q T WSEA LP YADYPR RVNPADGQITTA RDNRTREVAA WEPGHEWRGWHEMPYGTVV EDGVAVMA PGPASSFPLALDGAAAWQGWLTPAEYPRVSNPADGQLSTA
 S DVDPNMPVWGD QGHD WVGWTPA S QHP QSI N Q D Y YVS W

TPTLSAIDEEHYS DLWWQQEPNLPSHINPSHGRLWTA S G GDTA AVVP T RT S EA WT SFVVPF DS LP QLL NPK G GYV EN S
 P G WD WR K DLPP G D R T DLLWE D YL P F DEEVPMMLDN PES GLI F N A PGDALAD LD GAKSSCQW GSDDPGAVVPGGVAPRRDYELNT D GVDADFPVRAEAAYEWRDWDPAANTARYTPPDQDYYVSW P SVNSALPLGWKASHRWNGSVDTNQLLQVINPAKGYLATA D GL P P F Fil R D GT GGNE WLEVVVP LEEELPHVVNPPA GFAINA P NQDSHGVTGSVVLAA WRHEYNFDELTVEYNPECGYSLTA A A A A A A DGAA W QAVLPPEAVPRVVDPAAGQLWSA PGQAPFTLVPGNSEFRPLGKVPNERAPRLRRRNDFVQNS VAAPEFFADPANPDHQWATLLDDSEEDPALLNPEQGFLAST GAGMLPLTAWEKENRWKGI HPPSVLNNFDNPSKGYIVTA DGSQSACALGRDRDAVQPGIFGPGRMPTLKNAP YAENS TP T LIF A DDEK DYSE LWWLAQEAAALPTYINPSHGRLWTA P DGGGGDFRDGSKSSADWNGVVPTEALPHVMNPPQGFIATA A DVDP S LP VKG EAA YE WRDFDPAAATPPAE HPDQDY YIS W $K P S V T A Y P$ Q V VQYDSRWAKSEGQRPVVYNPDNQRIWTA A ATRMAVLPGTSSALVYQQEVPYERAPKLR RNDYVLNA TANRLRPVPAWEPGHAWTGWH TPPRAGLTDGVAVMA PGFDWK GVLP GDSAALWT GYKPWVANPMVVDPSSGWVANA A HS GLY PVEGFFKQN WQGYYE GHQLYHFKNPD
UniRet90_Q4uss9 UniRef90-A3WA44 UniRef90-I2NBK5 UniRef90_B4V535
UniRef90_F3NKI7 UniRef90-T1BPM0 UniRef90_UPI00037B3D01 UniRef90_F8EBY1 UniRef90-U1JKB1 UniRef90-B0SXX8 UniRef90_UPIO002F30FC7 UniRef90_E6UY79 UniRef90_C7LXV8 UniRef90-J2LE22 UniRef90-NOCQB6 UniRef90-Q6SGZ9 UniRef90_UPIO0038088D7 UniRef90 E1SLP5 UniRef90-A1SBI6 UniRef90_M9T109 UniRef90_UPI00037C99E7 UniRef90_UPI0002D48038 UniRef90-A0Z672 UniRef90_UPIO0036DCCOC UniRef90-D6Y9W6 UniRef90-L1KYI8 UniRef90_UPI0002E58A84 UniRef90_D6B0R1 UniRef90-A0A021W3W6 UniRef90-D6PCG0 UniRef90_UPIO00476D350 UniRef90_C0QH53 UniRef90-J2JSK6 UniRef90_A4X800 UniRef90-C0BN05 UniRef90-K4QYB4 UniRef90_H1S833 UniRef90-F3ES44
UniRef90 H8MXN9 UniRef90-R4Z2D5 UniRef90_D2VR61 UniRef90_A0A059FDI5 UniRef90_UPI0003C74AE1 UniRef90-A0A023NRH0 UniRef90-V6K8E3 UniRef90-V7ZDQ2 UniRef90-Q9YFA5 UniRef90_V6MK44 UniRef90-A0LOM1
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UniRef90-A0A010P5A1
UniRef90_W5W2A1
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UniRef90-K7A1U5
UniRef90-D6R1Q1
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UniRef90_UPIO003168654
UniRef90_L8GZI2
UniRef90-B4UFS4
UniRef90-AOYAE6
UniRef90_C5A8L7
UniRef90-F7RXH7
UniRef90-V4L7M5
UniRef90-TORUD2
UniRef90-NOCQK4
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UniRef90-UPIO003675F16
UniRef90_UPIO003B6E923
UniRef90-TOCE75
UniRef90_UPI000416F090

 NAR
NQR GPAARLGTEFAPPHRADRIRALLGGRPRWRAA NQR\|VDGR NQR
NHTPFNAT APADNLGYETFDNNRSARFAELMQGTGKLDYE

 NQRPVPGYPYY LGTSADYANGFRADEI AHVLSTTPHLGVR NDSAWLSNAEQPQTGFSGRGRDADDWLTHRVGADARIGPQ
$\qquad$
NQTPAADNP NNGPQYTN
NNSFWSTN
 NNKQAKGY N Q R
NSRAVSAS NQSPPDPSQHRRFGDGGYADGARSEQUKARLFEKNVFDAD NQSPPDPSSVAPNGGWQTRMTNRAVRGLSLFAQHNTVSEQ
 NDSAWLANADSEPFGVEFSPRYRADRI RYLLDRPVAWSAE NA NDSYWVSNPAFPHRQLSP L L GKYAT ARSLRTRSNFTET NER $N$ NTRTDDGDGLAGPLGTEFAPPYRADRDRALLTMARTGWRAG NNSPLSEENYDPTFSYREKENNRSLRFMEDIKDYDKLNFD NAGPWLTNPAAPDTGYPRVYGDTRTRDAERLSGGDRLGAP NNKTNPDYASGFNPGTAYGPFHRSHVIYDYFEEDGRLSFE NNKQAKDYDSAGFGNGSVHRGNLLDDRVRALTRDGGVTRA NERAVSA AGLGVFAPPHRARRDRELLDATAGWTAE NHSPF $\square$ SAGPENHLGFERFNNNRSARFQELI SGFDKVSYE NQR GPAAPLGVEFAPPHRADRDTALLGEEKHWSPG NDSSWLSNPSQKLTGFSPGPTEVAQRLRTLMEDGRRLSGE NDSA WMVNPAAPLKGFSPPLGQRARFALDRLGSLQQAGKV
$N D S Y W L P N P A Q P L T G F P D G G E K N V R S L R T R L G E G Q G F T L E ~$ NDSHWLSHPDDPLEGYSVGCGLDRTRTRQNLGLAQALTQR NNK A EANPVTTITNDYSLLYGRSMRDQSLLIARKNITDS
 NASYWPLEGYSPMIGRERSPLNLRTRFGHLIAKDFGRSED NQR GLATPLGVEFAPPHRADRIRTLLDAHRTWTAD
NSRIVDA QLAT LGNAGYDLGARAQQURDDL FAKQRFNED
 NNKQAKDFSAS GFGMGAVHRGDLLDDRLVDEGGVTRS NERSISA GLGVEYAPPYRADRI RELLGERTDWRAE
 NQR GLLATPLGVEFAPPHRADRITALLLEEKDHWTAA
 NNRPSEVTGGLGFLFNGDDRVMRARALFNSQKRLS PQ NAR GLATPLGDEFAAPHRARRDAELDESSTAWSAA NNTPVSATDGPGNLRFEDFPTNRAMRILEETDGTSPIDRE NNTPFRASDGPATMGLQTNMTNRAWRALETFGTDHA TADA NQPTVGVNYPYPFIGGYWTSGGRAQTIYHYLKSHRNTTVH NQR
 NQRQMMGA NARVISAD
NDSFWLTN P
N NA QANGYA
NAA ANGAAAGADSAVHRVDLLDSRVKKLIASGTKVTRV NARVISADYRYGDGGYAVGARGLQIRDRLFEKKSFNEQ NDPPPLDRSKYPAYFPELRLGLRQQLALDLINNERKLNLQ
 NNTPYSATDGADNLSSDDFPTNRSLRIIELTGDGEPIGRE NDSAWLANAKAPDTGYPHQATERNPRTREALLTAERGGFT NNKQARDYTTAPWGNGSVHRGNLLDDRVKKLVAEGGVTRA ND D LQ Q PAPGAPKADNYHMGFYRVSRINELI ENKGKDTWD NNDPARPGGGDYY LAPGFDAGFRAGRITRRVKDVLA A GKM NDDTMEDRGSFP I HNYPTFNARAKRIQALLDEKISKNSH NNSFWLTNPDAPIDTNDFGPVNDQQTLRSRMAQKKDMSDT
 NNLIESE GFAKA NNAPM ESYRHDR VELL K K S STTQD NDSAWLTNAERPLTGYERVFGTTATQ RSIRTRGADEDD $N A R V I S A D D F L R Y G D G G Y A V G A R G L Q \square R D R L F E K Q R F N E Q$
 NARVMSDEDMDRFGNGGYAVGARGKQDRDRLLKKETFTEQ N NSYWLTNGYSPLYGHVDYKQTRRTRLNLMRFARGADGKF NQR $\mathrm{N} N \square \mathrm{P}$ WK A S NNR】QHE GPA T P L G V V E F A P P NDSHWLSNPERP LTGYGDEESTARSDRTM SGGVVAVEERDVE
UniRef90_Q4USS9
UniRef90_A3WA44
UniRef90_I2NBK5
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UniRef90_C7LXV8
UniRef90_J2LE22
UniRef90_N0CQB6
UniRef90_Q6SGZ9
UniRef90_UPI00038088D7
 ELERI KYDT A YVVRESYVDKMF DELEALEAE GDLLE EAR





 $R M G A A E L R S R R D R N L A G L L V M D D L Q A A C A A G G A A L N A D Q V C$
 SATMAAVHTDTHLASSRRLLSLL A WAPDLGPDAER LRR EA WELKHDND YSPNYRGMA FFKRVTGLSATTETQAQA
 D F
 DMPSIHMDTHLGSAG

 AAD Q GQQQFANRVVAA DLAVEDVARACDSDGKAVDVSEAC





 $D M A T I H T D T L L A S A D P L D E H D A A D D A L S P E A A G L R$ DGLLQAVLFRDRNLSGELVLDDLLNACLGTKDAD LSSGC

 DMAKV Q S D SVVSVLY LMN RNDFARMKPFTDTYKEGVRNDLA R L L S I K F D TA A A E GSAR QVI ETVVLA QD WS DEPDMAAAAAA


 D A GDMRD QLDVEDL GLLKT LVVS MVRVASGD GGHVLER YM TFRQI QDDKKDVFAQRALAFLLPYVPED
 QMASV HTDTYLAAAGPLLDDLLADVV DGLSAPA A L R ESALLAAVQLDTRAVF LQQRWWAL LQDQARQAPA GSALLRALA E L L R YR SDTRYHPQSA DMQMVVQLVATPSDDPLIAKEAQ DMPAI HMDT QLASAA APLLDLLSADGTLSPEAARDR NMMAL QSNVTDYWASQFNPIILKAISGMSMNSSEEEAY D L Q TLAFANRIIH A A E LVLP EFGLPMCQASP DTV DQQAC $A L L A L Q L D V T S P L A D Q L S S Q L A E F C R P H L L N S E Q T V L C$ $D M P T I \quad H T D T H L A S A A G L L A V V E A V G T G G S A E G A V A E A$ $K L L A!K Y D T G F V G S \square A D E A L K V V L A$ EKFDEGSVYAKAG SFRAHKFD DAFSDRSSVMDMVREVTA DDPKGDADLA QAQ DM MNLQSNVSDYWASQFVPVILVSLSSMSMNTSQAAAY DMPA $\square H$ T DTQLAASA APLLDRLSALDDLSGPAAEFR RRAFD GALDDRAALVVGQWRQRALAA LDAQA LAAGHPARAEF EMPAL HMDTHLSSAGPLVDRLAALDDGAAHGSPATGNTA

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

 GF TEAN MRELLFR DTS RAAVLAGGRETARLCA ELEPGTPAC T D SMMK Q MLLFA D H S L F A D LAA A A D L A K L C A S F P D GLAA P S S A C A LVVKAMA EAG LIA DL R A E DVVPDDLLKVIDESAPDVTDPAAAAV E EDMKRF QLDVVSKQGEYYMELL APILKAKPNCTS T F E Q M Q S Q A DVV LLDD A EA LVVP YL A A A L D HARREGAPAP LA

 $\square E S T Q K Y Q S D L I S Q Q A R N F I S K Y K E I F C R H E K T$ A A MAERGRLRVVSLERQQLAN RAPTGDLVAADVAKWC D F Y S I QMDND ARFIMPWHTKLIDNLLGNNEKRYADU

 D R H ELE S UVTGTSASFELYKPTVMATCATETMSMPVDPAC DMPALHTDTHLASAG EA LLRDKFDKAYSRSSPAGKWMLAVLADDTNGKPDLAAEAQ M F K Q M Q S D T F S R Q A D L Y $\square N V F H S V F E K N$

UniRef90 Q4USS9 UniRet90＿A3WA44 UniRef90－12NBK5 UniRef90－F3NK17 UniRef90－T1BPM0 UniRef90－UPIoo037B3D01 UniRef90＿F8EBY1 UniRef90＿U1JKB1 UniRef90－B0SXX8 UniRef90 UPIo002F30FC7 UniRe990 E6UY79 UniRef90＿C7LXV8
UniReffo－J2LE22
UniRef90＿NOCQB6
UniRet90
O6SGZ9
UniRef90＿UPIoo038088D7
UniRef90＿E1SLP5
UniRef90 A1SBI6
UniRef90－M9T109
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UniRet90＿UPI0002D48038
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UniRef90－W5W2A1 UniRet90＿D8HT09 UniRef90＿K7A1U5 UniRef90－D6R1Q1 UniRef90－Q08Y87 UniRef90＿UPI000372E963 UniRef90－UPIO00375F UniRef90 UPIOOOO479FEE1 UniRef90－L8GZ12 UniRef90－B4UFS4 UniRef 90 －AOYAE6 UniRef90－C5A8L7 UniRef90＿F7RXH7 UniRef90－V4L7M5 UniRef90－NoCQK4 UniRet90＿G4QLC2 UniRef90－V5B6D1 UniRet90＿G2P8C4 UniRef90－UPIo0040F260B UniRef90－V4HNM2 UniRef90－UPIOOO3675F16 UniRef90－UPIO003B6E923 UniRef90－TOCE75
UniRef9O＿UPI000416F090

TATRQWDGHAStGSASYR ${ }^{3340}$ VRG
350
FRSMT $\square \mathrm{DADQ}$

ERLLA WDRHMAAGSTDATVFSAFRT
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DVVSHWQACACIGSVGYRVWKFRKLVFHAVLRPFDRLVRK
ETLRQWDRRTGPESKGAAVF
TELENWQQCACASSVGYT
A ThGWDRTDDHNRAAALAS
TALENWQRCACADSVGYTLVRKY RDT信M
RVLSAWDRTSNADSKG AALFREFWR
SA ASWNDQMGASSQA Y Y FAASVWWTWDGYD DRDDFG SARRQWDRRTDTDSGLGY贝YFAAA DRLLSWDRHMDADSTDATLY ARLRADVVHRLAGHPAL AVLKAWDRSTDKANRGAALGVCV
ATLARWDTRADTTSRG AALAQWNGAQNLDSVAGALLREFGYQFNSGLLSVPFD YT KALASWGGCACSDSVGYP QQLRAWQRNQSAAGSKAYAHSDAVR $\square$ MDA WWPKLVRASFE DRLDAWNRRMDADSAEAAAYSA
KEI EGWQGCACADSVGYSLVRGY
RAI REWDRATDKGNQNAPLGVCl
DRLLRWDLRMDAGSADALAYARLRSAVVRALAAHPALAPL DRLLAWDRRMEAASTDATAYAAVRAAVVRRLAAH PAL GVLKAWDRTVDTDSRG KALAGWDQRFETQSRG A ALFRAFWPKAARLPGL ERLLA WDRHMETGSVDAARYAAFRAEVVRLLAAH
TAAKQWEGRAEPGSVSYRLVRNWRRAVHTRLANGLTAPAQ N I K NWNKKGGYNNLGAAQWS
ATLAAWDGRARLDSRGA WAWGMDRALDWREF DLMSDWDGHFVSGGPDFWAWGMDRALMDVWDRKVINMTFA QQLEAWQRRETAAGSHTYAHPDAVRLMDAWWPQMI EAVFK TRTQNWDRKSDRWDRRMAADSADAGAFAAVRAALVRRITA EELDAWDRHMDADSRA AALRKWDRHSNLDSRAA A ALYAAVRSAVVRRLAA AALKAWDGRADLNSG
PVLAAWDLLKGDLDSRGELLWRVF DVLTAWGDTAGLNDPG TA LWRETMATIGA N NWDGDMKPDSK $\qquad$ Y A
LAEWDFDMDMSSRHA RVLAGWDRRMDTGSRG
 LLFDRFWLMLQRESRG保 KMLA EWNPQMNVDDYKPTL A ALSQWDGD DNDSKGGQQLAASRLFDVWTQHLTTDKVLG AALKAWNGKQDNDSKGG ALGREFAHQFSQKTML QQLEAWQRRETARGSHAYAHPDAVRVMDAWWPRLVEAAFK DRLLRWDRRMVADSVDA SAAHQWDGSASVDSVSFRLVRAWRLAVEDGLTAPARAALG EVLRNWDGDTTKENRGAA
RTLLA WDRRMDATSEA AALYAAVRSAVVRRDAA
SLLLSWNYSF YEPMKNPTVYQYVTAAFYNDTYD MALAGWDRKADLDSRG SGAYADSFAALLFFEFFWN

EHMRGWNMRDDVDRRGA KlLRAWDKKADVHDRGAA SILSQWNYTSYVNSTGET R VYWYYLSELYNITFD RRLLSWSGRASVESTGYRDARDFMWSVHDLLYGGVNAALK VGLSPAAAADRDRLLRWDRRMEADSVDAAAYAALRGAVVR ALLKNWSGRASVDSVGY RLTRAFMWALHDLVFE
 TALANWDLRGNLDSRGAVL ETLVQWKNCACTESIGYTLA RRYRSTVIN DMI ARWDKTVAPASRGG VDFEMWWRKYDDHTRP AALAAWDGRFNLESVGPPLWREFLDTFGLEALTQAGTLFA LLLAEWDRSTDRANR HAALGVLTVVQEVRSSFD AALANWDHTYSLDSRGS YTHADLEQRFAVRLGGVSRF DRLEAWGLRTETSAGSKKYTHADARTLDAWWPLLVKAAFE A GGEGWDGKDSPPPQAEVDAS DAATIYSTWRGQAIRNVD ELLENWNFRAGLDSQAACDY YPLMDKQWSMQFMHKVLG RRLL MQRWDVRASVASVGYRLARGFLYTLADDVFG AALAMWDGRMNKDSVGALVFREFA
DALEAWDGRYTRESNGAVA KRLCQWDFNYETNSK AALPG GTAAGSSGTAVDVSAACPVFEEFYRVLIRKFFS K M M WKNCA APESGGYTARKYRSTVINSLDAPDYNRMQD D LLRTWDGRMNVESVGATYGHAVYEVWMQWMLQDGFK
 $K A F A K W D G K F N A D S V S A P L D A$
$D R L L A W D R H D A D S A D A A A Y A V R G A V V R H L A$
DRLLAWDRHMDADSADAAAYAAVRGAVVRHDA KRLLAWKRHYDVDNCDATASAS

UniRef90 Q4USS9 UniRef90-A3WA44 UniRef90-I2NBK5 UniRef90-B4V535 UniRef90-F3NKI7 UniRef90-T1BPM0 UniRef90-UPI00037B3D01 UniRef90_F8EBY1 UniRef90_U1JKB1 UniRef90_B0SXX8 UniRef90_UPIO002F30FC7 UniRef90_E6UY79 UniRef90_C7LXV8
UniRef90-J2LE22
UniRef90-N0CQB6 UniRef90-Q6SGZ9 UniRef90_UPI00038088D7 UniRef90-E1SLP5 UniRef90-A1SBI6 UniRef90-M9T109 UniRef90_UPI00037C99E7 UniRef90-UPI0002D48038 UniRef90-A0Z672 UniRef90_UPIO0036DCC0C UniRef90-D6Y9W6 UniRef90-L1KYI8 UniRef90-UPI0002E58A84 UniRef90_D6B0R1 UniRef90-A0A021W3W6 UniRef90-D6PCG0 UniRef90_UPI000476D350 UniRef90_C0QH53 UniRef90-J2JSK6 UniRef90-A4X800 UniRef90-C0BNO5 UniRef90-K4QYB4 UniRef90_H1S833 UniRef90-F3ES44 UniRef90-H8MXN9 UniRef90-R4Z2D5 UniRef90_D2VR61 UniRef90_A0A059FDI5 UniRef90_UPI0003C74AE1 UniRef90-A0A023NRH0 UniRef90-V6K8E3 UniRef90-V7ZDQ2 UniRef90-Q9YFA5 UniRef90_V6MK44 UniRef90-A0LOM1 UniRef90_S4AM67 UniRef90_F4FHH3 UniRef90-G7UPY2 UniRef90_UPIO0040B0665 UniRef90_L8PA93 UniRef90-TOMZQ7 UniRef90_UPI00035E84F3 UniRef90-A6GMG7 UniRef90-UPI0003729FAE UniRef90-UPI0003797477 UniRef90-R0EG82 UniRef90-T0M2U9 UniRef90_UPI00035FCB27 UniRef90-K9D4P3 UniRef90-C9ZDM1 UniRef90_UPI000475EE34 UniRef90-A0A010P5A1 UniRef90-W5W2A1 UniRef90-D8HT09 UniRef90_K7A1U5 UniRef90-D6R1Q1 UniRef90_Q08Y87 UniRef90_UPI000372E963 UniRef90-UPI000375F18E UniRef90_UPI000479FEE1 UniRef90_UPIOOO3168654 UniRef90_L8GZI2 UniRef90-B4UFS4 UniRef90-A0YAE6 UniRef90_C5A8L7 UniRef90-F7RXH7 UniRef90-V4L7M5 UniRef90-TORUD2 UniRef90 NOCQK4 UniRef90_G4QLC2
UniRef90_V5B6D1 UniRef90-G2P8C4 UniRef90_UPIO0040F260B UniRef90-V4HNM2 UniRef90_UPI0003675F16 UniRef90-UPI0003B6E923 UniRef90-TOCE75
UniRef90_UPI000416F090
 AEYNNGNSPSI EEHLRNEVDHLMEHFGRDDPPMSDLLRLR

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

## A A VP R T G Y A LDes LLTVG

 $D P M N T P N T L V T D G R A L V A L A V A S E N L T R N G F A L D A T L G S L$ D SLLFAP LQ T RLA E E GL SLSSKIK GNLEVSVWQLLRQQPESW
 DQLAFAPDESQLAAQNLS LAALDERQLEDALWQLVQAQADSW

 WAVP
 VALGKPEFKQLEGVVWPLLEQRPANLL PRNEASWDDLL

LGGNVPHRRPDGTPAPPD SWWKVPFDAA DELAVD DGSGNMVLKESKQULFNVLLHGLAGSESG PGLGGDLYDADRANESPSAGHGPTGGHAGSAFQYGWWSYA H PALAALADPPAYPEVFAPWLALAPRVGTALGALLAPDAL EA H PAFAALTTAPAYPEVLLPWMALVPRDGFADEHLLR A DEFNSTDPVNTPRGLRMRDESVRTEVFKALKDAVQAMRT
TAVGATGGPYLVPFNANDPVNTP RTLNTLN ADLRNAGTLFKVPFDPAAPLETPSGLATDH GALLRAV
 A GLWKVPFSAADPVGTPRDLDTDAPGFATALRGAVAELRA EDASNAAALWSVPFEPGKPLDTPRGL
HPVFAPDAEPPAYPEVLQPWLALVPRIGYADEHLLRAEEL
 ALLA SWYFARDFWESLYGSEEHWRFIKLEYAEKALKAYL KVLVRGSRALYTDFWP
TKGFDPANAATTPNTDTTDGSALVALAHAALNLEAAGFAL $P G L G P D G Y G A L T A D E A P S A G H G P T G A H A G S A F Q Y G W W G Y A$ A LAAAHPALAELTAPPAHPEVFTPWLALDPRDGYADPS LDR $S D L R M P A L P Q F E G T L W A L L Q Q R P V H L L P R A D S C A A L H P A P$
 K V L K E K Gl Y N Y T P C V Y I N T
A EIP NK WQVPP F D S S D P V N T P R S VA PAA GPA M L VA L


Q
 E I DP K A SAAAASAR $R L A A E P A F A A D A V P P A Y P E V F R P W L S L T V R I G F A L L E H L L R$ GANA ELAK LDD GKANVA LAATSRWPVV L GMLS M M L D Q Q G VNSRALLRGDEPAT TDDLWTVPFDPAHPATTPNTDNTASPAMRTALDADAVVQRMRA $P G M G D D \quad A Y N A M T G V L G \square N E S P S G W Q N G N G Q H T G Q P H K G$ $S L L G P D Y D G \square K D T D L A L K T A L R S D E P A D W Q L L D N E A M G W L$ DTMMYAVQWTAKAPASTTPTGDRFPDRSVVDAFKWAVDETATRR
 $\begin{array}{ll}L K V A E L G S S P W L V P F & D P G H P V T \\ G S S P P D P K A F R D A V E W L M T H\end{array}$
$T V P F D P K A P D L T M P N T V L N V G D A G L Q K A F G D A L A E \quad L D R A A G$ $P G L G T D L Y T A F T R N L P P S A A H G P T G A H A G S A F Q Y G W W S Y V$ $E N V G A V F Q W Y F D R V L D W D D N A F F D F T E D N A Y D R Y L W N E F L$
 L EK F S R NP T WAVP Y N F K Q P L T T P S G G L G S D A A A L R L L L A Q A V
R Y G P T DR D S L DHIF G A LL F DRFWRRAAAVVAAELWKVPFDPADPVRTPRGLLNTAA
 LHKFSDHALFVVAGGGFHALWLPRTEMLNHWRNNLLRALE SGLLGD GLYYDALVRANEAPSA GHGP TGGSHAGSSFQQYGWWS YA

 P K LRREVVDAMKATFGRLDVPLGDYQRLRH



UniRef90 A3WA44 UniRef90_I2NBK5 UniRef90_B4V535 UniRef90-T1BPM0 UniRef90-UPI00037B3D01 UniRef90 F8EBY1 UniRef90-U1JKB1 UniRef90_BOSXX8 UniRef90-UPI0002F30FC7 UniRef90_E6UY79 UniRef90_C7LXV8
UniRef90-J2LE22
UniRef90-N0CQB6
UniRef90- Q6SGZ9
UniRef90_UPI00038088D7
UniRef90_E1SLP5
UniRef90 A1SBI6
UniRef90 M9T109
UniRef90_UPI00037C99E7 UniRef90-UPI0002D48038 UniRef90 A0Z672
UniRef90_UPIO0036DCC0C UniRef90-D6Y9W6 UniRef90-L1KYI8 UniRef90-UPI0002E58A84 UniRef90-D6B0R1 UniRef90-A0A021W3W6 UniRef90 D6PCG0 UniRef90_UPI000476D350 UniRef90_C0QH53 UniRef90-J2JSK6 UniRef90-A4X800 UniRef90_COBN05 UniRef90-K4QYB4 UniRef90_H1S833 UniRef90-F3ES44 UniRef90-H8MXN9 UniRef90_R4Z2D5 UniRef90-D2VR61 UniRef90_A0A059FDI5 UniRef90_UPI0003C74AE1 UniRef90 A0A023NRH0 UniRef90-V6K8E3 UniRef90-V7ZDQ2 UniRef90- Q9YFA5 UniRef90_V6MK44 UniRef90-A0LOM1 UniRef90_S4AM67 UniRef90 F4FHH3 UniRef90 G7UPY2 UniRef90_UPIO0040B0665 UniRef90_L8PA93 UniRef90-TOMZQ7 UniRef90-UPIO0035E84F3 UniRef90_A6GMG7 UniRef90 UPI0003729FAE UniRef90-UPI0003797477 UniRef90-R0EG82 UniRef90-T0M2U9 UniRef90 UPI00035FCB27 UniRef90-K9D4P3 UniRef90_C9ZDM1 UniRef90 UPIO00475EE34 UniRef90-A0A010P5A1 UniRef90_W5W2A1 UniRef90-D8HT09 UniRef90_K7A1U5 UniRef90-D6R1Q1 UniRef90_-Q08Y87 UniRef90-UPI000372E963 UniRef90_UPI000375F18E UniRef90-UPI000479FEE1 UniRef90_UPI0003168654 UniRef90 L8GZI2 UniRef90-B4UFS4 UniRef90-AOYAE6 UniRef90 C5A8L7 UniRef90-F7RXH7 UniRef90-V4L7M5 UniRef90-TORUD2 UniRef90_NOCQK4 UniRef90_G4QLC2
UniRef90_V5B6D1 UniRef90-G2P8C4 UniRef90-UPI00040F260B UniRef90-V4HNM2 UniRef90_UPI0003675F16 UniRef90 UPI0003B6E923 UniRef90-TOCE75 UniRef90_UPI000416F090

PNVVTS WEQLLADAARDAQMDLAAQGEQPAERTWGAR QGDDLP LDGGSDTLRAST EAVREALDEDVADRAGRPDDVWGDRHRDTPWQADPGGAHE


NNKPASW $\square$ N PQFNSWDEQLAGAFDHTVNK LSEQFGT
PAGHADWNRFDTAAYVTMRDD $\square$ MVDTTGHVDGS $\quad$ QQARWGS LG DAVG V VTAGFAA

DVPLGVPQSREVR TGTMTPTADATPGDPHPSPSADATAADAQTATWLTSHLGS $R T S D P Q L A G K M K E T L D S V A R Q L A G$ L G LP YEDRLAMVAASAEAVAATHAASEEGPPSAWGE WGENRMGRGRLD G D EFAARDLPVDVELGAVQKWA
QFVEKSLPDGSASGARFPWSGANNFEGGFNVFSYSASGGD LDPEKMADWDSY LLQQ $\square Y R H N R A E L L S R H S Q A G K L A D L N W G K$ DKD
A GD KPDGTANWNVFFTTTYIDMRAMVDMTGHETGSLKALRWGD WGEVNRHGRGDTHYAMAGGPDTLRAAYAA
L VRTAAEETAAQLAAAAPGEPATWGEAHRLAPWQALAGE RDAVAE LVRAAVEEVAAAGSPSVPWGEAHRIXAPRALPDP AGl ALDAKLGDHQFAVHG ESLLTGGPVTEDEREAVEELEKAGDPLDAPWGDVQRVMAG EHAARDVIDDF G

KHTWGEHNTARIC
QPLTTPRG $\square D V T H P A V E G A D A D V V R R F T A A G \square P \square T \square T P G Q$ $\square V N N Y Y W F Q N V D S G A P Q A A D A I I V A A L D F A L A E L G S R$ DKD
PGLDAPALVRAALLEVAGSD $\square D P$ A $\square G R E A A R W G A$
AEE $\quad \square Y G V D R P E A V R A A L E E V A A Q P E G T W G D$ A G FALDAPLGQVQAATAP
$P Q V A Q A L G T A \square R T L R E R G D \quad A D D A T T G S V Q \quad G K$ DAAVVALGCAGVVLNTALSECQWADRNGKRVPVPGGSEGE QNCKSFSSDKTCLGYAK DQLEAVLVALRSKFSFVPSSYRIM
$W G E V N K L A R G D Q T W P I S G G P D T L R A V Y P A E D R D D G T L H M N$

$N$ TATSAPLEALQRAAER $\square G K A G V P L D A P L G D$ YG $\square D R P A V V R A A D E E D A S A R P S G T W S D T H R L A A W R A L P G E$ RSAQTDLAAQDGPLSERTWGERNTAADCHPIAR
RGEDWVF NYFPEGTLEGMVNRSVERAVKTSETFFSP
DAPDG DVQFVEKS $\square P D G T A S G A R \square P W P G S H N A E G G F$
DKD
A D DPGLDPAELVRTAAEQVAAADDTRRWGE ADDAQGWQRLLEAAAAGVRDDLSADAPRRTWGEHNTAK IC
$Y G V D$
NDPTSSWFNGNFTL
ENLT DAERDRVVPLCVDTAAD H
ATEAVAAPPATWGD
TMQKAFVMAIAFMDSKLGG DEAMLDALHIFNARLGDYQDD

NDPSSATWFNGSFNHTS
GDDRAATAFTREVSFLLRKLGP QGWLPAGHASWRDLQLAAVDRAIAALVDAGTPDAEATWGR SEE LYGIDRDAVVRQALEEVAGGTAGRWGD AR LLDARPAGWLPLGHASWQALQLAAVDRVDADSAATWGE

$S S F Q F G W W G Y V S K D \square R Q V L G Q P V A G P \square A Q T F$
PNEFTSYNDFLFASYESTKAELVKQYDANPDTLEGLEWGN FGAPDVAWGDVHRVRVGKVDVPVGGCNGDDGCFRVLWYKD GIEVNTPLGQVQYALRAGQRVPLHGGLGQEGVANVINYSN $H G R L D P E W G K V N R L V R G D T D V P L D G G P D T L R A D Y P A E \square R D$ LSPDAPLRD GQSVT R NGE
DKD
ADHEDPGREGKDAAAQARRSQLLERVVDEYLVPRERTYGS VPGLDASPADRRDLVLLKSLADALALLSGPDFAPAFGGST CDEVKKLIDNLDNEMGDQW QTILAAGFSVLDPLGDVQFVERSLPNGVASGNRLPWGGAN A ITDAAADFDPATSWGEVHVLRLTHA L
EDDQKLW FSEKSAEDYILEMADESVTPSQDPWSEVNKL PGVGKALADTLTELKAAGU
 DKD
PKEYASWPAF LA DAYRQSKQRDFDNYADGKQDFAALRWGK FA ADAPLGE LQFLQKGDRR DPWPGSPH
$N P Y G \square D R A E A V R A A L E E V A A E P P A G T W G D T \quad H R \square A P W R A$

UniRef90 Q4USS9 UniRef90_A3WA44 UniRef90-12NBK5 UniRef90-F3NKI7 UniRef90-T1BPM0 UniRef90-UPI00037B3D01 UniRef90-F8EBY1 UniRef90_U1JKB1 UniRef90_BOSXX8 UniRef90-UPI0002F30FC7 UniRef90 E6UY79 UniRef90_C7LXV8 UniRef90-J2LE22 UniRef90-N0CQB6 UniRef90 Q6SGZ9 UniRef90_UPI00038088D7 UniRef90-E1SLP5 UniRef90 A1SBI6 UniRef90 ${ }^{-}$M9T109 UniRef90_UPI00037C99E7 UniRef90-UPI0002D48038 UniRef90 A0Z672 UniRef90-UPI00036DCC0C UniRef90-D6Y9W6 UniRef90-L1KYI8 UniRef90-UPI0002E58A84 UniRef90-D6B0R1 UniRef90-A0A021W3W6 UniRef90 D6PCG0 UniRef90_UPI000476D350 UniRef90_C0QH53 UniRef90 J2JSK6 UniRef90-A4X800 UniRef90_COBNO5 UniRef90-K4QYB4 UniRef90 H1S833 UniRef90-F3ES44 UniRef90-H8MXN9 UniRef90_R4Z2D5 UniRef90 D2VR61 UniRef90_A0A059FDI5 UniRef90_UPI0003C74AE1 UniRef90-A0A023NRH0 UniRef90-V6K8E3 UniRef90_V7ZDQ2 UniRef90- Q9YFA5 UniRef90-V6MK44 UniRef90-A0LOM1 UniRef90_S4AM67 UniRef90 F4FHH3 UniRef90 ${ }^{-}$G7UPY2 UniRef90_UPIO0040B0665 UniRef90_L8PA93 UniRef90-TOMZQ7 UniRef90-UPI00035E84F3 UniRef90_A6GMG7 UniRef90 UPI0003729FAE UniRef90-UPI0003797477 UniRef90-R0EG82 UniRef90-TOM2U9 UniRef90 UPI00035FCB27 UniRef90-K9D4P3 UniRef90-C9ZDM1 UniRef90 UPI000475EE34 UniRef90-A0A010P5A1 UniRef90_W5W2A1 UniRef90-D8HT09 UniRef90_K7A1U5 UniRef90-D6R1Q1 UniRef90_-Q08Y87 UniRef90-UPI000372E963 UniRef90_UPI000375F18E UniRef90-UPI000479FEE1 UniRef90-UPIO003168654 UniRef90 L8GZI2 UniRef90-B4UFS4 UniRef90-AOYAE6 UniRef90-C5A8L7 UniRef90-F7RXH7 UniRef90-V4L7M5 UniRef90-TORUD2 UniRef90_NOCQK4 UniRet90_G4QLC2
UniRef90 V5B6D1 UniRef90-G2P8C4 UniRef90_UPIO0040F260B UniRef90-V4HNM2 UniRef90_UPI0003675F16 UniRef90_UPI0003B6E923 UniRef90-TOCE75 UniRef90_UPI000416F090
 TWR $\square D D D G R L S L V H$ G
 SQVHRLTPWSALPDPDAEWPGL GGDHDCVNATSTVPGF GVT, WGDTHLLAPWRALPPEAPGEAPQEPGLSGDHDCV
 $N \square K$ Q WQ WP F A K Q $\square P \quad L L A K L L N M P A A G F G D S Y M P A V Q G Q S F$ NTLNVQHPFSRQ $\square P \| S K L L D M P K A E G D R Y M P A V Q G K A S G$
 VGHWQWRRIV R REFPSAYGPRGSSGDAWTVNAADGGLLS $V$ H RVS P WQALPDATPEEVRPGLDAGDHDCVLSTSSVPGIL DYLT AVAGDGLYY I DRWMPSG
$G \backslash P D P G C D A G C F D V V E A G P D S G T \quad G T P T G G$ DTLLPQHAYAPA LDV VTGAPMRSRDSTEGYHV NALVIQQHPFSKQIPLLAPLLDMPQVPGFGGHFEPAVQSSG

THR L AP WRAL NRLQVQHPF SQQ $P G D P D G P G G D G V R Q W P G \quad \square A G D Q D C V L A T A A V P G V$


 $A Q R Y G A V P V P G C T E A E G C F D R \square R T G G E L G G Q G R Y P D V N T G$ PWGVGARGLIE YNH L M L

ETVHTMPFSSRS
RHRDAPWQAVPVNRGAGTVVADNPVPGSPGVDAGPLGGDH
THRLAPWRA $\square$ PAEYDEPRL SGDHDCVSAVPGDTDL TGRIAAHGGEEYEGVLNKLQSTPVSDKGDQVYFGT

RKNGTFYPVHGCAHDEGCFNQ $\quad$ ANQLAPDGTYEP $G V L N V L G P S G A D S L A T R Q P D P T P D A E R A A T S G L A Q G G Y Q V$
 AGDTW WGGTGTGVWNMTVPVWAPAGGGYTEVVRHVEWD


NPEAWVYGEMHYYNPEHGFGECPAPGGPFTVNVAP PSSV
NVFSTS $\square$ S GDDT L $\square P$ QHKYAP $\square$ MATGKAMASGMTAKGYQ $\square$
RHR $\square$ A A WRA $\square P D P A A A P G P$ E $\square A G D H D C V L A T S S \square P G V$ HPLAAALPGPAGRLLCMPADPLPGAADMPRVQAPDF G
THRLAPWRALPTTSYDEPS LSGDHDCVLCTSAVPGLTDLS E NNWDWGNIHKLEDAS GIGPMPDWGGRHTVSVGSIPRLL TRNGVRVPVHGGIGD!DGSFN SGMMRTGLTATGYHDU $\square H K \square R L R H V L G H V P L L G K D F S F P A A G S R E T L M K N A H G F D E$

[^0] DPDDWRWGKLHRIVFAHPMGGIPTDGGFGVVDASSHGARA KFNEWGH $M$ MNAGPDP AGSGTTLRMALHGPAK P LDQATWGRRNT $\square R \square A H P F A S V P L F G R W L S A P A D E V P G D A$ NIE GGFNVFRSQGADDGTLLPRHRYPSLPGTQLSEEGYHD DMNY ILLDGKLPAWLK IDDRNVPIPGNRATVVQGQVFKAH R $\ P \mathrm{P} V \mathrm{GGGTESLG}$ GWNKIEPVWNPAAGGYAEVSAGS $N K L K V Q H P F A A Q L G P L A G L L N M P V D G F G D S Y M P A V Q L P K F$ A GPLWYWGSVRARFFTHAMGAVPIGPWRWGGNFGT』RAHH
NALTVTHP LIASADPLIGRYLNMPEAGFGDSYTPAVQRNRF NSGGFNDYSTTNAMDLTSFAPQYAAPMKEVLNENWTDSTG LPDTSGSPEPGLSGDHDCVLC APKNMRWGDKNRYKMKH LLFNVE $\square P G N R S T \emptyset T Q G A V Y E A H$ $R \square P \square G G G T E A D G D F N K D E A V W T P G E G Y T E V R H G S S Y$

UniRef90-M9T109


SSF पMAVTPAGPRTRTVLTYS乌 SANPASPY TYAQCVEYGA DGPVRDESMFPDGESGD DRVGAGGAPV

DCVLATSSVPGVTDLCRYAWDLARRENSRWVVPLGPGSAH
AARGPAARYVWDDADREHSLWAVPFGASGV PGTPH
SYVQTVGFDEQGPVAEALLVYGQS
VDQQSAH
$\square L G S S F V M A V S F T D A G P V A K S V L T Y S Q S \quad$ TNPASPW TYGATFLFAVELTTNGPI GWGVLASGQSG DPKSAH PSDANLSNNFGPTYRQIIDHFIMPMGQSGND FSDT NQTARVDHPFG

VQAVGWDGGRCPVARTLLTYSQS DTASPW
 SETRGAPVEAGPSVRLIADLSTLPGGSSGV
LSPS

RYGSSWMMAVSFTDEGPVARG【LTYSESSN $\square$ LSPS TD DRMVVCBGGPSARYVH WDGGRRENSRWVVPLGAAGPH ARGPSARYVWD पADREAS $\square W$ VVP $\square G A C G \square$ EYPDPCV SIGSSDRTDARYGVFPGGPSEND VWGTSYVQTVTWDAGGPVAYAMLTYGQS ASYGSQSRHLSDLSDPDENHFVLLGGQDGWV
$P G S P H$
$V D P G H W$
$G N P H$


GASQRLIVRPGNEDKGILT VPGGQSGH PLSTF DNEPQAYSTLAYGES SFLMALEFEEGGVRARALLTLGQQG SREDSPH
NSASPS GSSFIQSVEFTARGPRASTLLTYSQS ADPSSPH EQTAEVIHQFGAA AHGSSYLQVVGFSGRACPDSSTLLT

T LDETSPH
GREQSFSYRFTTDLAQDWAYTATPGATSG RRFSGL

ASANAFMFSSGPSNRLVRAESVWPGGASGV
DDTEKVRVYHGPAFRWVVDLFVIJAGGNSGK
GMPRVAGPNFGQSERMVVAPGHMPGGQSGH
TSGSSWMFVMEFEKPVGGGLLTYSQS TKRRVTSRHISDMADPDANYFVLVGGQDGFW NRASSFSWKMVTSMNSDQLYTVLPGG LN
GASQRYIVRPGNDDKADVTRTVVPGGQSGH
SEPHVLSHMVVDTGDFKNSYWSFAPGVSGW
RFSGL

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| P |}



पN ${ }_{\mathrm{S}}$
SNPLSKM
SNPNSPH
GASQRLVVQPG REKFGILT DPGGQSGH PDSDY
LSTDGYPINYGSSWMMVVGFDEHGPQARGYSQSNNPNSPH ARGPAARYVWDLADRRRSGWG GPPGASGVPGS

GRTTSFVPSWKMVTNHVDVYTVLPGG

| UniRef90＿Q4USS9 | $\text { WGAGHDDWVIHGRPTPFDPT }{ }^{540} \quad \text { ATRY }{ }^{55}$ |
| :---: | :---: |
| UniRef90－A3WA44 | YTDQMQLYVDHKLKPVRFWEEDVRAHATSTRRVSNAR |
| UniRef90＿12NBK5 |  |
| UniRef90－84V535 | HRDQLPLWARCELIPVVTDWDRLTKET |
| UniRet90－F3NK17 | HRDQLPLWLTGGLAPVVTDW |
| UniRef90－T1BPM0 <br> UniRef90－UPI00037B3D01 |  |
| UniR |  |
| UniRef90－U1JKB1 |  |
| UniRef90＿BOSXX8 |  |
| UniRef90 UPIooor | YRSGFDAY EQASTP |
| UniRet90＿C7LXV8 | YENLIPPLWWNGYYLS |
| UniRef90－J2LE22 | HTDQTQLFGRKQWVSVPFSEAQDAADKE凸RTT |
| UniRef90－NOCQB6 | HRDQTELWASGRLAPVVTD |
| UniRef90－Q6SGZ79 | YLDDQAEDYANEVLHEPLYTKESRQGRIMERRYT |
| UniRef90 E1SLP5 | WNDQTRYYSENTLRPLRFTEDAIAEALLS DQTIRH |
| UniRef90－A1SB16 | YRSGFDDYAN HRPTPLLPGEVKK HMDRLSPQ |
|  |  |
| UniRef90 UPIO0037C99E7 | R |
| UniRef90－OPIO002D48038 | YRSGFGEYASQDSTPFLI |
| UniRef90－UPI00036DCC0C | HRDQLAPWLRGELIPVVTDWQALKES |
| UniRet90－D6Y9W6 | QRDQLPLWLRGELIPV |
| UniRef90－L1KY18 UniRef90－UPI0002E58A84 | YRDQTRLYSDEKWVTSRFCEKDILSSPK |
| UniRet90－D6B0R1 | ARDQLP |
| UniRef9－AOAO21 W3W6 | WGAGHDDWVHGRPTPFL PGQARYT $\square$ T $\square$ K P |
| UniRef90＿UPI000476D350 | HADQTELFSRGGWVTERFTEAE回GAYPK岛TT |
| UniRet90－COOH53 | YDSMTPVFDGFTHRPFPGFDK |
| UniRef90－A4X800 | DDDQ |
| UniRef90－COBN05 |  |
| UniRef90－K4QYB4 | HRDQLP LWTRGDLTPVVTDFDRDEKET |
| UniRef90－F3ES44 |  |
| UniRef90－H8MXN9 | FADQTAMFSQKQWVDRRYTEAEDAADPA $\square$ T $\mathrm{V}^{\text {T }}$ |
| UniRef90－R4Z2D5 UniRef90－D2VR61 | HADGARAFAAGD |
| UniRef90＿D2VR61 | Y |
| UniRef90－UPIO003C74AE | HADQTRLYSGERWVTARFCERDILRDPALRVV |
| UniRef90 A0AO23NRH0 | YADQAALYARKTWVHVPFFPKDIERQA |
| UniRef90－V7ZDQ2 |  |
| UniRef90－O9YFA5 | YDN【YWGYCRGEYH |
| UniRef90－A0LOM1 |  |
| Uni |  |
| UniRet90－F4FHH3 | HDDQLP |
| UniRef90－G7UPY2 | WGAGHADWVHGRPTPFLPGP ARHTLTLQPR |
| UniRef90－L8PA93 | HRDQLP岛WLEGD LVPV |
| UniRef90－ToMZQ7 | FDNQLPKWLNHQYYPM |
| UniRef90－UP100035E84F3 | YGDQVPLYSRKEFPRLPFTPEKDQADPAYQLT |
| UniRef90－A6GMG7 UniRef90 UPIOOO37 |  |
| UniRef90＿－UPIOO |  |
| UniRef90 R0EG |  |
| UniRef90－T0M2U9 | FsNOTTA |
| UniRef90－UPI00035FCB27 | HHDQLPLWLRGELAPVVTDWA LLKK |
| UniRef90－K9D4P3 |  |
| UniRef90－C9ZDM1 | HRDQFPLDWLTGELVPVVT |
| UniRef90 UPIOOO475EE34 | FLAGHADWVAGRTTPLLPGPAQ |
| UniRef90 A0A010P5A1 | FTAGFSDYATHAATPLLPSEA |
| UniRef90 W5W2A1 | HGDQTDLFGRGLWVQEKFSQAQ\｜VADPSTT\｜LR |
| UniRef90－K7A1U5 | YNAGFMAYAQAQN |
| UniRet90－D6R1Q1 | HSDQAAMFARGEMKRVYWMDKDVDAQT |
| UniRef90－Q08Y8 | FRDQLPLESNKQWRDVAFTEEE |
| UniRef90－UPI000372E963 | YADQTRLFSAGKWVRDRFTAAEI ASAPDQTTVLR |
| UniRef90－UP1000375 | YDDQAPLFADMK WRRALLERAAVEENAERTYR |
| UniReef90 UPIO00047 | FSDQTKLYSGGEWVKERFCEAD！LRSPALRTV |
| UniRef90－L8GZI2 | YMDFS FFRGL |
| UniRef90－B4UFS4 | NLLPLWLSNDTVPLFTRASDLGKDTHDVVQLVP |
| UniRef90－AOYAE6 | FADQYDYWLNSQYYDVSLVRDELD |
| UniRef90－C5A | FLAGHEAWVKGEAQPFL |
| UniRet90－V4L7M5 | YLDQY |
| UniRef90－TORUD2 |  |
| UniRef90－NoCQK4 |  |
| UniRet90－G4QLC2 | FSAGFSDYAEADNTPL |
| UniRef90－V5B6D1 | YEDMAHSMAEG |
| Uniree90－G2P8C4 UniRet90＿UP100040F260B | YASGFEGHVNNSGT |
| UniRef90－V4HNM2 | FTDASEHYAAGKLIDLPYTDAQ凹KQNKVSE】TLSVKK |
| UniRef90＿UPIO003675F16 |  |
|  |  |
| UniRef90－TOCE75 UniRef90－UPIO00416Fogo | YKSDVSNWIHN |
| UniRef90＿UPIoo0416F090 | F A D Q T K LIF S E K K WVT G R F C D G Elle K A |

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UniRef90 E6V968 UniRef90_Q97Y79
UniRef90_C7Q6B3
 SNAYGLGRDATTSGAGMLLANPHFPWDGTDRFYRMHLKVP SNGWLVDGSRTATGQAVVAGDPHRFDEAPGVYQQDHLSCP SNF $\square$ A $\square$ SRNRTGSDETLLADNTHQP LDEGPTSWYEAHLVSE SNGWAFGSAATENRRGALAGNPHFPWTTTNRFYELHLTVP SNALLVNGEHTASGHPIAVFGPQTSYFVPQLLLEMAVHGG SNALAVGSQGVSGGTSMLLANPHFPWQGKNRMWQSHLTDP SNALLVAGEHTENGHPVAVMGPQTGYFSPQLLMVQELQGP SNAVAFRGDTTANGSGLLLGNPHYPWQGGRRFWQSQQTDP SNAYGFGTQATHSDSPGLEFGNPHWYWFGPDRFYQAQLTVP SNNFAVAGSLTRDGRAILANDMHLGLRVPADWFRARLRYA SNALVVSGKYTASGHP\|AVFGPQTGYFAPQLLMLQEIQGP

SNAVAFGGTTTADGRGLLLGNPHYPWQGGRRFWQSQQTDP S WTVSPQHSVNRRSLLALNTDRAAPTPSLYSWVNLHSP SNGWAL GGLLSSSGRGALLANPHFPWQGELQLWESHLTVP SNAWVIA GSNTASGRPMLANDPHQPLTSPALVYAEHLDAG SNEWAAGAAHTRSGRALLENDPHLRLGDPGVWYLVDLRAP SNALLVSGKHTASGNPVAVMGPQTGYFAPQLMMLQELQGP

 SNAVAFSGATTANGRGLLLGNPHYPWQGGRRFWQSQQTIP
 SNAVAFSGATTANGRGLLLGNPHYPWQGGRRFWQSQQTDP SNAWAVPADPATGRGPLI AGDPHRLLELPGVYQQVRLACP SNGWLV RTPE RALLANDMHLGLSLPTVWYRAQLIYP SNAYGL GARATTSGNGMVLANPHFPWQGSERFYRMHLKVP SNALLVSGEHTASGNPVAVMGPQTGYFSPQLLMLQELQGP
 SNNWVVSTE GTTLHSCDPHLENRDPSVWYEMQLKDK SNALMVSGEHTASGRPLAVFGPQTGYFAPQLLMVQELQGP SNFLILSGRRSTNGHPLFVAGPQ $\square G Y F Y P G L T L E M D L R A P$ SNAVAFSGEVTASGRGLLLGNPHYPWHGGRRFWQSQQTDP SNGWA GKD LSATGQGMLIANPHFPHTGNQRFWQFGVEIP P


SNALLVSGEHTESGNPVAVMGPQTGYFSPQLLMLQELQGP SNGWLLAAERTGTGGALLAGDPHRFDEDPGVYQQIRRACP SNGFAVSAARSDDATTRLIVNSHQPWEGGVSWWEVVVHSE SNAWAL GHDK $\square E Q G N G M L L A N P H F P Y E G D M R F W Q A H H V V D$ SNALLVSAEHTESGNPVAVMGPQTGYFSPQLLMLQELQGP SNAVAFSGGTTANGRGLLLGNPHYPWEGGRRFWQSQQT $1 P$ SNEFAVSGSVTESGKPILANDPHDTLADPPDFMEMHITSN SNALVVSGKHTASGHPIAVFGPQTGYFAPQLLMLQEIQGP SNAFVVAPKRSADGFTRVI SNSHQPWSGPVAWYELSVQSG SNA AL GSAGSANGRGLLLANPHYPWQGAERFWQVQLTVR SNALVVSGAKTASGHPVAVFGPQAGYFAPQLLMLQE QGP SNGGA GGVVGGDGAALLANPPHFPWLGGDRMYQVQLIVPD SNGWLVAGERTVTGQAIVAGDPHRFIEDPGVYQQURLSCP SNAYAFGSEVTGTDSGVLYGNPHEPWNGVQRFYEFHTTDP SNAYAFGSEVTGTDSGVMYGNPHEPWEGVQRFYEFHLTMP SNGWGLGSDMTENGRGIVLGNPHFPHTGNDRFWQFHTTIP SNVIA WGQRATGGDGAVLLGNPHWYWGGPDRFYQMHLTIP SNAVAVGAERSANGRGLLLANPHFPWIGGMRFYQMQLTIPM SNNWAVTGNLTATGSGLLANDMHLGLRVPIIWYRTQLNYE

SNA VVVGAHTESGHPVAVFGPQTGYFSPQLLTDQELQGP SNA IAVGAEDATNGGSVLLANPHYPWQGVRRFWQTQLTDP


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UniRet90 E6V968 UniRef90-Q97Y79 UniRef90_C7Q6B3
 GYDVEGAALVGDPLVQDGHNGKVAWSHTVSTAQRFVWHRLL EFDVVGLAVPGMPGIUFAHTGDVAWADTNAMADYQDLYRE GTNV RGAAFPGTPCIITGANEYLGWTHTVNYPDKADVFAL GLDVMGASTAAFPVVSIGFNRDVAWTHTVSTGSRFTLFEL DLHTRGMTFTGLPYVVIGRGPDFAWSATSGNSDLTDVKVL GVNVSGASLLGLPAVNLGYNDNVAWSHTVATVAPFGLFDV G| SARGASFPGVSFVQMGRGTDYAWSATSAGQDTTDTFAL



$G L N V A G G S L L G S A T V S \square G H N A Q V A W S H T V A T G \square T \square N L H Q L$ QLQAA GLTI PGVPLVMSGFNGKLAYS GLDVYGAGIGGLPGVQIGFTEQVAWTHTVAPGPRFTFAQL SFNAAGFAFAGTPGVQLGHNEAVAWGATTGTADVMDMWSV GYHAAGATDAGTPGVILGHNASLAWGATNGTTAGLEVF QQNDAGITLPGVPFLLSGSNGNDAWGFTNSYVDTFDWVIV GVFARGVSFAGTNLVVLGHGLDYSWSATSSGSDNDDTVVE GQNVAGVSFLGVPLIVLGFNENDAWTHTVSSARRFGIFQL GLNI A GGSLLGSATMSI GHNAQVAWSHTVATGVPFNLHQL
 GLNVSGASLLGTTVVNLGFNDKVAWSHTVATGVPDNLHQL EFDVVGLAFPGVPGVHFGHTGRVAWAVTNAMADYQDLYRE NWRLTGLSLPGAPAIVSGSNGDIAWGFTNSYADTFDWVKL GVSARGASFAGVSFVQMGRGVDYAWSATSAGQDVTDTFAV GLNVSGGS LLGTVVVNDGFNEKAAWSHTVATGTPVNLHQL DSYLFGISMPGIPGIVMGRSQDLAFSFTYGFMDTDDYFDE SARGVSFA GVGMVQMGRGRDYAWSATSAAQDLTDTYAV

 GLKVVGGSLSGMPGIVIGFNENVAWTHTFSTASRFTLHRLD






ELCETDGSYVNASGDCVDFESLSVTPTDADQTPYTLTSLR RLRRGTRVQALGPDGWREAHVHVETVEVAGADPVPVEVVE TLNA DRTQYRLDGKWLPLEAKRVWL RVKFGPPIPRTVYR QTADNNPGSYVIDGVVRPVKSKPVHIEFKGDQTITKDHFY PLCETDGSYIDTSGECTEFEELSVTNEVADQTPYTLTSDR $T L Q D N A P T A I V H N G Q A E P V I W Q F Q S Y Y V N K M Q G V T V I V P R$ ELCQDD YHYLYHGTCTAMDKVERTNSWKPAGSYRMQVYR VRNAAGTD YRFDGKWLPDEARRVWLKVRFGPPDPKMVYR RLQPGSPTTY LVDGRPERMKSRQVTVRVAHPDGVRRTLWT ELCEQNGNFYRFRGQCLPFEIVERKNAWKPEGSYTLRSFR HLVPGDPTSY LVDGRPERMTETDDTVPTGPESSVTTKVYR $R$ R R R T GA G I E A P D G V W R R A A R H T E T V E VAA G E E P V E V E V V E




 A D D T

E L CEK DSNSYRFRGECLPMQTVVERENAWQPQGSYRUVSFR $P$ TVV GAPTKY LVDGVRKDMTS QEVAVEVRRQDGSIGTVTR
 T I NPENSNQ YLLDD RWESFE IGK DY LAAFKLFGF LK QEFRY QLMPDNPDQYQYLNEQRDDSKVEVSDDLPGGAAHTGAVYL
 TLNPADPTAQYLYEGEFVDMEATDDTVQAMNESDVTRTTLYR
 TLLDPADP TVVYLVVDGVRERMTERTVVTVVAVKGGPPVTRTMQWW
 TLCEP GGDHYLYRGQCIPMET LRRKRNSWKPAGSYDLVIKR
 TLCDPNGNHYLYHGTCTAMETDKKTNSWKGAGSYDLVIKR

 TLAP GDPTS YLVVDGRPERMTPRQVTVRVVDAAPVTRTRWW
 $T L D P A D P T R Y L V D G R S E P M R A Q P D A V A V R R A D G V H R T T V R$


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UniRef90-B513G8 UniRef90-A9C2H2 UniRef90-UPIO0041E20FC UniRef90-UPIOOO464DF4E UniRef90-E8RZ67 UniRef90-C6CG47 UniRef90-10H4Z1 UniRef90-D7B3S9 UniRef90-B4VGL1 UniRef90-UP10002D38D07 UniRef90-TORBC2 UniRef90-E2PWG7 UniRef90-D3F9Q8 UniRef90-UPIOOO4775764 UniRef90_HOILQ3 UniRef90_UP100047D1528 UniRef90_UPI0004782318 UniRef90-A0A011 PMX6
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 THFGPVVQFDWTDTTAYATTDA NATNNRA DGWLAMGQA TARGPVVVGGPDTGGPLSLRCPPRVTGDLGLSALLPLLRA STVHGPVQEREGKNVUYARRYADWKRETETGLPAMEQVNRA TEYGPVVSMPWTTQKAYALRDANRGNTRMADAWLRVGQA SPHGPVLGYATVNGQAVALVRQRSTYFAELDTALPFLNDV TRYGPITTSDQGDPLPWVVSRDVNMDNLRAMNTWFRLDQA SPYGLVFGTVDGTPVAFATRRSTYMREVDSLIGFQKFNEP SSYGPMI DPGWNNQTAFTLRDA NLENTRAFQNFLAWNHA SEYGPLVPDQWDTKKAFAVR DTNQENFRLWRNWLRFDQA TPWGP $\quad$ DHFDAQDRALARRWVAHDPGANLGLLDMAHA TEYGPVRATVGGKKVAYTTLRSSYMHEADSVIGEQMLNDP
 TRYGPVVSLGASLPLPWTATTAYAVNDPNSLDTALGFSKA TEHGPIVDLSGWTTTGATEFRDANADNSGLLDFWLGMART VPYGVLLGDALLEGLGDRLLLNWTGFEAGNELAFFQMGRS REFGVVMPARGM TDYGUVSHTVGGKPVAYTSLRTTYRHEADSLGGFQMLNDP THHGDVRTTVDGVPVAIVIERSTYGREAASILGFSRFNDP TRFGPVVDLGWTAQTAFAI ADVNADNTRAFQNFFAWNQA TRYGPVVPLPWTTTTAYALN DPNATNLRASDTALGFSRA TVHGPVVNLGAMDPASVFADRDDNAYNYRTFRNWLRWNQA TRYGPVVPLPWTATTAYALNDPNAANLRGSDTA LGFGKA TPRGPVIDHDRVTGEADALRTPSRVEARLGFEALLPLLRA
 SEFGLVFATVDGEPVAFTTRRSTYMREVDSIDGFQRFNDP TRYGPVMPLPWTTATAYALNDPNAANLRGSDTA LALGKA
 TAYGLVTHTVNGTPVAYTALRSTYRHEADSIIGGQLLNDP TVHGPVLGYAGVGGRRVAISRSSRGKDVLWQLMFRRMTNV TRYGPVVPLPWSATTAYAL HDPNAANLRAADTALAFSRA TKHGPVVDADGWTRTQAVAMADANADTNSTLSQYLGMATA SEFGPIIGNDPFTGGQVAYALDANLPNFELFDHWLGMNRA TRYGPVVPLPWTGQSAHALR DGNAANLRGLNTWFGLNQA
TIWGPVANPGDDGRKFVKWLAHDVTQAVDFGILGLETSA MRA
SDHGLVRSTVDGAPVAFTEDRSTYMREVDSDLGFQRFNDP TDRGPVIAGGPDDETAVSLRYPPRVRGELGFAALPELLRA SRHGAVI GNEKGGFAIRHAGIGEVABAVEQLYRMNKA TDDGPI IENEDWSESEFYVVKDUNLYNLDMI DHWLALNRA SEYGLVFATVDGTPVAHTSLRSTYMREVDSUVGFQRFNDP RNNGPIVQIDGSSG AYA STAYTGFGPTMELAFKKTNRA TKYGPVRATAGGKKVAYTTLRSSFLHEADSIIGFQMLNDP AVQGPVD DNKSGAFARYAGADQLRMVEEYYRLTRA TRYGPVTPLPWDTTTAYAVRDANTGN RGLNTWFDLDHA TKYGPVTSRVGGKPVAYASLRSTFQHEIDTIDGFQKFNDP SRYGPVLADGWTATHAVAVRGASADNGRAFNEWVSLDQD TGRGPVVPEPGEPPLAVALIRYPPRVTGDLGFGALLPLLRA SQYGP LLPTWGANNLAYTVRDAASENPRALNQWRSMNQA
TRYGPVTSMGGVPLPWVVSRDVNMHNLRALNTWFGLDQA TNYGPMIEVPGWGPGGNAFARDANAPNFDAMNHWGGLDQA SRFGPVVDLSRMDPAGWSARRAVNADNWRVYRNFLRWNLA
 SEYGPV KLVNGKRYALNWVA HHPFAVNLAIVDMGTA

T R H GP I DH R D P A R G I A V A V R A V W L E A GMA P Y L A S I GY L D A
SEF GLV FGTVVGGDPVAFTVRRSTYMREVDSIIGFQRLDDP
S K F G P V V L E M K G R
SHF GPMLPAWGTFNLAFAIPRDASSEN PRAI NQWHSMNKA

RYGPMLLTFEWSTAKA YTLLRDA NAENDRLLNNQFFRWNQA
SHQGLMIETPAAQGLGWSDSHAFTDKDANEFNMWSRMNAA
T R Y G P VVVSSD G G LDP L P WT A TTA Y A L N DPNAANMRFA F S K A
H $\square G R I V V E N D P W D K S H F Y V I K D A N E Y N \square Q M V D H W L A L N R A$
$R F G P L V N D G T M S P A A F A L R D D N T D N F$ R VFENFRAWNQA

$H L G P M I N L S G L S P A L L A W N S R D V N L E N P R S F R N F D A W N H A$


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

RFGPVVDLGGWSARKAVAIGRD INADNPRDFRNFARWDQA

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EDVQSFlLRSASDFEVP\| INFJVDADLKGNDGYSTFALLPDRN RSVGELRTVLRQFLPWVNVI AVDRRGQALYADHSVVPRVT REVAEVDRAFDAWAEPVNVVAADTRGGVLHRDAGRVPVRG KDIQDVDRASRQLTWNENLMAADSKGN GYWHPGLFQQRP TNFSEFYKALEMKALPYNIGYADRNDTUFYTSNGKIPIRA
 FDAQSFREVFNLTTGSFNWFYMDDQ DUSFIUAGLYPRRA TSAKDFQKAAMDDGYAFNWHYADAD DDAF DNSGANPVRT RSTDDVLASLARNQPWVNTLAADRAGHSLYTQSQVLPRIT ESGTDFYNLAREYDPWVNTAAVGRDKRALYSDDTVVPNVP ASIDDAMRVADATADPQNLLVTDRSGRDAWRLLGPVPQRA DYVQTFQSAAQHDNFTFNWFYADSSGTAYYNSGNNPVRA
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 TSAQTET DAAB D DGYAFNWHY VDARGEALYGVNS GANP VRT

 T DAASF QRAV HRVGYAFNWFYADSR TTAYFNSGDNPVRA

 R K NYK S FKRAMLLHWGAP ENLLVYAD T K TSA
 K D F D GWRS VMAMQAVPLNVI YA DAA GHVVMFYNAKFP DRR

 RSTA GVKEALRRTTQPWVNTDAADSS GHTFFSQA QVLPRRVT NNLADFQNALTYFDFSQNFAYADTAGNDAYFTSAENP IRQ D YVQTFQSAVQHDNYTFNWFYADST HTAYYNSGDNPVRA R D F GE WQ K A L A $\square$ Q GVP A N F LY G D A T G N $\square A Y Y Y N A S F P N R K$



 T S V R DV H DVV G LIETTMPFFNTVAS DRTGNALYA DIQATPNI T


 $\square N \mathrm{I}$ E S GLLKLAK E VRIP Q N MLI AD S A G S $\square$ A WQLLT G AMTMRK NTVDDAIAVGKEIAIPRQNMVIVDDAGSAAWLPGGAVMNRE


 ASAEDFQEAAADDGYAFNWHYADA GQVAFQNSGANPVRT

 SSAATF QQAAS DINFTFNWFYVDSK DTAYFNSGNNPVRA
 R GTA D V L A S L A R Y QP WV N TVAA A D S S G R S LiF TQ S QVL PR I T


 K S L E E F LTH G S E L G GVP WV N TVVYG D T D E K QTLLQDFIDAKK SII P WVNTSAAGRDGRAFYSDDTVVPNLP ASAAAFQNSASTIGFAFNWFYVNSS DSAYFMSGNVPVRS GSFDEFVEAHKKYQGVFNTVAVSKDGRAWYADTSATPRLA
 S NMQAFKKTFSTFDGMLNTLVADNHGETFYVDDSNVPQVF S DAASFQKAAQDVNYTENWFYA DSK DVIAYNSGNNPVRA
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250



280 NDSYWLANPEHPLEGYPVGDEQTQRSLRTRLGAGRGFTTS $N Q R$ GPAAPLGVEFAPPHRAERIRALLDERRVWSAA NNVPSQGWTTGDSTADERGQFHRVGWLMWLVRSLAKAPTW NHSPEADNPNAENDNFETYDNNRSTRLLKLLEEQELIDYN NDSSWLTNPAQKLTGFPMGETDVPQRLRTRIGLIEEGRRLD NDSAWLANPEQPLSFMGDAATPRSDRTQELI ETMGKLLFA NNKVAAGYTSGYGTGPVHRGDLLDGRVAGLIDDGHKFTVAA NDSYWLSNPEQPLTGFDYAQSLRTRMGHTLARERDTGTDG NDSYWLSNPQSPLTGYSMRTRLGHLMVQERLQGRDQYPGK NARVTDGEDLKRIGDGGYVLAVRARRIRDDLMAKPQFNER
 NNAAVGPEFPQAIWDWDAGYRAKQLDRGAGKVG NDSAWLSNADRPLTGYERVFGTDGTQ R RMRTRGAIEDV NQRLTQPGYGMQLSSSWASPERAENLAQQLAKKPVAASL NNEPGDITNDPFYWGTFFLPGFRAKRADDQLAADFSAGPM NNKMYGAGYPGRLSAQFAPPYRAYRDATLLRARKRYSDA NNRQAKDYATA AFGFGAVHRGDLLDDRLVAAGGVTRA NNRLLFDTTGDEDGDGGADMGVRSFAISQKLKSKDSVNVQ
 NDSAWLANAERPLTGYERVFGTGGTQARSLRTRGALQDV NDSYWLSNASAPLTGYPAIFGSHTMARQRLAGTDGYPGKL
NARVIGDGDLLRIGDGGYDLGARAAQVRDDLEARQRFSER NARVIGDGDLLRIGDGGYDLGARAAQVRDDLEARGRFSER
$N D S A W L H A D R P L G Y E E R I F G T A T Q R S L R T R G G V E D V$ NDRRDDVA NNRLLFDEQGERVGDGGADPGDRASAI HQALA
 NDSAWLANADRPLTGYERDWGTVATP NQR NNRQAEGYATAVPGFGSMADYR\DYUNREL SKKTWTED
 NNKPAAGFSSSDA DWSQGSTQRVTLLREGI AKREKHDLA NDSAWLANADTPVTGYERVFGNVGTPNA
$N D S M W L A N D Q L L T G Y Q P M L S P R T K T N A$
 NNRVASGEMLRRIGNGGYDLGARAKQI RDALFARDSFTER NQMNLPDYPYQRKLGFEWTNGSRFARISEVLAALPKVSLQ NNKPAQGYTSGWSTGSVHRNDLLDARVSGLIGEGHRFTTA NNVP WVS SDFPAELGUET
 NNKPADGYTADWAHGSVHRNDLLEARVESAMEEGHSFTPA NDSAWLANAERPLTG NNDPAGNNPLAMYYLNYNYSVYRVTRGSKLLSAMDA QQR NNKQAKDYTTASWGDGSVHRGNLLEDRVKKLVAAGGVTRA NNTPFQAAGYSALLGDETDTTNRGTRAVELLGADPSISAD NNAQASGYAASGADSSVHRGDLIDARVKKMVSSGTKVTRV NDSSWLTNPAAPDTSYGPVGTKRLPRTQEQIQDRDGTGFT NQR NDSYWFSNAEQPLTGFSPLLRRGLLQIAADLARNKDGLGGN NDSYWLSNPEEPLTGFSPLLRRRLTQULDRLSNKDELGGN
 NNSYWLANVDQPLDGFPSALHHRHQDADDLLQRGARSSEE NDSAWMVNPAQPLTGFS
NARVIGVKDLAQFGDGGYALGARQQQTKDLLMQQARFNEQ NARVISANDIARLGDGGYALGARGQQIRDRLFEKDTFNEN NNQPEKMSDGGVYPGYYVPDHRAKRIKSWLTRTQRWNMS
NNKRAPGTAGDRAEKGAVQRGDLLDRVVAVLAAGGKFNRV NNTPWDANPYPRVLGTTGGELSMRGQEAQLAVSRRVDGTD NEMNLPDGYRNDELTYDWYSSARAERLRDWLGSAAVVGDE NNKAARGYTSGWGTGSVHRGDLLDGRVASLIGEGHPFTRA NQNPYSVMGNHSLVHFEQRLTNRSYVANELLSSNESDDLD NNSPWVASPGVELDGFSPLLGAQGEPLSARLAAQRSAGVT NNKQSKDFSSAGFGNGSHRANLLDDRVKALVGSGQKVTRA

## N

NDSAWLANTGRPLTGYEPRRFGTVGTQRSLRTRGALEDV NDSYWLSNPYAKIEGATATPQTLRTRLGHMI AEAQDPHGVS NNKQAKDFSAADGNFSFGAVHRGDLLDAPLRARGPVGTS
NDSHWLSNPRQPLTGFDNAERTLRTRECTLGAERRRFTQD NDSYWLSNPNTPLTGYDQSLRTRMGHTQALLVANPPVTSA NNKQAKDYGAADGNFSFGPVHRADLLDAPVKAAGRLDRS NDSGWLANRNKLIEGDYSPLHGRQDRSARTLQNLDAVLDGA
NNSYWLTNPQQPLFSTEQSSRTRRHHMLSERAGERKKFNVH N NK QAKD FSEAS Y G D G S V H RV N LDD S RVVKK LV S S G QK V T R A


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 AAMADRGRLTVADLQRQQFANRAPAGDLAAADVPDDPEAC H AMHR QLDNRALLAASWRDRLLDCLEASACDTLADQAV RFTERLWQTTNRVHGAELVRDDLVALCRREPLATALTAAC SLLTRVMMEAGVADLRAQEVLPLLLEVIGAEAVDDPELAAV DMPALHTDTHLASAAALLDRLAAPALIGTDLSGPAAALR FMKKL QASTYSTQAEHFLKRYNKEFSSSH SLTRAMAEAAVTDLRGEETLPDLLAVLRSQPVTDPRLAAD SVTSAMNAAATQDLRAGPLLAGLHNVLAGQAPSPRSQRMA A AMADRGGLTVRDLTRQQFANRVAADLARADTPGRTDAC FTREDLMDTNNRAWLSEAVLADLVEHCQARGTTPVMSAGC MKELLFAEHSKMAELAAPDAAKMCAAFPDGQAPSAVRTAC DFLAALD DRGLLLARWHLEQLLAEEDAGQGSAAQGSA DSMDL QNDDLSUPARRLTALLDPLSST DDARTQAAL SLTATMMEAGVADLRAEQVLPLLLEVDDSEEVDDPEDAAV AMAVVHTDTHLGSAGALVAVLGGLTGLGPAAAADRDR ALLRIKFDKGYRASPAGQWMQKVLAV NTTGKPDLAAAQ FSLMELEQASDRSYLAELILKDVVALCDETPNKVDVTQAC S LTALSUEAGVGDLRAQEVLPLLLEVDDSVEVDDPEAETV DTPDNDKOLNQPADAEQVAPYLAADGADNDVAC SLVKAMADAALADLRAEDVLPKLLRVINSSTVTDTTAAAA DLLRKFDTGVSRLSWAAKWYGDI ARID PKGDAQLAKALL TLQSLL TSNRSLTAELTTPALADLCASLPDTVPVGTAC NLTQAMEEAADADLRAEKVLPELFKVDDKAPVTGPAADAV LDANMDELLTAERNWSAERARDAAVTMCRHDPLEVDVSAGC DMAADHTDTHLASAAPLLDHDAALDTPGAPGLTGPAAADR TFNLDNMQQVVYSYGAELVLDDVLADCQANPGTIDATQAC TFNLENMQYGNRSYVAELVLDDVLADCNDNAMSIDATQAC TMGQLIDNSRAADLALDATJVTMCRNVAFGLILVDNVSEAC
$F S P A E V E Q A S R S Y L S E S V L D E L L S I C S A R G T D P D I S S A C$ GRWAMQEALRSRAYSAEQFKLTLLDQVPASAGRDAYTKAC


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$T D I Q K W D R D T N Q T S Y G A G A Y A S L Y Y Q \square T P F Y Y Q L$
VALGRWNRTDAANARA
FML HDWAPRRDRDNDGRYDQEDAVALMDAWYPRMIE QLLP P ILAAWK DHNYTADSRGSWLFANFWVRLQGGQSI KGLRAWMGREPERDAGRYAHADA DRVMDAWWPLLVEAQFE GVLKAWDRTMDTGSRG

| LVLSAWDNTGNLDSRG |
| :--- |
| HILRDWDNSGNLSARG | ALLFDRFWRKLERAVPE AHI WDGVWNRLQG LPE DRGPLEPRATANAVQYRLVRAWRQTVLDRVRE TWDTAGGKRTET SAGSKTYANADARILDAWWPALVKAEFQ HLMDWTGTYDANSTGALA ABELFVNAFAEALHG RLLTGW DYGDDADSAAAAYFAVFWKNLLADAFG AVLAAWDRTTDTGSRG QALQSF AA AVLDGWDGRFRVDSRGA VLWRELLTAVLA AELEAWDRHFARESSASVA AA AL R WNGDIGAPNSTGATAAVT QQLDSWRARKETSPGSHTYTHADARTMDAWWPKLRRALVQ TLLASWDG SALADGAHRVDYDRTGSYEHEAADRIFDTWWEDGDEALAY EVLRKWNGTADDDARGAN LWDEFWQRAMQI GVLAAWDRSANTGSRG ALLFDRLWRRL

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NVLK GWDCVERVD
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DSLRAWDGREPHRD AG AGYYDHADA

## ALLQRWDRTVD

QLLSEWNGEFNADSRGA VVFRELAFLIDQ
EGLRAWARRQEPERDAGSYDHAEARVLDAWWP VRAQ PVLRDWDRTAGTSSRG ALLFDRFWRLLVRAQFE SYLQGWNLLATPTGLAQGYDADVAATLYYLWRSNAlKNDED VKLSAWKRTETSAGSKAYANADA川RILDAWWPLLVKAEFE ALLRGWNWDFDGHHKGQADAA ILLRTGQKWHYQRRPEDPR EVLASWDKHF TAESPGSLLFATLWTRTTLTADE AKLKTWDAAGGLRSETAYANADA DR $\amalg$ MDA WWPLLVNAQFK SALAAWSGRNSVGDRGAVL WREFWLRAARV ERLLAWDRHMD
TVLSNWDRRNNDDKG AHVFRKFWTNF
TVLSNWDRRDNDSKG AHVFREFWNNVNF自ET PVLAAWK GVLRAWGNTGEADDRG ALLWDAF WDE $\square$ EK $\square$
dalnnwgacacadsVGyTL
AYLRKWGECACEDSVGYT
AQLKGWKGEHTLESVA
DELRAWDGGKRVETEPGSRDYAHADLYYKMLDSHVLYKTLKK TALSQWDGTFRLDSRGAVFFSRF
DRLRAWDGREDAGS
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DTLARWDRANNVGSRGAHVFREFSR AVLAGWDGAYNVDSRGAVLWREMMSAVLAAYPDALSRQGP DGLKAWQRRETTPGSHTYANADADRVLDAWWPLLVQAEFQ SVLQAWDGTHNLGSVGGH I WREFWRNIDPLPV TLLAQFDGKMTLQTKGAALIREFAHLFDPEVHLFDNFSSU AVLADWDRTMDSSSRG ALLFDRFWRKLSAKVPA QVIA A WNGRFDKSAKGSLLLRELAFMINS
KVL AAWDDTAAADAVGATLWDELWRRLDT SKLSAWAQRVETSPGSKTYAHADARIFDAWWPKLVRAMFR AALGAWDGKANLESKG AHLWREFWSRA $\square A N P G G$ SVLDAWDNTGNLDARGALIWSQF
SALSSWARRVETSAGGKAYANATARVFDAWWPKLVRAEFR
RVLDEWDGHFDPDSVGAVVWREFLAAFARADRTDTGLLFG RVIGAWDRTVDTDSRG RAVSGWDGKFNSTSKAAHLINEFVYMLDDAWWSLVQGEFE $K Q L T T W Q G S H R L E T T P G S K A Y A N A R I M D A W W S L L V Q G E F Q$
$Q V L R N W S R A D A G D R G$
RNG NYLRNWNFTFYQNEDA $P T$ YT Y IVAEMVNNSDA


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AQDTAQVYATDFNPADPDYTPRGLRMHDAAVRAAVFKA QLLPLEATDFGNMPVGRDNKPGDMGSAYQHGYYGYLRRVL EKLP PGLGGGDYRDLTGVLQVDESPSGSLGGPPGNVKQGQTHKG DRLWKVPFSAADPVRTPNTLNTDAPSLAGALADAVAELRG SILFAVPFDKHDPLNTPRKLHADTETLRQALGATVLDLLAR $G L L M P A R V A L G A E A E M P E L P Q L E G V A W P M V T Q R P A N L L$ PGLGDTLYTALTNNLYPSAAHGPTGSHAGSSFQYGWWSYV EEDLA【YTATWDPWALLRDDLERLGPDRLATAALA RKLPASAPPDGGDRWF

RVVQTLV AQLWKVPFSAADPVGTPNTRNTGAPGFTTADADAVTELRA QELQT EHPDALNAAGPLLSSPFDPRDPVRTPGAPRPDPGVVGRAI DEMSLVFEAILTAAPAFALKFSALTVTEAYPGSPALIDD WTQQPFMDDEMSERAGATPADGGALQLAARERPQLVPWSD PGDGDGDYTADTASLAPAASHGPSGAHSGSAFQYGWWGFA E DD QLASQWPQA YRRANPRWDETLFSGMNAGKWVPE

 A D LLAAPAGAVPFDAADPVNTPRGПKPTA
EDGLAAPA LAAALADGFEMPKLAQDEGVAWPLLQQRPAHLL
DE PCGFDELFAPWTDPAARDGLALDHLAAEFGAGLA $T$ DQQQDAQAWPKAGYRVANPRWDVTVQQLMHDEAR AGG｜RFADTFDVSDPVRTPRRLN
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DDFDPS
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RAV 冷QDAAAMMPPDVAVLLDTL PGLGEDDFTQTTRAASVDESPARNGHVGSAFQYGWWSYVD RRIA AHPALA ALLAEPPAYPEVFAPWLALTPRVGYALEHLL

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D LWWKTPFDPNHPVSTPHTLNTAAPEVRTADGDTI REL PGMGDA AYGAMVGVLKINESPSGWQNEVPGKHVGQHAG PEVWSVPFDPSRPVSTPNTLDTDSPGVRQALADAVLRLAQ

GFSSYAGFSVPFDKADPVNTPRDLITNDKTRKALGDST DTAFEVK FDVNDPVNTPRDLIINDNTRTALGDA AKLP WRVPFDPKDPVHTPNS
FRLSPQWTVPFDVNEPVTTPRGLANNDTTLAQLATAMLNV PEGKLYRTSFSDEAPLSTPAV PMPSDGGVGKAL
QLLVPTNETLKEHDLSTSYLLRSTEPATWATIEQDAKDWL KILSSIDDQGVQSRSLLRGUEPAVWQLI HTQPDSWLPEGT DAMGGTAN NAFMT

VLKARAVPGLWKVPFDRAKPLSTPNTLAVEL

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DAANTPNTLRPDGSALQALAHAVLNVTDNGFADDATLGEL AQRWKVPFSAADPVGTPNTLNTAAPGFATALADAV
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WNRARNLSNLYTTPFNAMDP $\frac{L}{L}$ TPPNGLNTAN $P G \square G D G Y Q A L$
DEF GDVS $\square$ WANEFDPAKPRETPNGLVKAGPDGDPVLTSL PSAQQWTVPFSPADPVRTPN TVVTAA RDFNVKFDAANPVATPRELAVSADMLKRLVIDADIVHEAG PAMGNDDFTMTG

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UniRef90- B4VGL1
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UniRef90-H5T9B4
UniRef90 F5ZBF3
UniRef90-A1ZPV7 UniRef90-UPIo00237B331 UniRef90_S5UAQ1 UniRef90 UPI0003B49BC3 UniRef90-UPIO0034514AB UniRef90-K6GG05
UniRet90 - A TB08 UniRef90 IOPLM0 UniRef90-W5W0K3 UniRet90_R8AY75 UniRef90 UPIO00349221E UniRef90-G2GMA1 UniRef90-F7NZQ7 UniRef90 UPI000370A334 UniRef90_D6Y1Z1 UniRef90-A6GL75 UniRef90_K2GK32 UniRef90 W2EFC1 UniRef90 R4Z782 UniRef90-M5ASN3 UniRet90-F2R5S UniRet90_U1J7A4 UniRef90_W7T299 UniRef90-E6V968 UniRef90_Q97Y79 UniRef90-C7Q6B3

GTSKQDFFDDVVRTEQRETAGD\|IYRSFVYAVSYLSANFGS


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 NPRFESWDALFDDAAAQ VVRNGLAKHGPLNERSWGE D K D
$G L D R A G E G V R R H R A W G A V H R L R L S H V$
SEPGSEWWTD STLGVAGRD DMDEHAGNAAWKEAVQRDGG $A G \square \quad A L D S P L G Q H Q F V \vee R N$ GREDSPFWQSSAASKADFLIDNLLSSRQANTAVITE
DSAQ RNVEAAGFPLDVPLGAVQHSVKGGRELPVP AGA SSVAELALLAALDAT』AWMDQNAGGS
D K D
GNSSWEDFTR
HS $\square \mathrm{D} \square \mathrm{A}$ WQAMAAGHTTWGDV
$\square G G A A L A L K L N G F A L D S R R G D \square L Y T T \quad R N G A R V P L Y G G C$ DTGSPAFARALDADTVTEDRAAGIALDSRLGEYQFVVRNGK K A A L Q KAFA EAVK AVVAS GFAMDAARGTVLF SQRGGD PRRFASWDA LLEDAARE NTAAPGFAKALDRAAAELRAAGIPLDAPLGSHQFVVRNGE A PAAEALLEVAAGPAP GEWGGRHLL
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$P G V G R A L A D T V A E L K A A G I \quad A L D A P L G E H Q F V V R G$ A DE F N SK SAA QY V DD ALK VKK D S Q $\square$ WGEANK DDMNF $\square$
D K D
TRFRSPFATRFCGGGDATCRAA $\quad$ TWRAFEETGAA LALDTQGE $V G E \square R A A G \square A L D A P L G R H Q S \quad D V R G G K T Y P V H G G$ QRAHDPVDAPLGGVQREVHTGRLL P $\quad$ GGGGTDDEGAAN V $L A V D A P L G A V R S L P N G Q P S G Q K L P W G G A N N V E G G F N V F R S$ NTGAAAVQTAFGNAAAELRDAGI PLDARLADYQSVTRN
$E Q P Q A R L G E Q \quad A A H Q R D A \square L L G S L G R A Y A E M L T L Q G E$ $K D L R T V L D R E V D$
GGTS LP GLDDAAAAVRAAAEEVADAA
$L D L D T P V N K F Q F \square E S T A P D G K P A G N R M S W P G V F E E E G G F N$ SSFQH GWWSYVD KD LRTVLGEDVD GALPEA Y
VGEDR GA GVALDAP L GEHQ ASGVNFFAVSGAPDAASARDYVLLKSLKDALFAAAFNNST D K D

QA A GSPLNAP TGTRQY IPKPTPQTQA
P
S S Y Q S GWWGYVHKD $\square R S V L G Q N V A G P L$
L H VPVD A P LS A
A Q Y T T VGGG
S Y Y N SK
NI ALDAPLGSLQFVIDA
A Y F T SK NI ALDAS LA DLQYVIDA
 QAAGVALDATLGEVQFVERSLPNGAATGVKLPWHNVEGGF TSA $\square$ A A L T A K G $\square P L D A A T G N R R H V R S G G R$

P Q N S D DFPA LMLLSVY D D TK T R L IE Q H D A K S D D L S QL N WG N ESFDDLLVDAYRRAKHTLLDEHSPDEAN MEDLRWGS Q NKNSLWWDNATTLSKETRAD $\square$ FREAFVQTMNELEQQLGK
$A G V Q Q A F G D T A R E L A A A G V A Q D A P L G A S Q Y V T R A G Q R F$ $R G D L R M L A D V L A S P G G A A L T A A V G S T L G D A L A E D E G R L G T$ D K D
$R T R T A L G D A \backslash V Y F V T R N V \quad A L D E Q L G N L Q F D \square D V$ $\square A L D V P L G Q V Q H T M K G D R R L A D P G A P G E L G A S N V V G Y D Q$ PHKGSAWWSYVDKDLRSVLGDPVRGALSRSY $N V A S P L V Q A A F A D G V Q A Q Q D S P M A M D A A M G D$ QFVEKTLAGGMASGEKLPWAGPMHVEGGFNVFRFDRRGLS $G E L R A A G D A L G S R L G E R Q V V$


A KAVVQLMDS QQLKVNVT LGE LQQRDGRDDDGAS DPGGFGS RAVQTMTKAGFGLESTLGAAQFTERSGNRDPLHGGTDDDG $P G F A K A L A D A V A E L R G A G \square D A D A D G D B Q V R N G V$

VE E M A R K GWA LD T L L G E R R F VR SEGR N D P T S T WVNGNFTN

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UniRef90 F5ZBF3 UniRef90-A1ZPV7 UniRef90-UPIo00237B331 UniRef90_S5UAQ1 UniRef90 UPIO003B49BC3 UniRef90-UPIO0034514AB UniRef90-K6GG05 UniRef90_H5TB08 UniRef90 IOPLMO UniRef90-W5W0K3 UniRef90-R8AY75 UniRef90 UPIO00349221E UniRef90-G2GMA1 UniRef90-F7NZQ7 UniRef90 UPIO00370A334 UniRef90_D6Y1Z1 UniRef90-A6GL75 UniRef90_K2GK32 UniRef90 W2EFC1 UniRef90-R4Z782 UniRef90-M5ASN3 UniRef90 F2R5S1 UniRef90 U1J7A4 UniRef90-W7T299 UniRef90-E6V968 UniRef90 Q97Y79 UniRef90-C7Q6B3
 PIHGGHHEVGAFNMITSGFAPGVGY SHRLVPWRALPDDGEDAPDGP GLAGDHDCVSAVPGVTDL.

DGD\PDHGGEEYEGVLNK पQS $\square P \square G P Q G \square Q V D$
IGNRDNW
SEQ $\|P \square H G S \square G E \square G V L N V I T P G Q V D G K \square D\| V F G S S F$
RपPVPGGAGQपGVWNVIQPTWDAAGGGYTEVPFGSSHपQA
FFLKPGEQIPQYGGE
GSEGYFT HVPLYGGCGNAGYFTGACVENIPQYGE DVKNSDVRNRH NTAS $\triangle C H P L A A A \square P F A S R L L C M P A E P G D S L T P R A V A P D F G$

LGALPGTGRRWRFVDAPTAGSNETVMKTAHGFSG DPSSWRWGSLHTVEWLFNRGPYRVGGGSSIVNATGWDASA GQ R $\quad$ DPVPGGTESLGVWNKVEPVWDAA KGGYTEVT
GAPDADGAVNVVERVPAPATT伿VARGSGEDTSDGYRV STAGLRWDEFHITEFASPWGQVGSAGSVCILNQATAKYLT VTVRHPGAAGARFLDGSRFAGDGDGFVIHVQRQGF
NRSDYEHP LAKS $\square$ P LVGRY $\square R S P A V P \square S G D N N V I H V N P$
DEAGYFT IVCARRPLDPKGYPMDSSG
R\AVPGGTESLGVWNKVEPVWDPAGGGYTEV K IALYGGCGEVGYFTDTC NTAHICHPLASADPVFGQRLPPDRLDGDGNMPRVTAPAFG $R \ P V S G G T E S L G V W N K T E P V W N A A G G G Y V E V \quad A H G$ HPVHLGVAPAVTDAVAAMRQRVALAGDTDCVLATPGVSDA


GV RDPVGGGTEALGVWNKDEAPWDAA AGGYPEVV


D P A Q W
TESGGVWNKTEAVWDTGRGGYREVAAGSSHTQAVGW
DCCSWGTSSEPRTSPGDRLEPGTELRADPEVSGVLNGYPI NMSNDGTALPRHTY $G V R \square P \square H G A P H Q L G V L D V I S P V$ WDARRGNVEV

DPAQWQWGR LHATRAK $\square N G \mathrm{~V} \square \mathrm{PK}$ KGGPYSPNQSMYRPGG DGPVRWGDLHR $\square$ AP WQALPDPDAAPGPRLDGDHDCVLAT M $\square$ AT S DWDKT $\square$ FPKHHYPVGNDVVSGEELESQLTDQGYHV TEALGVWNKTEGVWDAS

AGAYTDVS NPADYHWGLLHLAHPLGGPFNVPGAGGWETVNPGGHRVSG

T LSPAPSPSPARVPAPGADEPGGVLNLIVTPAPSGDHP■ E पPVPGCGNVEGCYDDTAATDSGLLGSDGRFGAV
DKNGEK $\mathrm{D}_{\mathrm{P}}$ MHGGFGGEGПFNVASSGQNSDGTYGP $\square$ TN GKSNEKISMHGGLGREGAF NVAQSRGREIIRNGTTNSDG GEQDPVHGSDGQLGVLNVITPGQVDGTQDVVFGSSF NVFDTATGNNGTLLPRHVYAPLN DNTTRLSAEGQGYHI RWP $\square Y G G C G G A G Y F T V A C P E D G K D V L D A N A V S N$
NALEVKHPFSSTLGPLSTLVDMPVAGYGDSFLPAVQSGSF NALTVKHPFAAQIPFVGHKLNMDVEGFGDTYMPAVQSSTF KVDKWHWKKMHTLEHKHPLGPYAVMGGLEVINNQAFKLDH
PTHGGPHDGGVLNVIPVWGSGGNTEV VHG

DPSWHTWGADHHSLLVHPLGPVPRGGSGDTVGNAGYDFRQ
GNNNER $\square$ PMHGGRGQEGDFNVLATPRA NAQGEYTPV QPGTSLEPVMPS GRPपAGSDDT SAGYVV
पQVSGDHDTVIPTFGGEGFEGAFTTASSRPHDTSDGLYDV



GVQASATP TFGGTSPEGAFT VSTEPSR पNSEGYKV QVRDYQTYPKQGVT GNEGYFT

EGDTNVVGRGGDGGTSEPVREDPDWVTDDTDDTTDGYPV TTNIVTWSTNNSSTEPGPVRGDRVAPDGSLRGDGYPVNFG

DUTTFAKPVKAAVLNPLTEKETWSGLNKEGVEV HFG
$N \square S Q W Y W G R V H F \square E \square Y N P G G P \square P \square F G D P H T \square A V G S T P Y \square P$

UniRef90 UPIoo03B41164 UniRef90－UPIO0036B874E UniRef90－M3ETK6 UniRef90－H0EAS7 UniRef90 UPIO00370A0E1 UniRef90－D8N7J6 UniRef90－K2HK76 UniRef90 UPIO00375EF06 UniRef90－UPIO0047818B6 UniRef90－D9X7K0 UniRef90 UPI0003A0A6FA UniRef90 D3VBT7 UniRef90－UPIO0041C26CO UniRef90＿UPIo00475B1A1 UniRef90 K9HT53 UniRef90－U3P8T8 UniRef90－K4RFX1 UniRef90＿UPI0003B64582 UniRef90 C6WC02 UniRef90－A6GGS7 UniRef90－E6PH76 UniRef90 E8W5Q2 UniRef90 UPI00030297C3 UniRef90－E2SE65 UniRef90－K8R9V2 UniRef90－B513G8 UniRef90 ${ }^{-19 C 2 H 2}$ UniRef90－UPIOO041E20FC UniRef90 UPI000464DF4E UniRef90 E8RZ67 UniRef90＿C6CG47 UniRef90－10H4Z1
UniRef90 D7B3S9
UniRef90－B4VGL1
UniRef90＿UPIOOO2D38D07 UniRet90＿TORBC2 UniRet90 E2PWG7 UniRef90－D3F9Q8 UniRef90－UPIOOO4775764 UniRef90 HOILQ3 UniRef90－UPIO0047D1528 UniRef90－UPIO004782318 UniRet90＿A0A011 PMX6 UniRet90 UP10002376F79 UniRef90－J7L877 UniRef90－I0L508 UniRef90－UPI0002FD458F UniRef90－D3VGT2 UniRef90＿UPIO0034C4FB6 UniRef90－UPIO0036E8EAF niRef90 UP100036259CD UniRef90－082804 UniRef90－UPI00026CAC13 UniRef90 L8EQD5 UniRef90 R4SR17 UniRef90－W7SYD5 UniRef90－M3E4A1 UniRet90 UPI000287CAAD UniRef90－UPIOO0472CC17 UniRef90－E8W3U8 UniRef90－UPI0004793B29 UniRef90 N7A485 UniRef90－V6US09 UniRef90－H5T9B4
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T N P N S P W GSAH

## EGTSYVQTVGFDAQGPDAQALLVYGES <br> T DPASPH

## DQQVRFTTDGPPQAYSVMAYSQS

ANPNSPH
VGWDG GRCPVARTLLTYSQS V LRNSYMHVVDFPDEPVRAYTLVS
D Y G N NY L QLVSF P N NKVEA Y T S L LT
ASERMVVAPGHESEGDTH V V $V$ GGPTG
SNPKSPH
DPSSPH SLSDDPASPH

GPHAANARHVSDLADMDANWFVLMGGQD GYEVGHVPMVIDLADFDRSTWVNLTGASGH TGSSYQQAVGWDGSRCPVARTLLSYSQS NTGTSFAAVAFASFAGQSDNPYSPH PAGEVADRFISTDGSMFRS VIVFGEDGRPRMHFNFGPN FFGAERMVVPGDEQQATS 品SGQSG
SFGASERMVVSPGDEQQATLS पPSGQSG
NPLSPW
TQGDSYVQVVTFGENGVEADTMLS PHGNSYMQAVGWDGRCPVARTLLTYSQS PHGNSYMQVVSFPSAGVEAHTFLTYGGQGF ASERMVVAPGHEADGUIHRARTMPGGQSGH SNPLSPF

HSESDDPASPH
SNPNSPH CWRGPVARYVWDLTDRAASRWIVPFGASG RPGDAH TFGASERLVVSPGDEANATLS LIPGGQSG NPLSRW PGVGYPKVVHGSS FVMAVELGRHGPSGYSQSTNPNSPW

HGSSHDQAVGWDGGPCPVARTLLTYGQS ANPNSPY AARGPAARYVWDDARREDSRWVVPFGASGV GRASSFSWKMVTTMNENYAFTVLPGG
$\square N D N \stackrel{\text { GS S }}{\square} \mathrm{F}$ S

> DGGRCPVARTLLTYAQS

QEGDSF $\square$ MA $\square$ QYGPDGPDAKGVLVYGN TYGSSWMFAMEFTDEGPVANGLLSYSQA STGSSFLQVVAFRDACPDASTLLTYSQS
SNPASDH
PDDSRNPA
SDSRSYH
ADPTSPY

TNGPSFRVVDVG NWDNSRTVNAPGQSG
D P E S PH

SSVPGVTHACFRGPAARFVWDLARRQDSRWVPLGPGDPH RFGSSWSMLVEFNQQGPNARGLLTYSQS SDLDSPH TGSSYTQAVGWDGGPCPVARTLLTYSQSASNPGSPH VNDFMFSGDTAPGRRFVNAFEVIPGGNSAVL

GSPN
VHGSSF $\square$ QLVSFPTPCPTTHSLLTYSQS
TDRTSPH
TMGSSFVMAVRLTRDGPKARTLLTYSES
SDPSSPH
GPTYMQSVTFDSKGPVVEALLAFSQAG
DTTRPF TYGPTYMQTVTFDDKGPIVEALLAYSQS ADSTRPY VQQVRFTAEGPPQAFSVLAYSQS ADPESPH NYGSSWMMVVGFTDAGPQARGLLSYSQSSRFGEDD

SYLQVVRFGEKGVEAHTLLAHGQDELAVSNGRGSAP
GASQRLIVRPGNEDKALT VPGGQSGHFM SPY

SSFLQVVEFKGDKAPEVRS LLTYSQSGTDPASKY S 1 GSTFRMVVDVGE WDGSRAMNAPGQSG DPRSPH

TAGPTYMQTVTWDANGPVAEALL GFSQSADLTSPF NEGTSF听AVEFTDNGPQARGLLT FSESTDPQSPY
 NYGSSWMFVMNFTENGPVARGLLTMSQSAHSD SPH TGSSHTQAVGWDGSGCPVARTLLAY SQSSNPNSPS


TNGSSFПMSVDFAKGGPQTRT川LTYGQ TDDQTSP TS FVMVVDFSSGEPQASALLTYGQTG VQAVGWDGSRCPVARTLLSY

SQSSNPDAPE
TLESSPH

SHGNTY LQVVYFDRRGVHARTLLAHGEKETAVTNGPGAAP TVPDPYV TVGSSLRFLASYGUFPGGPSESLV NGPGAP

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UniRef90-K8R9V2
UniRef90-B513G8 UniRef90- $\mathrm{AgC2H} 2$ UniRef90-UPIOO041E20FC UniRef90 UPI000464DF4E UniRef90 E8RZ67 UniRef90_C6CG47 UniRef90-10H4Z1 UniRef90 D7B3S9 UniRef90- B4VGL1 UniRef90_UPIO002D38D07 UniRet90-TORBC2 UniRef90 E2PWG7 UniRef90-D3F9Q8 UniRef90_UPIOOO4775764 UniRef90-H0ILQ3 UniRef90-UPIO0047D1528 UniRef90_UP10004782318 UniRe90_A0A011 PMX6 UniRet90 UP10002376F79 UniRef90_J7L877 UniRef90-I0L5Q8 UniRef90-UPIO002FD458F UniRef90-D3VGT2 UniRef90_UPIo0034C4FB6 UniRef90-UPIO0036E8EAF UniRef90 UPIO0036259CD UniRef90-082804
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UniRet90 - H TB08
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YADQTRПYSDKGWDTMKFTQRQपRAD HRDQLPRWLGGDLVPVVTDWDRLTR

AFDQMRAFSAKRWПRपPFSETADAADPALKTT
YADQTK $\square$ F SAGQWVTERFTEEQ $\square$ AASA $\square Q T K \square L$
FADQTRDFSGEKWVTSRFCEKDVLSPKDRVV
YSDYTEAYSAKQWHRVPFTREQI EAEDESSITI YSDSTWMYSAQKWLHLPFKESE! DAD
WAAGHADWVHGRATPFL PGATLHRMTEPA
F LDQWDLWREGQMMHVPLR\ESVRRDFPYTTLRPP YADQTALWVRGQTRPWPFTPAASREAATQTLRLTP Y SDQTRLFSGEKWVTSRFCEKD RKSPALRVV P FADQQADFARGEVRECLFTWAQI QADPQQRTT WGDAVEDWAAGTYVDMPFTLAEIEAASDEVRIDE YTNESRA WDAGKLLPMPWSRAAVRAATRYTLTLSP
WपNNFSNWTQEDAQPMपPGEA
SGDATRAFAAKRWARFPFTEQS DDSDPAVTRV FSDQTRLFSAKKWVTSRFCEKDILSSPALRQV $Y V D Y T K A Y G A R Q W L K L P F T D S A \| Q A S P A Y K T$
$W G A G H E D W V H G R P T P F L P G K$


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

Y A DQTRLFSQERWVKARFCERDI
HRDQQPLWRAGDLVPVVTDWDRLHRET
YKSDLQNWLDGSYRKTEF

YRDQTA LTYAGERWVTARFCERD
YYTGAQAFSAEQLRPLAFTAEAVAQEAVSVVTVSRPR Y LDQT LLY AEPQLRTLHFQQEDI AAAAVEQLSLT FADQTELFSRGEWARGRFCERD\|LDS

YRDLAEKWLHGDYFPLLYSRKAVEQATLQK\|VLEPGK HDDQQAA WLA GELLPVTTDWD

F A D Q S LF Y S R K Q L LP $\square$ P Y R S E E $\square$ K Q S T $\square$ S E L I I Q
FSDQTELFSRGRWVTSRFCEKD\|LRSPALRVV
Y VD QLPLWLT GQYHPL
HADQAELLGKGELPRERF
H G D Q TVLY GRGGWVPDRFGEAE $\square$ T ASPE
HRDQTRRYADKDWlRLPFSAGEVSKQAVG
HRDQTRRYSAKDWI RVPFSAGEISAQAVG
HADQTKLFSAGGWVTGRFTEEQIAAS
$F D D Q T L L Y S S Q Q L R N G R F T E S D I A D N L V M Q \| D L$
VARYSRKAWLRFPFNEADIQRDPQTRAVLRP
YK T GFNEYAAQGNTP LL PQK $\quad$ HQ $\square$ NF T P S R FKAGFSDYATQAATPLLPSE YSDQTELFNSGRFRETPMSRDS $\square$ QKMRRRK LVLKPRK
HTDQTALLFSQGDWVRERFTEHDT
YADLDEAWAAGDSFPLVYSRAAVEANAXTRDRDEPS

NRDQTRRYSEKNWDA LPPFSTAETAADA
FADQTVLFARNTMRDCLFSEEAINADPALT
YKDMTEAYSGKQWDRFPFTQEEDDSDPEYRLV
FDDQSRYYSQQTLRPLYFSEGDI SNNLIAEMSIS $\square E K$ YSDQTR LLFSQERWVTARFCEKDVLA S PALDRVV

FDDYTKAYSQKNWAR $\square P Y T D A Q D Q A A K V Q T K V L R Q Q R$ FADYTQAYSDKQWNEFPFTREALIEASL

FTEQTEMFAKKQWKDVSLDPTVIADQALS
FESQTVRFSEKNWRPVLLTDDEI AADPELTE
SSDQTRLYAGERWVT SRFCEKDI LRRSAALRVV
FADQSVFYGKQQLVDLDPTKEALVAKD
VVRYAKKDWLRFPFREED $\square$ ARDPS $\square R Q T L Q P$
RENQLPLWLSFKYV


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UniRef90-A0A031IVP7
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UniRef90-AgDOT1
UniRef90-B2GG13
UniRef90-I1AZ32
UniRef90-UPIo003140FA8
UniRef90-U1PKR4
UniRef90-M2XAW9
UniRef90 UPIO0016AEEFA
UniRef90-나861
UniRef90-UPIOOO2630A29
UniRef90_V8E6K3
 SNAFAVSGRKTKDGSTFLAIINSHQPWAGPFSWYEAHLHGE SNGWGLGSDKTENGMGMVLGNPHFPHTGNLRFWQFHTTIP SNAVVVSAAKSASGHPIAVFGPQTGYFAPQLLMLEELSGP SNVYGFGTQATNSDSPLLEGNPHWFWFGPDRFYQAQFT
SNGWGLGKDMMANGKGGLLANPHFPHEGNGRFWQSHLTIP SNAFVIGGALTASGFPIIGGDPHRLFESPNVYAQVRLSCP
SNALAV TEGAQGSTWLASDPHLGFALPNAWLLLGLHAP NAWALHGSRTASGLPVVAGDPHRLLELPGVYQQVRLACP SNMFAFGREATG GEAVLFGNPHWFWGGPDRFYQMHLTTP SNVIALGQRASGGDGAVLFGNPHWYWGGPDRFYQAQLTIP SNAWALAGSRTASGRPLLAGDPHRFLELPGVYQQVRLACD

SNALLVSARDSKSGHPLAVFGPQVGYFSPQTLMEEDTHAP SNAWAIPGE SNALLVSGAHTASGHPIAVYGPQTGYYAPQILMVQELDGP SNAAIVSAANSATGHPVAVFGPQTGYFAPQLLMVQELEGP SNALALGGQATAGHGAVLFGNPHWYWGGPDRFYQMHLSIP

SNA $\square A V G R A A S A N G R G V S L A N P H D P W Q L S G R L W Q S Q L S P$ SNAWAVGGDATASGESLLLANPHFGFADGLRLYQVHLTIP ATGHPVAVFGPQTGYFAPQLLMLQELQGP ATGHPVAVFGPQTGYFSPQLLMDQE पQGP
 SNEWVVCGNKTATGR SNTCRRAGPGLQPP SNA WALTGSRTASGAPM $\square A A D P H R V L E A P G \square Y Q Q \nabla R L T P$ SNAWAFGSDVAAGDSA LLGNPHSAWQQRDYMHQYH T P P SVLIJAPHFSFNDGLRLYQVHLTIP

SNAWAV RVGAEGAPLVAADPHRLLE पPGVYQQVRLVVE

SNAWLVPGELSVSGAPLLAADPHR【VEESGPYQPVCLSAP SSAWLVPGELSVSGAPLLAADPHRVVEESGPYQPVCLSAP SNAWLVPGRपSASGAPMपAADPHR\|VEESGPYQPVCLSCP


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| UniRef90_I1AZ32UniRef90_UPI0003140FA8 |  |  |
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| UniRef90_U1PKR4 |  |  |
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| UniRef90_UPI00016AEEFA |  |  |
| UniRef90-I2F861 |  |  |
| UniRef90_UPI0002630A29 |  |  |
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GFNKN $\square$ A WT $\square T$ DTQADGTFFFEQ




$G \square N V S G A G \square P G \square P \square M W L G H N E T A A W G T A T D T T R T Y T L F E L$ GFDVAGVSULGCPTVNLGFNAADAWTHTVSAADRFGFHRLL G $\square$ S S RGVAFSGLNYTLLGRGPDYAWSATSS DQD DTDTYAV
 GGR $\square E G \square A \square A G \square P G L L V G Q S R H F A W A L A P S$
LHMVRGAGYR LQPAHS LDPHGREA DS W GTFFFVQ $T \square D V T G L A F P G V P G V H F G H A G T V A W A D T H A M A D Y Q$
$G L D V A G T S F L G F P L P M T G Y N A D V A W S I L D A A S V T P F V L Q$ GFDVAGVS ILGCPTVNLGFNASLAWTHTVSSAERFVLQRL


G $\square R \nabla R G \square A L V G \square P G V H F G R T E T A A W A \square T A A M T A T E T \square T E \square$
 GVRVRGLALVGLPGVHFGRTESAAWADTASMAVTEQLAED

[^1]

$K$ KVGND YEWNGTLHPLTEY KVNG FDVNW
 DLCEPGGGTYLLAGACTPFERLQQHNAWQPAGSYDLVALR KLCNADGTSYLYHGTCTPMQALTQTNSWKPAGSYRLTVQR
 GVDVNY
$K$ KVPGSPTTY LVDGKPERMRRTDVGVLSRKADGVVRPQWT RLVPGDATAYLWQDAPEAMQQRQI AIIPVRGEAAYI RHVWS RLCNLDGTSYLYHGTCTAMENDTRTNSWKPAGSYRLTVQR
$R L V P G D P T A Y L V D G V A E R M T A R D \square T \square P V R Q A D G D T R R L W E$ PLCTTDGDHYLYRGQCVAMEQLAHTNKWKPAGSYKLVAWR
$$
\text { E G G T A R LVPEPSEGVRS Q } \square \text { T A } \square R \square R G A E P V A H T V L I
$$
 AMGQQQVSVQUAPGSDPAMPHPL
 QLVPNDPTAYFWDGRPEPMQRRRVALELRGEAPHERDLWQ

MERRTVPVTVRDGSGRDTTVER

D APEGPEVLDARTERVHVRGGDPMDVRVAH DGEPERMRKRTVTVAVKDGAPVTRTQWW P VEARDGTWHVTGTGEPLAVRHAVLRARDGVERPVTVRC P VEARDGAWHVTDTGEPLVARSTVLRSRDGVERTVTVRS $T V V R C G E Q L V Q Q Q T G E P L D E S G \quad F R D S T G A L R V I R R$

lupas_21
lupas_14
lupas_28
jnet
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sol25
sol5
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 SHNAPVIQNPRGT YADRYCGSERIDQQLEQWLAMTKA TNYGPMIVVPGSFGWGAGGSADANLPNYDVLDHWLAMNDA TKYGLVRGTVNGQPTAFATLDRSTYQEADSADGFQMFNQM SEYGPLVNLSPDRWKAFAVR DDNQENFRDWRNWLRWGQS SHHGLMI ETPAANGLGWNDSQAFTEFNMDVVAQWSAINQA SDTGPALEVDG GVVALCDTGPSYAEGSMGLDAVLPLLRS

TTVGP VVSDTRLWPKGQKVA LA WMGHRPSDFTPLLELMEA TARGPVLWRGGGPGAAWSVRFPVRATADAGVSCLRRLLHA TRYGPVLDLGAHNPAAHAFARDVNADNFRIFPNYFQWNQA SRFGPLIDLGQQNQRALAVRDVNADNFRUFRNFFYWAEA TARGPLVTDE ARALCWPVRVTADAGVAAWRRLQRA TNLGPVMVQNGST SUVMDWMGNUVSNEIGLLEDNSA TKLGVVRATVGGRPVLFTSLRSTYMHEVDSARGFSDFNKM TDRGPVDAGPGLAGPALSLRTPARAGSDLGFDVLLPLLRA SAYGLVTHTVGGRPVAYTALRSTYRHEVDSVIGFQQFNDP $T N Y G L V T W R V G G V P T A F T S L R S T Y R H E A D S A I G F Q M F N E P$
$T R Y G P V I D L G G H H P A F G W S A R D V N A D N F R I D R N F F Y W N Q A$ $T N L G S I M$ G $V Q N G S L A L V M D W M G N M F S N D L A L L N L M T S$ TRYGPVTELDWTASSAFADADANAGNLSMTNSMF EI A ARG SRHGLALHVPGWTAESVLCLSNANAGNPEVLDHWDAIGAA TRYGLVTGTVGGAPVAFTGLRATYGHEADSAVGFQMFNQM PYMASLSVMRA SRFGAVLAMPA RGLA WTAETAWA DTDPERADQWLGLGRA TK $\square G L V R G T V G G K P H A F T Q L R S T Y R H E A D S A D G F Q M F N D P$
GHSGPVVAMDE SGAAADRSPVLQPGQEVAALLGDNDA VTGQHPKRNAGHTGLFPTLALDAPDLLCRIMKTSR TNWGPIM $\quad$ QNKGLALVMYWLGNTYSNDFGLFYISNA

 TRHGPPLSVPGWNPEWVFCLGNANAGNADVLDHWLAIGAA TRFGPVLSSGWSTETA YA V R R A N NADNLLRSMNTWLAMGKA

 CGAGFVLPAPGATATVTVVSPAPVPEPSRADAACRELLTGA CATGFVLPVPGSTATVTVVSPTPVPEPSRADAACRELLGA CRQGRVLPGSSEREAALSVRTAAEQLSPTADSACRTLLGA


RSAEDFQRAAADUNFTFNWFYADAD DTAYYNSGANPQRP TTFEEWSAALGRQTMPLLNAATSSTATTRCFPRTGRPPTT GDMNEFKQAFKDYDGVINTMAASKEGEVFYDDDSTVPGLT GDAAAFAASASK $\square G F A F N W F Y V N S S$ DAAYFMSGNTPVRS RS LDEEDA DQQQEMPWVNTVAVGRSDQAWYADMGAVPNVS TS LEEMKASFAKYDSFNNTMASDKEGNVFFVDDSTVLKLR RSVEDVDTALERWVEPVNNVVADRAGRMLHRVAGQLPVP
 RDAHDVAAVLRDWVDPVNVLVADRSGTVLRVVAGRVPRRG RSLDDEFIAAIQRREAPWVNTVAGQGDGRVWYGVAGRVVRRGP
 $R T A H D V A A A F A A W V D P V N R V L A D S S G E V L D S D T A G R V P E R E ~$ SNWTQFRNDLSSDWKAPQNFAFANRT TIIADISPSFYPI FS KTPKDFMKSAAKIGYTFNWLYATNDRDIAYYNSGNNPVRA TTA D QVA DALSHWVEPVNVLDTDRTGRVVQLAAGRVPVRD TSAAAFQRAAQDIGYTFNWFYADAD HTAYYNSGTEPLRA DTPAAFTNSASNISFAFNWFYVNSTDSAMY TSGAEPVRS RS LDD F D A I QRREVP WVNTVAI GRDARVWYGDVGNAPNVP SNWNEFRDALS I WKAPQNFAFANRT MIIADISPAYYPIFS RNYAEYVKALNGWCPSVNHDYADTTNKIA WKPSGASPDR

 KNYADYARADDGWCPSVNHDYADTTNTDAWKPSGATPVR $K N Y A D Y A R A L D G W C P S V N H V Y A D T T N T I A W K P S G A T P V R$
$G S V A E A E A A A T R G T P W U N T L M A D A D G R A G H A D L T T S V P P V T$ $G S V A E A E A A A T R G T P W I N T L M A D A D G R A G H A D L T S V P P V T$
$T$
RSYEEFRDAVREWAVPDTVIYAGVDGTVARDETGP GTAVPDTDACDLDAVMQSMAAAGVSVNASSLNMPLDRRRLD SNWQQFYDALRHWHVPQNFAYADVYGNIGDVSAGLYPQFA $R T V D D V D A A F D D W V E P V N V I I A G S D G V V R E R V A G R M V T Q E ~$


 RDLAQLR A AQDTCQGVPWTYADTGGGTYFTDSSAVPHDT RRTADVDRAFDHWVEPVNVVAADTEGGLLHRVAGRVPVRA ASAAEACAVLDGHVEPVNRVIVADRRTVLTRHAGAVRRRD

TAWFSWDCCVAKAW RSTDDVLGS LARHQPWGNT $\square A A D R A G H S D F T Q S Q V L P R D T$ SNKDEFQQAFKNYMIFNNTMYADKEGNTFY FDDSTVPAAR RTAEDVVAA QS GWAVPCNVLAADSEGRCRHTVAGAF
RTADDVVAAQSGWAVPCNVLAADAHGACRHTVAGAFPPR R R R GTAADVLAAAQGWAVPVNLVAADTTGRCVHAVIGAAS RP L

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240 TGNTSSTVWPPT YVPWDRDPRVLNPSSGFVQNC ATAGFTVLPGFASAFDFNAPVSYENAPKYE GTDYVQNS AVSDPNLPMTADAAHEWAGFDPATNTATYTAPDQDYLVSW $\begin{array}{lll}P E Q G D P F F D G S H S F C D W Q G A V G P A R M P N L L & R T D Y V A N M \\ E S T G F D L V P G N L K L F E P Q G V V P F E Q A P Q L S & R T D Y V Q N S\end{array}$
 QGVNPSF\|LGSTAQADKSGFYPFSANPHEENPARGYIVSA SAYPDLLRDPRDPRMRWTANHQCPDRVRVQRTEAGIAVSA AADRLRPHDAWSDA GRAPTWAPPVPPEEVRDVAVDA DADWTPVLDGSRRACDWQGA 1 AASS DPWLL REDYVANM DGSRAACGWRVDPRAAQPGAMATADMPGLL RDDYVANM AGERVVPDPAEAAPPRWRSLPPPVRV,
 KTYNPAAVMPGDGSEFIVGSIPYSSVPQVVNPPQGF VS S
$R G T T G Q L P M G W D P D T N V A D Y T P P A Q H P Q V V N P Q A Y I T S W$ $R G T T G Q L P M G W D P D T N V A D Y T P P A Q H P Q V V N \quad Q A Y I T S W$
$D R N R W I P V P A W D P A Y S W Q P G W A P M A R F D V V$ PGTDPDLPILARSGYTWQGWDRAANTSAVEPPDQDYYVSW $T S A D P N L P T K A E Q A Y E W Q G W V P S S G H P Q A V N P R Q D Y F V S W$
$D A L R A R C L D G S R A D C N W L D E A G A A Q M P T A R L P R T D Y V A N M$
 QNWDGLLPVPGDGRYEWNGYLLPQAGPCEVNPARGFI ATA DEKAARCLDGARTACAWGRRDDAALRPGVFGPSSDYLANS
DETRAALSNRAHPLAQARKQNGFAVLPGDLSSHRAVIAN DETRAA
$V G A D R A H P D A Q A R K Q N G F A V L P G D L S S H R A V I A N F$
$V$
$V$ ENWDGLLPVPGDGCYEWNGYLAPQSGPVEVNPERGFIATA DAARDT LAGDRAACAVPGLMPADQMP VRNSRRDFM NA
$P G S N P N L P M K A E P A Y E W Q G F Q P A S Y A P R S A H P D Q D Y Y D S W$ DGVNPAFILGASSQADKPGFYPFSVNPQQENPASGYIVSA QTSTWSTYAPVKTDAAFT SVPRAEL REEVNPEDGTABANA SSGGGDPDMPGDGQVYVKGFIPYEDIPHAFNPPSCFIVSS

 EANRLKPVPAWEPGHEWHGAHETPYARPA TENGUAVMA A GEGPTALDGSTSARAWPGDHGPSHQPRMSSRADYVANS SGGDSLAVPARRTSDVWTRLIPYDSLPQMLNPRGGYLHNA
 RRSA WRASALGPGSADGSHDQPWVRWP APATADDVVVAA
$A T C R K R S G Q P M W R R I V P R G C F C I S A L P W S E N P K A G F I V T S$ DGSRGECADGSDPDAAAPG $\square F G P A R M P T L K D A P \quad Y V E N S$ $\begin{array}{rl}\text { EQAGFT } \quad 1 L P G N T S V F S F D G P M P Y E F A P K L E & R S D F V Q N S \\ H G T A E P P R E & P R G U T V R A\end{array}$ LHGDTVRANQRPSDAEGSAARDACASPHRADRATA LLDAA VA WDDDSPPADRGELSW VPFAENPHVEDPE YLATA WRAALPPDAHPRIVDPAGGQLWTA HDVRASVPADARCA PWPLSTTQSPQRIDPADGQLWTA

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NNAQAQEYAAA GSGWSAVVHRGRRVVADIIADGGTANRA NSSPDADRAPAVSGMDERRMTNRALRALELLSAKGGLDAD NDSFWLTNFENPDTGVSPLYGKRSRMAHKLLNQASGSDGK NNKQAKDYGAADGNFSFGPVHRADLLDAALAGSGKLDRA


 NERPARPEQD LGALYAPSQRARRLRALLDATRTEPAT NDSYWLSNARQPLTGYMLRGRLGHHMALDLLQAKDPADAF

 NQRVGPSYPYWFGMTNSFSDGYRAQMEVNYLEQHSLVSVN NNKQAPGFSGADLFSSVFRSQMLDKQVDTRLSGGRKLDLP
NDR
 NNKQASNFGAAD GNFSFGSVHRGDLLDKPLKAGDADGRA NDSYWLANAAQP LLGGERQPLSLRTRLRSFVARPESATPAA NQRVGPAYPYWYGNTLSFSDGFRAMMEVNYLENHTGISVK NNVPDDWAAASPADGYEWLDSSRHDTLHRELSRETPISLE NDSYWDFNPAEPPVGYEQNLRTRGGFGADQLAAKGGFTGQ
$N N R V D C D R P L P E H H P F D A P L S P R A R R G Y R R P A A L A R L T L D$ NNRVDCDRPLPEHHPFDAPLSPRARRGYRRPAAGARLT LD
NNKQAGDFSAAD GNFSFGAVHRADLLDAPLAAGVRYDRA NNVPDAWTAANPATGYEWLDSSRHNTLHQALSRKAPDSQE NDSYWLSDPATPLTGTDVPQRLRTRMSARQLGELTGRPGP
NNKQAKDFGGAD GNFSFGAVHRGDLLDKPGLAGKKYDRA

$\qquad$
NQKDTP NGYPYLLGADFAWPYRGARI QELLAAANQDKLLT NQRVGPSYPYWYGDSMSFSPGTRAWVVYDYLLYHNNVTLQ NDR GMRPSVAGLGEEFAAAHRGSRI AELLLAHRERWDSE NDSAWMVNPAAPLKGFSPP LGQRARFALDRLGSQQQAGKV
N SVVQDFPSAAGLRYDPRLIMSTRRLDELTAEGSITPDK NNPYDAADPAHHPLFGAFDAPLTPRARHGLRLTRELARPD

 NQR GPAAPLGVEFAPPHRVHRITALLAEKDRWSPA NEP $\quad$ HPDTARLGTVDACAPWRSRRI REALCABLAPQERT
 NNSFWSTNLAEPLENYSPMYGAERGQLEDAAGDDGKFNI E
NQRPSDAEGSAARLACASPHRAHRAAALLDAAVAEHGVVR NQRPSDAEGSAARLACASPHRAHRAAALLDAAVAEHGVVR
VAAHGVVRHEDLLSAQLDTAAPHWPRLLRSLFVEPVRSTE NQLTVDDDHLAYYLGVEFDPGYRGERIVYLLDEQIEADEE
 SHSVRDWYPYSLTVGGETGHNPRSQRGYEPLDDQNEFTFE

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| UniRef90 UPI00037D46BB | VREMAE ${ }^{290}$ ( |
| :---: | :---: |
| UniRef90-L8HHI1 | $\begin{aligned} & E L V R E M A E A G L A D L R A E R V L P L L L R V L D T A P V T D P L A R L R \\ & Q F V R I K F D E T Y A S L M A Y L V N H S L A A Y D Q Q V E E V G K E Q R A M \end{aligned}$ |
| UniRef90_G4QLK9 | F NMMEVEEASNRSYLSEDIFTEILSTICQSNREVDTLGEGC |
| UniRef90-D2B5Q6 | GTVK】MAEAATTDLRGRKVLPDLLRVINSA |
| UniRef90-W1IQ14 | S QLIEEKACHSPLVDVQHDPMSNITY S S P QRVNV |
| UniRef90-E6RGY0 | DLAELNALVGNRDYLGELVFDDLVAQCKARGATPDL |
| UniRef90-R7XTR1 | AVAAVLGDVHLDHDL |
| UniRef90-UPI0001BCA1CC |  |
| UniRef90-F9ZKY5 |  |
| UniRef90-F4GZ65 | A A GTARLHGDVRHDGAARLLAHLADAGTSGPDSAAARALR |
| UniRef90-L9PAL5 | SQRDMHDVLTPRSYSAELFKDEVLDQACVLPQVRLDAAAQ |
| UniRef90_W0V439 | RAMDALEPRSHAAELFKNGLLDGACNEAGAAPLT DAC |
| UniRef90-F6FVD9 | PESQGRVHGDVQDAGAAALVGWL DigVVPGAAA |
| UniRef90-X1GP30 | ESMKTIQNDVNSTAARAFI P ELTEVIYDYYGPM |
| UniRef90-TOLJU5 | NII INFQAKN YTDYEAEAAVPHLLSYMSGSSNATVAK |
| UniRef90-UPIO00426 | GLVDAMEEAGTTDLRGQEDLPLALRVI GSPSDPALRS |
| UniRef90_IOHG32 | Q M |
| UniRef90-E4N5J2 | D L VQA MEDAANVDLRAERVLPELLAVLDSPVADPAAAAA |
| UniRef90_UPIOO03700519 | SLLKVVESAATTDLRGTDVLPVLL RVIDTATVTDSAQAA |
| UniRef90-UPI00037D89BB | LLRRLERQADAQAYSATLFKDDALRGACTQPVV |
| UniRef90_T0 | QLSAFQQQN YT DYSAQLAVPRIIGY\\|S G T NA |
| UniRef90-U4VFV9 | DCVRL QCSTFSP $\square$ ATRALKCLKAM GVTGEPAA W |
| UniRef90-M2Q1Z5 | AMRDLMFSH RDHAAELVRDDVVGMCRTMSDLD A A C |
| UniRef90_UPIO00463B320 | NHVQMADMLLDDLLALGARAPSIITARS |
| UniRef90-G8SHI2 | SLLKVVEQAALT DLRGREVLPVLLR |
| UniRef90-M3JIE5 | DCARLQQASTFSP ${ }^{\text {CAARTLKSLKGLFQHSND }}$ |
| UniRef90-I3TUA0 | A \( |
| ) APSDLE A M |  |
| UniRef90-C4RKG9 | TLTALLVERAGLT DLR GVEVLDELIRVLESQPVGDAA |
| UniRef90_UPI00036A1018 | QNS QALQLDTASDYGPRTLAP L L A TLIRQDAQGDEEEELV |
| UniRef90_Q67TD8 | FLARLPGDTVNMQARLQTLQEGLRQGARPESLTELEKRALL |
| UniRef90-V9LTT0 |  |
| UniRef90-V4LMX1 | DMMRL QWNETDLAAAWSMPTII RALDEDS S N |
| UniRef90-UPI00029B565D | S L S TI QMDTRLGSWPTYRALLQRLE |
| UniRef90-D7HYE7 | SAENLQAMMDNEVYQAGQVLPDLLK |
| UniRef90-FOLPU0 | VLPII F DNRNYAAETFLDQILSVGR V S A S A |
| UniRef90-C5AID6 | GATALARDT DNHVPMSDLLLDDLLALGAA |
| UniRef90-H2K0C1 | GMPAIHTDTHDGSA APLLDHL |
| UniRef90_L1KQL0 | LSTLHASMLGNRVLSAETGRDDVVAMCRAHPRPT |
| UniRef90-W0RW72 | DVVVRTKHSYRMLLAERVRDDLVKAVRAS |
| UniRef90-UPI0003701D62 | DMPA |
| UniRef90-A0A031IVP7 | VDAMAALQTDTRTPAAPR A WLT T A VGALVAD GV |
| UniRef90-Q8PRC6 | DSEKL QNDQVSLP |
| UniRef90-S4MTH1 | AAMADRGRLTVRDLQRQQFANRVPAATGGDGKAVDV |
| UniRef90_A9D0T1 | ELLEAAMLSNRUYDLIT QCEAQADTP |
| UniRef90-B2GG13 | HEDLLLA AQLD TAAPHWPRLLRSLFA A APGRRLS HTASWVR |
| UniRef90-I1AZ32 | G A GVVQRDTVSTVARTLLPLMAKEDWGTDANDLRREL |
| UniRef90_UPI0003140FA8 | GTSA EDSPAVVSPAADSPGAARPGAPGRRLSHTASW |
| UniRef90-U1PKR4 | LDLSVLRERDTRDGRAETLVDGLLVEAARESEDDDLVDAA |
| UniRef90-M2XAW9 | SAELSAQLDTRSSSLLGLVHALLAPADAQKNSDDDAA |
| UniRef90_UPIO0016AEEFA | RAAYRLDLDDRALFMSLWRDRALRV |
| UniRef90-I2F861 | SFSETHRDDNVSA |
| UniRef90-UPI0002630A29 |  |
| UniRef90-V8E6K3 |  |

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UniRef90_E6RGY0
UniRef90_R7XTR1
UniRef90_UPI0001BCA1CC
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UniRef90_E4N5J2
UniRef90_UPI0003700519
UniRef90_UPI00037D89BB
UniRef90_T0Y7Q6
UniRef90_U4VFV9
UniRef90_M2Q1Z5
UniRef90_UPI000463B320
UniRef90_G8SHI2
UniRef90_M3JIE5
UniRef90_I3TUA0
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UniRef90_UPI00036A1018
UniRef90_Q67TD8
UniRef90_V9LTT0
UniRef90_V4LMX1
UniRef90_UPI00029B565D
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UniRef90_F0LPU0
UniRef90_C5AID6
UniRef90_H2K0C1
UniRef90_L1KQL0
UniRef90_W0RW72
UniRef90_UPI0003701D62
UniRef90_A0A031IVP7
UniRef90_Q8PRR6
UniRef90_S4MTH1
UniRef90_A9D0T1
UniRef90_B2GGG13
UniRef90_I1AZ32
UniRef90_UPI0003140FA8
UniRef90_U1PKR4
UniRef90_M2XAW9
UniRef90_UPI00016AEEFA
UniRef90_I2F861
UniRef90_UPI0002630A29
UniRef90_V8E6K3
 ALLRSWDLAMSGHS
 HILKAWDNSGHITARG AVLEGWNGAMNLLDTQGAALIREFAHLFN
SVL LGWDRSFGATSTA
RLASWKGDYPVVSVGATAF
A A L Y A QVRDR LVLA
 ARLLAWDHEMHAGSTDAAA
K A AG LQK IVRPARKVD DAKACATDRRWGNKADG A VLRNWDNRAATDD ERLRAW AAAGAPMHAGSTDAGLFARWRHALVRRVAA TVLESWQFVMD KEEAAPTIYRKWRDYFQDFTFN SILSHWNYNMTENSLA ASVWFFTYAY LFNNTF L QTLRAWVRRRDKDNNGVYDDADAVVRIMDAWWP LWMKAEFE AKLRAWHRREASKGAGAYTDAEAIRILDAWWPLLVEGEFR AKLRTWHRQETSAGSKAYANADA $\backslash R I F D A W W P R L V Q A A F Q$
$R V A A Q G D$ SI FSGWNYSMETGSTAAT QLLRNWDGNLAADS
TALANWDGRSDTGSRG
 AVLRDWDRKDALDASGSPL WLANGAVRRETAAGSKAYVDADA $\square R \square F D A W W P K L V Q A A F T$ LLLRRW GADLSAKSATAALFEVWLNKYLGPLVA AVLARWDRDSAPASRG A GLFRQUWRRS TKLKAWRQRVETAKGSKVYQHADARTFDA WWPLLVRGMFR EQLAAWRGDYPLDSTSAT LLLSDW SHEEAEAGSAGACLWERWYFDLVEADFR

 $A$ LL F LAGAHGY A LRA WRREDALDAPGAPLFREFAQAW D RLLA WDRRMAADSTEAAAYAAVRSAVVRRDAAH ATLARWDTRADTDSRGAAL
DVI AKWDGTVAPESKGGM DT L R WDRRMAADSH EAALYAAVRSAVVRRDAA

LFETWWRRYTAGTRA ESVPAWAGDASAGSAAARWWLLVEHAVAAALIAHLPPASR AVLAAWDRTMDTGSRG DALKDWNGKQDNTS $\square G G A L V R E F A H Q F D Q S S M L T V P F D A T$ ARLLAWDGDMATGST VASWFAVWRDAFVREDVD DRLASWNGDMDR ARLLAWDGDMSAGSTTASW DTLESW ASDPAAYRMDPDTEGA GGVWRDAFVQELVA QFLLEWDGEMAADSVAAAHAA GALLFDRWMEQYRDELFA QELLEWDGEMAADSVAAHAA
 KALSHWDYRLLKNSRAAD QAAKHWEGRASTGSVSYT ALLQGWNHQAAAD

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400 AEPGA IAHRFYTRRGDREDGDGDGQA ISLDELGLTPGRLL DA D DVLNTPRGLKYNSTTLMQLATA IDK IERAG $\square$ ALDA $P S \square G D$

PDH【LFA TPFNKNDP【NTPRKLHADTTET
GDEYLAYDNF DVTNPANTPNTLLAADGSATTALARAAB SEPDAS S DA DAA Y GEMWVPWLWDPGRVASTBER
DELGDTMFE TLLSTRVLDAALDPRDA
 HPALAPDLHDDPGAGPVLAPWFVVPARVADADPALLDADRA DDRGVLLWEALWARLDSLPEAQRYGK ADPRVRQALVFSAD
 D E PFLGD HGWYEYNNS $\square G \square P S A M G N F D A R T R G V Y A S M E D V K$ $P T L G P E V F S T L P H Q Q D N S P N N D G D H L L$ DCGYDPLFAPWTDPRGRDGHADDGVLLGLGLDPATLVDPA PGLGDAAWGALTAVAP
SGMGDGDFQSL VNA $\square Q \square N E S P S G G Q$
A LLLWEAFWERVEQTPEAERYRVPFASDTPDTTPSGLKKLSE PYLDS $\square$ GWLHGENKTLGTPSGMSGS LDNTTGYAS LDVDLV RREGAEPHI $\square$ PMLMPFDAP MGSEDWKVPFDVKDPVRTP

S IVEWLE E A AV EGQGYARGFDPTAPFDTPTGLP $\square W T E A D P A P A L V A L A T A L V$ GGDGDPDFGADVDALQDNESPSGGQ
$K A E G A T$ ADPGRAGGFWSVPFDPAHPFDTPRAPDAHDKGTADLLRGA DP LGPDLYQSLINA $\square Q \square D E S P S G H Q R G D T S T L P T S A N E A Q$
 A DA ATGSTHWPPARRY LTRMLTAPSARMTAECADYMRD
H
$H$
$N$
$N$ SMQGVASRWRVVFDPQNPTHTPSGL

$W \square T F F D R R L G A G P P D T W R R V P Y D P A$
DTMYAE
PWTPAQPTATPRGIRFLP
 ALRLRPSEAASFGAP

DAAAMLDAL
AELWKVPFSAADPVRTPNTLNTDAPGFAVADADAVAELRA KAATTPNSLVADGSALQALALAALNVEAAGFDVDAPLGSV RTELRALVGPTGMPALWDPFLDGTGRVGLAVENIV DEFPAAQQLDWTRPNPNFLYAVLSDR STD DSALSAPTGMPALWDPFLHGTGRVGLAVEN■VRRAPA EGFEEADLGDEYYPSDGADEQLP
HPALEPLRGATGLPPDWDPLLGTTPRVGLADESDVTLGPG
N TVTALVASKYGG
GLDARLKQQQHDADYALANRRWPVVI


[^5]

UniRef90_UPIO0037D46BB UniRef90-L8HH11 UniRef90-D2B5Q6 UniRef90-W1IQ14
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UniRef90 ${ }^{-}$TOLJU5 UniRef90-UPI0004261FA0 UniRef90_IOHG32 UniRef90 E4N5J2 UniRef90-UPI0003700519 UniRef90_UPI00037D89BB UniRef90 T0Y7Q6
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UniRef90 G8SHI2 UniRef90-M3JIE5
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UniRef90-Q67TD8
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 DDVENAGRDLKWGAGRMDPEWSHQQRLIRGRAEFDLSGGP TLGEVQFVEKGTAEGLDPGERFPWG GAHNVEGGF
$\square G A T V L D \square N H R G L S D N A Q R G D Y \square Y \square S$
$L N L Q S N Q F V E K T L A G G D A S G E K L P W S G P M S V E G G F N V Y R F$ WLTVDRPLGIDDEALI ASALDVVEPASATWGE ADADSPWWNNRNSPHEESRANTVKVAWRASVSHLRSLYGT R GRワDLDGPALVRAALEDAARPEPPTGPAPGTTPRPAAEGA APLDTPLHLRAGKGIAARALAASVAEFAARGWPLDAALGT DLRGKGWAIDAPLGDVQFVRAGGRHA LVADGPVLDGRAEAAAALTEVVAEGAEDSWGEDHAVAPDH LNESSHWFDNVSTPGKETRNETMILAELDATGDWLESFYGD

SVESSPWGERHLL
TGPVSSLPTSANENQAHKGSSFQYGWWGYVDKDLRATLGD DALQQALAGAVEALAAQGDAPDEALGARRFVASGGDRLG NYLVNHVSAPFGSDASPTMKGLVDQAVNQAMNYLLSMYPS DTGNAADRKALTDAVTELKAANLPDDAPYGDNHYVVRGGK ERLARHGFEPAVTLRTLQYREQSDGGRMPGDGGPNLTGVL TGPVSTLPTSANESQAHKGSAFQYGWWGYVSKDLRAVLGD PFDSPSIVSWLENAETSSRHAADQQSLTDAWAECASLMGA $\square R Q A V A D L R A A G L \quad A L D A P D S A F Q Q R G G$ AHKGSSWWGYVDKDLRAVLGDPVSGGLGRTY ADAESPWWNTRGANQRTDRSSTVREAWQKSLGHLRDTLGK RGEESPWLPLEGEFG LDRRLASAFRRAVAYLAARQGR

TSTQPCMDFAVAKFKEQANDAGAGYKEQWGN
$R G G H H G L P V A E L A A A A L G R V A D T L G$ ENPRVASALRAAMLAAVDEVAKAGLSPESKWGDDQVSSLS FA ADTAWGEALIFTADNSKIALHGGSYQE A G
A GD $\quad \square Y G V D R A A A D R G A D E E V A A A$
 SAVEAFAWATTETARRYGAVDVAWG DVHRVRMGS AAE LYGVDRDGTVRGALEEVAAPPRGTWGD RAAVAAVGDAAEPPGPDDRTWGAAHALTPFLDFTHEHPGGP EHPGAAFGAT A G 1 PAARRDQLLLESLRNAYHADGSLQGP ALDAP LGAHQVRGGE EK S L P D GTASGTK LP WP RRGPGLGVDVTGCALEALERVAEQHLGPSGS $R G S A D W C D \square R L S S P R E T C E E Q V R V A L D D D A L G W L V D R Y G R$ LGVDV TGCALAAVERVAEEHLGPAGS LGDSPWFGAR PR RAGVMRAALRAALEEIDEAGHEVYGD V V ARLLDEQPPGWLPADAASWRDVQLAAMDRTIDTLSAN GA
 DGQADLRFWCG AQEQGCDLKLNQSLRSALDELRAAHGS

[^6]

470
PMMDNTS TVLDSAK KAKRVVA
$\mathrm{D} \nabla \mathrm{D} \mathrm{HT} \square \mathrm{QG}$

## NVFDARTSNNGTELDSHTY

RGNNRVP $\square Y G G C D E \square G Y F T \square A C V K S \square D D T K \square A$
DRSSSRSFSTVIPYIDHQTLDDAITGKPLASNLTASGYPV RHRFAPLHALTDLGVTHPFDPDVAGRGLAGDTDCVAATG NPDEWVWGKAHTLTQAHMIFNVGPYAAPGTHEVPNNLSSS LLPGQQWPSGGSRETLMKVVABAGLVGPHRASF AVGDRTWGDLHRLHPLHVLDEVPGCASPFVVDVGLGGDST QRY VNSGGRRLPVFGGCASAGYFAVACNGSLMGPD
 $N P S T W R W G D L H Q L Y F S S L T G P Y E A D G E G Y T I N P A R V N D D N$
$P S G N Y T W G H F Y G F L F P N L F G P G P K G G D F N T P N D A S Y P T G G$

HP $\square$ QLD THEVAFPDVP LSGSRDCVSVTGVSDRC
TVPGWST

GNFTWGKFYGFGFPNLFGPISKGGDFNTPNDASGDNYP KPDEWSWGRVHRDK LSHPPDQLE LGGSSSTLNYANYRLND K $1 P \mathrm{P}$ GGGSAGRGVYDSLGGPWDPARGYTE IVHGGTYLH NVSQVGAMTPRERLAQLQRGRVPDPSG LGPHGYGV $P V P G W S T T Y C G G G A V G A C R G A L L S S L G A A D S E P A T V T Y P G$


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

VPEPQP $\square$

PPTGPWSATHRLAPWTALRPAP GPGADGPGLAGDHDCV VQKWAGDPLSGCTGDKGCFNVLEAGPDSGT GTPPAG GPNAVDVPVGGCSGD $\square G C F R V L$ SYRQEPDGKDAA THRLAPWRALP $D V P$ V $\quad$ DADVDDTDGSVRVGGTADAVCATSHAPGG DTRQWQWGNLHTNKI AHAMGPFAKGGSPYTPNQSSYDPRQ RLPMPGGSGRLGVWNVLEPTWNAARGGYTEVPFGSSHLQA
 $L L P P W G T L H A F A P W R A D M T P A T P V A V G G D T D C L D A A G T L P$
$D P S T W T W G E E H R L D M Q W S P D Q A P I V G D P F T Q F L T S F G V E E ~$ VLPPWGTLHAFTPWRADPAQPVPVGGDTDCLLAAGTLP ISHTGQDGHPDELGFLAYPDHPRGGSGETVQNAGFDHSA QHAFAPWRACDQLLP $P$ LADAA WGRRNTLR LAHPFRSVPLVGRWLTAPADPVPGDA $A V S Q V R K V V M V Y Q T N L E G L P S I Y P D A N R K A P D L V T T S G N T$
$N R A A V C H P A Q G L P G P L R G W L C M P P L P G D D N M P R V Q R P E F G$


[^7]7777777666666667777777777777777777766677

UniRef90_E4N5J2
UniRef90_UPI0003700519
UniRef90_UPIO0037D89BB
UniRef90-TOY7Q6
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D S GDGYVQVVRWDAGQVHSQAVQPYGANTFTK TYGSSWMF IANFTEDGPVARGLLSYSQS

HNPESS S
TFGNSY LQ I IS FPNNKVEAYTSLLT S L S DDPASPH NYGSSWMFVMNFTDDGPVAKGLLTM STSSSDSSSEH S IPGLPVSVSGPVARYVVAWGLGEMRESRWAVPGDPSSEMH IRPAPWPVGYGPSTRRLIDFGINPVGQSGV PFDKH
 SHANSYMQVVRFGASGVQAHTMLAHGLDEAAVAGGRGAAP

 QS WEMVVNLGN【SD

SF GVYPGGQS
ENPASS S (L
LRGPVARYVWDVTDRQRSRWVVPFGASG DPASPH

AVANSYLQVVRFARDGVEAHTLLAHGQDEDAVRGGAGSAP $T G G Q S W V M V V N L S N V S R S I G V Y P G G Q S$ $S \quad G L$ EDPASSQ ANPESAH RSRPGTSW

PSSEH
FSVGPSVRMVIDVGDWDNSLFVNNPGQSGL S WVQLVRWRLADGTTAPVARGLLTYGQS

■S S A P WPVT Y GPSTRRLIDFTTNPVGQS GV SGTATTYCRLVDLARPGEPVAVLAPGTGGH TQAASMRQLYDMWNSTHYMYFQLPGGQSG

QCWRGPVARLVWDLAGGSTW VP $\square$ GADGPSD SPH $V S G T S Y L Q V V T F D E Q G P R A Q G L L A$ FSESSNPQSAH GSAY I QLATWDEQGDTVQGILSHGQ R W
$\square C T S A V P G \square T D R T A R G P A A W D L A D R A N S R W V V P F G P G A A H$ AFGTSFLMAVELTPDGPRTHTLLTYGQS ANPASPH TVGDGWVLAVEFGKDQPRAYSVLAYGES AARGPAARYVWDLARREDSLWVVPLGASGV THRGPVARVVFDLGDRTRSRWVVPFGASSL TIGPSARLI I DLS NWDNARAMNFPGQSG VGWD G GRCPVARTLLTYSQS SSDASPF PGSPH RYGSSWMMAVSFTGOGPVAKGITNPDSPH GSGPACDRVPAARVL WDLADPAASWWDT P DRPF LVVAGSNFQAVMSDSYYITPAGQSGH GTGPACLRVPAA RVL WDLADPAASWWITP PRGGSWEMQVDLDGEY LAALDGGNSGRY GAG CARVPSARVL WDLAHPAASAWDTPD NMPRVAAPRFGQSERLVVSL
 PAN PRFTRIAATLRMV

DLADFDNSRYALSTRNS GP品

[^8] В B B B B B B B B B B B B B B B B B B B B B B B B B B B B $\quad$ B B B B

FRDQAPLFAERRLREVHMEERLLMDGAHDEEAYRPGR S DDQTKLYSSQQLRPLRFTEADIAANLVKEM

YSDSTRSYKAKQWLHLPFEESET
FDEQSRFYSNTVLRPILFKDADINLNLINEMDLSMSK HEDQFEAWSSCRLIPV
YSDQAKAFVSGEYVPQRFSEKDVAEHTEGVLRLVP
FADQDPHWREGRYI QMPLRRETVVQRFPHRLELK
ALDDLDDWVHARTTELVTDWD
VERYARKE WLRFPFREEEDARDPELTR\|VLPAR
LLRYARKEWLAFPFSEAAI ASDPQTRRVLLP
FADQHPTWAAA GTAP DETD WARLLR
YSDQLE LD LQGKYHYQYFT

FVDQLPLWTSGDLVPLVTDWD

VR RYAAKDWLRFPFTEAA $\quad$ RRDANSRKVLAP YSNYVMDWINGNYLPDTFAEKASD\HA
YKDLLPRWHEGAHCPLVYSPNAVQAATVEHT HSDQTEDYARKQWVTERYCEKDI S DGHVVPHLGSAASRFPFDVTEVSARTVTHVDLT

YK D L L A NWQEASPVP LLYSRERDDK VT T T K $\square M \square R$ HTDQTRLYAAGRLFDLSFTAEQUAAD

YADQAEGYVQGQYQKAQMG VIPAQSTLRLVP FAAQLLPWLRGDLLPPRPTGEDVLR
YDNLLQLYEKEEYLHVP
A $\square$ D Q H D $\square$ WRA GAQ $\square$ PTR
SSDQTEAFSKKQWSELPFTEQQTKADPAYQ
RTTQQQQFAHKQLHDLPFTEAQLDAAT
HRDQLPLWTAGELVPVVTDW
YTDQTRLYSRKQWVPERFTQAEDANDALRVTTLH HSDQAAMFARGELKTVAWLPKDVDAQTVKRYR HRDQLP $\square$ W $\square E G D L V P V V T D W Q H L T K$ VTDQLDAWAA GRLL
YRDLAAPLWLNGSYFPLLYTRAAVDAATEQTFDLVPA
FADQTRLFAGERWVTSRFCEKDILSSPKLKVV
$F V D Q S L L Y S K K Q F R P L L F T E D E \| A A A V E S T I E L S M Q K$ GLDEAPRWARGEM
YDN DFPSW $\square \mathrm{QGE}$ Y $\square$ AMS T D $\square S \square A R G G A S G \square S R \square T P A$ RLDEAPRWARGE Y D S Q $\dagger$ GRWARGEYRSL
DRGQLDRWAAGE
F LAA GHEAWVK GEPLP LLPGPTE
FFDQVELDWVTGETMPASLSREEVTKYVES DETL WGAGHADWVQGRATKFLPGP




[^0]:    VSTWTWGRVH LLEDAS GLGPYPMYGDSHTVSAAYVSRQL THRLAPWQALPDPGRQAPALADDHDCVLCTSAVPGWTDLA NTADIAHP ISMAVPALRPWLGQPDAGDAHMPRVAGPKFGQ SHRDVPWRALPDDGPDDGPDGGPDGGPSDGPDAPGGPGDA
     $D M E T L A W G K V N A L S V E H P F A S \bigsqcup P L L G S M L N M Q Q V E G$
    $D K A V P G C G N G E G C Y D \square T S G L G G A Q L L G A D G R F P A \square$
     DPDGKR TLNTSLEPPTPRATVLNTRSGLTSEG YVINNGT $R 1 P V H G G P H A L G V L D V \square T P Q W D P K R G N T E V V H$
    D $\square$ GELHAAAGDTWI ALVEWDEDG $R \square P \square H G A Q G F \square G V L N V M T P Q W D P A H G N T E V$

[^1]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol5
    sol5
    jhmm
    jpssm

[^2]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
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    sol|
    jhmm
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[^5]:    lupas 21
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