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## V V H <br> R HL H A

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

HESRS

| K | I |
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| R | N |
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T


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 Y K L E E L L L V SHPPS S P E Y GK H WT P K Q V V D Y F R P S E E T V Q S V


 A D L Q A LI A QQ D T A S S L Y H Q WL S P E Q FA E R F G VA D S D I I K I
 $K G L E A L Y A V S T P G S P Q Y G Q H L S K Q E V E A L V A P T P E T V A A V$ $N$ IL E K HLLY E V S D P D P R Y GA Y L S K E DV E K I I A P H P A S L E A V


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| UniRef90-S8EF73 |  |
| UniRef90-X8JQQ8 |  |
| UniRef90_W4JXF3 | VK\\| I P N P P S A T S D SIVP A S |
| UniRef90_A8NYU1 |  |
| UniRef90-R7SNY1 | P Q F H T P P A VNVT S D A VP S S |
| UniRef90_V9DE90 |  |
| UniRef90-UPI00044077CE | LP V V S S P |
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| UniRef90-G2Q9P8 | R S QVF EVVE T A P S QVKVAA |
| UniRef90_UPI00036972EC | FRIR SGYEPRRAAA |
| UniRef90_UPI000455DFDD | SNTLH |
| UniRef90-J4H3C4 | V VP P A K S S VT A Q |
| UniRef90_UPI000441419B | H R |
| UniRef90-J4G8M9 | F NTVKLATVPSPAATPSA |
| UniRef90-W5W665 | V R P R A DVPGMSPA Q L K G A |
| UniRef90-S7PVU9 |  |
| UniRef90_W4KD66 | LQ V V S E A S S Q D A D S |
| UniRef90-UPI000444A8EE | FNHR |
| UniRef90-D6U6S6 | TQQSRPATGP |
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| UniRef90-A0A023XTZ1 | FRRKL |
| UniRef90_D8HM78 | F K P D A T G S T P S |
| UniRef90-S7RCM7 |  |
| UniRef90-S8G2W6 |  |
| UniRef90-D6U0F0 | T R L A P A A G G G Y T P T D L R T A |
| UniRef90-M2R4N3 |  |
| UniRef90-F8PSM4 | F K L S K S A P A D S T |
| UniRef90-E4ZTY4 |  |
| UniRef90-C1F5B8 | VQLSRNTQG |
| UniRef90-E2ST01 | FRFVPLPAGSTEP |
| UniRef90-R1EYA9 | A S NVR P |
| UniRef90-H6BSP6 |  |
| UniRef90_UPI00044171B6 |  |
| UniRef90-W5WKV4 | A R P A $\square$ A P S GF GPSELRR A |
| UniRef90-E3RUY9 | T WFHTTAQSSSPPTNSS |
| UniRef90-K5W465 |  |
| UniRef90-UPI0004621925 |  |
| UniRef90-UPI0004449BA4 | FKK ${ }^{\text {L }}$ T QPNVNDT S D AVPPAS |
| UniRef90-W7TDB0 | LK QR A VRGVTPANLNGA |
| UniRef90-G2QV65 |  |
| UniRef90-UPI0004622A04 | S K L GAPGS GPVT PK T T G |
| UniRef90-B9XNY4 | SHKLDP |
| UniRef90_S8DUL5 | FDMPRGPAGQWQ |
| UniRef90-J4G149 | VQY ${ }^{\text {Q S A D A }}$ IRNASPSA |
| UniRef90-UPI00047755BA | QDTLPPPGAVF |
| UniRef90-G2Y9E1 |  |
| UniRef90-F8NRY3 | FDARLS R R S E P ARSVG |
| UniRef90-A4IHM3 | LSHKRD】QGQARAGFH |
| UniRef90_UPI00035F7BE4 | DDVLPPPDAVF |
| UniRef90_UPI00036ED278 | A RII A T P A P T S A N P K A M A |

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UniRef90_R7STZ4
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UniRef90-R8BTR4 UniRef90 W4K906 UniRef90-R4XG80 UniRee90-UPIO003A58BC0 UniRef90-W4KIB9 UniRef90-UPIO00455F031 UniRef90-W5W406 UniRef90-UPIOOO4623601 UniRet90_W7HZ29 UniReffo-C1F125 UniRef90-N1PY77 UniRet90 D8Q408 UniRef90-M2OS30
UniRef90 H2U3L UniRef90-M3BKE8 UniRef90-W9CBH5 UniRef90-E8WV79 UniRet90-M5C9U2 UniRef90_C1F2E1 UniRef90_BOD567 UniRef90_UPIO00455DD31 UniRef90 E8X6C1 UniRef90 UPIIOO046F412E UniRef90-UPIOOO16A756A UniRef90-L8P9C6 UniRef90-M5FV78 UniRef90-UPIOOO4407897 UniRef90_UPIO00440882C UniRef90-B8N893 UniRef90 S3D4Q2 UniRef90_UPIOOO4415855 UniRef90-M2R412 UniRef90-B8PG43 UniRef90 UPIOOO37032EA UniRef90-J4KM24 UniRef90-UPIO00440D850 UniRef90-K1WGK7
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UniRef90 C7Q7T9 UniRef90-U7PNX1 UniRef90-K9HU02 UniRef90-UPIOOO4415F33 UniRef90-M2MYT1 UniRef90 L1KP79 UniRef90_UPI0004449F57 UniRef90-UPIOOO4624040 UniRef90-G3JBV3 UniRef90_UPIO004407561 UniRef90-S8EJ40 UniRef90-W6YYB4 UniRef90-G9NRV9 UniRef90_N4VF91
UniRef90_S8FWP5 UniRef90-J4KLA0 UniRef90-UPIOOO4413328 UniRef90-UPIO00455CFFA UniRef90-UPIO004414853 UniRef90-W5W7G6 UniRef90_W9CMSS

K R A MSVHERTPPTGFTR|L|GAAHPDTPDT|L|R|L|A|L|KQSDT RNMVVHDSRASAPAGYVATEPTPGDQVLNLIIALAQSNA H K V K E S V A A P P R G WV K H A P A P K D H L I D L R R G L P R P N F S Q R I


 $R D T D V$ V VA
 STHVVLM



R HVL

LK E S V
RRVA HETRRSLPS GWNVARRAQP DMIL P L LVGGLVQSNL

S D
E G

MS L $\begin{gathered}\text { H E K R D A P P H } \\ \text { L } \\ \text { H E K R D A } \square P \text { A }\end{gathered}$


V V H E S R T S L LP Q G WQ R D S R L A A D A K V P V K RATLP GTKPKADA SA QDMGAMSSS QTV HMMLVLKPS QQ RHNVPRAWARVGDASKS DMVHLQI GLK Q Q N E
E K R D E LP $H V V H E K R A M E P K R W Q L V R R L E A D K V L D M R F G L T Q Q N L$ $\square P K D W T N V G R V D A K E E L Q L T F A L L K Q Q N V$ $R Q S L A G T K P E W A T A A A D R G T M S A K K A V T A R V Y L A G R D A$ $H V V H E R R S E P P A K W S R A S R L H P E A V F P V R I G L T Q Q N L$ QRVTLA GSRNPRALAAD DTGSLLAS GTVLEMSVVGRRTEA R HAL


Q
REVP S GWTK I A R APA
1 L


R S T L H G | S A R |
| :--- |
| T P S |
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| V $V$ |

$V P A S$
DRDPLAGTRPAWATARS
VKESVSVIPR GWTTSGATA
ERRTFVPENR
GWRFARRLEQDAVI PLRI GLTHQNT
S P R H V L H E K R A F E P E E WV Q S G R L D P G Q L L P L R R G L A Q S N L
SKRSILHETRPVAAAHWVKAAKLHHEAVLPVRIGLTQQNL


VHEALQSTPSGYT DTGAASP
$R D T L A G T K P A W A T A K A D K G S T S D S A Q V S A R V Y L A G R D A$
$R H V V$ HESRKTNGKSFVKRDAMPANDRIVQRVALKQRNE
$\checkmark$ HE S RAN DP S G Y T L I S P A P S D K V L S L R L A L V Q D D P
 ALRVVHERRVVPSGRSAGSAPAGHTLDNLRIALQNNNL
EKRDVSSG
ETRDTVVHG

SERLVVR SQVDVPT | $R$ | $W T$ | $K$ | $R$ | $E$ | $A$ | $A$ | $D$ | $A$ | $N$ | $T$ | $K$ | $V$ | $P$ | $V$ | $R$ | $I$ | $A$ | $L$ | $K$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Q$ | $Q$ | $K$ | $N$ | $L$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $Q$ | $W$ | $K$ | $V$ | $G$ | $H$ | $A$ | $A$ | $P$ | $D$ | $T$ | $P$ | $L$ | $T$ | $L$ | $R$ | $I$ | $G$ | $L$ | $K$ |
| $Q$ | $R$ | $N$ | $L$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

VPTGFSYQRKATAEQTLNLRIALTQNNA
VVVV H E S R S H V $A$ P R G WN T V R R A E P D L I L



RDTLRGTRPAWATAEADAGATADGSRLTLRVYLAGRDA
QRRDQLPH
GYKD L G P A P P D Q T L K L H L S L S Q G DV
RSMQV HETRESVPSAF QRVSAAPSDATVLNLRIALVQNDM QIPS QWQAS GAA EK TA LI I K GQU GLLKQSND S GRVVRLK ERVS H PR R GWLK GK R A P S G H I L E L L K I A L P Q P S F
 QRGHVLHEERRSLP

HERALSPTDWVKLGNINPD GLLPVVRIGLTQQNL
SQKHVVVHEEKNPARREWVKNHRLHSMARLPVRIGLASSNL RMMRVHARRDSAPA GF IVRAADASPDTTMIKLRLALAASSNP SKMVVHETRGASHAGYTKGAAVETNTRVVVVRIALKQRNL MVLREKRTAPAARFVQNGVARSDEMLDLRDALKNSNM


L H ERRE Q A P R N WHREN P L H P D S H L

UniRef90 UPIO004415D50 UniRef90_UPIOOO4418681 UniRef90-F8PPP8 UniRef90-Q1IVJ7 UniRef90-G8NS72 UniRef90 J44BX1
UniRef90-AFF2R: UniRef90-ATF2R2
UniRef90 UPIOOO4409D92 UniRef90-UPIIOOO3B59EC6 UniRef90-L9PDH1 UniRef90_UPIO004413D69 UniRef90-UPIO0028921EB UniRef90-E4MZ12
UniRef90-J3NHF1 UniRef90-B2W2G0 UniRef90-K2QV12 UniRef90-O5AWX9 UniRef90_J4GJM9 UniRef90-UPIOO03642816 UniRef90-88JOH9 UniRef90_W4KA29
UniRef90_J4GJT5 UniRef90_R7STZ4 UniRef90-UPIOOO4414606 UniRef90-D9VIQ5 UniRef90-R8BTR4 UniRet90-W4K906 UniRef90-R4XG80 UniRef90-UPIO003A58BC0 UniRef90-W4KIB9 UniRef90-UPIOO0455F031 UniRef90-W5W406 UniRef90-UPI0004623601 UniRef90-W7HZ29 UniRefolo-C1FIV5 UniRef90 N1PY77 UniRef90_D8Q408 UniRef90_M2OS30
UniRef90 H2U3L UniRef90-H2U3L9
UniRef90 UniRef90-W9CBH5 UniRef90-E8WV79 UniRef90-M5C9U2 UniRef90_C1F2E1 UniRef90_BOD567 UniRef90-UPI000455DD31 UniRef90_E8X6C1 UniRef90 UPIOOO46F412E UniRef90-UPIOOO16A756A UniRef90-L8P9C6 UniRef90-M5FV78 UniRef90-UPIOOO4407897 UniRef90-UPIo00440882C UniRef90-B8N893 UniRef90 S3D4O2 UniRef90_UPIOOO4415855 UniRef90-M2R412 UniRef90-B8PG43 UniRef90 UPIOOO37032EA UniRef90-J4KM24 UniRef90-S8FTX9 UniRef90_UPIOOO440D850 UniRef90-K1WGK7 UniRef90_UPIO0044128FD UniRef90-M2QTD6 UniRef90-E9ET17 UniRef90-Q2H7E9 UniRef90-UPIOOO4624486 UniRef90-C1F3C8 UniRef90_S8DTV9
UniRef90 C707T9 UniRef90-C7Q7T9
UniRef90_U7PNX1 UniRef90-K9HU02 UniRef90_UPIOOO4415F33 UniRef90-M2MYT1 UniRef90-L1KP79 UniRef90-UPIOOO4449F57 UniRef90-UPIOOO4624040 UniRef90-G3JBV3 UniRef90-UPIOOO4407561 UniRef90-S8EJ40 UniRef90-W6YYB4 UniRef90-G9NRV9 UniRef90-N4VF91
UniRef90_S8FWP5 UniRef90-J4KLA0 UniRef90-UPIO004413328 UniRef90OUPIOOO455CFFA
UniRef90-UPI0004414853 UniRef90-UPIOOO441
UniRef90-W5W7G6 UniRet90_-W9CMS9
UniRef90_J4KN55


50
60
70 SGLEQLLEVSDPAHADFRQWLSKEEVENFVRPTQDTVTAV PALEQHLWEVSDPSHRYGAHLSKAETDALMEPHQESIDDV QQLDTLVAAQQKGTPQYHQWLTPEAFSARFAPAPGDVAKV ENMEAYMDVSHPESPNFGKHWSPAKVAHDFRPTEVAMDTV HNAEAYLMDVSPSSANYGKHWSAKKVAETFAPSAESVKAV PLLERHLLEVSPSHERYGNHLSKEDVDALVAPLPESVDEV
 GLFEQLYAVSSPSSPRYGQHLKRDELRDMMKPHEASTAAV EHGDRFLHDISDPSPNFGKHWTGEQVANMFAPHPETSDAT HKAYDYLYEVSPASEKFGKHWSAKEVAETFAPSSETVDTV

## A

, ETHLDEIS DP H D EALLDVAHPESPNYSKHWT
 HKLE Q LYD S SPDHPKYGQHLK SHELRDDMAPREESTAAV
 A GLAA YAKVSDPASPQYGKF LSAQQAASRFGATKA QVSAV K G L E D MLLYAVSTPD S S Y G Q F L S Q S EVVK K F VAP SP D S I K QV

 DGLEAALDVSTPSSDNYGKHLLSQDQVKAYAAPSAETMS HKLLEELMAVVSHPESPTYGQHYYTPTEVVVDVFAPSSDETMSAVV
 HRAEEFLEVSHPESK LYGGQHWGPEKIAAMFSPTQETMDVV QEAD LLAA QQNPASPL Y H QWLSPE QFGTRFGLSAS DQA KV G LVLKVSDPANSEYGKHLSKEDVDKLVAPRSETVVESV
 GELL E D HL L Q I S D P S A R Y G M H L S K K E E V H E L M A P H P D S H D L L
 A P L L T S M

 H T L E S L L NV SHPDSPEYGNHWSAGQVVEHFAPPAETVNAV





## A

H R

SGLEAYAAVSDPSSASYGEYLSPARAQARFGATKTQVAAV
AGLEALMDVSDPASPLKGQFLTKEEVNAFVAPKPETVAAV
HALEKHLYEVSPGHVRYGQHLSKEEVEALVAPHADSI ASV

 ONAEAYLMDVSPSSNFGDWSAKKVAETEAPSADSVKSV

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UniRef90-A7F2R: UniRef90 UPI0004409D92 UniRef90-UPI0003B59EC6 UniRef90-L9PDH1 UniRef90_UPIO004413D69 UniRef90-UPIO0028921EB UniRef90-E4MZI2
UniRefol - J3NHF1 UniRef90_B2W2GO
UniRef90_K2QV12 UniRef90-Q5AWX9 UniRef90-J4G.JM9 UniRet90_UPIO003642816 UniRef90-88JOH9 UniR Refo W4KA29 UniRef90_J4GJTT UniRef90_R7STZ4 UniRef90-UPIOOO4414606 UniRef90-DgVIO5 UniRef90-R8BTR4 UniRef90 W4K906 UniRef90-R4XG80 UniRef90-UPIO003A58BC0 UniRef90_W4KIB9 UniRef90-UPIO00455F031 UniRef90-W5W406 UniRef90-UPIOOO4623601 UniRef90-W7HZ29 UniRefolo-C1FIV5 UniRef90 N1PY77 UniRet90_D8Q408 UniRef90-M2OS30
UniRef90 H2U3L-UniRef90-M3ВКЕ8 UniRef90-W9CBH5 UniRef90-E8WV79 UniRef90 M5C9U2 UniRef90_C1F2E1 UniRef90_BOD56 UniRee90-UPI000455DD31 UniRef90-E8X6C1 UniRef90 UPIOOO46F412E UniRef90-UPIO0016A756A UniRef90-L8P9C6 6 UniRef90-M5FV78 UniRef90-UPIOOO4407897 UniRef90-UPIo00440882C UniRef90-B8N893 UniRef90_S3D4Q2 UniRef90-UPIOOO4415855 UniRef90-M2R412 UniRef90-B8PG43 UniRef90 UPIOOO37032EA UniRef90_J4KM24
UniRef90 S8FTX9 UniRef90 S8FTX9 UniRef90_UPIO00440D850 UniRef90-K1WGK7 UniRef90-UPIOOO44128FD UniRef90 M20TD6 UniRef90-E9E17 UniRef90-UPIO004624486 UniRef90_C1F3C8 UniRef90_S8DTV9
UniRef90 C707T9 UniRef90-C7Q7T9
UniRef90_U7PNX1 UniRef90-K9HU02 UniRef90_UPIOOO4415F33 UniRef90-M2MYT1 UniRef90-L1KP79 UniRef90_UPIOOO4449F57 UniRef90-UPIOOO4624040 UniRef90-G3JBV3 UniRef90-UP10004407561 UniRef90-S8EJ40 UniRef90-W6YYB4 UniRef90-G9NRV9 UniRef90_N4VF91 UniRef90-J4KLAO UniRef90 UPIOOO4413328 UniRef90-UPIOOO455CFFA UniRef90-W5W7G6 UniRef90_W9CMSS
UniRef90_J4KN54

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NAFLSENGTSAHSASPAGDWLEFTVPVSKAND 100 LIFDAEFS ${ }^{120}$ SQWLSDNGLSSRILTPAGDWVEFSVPASKANDMLDTQFTT NEWLASHGLEEEHLSSANDWVTVQVPVGLAEEMLDTTYHV AA WLQSHGFTQVAVSRSGQRIEFSGGVSSVESAFGTSMHQ RKWLFESGMEEHRVSPSGGWMLANVTVEEAEQLLGTEYYV FQWLEEYGIKSERVSQSGNWIHANVTVAEAESLLNTKYYA KSFLAGQGMKVTDVADGNKWIDVTGTAAQUDKAFDTTMNT TAFAAQHGMVVTSSDAAQRRVVLAGTAAQMNDAFGVQLEE ESWLHAYGLSASERSPSGDWITVRVSVAQAEKMLGTKYNV RAFLTAQGLRVDSVSANRQVVNATGTSARLSAAFGTHEST LLKWLDDAGUPQALVDDDSDWVNVATTVRNASALLGADFAV KSWLTDAGI AAGRVSQGLNWI EFDATVEEAEALLKTEYHV RAWLESEGGSDTRUSANKQWLRFDATAQEALERLEQTEYYL


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UniRef90_J4GJT5
UniRef90_RTSTZ4 UniRef90-UPIOOO4414606 UniRef90-DgVIIO5 UniRef90-R8BTR4 UniRef90 W4K906 UniRef90-R4XG80 UniRef90-UPI0003A58BC0 UniRef90-W4KIB9 UniRef90-UPIO00455F031 UniRef90-W5W406

FEHSGGSKDVRT|LEYS|L|PTD|L|REH|V|S
YTHNSGQPSVRTLSYS:PVALKEHI QLIHPTTSFT AVTR WYHPSDES IVRTTSYSLPEVLHEHI DLV Y H L N GK D Y FANASDVSLPRALSSVVRGVLSLNNFQKFTSH YQAGTENHIANATTISIPAALAPVVSGVLSLNNFPGHTTL
 WQHEDGDVLIRTTSYSLPAALHRHVTLI QPTTDFSRTRLQ YSHGGKHVYAPSTADSVPTSVAGVISGVTGL
YEYPDGSYRGRVGELSVPNQLAGVVEGVFGLDDRPVATPK FRHKSEDYVIRTMNYSLPNVLHEHVAVV
YTKDGHTYRAPAKAASVPASLNGAVLTVTGLDNAPH HAK YTDPGRAFFANDAAASVPAELAGLVEGVSGLNDHTVRTS YGQDGTRVRIRALRYSVPEHVREHITMVAPVDRFGQARPL YKHETGGSRI ACDKYGLPHEVREHVDFIMPLDSKPVAQ YHHSSGQPHI A AEAYSLPAHVREHVDFV
YSHETRRSHI ACREYHVPEALQKHI DYITP
FEHSTGLQTVRTDSYSVPNDLAEYINLVHPTDSFPDFASK VS LR GEQHFSNLSAPTLPSSI A GVVLAVTGLDD YRHTSGAHDVRSESYALPRSLDSHIDA

WTHESRESII RTTSYSLPEHLHDHIDDVQPTTLFSRFR YEHDGGEHVACHGAYHLPETVSKHVDLI TP T T CHFDAK YQHDDSEHLACHHGYHLPEHVSSHVDLVSP
YRKGGLT LAAPEGEVTLPRAVRPAVTAVLGLDDGDRAVTA FAQEGTEVRIRALAYSVPEEIVPHVKMIAPMDRFGQLRPQ YTHSSGMEQIGCRSYSVPDHVREHVDLI KPTVHFTQHLPR YEHKNGH LVARSEVYHVPSNLAEHIDDITPTIDFDMNLAH FTKGKRTYRAPQRTASVPAALKGAVLTVTGLDSAPHIAHH FKDEGGQEVVRTLNYSLPVALRGHLDFIHPTDTFP
YGHESGAEQIACEGYHLPAHVAPHVDFVTP
YRDGGRGFYANTAAPHLPSAI A GSVVDVAGLSTRSVRAHH FKHATGAETVRTLQYSLPGSLQGHVDLVHPTISFP YEHTSGQMHI GCEAYSLPREI HTHVDIVLPTDPSSEKQQH FVANGQKHYANATD DSIPQAITPVVAGVLSDNNFPQHTDP YQHEDGSTGSRAPEWSLPEDLHEHI DVI QPTTSF FRPS FVHPSDTTQVRTLAFSLPEALHDVVDAVYPTTS 1 VRPH FAHESGDEQISCHSYSVPEHVREHIDLI DROVB YTRDGQSVVRSSAPYSVPDDVYQHLDFVGGLHRFPLKQ Y VKDGRTYHAPSSTATVPASLHGAVLTVVGLNDAPRRAHR

 YK $\square$ A DKTHFANATNDSIPSALSGVVESVRNDNDF RPRPH
 YKHETGEGVIRTTSYSLPEILKHDHI ELVHPDTMYTSMKPL YTAPDGRFHANNTDPQIP YEHPKFTYRGRTGHVHI PENLTGGVEAVLGLDNRRQASPH F NYRGKAVYANDAAALI PASMSPFVDSVLGQQNAAVPHRL FEHEDGSSUVRCSSWSLPADLYEHVEFIQPTTMFARLKPQ FEDADGTERVGCEAYHVPEHLVPHI DVI TGFNARDPPAPV
 YQHEHGAHHI ACDQYHVPEYLKQHI DIVT FRHASKTQGIRTGQYSLPSSLQPHVELLEPGVSFPPKHTA YHSGDEQHIACEGTYHLPEHVSKHVDIVTMPTDH FTSSTGATTDRTLSYSLPSNLIGHVALVHPTDTFPNP YTKGSRTYRAPSKSASAPASLDGAVLTVTGLDNAPHKAAS YHHPRSEDHDGTDEYSLPHDVSNVVDFVVGL FTHPGTNKQARTLAYSIPADLVGHLDFVHPT WKHADGE IVRTTSYGLPEAI HGHVLGVQPTTMFGRFNKH YRHEAGHNHVACKQYSIPAHLTDHIDDVTPDGNPKRTVHH F VHDSGTETVRTLEYSLPENVAPHVKLVHPTVAFTRP YEHEATRHIACGQGYTLPADVAPHVDIVLPTVHFAKHRGR Y DHQARNAHIGTDEYSLPNEI SDLVDFI TPAVVMSQTSKP YENAGGARLI A CESYSVPAVI QGHI DLV YTDKTNKTVI RTLAYSI PETLQEHLQFIYPATQFERHTPA YA $\square$ NGQMHYAAATEPMI PSALAPVVKGFVSDNDFPV YQFEDRTHVACHEKYHLPEEVAKHVEGVTPFDVKPKSKPV WRSSGRDVFANTAAPSLPTDIASVVSGVAGLSNVSQRTAS YQHNHGGHHVACDQYHVPEHLQEHI DIV

 YRKDGHTYRAPTKTASAPADLNGAVLTVTGLDTAPHRATH FSHDSGSKVLRTMSYSVPTSVQSHI AFVHP FNHATGKTMIRTDAYSIPAELKGHLDFVHPTTVF VPAPA FTHENGAQIPRTTKYSVPEGLHSMIDMITPTTAF WT HESGDTSVRTDEYSVPESVLEHVELVQPTTMFARMRTT YHGEDGSVIACADKYHLPEHVSAHVELVTP
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Q R

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R A SYWVQHSAAP ED
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 ALLE R T LLYEVS DP HARYGQHLSRDAVASLLAPRAESTAAV EHSDDFLEDIDDPDPNFGKFWTAEKVANTFAPHPETSEAV


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 N A WL S D N GI K A DP V S P A G D WI E F T L P V S K A N DVVF DA D F T V
 H N WL E V E G I KL D R V S R NR Q WI Q F HA TVVGELEKLLNATY D ME WL E S E GI KRSRIISK GRNWVQRFNGTVGEVERLLKTEYYA



N
R T A WL K Q S G L K V S G T

 $K V W L E A H G L T V V H R T G G G D W V T V R V S V H Q A E R M L G T K Y S V$ HRWLQTHGI SNCRTVVRTQDFLQQSMTAEVAEAGLGSREHR E E WL A S H DL A GD A L S S A G D WI TVVK VP VA L A E T ML D T T Y Q V

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 N S W L Q E N N L N AT T L T P A G D WL S DQVPVS QANE L F D A E F NV
R H WL Q Q S S G $\mathrm{L}^{\mathrm{L}} \mathrm{T}_{\mathrm{T}}$
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150
160
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 Y H H P S G E K V V Y VRDGRSSVRSSSPYSVHDEVHQHLDFVGGLHRVP WTHAS GDALVRATSYSLPEHLHEHI EVI QPTTDFSRFSSK

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 W HKDGHT ILRS GAYSLPHELGAHI DTIQPTTDFS DMRKH YTK K GRDVYHAPAKAASVVPASSVA DAVLDTV S GLDNAPMEAR H WGQDGTVVRVRALRYSVPDEVAPHIRMVAPVVRFGQVRPR Y R H D S G GFRI ACDEYGLPRHVREHVDFI MGMQPVAQRMPA Y E H T S G Q M H G C E A Y S L P E EVVQEHVVDVV M P QQ SE G T S S P K
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 Y SHS G GRSHVACREYHVPESI QHHI DYI T P
F H H T S G D Y L V R T L G Y S L P T H L H A HIVDVVQPSTTFARLQPK Y E HDTGKNHVACREYHVPKHVQRHI DFI LEVVNVKQAKP Y T Q S T GA Q TIRTLSYSI PQELVGNLKVVYPTTTBP WK D A GRA F Y A N E T A P T L P T G $\operatorname{P}$ A G L V S DV T G L N N R A Q L H H Q

 Y N $\quad \mathrm{D}$ G R V VA Y A P L N D P P S V P A D M A G M I S N V A G L E S S V A R Y H H Y

Y Q HK H GNLLHVACDK Y H V PN HL M E HI D LI T P T I H F D Q R V G H Y T K D G T V Y R A P S N A A T V P A S L H GAV L TVV V G L D N A P K R A K H
 Y $\square R$ D G Q S QVR S S A P Y S V P D D L H Q H L D F V G G L HR L P R
 Y Q H P S RT F Y AP D TEPS FD RTL S

 Y S H D TG K K L R V G C D E Y S V P E H L L P H I D F I MP VT K R NVP S P G Y QLA GRS GFANS GKAQVVRAL GGVVGSVLGLQNVARARPL Y RVV G QVLRAADRELDSVAALAGDVLGVIGVD QA


 Y R H K S G E S V V R T M S Y S Li P S A L L H S H Y T DQHRDFFANDSAPKLPADVAGVVQGVVGLDNHTVKHKN
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 D GLLD QL Y A V S D P S S A D Y G N H L S L D Q V A D FM A P P P D A L S A V

 DATD AFA A HA EA D P V A R G DL S VD QLGARFGAAD D DV E K V
 A S L E A FL DVQ NP S S L N F HK F L S P F DFG DA Y GPA A A D I D T V D GHD L L M QV S D P D S K S Y GKFYS A E E V H DL F A P VK D S V D A V A DEDE L M A V S D P D S P R Y G Q H WT Q E E V V H S F F F S P S D E S S V T T T V

 A GL D A FLA RVNPSSADYHHYLTPDQFRDRFAPTQAQVDQV
 E QLQ S HL Q V STP GS S GYGQY L D S D D DA A Q Y GPS D A S V D A V D DAE H L MDV SHP AS P NYGKH WK A E DVVHAMYSPSSE E AV A A V D QLDTFLR DVN PGSASYYKY LTPA QFKARFSPTDA QVAAV E H A E D L A N Q I S S P K S E K Y G K F L S A Q Q V V D L F A A P Q E V I S E T E GA E LLL R D V S S D P S S A N Y G K H W W T R Q Q V V A E M F E P P S K E T HR A D EFMN EVVHPESEFYGRFWSPQKVVEMFAPSEDTVVET

 E ELAA A LYEVVSDPAHDRYGQHLSKDEVDVLVAPHSDSADLV
 A GLLEA LYD VSTP GNALYGQHL S LDEVVAAFAAP D ELKK S RLLKADS PT S K DYAK QL S QE S V E S Y RAA S R E DV D AV

 S GLEA L Y A V STP GNSRYRQFGLSKEEVVEAFVAPSNETXSAF

 AA GDRLLEISDPTSFHYGNHMTPDEVDDFFAPPQSSVDAV A ALLE QV L Q V S NPRHANYGQHLTRDELRRSTAPTPRAVRSV E L F E QLYAVVSSPRH DEYGQHMLEREEELKRF DKPADQSTQAV

 A ELD QLLLRDQDPKSP QYHQYL S VEQFTARFAPTAADYD T V A GLERLLEDSDPAHQNYGAHL SAA QVRAYTAPTDEAVARV





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 HE WLA D H GIDD TI T Y S V G R D WL SVVSLDPVSAAERLLRTRYR I
 R T WL S S S GF GI G E I P S N N Q Y V E A T G S A A Q V Q H A F GVVNL G L

 E $\square \mathrm{I}$ A N A H R L L K V K E V N T S WLE S Q G L K V E K V V A G K S A I Q F S G T A G LVGGA A L K T S L H K
 TA WLD R N GVVKATP GTT S QWLNI EVVPVAKANAMDDT E F S T K A WL T A H GLEEGK PVVSPA G DVL Q I S T K V K K A D S LI N A N Y S R NA WLAD H DVVRSERASPAGDWD QFTVPVVKANMLFDADFKV VA HLLSKSGFVNDQVAPNRHLVTADGTAATVQTGFRTADKR K A WLVK G GVPA S S I S K S K G WL D F V T T S G QL E S L L K T S Y S T
 $T A W L Q A R G F T V D S V A P S R N R I V F S G T S A A V E S A F A V T M K Q$ ERRAK DHGGLEVVDESAAARRRVLDRGPAAAMAEAF GVS LGR



## K

 H S WL I D N GF S R DRVVTPAKS WI EVVDATVVEAESLLLRTEYND $R S W L K G Q G F G L R D T L G G M Y V E A S G T T A Q V N K T A G T T L K N$ RA Y L A GK GLLTVTVDVASNRMLI DAK GPARTVVQSAFATTTVSR
 S G WL R S Q GL H V D G V S S NRHF I DVTAN T GQLE GAFRVVSLGK T K WL K E A GI T E I H N N G Q S I N F A T T V V K A N K L L G A D F H Y
 $M Q W L R Q G G \square N G N R I M P G R N W L K F N T T V A V A E K L L D T T Y Y T$


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

 RA Y L A S K GLTVVTGVSGNRMAVDAKGSASVVQQAFGTNDST
 R S WL T A Q DIV VDLEVVS R S WI NFNTTVVAGEKLLNTEENQ NTFAQDNGLETSVISPNGDWVSFTTTVGHANTLEGASFQT E E WLLR DHGI A E WRRN GA GDVI HCTMEIGKAEELLLNTTYST



A I L J K A K A
F HKAT LVTA QTQAASAVA

LK QRPEPQVAGT
VRVSRKSENR $\square$ MRRATPSA
YRRJLGALKGMAAKTA
PQ ILPPETQD LSARRVA FKRSAHA
FMRDK

VGANGDANADTVAQTKTAG FRGAPRTWAHTTAQ
V S H
FRMRKNMSG
FQlLHETDQT $\square$ QSR
SHLLGSAE
VH $\square$ AS SHRHNSTAHTRRAG IR FATHSAANLTS
HRWVQTPEAGVSAQAK
Y S VVRPRERSADA

HQTAP】PDAQTN
GA GAQATLDSATH
NSVTRNSAGKLAATTQA
LLQKRGDPAAHPVKQQGA FKLARRANAP
FRPGTPCSGEKTATAQPAA VPDFSAPE PDTSTAGGAS FIAPVVTETNVTARANPA TKAPNAPAGGYTAQELRSA
MATRGET
VAMRAPNGA
RR L S HRAAAP
LHRFAPSAAVEP
FRVLDSVP
FNHR
SPKKRGDDRSNASQ $\square$ QS
VRQR
TS IVPPPAG
F GR【HEMRATSF $\square$ QS QAA SKPLAQP

Y QRHSSAQKLTSAAPHAGS K 1 R S TPQ Q S F PA
LRLDPLAEKPKAP
ARLTPMDFVTVEKRAVSAS
ERIR

VGP DTGTQATVPPPKAA
SRRFAPVPSPVKPT
SSSRGPGGGYTPAQLKG
F EMHHLDANAANK】KLAAA
FRHTHTP
TRDRTGSASSMPSKKRAAS

TPHNGPGGGYTPAQLKG
KKYKP $\square K Q T S V N A T S$

VRRRAATGRTSPAGSDA SKVMGKAA

PQAVHGPSGRWNA

| P |
| :--- |
| S V $\mathrm{S} L \mathrm{~K}$ R S PS GQSTSNALTS |

S R Y G G P P P

| SRYGGPPP $\quad \square$ PRRAEAS |
| :--- |
| $\square$ |

FHHADAVRQPF
FEDYEEPETQGDANVKVAA
HRQEKR

UniRef90 F9X068
UniRef90-UPIOOO3B5C6AC UniRef90-G8NSCO UniRef90 ${ }^{-}$M3AOS2 UniRef90-R01LU9
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S $\square P T G W A H A G R A A A S D G L Q L F A L R Q Q N V$
HTLHERQPAPAARWQRTKRVPADATLPMRIGLKARNLL
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KHVLHEKRGSPATDWVKGARIESSA LDP R RUGLTQSNP
VHEKRSKLPRGWSRLRRRDSTE GLSLRFGLKQSNT
SPDEDWTRVGRIAPTEKLELTFALKQQNV
VPEGWSEVGAPSPDHKLFFRIAVPSKNR SARTRYVVHERRARSNFSKRDAVPSDERI QVRVALKQRNL QRRTELVSFDPHP AATPKADDRGSLASSSEISVTVALRPRDP
ATPDSHPSWANPNAKVGNADTASKLTFRVYLKLADQ KTVLPNNVPKFTASSVDLGPADPTQQITVTMTLASKNA RSNLVVHEKRAPVDWELSRKLEPDVVLPMRFGLTQNNL

DGAAVTADEADHPLHVEVALKLRNP TPDDWTNVGRVEPAEELTLTFALKQQND
HERHWGRQWAKRDKVPARALLPMRTGLVQRNE HYVPRKWVQKGRAPKDQMLAMQUGVKQGDF
 QRHVLHERRESSEAWIKRDRDHSDAVLPVR|GGLAQQNLD NRFKLAERLSVIPDGWTRRARANPSSTVHDKVSVRAKDP

RVPDGWRRDERVGESESVLLTFALKQQNL
SIPAGWTHTGRVADSDQLLTFALKQQNL
HEKRAAPGSRFLGAARGDELLSLRIGVKNGDL
R R VT LKES $\qquad$ P S K Wl REGMAPPAMN S STRSSFVSHEKRNAPHAQKRDRMASTTELEP

$$
\begin{aligned}
& \text { LHERRD }
\end{aligned}
$$ ERVVIRGSERNPLPNSAPVGVPDPTDLVA SRVTLGHTMHPLANAANDRGALADATPLRIHVVLKRSDA HVVHERRTAEPMDWVSSRRLERDFMVPMRIGLTTQNNLL

ESVNELPEGWTQVRTPAPETVVSGLRMALVHPNQ
HHAEAPQGWQKAAKVASNTQHVFS LAALTMQNV
RHALQGTKPRWATDQADQGATSGATAVNARVYKAGRDA VMHHNVAHQLLKQSTLQGPAPSSATTTFEVALNWRHV A L S GAAPAPVKDWVKGER $\square K R D S \square$

AANSPTDLGPSDQNQKVSV TLVLGLRNQ $P L L P P G M L R L T I A L P Q S N V$ $\square E G H \square P A V V A R S D P G Q P L P P T Q P L Q L M M E V E Q M P N Q$ LPLRFGLVQPNL
GTAPALPSGATADSSALPAE LTVAVALKPRDQ RSPVPHSRPGWLTHARDDGRAPATAAVQARIYLAPNGD EERNPL TERT WTRSRRLYNGT LLPMRIGLVQQNL MMVHAVVPKVVARAVY乌RNHNPSAFMTVTVGLRLNHE SDRSSVRETIPAHARQATDLGEETSGQTLSVSI HFNLTDA HERRVPASWTDSKKLDGSVMLPVRI GLT QSNL PRHVSHERRHAPLRNWQKTGPIDAKVKLPMRIGMSQSNL

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


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HVLHE QQWIR GQQAS KRTPGS LWVKRERLYEDVKLPMR
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UniRef90-Q8NK92 UniRef90_UPIO003EA9CFF UniRef90_UPI00044172C4 UniRef90_S3D046 UniRef90_UPI0001CC061F UniRef90-B8MIE2 UniRef90_L8GZY7 UniRef90_V2XIC3 UniRef90_J4VYP4 UniRef90_M3ATD3 UniRef90_B5X2E6 UniRef90_U7PJ37 UniRef90_B2VRW6 UniRef90_G3JP65 UniRef90_G7E7F3 UniRef90_B8ETI7
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UniRef90-C3Y933 UniRef90-C3Y933
UniRef90- V9KHR5 UniRef90_D8Q0R8 UniRef90_UPI0004415034 UniRef90_C0S1S7 UniRef90_C9SV00 UniRef90_G2XT66 UniRef90_I3KW36 UniRef90-U1HQB6 UniRef90_Q02BI2 UniRef90_E8X695 UniRef90_V5GN62 UniRef90_L8GEY0 UniRef90_M9LZ57 UniRef90_F9F0U9 UniRef90_UPIO003A20D2B UniRef90-X0MTV4 UniRef90_UPI0002E64297 UniRef90_K9GFD5 UniRef90_E3S4U3 UniRef90_A0A023NMK2 UniRef90_R7SQ88 UniRef90_S0EZ85 UniRef90-S7QFM7 UniRef90_A5XL94 UniRef90_B8P1C1
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UniRef90_G3JFL2

50
70
HGEDWLMEVVHPESEKYGNHWSTDD\|VSAFAPSQHTVVSII







 A GADYAMRVSHPGDALYGHY LTPSEFTTARFGAREDDVVAV D R L D S L F A V S D P E S P Q Y A K Y L T T D E I T E E V
 DAGAS LMDESHPDSPRYGGQWLSADEEIDDFAAPPABAMVDAV

 D GMD Y L M DV S DPNSPNYGKHYSAE QVAELFKPADESSVESVV A E LDE QL A QV S D P LDHEKYGQHLSREQVHALLDAPKPDTLALV

 S GLQQQFVS DIT P GTGSYHEFLTPALFATKYGAADATTMAV HKLEELMSVSHPTSQSYGKHFSPEDVVDTFAPSDETIGAV


 D E L E RHRHLLSPAEEVVNA LTAQP K
A ELEAVVDMSTPGSENYGKHMSRLELRAYTAPSEQSVVSV

 DKAY E YL H EVVSPA S EKYGQQHWSAK QV A ETFAP





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UniRef90 R0KB79 UniRef90_E3QC90 UniRef90_UPIO00444A902 UniRef90_E9DWM7 UniRef90_M2N5J3 UniRef90_R7SN54
UniRef90_G3JFL2

90
100
110
120
K A W|L|NSEG|IESQR|IS TSLLGWLTFHATV|DEAEALLLNAKYH|V| VSYLKRQGLTITGTPDSRQYVVYRGTVDQLDAAFGTTLHT VSYAQSKGMTVTRTHKNRMLVVVSAPVAQVNQTFGVKGGT AS WLLQSHGVKNFVKQAGS I WFYTTVSTANKMLSTDFKH R S WL E S A GVE G H RIS VNK K WME LD D S TA EA E A L L Q T K Y H F



 RSWLQSHGI KACRTVYTQDFLQCDMSVRVAETLLGSEFHR


 KRWLTGHGNHRISVVRSRGWI ELRATVEEAEMLLKTEYHLL TEWLSSHGDDAGQV NSGFLTISVSVDEAKKLLDADYGV
 SDWLRDNGIAP SVVNDWVSFTTTVDRANALLDTRFDW I NWLEQSGVEARDDQNKGEWI NFYAPVKRAEAMMGTTFKT
 DATLKKGYLLRVEQATPAFFLRATGTPAKVESAFHVSLHQ RS WL S S A G F S A G DVVP S N N A Y VV S A T G T V D Q V V Q K T F G V V T
 N S WL S A H GLLNATAALSPA G D WL


 VGWLAESNITTA SVNNDWITTFTDVATANELLDTTGAW

 K S WL A S A GI A TEERVS QGGNWI EF DATVVDEAESLLLMTE Y HV V



 R N WLVD S GI A A S RI S DT K G WY A F DAT T S E L E N L L NT Q Y Y T

 LGWLRSEGVPEADI EDDGDWI NFKVAVGKAESMLNTHFYY




 TA TQYFSQF GMALQSVSSNHNTLTFRGTYGQDEQALHVQMMR RRWLEAS GIH GSRITDNKGWLAFDAYAHEVEELFKTEFYE


 H L W L VE S GI D S M R L S Q G G G WL K A NVTVVEQAER L L Q T E Y HV





 LD WL R G N GI NDT RVTENMGWLA FVVASASELESVVHTEYFH
 T R Y L H A Q G LTV G K V V H A G N L L V DA S GTAA QL E KA F GTEL S T GA WLEEHGVSECQVVATMDFLQCQMPAGTAERLLGARFHR
 L R WL E Q S G I E S R DI Q N D GE WI N F Y V P ViKRAEQMMETTYK T

 K A WLE E A GI H H A SRVVSANK QWL QFDAKTSEAEELEQTNYHF


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UniRef90 Q8NK92 UniRef90-UPI0003EA9CFF UniRef90_UPI00044172C4 UniRef90- S3D046 UniRef90-UPI0001CC061F UniRef90_B8MIE2 UniRef90-L8GZY7
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UniRef90 B0CPZ8 UniRef90-V5GN62 UniRef90-L8GEY0 UniRef90-M9LZ57 UniRef90_F9F0U9 UniRef90-UPIO003A20D2B UniRef90-X0MTV4 UniRef90_UPI0002E64297 UniRef90_K9GFD5 UniRef90-E3S4U3 UniRef90_A0A023NMK2 UniRef90-R7SQ88 UniRef90-S0EZ85 UniRef90-S7QFM7 UniRef90_A5XL94 UniRef90_B8P1C1
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130
140
150
160
Y DHETGTQHVJACDSYS|V|PAALLQNK\||DF|T|
Y S HDERQLVAPSAAPSLPADVGTSVSAVSDDQSRMLTRPD

FEHASGKTTI GCDQYHVHEDVKDHVDYi T P
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$F$ QYAGRSGFANASTAQVPRALGDVVGSVLGLQNVARAHPM


Y LK GHLSLVRRSALYQVHEELAEHLDFVGGLHRFPAAT
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FEHADGKSTI GCDEYHVHEDVKKHI DYI TP
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Y SHSGGRSHVACRQYYLPTSVREHI DYITP
FQNKDGDQRIRTDQYSIPLALHGYVQMIQPTTRFGQLRPQ YRCPHGUFRSRTGALLVPANVGNVVVGVFGLDTRPQAATR $Y L V N G Q T H F A N A S D P Q I P A A L A P V F G G F T S L N N F$
FTHPSGQEQISCSDYSVPDHVQSHIDLIVHFSSRPTTMAH YEHKSGTLAVRTPEYSVPEHVSEHLDYVGPLTLFTQPRA YKHNDNKEMIRTDQYSLPSSSVAPHVLTVQPTTRFSRMMAQ
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YKHET GGFRIACDEYRLPHQVREHVDFI MPTDQ FKASDGTFRRPSATPTLPSSLSGTLVVASGDSTEARYRSH


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Y Q S D G GQ H $\square$ A CYEKYHLPEHVAKHVDDVT, P TLH FRATS GERFFNATKVSLPADLAGVVRGVTGLTDRAAAA
Y SHD GQTVQAPDDTLT TPADLAD DVLAVD GIDT T P
FTHHGHSHVACDGYHVPRHVMQHVDLI TP
Y VYHGRTFYAPSHDPVVPASIA GDVQSFIGLSDAA
LS WNGERHFSNDADPQLPSPI ASLVSGITGLNDF KPRPH Y S HH T GRSHIACREYHIPRSVREHI DFITP
Y EH GS GQK TV A C D E Y F L P E HVVREHVVDY T G L
Y A HE T GVVEEAGCK QY S I P D H L T A H I D LI R P TVDD F N N P S Y TVNGDSVTGATSAVTVPS SVA SHVLAAT GIDT
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Y E H K T G E L L KI G C D V Y
Y T V G G QVVHIA N S Q DP Q I P R A L A N V V E G L L S H D L P R
$F K D A G R S F Y A N D S A P T L P T A D A S L V V D V A G L N N H A C L H H C$ FVNEEQRSVALSTPYSLSKEMQEHVDFVGGLHRFP

FTHNGRSVVYANTVAA QVPNAIVGGVQAVLGLQNVELMHT
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F G $\square$ AKASAT $\square$ Y A P
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$\square R$ L R H
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$\square P \square Q E V P A S S N Q A R T$

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LR K R S T P
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1 RRDADOE 10
10
A SWAK ${ }^{20}$ A 30 SRIVALRGSYRQHSPKAIKKIGRPPDSDFEMRVIGLLAQRNLL LPGSERRPSPTAKALGDANPNESFAVTVLRRRDG PLVASVVPGLDRAVRTGALPGSQRVSVAVSLKLRNQ SQRARISGGLTAQTATATDQGALADGAPLDIILMLKRTDA $\square T L L G N V H P L A T S A A D Q G A A L D S L Q Q G R T V L L K S S P$ APSVSQKWVRTQRLSDHVVLPVRIGLKQSNE


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QPTTVSQGTGR
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A VP SGWT VAET
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$T \| L A G S E R R T A A S T V E A G Q P P Q D E R L R$ AVPQGWKYSHTPSDRDPI RLQLA HDPAQLQSAKQLGALTASAPISVVMTLKQHDV VVVEHLDQPPDGWKVSALPANQPI HLGITLPLRNV THLLKGSERGNTADAAYRERCNDNESIRVMLVLRFTP STHTVHEKRYGHHARWTNPLRDRSESDIHVRVGLKQNNL

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 MR GLK Q RNL
HGVPEGWSQVGAPNPDQKDRFRIAVRSADS $\square A G S S S P R V S H S Q R L D A A P A Q Q Q R T M V S L A P H N V$

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 LA WLESAEIPAESVRTHGNWMEVILPVSRAESLMKTKFHI EAHLRKSGFRDIGVSPNRLLI SATGTAAAVKTAFNTRLKS VA WLNNAGVGNVVHSDNKGWLAFDIPASQAEEAFKTHYHE QNWLKQSGVDDRD QQNDGEWI NFYAPVKRAEEMMGTSFKT TSWLTSAGAQN TVSDGSTVSFATTVEKANSMLNAKFKS VGWLTSAGUHDDRDSANKQWI QFDATVAEAEELELAEYHV QKWLLAAGVQDCQTVITEDFLTCQMTVQQAEQLLGAEFHR TQYLKNYHLS TKVYANHLIVSASGTAGDFNKAFSVTDQK RDWLTSSG VTDFQRDADWVTDRTSVRVANSLLDANFTW TS WLTSAGAQN ELUWLREAGI HDDERSLSKDTFTVHVPARQARKLGNADLGL HAWLGAHGI HQLQYSPAKDWVSINMTVSVAESLLKANYHLD LS WLEAQGVDATDIEDNGDWITVVASVAQAETLLDTRFDY
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 FALLNGRSFNANDSAP QVPAALAPVVKGI T LDNNYAPGAB Y H Q A A GNHTVACEEYSVPENIQRHI DFILAAPKTPQLKTK HEKNNKRYRGRTGEDTLPAALKDKVIDVMGLDARPAAHPR THHDAKRATVGSNAYHLPGHIRAHVDYITGVKSVSMNLHK F QVEGRMHF GNAGEPAI PAALESVVGGFTGLDDFAVARP Y QLA D GTERGRTGVVNVPSELVEHIVGVFGLDNRPQARAB F QHETSTT QVRTLAYSVPHDVERYIQMIQPTTRFGQPARH Y Q H D GGSPKLLRTLQYSVPDNLIAHVDMVQPTTRFGQ
Y H H A A GTYRGRRGE $\square$ S L P QEL SK VVTGVFGFDTRPRHREP FAHAS GRQLVRTTLQYSLPDGLREHVRMVHPSTSFFNARS Y THRDTHRRARTLLSYSVMRALEPDI QLI QPTTHFGQARPN Y HAPGRDYYSYAEPLK LPSTMAPYIVDVGGAENFTKPHPR F TLEGRRRVANQDAAQVPTELGG\|V GAVLGLDSATLAHTY H NHQSDTVVKDGCDHYYVVEHLABHI DYVTP
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 Y H H T L Q D Y T V S C E E Y Y L P S T V R P H I I D F V T P L L L A P K Q P H D N Y V G G G G R V V R S P R P Y S L P G A L A A A H V D F V V G G L M R F P R A Y TNATGRETVRTTSYSLPQYVHSAIVMVLGLSTRNM
AK FKGRSFHAAKNGPKLPRFLANNVLAVLGLTNYSELTPR Y T G G Q Q S VR Y T S N GVT K V $V$ RTT Q Y S V P D H L A E H I D LI S P
 Y E HK S GTLALLRSPEYSVPEHIVEHLD YVGPLTLFTEPR Y R R D GS DVI R S E Q WS L P A DVV H D II D T I H P T N A F
F Q HA T GQSHVACDEYFLPEHVSKHVDYVTGL
F H N A D N S WRI R T L Q Y S I P D S L H P Y I Q TII QPTTH $F E H E S$ GAK QV S CESY S V P E HVVREHI DLI K P TVGH


 Y D HK H GT F R G R A G G $\square Y$ L P E Y L Q G VVVA V L G L D D R L A T N C C





Y R H H T N E S L V R T T S Y A L P S $\square L H D H V N V V A P T T F F G V P Q A$ Y V H GAMRYRGRTGPVSIPQALDGDVTAVLGLDARPQAQT HDSNDGVK $\quad$ GCD S Y S L PA HVVK HV D FVV
$Y D V Q \quad G T M K L R T Q Q Y S L P D T M A E H I E L V T P T T Y F G K M K P A$ RRGDS GEFAARSGELDEVPASSADVVVAVLGLDERPAARAM


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 F V S E E GTPRLRTTLEYSVVDEIAADHINLVQPTTRFAAVRTN Y ALP T G DRVAVVDGTPTVPGSLAAAVLAVGGLD
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 $\square S W L D D N N D T$ S $\square A D D G D W I V L Q T N V G A A N K L D T E F Q W$ RAFAKEFGLTDQTPAPGRRTVKLTGTVANLQRAFGVTLRN LS WLK AA HIPATS INKHTGWITFTVPVSQAEQLLRTRFYT
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Vs
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HR\|AN
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H HVLP
VQPNSKKRALYTS
T QMKRYVQGEKEPRS
F
A THSSKPKGG LDD A $\square$ S QAA H P MVK GSDGQFYP

PQKHK LNHKSVQSTPNA
LNQKRTVSGSSHS
V S HVAP Q A GKVT P
D S QLA A GAAGLT SPAS RSLIHAAVSGEPP

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UniRef90
TOKM UniRef90-UPI000477D154 UniRef90 G7XJX2 UniRef90-UPIOOO4409631 UniRef90_-FOXEU5 UniRef90- S7ZE17 UniRef90-S88BJW0 UniRef90-81E7V5 UniRef90-14WCP4 UniRef90_W5W1M4 UniReffo-B8NPM2 UniRef90-F4RKI3
UniRef90 A1CIX0 UniRef90-F9X530 UniRef90-A2QL74 UniRef90_K5W469 UniRef90 J4KLI2 UniRef90-J3NPN7 UniRef90-U501P1 1 UniRet90_G7DTK3 UniRef90-W7SWJ1 UniRef90-A7S3J9 UniRef90_TOZD89 UniRef90-G0S4Y8 UniRef90-CTYVP3 UniRef90-E6QN21 UniRef90_C7Q0B4 UniRef90-R4K027 UniRef90 UPI00036216C7 UniRef90 UPI0004023BBA UniRef90-F9F825 UniRef90-K9FBZ8 UniRef90-F9X227 UniRef90-M2TEH7 UniRef90-UPIO00414FBAD UniRef90-J3Q5P7 UniRef90_OOUFKO UniRef90_D9V398
UniRef90 J4VZB6 UniRef90-E3QXP0 UniRet90-R1GMY2 UniRef90-G9EUG8 UniRef90_Q470Q9 UniRef90_D3TC53 UniRef90-H8L2U6 UniRet90-R8BFN6 UniRef90 M1 WEXO UniRef90-UOZHX1 UniRet90-K1WAL7 UniRef90_U4LBN3 UniRef90-TOYG26
UniRef90 H3AE45 UniRef90-H3AE45 UniRef90_UPIO004621672 UniRef90-G9ENV8 UniRef90-A9UZT8 UniRef90-E4NCB4 UniRet90_G7XNP9 UniRef90-V4K047 UniRef90-E3L515 UniRef90 O7S1D2 UniRef90-E3KXZ6
UniRef90 U2TEE8 UniRef90-R4XGH7 UniRef90_L8HDK1 UniRef90_G8P0D9

HERREMAHPRDKRRMEADTVLPMRI GLRQNAQ RAVPEGWKFSHVPENDQPVRLQLALQQQNV HEHVPQLPQGWARMDA $\square D P D Q$
H H V AVRSWA AVRSQWAQQGRATHEALITI RFALTQQNL
A VVEHLH RAVRNARPVGRL
$\qquad$ SVPSGWEQVAPAPGSELVRFRLAMEQIKT HPIPPGWTLHRRADPDTKLLVRLSLVQPNL
PDQQRTLPSGWVSLGRADPEEELSTVFALRQQNL GTGSAVDDNASYGDDPDSTPVTVDVLKANKE


RPVVVESLDETPEGWEESSSPAPDKP ESGGLESEDH HVVHESVEQ PRGWRHVAPAEDGNTVRGSVALKQPGL $\square R E A \square P A V P D G Y V N N G P A P A D T Q L N D R I A L A Q S D P$
 VLHESKSHHIRNLHKRRSVRPDADP KIGGTSGE VShPGSERPERPGFRAHGALDPDAVVSATLVLRRRAE VPIDPSDHSAPRNCRHVGKTSAAQQUTVTVVLKRAQP

HERRQVRGQGRGQRDEADT\LPMRTGLRQNAK HPLAESTNALPAGWSTGGPAELSTNLTLRLEIKSPGT RTPTHESTPALPAGWAFQSKASDNETLSLRIALHRPHS

AVPNGWTLIKDAPETD
EHRQSLPEGWTKHQRVEPNAVHD
HQRRNDARFEKRSADDADSKTPFETALKONP VQTLPERWAFSGAAKDDDTLAGKVALTQPRL SQUALSGSVRPFSASVRVLGDADSRSTVEFQVALKMRDL

HHSLSETPRGWSRARDAHPETVLALSIAIKHADT
 VKG $\square$ PPGWS LHHEADPSDK TLFVALK
$P Q M Q A S V D M G A A N A S Q S A H V T L V L K M R N R$ QQLKGHVPD VVKNGQAVS LLPSNQKMYLSIVLPIRNK AVVGAVPSWTGQATDLGATSGQQQLTTTLYLGGQDP ESRVPLPGSERPAAARUQNLGPANPAHRIEVTVGLRRQ VLNNTNYFGDADPNTPV TIDDVMKLQNK
 HVLHEERDVERSSLAKRDRDHPETPLVMKI ALKQQNM VLHERRSANLPEWVKRHSAEANSSIPISIALAQRND




VPTPG $\square P L L N Q A T L T K P L K A N T P \prod H T V W \square K \square R N K$ VQLAGSRRPLPHNADRVRDVDPHADVDVTVTLKGPDD SGFNPKLDHDGTFIGYANENQKIWVTIGLKWKNE SSTARLQASLRSASSHAVKL ASDD $\square R \square D V V V L K P R D E$
rratpygwrsgadahgdembel tialk innl
Mr TIPDGWKFLHEAPPWTPMRISIALRQPHI RHVLHEKRAVESRDWUKGDRLEKTAIVPMKLGLTQSNL ESLPSDPEGWTQLSSAPATAPLTGRFHLKTHEA
 $S \square P S P G \square T L L K Q A T L D E P V A P K T K I S F \| V W L K L R N K$ AVDSQQEIRFTFALKQRNL ADPGTHPAWATPQADAGATDASAPASARTYLAGRDA VVL ETVKSVPSDWKLVKAADTSSTDSGSVALARQNG SR\|VLAGH $\square P A G W K V E R H A G P S L V S L K F G L K Q S N L$ AROAPRSFTKREPQSHKHTLNLKI ALKSGGM
 KERVTVP REW SKYEGRVDKSKAMT

TRLKGHVPTWALSSNDAGAVPNDTNLRLVFVLSRRQA

| UniRef90＿S7QBK8UniRef90＿F0XQW7UniRef90＿V5FLY3UniRef90＿R7SCV5UniRef90＿A0A014P937UniRef90＿Q8MZS4UniRef90＿UPI00047BA4F5UniRef90＿A1CK11UniRef90＿B6QEA1UniRef90＿UPI0004411985UniRef90－F6RLK1UniRef90＿UPI000288C8EEUniRef90－R0J6F4UniRef90＿B5WS00UniRef90－J3QCL4UniRef90＿UPI000479A889UniRef90－C7YSA1 |  |  |
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UniRef90 J4VZB6 UniRef90＿E3QXPO UniRef90＿R1GMY2 UniRef90－G9EUG8 UniRef90－D3TC53 UniRef90＿H8L2U6 UniRef90＿R8BFN6
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UniRef90 U2TEE8 UniRef90－R4XGH7 UniRef90＿L8HDK1 UniRef90＿G8P0D9

EDLIASTFEVVSDPAHQRYGKHLLSKEEVEELVKPHPESTNLV SLA Q ALMDVSHPTSANFGKHWSAEAVIDAFQPSGETVVVV NAFEAVMQMSTPDHPS YGRHFSHEEMKSMLLPSSSEAVDAV
 HRLASKFA PGSG HLSSLDEVRTVRAPDPKDAAAV

 $D N L N T V L G L S T P G H A S Y G K F L S P E Q L K D L I A P A S A A S N A$
 $P E L L E A R E S$ RLE SD P Q S S S Y GQHL

 D GLD A L Y DV S T P T S S S Y G Q H L SKE E QAHNMLMDTSNP LDSTQYGGHHLDSDEEVTEMFAPSSEAMVDEVV
 NELMLLIAQEVVA S
LP ES A FTA R
 LNVA A L K

A M M M S T P GHADY
G Y Y QVS D P L H P N Y G

## ローのメ




D QL E S K L R V S S P E S P H Y A D H WD S D K V S R F F S P
 QEAEDKLY DM


A A L E K L FWQV S D P D S R Y G R H WS LE QL SN LI S P
AKLDSLLAEQQ
D
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A
A
A



A
E E GE K LL L E V S SN P N S D S Y GK H WS P K DVVAA A F A P S S H T L K A P V

 E E GT Q R L Y D I S P K S P N Y GK H M T A Q E A I NY F A A D DVT I Q TV
 $G Q L D Q L V Q E$
E S L N L F LKEVDPSSPNFG
A GLD QWLA QRLDQRP L

HELPS KILSSAT
$T$ QLNA LTDS LLAGTS HK
ALSREEVVQRF GDVAETVRKV Y L T Y K E F K N K Y A P S P V I Y N K V A L G R D E LI $\operatorname{L}$ R R HAAPS Q A QVVD A V
 ALEE ELIQUSDPAHVRYGNHLTQQTLLSFTSPDDGALTAV


 D QLE IALAAVSDPTSSKYGQYLTTEQIADLTAPRPEHMAAV S GLAA LAAAVSDPNSASYGQYLGADQVRARFGATPQQVKAV

 EELKRRLLQQSDDHPNSRQFT EELKRRLLQQSDDHPNSRQF TKEEVEKHRQPDQRSV TAV DLI K RLVVETS DP E S S S Y GR HLLT F E EI R DLDSAPSSSS SLLEA I K GAEAL AK QVSNPAA GYRKALAAPAQWIGRFSPTQADSSDAV RVAED TLK RIS DPHRDYGKHLSMAEVKKLMAPAQVSVDHVV


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UniRef90 TOKMY5 UniRef90_UPI000477D154 UniRef90_G7XJX2 UniRef90_UPI0004409631 UniRef90_F0XEU5 UniRef90_S7ZE17 UniRef90-S8BJW0 UniRef90_R1E7V5
UniRef90-14WCP4 UniRef90-W5W1M4 UniRef90_B8NPM2 UniRef90_F4RKI3 UniRef90_A1CIX0 UniRef90_F9X530
UniRef90-A2QL74 UniRef90_K5W469 UniRef90-J4KLI2
UniRef90-J3NPN7 UniRef90_J3NPN7
UniRef90_U5QIP1 UniRef90_G7DTK3 UniRef90_W7SWJ1
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UniRef90_C7YVP3 UniRef90_I4WC64 UniRef90_E6QN21 UniRef90_C7Q0B4
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UniRef90_V4K047 UniRef90_E3L515 UniRef90-Q7S1D2 UniRef90-E3KXZ6 UniRef90_R4XGH7 UniRef90_L8HDK1
UniRef90_G8P0D9
DEW|L EHHG|V|QETHRSGGGDW|I|T|LVS|V|DQAERM|L|GTKYNV. TA WLVGAGI SKER DS DNKA WLAFDATVVAAEQLLHTEY L H
 SEWLAFHGLDETKYSSARDSMTVRVPVGTAESMFNTSEHV


 R S WL V S N DAE S STI IQQT DEVVLSSLNI SVVAQAERRIFTTN Y NV QK WLLAA GVRNCRSVIT QDFLTCWLSI RQAE LLLGAEFHH
 S SWLK TS GI GNFEL NS D WMTFTTTVVGVANKLLNTHTS W $T$ QVMS GF GIK TVVSSSVGARTVVELSGPVSAMESAFNVK LFN NEWLSSHGFDESS ISHSKDWVTLEVPLQKAEEMLNTTYFY A A Y L L K N GFT H DQVAP N R L LVVAAD GTVVGQASKAFNTTMMMQ

 N A WL T Q A G V N A DP I S P A A D WL S $\square$ T A WVVVDS GI PA DRVVSANK QWL QFEAQAHEAE SLLDT LYYY H

 A S WL RTLAARHGLTLVHEDRAA RDWLESAGVHNJQVDA DWVKFHTTVNKANADBDADAKW
 MRWLE ES GI AK ER I S DNKA WLA FDATVAEAERLLHTEYE H

 RSFGRQHGLQELACEPARRTLHLRGTVQALQRAFGVQLGR A N Y L R G Q GLTVVSGQSANRLSLTVSATAGQVRDTFGTTGSR
LRWLR N A G
L K WL K K E GFK KVVELSRSRAWVHVHMSI DQAEKLLDDTKFYK
 RQWI E ET IARD DDHT LHKGHL RFMATTSELESSLLETEYYY


 D D WL K Q S GVVQEH Q $\square$ S DA GDWV SIVLDPVSKAEALLLKARFAT TK A L K D A GL N P G A AT P D G LDS I PVVKATVAQAK SAL GVD FA G



 DE F L K K N S G L K I T K T Y N S H M T I KA T G S V A D I E K A F K V V K

 RNWLESAGI S K DEQDA D WMTEYTTVVTANELLAAANFQF
 K A WL Q G G GL SVVD Y A A GA G D Y L L A S GTAQQQ GA L L R T S F D R


 E Q WI K S K NV H E Y T Y GLRRNAVLHDTDGKIGNLLGVRFGY VA HLK A A GFNRDQVAPNRLLI EASGRAGAVANAFHTMLNH
 VS WL E S S G ID RT RI F R A R D T L H V R M NV T NAS ELL Q A E F S R

 TQWLLT DS G $\square$ A HNRIYENKGWI AVDVTVQEDEDLLKAEF VD WLE S S QL $\quad$ P YD $\square S N D V I$ KVVKLTVA QAESLLKTKYST ES Y L K Q M GFT N $\square$ S A P A N N LYYVTADGTAAAAE QAFNTP DWQ H E WL L N Y G V E N C WT VQ T L D F L Q C S M E A R T A E K L L G S Q F N R TN WL N E N NVV TS T G Q S P S G D M L








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 UniRef90_B6QEA1 UniRef90_UPI0004411985 UniRef90_F6RLK1Y R H D A T S T|VV|RTLS YS|L|PSVL|HEH|I|QVI|TP

Y K H E S G N ALLV Q T T H Y S L P E VL H D H I D L V H P L VMLLASAK T L Y S F D GKVVSMVRAREYSVPSHLSAAINFINPI SNFPLREPM F Q HK T RTSKVA D G GYK I P A E I A E HVVD FVVA G L F E F P
Y R H P T E D R V F Y S P D R E P T P N L P F N L W H V S G L
 YRANNGFERVGCHQ GHFPAHVAEHVVEVWP S S G LVTYGGPR YMGPAETHVVRSPPYQLPH LLEPYVTTVGGTSFQNPFR AK LIK GKT F HATKQGPKAPAYIARHVLAILGLSDYSALTPK FTSNDVPPRDRTLEYSVPDEVASHI NLIQPTTRFEATRTA Y A H S S GNYRGRVGY LF I P DEL K DVV Q GV F GLD N $Y$ QHDD GE L L L R T E R Y S L P E E I H S HV E L V

 FHHKSGSTVTRTLEYSVPEDVVRYVHLI QPTTRFGHFRPQ F NHETGKRIVRTMQYSIPVDLEGHLDVLHP
 HEDKD GHS R DGCDAYY LPVHIMQPY IVDVTP GVKSSPR Y Q GPNGEYYAPAGMPRIPEALQGGTLILGLTNRTAFKPQ SARA GAPYRQRS GGLDS PRAMLGGVVTAVLGLDDRPAARAQ
 Y V S E A K H R R L R T L Q Y S ll P D A L V S H I N M I Q P T T R F G Q I Q P R
 Y H VT S Q R SLV RTLE YSVPCEI LDPHVLSI QP T TRF $F$ Q NK T G D K V V R T L S Y S I P R D L H S S V AL I
Y S Y R G Q S P V L R T Q S Y S V P A GLLA D S I D F F L G $\quad$ S R Y H AP T L Q
 WQ D S H R E F I A P E S A P L L P D V D L I G L V S D I S G L L D S A P V A E P R

 Y Q NGASQKLRTTEYSI PDSLTDAI DLV

 C

 YEHSNGATATRTLAYSVPRHLHAAI AGI QPTTY YKTDGRTTEANTSAPKLPAAVASSVTTVLGLNN
FRHSSKPVIRSTHHYSVPF KVVAQHLDFVVGGVLRFP


 YR DAKRDFYAPDREPS D S L S VVPI LIVVAGLSNAMIAKPM YRLAG G A R R A P Q S P P R V P A NLATAVVGI S GLLDTTP

VT GHDVTHRHRTGGLE I PAELDGVVTAVLGLDDRPQARAQ ATYHGKRFHATPQAPKAPSNIANDILCILGLSNYSDFHSN Y K F E D Q K P V L $\quad$ R T K $Q$ Y S $\operatorname{V}$ V $Y$ DNGVKK I R L R T L K Y S V P D A L V S H I N M Q P T T R F G Q L R A Q

 F T F Q G Q S F L A NVA A P T V P D A L P P V V D Y QDQDS ERII ITTEKYSLPKNLHRHIDDVQPTTMFAQAT Y V S E E A K P R L R R T LLE Y S YTDTGRKFYANDSAPELIPASVVAVVDSVVGLDNHAVKH Y Q S K T GRD H IG GVED YRLPRDIA DFVD FVVF
FEDNDGHVLVRTLEWSLPGHLRGHIDVVQPTNSFLRTVPQ FEHKDGGFRIACDEYHLPRHI QEHVDF
Y NY Q NKTVVYAND QAPTVLRADI A QYI S EDIS GLSNLVCY QPA Y H VP G GQI R A R H GVLMMVPGEIADVVEGVFGLDQRQMAKR H FKSNSKEYFAAMNEPKI PAYLKPYISGINGLNNATKFK


 Y RFGNGK DVLRTTEYSI P DDLTSSAI DFVVPVVNFMTPEHE $F N V N G R T A F A N V T A A Q V P Q S L G D T V L D V H G L V N V H T H E T T$ Y E HGSRTSKIRVGSYHVPEHLTSHI DYITP
F T N E E GK SVVVRTLQY S V P S EVVK K Y L A MV Q P T T M F G L R P M Y Q VP T R T VYA NT QR A EVVPTYMAN AVVSVVGLENDDTMHT
$Y$ V S G Q Q T I VR S PVP Y R Y Y G L A E H I DFV GGMMRFPSNR

 AKSEK GQSK DHA GAYTLDA E I A D A V E T V F GLLH GLD DPRES Y R T A D GTHRAPTAD
YK S GS T QK L R T T K Y S VP D DLA G S $\square D L I S P$
 Y L H E T GQ T H I A CEDYKL P ERLFR HI DMV MP TVV Y S Y N G S T Q I L R S R S Y TI P R WL S D DI D FVV P LT NFMPPR

$F N Y A G R Q L I A P A T A P S L P A B G G T K V S G V S V E Q S R T G T R P$
Y HHKGTKLVRALQYSLPNHLHEHI DLI QPT TLFGSLHA H


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| UniRef90-R7SCV5 |
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HERRNEFAAR

LT R R N S P P TVK GAR
A $\square K Q P$ VGA QPKD
GRIVQAMDQVS

RE $\square K M R D S G M T K R Q S$
A G MPD DTP VA LT A
$T R Q P R Q P R V R H A K R S T V V A$
LRKRTVTQGR
YR 1 S HPANSSLPAPLQVAS FRIARPAA
RRQDSVQELKKTKRASS
$\square R W D N Q \square G F A K P N A A E A S$ SKPKHADETFLTAATLA
FHVNEEAGDLNLTNSEAA
KRVRRSTPKAY

ARQHNLPT
F R V A
QVGSGPAGGYTPA
$V A L X P T H H K F A A G T K T A A$

A G L N Q RAQTHVAKRSNSSS HPVISTPS G

SR L R E ESDRQFSALSSTAA
TRLQPQSPTK
F H

FQGS GS S QRFYGPDFQAA HKTRRPRPKPKPTKTQ TPVPRPSRTTVTKRNDAAS $R \| R T L P$

FK L K P S S S Y NK Q $\square K$ S QS $\square S$
FHA $\square$ PRAASGT
A $\mathrm{I}_{\mathrm{K}} \mathrm{R} M \mathrm{DNGDTSTPT}$
KELTTPDPALTPS
RALLH
RKRRRDRRAATNQHATGCA
F DVQSEA
RSEAPAATPGLP
HEVAHE
HAKPAAAP
D R Y
VRTRP
AQAAA
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A VFPPR
RQVSTTTAKNSTATA
VSFAPQ $\quad$ GA L QRRRHRRS
L Q
RNTHGPPVRYFETDTAA

NRYQHAGFGQITSRKQ K VAVQA $\square G Q F P A A A K S G S$ L $V R S \nabla G D V V A D T P A$

Y
FDTVPTTYAGFTARRDG
F GRDAPKRSMFTS
AREA $\square R \square D G R T$

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 $V V T V G A A P T P P A D A Q F D G P \square S G A Q T I Q V N V V L R S R D S$ ERVVPLE GTRSHVVHD GT DTGPADPAARVTAQVFLA G D S R


 PDSHFKI
$\square$ L G S H R A P VD GARP L G DP S P D E P VVEVTVVLRRRRST $Q \square L R G S E R S P L P G C T D A G K F P A A H R L R V L L A L R R P E L$

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

SALLRAAGNAVSAAPMSATAPVHVALVLKLNDE HHAEVVPK GWQVARVASTGKQQVFS I AL TMQNV $R \vee P \square A D V T S A P A H F V Q N K L A K S Y E L V Q F K I L L K Q R N L$ $R V V L A G S T R P A A H G F T P A G T L D P S T E V T A T V V L R R R$
 ERAVVASRDPRMRGAHPEGTLPPSQPMHLVITLRLRHE
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HESTPVLD KGWSFCSKAD D

 $S R \triangle V L A G H$ $T$ L P A G W R

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

 STRNTVVHE K R D T V V


P D Q Q R T LP S GWVSLGRA DPE E ELLS L T FA L R Q Q N L GWVKHSAAHPDTMLQQLQSLAQPRS
 STTSLPDSVPTTPAGATPLSQAESDARLEFEVSLKMRNF D R T T V A G T V P S WA T P Q S R T G D A P D Q S VVRQ



 ARAPPS QWTRSRPA DP D H L F S L S DA L D K S R Q
HEHVPQLPGGWARMDAPDP
VY A A TI A PRLK D S Q F LLS QMNPNMQLAL Q F F L K P N H L





R D P P A GWTVVSRPADPNHRFSI S I A AD R S G H
H GWQKRSPAP PD GP IK L H V A L R QE D G
S R L V P L R G S E R S A H A A A R S T G A V S D S E R I EVVTVVL R R R T P
H S QVP K G WLLS T K R lle S D H T I T L T F A L R L R N M
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$P G B P$


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 KDLEALLETSTPGRPEYGHHLSLSQLSKYQEHNRTSEDSV DYLR DAEDVSDPASPNYGKYLDAADLQAVLPDMAAVASTV NTLEKIVWEVSDKHPNYGKYLNFNQVKSIVEPSEESVRIV AGFEKVLEMSDPDHPSYGQHFTHDEMKRMLLPRDDTVDAV HGLANYI QQVTPGSANFQRFLSTAEFARRFGASDAEDARV俭 ANLESKMTAN ENLKTGDRKRDATSGQYDQHLCQQEALALRTPDKKDVDKV ASPGAEVFDGVLTPAELAARYGAAPADVALVV A S
 DDLNKTLWLINPRSPQYHHFLSWKEFKNRYAPSKDVYNSVIV DNLKTRLRRRDTSGKFTQNHLTQKEALALRDPDQADDDEV HVHKALYSVSTPGHELYGKHESSREAQALLMPDDESRDIV ENAERFLQDIDDPSPNYGKHWTAEQVANTFAPHQEATETT AQLITTFLAAMTSTLSMVQHRMSSEQFVANYSPTADQANQV AQLDQLVAQQDPTSPMYHHYGTSDEFNSYYAPTAQQEQSV GELEQHLHEISDPSHRYGMHLSKGEVHELMAPHADTHKIV DVLESLLDVSNPKSHNYGKHWSDERILDLIAPEAHLSTEV $A D L Q A R V S R \quad G$
A
 TAVDYYHAEYTVGNAAYHRFLTPAEFASRFGVNPSTYARV ASLEAALYDVSPSSANYGQHLSQSEREKFVAPTAESVQAV AKLEATTRRSDPVHADYGKYLSPDEINGLIAPSSSTVAAF VE EALYSVSTPGHTLYGKHLSQDEAQLLLNPDSEALDAV DELEEFVQVSNPDHPNYGSYKSFSERKEMVKPDEESUPKVV HKLENLAQEVSPQNRLYRHFLSSRAVESEFAPSDNAVNTV
 GQLHAFIAQTHAGVMATRPVMSRAQFRSQHSPTDTQAQAV AA ALEQDAKDHDSSPQYHHWMTPAEFTAKFAPTAAQVAAV SELEATLKRSDPLHANYGRYLTQDDVNSLLAPSSTTLATF TDF HQVLDLSTPGHPRYGMHMKRNEVESFLRPRSEDSDQL AEAALLMEVSTPGSRKAGLHYTHEQVGQLLSPDFEHTRTVI GAARRLTQASDPNSAGFRQHMSASQAVELSPPTSGCVQSVV DELVKGPETI HPTPAAWPHPCKREEFDAQWGADPADAEKI ALSQALMNVSHPGSENYGQHWTQEDVINTFAPSDDSTVAV NLQSQLLEVSTPGHPNYGKYLDHDAVNSAFAPSADAVSSV
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m


 VDFLSASGFKDKQIGANRMTILADCTVAQAEAAFKTSDHD


## 

 RAYFIAQGMQADIVNHS VVVTASVQQIENTLHTSINY KAYLASKGFTNDKVADNNMVVEADAPAGVISGVFRTTMVP TKWLKSKG VKHYNVNDGFIDFALDVKGANALLDSDYQY
 HDWL GS SNI QLEQYTPAKDWI VVALDPVSQVEELLDTEYHE MS WL NQS GI A PVRRSKSGGELYMNITAQEAEKLLHTTFY(I) VQGLRAYGLSVQQTADPMVLSVAGRARDVERAFGVREMK LNWIKNNNVHIA YTYPMRNALVI HDTFKKIGNGLHVQFGY VEWLGKSGlDQSRVSYGGDRLTLNDRVQEAARLLETTFYH TRLAAERGFTVVATDLVARTVALLEGTARQMAETFGATRRT SKWLQLNGQVDYRTD GPWVGFNATARQAKT LLDADVGF

 RQWLENGGVTDFTQDA DWI NFCTTVDTANKLLNAQFKW


## Q

 Q S TLLA S G L G A A A V V A S V D A A S R R V E S F L K GH G L H NI R Y S S D GT IA S I K T S V Q KA D S MLK A K FRM

 $V$ N WL L N Q GL D Q S A DA S D G H WI RRV T T T V E K A N R L L G A N Y S W


 D D WLL A A H G I I N R T K VV S A A G D WM M V


 V A Y L S Q H GF S GIVEVA S N H L VTV TA A D G TA G GV S S A F N L T M A T




 A A Y L T K A GFTHVNIA SNNMLVSGDATADVVKAAFNTSFER












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UniRef90 - TOYPS UniRef90-LOTOW5 UniRef90-G9MF51 UniRef90-Q7NWL8 UniRef90-UP100037DC67B UniRef90_Q97CF2 | UniRef90- QOBHP8 |
| :--- |
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| :--- |
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UniRef90 C
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 YRKDDLRYRGRTGAVSSPTALHGVVSAVLGDDDRPQAHT FAYQDKKTVLRTTKYTVPDSVAGAIISFI HPLANFMSAHH $Y D V G G R Q A V A N D Q N A Q V P A S L A G \| V L A V H G L Q S V H Q F H A A$ YLYEHDIVYASTSKASLQAEMAQYVVDITGLNNDPQYYPN YTYPGGDFMTNTANPYIP向EFKGVIMHVYGLS
VAMADGTTHDNTAPETVPDADSGVVRGVLGLDTATRDRPN YSSSRTKRIRVVGQASMPMHVLAKVDLVLGLSDF VSLGDTRMRHRVGADEVPAELDGVVQAVLGLDDRPQAR YENADGDRTVRTPKYGLPKHLHDLIDVVAPTNYFSKP YKHQTNKTLADCEKYSVATFVEKYVDFIT TTEQFHHG YEKGTAAWYAPDGAATLPAPLAARVSAVVGLSSDAMERHL FKSNNPSYFAA DNSPSVPDDLKNDISGI NGLNNATRFKLH QTHETGRKQUACQDYHIPESLAGSIDYY LGAAASPVQTH YAYKDGTPVLRAPSYSVPDELKDDIIFVFPLIANFMAPPR
 FTHESGRTLI RSLPYSVPWELEDHIDFIGGVNHFP它 YVSDKHRRRLRTLQYDVPESVTPHINTVQPTTRFGKISPK YRANGRLYHRPTGDVVMPAGLAGQVDADVGDDNESSFLSH

 Y SF E G K K P V L R T T K Y T V P D SIA D A S F YQF A D QEPVLRTRDYSLPESLVNSISFIHPIANFMRP

 Y RGD GKEYFA $\square$ S K P DEFPSNF DP Y I F GI D GLDN A TA Y H YVHETGVVEQAGCKHYS IPAHVTAHIDDLIRPTVDFSHSPSS Y Q F E NQDPVLRTTREYSVPESVADAI SFI YPIANFMRPK
 Y Q H K
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D S E E S L I R T LEE Y S LP E VL H DH ID
 $F R H R S N N V R A E Q H A G S I P A E L S G H V D F I D G H N T F P H P R V R$ VAVE GHE F S S A VGAPSVVPS GIA P L V VGI HGLQPBLRABKH



Y S Y S G G T QLLRARSYT IPR RWLNDHVDFVVPLTHFMPPRNH YKHKTGETILRTSAYSLPLYLHEYVDAVQPTTYFGLGRAG





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WRATSTGADEASSTSVAA SRRGSNGAYAYNDLKQA DRPRKRGAEHWRRQSQSCG
H $\square$ ANRPATGNAAGGQHCA
VS VA P P

QLLKGSERGNDADAVYRERCDVNENVRVMLVLRFTTP SLDRKAPQGFAYKGSLD PDNKVMFAMIVIPLKNF PAPDPGYTDKGTAGGEEIVRALMGFPIRNA TSLSTSQSAQASTSN

V S D S K Q QL V
PGSHR ALDYWSKAARVDGCEVHAVTLELRHTHL
 LD Q S K P M NVAV S L K L R N K RATS T D K I $S L P S S A R A A V P \quad L V G P A P P E G P V R A M V Q L P F R H A$

MRAHERRSPEGFVHSGPAPAQHT LTLHLGLAQGNF $P$ LG WS F R G Y A GP S D K I T L F V A L K E P G D



VP N P DGVPSPLPGYDDLGAA DPNDSFRALIGLYLRDR A GWRRESRAPGNHP $\quad$ RMDFALLPES G $\square$

 RTPLPGSTRPPAAGARAATPPAAEARIEATIVLRRRAA MAVP QHVPYFARYTKDLGTADPKSETTFTVVLKLRNE ANSPPVLLKGFHY LGRAAPEGSLTFFVELNTGKE P Y H F VQS GK S P L A E E I I S F K K L L L K Q N N L

Q Y T GRA D A N Q R $\square T L S V G L R \square R N A$
PEWREEAADVGSTSP MRDHLALSPQRE SVVPGSVFVQPLNTSTELYI AVLLNFTNV VALDP P VTVVLKDYKIAGKLNPNKELMVFLTLKDRNK
 $\square P D G Y S Y Q G P A D P D T \| L N R L I V K S A G A$
 $R \square G P T D P A T Q L T A R V F L K G D A$ D NRQTVVNVALKAANE HELP GSHREEFAPAT A PVDPDDEQQ EATVVVLRRREP T TLAD GLPRPMEGYFDFGAAEDDDALRVLVGFDVRDR

A P P P GWE LDEDAVF DKMMKL RL HL ISQNM
T P $\square P$ T TEP GP LPGYTPDKGEAPETDDIRGLVVFPIRDP ETLKKATPS GWDK SEAVD K DATI T L K K H LVVNK DM
 $R R H A V Q N$ A HAARWEERGRAAPTT RLL Q Q L R V A A L A K K S D A PERPGFRAHGGGLAPDSNVVATVVL$R$ R R RA E

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AQLDAFVA NPHHPN
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 GGLFAAAKQ NPKNHVRMSAQQVAAAYGATPQSIMAV
EVPESVLE FWAVSDPTSRDYGHFMTVPQLRGLTAPPAAHVQAV EWhKKQLQESDPKSERYGKHLDKNEVEGMTKPSQEHFDRV DLVARTAEVSDPKSPSYGKYLSAEELRELVAAPQEVEDHV LPEAFI RE PDOSKN

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DKFHDLAMNV SQLSDKLDQISPTHADYGKHLSQEQLASDTEPEAGTVDLL DALNSLLKISDPTSREYGQHWSAQQVAEAFAPSKQSLKTV NGLAGYARAISDPDPRYGHFLTPAQTRGRFGPTQQRIDAV DALTNYVYDVDPTSANYHHYLTPSEFAQKFGQSAAYVAAF VPHEVLL QGLVQRUDRMDPESAEFRDYMSPDDWNAQYAPAAEDVEEV PEFHKMMDIATPGHALYGRHLDQTVIDAMDAPKTQSRDLV AADEQRTADDYPGGPRFRQYMTPAEWMAKHAPPEKDVNIV DKFEHAI NDATPGHNLYGQHMSHEDILAMVAPAEESAALV EDLKAKLHQQNPAHPSFGRHLSRNEVIQHRKPAADPAVV GEVEKVAAAVSDPSPSYGKFLSAQELRDLVAAPPEVEQAV DLAALVMARSDVTSPEYGRYVSNEELREHFRPHAHATLAM SGLT SLLNFDYGSKQYYHHWLSPMSFDNQFYPKRSYVNNLV
$T N L N D V Y D T V D P S S T S Y H Q Y L T P S Q F A E K F G Q S T A Y V V S V$ NELENYATEISPGSPGYRHWLTTQQTNSMFG NYQGVETV QKLDALMKVSSPGSANYRKYWTHAMVGELDD NAAHVAAV
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 $\begin{array}{cc}\text { Y } & \text { Y H G E D K V }\end{array}$ YTDQDTTTKLRTSHYTVIPDEVENYVAGVDPGGTFFGSTQK $\square Q F R G Q P F D S T R T A P S L P A G F E R F V A S F S G L Q$
F SNGS $\square$ S YYA $\square T$ SYSGNAGLAPYI SNVT
FQYKDKSTTTRT LGFTVPSYLKPHVDFVCCMDQFPEPERK Y SNGSDTYYTVY GVPKLP
YAHPDRR\｜VRPSGSYQLPSNVKPHVLLVDGLDAFP VTEGGTTYQKATKTPKLPKSSSKSVL AIMGLSNYSTVSSN $V$ VNGTSEYYQGVGVPK FEKGSYQFTAPTTSAMDPAQFASQVINIAGMNNEHLAT YA DSGDALARTTKYSI PEDLHNHVNLV
YVHEATTTVWRTLTYSVPAHVEEHLSFVYPTTQF
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D LHEGANAKAVAGP $\square Q \square P A A L R D S G A V V T G L T$
Y QSASNS IVRSATHAVVPSVVAKY I NLVHGFTHFP ILKSN FNVDDGHRLLRTTSLTLPDDVAPHVAY LDNVNAPMRRS YTHSGLSVVVRPEESYSIPQELEGVVTYVDGLESFP
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YAYNGSDAVLRAKSYT PPVALRDYIDFPKPTSHAPTPTSH WRVNGRTVHARTREDAVPKDLERHLDGDLG ABADBS
 YKHDSAEAVIRTTSYSLPEVLHAHIDLVHPMDMYTSPKPF CMRKNPQVYCTTDSFTLPAFVAD
YSKDN SUQLATKSFGLPARISGHDDAVLGTDAVAKAKPF SVTEKRTHKSRTT YKLPAHLSNHVLTVMGLSKPTVNKPV YTDNGQRYYVNDGAAKVPAALAGSVAGVLGLDNRNAATPK YRFQGHTGYAPATGDAIPSPLTGMVSGVLGLDTLDRPVSN
 FAQPEGKFR
FTHSQRSAVLITS SATDPVDDS QYVRGVVGDAEVMTSHHV YGNGTDTYYTSYGTSSVSAYV
HVPEDSSYRCREGELQLPAELADVVTAVLGVDNRPQARPS ELQAGKQARTAASPLQLPPALRNSGAVVTGLQRGSVP YVMSGKSRSR $⿴ 囗 ⿰ 丿 ㇄$ YVKGQRSVIRSPHPYVVPEELAEHI DFVVGLHRFPAERSV

 Y SHASVSRAERFHEYNI PEHLDAYI DFVMPL
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| UniRef90-M4ZHP0 | $\square \mathrm{T}$ H H $\square$ D P H A T V |
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SEAPPPYGFRDAGPAPPNMTVTGVIYVPLRNL
T LVHETLSTRDPSFKETNDSGNTPVDASIYIPLRNL A GWRRESRAPGNHPI RMDFALPKSGL SPSAMI SVFDSFKPQ ASNAFISVIFA!KQRNT V NVAFKASNE
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F IS DLPSNTMLSFSI広PPRNY AVHESFPGPPFGWTQSSAVDLSANTTMQAWLQYANL

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 VKANTETSFDIVLKPRQQ VLHEKRSSAPQGWSRAGKHNSAADIPDRFAMASNQ $\square P S G \square P R V G S G A S Q T T Q A S K T S P T T V S V V L K P R D H$ PK P T T T S F Di F L K P R N E NPNAQLVVTLSLKPT
KRET $\square$ A $\quad \square$ RNPPSYFNFKS $\square P N E N E \square I E F K 乌 L I K Q N N L$
SRTVTVERAATVPELWRVRAPSHPEKLLELTFAVRQQNV PSSI RRMLQQATYVGPL TKPVALAMLAQPQNE LTGFDTLGAASSKTPVTVNLVFNVRDQ VLPSGLPRPLAGYMDFGAAPEEDRFRALMGFPTRDV
VP L A G K L P P
T P V S G P

 A A QVVKLSIALQPESR




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D NRPTVANVALK P SHE
AQK $\square$ GKNDD VTFD VLKPRNE

## UniRef90_J4W8G1

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## TGLQRFDA DPRHAT

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UniRef90-D2V5H7 UniRe990_D2V5H7
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 H Q WL T T G G L T I T G E N A H W WI D V A G S S A K V



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YYYPFKDYFTNNVTPSLPYGVGKYVLGVVGIDNLPHAYQG EDARGFFTF HVSADVSECVRWILGLDDRLITRPS QQEGGK $\square Y Y A S T$ HPELPSFIGGEIASVAGFTNAPZ
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ARYHGKK $\square$ QFSKQNPR $\square P K Q V A Q P \Pi R A V V G V T N M \square A K S \square$ YYYPFKDYFSNNVTPSLPYSVGKYVLGIVGIDS
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UniRef90-C5PF29
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NK QVAR S
A S VTPS

- ${ }^{\text {DKA P }}$

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$\square R \square R A D P G A K \square K R R Q E A A A$

F

T T K S P A Q VK H LT A K R S P T
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Y
F S Y RVMTGARSRA
$\square A A Q E T P V E P V R A P A N G S A$

UniRef90 ToN050 UniRef90-Q6L06 UniRef90-S8EK81
UniRef90-D2V295 UniRef90 G9MJLO UniRef90-S3DBI6 UniRef90_C4JL45 UniRef90- 1 1PFM0 UniRef90 A9V4Z1 UniRef90-V4LNQ8 UniRef90_E4XYK5 UniRef90 M3A6G3 UniRef90-TOQEP8 UniRef90-Q2SW22 UniRef90-F4FW87 UniRef90- G0RUJ7 UniRef90-F812T1 UniRef90-F2DF53 UniRef90 UPI0003A495C7 UniRef90 ${ }^{-}$C6B8N6 UniRef90-A5YVA1 UniRef90_M11CA5 UniRef90 F4FTP? UniRef90-UPIO00366688F UniRef90-M4BFM6 UniRef90 A0A031LVG7 UniRef90 W4KK20 UniRef90-A4YGH5 UniRef90- U5QNQ5 UniRef90 UPIO003702E34 UniRef90-FOWOQ2 UniRef90-S8DPO4 UniRef90 Q96YO UniRef90-TOLS64 UniRef90-FOWRC8 UniRef90-T1A5E8 UniRef90 C7QKFO UniRef90-D6TUF3 UniRef90-Q6L2K8 UniRef90-UPIO00455F277 UniRef90- J4KPP4 UniRef90-T1B120 UniRef90-A4YEM8 UniRef90 UPI00046237CD UniRef90-E2L4M1 UniRef90-M1VVJ5 UniRef90 A0A024GQ42 UniRef90-E9F628 UniRef90-J3Q5P6 UniRef90_T1A057 UniRef90 F4G2C2 UniRef90-D2VT43 UniRef90-Q86AG5 UniRef90-BIF82 UniRef90 C3MNE8 UniRef90-A9GV31 UniRef90-ToROA4 UniRef90-X0JPT7 UniRef90-H2C7C0 UniRet90_M2VSL5 UniRef90 C3MNA7 UniRef90-Q6AG52 UniRef90-C2CXW1 UniRef90- UPIO004411CD5 UniRef90-DOMYK8 UniRef90_DOLUE6 UniRef90 A0A022MGG5 UniRef90-G4YGA5 UniRef90-TON979 UniReigo Q5GUU7 UniRef90-H2C386 UniRef90- UPIO004624818 UniRef90 M2T2U6 UniRef90-F2L288 UniRef9- S8F165 Unerso-Q96z UniRef90-G2R6V3
UniRef90 E1QR72 UniRef90 FOY8B9 UniRef90 UPIO00375DA13 UniRef90-UP1000346794E UniRef90-W7KJL7 UniRef90-M5B6P3 UniRef90 ${ }^{-11 B J A 2}$ UniRef90-UPIo004412EC8 UniRef90-Q6AH24 UniRef90_Q1INB4 UniRef90-E9CIB3
UniRef90-A0A022LJL8

TVTVT LS FKNS
 $P L G T L K G V Q P D Q \| S D A L Q P E C R$



## 

WD N LG T A P LDESAVF $\square \mathrm{FGGL} \mathrm{L}$ QK N T
A T A WRR LE RAHEADTME LRTQL QAEA $S L A D A A E R A P Q V P A G Q Q L F D L Q Q V L L K P S N P$ ALKANSTAS FDIVMKPQDS
 $M R L P G H T L S R A P E$ GHWETR LIDGPETVVVVAFVLMKPR PEETRQWV STKRAAVDA DEEIMKAYVALK ENA VP LP DH PGLTHNGLMVNAVEPASTTPVDVMFSMDDA

VFK S R HE
LP S N T L L T LTT F F IPP PK NL L

 A VKHSWSTDP A GWEYHGTYP P H R A F P P


QK $\square$ G P
 VK $\square$ G S L P Q N M E I T I G F L I P P K N F

P QWNK LARARPFEK $\square Y F K L I L P D A D P$
$P G \square R P V A P V P P D L A M N V L V G L A G S D P$
MAGSAPAPAQ
A QS VTVQVWLTP DL $H \square P P D A L N S P T \square G P L P P D T K L H V I I T Y K A A N Q$
 $\square K$ D S LH G VP Q G WVQQAPAP QD QLI QVK A L A QP S V


Q WNK DS QARPFERVVLS LADAPGVV HEHVP QLP Q GWARMDA LDD P D QP FR L S I AL R QP E L H S APATFRKLR QAPD D H S IT L L Q i G L R N T R E
 R F Q G ELLPS G S E V V C

D R H A V H D
 VP L R GA K R L A L TMGA M D L V F A V K H R D P
 R A H GP WAP S R D P V PAD WQESDSPDPDQQI EFS I GLQPEDS

PQSND I S S LP T N T N SRTPGTGSVPVWTATTTSSPAPDADTTLAVVL LS Q NTTTS FDI ILLKPK A H VS Q Q S L L N S I S P N QLVTVS IVEKP QNL $R Y$ VR Q S R VD PE QVVP LVIGLHPD D F $P S S Q S R P V E L V L^{T} V R R R$ RYVRQSRADPELVVPLVI GLQPE DF
 LS QAMPLFSPHSDYDSVLPHNQLVSVTIVERPNNL
 $V L F R G T V R R A P H G L S K R D R L H Q D T P L L V K D A L Q K N S N$ $V$ P Q NA P A H L I V WL WL N N N P A A P E TMPSLGMCLIM Q S V L
 DWVRSSRAAADATLSLVFALVVGDA A A GLTALLASAGPPAERGGRLALSGP

L N K D A Y V T V T V V E Q P K N L
LG GSAPA WPSPAVRLGDAPADATIA FTVLLDP

$R \square D L A D L N R A P R S E E Q V I G R T A P D T Q L S V T \| V L R R A T D$ $R P Q L A E C S T D N G L A$ H MTFAL R L Q N K $P \square A D S V P A W T A H A E R G D P V T A D E \quad L S D T V E L \left\lvert\, \frac{V}{D}\right.$

UniRef90 TON050 UniRef90-Q6L067 UniRef90-Q8EKK81 UniRef90_-G9MJLO UniRef90-S3DBI6 UniRef90-C4JL45 UniRef90 ${ }^{-}$N1PFM0 UniRef90-A9V4Z1
UniRef90_V4LNQ8 UniRef90 E4XYK5 UniRef90-M3A6G3 UniRef90-TOQEP8 UniRef90-O2SW22 UniRef90-F4FW87 UniRef90-GORUJ
UniRef90- F812T1 UniRef90-F2DF53 UniRef90-UPI0003A495C7 UniRef90_C6B8N6 UniRef90-A5YVA1 UniRef90-M11CA5 UniRef90-F4FTP2 UniRef90-UPIO00366688F UniRef90_M4BFM6 UniRef90 ${ }^{-A 0 A 031 L V G 7}$ UniRef90-W4KK20 UniRef90-A4YGH5 UniRef90-U5QNQ5 UniRef90-UPIO003702E34 UniRef90-FOWOQ2 UniRef90-S8DP04 UniRef90-Q96Y03 UniRef90-TOLS64 UniRef90-FOWRC8 UniRef90-T1A5E8 UniRef90-D6TUF3 UniRef90-Q6L2K8 UniRef90_UPI000455F277 UniRef90_J4KPP4 UniRef90-T1B120 UniRef90-A4YEM8 UniRef90 UPI00046237CD UniRef90-E2L4M1 UniRef90-M1VVJ5 UniRef90_A0A024GQ42 UniRef90_E9F628 UniRef90-J3Q5P6
UniRefo - T1A057 UniRef90-F4G2C2 UniRef90 D2VT43
UniRef90-Q86AG5
UniRef90-B1F8Z5 UniRet90-A8E088 UniRef90-C3MNE8
UniRef90 A9GV31 UniRef90-TOROA4 UniRef90-X0JPT7 UniRef90-H2C7C0 UniRef90-M2VSL5
UniRef90 C3MNA UniRef90-Q6AG52 UniRef90-C2CXW1 UniRef90-F4FYM8 UniRef90-UPIO004411CD5 UniRef90-DOMYK8 UniRef90_DOLUE6 UniRef90_AOAO22MGG5 UniRef90-G4YGA5
UniRef90
TON979 UniRef90-O5GUUT UniRef90-H2C386 UniRef90-G2LSH2 UniRef90-UPIOOO4624818 UniRet90-M2T2U6 UniRef90-F2L288 UniRef 90 -S8F175 UniRet90_Q96ZZ9 UniRef90-G2R6V3
UniRef90-E1QR72 UniRef90-E1QR72
UniRef90 FOY8B9 UniRef90-UPI000375DA13 UniRef90-UP1000346794E UniRef90_W7KJL7 UniRef90-M5B6P3 UniRef90-T1BJA2 UniRef90-UPIO004412EC8 UniRef90-Q6AH24 UniRef90_Q1INB4 UniRef90_E9CIB3 UniRef90_A0A022LJL8

SRLEGYLDTSNPSSSLYHHYUITRSQFTQNFSVPEKLYNMA AHLSSYUNEISPSSPFYRNYMNVDEEGSEFGLSSQSTYNMD AHLTPHYDVSTPSSVNYGSHMSKEAVEAFVAPKPGSV ELLEQTRYLSDPSSRRYGQY GREEAKALLRPRQDSTDAV VDLEKALAESQTPWA HLHQKVMELSTPGHASYGQHLKREALDTLMKPNVTVTESI HNLEALAAVSTPGSPRYGQYLDVESWNTSFGPSNDSASHLL EWLEALMRVSDPKSPFYGQHHTLESLATRVHGVPESVEYV NILERFWQVSDPDSPQYGKYLKNSQITKLTGRDKHFVSLF DGLHLLLLI ADPDSPNHGMFLQPASCRQALVSSEETSNEV DLAA ALAA SDVTSATYGRYLS NDDTAARPSDAAAAAM VPSDSTAAAAAARKARF TAYYQALDVNDPTKADFKNYLSTSD四RQQFGQPDAVINGW ELLEQALHHSDPSSPRYGRYLGREEAKALLRPRREATAAV QDLDAY AGLESTEASSDPARPRYGRHLEWELLNALVAPSEDDVAGV
 PDLRKELE NMLYYTAEEVAN HQDSPLTPQQIIKEFSQPNKVTSLE LDPAELVTGTAT DALEREFYVVSDPTPQYGQYLVQEQADVLSRPVDGALDAVV
D


 S K
 HQTK P I
DRLEELIDS $\square$ SNRSSTYGHYKTQNESRKEFF
SGLAARVAAATPGSTLYHDYLTPADVAAQFGASTGTAAAA A GATAFADAVSPGGAGYRHYLSPNAYTARFGPSAARIKAV DELKKLKALKNKADS GVDLKQ QKLESIAAVSTPGNPMYHKFLSYND DEKE HELEKHI
ALLQQTVQESDPTHPRYGQYПSREAA DDLQPDPGVD VV IGGQYASDVQTVGSPFFRQYLTPGQQGSVVGVPTRTYDQV ALLQL $\square \mathrm{Y}$ VQE

ESAAAALHDTSDRSGRFAQHWTPREVHRLDASEARQVDDVV RLEEMIDSISNHSTSYGHYKTQNESLI HFAPATESLDVI
 SELTRLLALSDDPSPEFQHYLTASQFDEAFAPSSGTYAAA
 EWLQRIFENVNNPHRDYEKYLTMKQQVSDUTVSSPQQTNLV
 $D$ E RVKK R R T L VEA $\square$ A A K P L A R HE V V E L H GAND QVFT TV HALDAFANVT TPSHPRFMRYLSRAAVDALTQPEAAALPAL

 NELYLVAQEVAN HQDKPLSNTQLISMFSNNQEKVNEM
S P LK TASEEVNTPGSANFKQFDTPGTWAKTYGQSTADINRW E QLQMLVQE HKVLSREQVQSLF DP K S DIDRL D GL R A L L A V S T P G S A R Y GR HLTTKDELA
NGMERFYR V S DPA HTTYGQQYLT QEQTD H L S R PA H GA L G A V A D 1 Y G LLRVS DPGSSDYGKYVSRSTLKQMAAPSHTARQRC
 NVLERFYSVVSDPTYTS YGQY L A P E Q A DK L S K P A H G A L N A V
 A GLD A F LA EVDPLSP QHHKWLSAAEFQRRFGPALA QL A QV
 A L A E S L N DV S T P S SAS Y GKRLSK EVVEQLANSSSYS GGSV SWAE L WLLNEVSPQFQNFGRYWAAKQVDEAFMPPQHAVDSA

 DVGHQRLMDIQ
$N$ GLLY LLLDQMNDS SPYFHRF $\square$ T P QEFASWYSPPSSVVSYV A LEA EV AA V S DPASKRYGRHRSVAE LDAYRAAHPEAASRII $L A H L L S A S V D L G P S A A S H L T A A L T R A T R P$
E L L Q M Y VE N H T V
$\square N L T Q V E R L F \square P N D E M Q R V$
S S L N L L A E VS P GSPMYRHYLSHAQFESEFEPATTVFNAI
A A MRAADLAA L


UniRef90 ToN050 UniRef90-Q6L067 UniRef90-S8EK81 UniRef90_G9MJL0 UniRef90_S3DBI6 UniRef90-C4JL45 UniRef90-N1PFMo UniRef90-V4LNQ8 UniRef90_E4XYK5 UniRef90-M3A6G3 UniRef90-TOQEP8
UniRef90 Q2SW22 UniRef90-F4FW87 UniRef90-GORUJ7 UniRef90-F812T1 UniRef90-F2DF53 UniRef90_UPI0003A495C7 UniRef90_C6B8N6 UniRef90-A5YVA1 UniRef90-M1ICA5 UniRef90-F4FTP2 UniRef90-UPIO00366688F UniRef90_M4BFM6 UniRef90_A0A031LVG7 UniRef90-W4KK20 UniRef90-A4YGH5 UniRef90-U5QNQ5 UniRef90_UPIO003702E34 UniRef90-FOWOQ2 UniRef90-S8DP04 UniRef90_Q96Y03 UniRef90-TOLS64 UniRef90-FOWRC8 UniRef90-T1A5E8
UniRef90_C7QKF0 UniRef90-D6TUF3 UniRef90_Q6L2K8 UniRef90_UPI000455F277 UniRef90-J4KPP4 UniRef90-T1BI20
UniRef90-A4YFM8 UniRef90-A4YEM8
UniRef90 UPIO0046237CD UniRef90-E2L4M1 UniRef90-M1VVJ5 UniRef90-A0A024GQ42 UniRef90_E9F628 UniRef90-J3Q5P66 UniRef90-F4G2C2 UniRef90-D2VT43 UniRef90-Q86AG5 UniRef90_B1F8Z5 UniRef90-A8E088 UniRef90-C3MNE8
UniRef90 A9GV31 UniRef90-TOROA4 UniRef90-X0JPT7 UniRef90-H2C7C0 UniRef90-C3MNA7 UniRef90-Q6AG52 UniRef90-C2CXW1 UniRef90-F4FYM8 UniRef90-UPIO004411CD5 UniRef90_DOMYK8 UniRef90_D0LUE6 UniRef90 A0AO22MGG5 UniRef90-G4YGA5
UniRef90-TON979 UniRef90-Q5GUU7 UniRef90-H2C386 UniRef90-G2LSH2 UniRef90_UPI0004624818 UniRef90_M2T2U6 UniRef90-F2L288
UniRef90 S8F165 UniRef90_Q96ZZ9 UniRef90_G2R6V3 UniRef90-E1QR72 UniRef90-FOY8B9 UniRef90_UPI000375DA13 UniRef90-UPIO00346794E UniRef90-W7KJL7 UniRef90-M5B6P3 UniRef90-T1BJA2 UniRef90-UPIO004412EC8 UniRef90-Q6AH24 UniRef90_Q1INB4 UniRef90_E9CIB3
UniRef90_A0A022LJL8

 MEYDKSPEAK IVVQVAHENFVTVDMPLKS DDRYFKTKMTP KGWLSQAG】PAIDIQSDGQFI NVQVMAEQARALLGTG
VSWLARNGAPGAVQD GAWVKLNATVETLDRII FDADMAY

 LAARLSGQNFLETDVNTN IDDI TCEFSIVRNAMRLFNVKFHV
 VSYLRQNGFTHIEAAPNRFSIRAQGTIANVSKAFRVGVKT VALFKKNHLT THVYQDGLVLNVQGKTKDVNRLFKTNLSD REWLVQKGFRDTAESE GLI WTEVTLSSQLAQALDLEFRF TQWL ERAGVEHWEVMASRSWVRDAASAEALEALVKCRVRA RAALQAAHMRVVQQ GATLHVSADANSVERLFAAPLVA
 NRYFSQYHLK SAAYPGNFVMKVQGSQKNLVKAFKAT $V$ V S LENAGARVHEQHAGSRRVSASAPVAVAQRLFGVELSA RDWVASHDENGGTFLDPTSNLYKVPMKVKHIGRLLNTEKYH MSYLEAHGFQVVYSSPFS

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



 VRYFNGFGLTATPLGAGGTLIEVRGGSGAIARAFGTSFDLD TDWLTQQGLKQVRLSSGHDYLSATGAV

 VNYLHGYGU ATSVSLNVITATGTVSQFEKALGGSFYV



EGWLKGHGFANHQMTAHKDWISLE
LA YFEALGARGMQTFTDRVT SFEASPSSADRMFHTTVQE
 I EYLNS PDCSILNDSKHGNLI TVKKISLQSVNLHLNAKMKP
 TAFLRSRGLKQUDMTVNGEFVVASVPVPLAHSILKLT
 TA WLGGQLN TVTYSAASNLLVVESS

 $\square E Y L E S K G F T V V Y R S P F E$ V $V$ MAEAPVSLVSSVFGTDFVV AEWLDSHGLDASGWDHRTGTLRVNGTRSHVAEAFDTAFAV
 VSFA T RGLNATAASSSGNWLRVRAS
RHWVREFAHENNA RSVLERAGLWVTESDAASRRVVVRGEPALVDEVFGT
RNWVGDYAHDNS T $\square$ LK SKGFHVDSSSSDP $\quad$ IVAS QSAGY $R A A L Q A A H M R V V Q Q G P N$ LVVSANADGVERLFAAPL
TSYLSKFGTYTTSY LNVIEATGTVGQFERALGGEFVV KAYLSRYGUTDVRPA DDGRLLQVRATAAALQAALGTPLRA LVSVD DA N ASDPS LYADAGWVA ASVSFSDANELLRANFSV $\square D W L Q S S G D H R D N V S D D K Q W L V F P Y S T Q Q A E$
KDVASSSGLT ILGVYP MAVVASGTASAVDNADAA
NKWLANHN
$\square$ WI QFDAPVVEVEEELLDTRYQN
VNLAESYGDTVNYTFP MLI EATGTASEVDNFLTA
LSYLDDVGGKSADEAARRGFLRAEVSVASAEELLGGEYYE LQWASAAGLSV QWRPGDDWATVEGDARAMARALRVDVRD
 SQYYTGYGLQA
DTWLSKHGLTATKASAAPDT TGHDSDLDSV DVEPVR YLKASGLTHTGVPASREYVVFRGAPSQFNSTFKTS LHA RDFSIRHKLDLEDSGDPDDFVTLCGRAADFEYAFHFELLD A S QLAAFGAKTFALSQTRTFAYACGPGSAAQVLL
 UniRef90-A5YVA1 UniRef90 F4FTP2 UniRef90-UPIO00366688F UniRef90_M4BFM6 UniRef90_A0A031LVG7 UniRef90 W4KK20 UniRef90-A4YGH5 UniRef90_U5QNQ5 UniRef90 UPI0003702E34 UniRef90-FOW0Q2 UniRef90-S8DP04 UniRet90_Q96Y03 UniRef90-TOLS64
UniRef90-FOWRC8 UniRef90-T1A5E8 UniRef90-C7QKF0 UniRef90-D6TUF3 UniRef90_Q6L2K8 UniRef90-UPI000455F277 UniRef90-J4KPP4 UniRef90-T1BI20 UniRef90-A4YEM8 UniRef90 UPI00046237CD UniRef90-E2L4M1 UniRef90-M1VVJ5 UniRef90 A0A024GQ42 UniRef90 E9F628 UniRef90_J3Q5P6 UniRef90-T1A057 UniRef90 F4G2C2 UniRef90-D2VT43 UniRef90_Q86AG5 UniRef90_B1F8Z5 UniRef90 A8E088 UniRef90_C3MNE8 UniRef90-A9GV31 UniRef90-T0ROA4 UniRef90-X0JPT7 UniRef90-H2C7C0 UniRef90-C3MNA7 UniRef90_Q6AG52 UniRef90-C2CXW1 UniRef90 F4FYM8 UniRef90-UPI0004411CD5 UniRef90-DOMYK8 UniRef90_D0LUE6 UniRef90_A0A022MGG5 UniRef90-G4YGA5 UniRef90-T0N979 UniRef90_Q5GUU7 UniRef90_H2C386
UniRef90-G2LSH2 UniRef90-UPI0004624818 UniRef90 M2T2U6 UniRef90-F2L288 UniRef90-S8F165 UniRef90-G2R6V3 UniRef90-E1QR72 UniRef90_F0Y8B9 UniRef90 UPI000375DA13 UniRef90-UPI000346794E UniRef90-W7KJL7 UniRef90- M5B6P3 UniRef90 T1BJA2 UniRef90_UPI0004412EC8 UniRef90-Q6AH24 UniRef90_Q1INB4 UniRef90-E9CIB3 UniRef90_A0A022LJL8

160 FEYKSKGMYVNTGDLSLPEYI SQYI GGIISGLDGAMAAPAL Y THETKGQVVRTGSYLLPA DLVGHLGDVVGPVTAPGP F $\square H E S G K D I Y R S E Q F A L P Q P L S Y A V K T L D G V H N F P V F Q H K$

YTYNSNNTVLRTRSYSSIPASLSSCVDFIFPLSHFMPPTS $\square$ FTDRTKVKKI RTTEYWVP
YT NGKSTKLRTTTYLVPEELVEYDG\|V
YRHATQDTVARCLQAPVPDHLSPHVDFVLG
FSNGSDSYYAVT SYSGNAGLAPYI SNVT
FRKPGQRKYIRTTSYKIPQSAANMI DYIGG
FQHENGGYRVACDSYHLPKELQSHLD GLQPDAQKSPA Y S LETRR LRASNGVVMPKSIAAHVVLIDGLDRLPRTKAR FMYEGRPVFANDDTVQVPANLGADVGNVDGLQN
ATYHSDPLQFGKSKPNIPANLQDSVLAVMGMAD
TLGSQTIADST LPGKIRKHVMTV
K L E DGHRLYHSLVDPELPDWMAPHILAVMGLQNVTRMTPK


## D LKAGKTPR

VTRDG $\square$ TYMSAQNPPSLPAEDGEPVHA LLGLQPFRRAQKH KDGQFM P L REPLVPEWLAPHIVGFVGLENVSKAYPR FSYNGHVYYKPLTSPSF

PAKTNKDWDVTGTKLPGKLSSQVASVLGL
$V R D \square D A A Y R M R S G L L Y V P A A W A G V V T A V L G L D D R P Q V R P N$ YEAKQRRLMRATSALSVPEHLEDVVSF
YFSNNETFYKP IVDPS IVS SMLRNV LITYGLTNFTKVDP


 YQNPSRSL
$\square T H$ GT TAH
YKYGN\|VYYKPSTNP\|LPSFFAGV TDNGLTNYT FNGNHNSFlTNKADPWI PRNFSE I YHIIYGLS YQHKQHDLI RPEAQF I PS LLLDHVVYFDGL EGFPQRRYQ YRAPDGSFVGHPTPAVLPAG1 PWTAAVGLGNASLPVP TKLTVPSSLAADVLGVTGL
HKKNGRVFYAPETAPKIPDFMKDRIVGINGLDNYSQAPTG YSNKTESFYYGFGTPKI
YTHSTSGDNLRAADDDVPQAHAKH
KRDGDGAESGLSGAFAVADEAAKHワR\VH LDNLNRGVLQ $P G G N A T T V F V N T A P L L L P N Y \square S Q L V S G I T G L D G A L V P$ EKFHNLTFY
YVHATNTTMWRTLSYSVPAHTDEHLSF\|Y PTTQ FVHESGEQMI RTLEYSIPVDLQGHI DLVHPTTTFVK
CSRGTRT DI CSETYHVPETI SHHI DHIT
FEHKQHDLIRPEAQFSIPTPLKDHVVYFDGLEDFPTELQA
ws
YKTNDMVYYRPSSAP I IPQQLQN TMDMGLTNYTLIRPD FVHETKEI IFRSLNFSLPGEISK VKTVFGIHHFPH Y Q S N SLDQR LRVESASIIPKYLKNKI DFILGGLSDF
 YEFNGKRFYEFAGSPVISNAI
VDGEGRRVVVPVANARMPEALANYVTAVM
FAASDHRVIVKATTP $\square$ HVPDVVAAYVEFVS
FNDQGE $\quad$ YYYRP LTPPVVP $\square Q Q E G V \quad L I A G \square T N F T Q \square M P$
EHVGTEKVR
AKSASGQYYKPGGNVK $\quad$ S SVLDNV LIGGLTNFT
Y S L S S G S TVAPTTALSVPASL PQIVGVSG
AKYHHDPLQFGKRRPRFNKTLQNSVWFLSGLTD HNPN ERFHNDTFYQYVG

GKELVRTLQYS LPDELKGHVRMVHPRASLPDKTSS RRLMRAATDVSVPEHLQDFVSF
WLKGASSGGAPRGLWGLPTEIAGVIKADH
GTGRHDDGRTHPRPPAELGEVVRAVVGPGTRPDATPL YKVPMKRRRRAADAVSVPEHLQDFVSF
YSNGDSSYYYGYGTPSLNNVNVLVTNDTGL
TK F H DKTFY
$V$ VADGRGVSAA QGTVAVPAGLQAVVQGVVGDDGTAGAKVT FEDESGLHA $\square R A R S Y S I P A E L G D H L D L V H P T D S F T T P S P H$

F
Y T Y Y S G T G Y L N
FEHETG\|KN $\downarrow$ A CS QYHVPHDVSHH $\square$ DY $\square$ T P
FARTDGQTATRCVGCSLPENLRSAAAFVEPTSRFPNLR YRGRGQTFYAATSQPELPPSLVPELSGFLGFTPFRESRPL TRVSGREADAPMRDLSVPRALTA IETVAGLVD

RHGRRAAKVRAGTASVP
FK KKGMQVVAPASAPSLPSR GAFVAGVSDDSRPHAAP
VER
VE QD GDRYRRYTETPSLRPG』REVVVG\|FGL

UniRef90 TON050
UniRef90- Q6L067
UniRef90-S8EK81
UniRef90-D2V295 UniRef90 G9MJLO UniRef90-S3DBI6 UniRef90_C4JL45 UniRef90 N1PFM0 UniRef90-A9V4Z1 UniRef90-V4LNQ8 UniRef90 E4XYK5 UniRef90 M3A6G3 UniRef90_T0QEP8 UniRef90-Q2SW22 UniRef90- F4FW87 UniRef90-G0RUJ7
UniRef90-F812T1
UniRef90_F2DF53
UniRef90 UPI0003A495C7
UniRef90-C6B8N6
UniRef90-A5YVA1
UniRef90 M1ICA5
UniRef90 F4FTP2
UniRef90-UPI000366688F
UniRef90-M4BFM6
UniRef90 A0A031LVG7
UniRef90-W4KK20
UniRef90-A4YGH5
UniRef90 U5QNQ5
UniRef90 UPI0003702E34
UniRef90-F0W0Q2
UniRef90-S8DP04
UniRef90 Q96Y03
UniRef90 ${ }^{-T 0 L S 64}$
UniRef90-F0WRC8
UniRef90 T1A5E8
UniRef90 C7QKF0
UniRef90-D6TUF3
UniRef90-Q6L2K8
UniRef90 UPI000455F277
UniRef90- J4KPP4
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jhmm
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ssm
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AYLLASSTDLGPS

HRTD T QLLTAALRNS SRPDALL L L



Y RAPSGEFYASAYQPGVPPALRAEVTGDGR $\square$ NS YRTAQPA FQHRTGR $\square F \square R T S Q Y S \square P S$

VS T DGRVGVAAAQGAVAVPALQTVVQGVIGDDGTAGAKVT FEDENFSYVSKTGDV
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P $\square P \square D V P D G G \square S P S A L L A A$

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j̣hmm
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