WSFTCGEEDDGK $\square$ WFP
EATDNPVIEQ

TKHTEQMEAGVQEQMHTLRNGTFQFSDSVSSKHRDLDY RITNQRENKTLN DMVRWQKQKLQQQDASVETY


WQYMTGKSFMDPEYFS
KHMKAADPQ $\square E E E H \quad \square Q G W R H E R \square$
KHVQQLDERTNEQRKQLGHNAKTPADEVVLRSRTAVD
RE 1 R $\square H V A G K \square H K V K Q A E D G F E H R S E L L H L$ E पQKEQWQDEE पKGLRTPEVRQ


WQFCTREQ $\square$ GGD
 RSRRTVADTHFRपRGPVWSFTCGEELDGP PLEYFP EAF पK पERE पSSRKE EEKK पLDGHQRNप

KVKARAAETRRGLHNYAAERSTGNLELSGCEDL EQTFLKFQGQREWADEQMP DGEH QRPLLQL DSRRMRKRDT GQLEEAEHAGGEDPKAYRPL A D DWSF CTGEVLDEGDLWWFP
ANQKLQFDEHELLPANQVTNSAREL
G पEEVLEKQKELLRTQKF DFNNRVTQDNQDLIY
D WNLSAPKRMHESGAYF DPMPVLEGSPGDSLEVQLV

KRLETLKDETEEYM RQDME $\square$ IDAANKNL

WHRVTGE\|IT DP $\square Y Y$ P
HWRDTHFRLEGDDWYFATHEAVKGGAYTP
RRTRKR $\square T M Q \square E E A \square D D R P D \square D E H \square P G A L$ QVQKES $\square$ PFMESKNET $\square R H \square E A D S P S A A V Q$ WNFCSKEK $\square$ N ETRRGDHRHAEDRSQADTSAEDTGNPETG ERQLTRQYDTHDPQF

ATAMQEKFDS $\square$ LHESWPYपREDPMAMKGपWEKDPEVA $\square Q$ VRQLAAAFAWD WTFTEGEDLAGPTYFP AKKMTEESDAVVQEUENYFRENDKVREKDEALDEG GSNQ EWDARELTNDTDTTASGRGL

## QUERY

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UniRef90-T1D7S1
UniRef90-X4ZEQ0
UniRef90 E6TK64

SDWLLQTPGCWGDDKCADRV00 ${ }^{60}$ TKRLLAKMTENTGNATRTV ${ }^{70}$ AGWLLQTPGCWGDAGCKDRAGTRRLLDKMTRNIADARHTV MNLVSSDSGYTQDNEVVEVFTDGREKFDALIEDGKQAEDH| (IKMIYSAEKSV F पNSGLAP LT पHNRAEIL NGREKFKALFNALEEATHH1 NNKVDI FNDGQEKFQAMAASIQRAEKY
 FITEESIVSMNTDVQLFTDGREKFDALIADIEKAQHHV NNALLTQDNQVDIFDDGKDKFEALFADIKQAKDHI E पDRAGDपPMR FKRLAHSVSTEDNNDVMLLKNGEGKFPE
MQLANDGSVLTKENDVRVYTDGHEKFDNLI SKYIADWGPVYRNTATKYYESGEAMFPDMLA RDFVTNKTLLTQDNEVETYTSGKEKFEALFAS LIYLLHDALYSDNNEVEVFTDGQKKFHALTQDI QATDHI VSLLLN

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PAEVESTPGAVQ
1 IPSGPDSE
FALLNNDPGAMITNEVLVLANADEAYPEMDEA MFMTTDAAFLSRQNKVHIYTNGNDKFHRVIVDIVGAKKS FSELLADSP VTSHNRCEVLSSAQAAYKSMLEVMEGAQEHI KGNA ПDIFHDGQDKFDQLI DDIRAANHHI TVRLLDQA ILTKNNKVDIYDDGHDKFAKLLADIDAANHHV EPY乌PEPGPVGDIPMRIVTSGPDADLEKMLQAITLAKKHV A LMVLTTRPVVGNNS TCLHDGDGAYPHMLNAIENATKSI


 A PDSAGEVPARVVASGPDNDKDEFTMLQAVAGARRR1 FHLLGNSP $\square S F G$ TSTQVLTDGDETFSTTLKELRKAKHHI TETKVLTDGKETFTHILQAAL DRLLLSESPVTGRNASRILLNADEAYESMLEAM AHRIGKSP VSLATETRVLTNGEETFSTHEE ARLLRTTSHAVYGSRTRYTDGSSKMEALDGELKATHHI VQIVSGGPDTYWNP RITESYTDGSSKMEALLGEEM ELAPAGQVVSRGDPDGPD EDFESFLHTLLGAL VRLFLETDNAVKRNAVRDYTDGNKLFDSGEEDV


YEGNDTKLLNSGEEAFGATFKA NNRVNVYVNGEDKFKQLDEDI
Ta ${ }^{T}$ CRGKELVQVVKSGPDILELIFSLI ATPGGVLAQVVASGPDNDAI RDTYVAAVVAKKRI
■AATDHSVP पYG SRIVTPYTDGKSKMEALLEDE $V G N V A Q V V S$
SNYTHRYSPVHENTTA
ADYFPQNP
FKNVEVEA GNSVDYFTSGEAMFAAMEE RSELLRDSPVTGRNMTRTLVNADETYDSMLEAME
RRSLLLGPP L GNKIVEALVNGDQIF

SQY $\square$ QRFSP $\square H K N T S V E Y F Q V G D D \square F P \square L I K E$
D DDASGADLMR\|VTAGPDTDLEKDEFVMLQA


FDGNRVETYTHGLSMFQALLREL

FKNNETNVYVSGYEFFPALGAEI


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UniRef90－UPI0003763AEF UniRef90－D1XXL9 UniRet90－T1D7S1
UniRef90－X4ZEQ0
UniRef90 EGTX64

DTSTLAPFPNGAFQDATVAGLKESAAKGNKLKVRTLVGAA DISSLAPFPNGGFEDAVVDGLKAVVAAGHSPRVRILVGAA HFQYYLY RSDTLGEEVREALTEAARRG VKVRVLLDAW

YI QTPYFVPD ESLMHALRDAALSGDD HLSYY FKDDEDGEDVDKDLSRVAEG HLEYYl Z Z NDATGRSLRDULSRKAAEG W！QTPYFIPD ESVQEALSTAALSGVDVRI


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| $V$ | $E$ | $V$ | $K$ | $L$ | $L$ | $Y$ | $D$ | $D$ | $M$ |

V


| $V$ | $R$ | $M$ | $L$ | $S$ | $K$ | $P$ | $D$ | $H$ |
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| $V$ | $R$ | $L$ | $F$ | $A$ | $K$ | $P$ | $D$ | $K$ |
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| $A L R G$ | V |
| $A R H G$ | V |
| $A A E G$ | V |
| VK E G | V |
| Q K R G | V |
| $A M S G V D$ | V |
| $V A R G$ | V |


| $V$ | $D$ | $V$ | $L$ | $P$ | $K$ | $E$ | $N$ | $N$ |  |
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 GSRGLRKKGLHPFRNKGGHAEAFFPSKLDPLINGRMNN
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 G G CRNEVPRRLRYRRFAKAGGHVVSSFYR


 GCLTTLPHKYYEFLRSKGIMCEV FNPFRPLLVVIMNN SVFVVH TASS F FE ELLKA GVEVYRYEK GFV

 G GR F MPKKLWEKMEKAGIKVGVFFPPFLGGWLNLRVNY GSHGTNYKTEKEFEKVGGQAQAFVSTPKSRRWTSVPRLNY GS WK T PNRF FEQMRE EG GEVVHPFMPVRFPAFTGK VVY PSMP D H A F V Y R A T Q Y Y A R A L A N E G V T I Y S Y Q L G F


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RNHRKILVVDGSTGFMGGLNI ADDNLVKPRNPVSDTHFQ円 DHSKTIVVDGKI ASVGTANI DVRSF RLNFEVNAFLY RNHRKLAII DGKI GYUGGFNI GDEYYNKKFGYWRDTHLKI RNHRKIVVIDGTVAFTGG $\mathrm{D}^{2} \mathrm{NVGDEYMGKDKMFWRDTHLLV}$ RNHRKIIVIDGKI GYVGGMNI GDEYMNRSKRYWRDTHLRI DHSKLMVVDGILSLIGSANW
HSKLIIVDGKIASVGTANMDVRSF K LNFEVNAFT RNHRKILIVDGKIGFLGGMNTGDEYLGGNPKFWRDTHLKL RTHKKLLVIDGRTGFVGGVNI GDENLVSPPEPVRDTHFLL RNHSKLLVVDGVWSFIGSANI

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GIMN
RNHRKI AV DDGALGFI GGFNLGEDYY KGKQAWRDTQVRI RNHRKI LIVDGLVGFTGGTNI GDEYLGKDPKMWRDTHLEI RNHRKI IVVDTTYAFDGGLNI GDEYLGKNRYHWRDTHLFV RTHRKLLVIDGKTGFTGGVGI ADQWRAQDKDHWRDSHYRV RYHRKIVVVDGSI GF $\square G G L N I G D E Y L S R D S K F W R D T H L K L ~$ RNHRKIVVVDGEUGFTGGLNVGDEYLGRSKPVWRDSHLKK RDHRKICVIDGHTGFTGGINL HAKTFVIDGEVASVGTANLDARSF
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E GPVVH QLA QVA A WDWYFT T GEQLNR DLFLQEHAGNGAS NRQLATQLLHAFNKDVEYSTQ
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$G \nabla Q \| A S S G P D E E W E$ AVQ\|VASGPDSEEP

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AL QVVT S GP T S
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MMQ $\square$ VAS GPDSDWES

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GIQUVSSGPDSS
NMQIVSSGPDSD
$A V Q I V A \operatorname{SPDDA}$
A 1 QMVS S GPD S
GL QVI S S GPD S
LI QLVTS GP
$\square A R \square V T A G P D T D$
G DQ $\$ VS S GPDSEWE
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GlQQVVSSGPDS

A VQVIP S GPDGEWDS PARVVTSGPDAD

GVQLIA G GPDNEW
GVQMI AS GPDTRWE
GVQMI SSGPD


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G I QVVTS GPD
GI Q|l $V$ TS GPD T D
GIQQVSSGPD
LARGV $A D G P D$
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SI QIVSGGPDTPW
AVQUI GSSPGAA
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YVQPYCDTP
$\mathrm{F} V \mathrm{VP}$ Y G D S P
SMQ I I TSGPDTNEP


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E Q WRDTHFR $\square E G D N W \square K T T G R V L N G P T Y F P$
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$$
\text { K K } \square \text { QEAFANQEEA } \square \mathrm{RPF} \square \mathrm{YPNKMDLDAKGQ}
$$

EALALRPSANDSLEKEAPPQ MRRVLMRFRPK LSS WLSRPLGGNPTHLDADE $R Y \square G K R \square G R \square K L D T W E \square I D D L R L S K P A A N L$ DMEQTPDLTGLKGNQKRF WATQQLPPLDSPPATH RARRRKQRE $\square$ NELI LSSTKGMDLVSSDHPW

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 GS S $\quad$ G S N ATKKRMTAA G $\quad$ I E Y E AF M P NEMT T L L S Y D Y $\quad$ DE R L H K V G I KA Q

in

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 $N N L M L V D R A M T A$ QF D QI LIKNYC R I WR S T G S

 K L A L Y A Q R H H Y S K L L K A G V K Live H S S S L L V V L L L L V M N H
G

G
 G
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GSH A LPS SYS QVLRD GGVQQHAFATR R GWFNRF QVNF

 GS L T M L P F R Y Y Q K L E S Y Gl IK C I A F NHFDP F In A R D A



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AAT


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RSHRKI CVIDGLI GFTGGFNI HRDYWSPNPEQFQDTHFRV RQHRKIVVI DNQIGYTGSMNLADSRMFKQDAQWVDVLVRF
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RDHRKIACIDGDTAYTGGANI ADEYANDTERWKDDGTRL RNHQKLIVLDGKDAYTGGLNVGDEY LGKEEKFWRDTHLRV RDHRKITVIDGNVGFNGGINLADEYYAKHGHYKKSAVML
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HAKIMMVDHTCDIGTANVYTNHETNCLLYNQDFDQET RNHQKIMVVDGTDGYTGGCNLADEYY:KGGSEWKDSMVRL RDHRKIVVI DGVLGYTGGMNV ADYYITGKPEWRDMHCRV RSHRKMLIIDGQISYTGGDNIADEYLIDRFGHWKDTATRL RNHRKILVVDGHTAFMGSQNMIDPSYLKKGRHWIDVMVEV RNHRKITVIDGKDGYSGSRNCADPEFMPKYAPWVDIMLRI RNHRKIVVIDGHTGFLGSMNMDKREYKTKDRAWIDYMVEL RNHRKIVVVDGDRGFVGGLNVGDEYLGLKPPPWRDTHLQL
 RNHQKLIVIDGR\AYTGGLNVGDEYLGKHKKFWRDTHLRL RNHRKVVVVDGECGFVGGHNVGVEYLGEKPPPWRDTHMEL RNHRKLLVVDGQVAYTGSQNI GHRSYVRKGRQWKDLMDRG RTHRELLIVDGEIGFLGGAGVSDQWFGRKHPCWRDTMFRV RNHRKIIIIDGQIGYVGGFNVGDDYLDGKLGYWRDTHTRV RDHRKLLIVDGEVVFI GGПNLGAELSGSGGYSWRDTDVR RNHRKLVVVDGERAYVGGHNVGTEYLGEQPPPWRDTHIED RDHRKITVIDGQVAFTGGVNLGADEYUNQDKRWKDAADM/
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 RNHRK LVIDSKLGYTGSFNLADPRFFKKDSGWVDVMMRC RNHRKYLFDSKGALNSGGNLSDNYLGASKERWRDLLF LV
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EGMADWNFTVMF LDNDWNSF $\square$ PTEEDYSKFRPHVHHPQPDG EGEGAWSFTVMFLQMWNY
EGGAVHD DQTIFLRDWEKVTDEH $\square R D S R F Y Y M P Y G F E G \square R$ KGDAVWSMTVMFLSLWE VGPSVLGLQEAFWEDWHWATGEVIRL DWVPRESDQACR DEKTAGQLEAAFEKD

## V



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 GNSVVAKVEEDF
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 D GP I TAD QLVVQL F NQD

A Q Q D Q A D L D A YFPVLSEVGDK
$K \square Q \square S K D \square E S S T L L T W K D V S S L S L D K G K E W \square$

 I GPAV R DLLQWRF F LD Y R FA G DED D FVGG T KLLS YP V V G G D K KGEAVANFTLMFLQMWNFDTKEEND
$T G P S V L G L L H S F H S D W A F M E L P Q F D D G E N F S F Q S R N N G S V$

 Q GPVVTRQL EDVVF LDD DWE FVT GERRPALSAPA GPEQQ T GTA

## 

G GP IVVSSSLEMVFAMDWLMETDE EDVPSAND IALDDSSPGAN
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E G D A VLSFTVMF LSSMWEYSTGEVSNL
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| UniRef90-W0ZBT7 | D A QVVP S G P |
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| UniRef90-A4AQJ1 |  |
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| UniRef90-I3U104 | S 1 Q L V S S G P |
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| UniRef90_UPI0004761948 | $N \vee Q L I P S$ G P E |
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| UniRef90-W0FCD1 | F V LP F G D G P S P |
| UniRef90-X5DPR0 | I L Q V VP S G P |
| UniRef90_Q1Q853 | P A QVFS D G P T |
| UniRef90_C3PJI4 | $H \square Q L V P S ~ G ~ P ~$ |
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| UniRef90-A8SNL3 |  |
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$P A W L V D M N S T Y G G N S G R D L Q N G D R I F P R M L A A L R A A R R S V G U T V K M A D A V D A A T N Y V$ AKFLYESFPVYADTK LEYYSDGEYAFESTKKELLKARDYI VKGNKLQLFTSADDTLKTLDHDIRLARYNI POGRRVILINGAETFPAIEAAI


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AVSFLKNG

## QRDPMENNNL

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HFAGGHRVRLLYNGTDYFPLLLAEI

QREGTYG
RT $\triangle T A D P A M S$
and
$D G N D V A L L V N G E D Y Y E R V F T S I I ~$
NGHHVAEKYUELI KQAKHS


|  |  |
| :---: | :---: |
| UniRef90-B4ECP5 |  |
| UniRef90-14WH51 | VQFFII HDDALGRRLQQVLLERAAAG VRVCVL |
| UniRef90-Q0g2A6 | L DTYGADDRTGQKVAEALARARNRG VEVRVMLDAL |
| UniRef90-E4L419 | LEFFUTAEGLMWGEILGTLERKVKEG VEVRVLYDGM |
| UniRef90-E5BF5 |  |
| UniRet90-F5SWI |  |
| UniRef90 R9TZM8 |  |
| UniRef90_O1LE40 |  |
| UniRef90-R5W943 |  |
| UniRef90-R4XLX3 | HMETYI FDDDAQGARFAEALIAARNRGA DVALMVDA |
| UniRef90-UPIO0030BF587 | FVEFFI 1 HQGYFWGT DEELAKKASE |
| UniRet90_R6TP82 | FLEYY! |
| UniRef90 UPIO0036D8F5F | HFESYIVHEDDTGREFADALIAKAREG IVRVRLIYDWL |
|  | HLETYI FAADRTGGLIIDALGRAVARG VTCRVLIDAV |
| UniRef90-B10GR3 | VI TYPYFVPS |
| UniRef90-D2TZC3 |  |
| UniRef90-W | YHA\\|EDGTAWNE |
|  | ETY MFISDAVGELFGQALAEAAERG VHVKVLFDAV |
| UniRef90-HoPs | Q QLL Q A A R GVDVRVLPGFSDF |
| UniRef90-UPIO003696BF7 | QVTYELVMA KAKAFQG VKVHFVVDG |
| UniRef90 C2LOM6 <br> UniRef90-UPI0004770905 |  |
| UniRef90-E1VYQ4 | HIQFYIMGDDPDYVGPVLDSLEAAADRG VHVRMLF |
| UniRef90-R5V | S Y F |
| UniRef90_U1RS | FECFIVKADETGFEFRDALIDAARRG VETYAIFDTW |
| UniRef90_A1TPI0 | ERARAG VKVHVLD WV |
| UniRef90_MMT16 | AVARG V NGMYDG |
| UniRef90 J6HOH3 |  |
| UniRef90-A0/ | HMEFFID RDDDLGRRIGGMLMEAARRG VKVRVLY |
|  | ALQSY FDHDRAGLRFADALRRARERG VEIRVLIDAV |
| UniRef90-O7N467 | DMVFY:WQ TGGLVEQVTDALMAAAHRG VRCRIMVDSA |
| UniRef90 W6APC1 | WLS TYFlAPG |
| UniRef90 K6VSR0 | FLETFI WKNDAIGEKFKEALIAAADRG VEVFVIYDGF |
| UniRef90_UP100047B | DLEFYI FRDDHLGRRMMQLCQRAKEG VKIRFLRDGM |
| UniRef90_C5WG |  |
|  | YI WQSGGLV DQVAEALMAVARRG VRCRLMLDSA |
| UniRef90 UPIO004780748 UniRef90-A60879 | HVLFY WVKDDALSQEFFSLLKEKARAG VEVVRL |
| UniRef90-H8MV08 | WI SQAYFTPND ALTALLVEKARAGVDVRVLAPGDDQ |
| UniRef90 M9SZT1 | RAKAG VRVR |
| UniRef90- J4TFH5 | FMEFFI VSQGELLNELLDMLEKKVEEG VEVRLLYDGS |
| UniRet90 UPloo0463C02A |  |
|  |  |
| UniRet90-UPI00047C21FB | WISSPYFVPPVEGHEALCTAAKSGTDVKVПPGKTDK |
| UniRef90-U7VBK1 | HIETPYFIPD |
| UniRef90_B8EMFO |  |
| UniRet90_UPIO00365F8FA |  |
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| UniRet90_Q1AY79 | EVY FSDDGVGRRFAEALSRK |
| UniRef90-UPIO0034A3B8A |  |
| UniRei90-UPIO00047848EE | MLETYI WKGDAMGRQFKDALNDAAARG VKVYVIYDGF |
| UniRef90-L5NDW7 | DVQFFSD ETDYISDNFLTVLKEKAEQGVPVRLLVDRD |
| UniRef90-W5XGD9 | SLEFYTFYSN QLGHRVLKALEEAAANGAK VRVIYDTS |
| UniRef90-V3SZN0 |  |
| Un | NY 1 RDDEVGRAFRDALAGRAAAG |
| UniRet90-A3DF | VRLI YDDM |
|  | YFIFQFDG IGKEIADLLIKKAKEG VEVNLIIDGV |
| UniRef90 UPI0001E89F10 | WRDDHASKEFLTELKDKADGG Livkll |
| UniRet90 UPIO003B4136D | WRSDGWGQRFKDA VAAARRG VA VACMW |
| UniRef90_UPIO003728315 |  |
|  | FIIYE DKVGHQLQRAL!EAAQ |
| UniRef90-UPIO00475C20F | AYFIPD RELVNALVTAAQRGV |
| UniRef90-D4CF | EYFl FKFDNTGKEIADLLIEKAKEG LEVNLIIDGV |
| UniRef90 UPI0002558F98 | ALSDACRRG VKRLIVDGF |
| UniRet90-D6TZ73 | DDEVGRAFRDHLARKADEG VEVYVI YD |
| UniRef90--F9QAV7 | MLIFY WAEAGRV EEVASAL |
| UniRet90 | VTYFIPDAD |
|  | LSFYI WLGDNNGTKVVEAVC |
| UniRef90-A0A023D4F6 | HIAFYIWLP DRNGLEVVEAVKRAAARG VTCRIMADDL |
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|  | WISSY FSGDG DGMEIVAAVTNAVERN VACRVVVDGV |
| UniRef90_Q3JAJ2 |  |
| UniRet90-D5WBF5 | LIANPYFMP GRKLRRALVFAARRGVVVKLTGRKEF |
| UniRef90- UPI00036877FA | av Vo A |
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| Ref90-1317 |  |
| UniRef90- Х2HFW6 | - |
| UniRet90 06 FOJO |  |
|  | HJ CYAOSWDGETVEEFFAAVEAAERG VAVRVLVDHL |
| UniRef90- UPIO002EB5773 | DDKVGRALQQVLIKAAQRGVR |
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GNFNQDPRFRHLPKMRNLHTLQFPLVRT GDFTGRARDKG GSSKMEDS Y LDEMRAAGVEIEKFHKPHWYNLA R R DNN



 FVLDI TK T Y C KE LLAA GVKIYEMNNVFC
A NLVVDPRFFRFPDH VVHVLRFPAVRAGMLMFNDRYFG


 PA $\square$ TLLQRQSYDTDKAAGVRLWEYQP
GSRLI ERRHLEEMDEAGVHVSWFRKPFLLSPFKQ NH
 GNLSVPPAFTDFP KRMTHLHVMRFGLVRSFFLSFHSTG GNLVVNPAFKRFPKHPNLHVI ILPADRTGVDTLNPRKTG KLLLEVSKRWT RQLFEAGVRI
AFVYWANQYFYGELLELGAEIYKYKYGF
GSFSTSKRALDPLLRAGG EAVFFLPVGLKTFTRTNL
 $G C L D V R S S F W E G L R R A G V E A C P$ V VNAPSLREPRDLLP ANLVVPRSFFRFPLRRAGVVACPRPVVHPGVLLLDVRKGG GCINTMKTKDWTR DAEGGIKFGKFNKF KMIISVVMNN ANLVVPPTFYRFHPN VEVFRFPVVRPS ILFTNIRGTG AGFKMNK HIQKELTNNGVIFQFTPGFPFLFYKMNR GSRGTKPSFF DHLRELGGEAQPFISTSKKHWFTTPRLNY


 GVLNQDPRFYRFPEDPSLHVR RFPADRSGDFTFNDRNTG
 GTAD LSAEFTGAMTEAGVRFHL FDPQPRLAGLRTNLFR PERSNHU1AADWLARGQYTHLLH GGVRLWLYQDAM $N \square S N F K L K R Y F K N T G V R L E Y F F R T Y G P I F N D R L N Y$
 GSKHFLKSVACRSMKANGUAB DEADHVNLLRMFFSRIDLD PVAGGASRTYYGELVEAGINVFQYNKGVL GSRSLIHSARWSAMRDAGARLCSSLQAPLGLFLVGHRTDL



 GARQFPP VWRERLEAAGAWLLFFRPDIRPDSFNTSRDR



 P LI KEAAYPYDREAVKHGI TVYGYKKGMF

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UniRef90 Q0G2A6 UniRef90-E4L419 UniRef90-E5BF51
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UniRef90 R4HZQO UniRef90-R4HZQ0
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UniRef90-H8MV08
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RNHRKTVVV 170
180
 RNHRKILVVDGTRGFVGGLNAGDEYLGLKPPPWRDTQLLEL RNHRKLCII DGSVGFVGSQNIVDRDFRRGIVNDELVARVV RDHRKI VVI DGDIAYTGGDNL ADEYDNEDERWKDAGLRVV RNHKKLCII DRKI SYGGGFNI GDEY GGNGKGYWRDTAURV1 RNHRKLMII DNTIAFAGGMNI SDDHRQLALQPRRDDHFSF RNHRKI AlVI DGKIGYVGGFNI AKEYGGKKAEPWKDYHLRM HQKVILVDDDAAAVGTANLDNRSFLNFEMMVMTAHPAF

 RDHRKI LVVDGREVFTGGVNL ADEYINVEERWKDTFI R I
 RNHRK AVVFDGELAYY GSQNVIDSEAAKGUEPWRQELVVERV RNHRK VVIDGRTGYVGGFNVGNEYVNKGKDFWRDTHLRI HTKSVVI DNNHCLI GTVNL
RQHRKIII I DNYISYVGSMNMVDPRFFKQNAQWVDUVVRM RDHRKI TVI DGNI GFTGGYNLADEYFHRREPFWKDTGIKI




 RNHRKILVIDGTVGYMGSLNMISRDY 1 RDHRKIIVIDGKI GFTGGIN ADEYINKKERWKDCAIRI RQHRKIVLVDNYIAYTGSMNMVDPRYFKQGAQWDDDMVRM

 HNKI AI FDDEIA IVGTCNLDYRSFFSDHQT TAI IY

 RQHRKMVLI DNYVAYTGSMNMVDPRFFKQDAQWDD DMARM
 MMHAKTMLVDDRLVLVGSINYDALSF NLLEEGSLVL RCHRKVLVVDEKVAFTGGVGIAEEWCGDARNEWRDTHVRLI RDHRKIVVI DGKVGFTGGINIADEYVNKKGHWKDCGVKI

 FNHTKAYLFDDNI AFIGGSTNLDFRAFFSDQQ
$H S K L V I\|D G E\| A F L G T A N F \quad D Y R S M Y Q N F$
RNHRKMLI ADDSRAIAGGANVATAYMGPEPDPWRDLSFLI
 RDHRKLCVVDSKLGYVGGFNLGNEYLGKGKMHWRDTGMRV


 HDHRKLVI D DHHI GYIGGFNIGGDQYVNKSPHWRDTHLRV RDHRKLLVVDGA IGFVSGDCLWLGDPARGDAP WRDTGVAD


 RTHRKLLVVDGHTGFIGGANVADPWVDGDDRDGYRDHFRI MVHAKLGIVDDFTAVVGSANFDVRSFF RLHRK VVIDGERAFIGG $\square$ NYSADHLGDYGPMAKDYAVEV

 RQHRKIVVIDNQDAYTGGYNMGSDPKYFKQDSDWVDMMVCI

HAKVMIIDGEI AEVGSSNYDLRSYRDNYEVCVAVMY RNHRKI AVI DGRVTYCGSQNCADPAFLRRFAPWVDILVRY RDHRKIVVIDNHLTWCGSQNCADPAFRAKYAPWVDLFARF
 RNHRKIAII D $\quad$ EYAFFGGLNDDNRHFVTSD

HTKSIL DNQLVMVGTVNMDMRS
HGKVAVVVDNWGTVGSSNL
RLHRKLVVI DGRVGYVGGINILSDPGLPGDAPRYDYAFRV RMHRKVSVI DGKVGFVGGINIIDDYNVDNTPPRDDYAVRV RLHRKLIVIDQKLAFI GGUNFCFDHDSNSGPAKQDYAVAV RDHRKDI SIDGQDGYGGGVNIS DEY IDNKSGFWNDSAIRBI RNHRKMLIVDGHHGFVGSQNLIERHYGSTRNAWVDDMMEVV
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## UniRef90 B4ECP5

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 VGEAVDSFLILF LQQMWSI TEKE

 AASVAEMLEADFAQ
SGPIVVTMESVVADDWYLESDEVLDPETRHPTAPPAADAN
 K GPAVQSFT DMFLQLWDSEDKEDLKRY LKTYP
EGEGAWGFARQFIQMWKMDGRTLPNEDDYYRPRQEGAGNG RGYGVADDEHAFAQVWATIGAEIPDDEKDHEDTLTRAGDM EGP IVVEAQSVFATDWFLESGETLDVGSSYFRHHPTSGST
EGPVSTT LGGVYAFDWE $\square E T G Q R \prod L P P P P D \square M P F E Q A S G H$ EGEAVKNLTVTFDEMWNAVSHKDVD
EGPAVHELERRFRATWRMAFQDRERFRSRLHPSQWRARKT RGFAT ELLEKGFALD
EGP VVA


NKDLAKEMKDDFHQ
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TGPAVWE ENTFVDFWN
L

> e

TGPVATAMGIIFSCDWEIETGERILPDDVNIMPFEQATGH
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$E G P V A D Q N Q Y V F A S D W M L H T D E S L Y E L L L Q P D T M P M E D G F$
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 TGE IVQGLHD DFEDDWQ
\GQSPILMEVRFAMDWNTS $\square R R$
EGPDVTTMGVIYSCDWEMETGKRLLPPPPDDMPFEQESGH RGPACADLEHAFKTTWASSLGAADD DDNAVPAAC GE $\square$


$T G D A V W E L E N G F V D F W N Y$
$Q G P V V G N G Q V F L E T W L D A T G \quad R M P T G E A Y F P E L S E M G D R$
$T G P V V A Q V H A V S R R D \quad M S P V L E P P S E V R P V T D P T G D \square$
E G V AK HLEAVFDND
 KGPVVAD V V VFNQLWFRCTSQRLSPPS PQPELGQA
KGPGAGYV ANSLFAWDWE IE TRQEDLPPAVQPPSVDDNDTH HSDVARELTEQFERDLDAEATPYRLE
EGPVTRQAD IIFASAWTAETGEDLRPYMTMDPPQPSADGF EGPVVLQNQHLFATDWMAHTEESLVPLLACAHVPERPGF TGEGVNDLEEQFASDWKRDTSE
$E G P V V R Q N Q H L F A S D W M G N G G G D \prod G H L L R Q Q M V D T K P G \quad F$ YGPAADSLAKVFSHDWYAATREMLVVAAG NM NREKRGNS EDQVANEปSLLHE NYMNESELIDENDWF

E GPVVAQMHTAADRLWRHTAWVQLKH EGKLLPADLSSVKKLWRRDSVLHLQP
QGPVVADIHQ
I G GPIVNQVSNNFDRYWNSASSYPGN
NGEGVQEI EA ITQKDWNFYVTKKQKKDEKDEPKFGKATDE
RGEVVQAMDGVFAVDWFTESGEPQAPGRKGGDPTAGDPVS
$T G P V V R Q \square R D S S L R L L A A V L A P P S Q L L P T P V P$
EGPVATAMGUVYSCDWEDETGKR』LPPRL

GGPI VAQVNEALTQDFH


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UniRef90 UPI0003696BF7
UniRef90-C2L0M6
UniRef90_UPI0004770905
UniRef90 E1VYQ4
UniRef90_R5V3Y2
UniRef90_U1R9F3
UniRef90_A1TPI0
UniRef90-M7MTI6
UniRef90_J6HQH3
UniRef90_R4HZQ0
UniRef90 A0A010YD14
UniRef90-W8WUL2
UniRef90_Q7N467
UniRef90_UPI0003FCA75B
UniRef90 W6APC1
UniRef90-K6VSR0
UniRef90_UPI00047B5CCE
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UniRef90_M9SZT1
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UniRef90 UPI00047B48EE
UniRef90_L5NDW7
UniRef90_W5XGD9
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UniRef90_UPI000475C20F
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UniRef90 F6ICP0
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UniRef90_A0A021XH46
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UniRef90_I3DI36
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UniRef90-I3I751
UniRef90_X2HFW6
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UniRef90_E6J5Y6
UniRef90_UPI0002EB5773
UniRef90 V1L804
UniRef90_J8SSU7
UniRef90_V6JK90

HCLAVPMGPADKQETG
SALVVACGPADPQETG
ALQAMPSGPDFDTP
$\square M Q \vee A T S G P$
HCRV $\square$ PEDPDEA
HAMHATKG
VLQMDPSGP
Pi Q
$R \vee R \square L A N Q P D R S$
WCQPFTDGP
S LRVVATMPATA
TAQLLASGPD

T T QVIDASGP
P
QA $\square G V L G A P Q E Q G D T$
GDQVIPS GP
LA QLLPS GP

R A Q
LT QVVPS GP
A T Q V I A S GP
PVQVVESGVDSVW
T T QVIAS GP

EAR\RAS
TRQPVPS
T $\square$ QV I A S G P
T A QVVATGPTERPT
V VQV V
LIQ V V S GPNHASP

V VQ A A S G P DVP G
$\angle M Q I L P S G P$
VA QVVSS GP
AARVVAQEP
PDLFV

| $D$ | $S$ | $L$ | $L$ |
| :--- | :--- | :--- | :--- |
| $P$ | $A$ | P |  |

TTQUIASGP

YMQVISSGPNYEFPA
HKLVPTNG
D A QMVNSAPR
T A V]MVE
Y M QLISS G P
SVQ\|IGSGP
AA $\square$ A TGTGP
VA QVIGTS
T A QVVATGPT
FARVIEDGPD
$P \vee G H V V A G$

F $\square \mathrm{Q} \| \mathrm{V}$ S GPNHDRP
$A F Q L V P S G P$

UniRef90 V4JCC6 UniRef90_S6G3U7 UniRef90_H0JGI7 UniRef90 R5KWP8 UniRef90-J31843 UniRef90_UPI00047011BC UniRef90-UPI0004792321 UniRef90_R9VRS9 UniRef90_A7MJ17 UniRef90_W0Q423 UniRef90_C5CVX7 UniRef90_W9A6V4 UniRef90_UPI00047D0CAB UniRef90_S9P8Y5 UniRef90-A7IDV4 UniRef90_UPI00047CE7CD UniRef90_W4HFB8
UniRef90_R6SWR6
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UniRef90-U2FV81
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UniRef90_C9YVR8
UniRef90_Q89AL5
UniRef90_M5QJQ6
UniRef90_WOH2W6
UniRef90_U7DSZ0
UniRef90_A5WDS6
UniRef90_14N781
UniRef90_UPI0003461356
UniRef90 G7UV06
UniRef90_U4ZXH4
UniRef90_A3QCX5
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UniRef90_UPI00036F12BA
UniRef90 A4XRD3
UniRef90_UPI00037CB9B9
UniRef90_A0A010PCV0
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UniRef90 A0A024II95
UniRef90-G2DIH1
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UniRef90_A0A022H187
UniRef90_Q0ADR8
UniRef90_-T0ATF1
UniRef90-H8L268
UniRef90_Q5P2K2
UniRef90_10HL35
UniRef90-N9DJB4
UniRef90_14JY52
UniRef90_F0GAZ4
UniRef90_F2PFJ9
UniRef90 G8QJL8
UniRef90- UPI0003B37AA3
UniRef90_F7SHQ2
UniRef90_B5EI99
UniRef90_UPI0004648905
UniRef90_L8MK36
UniRef90_14K6B5
UniRef90_V6VTG8
UniRef90_L9U935
UniRef90_U3HFL7
UniRef90-F0EEJ2
UniRef90 E8LWN6
UniRef90_UPI0003B6577D UniRef90_K1YAE0
UniRef90_UPI00047211B5
UniRef90_D5WLJ7
UniRef90_E4KU29
UniRef90_B2UI70
UniRef90_F7JTG2
UniRef90_N2JHLO UniRef90_K8RIJ5 UniRef90-UPI00031321A6 UniRef90_UPI000373A33A UniRef90_UPIO00474EDEC UniRef90_V9RA82 UniRef90_W8KJ67 UniRef90_N9P2G2 UniRef90_UPI0003B7676E


E T P A A DLLE Y GWSNNRVELLENGEAYFPRVFAALRQARSED GNQVALLENGEAYFPAVFEALRAAEREI GD DAFRL FTE GDELYAAMHAAI NGAKREI $\square R L P P L R G G H G L R L L E G G S R E L F P A D L I A A I E Q A K R E V$

M S H GNHWVG


AQGAAETAF IVRDNQRH NYQLFRTPIYCDNQITIITKANEMYEQTDK $Y R L Q Q P$ TQETS A VLL QDT GWDALA QRLALI PRYSRGNDI RLLRNGTEYFPALLQALETAEHSSII I I I I


 GRS $\square$ AQAAPHEGKS GFRLLSNSGEAFMARAELIRNAQSSL GVYDKHKMQLLTSAQATFESLIDSDINHATTLI G L S GF R L L P N GP EAFRAARAELI R NA Q K SLL


$$
\bar{V}
$$

VERLGDFMPTHGN

$P L V L G N E A$ HLLIDGPQTEAAMFAAIGA
NSAVLLQDTGWDALSQRLALIETAEQSD
 GNRFELLLDGAAFFPRMLAAIDDAERQV

LRTCARWPVS VGNKAKDAGS GNRILA AS EA $\square E M I V A D I$

GRLVVE
 PDFVEG
A L P MVQA H P
$\qquad$ N A V
 R R P RWQD GNAVELL ENGEAFFPAVFDAI
T Q HWL $\mathrm{N} E$
 GED AF H V L R D P VVDA L D A R V L L A D
 H V WR D NQFNLLDDGPAFFADWLQHV
GN RATTLFARY GSADFFPAALFDAA


GNRFTLLPEASRFLPAMFEAVHNA PAS N A YSARAELI RSARMVV MNRPWVEGNN VKLLDNGEQYYPCVFEAMARARES L

AGYMRSAFLVRDN A V ${ }^{\mathrm{K}}$

A GYMRSAFLVRD N

LA A HA GFAG
$\square E R L T D T P L T T A N E L$
$L T H$
$G$
G R
L I D D
GQS GFRLLESSTDAFTARAELIRMAQRS L
A PR $\square$ A Q N P

$P$ TRGPHAFRWLVDGGAFFPAMLQAIGRARHRV
A Y F V A D S P A K A R P


## UniRef90 V4JCC6

 UniRef90-S6G3U7 UniRefefo-HOUGI7 UniRef90- R5KWP8 UniRef90-J31843 UniRef90_UPIo0047011BC UniRef90-UPIOOO4792321 UniRef90-R9VRS9 UniRef90-A7MJ17 UniRef90- Woo423 UniRef90-W9A6V4 UniRef90-UPI00047DOCAB UniRef90_S9P8Y5 UniRef90-A7IDV4UniRef90-UPI00047CE7CD UniRef90-W4HFB8 UniRef90-R6SWR6 UniRef90-S6KGN3 UniRef90-W2F4U6
UniRef90-U2FV81
UniRef90-L1M7L3
UniRef90
F5XWS
UniRef90-D2C2E9
UniRef90-E6UXP1
UniRef90-UPIOOO364A251
UniRef90-E6WW36
UniRef90-B5ZCA3
UniRef90- Q6LII3
UniRef90-C6XAE2
UniRef90-C9YVR8
UniRef90-Q89AL5

UniRef90-U7DSZO
UniRef90-A5WDS6
UniRef90-14N781
UniRef90-UPIOOO3461356
UniRef90-G7UV06
UniRef90_U4ZXH4
UniRef90-A3QCX5
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UniRef90-UPIO00376032B UniRef90-UPIO0036F12BA
UniRef90-A4XRD3
UniRef90-UP100037CB9B9 UniRef90-A0A010PCVO UniRef90_UPIO004765735 UniRef90-A0A0241195 UniRef90-G2DIH1
UniRef90_UPI0003B50053
UniRef90-A0A022H187
UniRef90-Q0ADR8
UniRef90-TOATF1
UniRefo -H8L288
UniRef90-H8L268
UniRef90-IOHL 35
UniRef90_N9DJB4
UniRef90-14.1Y52
UniRef90-FOGAZ4
UniRef90-F2PFJ9
UniRef90 G8QJL8
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UniRef90-B5E199
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UniRef90_L8MK36
UniRef90_14K6B5
UniRef90_V6VTG8
UniRef90_L9U935
UniRef90_U3HFL7
UniRef90-FOEEJ2
UniRef90 E8LWN
UniRef90-UPIOOO3B6577D
UniRet90_K1YAEO
UniRef90 UPIINO047211B5
UniRef90-D5WLJ7
UniRef90-E4KU29
UniRef90-B2UI70
UniRef90-F7JTG2
UniRef90-N2JHLO
UniRef90-K8RIJ5
UniRef90-UPIOO031321A6 UniRef90-UP1000373A33A UniRef90-UPIOOO474EDEC UniRet90-V9RA82 UniRef90-W8KJ67 UniRef90-N9P2G2 UniRef90_UPIO003B7676E

UniRef90_V4JCC6
UniRef90_S6G3U7
UniRef90_H0JGI7
UniRef90_E2MWQ1
UniRef90_R5KWP8
UniRef90_J3I843
UniRef90_UPI00047011BC
UniRef90_UPI0004792321
UniRef90_R9VRS9
UniRef90_A7MJ17
UniRef90_W0Q423
UniRef90_C5CVX7
UniRef90_W9A6V4

GSHTMITHSEHWH
140
150
160 GSYDVFLKS KKKLISHGANIVSYAKVMFPFIKW GA A Y
 GS WK Y PGYY K L K K RLD Q A K DS WHPM LP V S L L K LT WR R L D L




 L A GV

 GSRALIRSAHWRDMATS GVRLAAALPVNPLLDRLFKGRIDM


## G

A

## 

 GS LLF WA S R K L D R FLRR D
 $N$ IDDKRVS RLGGSQRHYE QLLLECGVVEVRQYMPTMLL
PSVMMAARTLYRQLIGDGVCDREYCTRPF

 GSRLIDE TVEQLETMERAGVQVAWFRKPLYLSPLKQNH GS LEF F R S K WVDMMQQSGDQ IVEALK DNLLMFFF RRMDL
 ATLAAHPQQQQRLFNPLHLGRATGVTRTMGRLFNLSLQHR GSFSFFTDDWHK RLT QAGVT DHQSLPVGLFKTLFKRTDL



 GSSIGF $\quad$ IN T D F V I K K M E C CVGll





$$
\begin{aligned}
& G S R G L \\
& G S P D
\end{aligned}
$$

$$
G S P D \quad L G D E F V Q Q G L!D A G G V L
$$

SDHPMLCHATRALYYFFGGRS DHLGEYH
GSPDLSP EFTGSLRAAGVRLDRSFDPSWRLFGKRFNVR

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| :---: |
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|  |
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|  |

 GTNAD DRKLLE $\$ SAHPNIGIRRATRHFKKLGAVFEFARDNR
 GSRQFKHPQRRRWLEAGDELRFYN PLRWTRGLQNFY
 $R L L D W A V P A L Y G G F L K A G V R V A E Y D Q A L L$
G S L K LG S TA RAR LVESGVQLQFYPLRWRKGFSNLY GS L
 $G S M G L S G S D R Q R L K Q G \quad D V Q R F F N P \| G F H S L A L N L S$ S S D GRDAS SALLLTAHPNDQVRLFNVTRTLGRALDLGQQHR
 NTSNTNANGHENIEVVRLFNPFMLRKKPRWWGFLLTDFTRLLNR E Y R L A H S R A Li G NF L DAG $\square E V Y E Y H Q S D L$
 GALDDP T L S ALLNSHPNDEVRLFNPFVVRNPKFLGFASRANR

 S S LIA A HPNDEVR VFNPLHIGRSTGVTRYMGRFLHLSQQHR GTNADDQFASHPNVQVRLFNPVSNRTEKLGSAMEF FRVNR
 D D R

 A AVHAYYQQYRQQLLKSGIELWEFKPYIVRPERTWYEIMT G GLT D P

[^1]

## UniRef90_V4JCC6 UniRef90_S6G3U7 UniRef90_H0JGI7 UniRef90-E2MWQ1 UniRef90_R5KWF UniRef90_J3I843 UniRef90_UPI00047011BC UniRef90_UPI0004792321 UniRef90_R9VRS9 UniRef90_A7MJ17 UniRef90-W0Q423 UniRef90_C5CVX7 UniRef90-W9A6V4 UniRef90_UPI00047D0CAB UniRef90_S9P8Y5

 UniRef90-A7IDV4UniRef90_UPIO0047CE7CD
UniRef90-W4HFB8
UniRef90_R6SWR6
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UniRef90_U2FV81
UniRef90_L1M7L3
UniRef90_F5XWS7
UniRef90_D2C2E9
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UniRef90_UPI000364A251
UniRef90-E6WW36
UniRef90_B5ZCA3
UniRef90-Q6LII3
UniRef90_C6XAE2
UniRef90_C9YVR8
UniRef90_Q89AL5
UniRef90_M5QJQ6
UniRef90_W0H2W6
UniRef90 U7DSZ0
UniRef90_A5WDS6
UniRef90-I4N781
UniRef90_UPI0003461356
UniRef90_G7UV06
UniRef90_U4ZXH4
UniRef90-A3QCX5
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UniRef90_UPI00036F12BA
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UniRef90_A0A022H187
UniRef90-Q0ADR8
UniRef90-T0ATF1
UniRef90 H8L268
UniRef90_Q5P2K2
UniRef90_10HL35
UniRef90_N9DJB4
UniRef90_I4JY52
UniRef90_F0GAZ4
UniRef90_F2PFJ9
UniRef90 G8QJL8
UniRef90_UPI0003B37AA3
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UniRef90_I4K6B5
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UniRef90_D5WLJ7
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UniRef90_B2UI70
UniRef90 F7JTG2
UniRef90_N2JHLO
UniRef90_K8RIJ5
UniRef90_UPI00031321A6
UniRef90_UPI000373A33A
UniRef90_UPI000474EDEC
UniRef90_V9RA82
UniRef90_W8KJ67
UniRef90_N9P2G2
UniRef90_UPI0003B7676E
UniRef90_UPI0002375894
RNHRK LVIID DW WTYCGSQNCADPEFDAKYAPWVDAMMRF RNHRKDI SI D GKI GY VGGDNDGDEY LSKKF GYWNDAHIRI
 RDHRKIVVI DGKI AYTGGVNLADEYADERYGHWKD G GVVKI $R D H R K I V V V D G T I A F D G G I N F S A D H L A D G P E A K Q D Y S V E V$
 RMHRKIVVIDNTVAFVGGINYSAEHVTS GPEAKQDYAVRV H GKV AL MDD HWATVGS SNL
R NHRKI LV VD Y Q $\square$ GYTGSFNL $\quad$ DDPVLFRKEGRWFDVMMRC HAKVALMDDGWT TVGSSNL
RMHNKSIAADSVFADTGGRNI GDEYFSANDNVFGDFDLLM R NHRR I SI DD GRIGYDGGFNI GKK Y L GEKVKHWRDY H L Q I RTHHKLVIVDGKVGFTGGFGIWWSWQGDGQCPWRDTNVRV RNHRKIVVIDNAVTYCGSQNCADAAFAARFAPWVDVMARF RCHRKVLIVDEHTAFTGGVGDADEWKGDARDSWRDTHVRV RNHRKLLVVDGREAFLGGFNIRNSRRLHGETRQRDTHVRV RDHRKIVVID GKIGYTGGMNISDDYFVR WRDTHMRII

 $R N H R K L L V V D Q R Q A F L G G F N D H R E N S R R G E R R W R D T H V A M$ RMHNKLWLVDNSMA VVGGRNIGDAYFDEPNLNFTD』DLLG R L H R K L CVVV D G T M A F C G G I N I L L D D L H D P N H P R F D F A V Q V
 RMHRKIVVVDGERAFVGGIVNYSADHLLDFGPKAKDWAVEV

HGKVAVVDDEWATVVGSSNLSLSLNLEANLVVRDRGF
 RMHNKSFTVDGAFSIVGGRNI GDEYFLSDK IVNFRDRDVLV $R L H R K L V T V D A Q V A F V G G D N D D D D D V P G N M G P R D D Y A V R V$
RCHRKV LVV DEEI AF TGGVGI AQEWCGDARDEWRDTHVVEV

RDHRK LL LVDHQLAVVGGTGVTDDFWQPGQNTWHEVMVA

RNHRKIVVVDDDD DGYTGSFNLVDPEFFKQDKAWDDLDMRD RMHNKLWI ADDSMAIVGGRNLGDEYFDAEANNFTDDDLLS RTHRK I CVVVDRDVALVGG $\quad$ TN I ND DMF CDYDHPRWDFAV QV RNHRKIAVI DNRAGYVGS QNLADD G GFVRGYPNRELVARV R M H N K SFTV D S TLSVVGGGRNI GDEYFDLSDENFRDRDVMV
 RDHRKITVID GKVGFTGGYNLANEYYTHPYGQWKDTGUR RMHNKSFTV DGAFS VVGGRNV G DEYFDLSSENFRDRDVLV R D H R K L V LV V G GVA FTGGFCLTMD F F LDDR RCHRKALIVDEHTAFTGGVGIA E E WCGDARNPWRDTHVQV NHSKILVVDDEVGFVGGYNIGSLY AKKWRDTHLRE RNHRKIVVIDDGDTTWCGSQNCADAAFLRTFAPWVDDLI RY
 RMHNKSFTAD G V VT I G G RNVGDEYFAGTGVMFADLDVAA
 RMHRKLAVMDASLLAFVGGMNVVDDCYSSADFPRFDYAVQA
 RMHNKVMVVDRVAGITGGRNYE DRYFLDPAFDYVDRDVLV HLLHAKVAVVDRRWATVGSSND
RMHRKIVVVDGETAFVGG $\square$ V Y S A DHLAD GPEAKQDYSVRL RMHNKLII ADGA $\square$ A VTGGGRNDSREYFDASDNQFTDDLDILF RMHNKLWLADNSMAIVGGRNLGDEYFDEPNLNFTDIDDLLS R M H NKAMVADNQAAI IGGRNIGDEYFGASSMDFGDLDVVV RNHRK LLVVDDREAI TGGGNVENDYY DLSEHYE LDDRDLVV
 R DHRKLLLVDANIAYVGGAGLTDQFWGAAESTWHETMVRVV
 R D H R K L A V M D G W RV F T G G M N IA NVV L G K K R T K WR DV G L K I
 R D H R K L L L I D Q R I A VV G G T G V T D E F WG Q D T A D WH E
 RMHNKLWL ADNAAA VVGGRNLGDEYFDEPSLHFTDIDD L A $R L H R K D V V I D G E R A F I G G Q N Y S A D H L G D F G P M A K D Y A V E V$
 HAKVAVIDEHWATVGSSNL
$R \square H R K V A V V D G R \square A F V G G \square N D V D D H D D A D P A R V A D Y A D R V$
 $R N H R N L V V V D G A V G F T G G N V L L S E H L P Q G A Q P L A T T H L R M$ RMHNKAFI ADNALADTGGRNLGAEYFQNQTTNFFDDLDVLA RNHRK IVV DDGRVGFVGGFNVGREY LGKKFGYWRDTHLCI R M H N K L L L A D N SVA AVGGRNLGDEYFDKPEMNFTDLDLLG R M H NKALI A D NQAAI L G GRNI GDEYFASSTVVAFGDLDVLV R M H N K Q MV V D N L V G V I G G R N I G D A Y F A K K P D L D D F S $R M H N K S M T A D S V L D V G G G R N I G N E Y F F E S S S V E F G D F D L L L$

 GDHAKFFDLDG MVFVGSFN
RMHNK LMVV D GQQAVI G GRNDQDEYFWNDKYDYRDRDLLI

UniRef90 V4JCC6 UniRef90 S6G3U7 UniRef90-HOJGI7 UniRef90-E2MWQ1 UniRef90-J31843 UniRef90_UPI00047011BC UniRef90-UPIOO04792321 UniRef90-R9VRS9 UniRef90-A7MJ17 UniRef90-W0Q423 UniRef90-C5CVX7 UniRef90-W9A6V4 UniRef90-UPI00047D0CAB UniRef90-S9P8Y5 UniRef90-A7IDV4 UniRef90_UPIO0047CE7CD UniRef90-W4HFB8 UniRef90_R6SWR6 UniRef90-S6KGN3 UniRef90-W2F4U6 UniRef90-U2FV81 UniRef90-L1M7L3 UniRef90-F5XWS7 UniRef90-D2C2E9 UniRef90 E6UXP1 UniRef90_UPI000364A251 UniRef90_E6WW36 UniRef90-B5ZCA3 UniRef90 Q6LII3 UniRef90-C6XAE2 UniRef90_C9YVR8 UniRef90-Q89AL5 UniRef90-M5QJQ6 UniRef90-W0H2W6 UniRef90_U7DSZ0 UniRef90 A5WDS6 UniRef90-14N781 UniRef90-UPIO003461356 UniRef90 G7UV06 UniRef90_U4ZXH4 UniRef90_A3QCX5 UniRef90_A1K6B5 UniRef90 A5ZWR3 UniRef90_UPI000376032B UniRef90_UPI00036F12BA UniRef90 ${ }^{-}$A4XRD3 UniRef90 UPI00037CB9B9 UniRef90_A0A010PCV0 UniRef90_UPI0004765735 UniRef90 A0A024II95 UniRef90-G2DIH1 UniRef90_UPI0003B50053 UniRef90-A0A022H187 UniRef90_Q0ADR8 UniRef90-T0ATF1 UniRef90-H8L268 UniRef90-Q5P2K2 UniRef90-10HL35 UniRef90-N9DJB4 UniRef90-14JY52 UniRef90_FOGAZ4 UniRef90-F2PFJ9 UniRef90_G8QJL8 UniRef90_UPI0003B37AA3 UniRef90-F7SHQ2 UniRef90-B5E199 UniRef90-UPI0004648905 UniRef90 L8MK36 UniRef90-14K6B5 UniRef90_V6VTG8 UniRef90-L9U935 UniRef90_U3HFL7 UniRef90-FOEEJ2 UniRef90-UPI0003B6577D UniRef90-K1YAE0 UniRef90_UPI00047211B5 UniRef90_D5WLJ7 UniRef90-E4KU29 UniRef90-B2UI70 UniRef90-F7JTG2 UniRef90 N2JHLO UniRef90-K8RIJ5 UniRef90_UPIO0031321A6 UniRef90_UPI000373A33A UniRef90-UPI000474EDEC UniRef90_V9RA82 UniRef90-W8KJ67 UniRef90-N9P2G2 UniRef90_UPI0003B7676E


TGPVVLEMAAVLYAD $\square$ AVEDDEN $\square Q K$ VK DF LLLTPPTTGNV
MGK $\square \mathrm{IP}$ Q $\square$ SRQFDEYWNSATP $\square E A L V S E A H \square P T T$
RGEGVQDLEHQFVLDWKKNSEQQUHLHSA
EGPTVREMQLAFARSWQECGG ALLPESCFPRVPWGGDA
EGPVVRQNQYLIFASNWMAQTDEDL AS LIFAEPLPAQPGF
RGPAVDGIAAGFAQNWAECHDELFDERDRFRPHEPAGDA
AGPLVVEAVRHFERLWLDAGQLPASADPD
TGNAVAGLQYSFLNTWUTADGE $\quad$ DDNDFSKYFPMCAEQPAL
EGPAVVDIHHFAL
$\square G P A V A D L H H F A L A$
AGNQAKQAQAAFEADWHWQAAPETDSPSAVVLPNKTADC

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




N GEELSASSLDQDWMDHCEEVTLERGLDQRPRWPVPQ
MGSVVTDI QASFGEYWD
QGPLLPE QLRVERDWR
RGPAVDGVAAAFAQNW AECHDELFDERDRFDEHRPQGDA EGP STTMGADYSCDWEVETGQQISPKRVKIPTYPDKECT


ESEVVTAALA AVNVTD
 MGSVVTTIQASFDEYWN
DGDVVDEVSDQF DRYWNSE
RGPVAMQFQQLFDDAWRTQGCHPADSGLREAAAPARAGNM EGDAVQSLTVTFLEMWNAVSDKDANDSD
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I GPLLEKIHATARHLWW
IGGPVVEDVSVDFERYWSSESSYPAER
GGPAAQAMSDSFEQFWNALIDRHDQAPFPSWQPPVYRQPQA
$R G P V V E T \square R Q F A \square G A \square R G G T R G E P P V Q R P R \square P P P R A E G P V$ YGTAVKHANEVFSDFWN
VGPVAEQLGHSFDQYWNSALSKP $\square E Q F \square S H R P T P K D L A N S$ HGPVVNDiSDEFDTFWN
KGSIVKAMRASFDAFFEHEDSERYQAPEDP
EGP LV EPDQRSVRHVWE VV
 AVTLREALEKAFDA
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TGPVVAQVHAASKRD MSPVLQEPSAVRPLTEPAGST
MGAVVSDIQTSFNTYWD
VGEAVRDVSADFDKYWHSASSYPLER
EGP LVAQARQAQAS LWNWARHPG L
$\square G P A A A D V S R D F D R Y W A S A S A Y P V D$
TGAVVRQLEYSFALDWYVATQ QLDSPQQSSATVPTAEPD

A GP VAHQLGVSFDQYWNSE IDSQPI
HGPVVRDVSSAFDLYWN
AGPVVPVASKVFDQYWN
SGSAAK EVVNASFDEFW
YGNTVEQSADQFD $\square Y W N$
EGEIV N SLLNDLFAFHWGLVDSTKPPRKKREEPNNQKKGKL RGPCVQDWEALFADAWRWHHQDMPGLGDLSCEGTQPSDPR

AGPATQAMTENFEAFW
$R G P \square V A Q M Q H$

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LVR\|ISSGPNHNEP
VVQVLP S GP YVLPFADGPD

TQUVT TGPNHES
$\square \mathrm{AQVIPSAPE}$

HAAFVES
VAQVI GSG $\vee \vee Q \vee V$

PS

A V P P WP Q D P A P A A E

IVQV V
SVQVI A S GP

K T R A R
A A QLLPSGP

A MRTVAADP

V V Q V V
A A $\backslash \mathrm{A} V \mathrm{~V}$ T GP $\square$ S PRAT

GAMLVV
$\square \mathrm{AR} \square \mathrm{R} \square \mathrm{E}$ S A D P A W
Q A M L VT
R L R L Q E S ME Q T

P P L P F A N
$N \nabla M V I N G G P$
L G R $\square$
P A
D G Y V IP Y G

TAVLVE

K M Q IF P THPTDDFPS
PMPHRPEGP
$P$ VQ\| I S S GPDS Q $\quad$ K T
$D \square Q L I P S S P$
D GRVV

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A ATAA LIAVLSFLLQALPPLDGRSESRALAPAETAGTALG
P ILHSMHHVWRLVA WAGTRRRRPQPLVAPRGPW

THKTR LGRA $\square$ AP $V$

TELDALIFAPL
D P S T T LA

D PRFMRS

|  | VRRA L R D L P D R F D G $\square$ | $\square \mathrm{REMVWDE}$ |
| :---: | :---: | :---: |
|  |  | P A P P A |

$\square R K R H N R Q H H T L W N V T S G V V G E$

RRLDGPASSALMPERDQTELDRLAAPL
AAAFY $\square D K M Q H T F E E A K R Y Y N S T P F D Q R W D D \square L S S A V L G$ ERKMRLIK SEFQMKQWVKSLDYMLKSSVWAG $M$ VR DE GVLVAHWRLLFEHQWLACEGR SPWKPGH
$D A G L R P P$
$\square$

ATALERPVSAALPADVATP QMEAKSKQVLKKWAND $\square R$ RVADASNWSQSHRDG GTPLDNPDPNQ

RHDEEHEQRTDAKRTK】AEH $Q L S P \square R A \square G$
$H \square D D \square K A K A S H \square K N K \square R H D E E H E Q E T D R K R N Q \square A E S$ DS VLQLIFNE $\square$ QKGDEERR


K $\square$ K D A VDREVQK $\square \mathrm{DQG}$ QGHARSTVEGF LINPRRRDDP

NS QMRK LSARNERQM $\square$ Q $\square$ TA $\square E K V A A S H Y T G$

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60

HYATIL ${ }^{60}$ GEVS VAR 70
80
 SRLFFRRVDMVSGNHLRLLQSGADYFPALIAAFDAARAEII AAGSVRACFLI RDN



GNHFTLLPEAKRF $\square P E M F A A T E Q A$ VSLFYDGDSFFNSLIRDIIRNAQK $T G M V I L P D N V D A F A V R A L T A R A A G R S$
$G N Q T L L$
$Q N G E A Y F P A I E A A F D R A V R E$

 MNRTHLISGAELMLLQNGAEFFPQLCTEI DAARHS

TSAFTLLSGAQAAYGARLALVEGAQQTL $R$ VSRGNVVIPFSNSADAFRHQWDAVDGAKESV ARFDSDLPG KNSGRDGLGGGGQSTTALVEAVRSAKRRV
 GQTGVYTLGQGVDAFVSRVSLINAATSSI
 F D WLINDQDAVKKEQGLTAYVALDDAFVS I A S L I RNAKRTL D $\square \mathrm{S} \ V \square E G N Q L R L I T H G P A L R S A L D T L I D G A R H S L$ R QKA GA G A YVALAADPLEAFASRVKLADAAERTL LD E $N K G L N G V S L I S D N M S A F A D R A L S A R K A$

| $R D S H G N V V V P F H D S A K A F E S M W A A V K E A$ |
| :--- |
| $P$ |


ATY T Q A TEKYAGLS GLRLITEGPEAFALRTALADQA SSALFDTARTRGKSGUYPLPNAHDAFAARALLAQAA

DAFAARYRLLAEMA
HWTDGNA $\square R L L Q N G G D F F P A L C E A I D A A$
$P \square R R N A F C K F L V D G R D Y F W A L S E A L R M A E D V I$ GQTGVAPLQKGADAFAARILLADAA
EGWCH PHRFGSYAPPWFVDGESAFEA $\square$ A $\square$ A $\square E E A K S$ APRLAQHP GESLFYPLQSGPDALAARLAMARAAQRS

$\square Q Q \operatorname{GDRALLQR\square ALDRDATHN}$ $\square R D A L A G P E A A G Q S G F R L L A G G A E A L Q M R I A L A R A A T K$ SFA IDPRP AHMTSFAQWYVDGHGAYEAMFHAIQSAKKEIV

PRF
PQRDNDSVKLYVD GMQLLRHCDDYF

GANAFAARSILTDMA
HRFQSFAPERDGN
NVVTP PFKDS GD $\mathrm{Y} F$ GEA $\square$ TASTPAAPRHYATVVDHGEES

LTGGGSQAQWFVDGQAAFVARLNLIRSATR HRFQSYAPERGDGSQAQWFVDGQAAFEA I ASS SERLILSFSPVRR GTDYFSRLEHII QNAKY
GSMDNFYVD GKSYF $\mathrm{GNLV} \mathrm{K} \mathrm{K} Y \mathrm{~V} V \mathrm{D}$
LLFFSEYGPVTRGNKVELFDN
PHERENAACSWHVDGRVL
ERQELNDSHRYKGNFVKWH DDGHDY Y
NVWRTDKAAFLVDGAAYF QWFVDGHTAFEAI AFAI QNA GNRFDSFAP $\square R \square N D A A Q W L V D G R D Y F W N L S R A I L$ HRFQSYAPERDGNC VKWYIDGRDYF

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C




VQVRVLI DA! $V V L L L Q V S D H$ V K K R L L L D D I Y CRI MLD S V $V R \vee R L L L D D N$ \begin{tabular}{l|l|lllllll}
$V$ \& $Q$ \& $R$ \& $V$ \& $L$ \& $V$ \& $D$ \& $G$ \& $L$ <br>
$V$ \& $R$ \& $V$ \& $R$ \& $L$ \& $L$ \& $I$ \& $D$ \& $D$ <br>
\hline

 

$V$ \& $R$ \& $V$ \& $R$ \& $L$ \& $L$ \& $L$ \& $D$ \& $D$ <br>
$V$ \& $R$ \& $I$ \& $M$ \& $V$ \& $P$ \& $Q$ \& $E$ \& $S$ <br>
$V$ \& $N$
\end{tabular}

$\qquad$

 | $V$ | $R$ | $R$ |
| :--- | :--- | :--- |
| $R$ | $R$ | $L$ |
| $R$ | $L$ | $L D$ |

 DVQYYADHA DASTARLLESVVNAARRG



## 



 Y L E S Y I F A S DETGNMVAEALQRAAERG




 $V \operatorname{SV}$ M $L$ M
 $V R V R L L D D D$
 $T V Q V \stackrel{R}{L} \quad D G 1$


 V K V RILVDKS

$\qquad$ $T E$ LLYDCG EVRVRLLVDDS | $V$ | $R$ | $V$ | $T$ | $N$ | $T$ | $D$ | $N$ | $L$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $V$ | $R$ | $V$ | $R$ | $L$ | $L$ | $L$ | $D$ | $D$ | $N$ |
| $V$ | $D$ | $V$ | $L$ | $L$ | 1 | $L$ | $D$ | $A$ | $C$ |
| $V$ | $Q$ | $I$ | $R$ | $L$ | $L$ | $L$ |  | $D$ | $D$ |

 KPVVVRMMFGNG


DLQYY WSK D DTGTLLLDAVHRAAERG $\qquad$ DLQYY YWKNDLSGRMLIRREVLAAARRGGVVVRVRILDDF WL A T PYFLDPSWKVRR HWQTYDC KDDFI GQGTVRALLKAARRGVDVRLLLTNTDH
 WLATPYFLPS RKVRRFLMRAAARG KI STPYFSLSNGLFNAFKDALL DVQTYLL ADDRVGRAMLKRMLNAAQRGSGVKVSIFYPGY DVQYY WRKDMTGTLLFEALLHAAANRGVRVRLLLDDNN T DVYY WRDDTTGHLLLDELRQAADRGVRVRLLLDDGGT
 Y I H D WWLSPELYMRRRI DRILKERAEKGVKIVIVVYR
 FICGWWLCPELYMRRRLDALLEAKAKQGVQIYI LLYKEV $R V L Y Y$ Y YEDDDA GRQVRDAL 1 AARRR DLQTYI FETTGTGAAVLGDII DAADRG VRVRMLIDG
 DMQYYI A T E D T T GKLLLLGAALYAA DRG
 $V R V R M L L D D M$
 $\begin{array}{lll}D I Q Q Y & L F E D G H S T R R I L L A M I A A A E R G \\ D A Q Y Y I ~ W H N D Q A G Q L L L K D L W D A A E R G ~\end{array}$ DAQYY
 FI A A WDI VPD DQTD L GAFLNDKVKRTPEL HVYILNWDF
 Y I A D WWLS P ELLF L R R R L DQL L K R K A EA GV KI YVIVVYEVA

 Y I E D WWLS PELF LRRRRLDQLLKRKAE Q V
 I L ST F DF HA DK S GK D V D DA AL I EAA A D R WF ET F FMTPGKRADD FAAAI TERASA




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140

160 GHAMDATLLALDGHPGDEVRLFNPFSVRHPKLTHFSRANR


GTGRENTNKLHLALSAAGVQHRSFN NTMGLDQNRHPDIEVRLGNPFSFRTLRALGYLTWDRARGVA

 NTSNYDDVLKAMALHDNIEVRVFNPFYDRTFRGDFERLNS $N V Q G F D R A F L A V R L F N P \| R N R G H V L R R T L E M L L G L S R F N R$ HILGDY LS RGYFEQMLRSDVTVLLYTAAM
YTLSATPNVQVRLFNPFCCGRGGFLSRFAASPHEDGRLNH HNAQVMRLAFEPNDEMRMFNPDPPISRMWNAATDFQRAQQ PGLDSVLADLDGMENVEVRIFNPFTMRKPKLLFDFFRLNR


 NT IGMDMNAHPNDEVRDFNPFSFRTLRADGYLTAFARGNR GSMGLVDED RARLRERGVALRFFNPLGFHSLAKNLT
P HLDKWCSDFHPLPYPMLWARNLFVKYALWRGSFLRKDNR NAALDSHPLIE DRLFNPTRAREGTLMRGVEMVLRMFSUNR GS NSLPKAMADSLEAAGVMMVLKFRPKTSPWTLRRRRLR GT QDLNGLLA WVDEQPN E GTMPAEEEHLERMEEAEVI RWREPAWYQLPQF LI GSAELSGEFVDADRMVGVEVQLFRPEVSPFLRRSRMRRLR MPDFAMDNHIAKELRQYGVDLRFYNDATLLELSTTQF HSAQVMRLAFVPGIEMRMGARSSALGRAYTLLTDFQRAQQ GNDTGRRRLVDGLKKSGANVIEHRPMWELFLPYFCRGMKW FLLGEHPNIAYRVFNPYKRRQDGFATREAMNLGDFDRDNH
 GG SAFRKEWLEGLRSGGVPVVVFNPMLPFLTDTDGPPCF KAPDSNPQLQILNQHKRLFNPSPNRRFKLGILTDFDRLNS VGMPVNCNKVIVKLTALVPKSANDNLWVGAW ALBRGVS GTSDLDAAQHPHDEVRLFNPFVVRRPKVIGYLTDFKRLNR NGNGLDPSDNPAFEIRLFNPYKFRKDRVLDYLFRAKAINH GSAKTPDRFFAPLVDAGG $\quad$ QFGRFGARRSTRYLI GSPDLSHEFDSALTQAGVRVHVFDPGPRLWGWRTNLFR G AGDMPAALAARLRDGGVALKVF RPDRGFRLARRNLR PGMDQQLAALNKHPNVEVRLYNPFVIR\|PKWLNYFPRLNH HSADVMRMAFEPNTEMRMGPRASFLGRMWGAVSDFSRVQQ CLSLDAHPNDEVRLFNPSRARTDRFKRGLEMMLRPDRTSR $P P V R F A G Q R Y Y P R L D R A G L R \square F E Y Q P R F L$
GNISG RARLTEELKQCGAKVIPYRPFFRWKRSPGL NVANTVGTDSDWTKHSFLGLHKNDHLDRSPNQWLQNTYFW PPVRYAGQRYYPRLLKAGVR $\square F E Y Q P R F L$
SAQKLVHQ IGGVEL KKLEKYGDKIYFTNGFF TSVGKQEMAAFDSQPNVEVRVFNPVPAGRDNWPGYLLRHR S GLDTMMAA LDSHPHVEVRLFNPFVIRKPRLLTDFSRLNR A GLDTQLSALDRHPQUEVRLFNPFAQRTPKALTDFSRTQR TPGLDDILRLLDSHPRIEVRLFNPFSFRLLRPLDFSRLNR
 $N V A N T V G T D S L W T K H S M L S L H P N I H L D R S P N Q W L Q N T Y F W$
$G T T G L D P D A H P M I V E R L W N P F N L R R L K M L S Y G F D F F R L N R$ GVSMSDKDFYS IRLFNPTKARENILRRGIEMADRFRSVNR
 GSDAAADNDFFDPLEDAG VAVCRFDPRFGRRYLL HTGGMDKDSHPNIEVRLFNPFANRSVRWLEMLAGFKRLDR WATLNAHPNVEVRLFNPLRGRGLNLLRWLYRAP KLNR GLDSDMSDIIMLNTHPNUDVKIFNPYRYLEMMACYDRUKK A ALNTHANI EIRVFNPFGAAQQGVMRRTANFFTRDDSFTR
 GSAR TPDAFFNPLVQAGAR SVGNQQGRFAQLDSHPNIEVRLFNPVRWGRRFLNVRRLHR NNFDQHLLRFASHPNDAVRIINPLMHRKFPTLNYVPR\|NR
 $P$ MLYVREREWLPILKLGWKTHGR IFYHQ SAITHENLQLRIYNPTFGKVKLNYFDYAGSVVCCFRRFNQ S I ALK $\square$ N SLYS AALTCHTKHALMGLCPEGSKGHGNDMVMRHPDHNVFTFYW
 MIAMDLGSRGVKSI FEKMHRRNDKVIRHPHLLPLYWS A A LTC C T K H ALQ Q L CPEGTPGYNNIVIMRHPDHNVLTMYW GCRELATED WQRLQQAGDTVRRFNRLQWARPD AALV GSCKIPNEWDKKLRQNGVNIVWFNPLFNKSVGPIVF KLALTLNSQYT KRSLNVHSNDHVLRDPIFQUQSLGFW SALQQMDGNAYFQALSTMDKVEDRIYNRDNLDMPWKS MG
QTMSMSSSHTKHALEDLHPNI ACMRHPD HIIGSKDDVEFW GTKDI SKQYWERLKRSGDAI SFFNSFNWKAPDDYA EFG

 TCNSAHTKHADEALCPEGTPGHRNIIVMRHPDHNVFTFYW


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 RMHNKSLIADGQAAIGGRNVGDEYFGATDGVFADDDVLA
 RLHRKVAVVDAR【AFVGGMNLLDDEPDRFPVARFDFSVEV HAKVAVVDAQWATVGSSNI
RSHRKLCVVDRQVAFVGGLNI NDDMVSDRDHPRWDFAVSI RMHNKSFTVDGIAS IVGGRNI GDEYFAVGDEPFSDLDVLA RQHRKM LVDNYIAYTGSMNLVDPKLFKHNGQWVDIMVR RMHNKSFTVDGEVTIIGGRNVGDAYFGAGDAPFSDLDVMA R LIHRKMCVVDARVAFVGGDNLIDDCY DDHHGWSDYAVSV RMHNKSLTIDGLI TVVGGRNI GDEYFSAKDDEFSD DDAIA RMHNKAWIADGRLAIVGGRNI GDTYYDAEEAMSRDADVML

 RMHNKSMTVDGLLATVIGGRNIGDDYFAGEGTAYFDFDALA RMHNKSFTVDNTATIVGGRNIGDEYFAAGDEPFTDDDVLA RMHNKSFDADNQ RTHRK VVVDKQLAF $\operatorname{GGGLN} \operatorname{NDDDMADHDHPRWDFAVS~} \square$ RMHNKSFIVDGEAT I GGRNVGDAYFGAGEQPFSDDDVLA RDHRKLVVVDGRLAFTGGFGADVEFLD AWYEVA I R I RTHRKMTII DEEI AYVGSMNFAEYHCAEGDAAWRDTGARV RMHNKAWI ADGRIAVVGGRNVGDEYFDAARDNFMDMDAALL RLHRKIVVVDREIAFVGGDNI DDDMAPGQTSPRYDYAVSV
RMHNKSFTVDGVATITGGRNVSDSYFFHHPENYDDADVLS RLHRKLCAVDQKVVFCGGDNVDDDFY DPDHPRFDFSVAV RTHRKLLIVDGEI GFTGGANVTDSWLEDDAPGYRDHHFRI RMHRKLAVMDGAVAFVGGDNI DCDARLGFDAPRDDYAVRV RSHRKLFLDDDVEADTGGRNI GDDYFDLSDHNFLDRDI HV
 RMHNKVMLVDNRVAIVGGRNLADEYFLDEEANFRDMELLV ALDHATLVIDGETLYVGTFNLD PRSANLNTEVGILV
 RMHNKSLTVDSLTSVIGGRNIGDEYFSASHEVFGDFDLLL WNHAK I AVDGQYLHTGGHNMWDAHY LKKQNPDHDLSFEL
 RNHQKMA ADDERLLIGGGNVEDGYFGVPQEGWRDLGLWM RMHRKIVVIDGQRAFVGGLNYSADHDADFGPAAKDYAVEI RLHRKLAVIDQQVGFVGGUNIIDDHNHGPFEPRYDFAVEV RMHNKSFTADNQVSIVGGRNI G DEYFGTGHGYADLDLAV RMHNKDFLADNMMGVTGGRNLGDAYFGKAEENFVDLDVLA RMHNKQWI ADGQLVIAGGRNIGDAYFDAAEQAFRDLDVWM

HLKMVLVDDWVSVGSCNGFDHWNLEANLEALLDRHF RNHRK LLLVDARQGFCGGLNVGNEYCAGGTGKFRDTHCGV AHHEKFTVI DNTVAFMGGUDLCFGRYDTPDHPWHDVHMMM
 RMHNKLWLADGVVGDTGGRNLSDAYFAPGDVNFNDLDVMA RMHNKSFTADNQATI IGGRNI GDEYFGATEGVFVDLDVMA RMHNKSFTADSQASIVGGRNI GDEYFAATDGVFADLDVVA RMHNKSFTVDGVVTLVGGRNI GDAYFGAGEEPFSDLDVMA RDHRKVAVVDAELAFVGGDNIVDDYDDLDPAPRFDFAVAV AHHEKMTVIDNTIAFMGGUDLCYGRYDTPEHPWHDVHMMT RMHNKSLTVDGHVTILGGRNI GDEYFAGPTADYVDLDVLA RMHNKAWVADGRIAIVVGRNI GDPYFDGEDANFRDFDLVM WHHEKVVIVDHQI CFI GGLDLCFGRYDSPEHPWHDVHCAL RNHQKLALADGARVIVGGFNVSDDYFGTAEQAWRDLGLWL RMHNKSMTVDNQMTLLGGRNVGDAYFARADMDFSDLDVLI RMHNKAWDVDGEAAIVGGRNI SEHYFVNADTNFRDLDIYA RMHNK IFIVDNVALVIGGRNIADVYFDNDDENFDDTDALF

 HHQKTLI VDQELAFVGGVDFAFGRFDTPRMPWHDVMVGV RMHNKLWUVDGANA WGGRNLSDVYFAETENTFDDLDVLV RMHNKSMTFDKQ TIUGGGNI GNEYLSDQSSQFADLDVLL RNHRK LIVVDDAVGFCGGLNIGNEYCGKGSGRFRDTHCSV SQHQKLVVI DNQVAFCGGLDLTNSRWDTPEHPFHDIQMAVV RMHNKLLVVDDVFGVVGGRNYQDDYYWDSEYNFRDRDVIL AHHEKFIVID YRMAF GGGLDLCFGRWDSRQHPWHDVAMGV RLDHKVVVADAEVILIGGINI SDKYHGTPKKPWLDYSVQI HHEKLVVIDQRI AYVGGIDLAPGRYDTQEHPWHDVQCKV HHQKVVVVDQRIAFI GGLDLCFGRYDNPRMPWHDVS IALL AHHEKFVVVDYA AFVGGGLDLCFGRWDARHHPWHDVSMAV
RDHRKVVLVDGRRAWVGGFNDESDPRDFGDDAWFDAMVAC RDHRKILIADN IIAFCGSLNLSAWNLIVKRPWFYDVHAKI SHHEKIVCIDQSLAFVGGLDLCFGRYDHSGHPWHDVHCSI $R L H D K Y V I I D D D L Y L L G G R N T Y D Y F L G D H G Y K N Y D R D V L V$
$S H H E K L V V V D N H R A C V G G L D I C F G R W D T H T H P W H D V H M T L$ RTHRKLLIIDSKFALVGGAGISDTEKDDDTQPWLDVEMRL CHHQKLVSIDDSTGFLGGVDLTARRWDEPDHPVHDMQSMV WHHEKVVIVDYQVCFVGGLDLCFGRYDTAEHPWHDVHCAL WHHEKLCVI DRAI AFMGGLDLCFGRWDTPQHPWHDVAMQI AHHEKFIVI DYDLAFDGGLDLCFGRWDTRQHPWHD IAMGV

UniRef90 UPI00030E2933 UniRef90-A0A024IM53 UniRef90-D7DL21 UniRef90 Q3SLK8 UniRef90 UPI000374B9F9 UniRef90-D8IV45 UniRef90_UPI000346218E UniRef90 C5WCN7 UniRef90-A4W961 UniRef90_UPI000382D9B8 UniRef90_R9PL4 UniRef90_A3PLL2
UniRef90_UPIO000510373 UniRef90-C5CYL4 UniRef90-UPIOOO3959724 UniRef90-A6FMG4 UniRef90-B2VDH4 UniRef90_I4ZTN1 UniRef90-UPI0002888867 UniRef90-UPI00030109EC UniRef90_UPI000465FC02 UniRef90_S2L5L6 UniRef90 ${ }^{-}$W5X0E4 UniRef90-M4WIR5 UniRef90_S7TUS0 UniRef90 A4BCB1 UniRef90-UPI00047E3D60 UniRef90_UPIO002889CE5 UniRef90-D5CQ53 UniRef90_E1WXP1 UniRef90-A9BND4 UniRef90_G0UL98 UniRef90-A4A7E3 UniRef90-D7AG95 UniRef90_UPI00047C9F60 UniRef90_C5KFZ2 UniRef90 U1KWV4 UniRef90-B7G133 UniRef90-X4ZHW6 UniRef90-N9BUF0 UniRef90-TOHEW5 UniRef90-Q12HK0 UniRef90-UPIO003721A4F UniRef90 UPI00046FD597 UniRef90-A1WAN9 UniRef90-UPI00037238C8 UniRef90_U3HF81 UniRef90-E9BQY5 UniRef90-J7RI96 UniRef90-U3AUC2 UniRef90 Q98PQ4 UniRef90-S2KXS6 UniRef90-D5C2Y7 UniRef90- T9KZI5 UniRef90-X5IJA5 UniRef90-G8ZSW7 UniRef90 A9EFF4 UniRef90-JOBXG5 UniRef90-K4AWH6 UniRef90-Q0JYC1 UniRef90-D2JNW9 UniRef90_K4RK19 UniRef90_UPI0002FC1343 UniRef90-M4BXL5 UniRef90-TOINN9 UniRef90-F1A1H0
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A GPEVVRMAANFDAFWR
TGAVLPDLSADFDRYW
$L G D V A K D M Q A S F E K F W H$
$Q G P L V A D H Q S V H H D W R V A L S Q L Q P \square D R$

EGPI STLMSFDYSCDWE $\square E T G K R \square L A P S \square$
VGPVVADVSDDFERYWDSAC

$I D P D A A E M E K A F D S D A E H S Q E L G Q D F \square D R H$
VGKVLPQLESDFDAYWNSE
MGPAVRDLSSSFDSYWN
VGPAAQDVSDNFDAYW
VGAASDE A A Q D F SRYWQ
EGPVVEDWI R L F A D $\square$ WESTRGDKAP DDRERPAASASAREM TGPLVMADHAEVESQWMRLGGLNLRYRWDRLLGRHSHG $\square G P V V E D V T R D F E R Y W N S R C$
EGPVVVDWVRDFSRLWD
$\square G P P V Q R$ LI MAF
MGPAVGQAEHVFDAYWN
EGPLVAEDFDSASRVWSRV
$\square G P V V N Q V S E S F N E Y W H$
 $K G E L A G E M Q A V M Q R L W E M V S$
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AGELVGQVSTDFDRYWQSDSAYPLHL
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VGPVVQEVCADFDRYWN
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LGPVAMEAATVFDRYWN
TA QVVASLLSRDFD
1 GPAAAHLAEVY
$\square$ GDPGRDLARHFVQRWNY LLREKRPSRATPL
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EGEVVKD I QK DF DD
IG PVVNVLSDSFDDYWNHPMAVPLQYFEQAPP


QGPLVPHLLYAQDLLWNWAR LRRH
$V G E A A R D M A R H F V Q R W N Y L L R Q K$ RPSRPTPLLTPPSDF
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GGDVVRSLVTSFDTYWQH
1 GKVVADDDNSFYDYW
$V G P A V L H L R E V C E D T W S W V R W R Q \square A S A A V$
IGPCIYDI AEHFVLRWNFCKRDKYKRDDDWDTMTGRTGED
$\bar{Q} G E A A E K L G Q L F T D R W Q W A T G P K T A S A P P W P E N L P P$
AGPEVRAMAANFDAFWR
WGPPCRD\ARHFVQRWNHAKRTKA
$\square G P C \square Y D \square A E H F V L R W N H C K R D K Y K R D D R Y$
VGGSAFD I S QHFDERWNFVIS K
DGKAARDVTYNFI QRWNHAKDSNRDYKSYPYLLSSETPLI
$\square G P C V Y D \unrhd A E H F V L R W N F V K R D K Y K R D E D W I I L E G R E G E D$
RGPVVSDFAA LFEQAWALAGRGPDTDALDRW
$K G P A T Y D L A K V F L D$
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YTPSlHQLEEYFESVWN
CGPAV LDLVQHFVERWNEVKKRKYSNNTDWDA $\square$ PHDVQEA
EGEIVVILEGVFSQHWTF
SGSAARLI GDVCRRRWKQATGKPVEDAP
WGPPCRDVARHFVQRWNHSKRNKA
VGQPARDLARHFVQRWNFLLR $\square K N H S R V M P F L L P P P E$
1 GPCVYDIAEHFILRWNFCKRDKYKRDDRY
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|  | 250 |
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| UniRef90-F0ZP58 P E Q P R G T |  |
| UniRef90_G9MZ00 E D L I GVQ R P K |  |
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EG\|ERAQDQ\IPNRRHDNPEEKANDE RAE VNSQMRKLIAKNERQMLQF $\square$ TALEKAASHFTG

YNKETPLEVQLNGTDA
TKH $\quad$ ENVSRK LI $\quad$ KCNSYRQAQWWSHE $\square Q R L S E H C D F L$

# K H $\square E N L S R T L T \square R C S T Y R Q A R W E F S Q K Y G T D F M K E N Q$ APEAKT Q D GK VP S T WP D S LS T K $\square$ N LD N P M N PTDGP 

K T GKEPART
PH L K $\|$ VENRERK LIKSSRDHKAWLESFRRMQHSTEWGM TKH $\square D S \square S R T L V F K C S S Y R H A R W V R S H G K A F L R D H R F G$
$K$ KQEKQRQMHEYRSAD NAPTPDRFRAVFPSL A QASHLKKGGKDENLFNPNHRHDEAHEQEVD\KRTA乌AES NMKRFRRRLARHVNDGAAQRFQAAVGRADLAALQQR
RTEREMEQFLLS LK WAAQN NDFGK


LGRPNAT\PAHWPAN TSTT TNKEKP LQVR DNGTPT SQMQAVSRHLNHTDNKFKGTAPESDPADEMTPY $\square$ PHP QRRWRDAED LEKDY LK LSS S ENRDPQPA

DGPARRGAASSP
PSTWPRPYDTRYNQETP M
SSFLDKFEETVSGVGSQLAQKDGTTDDADAYSSSTANP QAVLPKTWPRNFSSH DNRFHPDRGLFDGVST


MDQ $\square$ FRKVERG $\square$ DHTHMGHQCHEHHPADHAEN


HHPLLVRQENN $\quad D G V P \frac{Q}{T}$

A LE GEASRA G D LCRSRWKASTGEE


VA Y M S E LPP $\square Y$ R P A R CRFF Q NRPRFE E

## SPPLIGSTGY母PMT I IAPLNDQ

ALTLPQT
AFALLPDGAN

AAF $\square$ ARAA $\square A S \square A$ $\square F E A W M N V \frac{1}{\square} G$

YFSASPPVFCPEG
GFRLLP
EAAFAFD
SHRFNSFASQRSENAVKWHVDGHDYMYALSEMLDSAKDCI
THRFDSFSP $\square R M N V A A Q W L V D G R D Y F W N L S R A I L L A K E T I$ $G N D \square R L L Q N G A D F F P A L C A A B D A A Q V S V$

GVY LS S S P P D N G D A L L E RV

THRFDGFAP AbCAKGRT

EN F VKKWH

NTLTKWYVNGSGYFAD $\quad$ KA
H G S F A
PVRENTLTKWFVNAAGYF
GHRFESFAPVRNGNGAKWYVDGKDYMYAADALEAAKE

FTYMDNKYRLFVASSPPAFPRGRSYLDADLHCDAKAEK
ELVLVESSPDEARMDHPDDPD A WEVWPD M

GEPGAV
 S F A Q E Q

$S R L A G Q K P N A W R A D$ DEATFLI DGDAYFSA HRFQSFAPERDGN $\qquad$ $G Q N G L A N L L D P R D A F A A$
 LR WVLADPPAFGKRVTPWMSEG

D GNLIK WYVD GRNYFWAV
P N R F D S F A P $\square$ R R
$P \square R \square N$
$\begin{array}{llll}D R & F & L L & D \\ V & A & Q & W \\ V & D & D & G R\end{array}$
 $W N L$
D A YVD A



K NRYGSFAPVRHHGDAKWYDDGCS
EGWCH PHRFGSFAPPWFVDGRAAFEA IASAAI VMLN S T A S QVY $\square$ S S S P P P L T G R T D D L Q S I DN I I

 $\mathrm{L} \vee \mathrm{K}$ V I NRFGSFAPPRRGGNDAKWFVDGCGY
 NNRFGSFAPP RENNDVKWHVDGFTYFWAVSRA A AYFSASPP A L CPRGRTRD

GAY YTS SPPPF
ARLFVQFAP $L$ RCNTTATWWVVDGSSYMS S
GNAVALLESGQQYFPALA
IT GTRRLA PL IDGERYFA
RYGSSFAPQTTGNAK
VFVSSSPRSNAK
Y TY Y L A S S P P P F
SVYLSSSPPSFCAACAQGRTS
A A GRT P
N T Q I T

PHRFSSSFPVRENCHAKWFVVAAKTYMEYAADMMEDA TAYFSASPP A $\mathrm{V} Y \square \mathrm{~A}$ A SPPTF A L CPRGRTRD

CPSSRTQD
LDAVLGVMAGARE

N N QVVEVLVD NQSELLE SVLVQSIVNSARS
S $\square \mathrm{Y} \square \mathrm{L}$ S S PPSFCAAGRTP



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 DLQYYLYQ NDHSGQLLLERLLAAADRG VVVRLLVDDL DIASFYWTLSDEQGEEVLAELLKLPNRGVSLRIAVN DLQYY RWSDDTGGGLAREVLAAADRGMVRVRLLLDDVG YIEFFMTFENTKIENRIGDALVDREKEGLSVRVGIMQCQY
 FILDWWLTPELYGRRRLDRHLQRKARQGVKIGVVVYKEVT Y HDWWLSPELQMRRRLDRLLARKAKEGVMVYVILYQEVS HLETYDFTPDRTGSQV DDCLEAAVRRGVKVRVVL DGF H A VMSYILPTMEFWPTIDNHLRKAAYERQVHIRLLIGCW

 YUHDWWISP EDYLRRRLDNLLKRKAEDGVKIGIIGYNEVS QAQYY SWE EDSSGKLLDAELLHAA
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 FLATNFWDHSDAVTNAFRELSRRAGERGTKVIVKMVYDRF


 WI IGWDFNPD
Y
DA F TDWWLSPEDY DKRRLDQULKRKAECGVKIFVLLYKEVE

 DISSYY WSSLLR SE D TGGELI F Q K L L D N A IAA T S K l




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 UniRef90-UPIO0034B0D51 UniRef90-S9NYL7 UniRef90 C4MA11 UniRef90_G7X512 UniRef90-W5MKU5 UniRef90-UP100035FACD8 UniRef90-R6C818$$
\begin{aligned}
& \text { GF FS } \\
& \text { SFK }
\end{aligned}
$$ UniRef90-G8BFT9 UniRet90-T1HVN8 UniRef90-H2U5X8 UniRef90-11YJW8 UniRef90-UPIOOO471045D UniRef90-B6QJU2 UniRef90-V7EI12 UniRef90-UPIO003F05F3F UniRef90-C8RX32 UniRef90-L2FS82 UniRef90-M5EQE8

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130
140
150
160
 GS L H A LAA ALRERLEPAGVALADVRPTRRWWNWLQPGQLR

 PD DTVVGRSHYEE LCPDGTAGVVQUWWWQRKAGTVERRQG
 NNHQDVSSTGWQAAGVGLPPPEQMPNVDLAVVNFHRPPLG DTADKELLRNAHPNTQVRLFNPFHTRSTNLFVKGWQVRLNR
 P P S A H M P C S D L Q K L E E S G A $T L L S A H P R D E V R L F N T A R L R W L G Q F G L G L E F A L G G W H L N H$
 THSDPAMLYYLVRSLRALNNPHAHVKLFVVDVMNHTNIPYG QTMSMSSKHTK A ALLEDLHPNISCMMRHPDHDGSKDGW NRTTPTDSNYSK $\quad$ QRLTSSLHPNVMVQRSPSHERTTYYW GSAEFVD P LDRTRLTNAGAQCRDFRPRWFARYDPSRSRLR S GF LRRMKGNPYFEALAASSGTSIKDYNKVNPDAPWRS MG EHSKPAMFPF LK S LAAAMQDNGTHYLFTVPVNETQAE IPYA
 QTMTLSSRHTKNAL NELHENVMCLRHPDHIGGSSAVQFW
 YA GD N R F LEMVAHQPGIEVRRLNPFWLR GWRPFRRINH EMADLINNSEHSKRT GMNMHPNDKVMRHPDHMSSVVVL E VVLGLNSSEYT $\quad$ K K T L M G L H P N I R V V M R H P D H V P S T I L L QALTLLDSHHTKHALEDLHPNGCVFRHPDVYGFKDDDTLYF EMALGLDNS I Y TKRTLDQGLHKNIM, VMRHPDHY LSS GTMFW K H S R P S E T Y F LIR S LQD A NVN VEVK R F IVPT S PRWDR DP F S RS F GTS D F D K L K A L LDS E A GVVKF V P S S K E S Y Y WF R W D N V S HLT K N Q T T T K I L N SVMPNIVVIICERWSLI F S
ENHLPVVPEKKYT SEKVQLDAAAHEIPNDDLQVVNYHRPIFG

?



TCNSAH T KHAL RNDCP EGSK GAGNVMVLRHPDHNDFTEYW

 AALTCNSAHTKHALQALCGYGNDRDMRHPDHNVFENTEYW NVFTPTDSGYAK SRLMQLDPNIFVQRPSHLKTGTGYW

 S SV S PNLD T QLL A S Y GAADVVSLDFS G L S N L S D S H R R L T P K S Y L P S P E E I P H V D L E VM NV H T I P L G


 QA LS L S S SH TK H HLLEDDLHEN IVVVFRHP DVYGLS G GVVVLFW



 GSYSLNNGNLKGLMQCEDTTQKARVQAVVFNALTDSRWNH
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 GGRSFVAG LLESRLLRDAGVQVLIVRRELRRFSLQRHRLR AP Y A L R

 PHSPPVMLPFLKSLYRNKLDVQVRLFTVPAGPRQKAIPYA


 P D S Y K E I K D F FKE SS VE I I R Q
 GTTVVPIDSTYTKYSLLSLSPNDYVQRS PSHLRQSTEFW GTVRA GR G L TALA L L WLTSK


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Y $\square$ HSKAMVVDDRIA I GGAN


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AHHEEKMCVVI D QVI A F M G G I D L C C F G R R DR P R M P W H D DV M M Q I


RNHNKYMVTD K V VAY GTSNWSGDYFVVRTA GNQCAANA Q G

SHHEKVVVVDNHRACIGGGDLCFGRWDTSTHPWHDVHMTL


WH H E K M V A I D Q TV A F V G G L D L A F G R WD D S Q Y H L T D L


A H HEKLVIIDDQLI A F VGGVVDLYGRWDDARHK LT DL G S V Q
RNHNKYMVTTDA A AYI GTSNWSGDYFDNTAGVVGGVFEN







Y V H S K L M V V D D R L M I C G S A N I N D R S L I G K R D
WHHEK I VVVDQSVVAFVGG DDLL Y GRWDDREHRLTDVGSVT



RMHGKVWIAD GCCLADLGGGRNVGGDTYFGAPGS GARDADMLV


AHHEKFIVI DYAMAFIGGGLDLCFGRWDTNDHPWHDVSMGV
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W G K R D S $\quad$ I E D T D K Q I TL H S K F CVVVDGKRACDM SNNMADNDNL





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 RNHNKYMVTE RATYIGGTSNWS GSYFTETAGTSSLVTTQNG
 A H H EK K C L
 $V$
WH H N K Y M M
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 AHHEK LLI I DQL RNHSKFMVTD RNHNKYMVTB RNHNKYMVVTER R
VMHAAK T LI V D D K
V NHNKYMVTD K EAY
VNHNKYMVVDKVAYI GTSNWSGMYFVGSALVVNQTGSSS
WH HEKVVVVDQS I A F L G G IDDLCYGRWDD Y L HRLD DLLG
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A HHQKIVVVDDVLAFCGGIDMMAGRWDTRGHPWHDASAMV


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Y NCSAQDLGKMFEAYW
A GQAARQAQDAFDAYWASS $\square$ ARPDEQFRKVAG $\square S P$ AA $\square E D$
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QLPI QEQLKHLFERDWN
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RGP LDCQQAEQGFDQFWR

Y G
VGN $\square R Q Q \square E D \square F R R D W Y S N Y S F P L N \square S E A R F$
KGPCASLLNKHFASKW MVRGGDVFDYTRHYRTKESYGSD $R V P V V R A L A D V F E Q D W A L A G G E P S N S A G G P F S A R V E G G E V$ N GTI L NDLAYHFHQRWQFYNGS DES EGPIVDGLYDTALISW GRSLEPSLLPMLDSPATGAP

AE R DEA $\square H E Q L W D G S Y A W P V D \square L R D Y P Q P H P G K P$
Y GPSLKELQTYAGTMWENADSK
RSVAVEQAGRA
DGEAACALSD LIARERWFRATEQT LTP D $\square$ P
SGEVAGM RDVARRRWKRATSE
IGDCVYD I A EHFVLRWNCVKRDKYDTKVDYLLIEGRTGED AGG\|VTQAEQVFDSFWN
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 SGKAVS QL QQ1 F
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SGPVVQDLZRTHFT QRWNFDYDEKYSKKATRYARDPDTSSG CSSIVGEDALKDFEVYWSLGGKNGSVVPDHWPA YSCVAGDLHRDFAMY RALGGQGASLPTVWPA
S DT $\square$ QMQ $\square$ QADFERDWNSNYSRTFNTLS S W
S G TVRDQLEAVFSRDWDSEYAHK L
R

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$P G P V Q E Q L R Q L F K R D W N$
R S P
A QDVRKD LQ GVFERDWN
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$P G A V Q E Q L R R L F E R D W$
S GTLRGQLKEIFNRDWNSE
RGGLLRSQLEAVF LRDWDS PYSHD DDASAD
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T Q M G $\square \mathrm{T}$

G R Q

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S VT PALS PQGYLP
PC HASQQPDYDAP

EGLI A V Q R P K



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P
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$V A A L L H D Q P$

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RYQSFAPQSTGNAK EAVSR
WYVD GC
AVIVDA DDYFKAARAAMM
LDD GR NFWED $\square C R A \backslash L E A Q N$
 PVRTNAFAQWLVDGRDYMWNVSRAIVNMADVI T A Y F S A S P P TLCP H

VGKTTVTSLIDADQIYGKABY

S
LP D $\square W \mathrm{~L} D \mathrm{H}$ G L R Y Q H G
A HAPRGVGVVPY $\square P \square S Q G K$
$\qquad$

|  | $D$ | $T$ | $S$ | $S$ | $Q$ | $V$ | $T$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

PFD D CGAP L
TAFI GSSPPAFCPSGRTSD $\square D G$ S S Y I L E T P H

R C F N R I L
VA S P P L L G S S G VA P LT $\quad$ LSS D DVR HMS N L WH DMFDA

A VYFSAAPPGFQSC
GRESDID A MVKL
D MFDA

| I | L | N |
| :--- | :--- | :--- | :--- |
| K | V I |  |
| V |  |  |

A V $\mathrm{Y} \square$ S A S P P G F Q S C
QV Y L S S A P P
P $\square$ SARGRE D D
$Y$ SAPP $\quad P \square S A R G R S D D L S T I L S V I$


VR L IS S Y E E HLLR L VE GMM MT DL
RYQSFAPQTTGNAK
WYVD GCSYFWA
$D D G V E P V V E L$
VARADRLAC VDAA DYRHAKSAMLQA
S Y P T RHAP QRHDAK SVVS LVAPDNAEEAVI ER
NTLAK WYVNAKGYFEDVA
GMTFGAEFTPNPTTFATWMDMM
VY R N S S T LTY P S
$R \square D L S Q A R L V W S P D R V V R G V R E G N A R E K V L G L$ SPPLMGSCGTIPLTI ISD $\square$ MRHMSNMIVRA

PRRTWDWEEI CHAVLEARHLI
DVF $\square$ A T S P PLLDNG PRRTVDLEA LRAI NDS K A Y L
$P \square R$ L $N$ VA A Q WLVD GRNYFWNLS R A
Q VY $\square \mathrm{AK}$ T P P RLN N
PGRTHDLDAI WEALETINSA

$Y$ V S S S P P

GDHDVIYESG NCWQDIFD

Q S T | $V$ | $F$ | $D$ | $A$ |
| :--- | :--- | :--- | :--- |
| $I$ | $P A$ |  |  |

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UniRef90_Q5NXY2 UniRef90_A9WGA7 UniRef90-B9H5C5
UniRef90-X1MFE7 UniRef90_X1MFE7
UniRef90_G7KES1 UniRef90_R4FKR9 UniRef90_Q75KP6
UniRef90_F9WXP5
 YASVMEYFPTTRFSHPVLDNALDRAAAFAKGVRVRLLVGGG F LAA DWQDSPEGTYW RLDQVLKRAANRGVRIIYIVVYDPT HLEYY TFEDDGLGHRD DDALEQKLEEG VEVVLLLYDDL FLIGWDFDRDDEGPEKLGDFFLWLAKRTPGLEVRVLRWDT WI LD WWLSPELY LDRRRIDVMLKAAAERGVKIVNVVYKEVT Y I HD WWLS P QLYMRRRLDRLLQKKAREGVKVVFIVVYRNVE
 Fi LGWDID S R I ELIDRALFELLQWKARQTPDI QVYLNRWNY RVQVMEYFGPGRSRPVIDNALRSAAARGVQVELMV QFETY $\square F D V A G D G A E V A R A L E R A A R R G V R V H L V V D G A G T$ F LATNFWUYS DADTNALRELSRRAGERSDKVVVVIIVDRE

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

A NE | $G$ | $L$ | $E R R$ | $R$ | $R$ | $V A Q N$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $G$ | $V$ | $V L$ | $L$ | $L$ | $W$ |
| $G$ | $W$ | $D V L$ |  |  |  | $Y$

$Y$ | Y |
| :--- |
| Y |

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150
RLTQPFRF ${ }^{160}$ VSGLAWGAEVWHDLRAAGVPLSDPAHGWRVQLGNYAGTFP AALTLSSAHTKHTLEALHPNSAVFRHPDLYGSVGDTVLYW ALGGKNYEATKYLREKCLWKKHANL FTLTHPTLDGPNKW GSKNLSDREFKRFRAKA GAFKAM FRGRTLATULRWKAHPRDT DKDDGAHPDAAS QALTHSSHHTKTSLENLHPNDTVFRHPDHLPDRPTVTMYW APLASWARLSNGPY SVFLSAERESFSEAKWALSGADNLHFIFDGQLPLGAS A DWNTKKPEDDYLK S LAALDPNVQKVVTRPVADGGFDPYA GQVAEPWGSRLVQAGAQLQVYSPLGRLGLLLPRRWRRLHR NHQNVSPKEYTGDKGQGPAPDDIPNUDMEVINYHRPVLG GAA PMDDSYTKYSLLDDLHPNDPFVQRSPNQIRQNTFFW GEMVPGQGGTNEQAARALDNGLPPTGPERDVLHIYHFKSR DHSRKEMLPFLK SLDK INGTHHGQVEVRDFTVPQKK IPFT LIEDLHEN DACQRHPDHSGGELVYYFS ESAVP DDSQYTKFSLLDLHPNI FVQRSPNQFRQNTFFW
 GTRDEVTAKYFRGSRVQCVLCPRNMYVRGYDFRPTDSDFY ASUSRGKDAVLSRLIEAGIEDPREYITFHGLRTHAMLNG GAL KTLFHGQTLLRIAQWDKDPQIHLARLDGHHPPAG TSQNKCFFKSGGLMQTHDKETRKFFKHSYVTCVLVCRMFS SWEQLWNAHAPVRHSEWLPAKEDTKGLDMEVINFHKVLGG ELLALGNSGYSKRTLMLLHPNDKVMR PHTDPSMFPDLRSLQAAAGVSVDVKVFIVPVQNKSNQFFYS俍 YQDGFDHQLKHYNNMRMIKYLKDNNIDVVPYPRRYQGGGS NHTRSNMDRFGKSLASDDGTSKGSMQVKLYRVPVYKIPFA TSRSILGFKMDGFMGTRDEETRRFFKHSSVQVLLCPRRHS SVAEFKMATHDQETAAYFRNTKVHCVLCPRNPDDGRSMMF RHTDKSMLSYDKSLHVLTMDRKVHFEVKLFVVPVGKHSNR ASTTQQIMKYSYNTIKNGPNSMFIFFCTLRNYGFAVTEHI TS SPF VKNKNQDEEAFAYFNHTKVDCRKCPRLHHMFPT LFF NHTSSDMDVFGRSLAERFNDQAKLFCVPAYTPVEHEMPYA NAPQTSAEDTAELAAAVLSGAEVREVDLRAVTG GTRGTMKKEYTGKAVGGLDSKAEDPNDDLEVMNYHDPMGG THDEETRRFFKHSSVQVLLCPRNAGKRHSWVKQREVGTIY HDGGSSDPVQLFQNIANITVRQVDYKKDAGGV
GKKDDITTEFNMDTAEELKRRGAVVRFDSPK
SHTNARAYAYMHS LQDQGGKCVRRRFDQVPEMQYGNTPFS THDEETRSFFKHSSVQVLLCPRDAGKKHSWVKQKEVGT PKPYGMKPWQVQKEVRALEATGAYFRYVPTRFVSGDGAYR AHTAAKYYSYLHSLADLSSQLQCVYVIQVPDMQYGSDPYS RDSDPDMLPFLQSLASQQHDSUQUKLYTVPVANQSDLPFS GSRYTA ATWLARHGIPVRVNGHYDI
PLYPDNEPDNLIDFKAALVRLIRAYWE VVPEFVIGRTKMT GWLEHTMNALRTK VQRLRAADRHGRFHIYYPHVDGLGEK PARAAFTRFYGETLPEAURGVGVPGGFKVAFFKAKDAVTG RHTSRLPAEDAFRAVAR
THADILPKHTRNYLESLHPNTGVFRHPDHVPTGYDLQLFW GGDRANDETFQRFADAGIAVKWSNPKFYV G WEEQNRKLLKDANEAGIST GAFTADGR HGISDWDULDTFASLRTLRRFGAKVRKQ RAR KNG WYAAEENRAVTDRLEQWAQKVDAPLSVRLARP REDRFG R R GLALGDNSEYSKRU GUMHKHPNUKVMAHPDHVSSSVYG GLIGAAPGETNASMYKAFADKYPHKVPVYGVPVRGREVFG SRPAKKFPLSDLDALERSAAVRVVDMPRLTGGVL
AQS LPTKGFPDHDTETLRRKGAAEVRNVNMPRLVGGG
GSPADPKENTYFVPGAERLRKAGVRLRYLPSPY
SPKQVFNNHMEDKEEEYLGKKAEIPNDDLQVINYHRPVVG SHDNLFMQTHDEETRKFFKHSSVNCVLAPRYASNKLSIVF GLRFLSSLLESLSGLNTNGSUEARIFKPTPAAMQTVMVRER SSRTTPTDSKTYRSPSHFQTGTFYWA
HYPDLLTSFLRSLQALDDGAPNSSIEVKVFNAPVVISRER TSVGLLKKDGLMATHDEFQNTDVHCVLCPRNPGLQISTMF PLVFGVDRE LPPTYGFGWRAHRRVHLAYDNTHPVS G
SLEDPVDAKFAGDIEEGGDPDSWEETTAFLYPGSKDSFFY SHNKFMQTDDEERKFFKHSSVNGVKFGLIKKDRDPES TSKSMFGYKYDEETRSFFKHSSVKVLLCPRSGGKGHSWLY


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UniRef90
W2T558 UniRef90-M4АMT7 UniRef90_l3K2H2 UniRef90-G9MVX0 UniRef90-A0A023LH69 UniRef90-UPI00037DEAE7 UniRef90-A1K6E5 UniRef90_C1N7K0 UniRef90-A0A011 QYV8 UniRef90-N4VAR2 UniRef90-G8RYG8 UniRef90-A0A011 R017 UniRef90_C1ATS7 UniRef90-UPIIOOO3827471 UniRef90-F7PP59 UniRef90-UP10002F74D4A UniRef90_S9XTEO
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190
SANREYALI ${ }^{200}$ HSHAKLLVVDGQLLMAAGFNYDDQHYPTSHPSGRDLALVV AHHEKLCLIDGRIAFMGGDDLCFGRWDTNQHSWSDISISLD SHHEKLAVTDDKПAFIGGLDपSMGRWDVHGKYF
H HQKVVVIDDCLAFCGGПDMT $\square$ GRWDRRAHPWHDATSALL AHHEKLCLVDGEIAFMGGLDLCFGRWDMNHHPWSDVALSV AHHEKICIVDHDVAFVGGIDLCFGRWDTPQHSVVD H HQKMLVI DDAI AYCGGIDVTLDRWDTREHPWHDDSSRF AHHEKLLIVDHTVVFLGGLDLCFGRWDTPQHALVDTGFDD HHQKIVVIDDEVAFCGGMDVADARWDNRHHPYHDVQMLV $R V H S K I M T I D E R L A W V G T S N W S G G Y D D N S$

T FHA
 VLHSKFWVVDGRHIYVGSANMD WRSLT QVK ELGVI I AHHEKILVVDHMIAFVGGDDLCFGRWDTPQHSITD SCHVKLLI ADGAVGVQGSGNQDTQSWFHSQEVNIMVDSH WA RNHAKYMVTED DAYI GTSNWSGDYFDSTAG QLA D F H H DKLCI VDNKYAALGGLDACFGRWDTHDHPDADVH AHHEKLCIVDHTLAFVGGIDDCFGRWDTPQHTLVD SHHEKMVSVDQSVVFMGGIDDLCFGRWDTVDHRLQDV ILDHK L WVVDGKHFYVGSANMD
 SHHQKAIVLDQEVSFVGGLDVSYGRYDGPREPWHDIHAKV AHHEKICIVDHTVAFCGGVDLCFGRWDTPKHVLND YVHSKLLIVDDNTVICGSANIND
AHHEKLCLI DRKVAFMGGNNARVYDFADVGNWWSDVSLSL SHHQKVVVIDDDVAFCGGIDMTVDRWDTRDHPWHDATTML SQHQKCVI TDTKTVFLGGLDLCDGRYDTPDHPWHDLHCKG TFHAKFLI VDRKVALI NSNNI QD AHHEKLLVVDQAVAFLGGLDLAYGRWDDDHYRLTDLG





 YVHSKMMIVDDY TTI I GSANDNDRSMDGTRD
A HHQKTDTVDTKMSFLGGDDLCDGRYDGPREPWHDAHACV RNHNKYMVTDNAAY GTSNWSGTYFGGAS LVVNQTLAQM VMHLKGFVFDNTVLYSGS IDNDVMGYNGRYDRYHEIH
 SHHQKTVIVDADVAFI GGLDLCAGRYDTPNHPWHDLHSKV THHQKNVIVDADIAFVGGLDLCDGRYDTPQHPWHDLHSKI MHAKYMIVDNKNVAVNSANWSWDSLD SQ LHNGGVRI $R$ LHSKLMVI DKRIVYY GSHNYTHSAL KYNNETSVRI RVY HNKYFVTEKAVYVGTSNWTPDYWAGDGMVIRADDSSQ THHQKTVIVDAD【AFVGGLDLCDGRYDNPDHPWHDMHSK』 FYHAKYC V NGHEAEI GTANMDWSAFHRNREYLYDTT RVYHNKYFVTEKAVYVGTSNWTPDYWWG $V G M V V K P D D \square S Q$

 MHNKFMI I DGRTVETGSFNYTAS ADKRNAENVIVLRD WNHTKII ACDGVESLVGGHNL NMDLFRSYPPVHDVSAVV



 AHHQK VVI DDA LIAFCGGDDMTVDRWDTPEHPWHDATTAV
 KI HAK GVVVDGETALVGSLN WNDHSARENREVV VALAG VLHLKGFI I DDTVIYSG
WHHEK LVI I DQSVAF LGGG $\square D \square A Y G R W D D N E H R L T D V G S V I$ VLHLLKGFI DDQVIYSGASNYKERYRFDRYHALADSMVMI
 VHAKVIVADGNTALVGS DNMSQSSMNANRELGADLTAAG TFHCKYMIVDRK IAVLQSNNDQDNDND THHQKCVIVDNRKAFIGGLDLCDGRYDTPEHPWHDMHCKV RTHNKFVVTDDTQI G GTSNWSGDYFDGGSTGAAFVAQQ HSHVKLHVIDGQDVTVAGYNYTGWHLPDTEPSLHDVGALRM
AKHEKSCAVDRAVAFMGGLDHCFGRWDTPQHPWHDVMQV RTHKKLLVTEKTVVI GNSNWSGDYFESGTTGTAFIMNQ THHQKIVVVDGEVSFVGG DDLCDGRYDGPREPWHDIHSRL SHHQKIVVIDDALAFIGGFDLTERRWDTPAHPFHDLMMAV

THHQKTVIVDDADVAFDGGQDLCDGRYDTPAHPWHDLDSSKV
RNHNKYMVTDN TAY GTSSNWVGDYFTKTGG


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$\square G P S V K D L Q R H F D G R W N F$
T GPAAQA LGEDCRHRWTRAGGKDVAPVRSEPAQAEVAPNF T GPVVGQLTRHFVQRWNYLLRQRTPSRPTPF LLDPPDF AGPVAAVLARLVRYRWHFGGGKRARVDPKAWPPSWPACDK NNEAAARLDRLYQQ
RGTLVAFASTVMERFW
E GPVVDAMYDMLLIS WAKHTKPS $\square P M \square S S P A A Q R Q \square P S H H$ Y NCSAQDLEKTFQTYW

A $\square \mathrm{CQQWRRA} \mathrm{\square DRNQ}$
RQPAAKRLQAVFDRDWNSEYAKDL

D CPCAKDMSK DF QVYW A LGEENATMPDAW
EGP【AWDVLHNFEQRWR\|QGGDKEHLVDL

NGPVVESTTEHFTDRWNFDFDEK
QGPVAQALGDMCRARWEVSGGSAL
EGPAAYDMLKNFEQRWKKATE
EGPVVDAFYE $\square$ ALHSWY NRLNPPKPYEPPRGPDGKV
GVPTVQELRHLFERDWD
TKD DRKELQDVFERDWN
HSEVDNLI DEI FNKDWKFAWQR S I R DQLLQDVFDRDWSSEH
DGPAAYDVLKNFEERWDKASKRH
DNPDARDFESDFNMDWMLAQGAP LSNAYAKFAATPD DAPD GGPIA WDVLYNFEQRWEKQVGKELLFS

T GEAAWDVLTNFEQRWTKQCDPSFLVPS
ETNAQHQLAQLFERDWNS $\square$ HATP
E S C LA Q DAT R $\square F G V Y W S \square G G P S N G S ~ L P P Y W P A R \square S$
EGPIVDSLYDMALLTWHKKLDPPLPTRDTPAALGELGSF
DGPAAYDI LTNFEERW
DGPAAYDVLTNFEERW
RNPLATTLLAVFNLDWQLA
ESADVA

DGPAAYDVLVNFEERWLKAAKPH
NPTVVRAVQAVFDADWN
QSYLVNQFSQVFERDWN
$T G P A V K Q A E Q L F B R D W D S D Y A S Q \square R V D D L$
SQHASQQLKAVFNRDWHSE
EGPIVDSIYDTALITWKH
HGAASFGAQKF $\square N E L W N$
R G D A
DGAAARDADEKFVDAWREQTGEEGPPSAKTRPS $\square K$
DGEVLQRLNAVFESDWERRAAPRSDVLRAFPPARPEPAES
HDPVVAQVVEVFDADWQ
YDPAAAEI NRLFDADWD
D GDAAKAVGELARTRWKAATGRELGPVD
EGPA GYFGRVFADD
MGPSPGSLTAETTESMESLSHKDKNESNKSPPVLKNVDDR
AHPAVNDL
Y NCSAEDLGKDFEAYW
SNCTCRDIAKIFDVYWEVA
EPGAFFRLLRTMERDWRNAR PDNPFLLPPVEGVI

HGPLVVAEMKGIFLRDWYSE
RGPAAQDGVAVFDDLWRNAQQVR CPEGTPAPEV
VGQPARDLARHFVQRWNYMLRIKNHTRTMPFLLPPPE
TGPLVEEMVENFERDFN SEYAHPVEDYF
EGPVAWDVLFNFEQRWRQQGGKD
DGQAALALAGDARARWMGATG
TIPAVENYRVEFAEM
E GPAAYDVLTNFEQRWRKASK
SSQAAADFI QEFKRLWQQ
DGPAAYDILTNFEERWLMA
A GT $\square R A Q L E N \square F D R D W N S E$


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UniRef90-X1MFE7
UniRef90-G7KES1
UniRef90 R4FKR9
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UniRef90_F9WXP5

N S $\square$ P A S Q T P Q P S

TQQEDES
PVMEDVS
$P$
SSQVR $\square \mathrm{F}$ GQDRA
■G DTPSTGPHSYKPT
ARRCPPSHPDAARPTG

D A T $\square P$ E P WP D S Y S T $\square Y \mathrm{Y} \mathrm{V}$ E T P L QL QL N G T P A

A P LVSE A S S K T S S S $\square$ GRQ

D A S D T D A
FRHDADGSDTRSWSRQQTTFVDAEPA $\square G$

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UniRef90-T0RJ81
UniRef90 K1YY27
UniRef90-U5VD81
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UniRef90 H7EGP5
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UniRef90-M4R465
UniRef90-R9NGP4
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UniRef90 A9VB79
UniRef90-U1N8M3
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 LERLLRYi GSAKKSI GVDRAMLLETNKSAWDERI RLFNQAKERI KAFREHLLSAIEQATQRI
 SRFPAAT

FEDVAVTAFAAPDCAYEVFGATVA
WLLAT ANTREHDAKVTVLQDSEDETAALAKDIANAQNS
WLLATLCQAKSELFMLPYEQDKAFKSLHSSLKHAQKSI PHVQLDGGRPYEP RRCWEDVERAVINAREMV I IQVI HSSRREL REYFQVVHQALREASHSI F QVLYSAEQFRHHLIQAI RQANHR
$\square \mathrm{PK} \square \mathrm{P}$ QTVADVKT L Y S P
DAADYFHHAKSAMLDA
DAANYYHALIQAIAGGA
EKVEFLADSRAFKTRILQLIHSAKSRI KPLVNGEEAFAAVHLAIAKAKQSV.
NKARMIVDAADYYALLVRLMERAKER EA $\square$ KNLQNALKSAQK
$\square 1$ MS PPAVAT DAPESPSAGQAALQ GRSD ALIDVI NSAKE

DRLLACIVDAADYF
GERAKAQLKSAMLQARERI
IVDYVKGAKQAV
DADTWWLNPVRFKEELLSRRIRNAAHSII

EFYETLKDRI RHAKKRII
QENCWEDI C Y A I S EAAHHMI
TVQPLLTPDNYPEVVLSLVGEAQERL

PPATANEGAQLQVLTEAADDALLELI DSAQDRL S YPTSFEPKEDETQGVQLLTAPDNAERVLVDRIDRADESV
$\square$ LD S P
NESACVTADLNQALDALRCQLVDEAKETL $R$ VARARTAFYETLKAKI KGA GNTTDTFFPANNNMLQPVVIGAIINRA
 GREYYYEVLKTI EEANESD
 A A WL S AL RNATHSV
RSDLAAY TTGN AVTSFTVTKDFYDSVYEDLTKTKER

V L E
NAVRLLVDGAVYYEARLLNLIMEAADQFV
SVY $\square$ S S S P P
 NVQUVRTFSCQYKQYNEFAPRGESQFQARIKALKNAKNFI


L P KLIP QTVADVRTLYAP LS WLE ELMKI LANTNTREATLSSEALHTLLCAMISSATQRI DFLARQPLAFQVPAVRVLRSPDEFYNTLDNVRSAKN ALLCARGRTED LDRALLDTVIDAAGDRVV
 A R V E

YLARQPLAFQVPAVRVLRSPDEFYNTLLDNVRSAQRRI


PPPPGEVRPQVYFDEERAVEAMNERALQKTRYRC


| $\square V E T \square P \quad L L D D D E \square Q L T$ |
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90
$\overline{L L V} V G W D V D P D P H S P E T|L| G R F L A R L M R S R P G|L| H|V| R A|L| K W D M$


 Y I L D WW L S P E L Y L R R R L D V M L Q A A A E R G V K V H V I V Y K E V Y I V A L Y L Q D DEA GR GI L TA A Y Y EAA K R R NPA L D I K V F V D WH
 Y L V G W S I Y Y H K V K A GRE V L T A A Y E A K Q R N P D L D I A I CVVD WH



DI A MYAF
$T A D Y: A$
$\mathrm{L} V \mathrm{~N} \backslash \mathrm{Y}$ EFTD
Y A A M Y M F K S Y D N $\square S$
$\begin{array}{llll}R A M A & G & D R A A \\ R \\ R & L & K & S \\ I & T & D A A\end{array}$
DIAlly S F T N

 YI A GWVRDPRRPSSETLGQLLIDRKADEGVTVLMLVWD DGL $D \vee G \mid V Y Y L S D$ QVMYYEKYPDSPS RKI LRALAAAHRRGVDVRVI I
 HI SVVMD YFPNNRYWPVI DDAL RKAAYNGDKVKLLI S K WK I




DISYSFTN
K E I
D V A I Y S I T H P D
DI A A Y S F $\qquad$ TSHPI
YVSVMDY LP P $\quad$ RFWPDI AAALDAAQNRG


 ALA 1 Y DF RLGEALAK PVVDALVHAASTGVSVRI AYDEDGT Y I T A L Y L L E D D E A G R E I L Q A L L D A K A A R P E L D I I K L L V D Y H $M L V G W D F D A P D G Y P N Q L G A F V E A V V E R T P E L H V Y L L L K W N G$ DIA AYSF TSSKPITLALVDAQNRGVNVRVVADKKSN
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 DLEVF Y F S H $R P L I E A L I R A Q Q R G$ EIVQAS I GSRRRQPLLEAAI RAAERG VVDVRILLLS S Q
 YL DG WD FDEDGK S E H E F D D D A L L R E A L E E D N P D DMTA Y H L
 YMQTQYI HPSGHAGDEDHDALIAADVKTDKGLDVRLID


 $H V A A Y L I \quad T S T T L V D L L A G A A G R G I R V Y V V V$ LLSAYADDPTGAT TGVGKVFTDVVKRGGNINDILNWQN HFVT C Y WA A S D G $\square R$ Q T L L QL A E A R S R S G P P L N V S I GF S S W RMMAYNFSAPD E I Q Q Y IT T NESK TRLN PYLATAIDNASRRGVQVRVLLDSYWY DIA S WI Y F K N R E HF S QI DNA I RMSVS RGI K FRI LV S G D QK

 QMA A Y L F T S S D
 $F L S T L Y$ G $\quad$ GKSEQD L V M Y A L A R AKKRGVDVRIVV


 Y L VA L Y L E H D D A GREI L N A L Y Q A K Q R R P E L E I CVV L V D WH
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 D S L N P R P
 DVT F MYSFSRDDT GR $G R L V E A V \vee A A Q R R G V A V R V$

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UniRef90＿F6TGQ1

P FPTA乌DHPHEPLERWNRNTGRRLLARLDGELPDGA PFYQGWQRSLVRQLLRQLQAANARDRDGIYTLWSHRIIRN DHLPCYKWDSNDKCTKKGSDEDRFV QVPEMQYGKDPYA WYVEEENR ELVRWLEDQAEAGGDPIEARLVDSERFE AALTLNSAHTKHALEKLHPNDSVFRHPDHAPAGYDVVLYW GLI GASQSDGNAALYREYAEKYQHPDEVLGVPVRNREVFG WYVEEENRQLAAWLTDQAAAADLPLSARLAAPGDAABFG GLIGAEKAQGNAAMYQAFADQYKYSIPVYGVPVRNREVFG SLF GQTYPPATWVSKLGLPDPSELNGLNLEUKSIFLMPFS NSRNCHVK पNLDHLSANGVVC SGKIIRMEGNELFYALSSHPNVETKVYNEGNLAMPWKTQ G GLIGAEASEGNAALYKKFAEQFEETMPVYGVPVRGREVFG GATPDLWMAKFFRLQKGLVSGFSAFVWMVSEPDDDFTKMT
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 GTHDEETRKFFKHSSVICVLSPRYASSKLSTFKQQVVGDF GAFAADGR RRYMTPLFVVNWLTDRRLHLEMDGAHPLGS GESDHREDFRRYLVAARLGQTQEPPRVT
LAFAA LGADPAPVGTAAWLREQLGDSEVVLKP TTTPSGKL GLIGKKDDGGNDRMYRRAMEQAQUADEILGVPVKSREFMG AVLAAPGRLVPSLALSLFGGDRIHFALDGHHPFG
RGTRESPEASCASLLAPLVDEFGADRAETRMYHTPNDTG RGTRESPEASCASLLAPLVDEFGADRVEDRMYHTPNLTGL TSHDTFCLKTDGVMQTHDEETKKFFKHCVLAPRYGSNKFS FRNLFGSERNVIRRLKKAGMDDGPDHLLRYFP GLIGADKSDGNAALYREYAEKYQHKDDVLGVPVRNREVFG GEMLPRMKQQLNEEEKKLFKVYWYVGRDLDRPIHATKQIR NRDAFGREKNGVPNRQVAWELHKTGIDVRWCATQGE WYSEEENSELADWLNRKAEDENLSLDAKVADPGD ARERFE ATEMTDTSRUPFE：CRDEENDE：KTDGGLDNGKPWEVNN
 GLIGHKGDSGNYQMYRKVMQAAKHPDDULGVVKSREFMG TSHDKFGDSTVGVMETHDEETFKFFKHCVLAPRYASSKDG TSQYQTDAWVEKLANAGVV PRSVLRRQA NSVENRAAYSYLRTNGGKV GNFGLNNTLFIKKMQSYGIEIRARKTYGDPFTFPNGHFHQ GAPGANSRPGNAAWYQAQRQLRGLDVVIHGVPVQTRELFG GLLGAGRQPGNAAWYQAQRQLRGLDVVIHGVPVQTRELFG NDLGEQPAGVREKLLAAVKKFEHFTVRE KMEFSRNKG LKKYRSFNLLKARDALNA PVVSPGNGAKAVLLFDDRLPTMVS ANLSGASLDAAKNLLVNAGVKLRTNNHYKD NTEDEADNDEMVALINRIAAT ENLPDEARCADLGATGLE EEQKLMFS YLHSLSVILHSPVENRFIQVKFILIPQTKDR DHLLLNAQENQRLGTELNEAGAEVLLD QRVRRDA SHSKPPMFPFLKSLAA HPWSRDGYAYPRAAWPK GGPSDP R RDLSVKSLFFLPFS FDEDARYARHALGLLRNAGIAVRSVDVYPIL RGTREAPNPSCASLLVPLVDRVELRMYHTPNLTGMRKKYG ESKATGYDKYLFDMDAP DQKLYPN KLLKZY STKKELSL RAQRGRNADWYAEMKAAYSLPDEQEDATYGVP NNGRELFG GGVSNRSAA LDRLARS GR】GAAAANTNADWYCAMASQHPEQSVPVYVPVNTREAGG NDKSFDRGSDПERLGESGПPVRIDQSEF
GTRVDAQGRSSATALLHLAEQGRCALYHTPRLRSVARQLL SNAWYDARGNEALVEQVTELHAQGVPMQARGARPAGQFG KYSDPSEDHFDRSLQAEGVDDQMRRFVVPTTNELERGSGG PTNPVTEPASYTELKKGL IRWEVMPEDWLGRFYRDDTKMT GQTAGRPRVRRDEAYAQVRRTSENCERLAGVDLCYDDRPG CSKFMGADVYSLGEKGDLCTMDNNKMV


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UniRef90 W9AC04 UniRef90 U1QQW5 UniRef90_W1S000 UniRef90-I1JSY8 UniRef90-ROKAY2 UniRef90 ${ }^{-}$N6U5X6 UniRef90-UPIo0035D4A90 UniRef90-U4KH95 UniRef90-L7U815 UniRef90-Q11HF5 UniRef90-17KE60 UniRef90-D4H2N9 UniRef90-V8CFV0 UniRef90-A7XQW1 UniRef90-X1V6G4 UniRef90-K4A5W2 UniRef90-B7JB53 UniRef90-XILVIG UniRef90-UPIOOO3941771 UniRef90-A8QFQ6 UniRef90_COZMJ2 UniRef90-Q2NRN9 UniRef90_U2YHQ1 UniRef90-A0AO24HGA2 UniRef90-N9VXM7 UniRef90-T1D0X1 UniRef90-UPIOOO248C973 UniRef90-DOFP34 UniRef90-E9QJQ5 UniRef90_W5FRI4 UniRef90-K0FO90 UniRef90-K7QV26 UniRef90-G7VDJ8 UniRef90_W5WDL3 UniRef90-Q12NB3 UniRef90-A9ECQ1 UniRef90-G0RGW7 UniRef90-B9HHA5 UniRef90-B9GZ57 UniRef90_DoD800

UniRef90 R118P8 | UniRef90-R18P8 |
| :--- |
| UniRef90 $\mathrm{S} 8 \mathrm{~A} P 4$ | UniRef90'UPI0003B3A612 UniRef90-MONOO1 UniR Refo-R2RED2 UniRef90- H 6 C 011 UniRef90-I1AYF2 UniRef90-UPIOOO464F757 UniRef90-D4ZK57

 YVHSKVAl VDNKWATMGSANL
THHQKCVIVDTQTAFLGGGDLCDGRYDTPEHPWHDDHCKD RVYHNKYFVTESAAYI GTSNWSSDYWAGTG\|VIRADDFTS KLHAKGVVVDDHTAMVGSLNW NANSVENNREVALIV AHHEKLLVVDRNLVFMGGLDMCFGRWDTNSHPDADAH VLHLLKGFIIDDTVIYSGAS LNDVYLAQHDRYR KI HAKGLVVDGEHTLVGSVNW N N WSVRNNREVALLL VLHCKGFII DDTVIYTGSLNNVYGHYQDRYRFDRYHVIQH VMHPKFIIVDRQTAVLPSCNSSWEEWFEG RMHDKYVLVDEKAY FLGGGNNTADYFDGDYPNUYNTDPKL VLHCKGFII DNSVIYSGASNFKDRYRFDRYH
WNHSKGIASDGLESLVGGHNLNMDLETSYPPVHDVSVVM
YDHAKYLVVDGNTVLVGSENYKPGGYPAPGQGNRGWGVCL
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THAKLVI IDGIITILGSTNWTYYYSLAHNN EVVSVLI ANHAKYMVTDNS ALIGTSNWSADYF DNTAGAGRQHNTTL AHHAKVIVIDDALAFCGGIDMTVDRWDTSDHPWHDATYAV HHQKIVVIDDCFAVCGG\|DMSTARWDTPEHPWHDVTMLL VLHLKKGIIFDNTLVYSG
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NVHTKLYVIDNKTVITGNDNPTASGFSRNKG VMLVI MHDKYVVVDGKSVWTGSTNFTDDAWTRQENNVLQVN VLHDKGFIVDDAVIFSGANNDQDKYRFDRYHLIEESVELAV
 RQHMKLYGVDDEDGMSGANLSSDYFTNRQDRYH
 TNHTK GMVIDGHTVMLGSQNLTA VVYAGTGPNRDASLVI
 KCHAKGVVIDREAAVVGSLNWNN LLHDKLILVDDNYFISSGRNDGNRMDKSYEATYDFDLII CHHQKIVVADDSIAFCGGDDVTEDRWDTSDHPWHDATSAM VLHDKGFIVDDAVIYSGASDNDDYGHQGEKYRFDRYHVIE YHHQKCVLVDTQTAFVGGIDDCDGRYDTPEHPWHDLHSKI NVHNKGIVVDGSTVMVSSQNWSADGTGRN R RDAGLI
TLHAKDVVIDGKVAFIGSHNWSE SGGYWNNEVSVE ENHRKITSVVGKVLLGGSSNLNPDTDQGSFREFQLYDVKV FVHTKLLI: DDVYIVTTGGNLSYSFTTNREFFR YHVIG VLHLKGSVVDDCVIYTGSLNNVYLDRFDRYR
VLHAKVLVVDRNKAVVGSANFT YSGMTEGNYEDAVLL SYHQKTMVIDNAVAYVGGDDLATDRWDTDDHNWDDGHIRI VMHPKYVIVDETKAWVPSCNVAWERWFEG K THNKGVIVDGRAVLVSSTNW NTNSPGFNREAGVI। KIHNKGVLLSESKATIIGSSNYAPEYFYKSTGTAIIVEEEV SHHQKLFV DARDVAFVGGDDLSHQRRDDTRHPWHDAMLEL RTRYSVEVTAGSALVLDETGAGA
VMHPKFVI VDRKRAWMPSCNVSWETWFEG CTEF HDKYMVIDRRTVQTGSFNYT YS YAA YSAAHRNAENVLVVW LQHMKLYGVDDED DMSGANLSTDYFTNRQDRYH IHHDKVIIVDGNTVETGSYNFSRAAARKNSENV VVIVN YIHSKVVIIDDVYLSVGSANW VLHLKGFVEDDTLLYSGASDN NNVYDQQYERYRDRYHII FHHAKYAVIDDTAL DTTEN WKPSGTGGRSNRGWGIVV VLHDKGFVVDDTVIYSGAS RQHMKLYVVDNKVIISGANLQEEYFTQRVDRY K 1 HAKGAVIDNETAVVGSDNWNRH AETKNREVVFAV RVNCNSYLVTDRVAFIGTSSFSGEHFAGDGLVLQDMEYN VLHLKGGFIVDDTVIYSGAS LNDVYLHQHQKYRDRYQLI WNHTKVVSMDGTSALVGGHNL NMDLFRSYPPVHDVSVVV

 VLHFKGFI DDDSVLYSGASINDVYLHQHDKYRYDRYQCI

UniRef90 G7Z2Y2 UniRef90-UPI0003160904 UniRef90-M8BSX8 UniRef90-H2KZO5 UniRef90 D8J4S7 UniRef90-G9MTQ1 UniRef90_W9AC04 UniRef90 U1QQW5 UniRef90-W1 So00 UniRef90-I1JSY8 UniRef90-ROKAY2 UniRef90 N6U5X6 UniRef90-UPI00035D4A90 UniRef90-U4KH95 UniRef90_L7U815 UniRef90- Q11HF5 UniRef90-17KE60 UniRef90-D4H2N9 UniRef90 V8CFV0 UniRef90-A7XQW1 UniRef90-X1V6G4 UniRef90-K4A5W2 UniRef90 B7JB53 UniRef90-X1LVI6 UniRef90_UP10003941771 UniRef90 A8QFQ6 UniRef90 CozmJ2 UniRef90-Q2NRN9 UniRef90-U2YHO1 UniRef90- $\mathrm{J5H8C7}$ UniRef90-A0A024HGA2
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D P A QVKAFQRDFDEMW
$K D P$ G L A A Y F REVVF L F D T G

| $V$ | $P$ |
| :--- | :--- |
| $V$ | S A S R Y Y A E MF |

EGPVA WDVLHNFEQRWRKQGGKDL
E E E I DRDVYQERLD Y L WE FN QP QEHELS K
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$K S E E V A Q L S D Y F Q T V W$
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A GPVA GALAELGRDRWAVATESELPRLSD
T GP LIE Y LHRNFAQAWQKETGETLL
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VNKALKYYNKMFEQ
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TGSAVGQLREDFQRDWHSEYAQSDS
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DGEAAKA I GELARARWKSATGEQL
AP VDE $\square$ A GET
$H N T \square A R Q L T T I \quad I \quad L N D Y R$
D S QVAAAFLT DFEQLW

S GPAAAAF GELSRRRRWLRAT GDE $\square E G P S$
R P D $\square$ A EKYTREFNR LWS EAADTKATY
D GPAAYDVLINFEQRWRKATK
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RHPAANAFAELFEHDWTQYGENAPQPESRRL
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KNSLIGKQGNVYFNELWKAPYAVDKSHSSRPF
T GPAAKALAELSRDRWHRATEETLERPRD
APTLAATYQSEFRRLLWNEA
SAELAASMRQM
EGPAAYDVLINFEQRWRKSTK
H HEAAA YFL Q $\square F L H D W$
K S K E V A Q
$\square$ GK FETKFLEDWH
K N P AVQ T L K N I F LA D F T W
S P A L A D A MVDLVVRALLHH TATPRLDLPAPP
EGREAA I A RIIEEL


E QPGVAMYFRVFDADWSPAVRSPHPPTD
K G D N N H Q I K A VF DR Y WH S S Y T Q K L Q
$R G P V V G D V L R T F V E R W D D S H Q R R E R M P R H P F P D P P E A G R H$ $T V G A Q L Q A D F Q R D W D S P Y S T D L G S L A R W$
DGPAVNQLVRFYTSVW EPHGGQQVPGDPAAPASVV
NAP ELLAAQYLADWNWA
M P D V A A Q Y L E H WQ D R WD R G T
T NPALAESFVSF DE
MPA I A S QY L SHWQS RWEMGT
A DPGAAELATVYATDTDVTTWEDYRSNREFFESSPAQGSF
TNEVLAD
R
FESEFEKLWN
E GAAARYYGRVFAADWNNAHGPRLT LRERGVLLTGAVGAV
N N S L R T DLM A IF LR D W
HNPV LA D
$H$ GKP A Y GS Q L F L N NMWK C GNDLLS K E
GEPAARLYHAAFAALWR
$Q N Q L V D E Y Q Q E F E K L W W Q F A C N R L S V A D$
E GAVGE D LGALFEGFWAMA
R NPQMADI MYD WN L V E G R GVNRRDDSCRPK S P E


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PARFEPQTTDAA

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$\square D$ A VE K

PKYEHLP P LD Y A S S N T T A K LG H Q

Y K N K G WVD G H $\square$ R $\square \mathrm{H}$ G P T A K D Q

ALYGRDAALELQLN N S A A

A S $\square \mathrm{GKQ}$
RARFDGVPT

HEERDHRALDRLVKHL

N Q
$R L R Q A G G Y L K V L A D R V A D F L L E Q G S Q H P Q$
$\square K$ A R Q P L L K A T D WF LT E QE $\square$ T D S R G G VP
$L$ IGRAYRQGCK VS LY Q D A H VP
$E \square R A L T S G F T W A F W E S A Q R E L L A A G S L P P$

VYEESEEHALQK VNI
QP Y L E P TRWF LTTEE MRTSRDGYK

VWL R D A D T N L A R P F S $\square P$

R R P Y P T R F D P P A P VV $H V \operatorname{VIP}$ Y E GDMDDPAGGVRHVIPWKGN


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UniRef90 X5NZJ4 UniRef90-UPI00046656B7
UniRef90-TORSX6 UniRef90 W5NE72 UniRef90 ${ }^{-14 B 893}$ UniRef90-P44704 UniRef90_S3DL22 UniRef90 G3VES0 UniRef90-S0AP04 UniRef90-F7NZV0 UniRef90_H3HA10 UniRef90 H3GSI8 UniRef90-M4D038 UniRef90-L5JR54 UniRef90 E1REJ9 UniRef90_UPI00035D2B72 UniRef90-F2UEW8 UniRef90_Q7VP35 UniRef90 E3L3X7 UniRef90-V4ZW99 UniRef90_S8BUG5 UniRef90 A0A024JDV9 UniRef90-W2JGG9 UniRef90-V3SXZ2 UniRef90_G9ZB76 UniRef90 A0A023RRL1 UniRef90-W1J0D9 UniRef90-G4ZSD4 UniRef90 UPI000467CE03 UniRef90-N9PD46 UniRef90-L5M9D2 UniRef90-W2XJR5 UniRef90 A0A024E4Q8 UniRef90-G4MM94 UniRef90-Q2FRZ2 UniRef90 UPIO00441624F UniRef90 Q0UFY0 UniRef90_Q779Q3 UniRef90_K7M8T2 UniRef90 D4BW26 UniRef90-S6ESV0 UniRef90_K3X456 UniRef90_A3VZE7 UniRef90 - 2 H 3 M 3 UniRef90-U1PFL2 UniRef90-A9FN00 UniRef90 K3WX31 UniRef90-14EAV9 UniRef90-H3H221 UniRef90_E9RVB7 UniRef90_D0MS08 UniRef90_C8WVC6 UniRef90_A5FFM3 UniRef90_M9SBM3 UniRef90 ${ }^{-}$A0A011PSH3 UniRef90_W9AZR6 UniRef90 UPIO003798CB2 UniRef90 J3GP18 UniRef90_U5W584 UniRef90-A0A026VZA4 UniRef90 E8TM03 UniRef90 J3PFU6 UniRef90-Q0FM52 UniRef90-V9DUR0 UniRef90 C4QVM7 UniRef90_-J6HJZ0 UniRef90_M2RI37 UniRef90-V4XQB9 UniRef90_A7HHG6


NPNEFYALLKDKTSKAEERV |  | $A$ | $Q$ | $A_{1}$ | $N$ | $K$ | $R$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $Q$ | $T$ | $R$ | $A$ | $A$ | $Q$ | $R$ | $M$ | VAA A GRMSPAPSAS VVATAAARRDLREAVLQQTARAACRRML $P$ VR A G DVEEDH YA P $R P L V I D T P P E V V E H E V V F \quad D E L Q D T V I Q G I R D A K Y M I$ $R E G \| H \quad L Y T K G N R V K L Y V A S A P Y F S D V V D D M L E V R D V V$ PLI S D R D $\square$ G P C V L

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


SAPCPGPARLAPRAKVQDHEKALIAMDGEAQHH! $\mathrm{M} V \mathrm{NM} \mathrm{I}$ M N A K H S I Q DFYT TLLDKI D NAKERI $P \square V Y$ A A S $\square$ D T GF S P E G T A L R L



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UniRef90_C4QVM7 UniRef90_J6HJZO UniRef90-M2RI37 UniRef90-V4XQB9 UniRef90_A7HHG6

V9

S VVIGVYY $L$ S D ${ }^{90}$
0
R P\|R 100 K A A H A GlV| 110
110
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F
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 D ${ }_{\mathrm{H}}^{\mathrm{H}} \mathrm{F}$ Y S
 Y I E Y FVLVPE

L L A MEVMPR\|QRVIV


ILQQY IL

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|  |  | A GDKVDDLLIVAERRDKGVDVRI MA

 ( DGMLREALI L RDI KVRLLI SCW

 DVAAYTF DI ATALYDQADEAGEQULDALVAAKQQKPDLQQVRVVADDFH Y I E YFVLVPE Y I T GWSVVPD DT LIRKKLGELL KKKAEENVTVQMLVVWDDRT YASVMEYFPTTRFRRPVRNALREAAQRG V RVRLLVSCG D $\square \mathrm{NVYEF}$
RMSGYSFTAAD

TGTSI A GLLAEASGRGVDVDVLV LVMTQTF TSRALADVLASASQRGDTVRVVVDASWL YL TALYFEQDEAGQQILAALYQAKLANPALDI QL LVD WI
F
L L A GYTML

$\qquad$
YIEYFIYVP ELLDDAVVMEVLK Q



 D MAMFYLSE
$R N$ I D A L K Q A Q QR GVVNI R M M N K D A F DMAMFY L S E




 , YLS TLY I | Y | L | S | L | Y | l |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| D | L | L | L | I | I | R | E | D | N |
| Y | I | T | G | W | S | V | Y | T | E | Y T A LY L E K D L L VR D SRRPKRRRCNTWVLMLVWDDRTSV F L A S L L T I S S L Y L G T GALLERELVATLA QKLREEPNVQVVTVLDYS




 YLTGWVPFKPHEPDTKLADLAEHAVKRGADWRMLVW


 EII CWMYFKRGKTSSLI GDLLLIDKKA HE GVQVVRILCWYDTLL


 QLESSQDMDSGGPLQHAIVARISSQARRKREPFYALILTNCM $F$ L T S L Y L GK D


$\square A \square V A A F V Q D S G L E L L Q D P V F S A A D R G A \quad R \| R L I T G D Y$

[^2]
B
B
B
5
B
B

| 5 | 8 | 9 | 9 | 8 | 8 | 4 | 3 | 6 | 7 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $B$ |  | $B$ | $B$ | $B$ | $B$ | $B$ | $B$ | $B$ | $B$ |
| $B$ | $B$ |  | $B$ | $B$ | $B$ |  |  |  |  |
|  |  | $B$ |  | $B$ | $B$ |  |  |  |  |
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GMKPWQVRKEEREDEATGAll $140 \quad$ LIHTAPYRFTSHGDHYA ${ }^{150}$ S LK QVAKNHQRVDPSDWAGLGLPAKEIHDEVMNYHRPDMG GTYDIETMLADFQLNAGLEGGPRAFCTPAIQQSDMNGLGA ASTGGEYSTLKNA QTSPFTNAGYIKYFYESVEPDRSKYPNKFKIVTTKAKRSG EKTHPLTFNFVWSLCMEQANCSLEAKFFNPRGQRDVSLEG NKFQFNEEQNRHLGEADERAGGEVLLDQRVRGGGSHHQRL RGTREGEKSSAADLKRLTPRAAVYLFHTPHDRGLLKRFLG
 KKTHPLTLNFDKSLCMQLHNCSDEVRFFSRKEKDNDDQHG ANDPNSRTGRRYSAAQFLANKNVAVRLN $P$ LDDVHPGNVRLHLYRVPQLEHWAAKLLPPPF DETMG TQTNPLTFNFVWSLCTERPNCTLEVKFFSPKEQRNGTAYT YTSGYQ TMYHSNINMTLGNA GAEKSATNADWYCEQRQTYQDPDDPNMFFGVPDNTREVFG GLIGEASSEGNAAMYKSFSDNNEYK DP DFGVPIHRKEIFG KPRGPQPQADLQSLLNSGAQVRMVDMQKLTHGVL

YKQNADRYSAITFLANQGVAVRLN $D K Y$ V GLIGQEGARTNNDFYREIAKDYEHPIQUIGVPVKKRERFG

 GSPVGGVSDEEKNVCS\|LGSVRDPVLSMATENGVFHAPYR
 GEKTTSSNADWYANMKQQYNDPPEQEDAVWVP $\square N G R E \square F G$ RSTREHGRRFPDQVE $\square R$ LIFHTSELF ILKRFVPRRFDEGFG GGLSRREAAADDRLTRAGAA NLKQADKNHDYT GEKVRDPSPEEVKGDTLQVVNFHDPPVG

 GRDGAAAANTNADWYYRMAQENPGVDVPVYVPVNTREALG GLIGKGKQGGNHLMYQAMAARHEHQIEIYGVPVKGRELLG GQRGGLTASSVTMLAPLLKEFPDNVELFLDRPPPFNETLG G LK G $\square P N R Q V A S E L H A A G \square$ G KETDPLTFNFISSLKA CTEDANCKFFDDERENACATKEE RSFNLKARNVINA IPASP DNGAKAVLLFDDRIDPSVVSSY
 SLLQQYPPSTWEKQLGLLSEEKLRAARIVELHVKSLFF LPFS SPKQVFQNHDHDKPEEWLPKPEEDPGI EFEAMNYHRPIAG RGTRETPEASTASLLVPLITEFGPERVEVRMYHTPNLTGL GSWNKNDT FVMSSVKSLQTMCSNNDFSVKDFHDK PLLKEDGDMATHDEDTENYFYDSEVHCVLCPRNPDDGGMF GRIGVAANATNADWYYDVAKHYPEIEIPI YGPVNTREALG RGTREAPSKCSATLLAQLLKPAVVGWKESVIPKRFNEGLG GQRGGQDKSSVSMLKPLIAEFSDNVQLFLYKPPPFNETMG YHMTKDERVRFRAETPRLRSDCRVDNRDCFPDRDMDLHPA RGTREAPKSCSAS LLSPLVRDFDNRVD DRFKTPADTDFG $G G L S T A Q R T Q L N R L S N N G I A$ RHPRATMFETLRRLVHANVHVLGASEFL
S $\square$ Q WS LE QLE NRALDNGLSLDVLRKYLIVGRMQYHD VLV
$D P G Q Q H A L D R L R S I A D D V R M K P A G A$
$E N V Q P L K E K F P N K F K M Y S M K P S L D \|$
 SNDTERAQNHEVRDLINALPPPEQYGPARFVYDDRLPH QSRNRTAVEALRQAGALVRYYRPYGGELL
REFGAKGQAGLVKTLTMLKKFGFNGTDNDKVQC AEAEPLGVDISTELALLKSDDDGGADVRLINFGDHPQRFV RSGEAENRASRKMLEDAGVEVA ARAAHHDKDGKLVEGVSGMRILDDVGDKDHRDKHMKD ELLSF SSRPNRRLAEELNIAGAQVVLDHRV HRNG $R \square A Q T S E N P T P G D N V S N W F G R F K Q N R N D A Q$


 GWDARHGHGLLNTEAANRLTKAYAENLAMISPGQSKPAKDG | GWDARHGHGLQTEAAHRDTKAYAENLAMDS PGQSKPAKDG |
| :--- |
| LS DQWSLEQLEDCASAYGLTSEELWQHLQVGRLEHDGVLI |
| L | RCTRDSPKKYGSRVDVRLYHNTNKFWSMVLPSRFNEGLLGG ANTGTASEA AMNLLTSVGQPVRTVSAYK

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

[^3]


[^4]UniRef90 UPIo0026252F5


UniRef90-UPIooo39C80AA UniRef90-E8MZL1 UniRef90 V9ECR6 UniRef90-131X78 UniRef90-LOIXR7 UniRef90-G4YYR5 UniRef90-F1L4C7 UniRef90-G8AEC6 UniRef90 G3Q6A6 UniRef90- $\times 5$ NZJ4 UniRef90-UPIOOO46656B7 UniRef90-TORSX6 UniRef90 W5NE72 UniRef90 ${ }^{-14 B 893}$ UniRef90-P44704 UniRef90-S3DL22 UniRef90 G3VESO UniRef90-S0AP04 UniRef90-F7NZVO UniRef90 H3HA10 UniRef90 H3GSI8 UniRef90-M4D038 UniRef90-L5JR54 UniRef90 E1REJ9 UniRef90-UPI00035D2B72 UniRef90-F2UEW8 UniRef90 Q7VP35 UniRef90- E3L3X7 UniRef90_V4ZW99 UniRef90-S8BUG5 UniRef90 A0A024JDV9 UniRef90 W2JGG9 UniRef90-V3SXZ2 UniRef90-G9ZB76 UniRef90 A0A023RRL UniRef90-W1 Jodg UniRef90-G4ZSD4 UniRef90 UPIO00467CE03 UniRef90 N9PD46 UniRef90-L5M9D2 UniRef90 W2XJR5 UniRef90- A0A024E4Q8 UniRef90-G4MM94 UniRef90-Q2FRz2 UniRef90-UPIOOO441624F UniRef90-Q0UFYO UniRef90-Q779Q3 UniRef90 K7M8T2 UniRef90 D4BW26 UniRef90 S6ESVO UniRef90-K3X456 UniRef90 A3VZE7 UniRef90-12Н3M3 UniRef90-U1PFL2 UniRef90-A9FNOO UniRef90 K3WX31 UniRef90-14EAV9 UniRef90-НЗН221 UniRef90 E9RVB7 UniRef90 DoMS08 UniRef90-C8WVC6 UniRef90_A5FFM3 UniRef90 M9SBM3 UniRef90 ${ }^{-}$A0A011 PSH3 UniRef90-W9AZR6 UniRet90 UPI0003798CB UniRef90 J3GP18 UniRef90- U5W584 UniRef90-A0A026VZA4 UniRef90 E8TM03 UniRef90- J3PFU6 UniRef90-Q0FM52 UniRef90-V9DURO UniRef90 C4QVM7 UniRef90-J6HJZO UniRef90-M2R137 UniRef90-V4XQB9 UniRef90_A7HHG6

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DGVMVGKLPRDF
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TSKLAGYYAKVFDEDWD
VPK L A R QYAEEWRVLWEGGVDLPAKY
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QNDAVKLYKDEFLQMHNFASQKRQRAAS
DHPAVNDLTS
YNCSAQDLLAKVFEAYW Y LGQPDSS $\square P S P W$
NAPGVADYQSTFDQLW
TDA $1 V Q A H Q Q L F$
HGPAAKYVANNFVARWNSDY LIPRGLDDELLDFENPSYED
DGPAAWDVLYNFEQRW
A STVQEQLVRLFERDW
ESPALASFEDIFDYD
QDPGVAD
RGPCI QSMHTLFTQMW
ADSLVTFLQQHILTD
T G
$S D P A V A D \square A A \square F D A D$
EGA $\square V D S F F D S A M \square S$ WDSA $\square$ NPH $\square$ GTHTSFYEDNSRA

CNPA $\square$ A D TMSHYVND

RHE $\square$ SAE LDDD
RGPAVGALDTTFRERW
$\square G P V L K D A G Q Y F D A A W T N A N G R Q \square T V D Y A K Y A D E S K A$
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EGPIAWDVLFNFEQRWKKQGGKDLLIPPK

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HSRAAGELASVFAHD
TGDDAAALGRM LDASWQ
A GESVQRLQQEDFNMYFGSSGVHYAMADVFLVESGHGGCD
DPSAAKSFEARFQQLWNVSR

EGPATK DVAQNFFDRWNSDTQPSQDLMDDLLDFENP TR V VPAFAEAFESD LDH HQ $\square$ ARGSSYP
RDPVAQYFQEDFDFDW
SGKGAGYMERVFENDFDTVWGDTVCLEDAYPDLKGYRGTL



EGDEVAVLAWAFRRLWR
EQAAVMPFVNEFERIW
SNPVAWAYRLLFDEDW
 RRPDVKALRERLAKIW SGPCVNELQQDLLNMYMGTTGK $\square Y$ T WDQVFER $\square R G T A T Q K$
D D P T VA Q
$R Y L Q H W Q S$ RWDVGTDW

ESSAVADFARTYAADWR
RDP $\square$ AA S VKEAFEA VWA GATP $\square$ T $\square E W V T$ A Y A ARARPPGET

[^5]

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UniRef90-V4XQB9 UniRef90_A7HHG6
lupas_21
lupas_14
lupas_28
jnet
conf
sol25
sol5
sol0
$\begin{array}{llllllllllll}0 & 6 & 8 & 8 & 6 & 1 & 5 & 6 & 7777889\end{array}$
B B B B B B B B B
B B B
1

| jpssm | - | 50 | 60 | 70 | 80 |
| :--- | :--- | :--- | :--- | :--- | :--- |

90
100
$130 \quad 140 \rightarrow 150$
jpssm $170 \longrightarrow 180 \quad 190 \quad 200$


[^0]:    80
    

    $$
    \begin{array}{rl}
    H & H \\
    \text { EH H } \\
    \text { H H }
    \end{array}
    $$

[^1]:    $G S P D$

[^2]:    lupas_21
    lupas_14
    lupas_28
    jnet
    conf
    sol25
    sol0

[^3]:    lupas_21
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    lupas 28
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    conf
    conf
    sol25
    sol5
    solo
    jhmm

[^4]:    lupas_21
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    jnet
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    sol5
    sol0
    jhmm

[^5]:    lupas_21
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