

Alignment of DNA-PKcs (protein sequence)

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mosquitoes -----MESDLSTCLRQLKTCLDTPQIP-----QARSIIDRI
Zebrafish -----MAADTSIVGGIQGYLLKLHSSLEDTVSTNVAIVCHDIIGDL
Xenopus  MLPASAGGSSGDGGGEEDEVVVSAKSAGGLLGSLLHQLHGLLSLSPGMGN--EARTLLRNL
Chicken  -----MAGGVQECLQELH-----GCLQPGDAMRGYGLLRGL
Mouse    -----MAEEGTGVRWLLQLQEFLSAADRCSAAGASYQLIRSL
Rat      -----MADPGAGLRCWLLQLQEFVSAADRYNAAGASYQLIRGL
Cattle   -----MADSGSGVRGSLQLQESLSAADRCSAAVASGQLLRGL
Wolf     MFS-----SSQIPRVFLIPSRRELRLVLQLQESLSAGDRCSAAMASYQLTRGL
Human    -----MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGL
Chimpanzee -----MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGL
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mosquitoes TQLIVEKAEESSQAETDFNLECM LTSANGLVAFLNKSFSSAKHFGKVIESTFELFRKTI EK
Zebrafish  GQECMIT-KNE-NELVLQTSLLFAKEEGLLSFLRRSLSTEKILRETRVEIMNFLGAF LQR
Xenopus    AEECLVS-AGGSSALDFNISLIFSKEIGLLAFVVRKLSSEE-FKDCREDALKFLSTFLEK
Chicken    GEACLTC-LAG-GALALHVS L VFAPERGLLAFVCRSLGVVEE-FRECREEALKFLCVFLEK
Mouse      GQECVLS-TSS-AVQALQISLVFSRDFGLLVFVRKLSLIED-FRDCREEALKFLCVFLEK
Rat        GQECVLS-TCS-AVQALQISLVFSKEFGLLVFVRKLSLIDE-FRDCREEALKFLCVFLEK
Cattle     GQECVLS-SGP-ALLALHTSLVFSKDFGLLVFVRKLSLIDE-FRDCREEALKFLCVFLEK
Wolf       GQECVLS-SDP-AVLALQTSLVFSKDFGLLVFVRKLSLIDE-FRDCREEVLKFLYIFLEK
Human      GQECVLS-SSP-AVLALQTSLVFSRDFGLLVFVRKLSLNSIE-FRECREEILKFLCIFLEK
Chimpanzee GQECVLS-SSP-AVLALQTSLVFSRDFGLLVFVRKLSLNSIE-FRECREEILKFLCIFLEK
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mosquitoes HSPLM-GKRMVIVPI----ALRYIQSSSVPARSRELA-----ALVLQDSVAYGC
Zebrafish  MSATVRGW EKNYAVELKDT CIVVYTKDKSAKCRNPALDLLIKILYLT KDSSITQNLRI GD
Xenopus    IGSNV----QPYAMDIKTL CVTVYTKDRAAKCKIPALELLIKLFLQLLKN SYKIEEFKIGE
Chicken    IGERA----HPYACSLKQTCISVYTKERA AKCKIPALELLIKLLQSLRRSCLMEEMKVGE
Mouse      IDQKV----MHYSLDIKNTCTSVYTKDR TAKCKIPALDLLIKLLQILRSTRLMDEFKIGE
Rat        IDQKV----LHYSFDIKNTCTSVYTKDR TAKCKIPALDLLIKLLKILRSSRVMDEFKIGE
Cattle     IGQKI----IPYSLDIKNICTSVYTKDKAAKCRIPALELLIKLLQTLRSSRLMDEL RVGE
Wolf       IGQKI----TPYSLDIKNTCTSVYTKDKAAKCKIPALDLLIKLLQTLRSSRLMDEF SIGE
Human      MGQKI----APYSVEIKNTCTSVYTKDRAAKCKIPALDLLIKLLQTLFRSSRLMDEFKIGE
Chimpanzee MGQKI----APYSVEIKNTCTSVYTKDRAAKCKIPALDLLIKLLQTLFRSSRLMDEFKIGE
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mosquitoes LQNETYAQLDQLPAELLLL V FQOGKLPNRFQONLYELLGQLAQNFPASIP-EPDRVRDIYL
Zebrafish  MFNKFY GEL-----CQKHKIPD TVLGC IYELLGVLGEVHPSEM VNNSDKLYKAYL
Xenopus    IFNKFY GEL-----ATKSKLSD TVLEK VYELLGILGEVQPCEMTDNSEKLFKAF L
Chicken    IFNKFY GEL-----AVRSKISD TVLEKIYELLGVLGEVHPADMINNSEKLFRA YL
Mouse      LFNKFY GEL-----ASKSKLPD TVLEK VYELLGVLGEVHPSEMINHSENLFRA FL
Rat        LFNKFY GEL-----VSKSKLPD TVLEK VYELLGVLGEVHPSEM VNHSENLFRA FL
Cattle     LFTKFY GEL-----ALKAKIPD TVLEKIYELLGVLGEVHPSEMINNSDKLFRA FL
Wolf       LFNKFY GEL-----ALKTKIQD TVLEKIYELLGVLAEVHPSEMINNSEKLFRA FL
Human      LFSKFY GEL-----ALKKKIPD TVLEK VYELLGLLGEVHPSEMINNAENLFRA FL
Chimpanzee LFSKFY GEL-----ALKKKIPD TVLEK VYELLGLLGEVHPSEMINNAENLFRA FL
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mosquitoes NAAEKQLL-EENYPSLVSLAGAVRGLD LFLVHFAPSENDREL RQ-RLYLLVKKLSIWEEN
Zebrafish  GELKGQMTSTTKEPKLPV VAGCLKGIAALMVNFTKSVEEDPAASKEIFDYALKAI SPQTD
Xenopus    GELKAQMISSTRNPKFPV IAGCLKGLSALMINFTKTMEEDPKTSKEIFDYTVKAI SPQVE
Chicken    GELKTQMTSATRVPKLP I VAGCLRGLTALMYNFTKSVEEDAQTSKEIFDFAVKAI RPQVD
Mouse      GELKTQMTSTVREP KFPVLAGCLKGLSSL CNFTKSMEEDPQTSKEIFGFTFKAI RPQIE
Rat        GELKTQMTSTVREP KFPVLAGCLKGLSSL CNFTKSMEEDPQTSKEIFGF TLKAI RPQIE
Cattle     GELKTQMTSTVREP KLA VLAGCLKGLASLM CNFTKSMEEDPQTSREIFDFALKAI RPQID
Wolf       GELKIQMTSAIREPKLPV LAGCLKGLSSL CNFTKSMEEDPQTSREIFDFALKAI RPQID
Human      GELKTQMTSAVREP KLPVLAGCLKGLSSL CNFTKSMEEDPQTSREIFNFV LKAI RPQID
Chimpanzee GELKTQMTSAVREP KLPVLAGCLKGLSSL CNFTKSMEEDPQTSREIFNFV LKAI RPQID
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mosquitoes H-----DSSLPALYRALMNTLFVIVEKLDLSTRKRTFQDDGQE-----Q
Zebrafish DTGFVDGAPAAKNYNLRDLNRHLYDALVQSVMKIVEKLDLSVQKVSAADEVQSDA--SAG
Xenopus DSIFSEDEFSTLNSPLQSLNRLLYDELVKSSILKVIKLDLTLQKQDSGQENDGGI-NSSL
Chicken ESIFEEENFLTGN SPLQSLNRLLYDELIKSSILKIIKLDLTVQKLVHEQDE-NETDSAF
Mouse DFILGDETFLFVNSSLKSLNHLLYDEFIRSVLKIVEKLDLTLKQTVGEQEDGST-ADVV
Rat DFILGDETFLFVNSSLKSLNHLLYDEFIRSVLKIVEKLDLTLKQTTGEQEDERT-ADVV
Cattle DSSLADEAFVFNSSLQSLNRLLYDEFVKSVLKIVEKLDLTLKQSVGEQEDENKAAGIW
Wolf DSSLADEAFVFNSSLQSLNRLLYDEFVKSVLKIIKLDLTLKRNVEHEDENEATGVW
Human DSILADEAFFSVNSSLSESLNHLLYDEFVKSVLKIVEKLDLTLLEIQTVGEQENGDEAPGVW
Chimpanzee DSILADEAFFSVNSSLSESLNHLLYDEFVKSVLKIVEKLDLTLLEIQTVGEQENGDEAPGVW

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mosquitoes ELFFSDPNIDLLPTKPKDYHIFLNVLVELYRDMLHGPQTPAAVRELFADWIRPYFERFVRQ
Zebrafish IVLSSDPTANLMPNPKPKDFIAFINLVDFCELLP-----SRNPEYFAQWMHPLCHELILQ
Xenopus IIATSDPAANLYPNKPKDFTAFVNLVFCSEILP-----KEHIEYFESWVYAFGYELVLQ
Chicken IGPTSDPASNLPKPKPTDFIAFINLVFCRDILP-----DKHVEYFQPWVYSFGYELIIH
Mouse VIPTSDPAANLHPAKPSDFSALINLVFCREILP-----RKHVGFPEPWVYSFAYELILQ
Rat VIPTSDPAANLHPKPNDFSAFINLVFCREILP-----KKQVSFFPEPWVYSFAYELILQ
Cattle VIPTSDPAANLHPAKPKDFSFAFINLVFCREILP-----EKHVEFFGPWVHSFSYQLILQ
Wolf VIPTSDPAANLHPAKPKDFSFAFINLVFCRDILP-----EKHIEFFPEPWVYSFAYELILQ
Human MIP TSDPAANLHPAKPKDFSFAFINLVFCREILP-----EKQAEFFPEPWVYSFSYELILQ
Chimpanzee MIP TSDPAANLHPAKPKDFSFAFINLVFCREILP-----EKQAEFFPEPWVYSFSYELILQ

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mosquitoes SLNRPLVSGFVKLIEMGLATAERIGYFRQQEAPSE-----DFRTTQMLLAFYLEQTI
Zebrafish SIRFPLVSGFYKLLSLSMGIAKKTQYFQDVKQCP-KQVGGSTMENACFSLAKFGKEVCV
Xenopus STRLPLVSGFYKLLSVVMKNVKKIRYFEGFNSKTYKKAPEDPERLSCFALFAKFGKEVSS
Chicken STRLPLISGFYKLLSVTMKIAKKIKYFEGVGPKSLRKATEDPEKSSCFALFAKFGKEVTA
Mouse STRLPLISGFYKLLSIAVKNARKIKYFEGISPKSLKHSPEDETEKYSFCALFAKFGKEVSV
Rat STRLPLISGFYKLLSIAVKNARKIKYFEGVSPKCLKHSPENTEKHSCFALFAKFGKEVSV
Cattle STRLPLISGFYKLLSLAVRNARKIKYFEGVGPKSQKPSPEDEPEKHSCFALFAKFGKEVSV
Wolf STRLPLISGFYKLLSVAVRNARKIKYFEGVMKSQTQAPKDPEKYSFCALFAKFGKEVTV
Human STRLPLISGFYKLLSITVRNARKIKYFEGVSPKSLKHSPEDEPEKYSFCALFVKFGKEVAV
Chimpanzee STRLPLISGFYKLLSITVRNARKIKYFEGVSPQSLKHSPEDEPEKYSFCALFVKFGKEVAV

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mosquitoes QRALYAIGELQLACLRFVLNAPVRLLDVDFIEDKTRKQPLMVDVFRTAFLRGRSLLSIARA
Zebrafish -RMKQYKDELLAACLMFILSLHGMVALDI-----KAYIPALQAALRLGLSHAPLATA
Xenopus -KIRQFKDELLASCLTFVLSLPHDIIIMDI-----KAYIPALQIAFKLGLSCPPLADV
Chicken -KMKQYKDELLASCLNLLSLPHDIVMLDI-----KAYIPALQNAFKLGLSCTPMADL
Mouse -KMKQYKDELLASCLTFVLSLPHDIIELDV-----RAYVPALQMAFKLGLSHMPLAEI
Rat -KMKQYKDELLASCLTFVLSLPPDIIKLDV-----RAYVPALQMAFKLGLSHLPLAEI
Cattle -KMKQYKDELLASCLTFVLSLPHDIIALDV-----RAYVPALQMAFKLGLSYAPLAEA
Wolf -KMKQYKDELLASCLTFILSLPHDIIELDI-----RAYIPALQMAFKLGLSYTPLAEV
Human -KMKQYKDELLASCLTFLLSLPHNIIELDV-----RAYVPALQMAFKLGLSYTPLAEV
Chimpanzee -KMKQYKDELLASCLTFLLSLPHNIIELDV-----RAYVPALQMAFKLGLSYTPLAEV

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mosquitoes ALYSLQRIVRFRYPPLRREIRERLLRQVLPLEPFLRTRDSTQPPAQSLRLAKFKRHRTA
Zebrafish ALDALESWSSF----IPAAIILQPHYTDILPHLDGYLKTSSSEKDDSNMEVTFVSTGSSK
Xenopus GLDALQDWSTY----IPSDILQPYKDIIPLLDGYLTTTDISDESLSDLDAVRISRALQK
Chicken GLDALEDWSAH----IPRHIMQPYKDVLPPLDGYLKNSTTVPEPQNNWEVRKLSRAAQK
Mouse GLHALKEWSVH----IDKSIQPYKDIIPCLDGYLNTSTLSDET KSHWGLSALSRAAQK
Rat GLHALKEWSVH----IDKSIQPYKDIIPCLDGYLNTSTLSDET KSHWEVSALSRAARK
Cattle GLNALEEWSVY----ICKHVIQPYKDIIPSLDGYLKTSALESDETRSNWEVSALSRAVQK
Wolf GLNALEEWSVC----ICKHIIQPHYKDIIPSLDGYLKTSALESDETKNSWEVSAPSQAQK
Human GLNALEEWSIY----IDRHVMQPYKDIIPCLDGYLKTSALESDETKNNWEVSALSRAAQK
Chimpanzee GLNALEEWSIY----IDRHVMQPYKDIIPCLDGYLKTSALESDETKNNWEVSALSRAAQK

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mosquitoes IGLIVTEQEQIGLSSEANGGSHGAIVEQYLLALDHLGKLFQQRKALFNGCSSDESARSGR
Zebrafish ESLALAHFDEKSV-----GTVQQCCSSLDHLKRIIKHKADSLNINSKRRIIPRG--
Xenopus ESLALSHADEKSL-----GTTQQCCSDAVDHLKRIIRKAASLNKAMKRRVPRG--
Chicken ESLALHTHDEKSL-----GTTQQCCDAINHLKRIIKHKAPALNKEGKRRVPRG--
Mouse ESLALAHDEKSL-----GTVQQCCDAIDHLRRIIEKKHVSLNKAKKRRLPQG--
Rat ESLALAHADEKSL-----GTIQCCDAIDHLRRIIEKKYISLNKAKKRRLPRG--
Cattle ESLALAHTEQSL-----GTVQQCCDAVDHLGRIIEKKHVSLNKAKKRRCPRG--
Wolf ESLALAHTEKPL-----GTIRQCCDAIDHLRRIIEKKHVSLNKVKKRRRPRG--
Human ESLALAHADEKSL-----GTIQCCDAIDHLCRIIEKKHVSLNKAKKRRLPRG--
Chimpanzee ESLALAHADEKSL-----GTIQCCDAIDHLCRIIEKKHVSLNKAKKRRLPRG--
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mosquitoes RQLIPTELGGGEMEHLVWRWLFQCAARQRLYRRKCMELFARLSKTVRDVATAEQFLAKQF
Zebrafish --F-P-ADQSVCLSNVVLWLLTQCGRPQTECRHKSMELFFEFVPLLPGNSSPAMWLDEQL
Xenopus --F-P-QGSTVCLFDIVLWLLVQCGRPQTECRHKAMQLFFEFVPLLPGNKTPSAWLDQV
Chicken --F-P-ATKSVCLQDVVMWLLVQCGRPQTECRHKAMELFYEFVPLLPGNILH--LLGADV
Mouse --F-P-PLTSLCLLDLVEWLLAHCGRPQTECRHKSMELFYKVFVPLLPGNKSPSLWLKDLI
Rat --F-P-PLTSLCLLDLVKWLFAHCGRPQTECRHKSIELFYKVFVPLLPGNKSPSLWRDLI
Cattle --F-P-PMASLCLSDVVQWLFNTNCGRPQTECRHKSIELFYKLVPLLPGNRSPSSWLRDLV
Wolf --F-P-PSASLCLLDLVQWLLAHCGRPQTECRHKSIELFYKVFVPLLPGNKSPSLWLKDIL
Human --F-P-PSASLCLLDLVKWLWLLAHCGRPQTECRHKSIELFYKVFVPLLPGNRSPNLWLKDV
Chimpanzee --F-P-PSASLCLLDLVKWLWLLAHCGRPQTECRHKSIELFYKVFVPLLPGNRSPNLWLKDV
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mosquitoes THEQIVSIC--L-----QADSLQGIERASTLESIRNEQTNPPIMNISLWLEYFLATVDMY
Zebrafish KQRGPGFLISCLEGGG-----LLSQPT---LREIEAPFSIRGTLQWMDLLLAALDCY
Xenopus KKEGIIFLINRFEGAGHSDGKHMGIILNIP---LHDLHEPFSMHAFLQWLDMLLAALDCY
Chicken KKRVDVFLINKFEGGSDAKSPSGILSQPT---LRDMQEPFSLTVMRWMDFLAALDCY
Mouse KKKGISFLINTFEGGASSSDQAPILAQPT---LVYLOGPISLRGVLQWLDLLLAALECY
Rat KAEGISFLINTFEGGASSSQSGILAQPT---LLHLQGPVSLRGMQLWLDHLLAALCY
Cattle QKEGVPFLVSTFEGGG--ARDQAPAGLLAQPT---LRHLQGPFSLRAALQWMDALLAALCY
Wolf KNKDTSFLINTFEGGSGDRPSGILVQPT---LFHLQGPFSLRAALQWMDMLLAALCY
Human KEEGVSVFLINTFEGGG--CGQPSGILAQPT---LLYLRGPFSLQATLCWLDLLLAALCY
Chimpanzee KEEGVSVFLINTFEGGG--CGQPSGILAQPT---LLDLRGPFSLQATLCWLDLLLAALCY
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mosquitoes CWLRRREGLVV--DELL--QTLLSRILPAFRYFLRSVVFNTVQEIIMSNIIEPVES--FQQRSYEQ
Zebrafish NTFNTLRCLQLQRILGTCEKSSFLPAVHFFLTELSDM-----IQAARACFRLGNAGQ
Xenopus NTFIEMRFLKANIILGNADKSSFLKAVHFFIVYLSMED-----IKAAEKFFTVGSKSS
Chicken NTFFELRMIKPHEILGVNERSFFLEAVDFFLETIALHD-----IHAAEQCFDCRSRGN
Mouse NTFIEKETVQGQEVVLAQVSSLLKSAFFLESIAHDS-----ARAVEQRFQVGGAPGP
Rat NTFIEEKTQVQEVVLAQVSSLLKSAFFLESIAHDS-----ARTVEQRFQVGGTGP
Cattle NTFLDAGTLSAAEVVLAQVSSLLKSAFFLESIAHDS-----IAAAQCFQVGGTGD
Wolf NTFIEEKTLPKAPDVLGTETQSSLLKSAFFLESIAHDS-----ITAAEKCFGTGAAGH
Human NTFIGERTVQALQVLAQVSSLLKSAFFLESIAHDS-----IIAAEKCFGTGAAGN
Chimpanzee NTFIGERTVQALQVLAQVSSLLKSAFFLESIAHDS-----IIAAEKCFGTGAAGN
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mosquitoes -RMSADKVFVRFDALKSAVVVQVVDMLVLLLRHSEDTVCSAVVLELWQDQATIEFLLALL
Zebrafish SHFSPRETEQYNYSKCSIIIVRMLEFSTMVVQKCPQDL--WKLMEKDVFN--SLFTLVVLA
Xenopus -IFSPHEIEEYNYSKCTIIIVRIIEFTIMFIEICQQDS--WKILENSVFNE--TMWELIAVTV
Chicken -IFSPQEREVYNYSKCTIIIVRIMEFVIMILEICQQDF--WKLLEKELLNA--NFIELLVMTV
Mouse --PSLHEEEKYNYSKCTVLRVIMEFTTLLIASP--ED--CKLLEKDLCNT--NLMQVVLKMI
Rat --PSVQHEEKYNYSKCTVLRVIMEFTTLLVTFP--ED--CKLLEKDLCNT--KLMKVLVLM
Cattle -RPSQEGDRYSYSKCTVVVRVLEFSTLLGTC--DG--WKLKGDSCSA--DLMRLLVRTL
Wolf -RPSQEGERYNYSKCTIVVRIMEFTTLLNTSP--DG--WKLLEEDLCNNKFMFTLLVKIL
Human -RTSPQEGERYNYSKCTVVVRIMEFTTLLNTSP--EG--WKLKDLCNT--HLMRVLVQTL
Chimpanzee -RTSPQEGERYNYSKCTVVVRIMEFTTLLNTSP--EG--WKLKDLCNT--HLMRVLVQTL
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mosquitoes LKPHRLGQYCNFSIHHEVEGDRHLWAQLETLVLQLIERS-SEPIGQRFTIALTEQLILVM
Zebrafish CEPSSIGFN-----MADLEVMTHLPEVCFPLKALASAPYRTQLESCIRMRI--K
Xenopus CDPSSIGFN-----TADVEVINNLNPNICIKLLKSLGKTTYRSALEASLKKRVT--Y
Chicken CDPSSIGFN-----TADVQVMKNLPDISVRLKALMKSPYKEYLQLCKKRIT--P
Mouse CEPMSLGFN-----IGDVQVMNHLPSICVNLLKALRKSPYRDMLETHLKEKVT--V
Rat CEPLSIGFN-----IGDVQVMNHLPSICVNLLKALRKSPYRDKLETHLKEKVT--A
Cattle CAPSSVGFN-----VGDVVRMEQLPDVCVALLRALKTSPHQDMLEARLREEVT--A
Wolf CQPSSIGFN-----IGDVLVMNHLPDVCVNLMKALKKSPYKDTLEMCLKEKIT--V
Human CEPASIGFN-----IGDVQVMAHLPDVCVNLMKALKMSPYKDILETHLREKIT--A
Chimpanzee CEPASVGFN-----IGDVQVMAHLPDVCVNLMKALKMSPYKDILDTHLREKIT--A
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mosquitoes EDVSEMRMTLLIQRTHAEDQKLAKGLRFIAKHLRNRTLLAGT---AKDRRIPLAACRLL
Zebrafish QSVEELCAIDL YETDTRNSHASMNL-LLSACRQLHQSGLLNSVLHSQDASYGCSLGSKLL
Xenopus QSIEELCSVDLYDPEARFDRVKLCS-MLSACKQLYKAQFLNSIVTEQVGG--IRFGSKLL
Chicken QSFEDLCSVDLFNSDARFDQVRFSA-VLSACKQLQKSGLLHSVLHSQDERPHPSIGSKLL
Mouse QSVEELCSINLCSSGARQERSKLLS-ILSACKQLHKAGFSHVISPSQSTALNHSVGMRL
Rat QSVEELCAINLCSSAACQERTKLLS-LLSACKQLHKAGFSHIIISASQSTALNHSIGMRL
Cattle ESIGELCAVDLYGPDAMKRARLAS-LVLACKQLHKAGFLHVIMPSQSADEQHSIGMKLL
Wolf QSIEELCAVDLYGPDAYVDRATLAS-VVSACKQLHRAGVLHVVLPSQSADQRHSVGIKLL
Human QSIEELCAVNLYGPDQVDRSRLAA-VVSACKQLHRAGLLHNILPSQSTDLHHSVGT
Chimpanzee QSIEELCAVNLYGPDQVDRSRLAA-VVSACKQLHRAGLLHSILPSQSTDLHHSVGT
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mosquitoes QDCYEAIGQ--ESVC-LVLSPSATRFGTIVLEAIFGLADSTGHGDDMDGLVEFVIS----
Zebrafish TSVYKSIAPGTDKRSKSLPSMDVGSRKLADRLVQLSFC LGDQS-----EQTVGLLLNTITL
Xenopus SVVYKGIAPTSEKRSKSLPSLDISSKRLAEGLELAFMFGRC-----EELVSLLLNTVIL
Chicken SVVYKSIAPGSEKRSKSLPAVDISSKRLADRLQLAFADDQC-----EELVSLLLNTVVL
Mouse SLVYKGIAPAERQCLQSLDPSCKSLANGLLELAFGFGGLC-----DHLVSLLLNSAML
Rat SLVYNGIAPAQEKQYLQSLDPSCKSLASGLLELAFAFGGLC-----EHLVSLLLNSSML
Cattle SLVYKSIAPGHEGLSLSLDPSCRRFALELLELAFACGGLC-----ERLVGLLLDTAVV
Wolf FLVYKSIAPGDEREYFPSLDPSCKRLASGLLELAFAFGGLC-----EHLVDLLD TAVL
Human SLVYKGIAPGDERQCLPSLDLCKQLASGLLELAFAFGGLC-----ERLVSLLLNPAVL
Chimpanzee SLVYKGIAPGDERQCLPSLDLCKQLASGLLELAFAFGGLC-----ERLVSLLLNPAVL
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mosquitoes -CSLS--EDMLQPNIRHGEHFLVCFGGAVYELFLQNPNSNCLPMLLKALKPENFSFIVRFL
Zebrafish SVPLSGSLNPHFLFSFHGGEYFYSLFQTSINTELLRSVDRSVPLLLSS-ANQNPMSVSVLL
Xenopus SVPLSGLSQSNAINFSHGGEYFYSLFQTSINTELLNLD TAVVELLKS-SVEDPKMVSCVL
Chicken SVPLSKASERNFVDFSHGGEYFYSLFSDTINQQLKNLDVIVIHLMES-SVSNPQMVGSIL
Mouse STQYLGSSQRN-ISFSHGGEYFYSLFSEVINSELLKNLDIAVSRLMES-SSDNPKMVSTVL
Rat STQYLGSSQRN-ISFSHGGEYFYSLFPEVINTELLKSLDVTVSRLLES-SSDNPKMVSTIL
Cattle STPSSGGTQRNVVFSHGGEYFYSLFSETVNTPELLRNLDAVSELMKS-SMGNPKMVSTVL
Wolf SMPASGESQRNMVFSHGGEYFYSLFSEIINTELLRNLDMTVLKLKMS-SVDNPKMVSAIL
Human STASLGSSQGSVIHFSHGGEYFYSLFSETINTELLKNLDLAVLELMQS-SVDNPKMVSAIL
Chimpanzee STASLGSSQGSVIHFSHGGEYFYSLFSETINTELLKNLDLAVLELMQS-SVDNPKMVSAIL
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mosquitoes CNLMDYSYRKQAANTDSLKCLVEMLLAGGWSPLFECSRLQSNQFGACDVQLIELMSSVAM
Zebrafish NGMLDHSFRERSVRKSQGSQLAEQVL-KGWDLLRPWWDGPA-ATPESKTSVLSLLAKVLQ
Xenopus NGMLDQSFQRRTIRKQQGAKLVNAV L-QNWKRLDSWWCKD--SSPESKMAVLTLLAKVLQ
Chicken NGMLDQSFRETRIRKQQGAKLVNAV L-QNWKRLDSWWCKD--SSPESKMAVLTLLAKVLQ
Mouse NGMLDTSFRDRAVQKHQGLKLATAIL-QNWRKCDSSWWAPD--SAPESKTTVLSLLAKMLQ
Rat NGMLDMSFRDRAVQKHQGLKLATAIL-QNWRKCDSSWWAPD--SAPESKTTVLSLLAKMLQ
Cattle NGLLDQSYRDRASQKHQGLKLVSTIL-QSWGCCSTWWAGD--ATPDSKTAVLTLLAKILQ
Wolf NGMLDQSFDRASRQKHQGLKLATAIL-QHWKKCDSSWWAKD--SAPESKTAVLTLLAKILQ
Human NGMLDQSFREANRQKHQGLKLATAIL-QHWKKCDSSWWAKD--SLETKMAVLTLLAKILQ
Chimpanzee NGMLDQSFREANRQKHQGLKLATAIL-QHWKKCDSSWWAKD--SLETKMAVLTLLAKILQ
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mosquitoes I-CPFPLNEIHHRVGPYGRWLTELIGSTRSELSIELKAKAIVLLPPLLGPNGAPEAESH
Zebrafish IDSSVCSNTSHPAFNAVFTTFT-AL--LTDVSMPLNLKSQALIMLPFFTALPSMP-----
Xenopus IDSSVCFDINHLAFAEVFRTYT-SI--LTDQTLGLNLKSQAI ILLPFFT KL TGGK-----
Chicken IDSSVSFNTSHEAFTAVFDTYT-SL--LTDQNLGLNLKGHAVI ILLPFTNL SGEK-----
Mouse IDSALSFDTNHSSFSEIFTTYA-SL--LADTKLGLHLKQGAI ILLPFTSL REGS-----
Rat IDSTLSFDTNHSSFSEIFTTYA-NL--LADTKLGLHLKQAVILLPFFT RV TEDR-----
Cattle IDSSVSFNTSHSAFPEVFTTFV-SL--LGDPKLDLHLKQAVALLPFFTSSL TGD R-----
Wolf IDSSVSFNTNHSAPPEVFTTYT-SL--LADSNLGLHLMQAVILLPFFT NL TGGN-----
Human IDSSVSFNTSHGSFPEVFTTYI-SL--LADTKLDLHLKQAVTLLPFFTSL TGG S-----
Chimpanzee IDSSVSFNTSHGSFPEVFTTYI-SL--LADTKLDLHLKQAVTLLPFFTSL TGG S-----
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mosquitoes WAEVENALEALQTKHFPLRSAEFPNPERIGYLNCLERLLDAMVISRSPLLLKAI IQMT
Zebrafish LEE LRRALES LVATHFPMQSD EFP RGS LQCNNY MDCIRKFLEALQLSQS P L L L K L M A R V L
Xenopus LTELKNTLDL F V A S N F P M K C D E F P R G T L K F N N Y V D C I K K F L D A E L S Q S P M L L Q L M T E I L
Chicken LHD L K N A L D Q L V A F N F P M S S D E F P K G T L K H N N Y V D C T K K F L D A E L S Q S P M L L Q L M T E V L
Mouse L E N L K H I L E K L I V C N F P M K S D E F P P D S L K Y N N Y V D C M K K F L D A E L S Q S P M L F Q L M T D I L
Rat L G D L K H I L E K F I V L N F P M K S D E F P P D S L K Y N N Y V D C M K K F L D A E L S Q S P M L L Q L M T D I L
Cattle L Q E L R H I L E K L I V S H F P M R S G E F P P G T L R Y S N Y V D C M K K F L D A E L S Q S P M L M E L M T E V L
Wolf L E D L E H V L E K L I V S N F P M K S E E F P V G T L R Y S N Y V D C M K K F L D A E L S Q S P V L L Q L M A E I L
Human L E E L R R V L E Q L I V A H F P M Q S R E F P P G T P R F N N Y V D C M K K F L D A E L S Q S P M L L E L M T E V L
Chimpanzee L E E L K R V L E Q L I V A H F P M Q S R E F P P G T P R F N N Y V D C M K K F L D A E L S Q S P M L L E L M T E V L
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mosquitoes APDGDGHIAETELRTAIERFFADQPHEVQCKRLELWELFANHA-YAPVRETILRRYLC
Zebrafish CRDK-KHIMEELFQACFQKIAHQSYLKGQVLLSSTYQSFQAKEVPSNFMLMGLIDRVLL
Xenopus CRDE-RHFMEELFQSSFKVIERSSCDAQVILLNTLHNMFTSESVMLNGTLQSLTNRCLL
Chicken CRDH-RHSMEDLFQASFKRISRRSSTDKQVLLDVTVKMFQNE D L L S N I V R Q A F V D R S L L
Mouse CREQ-RHIMEELFQTFKRIARSPCVTQLNLLSVYTMFRKADLPSNVTRQAFVDRSLL
Rat CREQ-QHIMEELFQTFKRIARRSPCVTQLNLLSVYTMFRKGGLSDVT-QAFVDRSLL
Cattle CREQ-QHVLEELFQSTFRKIARKSSCATQLGLLESVYRKFSRDDLLPSATRQAVVGRALL
Wolf CREQ-QHVMEELFQSTFKKIARKSSCVTQLALLESVYRMFRKDDLLSNVTRQAFVDRSLL
Human CREQ-QHVMEELFQSSFRIARRGSCVTQVGLLESVYEMFRKDDPRLSFTRQSFVDRSLL
Chimpanzee CREQ-QHVMEELFQSSFRIARRGSCVTQVGLLESVYEMFRKDDPRLSFTRQSFVDRSLL
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mosquitoes TALWHCRYDSIVQFYTRIIRALSHNTMVEINGRTGWALEHALIDRAASYRLVEHYAALLP
Zebrafish PLASHCSPQALSQFFISNIADIMTTLQTRFTKSVESVFESQIMMKIGCKLLEVLYSRLP
Xenopus TLLWNCSGDALLVFFTNIIICLAMDTLKS RFTKVSEAAFENQITKKWGYKMLEVLYSRLS
Chicken TLM SHCSLDALREFFCKIIVQAMDTLNSRFTKSN ECVFDTQITKKMGYYKML E V M Y I R L S
Mouse TLLWHCDLDTLKEFFSRIVVDAIDVLKSRFTKLN EFTFDTQITKKMCYYKMLAVMYSRLL
Rat TLLWHCDLDTLKEFFSRIVVEAIDVLKSRFTKLN EFAFDTQITKKMGYYKML E V M Y S R L P
Cattle TLLRHCGLGALRDFFSRTVVEAIDVLKSRFTKLN EFAFDTQITKKMGYYKML E V M Y S R L P
Wolf TLLWHCGLNALREFFGKIVVETIDVLKSRFTKLN EFTFDTQITKKMGYYKML D V M Y S R L S
Human TLLWHCSLDALREFFSTIVVDAIDVLKSRFTKLN EFTFDTQITKKMGYYKML D V M Y S R L P
Chimpanzee TLLWHCSLDALREFFSTIVVDAIDVLKSRFTKLN EFTFDTQITKKMGYYKML D V M Y S R L P
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mosquitoes KQILTGDNC PVAQELYGSAHDTLGAPVRGQRLIGDFS KRAHGVRVALPTNDRTLAELFR
Zebrafish KEEVYSKNSAINQAFCGTGCA-----EGNELSKNLLKSCFEAFT-ENMTGEMVLELRR
Xenopus KDDICS---KVNAYHVSSNP-----EGNELTKALIKLCYDTFT-ENMCGETQLEKRR
Chicken KDDVHSKDSKINQAYRGSVSV-----EGNELTKALIKLCYDAFT-ENMAGENQLEKRR
Mouse KDDVHSKEAKINQAFHGSRVA-----EGNELTKTLKLCYDAFT-ENMAGESQLEKRR
Rat KDDVHSKESKINQAFQGSVA-----EGNELTKTLKLCYDAFT-ENMAGESQLEKRR
Cattle KDDVHSKESKINQVFHGSSVT-----EGNELTKTLIKLCYDAFT-ENMAGEAQLLERRR
Wolf KDDVHSKESKINQVFHGSCIT-----EGNELTKTLIKLCYDAFT-ENMAGENQLLERRR
Human KDDVHAKESKINQVFHGSCIT-----EGNELTKTLIKLCYDAFT-ENMAGENQLLERRR
Chimpanzee KDDVHAKESKINQVFHGSCIT-----EGNELTKTLIKLCYDAFT-ENMAGENQLLERRR
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mosquitoes KYQCAAYRALVALISNTNEDARMYSVLLFRFRESREKGEFLWRHLIDCSNEELYLECTQEQE
Zebrafish QFHCAYNCAIALISCSFNETKFKYQGFLFTEKPKDNQFIFDNLIDSQRVYNFPPIEID---
Xenopus QYHCAAYNCAISLISCVFSELKFKYQGFLFTEKKEKNLLIFENLIDLQRSYTFPIEVE---
Chicken QYHCAAYNCAIAVISCVFTESKFKYQGFLFTEKSEKNLLIFENLIDLKRQYVFPVEIE---
Mouse LYHCAAYNCAISLISCVFNELKFKYQGFLFNEKPEKNLIFIFENLIDLKRCYTFPIEVE---
Rat LYHCAAYNCAISLISRNVFNELKFKYQGFLFSEKPEKNLIFIFENLIDLKRCYTFPIEVE---
Cattle LYHCAAYTCAIALVRCVFTELRFYQGFLFSEKPEKNLLIFENLIDLKRCYTFPIEVE---
Wolf LYHCAAYNCAISVICCVFTELKFKYQGFLFSEKPEKNLLILENLIDLKRCYTFPIEVE---
Human LYHCAAYNCAISVICCVFNELKFKYQGFLFSEKPEKNLLIFENLIDLKRRYNFPVEVE---
Chimpanzee LYHCAAYNCAISVICCVFNELKFKYQGFLFSEKPEKNLLIFENLIDLKRRYNFPVEVE---
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mosquitoes QLSRTFEKRVAIRREGGGGGDPAQRKPALKDPGLSVVMESSLSQQVFRFDMSHSVVLSAR
Zebrafish VPIERKKKYVMIRKEVSGENGGDSAPVY-LSSQSYMADSSLSEEMSQDFSTGVQFSY
Xenopus VPMERKKKYFAIRKEARDASSADSEPRY-LSSQSYMADSSLSEEMSQDFSTGVQFSY
Chicken VPLERKKKYIAIRKEAREAWNDGQDEPKY-LASASYMDDSSLSEEMSQDFSTGVQFSY
Mouse VPMERKKKYIEIRKEARDAANGASGSPHY-MSSLSYLTSSSLSEEMSQDFSTGVQFSY
Rat VPMERKKKYVEIRKEARDAANGASGNPRY-MSSLSYLTSSSLSEEMSQDFSTGVQFSY
Cattle VPMERKKKYIEIRREAREANEDSGGPQY-MSSLSYLADSSLSEEMSQDFSTGVQFSY
Wolf VPMERKKKYIEIRKEAREAVNGDSDGPHY-LSSLSYLADSSLSEEMSQDFSTGVQFSY
Human VPMERKKKYIEIRKEAREANGDSDGPSY-MSSLSYLADSTLSEEMSQDFSTGVQFSY
Chimpanzee VPMERKKKYIEIRKEAREANGDSDGPSY-MSSLSYLADSTLSEEMSQDFSTGVQFSY
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mosquitoes EVAQKDA-----ELAKRQOGLTNSVSLERTKINRHEIMATVCGCIRHMAATKVP---
Zebrafish NSQNPSGVSSSSRMRRER-KEVLSQDETVLEMEDELNQHECMANMTALLRHMQRNITPKV
Xenopus SSQDKMLSQSASRKKELITEGKTFDDVMEFEMDELNQHECMAAMTGLIKHMNSSEITPKV
Chicken SSQDVTASSAHFRKRET-SEYMLVNDMELEMEDELNQHECMAPLTTLIKHMQRNQITPKV
Mouse SSQDRKPTTGHFQRREH-QDSMTQDDIMELEMEDELNQHECMAPMIALIKHMQRNVIAPKG
Rat SSQDRKPTTGHFQRREH-QDSMAQDDIIELEMEDELNQHECMAPMTSLIKHMQRNVIAPKG
Cattle GSQDPQSSAGHFRRRER-QDPDGPGLVDLVDLELSQHECMAPLVALVQHMRLEAALPG
Wolf GSQDPKSTHGHFRRREH-KDPMVQDAVLELEMEDELNQHECMATMTALIKHMQRNQLIL-SK
Human SSQDPRPATGRFRRREQ-RDPTVHDDVLELEMEDELNRHECMAPLTALVKHMRSLGPPQG
Chimpanzee SSQDPRPATGRFRRREQ-RDPTVHDDVLELEMEDELNRHECMAPLTALVKHMRSLGPPQG
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mosquitoes -----LDSVVHFLVGLADAGQKNVRLFLAKVIDNCRNELQPHAALLIGPLMQLVIV
Zebrafish EEGVRPSDLPPWMKFLQKLDNPSTPLNIRLFIAKLIINTEEIFRPHYAKHWLGPLMQLVV
Xenopus EEGASPQDLPPWMKFLHGKLGNTSTPLNIRLFIAKLIVNTEEVFCPYAKFWIGPMLQLIV
Chicken EEGVIPVDLPLWMKFLHSGKLGNSVPLNIRLFIAKLIVNTEEDVFRPHYAKQWLGPMQLVIV
Mouse EEGSIPKDLPPWMKFLHDKLGNASVSLNIRLFLAKLVINTEEVFRPHYAKHWLSPLLQLAV
Rat QEGSISKDLPPWMKFLHDKLENASVSLNIRLFLAKLVINTEEVFRPHYAKHWLGPLLQLAV
Cattle EEGSVPRNLPPWMKFLHDKLGNPSVSLNIRLFLAKLVINTEEVFRPHARHWLGPLLQLVIV
Wolf DEGSVPRNLPPWMKFLHDKLGNPSVSLNIRLFLAKLVINTEEVFRPHYAKYWLSPLLQLVIV
Human EEDSVPRDLPSWMKFLHGKLGNIIVPLNIRLFLAKLVINTEEVFRPHYAKHWLSPLLQLAA
Chimpanzee EEDSVSRDLPSWMKFLHGKLGNIIVPLNIRLFLAKLVINTEEVFRPHYAKHWLSPLLQLAA
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mosquitoes DGYI-FRGLNPLVTDLIALVLEWNASGEARRSLREGATGEIASLASVLLRFIMKHACFPQO
Zebrafish SSSNGGEGIHFMVVDIVTVLSWASVASPKGNTR-----DEVLVNRLGLFLKNCFHHS-
Xenopus SGNNGGSGIHYMVIETLVTILSWSSIATPKGLAK-----EEILANRLLLEFLMKNVFHE-
Chicken SGDNGGEGIHYMVVEIAVTVLSWTSVTTPKGNIK-----DEILANRLLLEFLMKNVAFHQ-
Mouse CENN-REGIHYMMVEIVATILSWTGLATPTGVPK-----DEVLANRLLRFLMKHVFHP-
Rat CENI-GEGIHYMIVEIVATILSWTGLATPTGVPK-----YEVLANRLLYFLMKYVFHP-
Cattle SENNGGDGIHYLVVEIVATVLSWTGIATPVGVPK-----DEVLANRLLHFLMKHVFHQ-
Wolf SENNGGEGIHYMVVEIVTVLSWTGLATPVGVPK-----DEVLANRLLHFLMEHVFHQ-
Human SENNGGEGIHYMVVEIVATILSWTGLATPTGVPK-----DEVLANRLLNFLMKHVFHP-
Chimpanzee SENNGGEGIHYMVVEIVATILSWTGLATPTGVPK-----DEVLANRLLNFLMKHVFHP-
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mosquitoes SARKMAVLRRLNLELIQEVIVQWHEALTPVAELLFEMVSHRQPTEDRSQQLIAGLQLGTI
Zebrafish ---KRAVFRHNLEIIRTVVECWKDCLTIPYDLIYERFAGTDPNSKDNS----VGIQLLGI
Xenopus ---KRAVYRHNLEIIKTVLECWKECLSIPLYMLIYEGFSGTDPNTKDNS----VGIQLLGL
Chicken ---KRAVFRHNLEIIKTVIECWKNCLSIPLYLIFEKFSGGDPDTKDNS----VGIQLLGI
Mouse ---KRAVFRHNLEIIKTVLECWKECLSIPLYRILIFEKFSHKDPNSKDNS----VGIQLLGI
Rat ---KRAVFRHNLEIIKTVLECWKECLSIPLYRILIFEKFSNKDPNSKDNS----VGIQLLGI
Cattle ---KRAVFRHNLEIIKTVLECWKDCLSVPYRILIFEKFSKDPNSKDNS----VGIQLLGI
Wolf ---KRAVFRHNLEIIKTVLECWKDCLSVPYRILIFEKFSKDPNSKDNS----VGIQLLGI
Human ---KRAVFRHNLEIIKTVLECWKDCLSIPLYRILIFEKFSGKDPNSKDNS----VGIQLLGI
Chimpanzee ---KRAVFRHNLEIIKTVLECWKDCLSIPLYRILIFEKFSGKDPNSKDNS----VGIQLLGI
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mosquitoes VLLKGRGKLPWMESTKQDYLRVLRCLDLPDS-TSFKSAALLLGHSLAHIYPDGFPEPE
Zebrafish VMANNLPPYDAACGIEHDFYQSLANNLSFIRYKEVYSAAEVIGLILNYMTERE-----
Xenopus VLANNFSPFDQKCGIDAERYFQCLANNLALTRFKEVYIAAAEVIGLVLHYIYHNE-----
Chicken VLANNLPPFDLKCIEDRVRYFQALVSNMGLLRYKEVYAAAAEVLGLALQYIAERQ-----
Mouse VIANNLPPYDPNCDITSAMYFEALVNNMSFVKYKEVYAAAAEVLGLILQYITERK-----
Rat VVANNLPPYDLKGDITSAMYFEALVNNMSFVKYKEVYAAAAEVLGLILQHVTERK-----
Cattle VMANNLPPYDPKCGVESVRYFEALVSNMSFVRYKEVYAAAEVIGLVLRYSGRE-----
Wolf VMANNLPPYDPKCGIERIKYFEALVSNMSFVKYKEVYAAAAEVLGLTLRYITERE-----
Human VMANDLPPYDPQCGIQSSEYFQALVNNMSFVRYKEVYAAAAEVLGLILRYVMERK-----
Chimpanzee VMANDLPPYDPQCGIQSSEYFQALVNNMSFVRYKEVYAAAAEVLGLILRYVMERK-----
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mosquitoes QQTGELET-FHTECIAKLTSIQ-REYDRKFAEVLYETAKGFPSIADPFLSVLSYRFPSPAS
Zebrafish ---NQIEGTLFNITVTKLMDLRKKEVDDKFIVCLSKVSKHFPPLVDRFINPVFYLLPKLH
Xenopus ---KRTDAPIFDYVVKELKRHQTSNKEDKFIMCLNKVVKNFPPFADRFMTVVLYLLPKLH
Chicken ---NILEDPVYDCVIKQLKRHQNT-QQDKFIIICLNKVVKNFPPPLADRFMNAVFFLLPKLH
Mouse ---HVIAELVCELVIKQLKQHONT-MEDKFIVCLNKIAKGFPPPLADRFNLALFFLLPKFH
Rat ---HVIAESVYELVVKQLKQHONT-MEDKFIVCLNKIVKGFPPPLADRFNLALFFLLPKFH
Cattle ---KMLEESVHELTVVKQLKRHQNT-LEDKFIVCLSRATKNFPPPLADRFMNSVLFLLPRFH
Wolf ---NILENVVYELVIKQLKQHONT-MEDKFIVCLNKVVKNFPPPLADRFMNAVFFLLPKFH
Human ---NILEESLCELVAKQLKQHONT-MEDKFIVCLNKVTKSFPPPLADRFMNAVFFLLPKFH
Chimpanzee ---NILEESLCELVAKQLKQHONT-MEDKFIVCLNKVTKSFPPPLADRFMNAVFFLLPKFH
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mosquitoes GGEKRLYLELLLGGRLKFNDELYRELASMEITLLL--QDGELQLPTLHLLNRSLSLVRE
Zebrafish GMLKTHCLECVLSRADV--IPEIFLHLKTKGLSQIMSHKDEGRQVCLDIIHKILACLKP
Xenopus GVLKTQCLELIMHRAED--IPDLFIELKNKEFCQIMNSRDDRQKVCLDIIYKILSKLKP
Chicken GVMKNYCLEVIMCRAEE--IPDLYLQKSKDFIQIMKHRDDRQVCLDIIYKMLSTLKP
Mouse GVMKTLCEVVL CRAEE--ITGLYLQKSKDFLQVMRHRDDRQKVCLDIIYKMAVAKLKP
Rat GVMKTLCEVVL CRAEA--ITGLYLQKSKDFLQVMRHRDDRQKVCLDIIYKMAVAKLKP
Cattle GVMKTLCEVVL CRAEE--TPDLYLQKSKDFVQVMRHRDDRQKVCLDIIYKMMARLRP
Wolf GVMKTLCEVVL CRAEE--ITNIYELKSKDFIQVMRHRDDRQKVCLDIIYKMAVAKLKP
Human GVLKTLCEVVL CRVEG--MTELYFQKSKDFVQVMRHRDDRQKVCLDIIYKMPKLKP
Chimpanzee GVLKTLCEVVL CRVEG--MTELYFQKSKDFVQVMRHRDDRQKVCLDIIYKMPKLKP
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mosquitoes LEHLQQLVEPIGRVATEPSTPNEARAVAFEILIYIHEHRSAEELSECRTS-----VWRN
Zebrafish E-ELKEILGAVTAFASHPS--VCRERMYDILMWIQDNYSDESREDSSTSVVSVARET
Xenopus A-ELHEFMSSIAAFNSHSP--VCRERMYEIFMWIYDNYRDQESQSDSKSVVFSMAKEG
Chicken P-ELKELLPGVTGFISHPSV--ICRQRMYYDILMWIYDNYSDPESQADGDSQEVLSLAKEI
Mouse I-ELRELLNPVVEFVSHPS--TCREQMYNILMWIHDNYRDQESQNDSDSQEIFKLAKDV
Rat T-ELRELLNPVVEFVSHPS--TCREQMYNILMWIHDNYRDQESQMDSDSQEIFKLAKDV
Cattle A-ELRELLSAVVEFLAHPAV--LCRERMYAILMWVHDNYRDQESQADEDSREVFKLAKDV
Wolf V-ELRDLNLSVVEFISHPS--VCREQMYNILMWIHDNYRDQESQADDSREVFKLAKDV
Human V-ELRELLNPVVEFVSHPS--TCREQMYNILMWIHDNYRDPESETDNDSDQEIFKLAKDV
Chimpanzee V-ELRELLNPVVEFVSHPS--TCREQMYNILMWIHDNYRDPESETDNDSDQEIFKLAKDV
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mosquitoes LIRGLCGSHETELGSGSIRGRILEYLTYSGLKLPDVKERFLFVLAQLYDPTVEGEFLGNA
Zebrafish LLQGLTDEN-----YGLQLYVRNFWSHESRLPPETLERMLVVLKSLYSSRIEEQFLSLA
Xenopus LLQGLVDDN-----SELQLIVRNFWSDETRLPSNTTERMLAILSSLYSTKIEKHYLSLA
Chicken LLQGLIDEN-----AELQLIVRNFWSDETRLPANILDRMLMLNSLYSAKIEYQYLSLI
Mouse LIQGLIDEN-----VGLQLIIRNFWSHETRLPSNTLDRLL-ALNSLYSPKIEVHFLSLA
Rat LIQGLIDEN-----LGLQLIIRNFWSHETRLPSNTLDRLL-ALNSLYSPKIEVHFLSLA
Cattle LIQGLTDEN-----PGLQLTIRNFWSHETRLPSNTLDRLL-ALNSLYSPKIEVHFLSLA
Wolf LIQGLIDEN-----AGLQLIIRNFWSHETRLPSNTLDRLL-ALNSLYSPKIEVHFLSLA
Human LIQGLIDEN-----PGLQLIIRNFWSHETRLPSNTLDRLL-ALNSLYSPKIEVHFLSLA
Chimpanzee LIQGLIDEN-----PGLQLIIRNFWSHETRLPSNTLDRLL-ALNSLYSPKIEVHFLSLA
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mosquitoes VALLLDPAIRCRESKDRFLHEYLNADVKFCYTIETAARQRHTMTLLTPMFAETSQQRQ
Zebrafish TDLLLEMTSHSPDFTRNMFEP--LSECKFQDYTIDSNWRMR--STVLTMPFMETQATQG
Xenopus TNLLLEMTSKSPDYLRKMFEP--LSECKFQDYTIDSSWRLR--STVLTMPFVETQLSQS
Chicken TNFLEMTSKSPDYSRKIFEP--LSECKFHDFVIDSSWRFR--STMLTPMFVETQASQS
Mouse TNFLEMTRMSPDYLNPIFEP--LSECFQDYTIDPDWRFR--STVLTMPFIETQASPS
Rat TNFLEMTRMSPDYLNPIFEP--LSECFQDYTIDPDWRFR--STVLTMPFIETQAFPS
Cattle TDFLEMTSLSPDFRSLFEP--LSECFQDYTIDPDWRFR--STVLTMPFVETQASQS
Wolf TDFLEMTSLSPDYANPVFEP--LSECFQDYTIDSDWRFR--STVLTMPFIETQASQS
Human TNFLEMTSMSPDYPNPMFEP--LSECFQDYTIDSDWRFR--STVLTMPFVETQASQG
Chimpanzee TNFLEMTSMSPDYPNPMFEP--LSECFQDYTIDSDWRFR--STVLTMPFVETQASQG
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mosquitoes LQSFITGRGSQMEQLIRATQGLGSDAAQKQLPFEPDQDPGRLSKGNETFAMPT---QQH
Zebrafish AEAA----GSQ-----AATVRGQIRATQTSLEFSQTLAPGRRSAYNWL TGSSVDTLADY
Xenopus MORS----RM-QGTMEADEPEGGQIRATQQHFQFTPTQNI GGRSSFNWL TGSSMDTLADY
Chicken TNRN----SSQERSLSISGSVGGVRATQRYEFTPTQNVSGRSSFNWLTGNSIDTLAEY
Mouse ILHT----QTQEGPLSDQRQKPGQVRATQQQYDFTPTQASVERSSF DWLTGSS IDLLADH
Rat TLNT----QTQEGSPDRRQKPGQVRATQQQYDFTPTQTSVERSSF DWLTGSS IDLMADH
Cattle TLQA----RTQEGSISARRAMAGQVRATQQQLDFTPTQASAGRVLSHWLTAGSTDPLGGS
Wolf TLQT----RTQERSLPAQVMARQIRATQQQYDFTPTQADGRSSFNWL TGSS IDPLVDY
Human TLQT----RTQEGSL SARWPVAGQIRATQQQHDFTLTQTADGRSSF DWLTGSS TDPLVDH
Chimpanzee TLQT----RTQEGSL SARWPVAGQIRATQQQHDFTLTQTADGRSSF DWLTGSS TDPLVDH
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mosquitoes TLL-----FESSALQLNRRSQRT-----GSS---TDTA-----AQ
Zebrafish SLSS--DSLSSLLVFDKRSERPQ--AAWRAVGAGFGSKRLTATSDDTDSRTAGQSLKIDM
Xenopus SVESP--ESLPSALLFVNKRNEKVRGPKPLGPNFGTQKLGPHVTE SKTK-S----IE
Chicken TVPSSSESLSSSMLLVNKRSEKFKQA AFKPVGPDFGKKRLSLPGDKVDSKTK-G----ID
Mouse TVFSS--ETLSSSLLF SHKRTEKSQRMSCKSVGPDFGTGKKGLPDDEVDNQVKS G----TP
Rat TVFSS--ESLSSSLLF SHKKEKSQRVSWKSVGPDFGTGKKGLPDDEVDNQVKS G----TH
Cattle LAPTA--EASSALLFAHKRPERPRGTPPKPVGPEFGKKRLG LLEDEVDGAQ-G----KN
Wolf TVSSS--DSSSSSLLFAQKRNEKSQRAPLKS VGPDFGKKGLPDDEVDNKAK-G----ID
Human TSP-----SSD SLLFAHKRERLQRAPLKS VGPDFGKKGLPDDEVDNKVK-G----AA
Chimpanzee TSP-----SSD SLLFAHKRERLQRAPLKS VGPDFGKKGLPDDEVDNKVK-G----AA
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mosquitoes QDRGFERLRKRILKDSATNRQQQTAWAVSRHYASQRQRTEQRRDSTSKVTLRYRRLADY
Zebrafish RRADILRLRRRFLKDEKESIKFAKKEIHSQRTERERRADLKIRQDAQVTLRYRVRGDL
Xenopus ERSEILRLRRRFLKDREKLSLIYARKGTAEQKREKAIKIEQKLGDAQITLRYRNRHGEL
Chicken ERAEILRLRRRFLKDQEKVSLIYARKGVAEQKREKEMKSELKMKFDGQVTLRYRVRGDL
Mouse SQADILRLRRRFLKDREKLSLIYARKGLMEQKLEKDIKSEFKMKQDAQVVLRYRNRHGDL
Rat SQTEILRLRRRFLKDQEKLSLIYARKGLMEQKLEKDIKSELKMKQDAQVVLRYRNRHGDL
Cattle NRAEILRLRRRFLKDQEKLSLIYARKGVVEQKREKEIKSELKMKHEAQVVLRYRNRGDL
Wolf NRTEILRLRRRFIKDQEKLSLIYARKGIAEQKREKEIKSELKMKHDAQVILRYRNRQGD
Human GRTDLLRLRRRFMRDQEKLSLMYARKGVAEQKREKEIKSELKMKQDAQVVLRYRNRHGDL
Chimpanzee GRTDLLRLRRRFMRDQEKLSLMYARKGVAEQKREKEIKSELKMKQDAQVVLRYRNRHGDL
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mosquitoes PDLQINLLAFLPLQALCRRDITTCARQTFVAIFNGLVECLLVGDSEGRGTGRMVGDWDRF
 Zebrafish PDIQIQFSSLIAPLQALAQRDATLAKQLFSSLFAGVLVEMERLKSNETAD-----I
 Xenopus PDIQIAYSNIAPLQALAQRDPTMAKLLFSSLSFGILSETAS-----NAS-----L
 Chicken PDIQIEHCSLIAPLQGLAQKDPFQKQLFSSLSFGGIFCEVKKSKIPSEKKA-----I
 Mouse PDIQIQHSSLITPLQAVAQKDPPIIAKQLFSSLSFGILKEMNKFKTTSEKNI-----I
 Rat PDIQIQHSSLITPLQAVAQKDPPIIAKQLFSSLSFGILKEMHKFRTTSEKNI-----I
 Cattle PDIQIPHSSLITPLQAVAQRDPLVARQLFSGSLCSGILRESGERRTVAEGRG-----A
 Wolf PDIQIKYSSLVTPLQAVAQRDPVVAKQLFSGLSFGI IKEMDKYKTMSEKNN-----I
 Human PDIQIKHSSLITPLQAVAQRDPIIAKQLFSSLSFGILKEMDKFKTLSEKNN-----I
 Chimpanzee PDIQIKHSSLITPLQAVAQRDPIIAKQLFSSLSFGILKEMDKFKTLSEKNN-----I
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mosquitoes VGRLDDEALNPILESTKACDPNLFGLLIELTLGKASGKFTLPPRTIASVAGTCNMLPMGAL
 Zebrafish LKELVQTLNAFLNKSTVYFPPFISCIQDMSYH-HKALLGVEPSLVSATCLASLQQPMGIL
 Xenopus IGKLLQFNSFLSNLSYFPPFIACVQDMCYQ-HDELLHLNPNANVSTSCLASLQQPLGIL
 Chicken IQKLLKDFNHFLSTSVSYFPPFIACIQEISYK-HRELLLEDSANVSTSCLASLQQPVGIL
 Mouse TQNLLQDFNRFLNNTTFLFPPFVSCIQEISCQ-HPDFLTLDPASVRVGCLASLQQPGGIR
 Rat IQNLLQDFNRFLNNTTFLFPPFVSCIQEISCQ-HVDLLTLDPAAVRVGCLASLQQPGGIR
 Cattle AQKLLQDFTHFLDTSFSFPPFVSCIQEISCQ-HADLLSLDPALVSGAGLAGLQQPGAIC
 Wolf TQKLLQDFSHFLNSTFSFPPFVSCIQEISCQ-HTDLLSLDPGSIRASCLASLQQPVGVR
 Human TQKLLQDFNRFLNNTTFSFPPFVSCIQD ISCQ-HAALLSLDPAAVSAGCLASLQQPVGIR
 Chimpanzee TQKLLQDFNRFLNNTTFSFPPFVSCIQD ISCQ-HAALLSLDPAAVSAGCLASLQQPVGIR
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mosquitoes YLEAKLADGADFDEPV-R-----TAGSVSSEADHWLQLSTLYHALHEHSVMVGIFGEEK
 Zebrafish LLEESLLHGAGASEEPLKRAR---GKRELPPDTERWIHLAKLYRSLGDYDVVRGIFSGK
 Xenopus LLEKGLLHIE-IPDEPPAKMRKEKAKSEIPDLDVRWIELAKLYRSIGDYDVLRGIFSGK
 Chicken LLEHALMALS-PAEPPSKMR---GRTELPPDVVKWLELAKLYRSLGDYDVLRGIFSGK
 Mouse LLEEALLRLM-PK-EPPTKRVR---GKTCLPPDVLRWMELAKLYRSIGDYDVLRGIFSSE
 Rat LLEEALLHLL-PK-EPPTKRIR---GKTCLPPDVLRWMELAKLYRSIGDYDVLHGIFSSE
 Cattle LLEEALLRLA-PQ-EPPAKRAR---GRPSLPPDVGRWMELAKLYRSIGDYDILRGIFSSE
 Wolf LLEEALLHLG-PQ-EPPAKQFK---GRMRVSPDVVRWMELAKLYRSIGDYDILRGIFSSE
 Human LLEEALLRLL-PA-ELPAKRVR---GKARLPPDVLRWVELAKLYRSIGDYDVLRGIFTSE
 Chimpanzee LLEEALLRLL-PA-EVPAKRVR---GKARLPPDVLRWVELAKLYRSIGDYDVLRGIFTSE
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mosquitoes LDSDPQLREAI EALGRYGAHRA YCELVMRVS---RARVDERNFCYKSAFNCLLQLG
 Zebrafish IGTKSITFTALQAEAKSDYAEAVKLYNEALNKEDWDDGEP TITEKDFWEIAALEAYNHLT
 Xenopus IEAKSITQRALNEEAKSDYAKAAKLYDEALTK-EFEDGDPTDAEKDFWELASLECYNHLT
 Chicken IGTKDITQALLAEARS DYAEAAKCYDEALS KEDWEDGEPTEAEKDFWELASLECYDHLT
 Mouse LGTTQDTQNAL LAEARS DYCAAKLYDEALNKLEWLDGEPTEAEKEFWELASLDCYNLS
 Rat LGTKQDTQNAL LAEARS DYFQAANLYKEALNKLEWLDGEPTEAEKEFWELASLDCYNLS
 Cattle IGTKQITQDALLAEARS DYSEAA RLYNEALNTQEWADGEPTEAEKDFWELASLDCYNQLA
 Wolf IGTKQITQS AIFAEARS DYSEAAKQYNEALNKQWVDGEPTEAEKDFWELASLDCYNQLA
 Human IGTKQITQS ALLAEARS DYSEAAKQYDEALNKQWVDGEPTEAEKDFWELASLDCYNHLA
 Chimpanzee IGTKQITQS ALLAEARS DYSEAAKQYDEALNKQWVDGEPTEAEKDFWELASLDCYNHLA
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mosquitoes QWDVLLDE-----IGNQVTNHEELWCDEWNQENLLPHYVHGNALLVLAGDEGGREFYRLL
 Zebrafish EWKSLEYCATVNI DSSPIRLDRMWTFTFYVETYLQYMMRSMKQLQMG-ETNQD LLSFV
 Xenopus EWKPLEYCVSTVNI DTSPPDLNKMWSDFYQETYL PYMIRSKLKMLLSG-NNDQTLLTFV
 Chicken EWKSLEYCATVNI DSGKPPDLNKTWSDPFYQETYL PYIIRSKLKLLNG-ENDQTLLTFI
 Mouse KWKELEYCVSTVNI VSENSLDLSKMWSEPFYQETYL PYVIRSKLKLLQ-EGNQSLLTFV
 Rat QWKELEYRSTVNI GSENSLDLSKMWSKPFYQETYL PYVIRSKLKLLQ-EDNQSLLTFV
 Cattle EWTSLEYCVSTASADGEGTLDLSKMWSEPFYQETCLPYMVRSKLKLLLRG-EGDQALLTFV
 Wolf EWKSLAYCVSIVSDNENPPDLNKMWSEPFYRETYL PYMIRSKLKLLQ-EGDQSLLTFI
 Human EWKSLEYCVSTASIDSENPPDLNKIWSEPFYQETYL PYMIRSKLKLLQ-EGDQSLLTFI
 Chimpanzee EWKSLEYCVSTASVSDSENPPDLNKIWSEPFYQETYL PYMIRSKLKLLQ-EGDQSLLTFI
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mosquitoes -----KDSSTLVELMQTAMNTSSKQLTEEPLSMGDRLRKFSMQCLQCGIDV
Zebrafish AADRSPFALETLGEEKVQKILQLSQA-----SS--IAQVVEGLQIQALELLRSACK
Xenopus AVCNEPDCLYEIDGGKAGVKVLDL-----ESPENVSGGLYRKS LHYFMNAVRK
Chicken ALSQDPKCCEQIEEEKTGKILELSGE-----SSEPEKILAGLNKRAFQCFSSAARK
Mouse ALSREPACLS DLEENKVN SILT LSGS-----NAENTETVITGLYQRAFHHLSKAVQS
Rat ALSREPACLSGLEKSKTESIFALSGS-----NTENTERVISGLYQRAFHHLSMAVQS
Cattle ALCDEPTCLAEIGESKARSVVELSGS-----SSEDADKVMAGLYQRAFHHLSAVRA
Wolf ALRREPACLAEIEESRARRILDLSGS-----SLENAEKVIAVLYQRAFHHLSAVRT
Human ALSSEPACLAEIEEDKARRILELSGS-----SSEDSEKVIAGLYQRAFQHLSEAVQA
Chimpanzee ALSNEPACLAEIEEDKARRILELSGS-----SSEDSEKVIAGLYQRAFQHLSEAVQA
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mosquitoes LLDEGPSSSREGNSSANDSSMEQLADAHRLRLARYCYDELDPARTA-----AEELPV
Zebrafish AEEE-----EQSFSQQHVNTHGIVEAYMTMANFCDRRLRESEQKEEA----ISSKLQSL
Xenopus ATEE-----EQSHSIDKVDVRGIIKAYMTLVDFCDSHLRKVEEKSAV---MDHADYQHF
Chicken SEEE-----VQSLSMEHVDVKVIDAYMTLVGFCDQHLRKEEEGSLE---INAADLQLF
Mouse AEEE-----TQLSCWGHEAAAERAHAYMTLVGFCDQQLRKVEESA---SQKTSAE MEAY
Rat AEEE-----TQLSCWGHEAAAERAHAYMTLVGFCDQQLRKVEESA---SQKTSAE MEAY
Cattle AEEE-----AGPLARGQGPTAGVTVAYLTLAEFCQQLRQEEGMSV---LGS AELLTY
Wolf AEEE-----AQPSLRGQGPVASTDAYMTLADFCQQLRKEEESASV---TESVELQTY
Human AEEE-----AQPPSWSCGPAAGVIDAYMTLADFCQQLRKEEENASV---IDS AELQAY
Chimpanzee AEEE-----AQPPSWSCGPAAGVIDAYMTLADFCQQLRKEEENASV---IDS AELQAY
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mosquitoes ERLLLTSLPAIKYGSREARHLFPVLLQLRNLQNDVLGKEFHENACSVPSWNFLPWIPQL
Zebrafish PEHVVKMMLKALKLSSEEARLKFPRLQLVEVYPAETL DLMVREVVSVP C WLLIGWISQM
Xenopus PEIMVEKMIKALKLNSSEARLKFPRLQIIEQYPS ETL DLMAREICTIPCWQF IGWISQM
Chicken PAIVVEKMIKALKLNSREARLRFPRLLQI IERYPAETLGLVTR ELP SVPCWQF IGWISQM
Mouse PALVVEKMLRALKLNSSEARLKFPRLQIIEQYSEETLNIMTKEISSIPCWQF IGWISHM
Rat PALVVEKMLRALKLNSSEARLKFPRLQIIEQYPEETVNI I I KEISSIPCWQF IGWIGHM
Cattle PALVVDKMLKALKFHSSEARLKFPRLQIVTQYPEETLGLMTREISSVPCWFEF IGWIGHM
Wolf PGLVVDNMLKALKLHSSEARLKFPRLQIIELYPEETLSLMTKEISSTPCWQF IGWISHM
Human PALVVEKMLKALKLNSSEARLKFPRLQI IERYPEETLSLMTKEISSVPCWQF ISWISHM
Chimpanzee PALVVEKMLKALKLNSSEARLKFPRLQI IERYPEETLSLMTKEISSVPCWQF ISWISHM
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mosquitoes LSYMQIATPDRPLAPSGVEHFLDEVLMRLVQDYPMALYFPARLLL GEL----LQPGASVR
Zebrafish MALLDKPQA-----TAVQH----VIEEIAECYPQALIYPYMISS ENYTFEESASGQRNR
Xenopus MAMLDKKE S-----IAVQH----IIEEIAENYPQALVYPFMVSGENYNFEDTVVGHKNK
Chicken MALLDKDEA-----VAVQH----TVEEIVDTPYQAI IY PFTISSESYCFKDTAAGCRNK
Mouse MALLDKEEA-----IAVQH----TVEE IADNYPQAI IY PFIISSESYSFKNTSSGHNNK
Rat VALLDKEEA-----IAVQH----TVEE IADNYPQAI IY PFIISSESYSFQNTSSGHNNK
Cattle LPLLDKEEA-----VAIQ R----TVEDIADHYPQAI IY PFMISSESYCFRDT SAGHKNK
Wolf VALLDQEEA-----VAVQC----TVEE IADNYPQAI IY PFIISSESYSFKDTSTGHKNK
Human VALLDKDQA-----VAVQH----SVEEITDNYPQAI IY PFIISSESYSFKDTSTGHKNK
Chimpanzee VALLDKDQA-----VAVQH----SVEEITDNYPQAI IY PFIISSESYSFKDTSTGHKNK
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mosquitoes PFVNQFRAALSF-PVLDRFVAELYRVVMPETRLSNMIAELKRHLASVTD-QPTYQTFIER
Zebrafish EFVVEKLESLLDKGGVIQGFVDALQQLSNPEMLFKDWDEVK NQLDKPNLDK KMKLQY--
Xenopus EFVDRIKSKLDKDNVAQDFIHALEQLSNPPMIFQDWKEEVSNELSKASVNRNRVKELYKE
Chicken EFVASIKNKLD RGGVVDQFIHALEQLSNPVM LFKDWADVRNELVKTRQNKI I LKEMYEG
Mouse AFVERIKSKLDHGVEIHSF I NALDQLSNPDLLFKDWVSDTKDELGKNPVNKKNI EKLYER
Rat AFVERIKSKLDQGGVIQGF I NALDQLSNPDMLFKDWVNDTKDELGKNPVNKKNI EKLYER
Cattle EFVARIKAKLDREGVVQDF I NALDQLSNPEMLFKDWMEDVKVELGKTPVDKKNIQ RMYER
Wolf EFVARIKTKLDLGGVIQDF I SALEQLSNPEMLFKDWTDDMKAE LAKNPVSKKNIEKMYER
Human EFVARIKSKLDQGGVIQDF I NALDQLSNPELLFKDWSNDVRAELAKTPVNKKNI EKMYER
Chimpanzee EFVARIKSKLDQGGVIQDF I NALDQLSNPELLFKDWSNDVRAELAKTPVNKKNI EKMYER
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mosquitoes LV-----PDVFPLDTNDLWRYGQAYRAALPLVERVRTLQSLHPVEDRGTILAKLQEL
Zebrafish MTELLGDAKSPRFGSYRRKFIQKFSKEVEKLLGAG--GSKLYERRKDKDFLQQ-----V
Xenopus LCATLGNVKDPFMGAFRRRFSEKYTKEFDKAFGPD--GSKLLSMKS-DQFSKS-----A
Chicken MYKNLGDVKAPGLGWLRRKFVQAFGKDFDSHFHGK--GSKLLDMKI-SDFNEI-----T
Mouse MYAALGDLRAPGLGPFRRRFIQAFGKEFVKSFNG--GSKLLTMKV-DDFCKI-----T
Rat MYAALGDFRAPGLGPFRRRFIQTFGKEFVKSFNG--GSKLLTMKL-DEFRNI-----T
Cattle MHAALGDFQAPGLGSFRRRFIQAFGKEFVKHFGRG--GSKLPGMKL-QDFYTI-----A
Wolf MYAALGDLRAPGLGAFRRRFIQVFGKEFVKHFGRG--GSKLPGMKL-RDFGSI-----T
Human MYAALGDPKAPGLGAFRRRFIQTFGKEFVKHFGRG--GSKLLRMKL-SDFNDI-----T
Chimpanzee MYAALGDPKAPGLGAFRRRFIQTFGKEFVKHFGRG--GSKLLRMKL-SDFNDI-----T

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mosquitoes ETNLESLRPRSKTTRLQLEDLSPWLADYHSSGQRGSTTQLVEIPGOYGLDRGAPSPQHV
Zebrafish DRMVQSMRG-FQKEPGNMKEYSPWLSSFKAETLK---NELEVPQYD-GSKPLPEYHA
Xenopus EPLMVKMRSEQQKEPGLNKEYSPWMSGFKPEFLR---NELEIPGOYS-GRSKPMPEYHV
Chicken TALLTKMNK-THKEPGLNKECSPWMSEFRAEFLR---NELEVPQYD-GKGKPLPEYHV
Mouse GSLLVRMCK-DSKLPGNLKEYSPWMSGFKAQFLK---NELEIPGOYD-GSKPLPEYHV
Rat DSLFVRMRK-DSKLPGNLKEYSPWMSGFT---VK---SELEIPGOYD-GSKPLPEYHV
Cattle GSLLERMLR-ASNAPGNLRECSWMSNFRVEFLR---AELEVPQYD-GRSKPMPEHHA
Wolf DSLFYKMCCT-DSKPPGNLKECSPWMSDFKVEFLR---NELEIPGOYD-GKGKPLPEYHA
Human NMLLLKMNK-DSKPPGNLKECSPWMSDFKVEFLR---NELEIPGOYD-GRGKPLPEYHV
Chimpanzee NMLLLKMNK-DSKPPGNLKECSPWMSDFKVEFLR---NELEIPGOYD-GRGKPLPEYHV

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mosquitoes TIVKVPDVVVYGTLRRLPIQLTFRGSDGNEYRFLAKFGEDLRQDQRIQQLQREITHRLRW
Zebrafish KITGFDERVKVMTSIRRPKRIIRGDDERDY PFLVKGGEDLRQDQRIEQLFGVMNMILSQ
Xenopus KISGFDERVKVMASIRKPKRIIVRGNDEREY PFLVKGGEDLRQDQRIEQLFEIMNIIISQ
Chicken KISGFDERIMVLESIRKPKRITIRGSDQEH PFLVKGGEDLRQDQRIEQLFVDMNIVLSR
Mouse RISGFDERVKVMLSIRKPKRIVIRGHDEKEY PFLVKGGEDLRQDQRIEQLFEVMNAILSQ
Rat RISGFDERVKVMVSLRKPKRIVIRGHDEKEY PFLVKGGEDLRQDQRIEQLFEVMNAILSQ
Cattle RIAGFDERVKVMASIRKPKRIVIRGHDEREY PFLVKGGEDLRQDHRIQQLQVMNSVLAH
Wolf RIAGFDERIKVMASIRKPKRIIRGRDEKEY PLLVKGGEDLRQDQRIEQLFEVMNVLLSQ
Human RIAGFDERVTVMASLRPKRIIRGHDEREH PFLVKGGEDLRQDQVEQLFQVMNGILAQ
Chimpanzee RIAGFDERVTVMASLRPKRIIRGHDEREH PFLVKGGEDLRQDQVEQLFQVMNGILAQ

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mosquitoes DQRCREQQQLRQTYDVVPIPNFGLFGWLEGTVMASEIAKQA-----APRYNPGRGOAH
Zebrafish DTACSQRSLALRQTYQVIPITSRIGLIEWMENTCTLKDFLSSRRTEQEQTII---TRP--
Xenopus DAACSQRHMQLKTYQVIPMTARIGLIEWMENTCTLKEFILNTMTEDEAKVYNS-KNGP--
Chicken DAACSQRNMQLKTYQVIPMTTRGLIKWLENTCTLKEFLRNSMTEEDANYNS-LKGP--
Mouse DAACSQRNMQLRQTYRVVPMSTRGLIEWIENTMTLKDLLLLSNMSQEEKVANNSDPKAP--
Rat DAACSQRNMQLRQTYRVVPMSTRGLIEWIENTMTLKDLLLLSNMSQEEKVAYDSDSKAP--
Cattle DAACQQRGLQMTTYHVPMSTRGLIEWIENTCTLKELLLSNMSREKKAYTSDPRAP--
Wolf DTACSQRNMQLKTYHVIPMTSRGLIEWIENTLTKDFLLSNMSREKAAAYTSDPKAP--
Human DSACSQRALQRTYSVVPMTSRGLIEWLENTVTLKDLLLNTMSQEEKAAAYLSDPRAP--
Chimpanzee DSACSQRALQRTYSVVPMTSRGLIEWLENTVTLKDLLLNTMSQEEKAAAYLSDPKAP--

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mosquitoes VHHEFGRFLMSVSKQLDPSANDSFNLSSYNAPALYGMAAAFCDRLQSKFVELAQITRG
Zebrafish -NEFYDEWISKVAGKVEG-----IRRYAELYKKAKRVDTVNNFRRIEQMPVD
Xenopus -LMHYNVWLDKREKIGD-----PRQHVTAAYTKCDRTSTVASFREREALVPK
Chicken -RAAYSDWLSKMGGAQ--L--LSRYNAMYKNASRTETVIAFKSRESSVPE
Mouse -IRDYKDWLWKVSGKSD-----AGAYVLMYSRANRTETVAFRRRESQVPP
Rat -IYDYRDWLKIVSGRSD-----VKGYTLMYSRANRTETVTAFRRRENKQVPA
Cattle -ASEYREWLTMVVGKCD-----PGAYARMFVANRTEAVTSFRKRESRVPA
Wolf -PCEYRDWLAKMSGKYD-----VGAYMSMFKAASRTETVTSFRRRESRVPA
Human -PCEYKDWLTKMSGKHD-----VGAYMLMYKGANRTETVTSFRKRESRVPA
Chimpanzee -PCEYKDWLTKMSGKHD-----VGAYMLMYKGANRTETVTSFRKRESRVPA

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mosquitoes NTLKRALYDMAATPEAYYRLRMNFAKSLATMNVTCWVLGIGDRHLSNIVLERATGMLVGV
Zebrafish DLLKRAFVRMSTTPEAFSLRSHFSSSHAVLCISHWILGIGDRHLSNFMINTETGGMIGI
Xenopus DLLRRAFVKMSTTPEAFSLRSHFARSHALLCISHWILGIGDRHLSNFMINMETGGMIGI
Chicken DLLRRAFVKMSTSPPEAFALRSHFVSSHALMCVSHWILGIGDRHLSNFMINKETGGMVGI
Mouse DLLKRAFVKMSTSPPEAFALRSHFASSHALLCISHWLLGIGDRHLNFMVAMETGSGVIGI
Rat DLLKRAFVKMSTSPPEAFALRSHFASSHALLCISHWLLGIGDRHLNFMVAMETGSGVIGI
Cattle DLLKRAFVKMSTSPPEAFALRSHFASSHALLCISHWLLGIGDRHLNFMVAMETGSGVIGI
Wolf DLLKRAFVKMSTSPPEAFALRSHFASSHALLCISHWLLGIGDRHLNFMVAMETGSGVIGI
Human DLLKRAFVRMSTSPPEAFALRSHFASSHALLCISHWILGIGDRHLNFMVAMETGSGVIGI
Chimpanzee DLLKRAFVRMSTSPPEAFALRSHFASSHALLCISHWILGIGDRHLNFMVAMETGSGVIGI
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mosquitoes DFGIAFGAGTRDLPIPELVFPRLTPQFVGVMEPMRLAGVLQKCHLYTLQCLRNCRLLRA
Zebrafish DFGHAFGSATQFLPVPELMPFRLTRQFINLMRPLAESGLIQSVMVHSLRAFRAEPDLLLN
Xenopus DFGHAFGTATQFLPVPELMPFRLTRQFINLMLPMKESGIFDSVMVHSLRAYRSDPGLLIT
Chicken DFGHAFGSATQFLPVPELMPFRLTRQFVNLMMMPVKEWGLIYSVMVHALRAYRADPGLLIS
Mouse DFGHAFGSATQFLPVPELMPFRLTRQFVSLMLPMKETGLMCTVMVHALRAFRSCAGLLTD
Rat DFGHAFGSATQFLPIPELMPFRLTRQFISLMLPMKETGLVCTVMVHALRAFRSCAGLLTD
Cattle DFGHAFGSATQVLRVPELMPFRLTRQFINLMSPLKETGLVSSVMVCALRAFRSRADLLTT
Wolf DFGHAFGSATQFLPVPELMPFRLTRQFINLMLPMKEAGVVYSIMVHALRAFRSHSDLLTN
Human DFGHAFGSATQFLPVPELMPFRLTRQFINLMLPMKETGLMYSIMVHALRAFRSDPGLLTN
Chimpanzee DFGHAFGSATQFLPVPELMPFRLTRQFINLMLPMKETGLMYSIMVHALRAFRSDPGLLTN
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mosquitoes CLEVFRVREPTVDWLRARQRMVEQPGESGRAEERRSDREWNQVRVDTVLRKLNKANPKQ
Zebrafish TMDVVFVKEPSLDWKNFELK-QLKK-GGTWTESVNTKEINWFPLQKVNFAARRKLEGTNPSV
Xenopus TMDVFIKPEPSLDWKNLELK-QIKK-KGEWMDVDTTSLNWPYPAQKIHCARRKLAGANPCE
Chicken TMDVVFVKEPSLDWKNFEQR-QLKK-GGTWIKENTAEVNWPYPLQKVSYVKKRLTGANPAR
Mouse TMEIFVKEPSFDWKSFEQT-MLRK-GGSWIQEVNTEKNWYPQHKIRYAKRKLAPANPAV
Rat TMEVFVKEPSFDWKGFEQT-MLRK-GGSWIQEVNTEKNWYPQHKIRYAKRKLAPANPAV
Cattle TMDVVFVKEPSFDWKNFEQT-MLRK-GGSWIQEVNTEKNWYPQKIHAKRKLAPANPAV
Wolf TMDVVFVKEPSFDWKNFEQK-MLKK-GGSWIQEVNTEKNWYPQKIHAKRKLAPANPAV
Human TMDVVFVKEPSFDWKNFEQK-MLKK-GGSWIQEVNTEKNWYPQKIHAKRKLAPANPAV
Chimpanzee TMDVVFVKEPSFDWKNFEQK-MLKK-GGSWIQEVNTEKNWYPQKIHAKRKLAPANPAV
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mosquitoes LLTDELRFVVAQQRDFLVGYLALVDAAPACTEKGRRATGTISTELQTEMLLEMAIDS
Zebrafish ITSEELCLGFEMKMP--EYKGLLAVARGEE--QHNIRARLADKDLTVEDQVDCLLDQATDP
Xenopus ITCEELRLGHEGSP--TYLAFLAVARGDK--AHNKRANDPKDGLSEEAQVQCLLDQATDP
Chicken ITCDELRLGYEKLK--FYNDFAAVARGSA--DHNIRAKEPEDRLSEETQVRCLLDQATDP
Mouse ITCDELRYLGHASS--AFRSYTAARGNR--DYNIRAQEPESGLSEETQVKCLVDQATDP
Rat ITCDELRLGHEASP--AFRSYVAVARGNK--DYNIRAQEPESRLSEETQVKCLVDQATDP
Cattle ITCNELLLGHEKES--AFRDYVAVARGSK--EHSVRAQEPESGLSEEAQVRCCLLDQATDP
Wolf ITCDELFLGHEKAL--AFRDYVAVARGSK--DHNIRAQEPENGLSEEAQVKCLLDQATDP
Human ITCDELLELLGHEKAP--AFRDYVAVARGSK--DHNIRAQEPESGLSEETQVKCLMDQATDP
Chimpanzee ITCDELLELLGHEKAP--AFRDYVAVARGSK--DHNIRAREPESGLSEETQVKCLMDQATDP
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mosquitoes RLLGITYSGWYPWF
Zebrafish NILGRVWIGWEPWI
Xenopus NILGRVWKGWEPWI
Chicken NLLGRVWEGWEPWM
Mouse NILGRTWEGWEPWM
Rat NILGRTWEGWEPWM
Cattle NILGRTWEGWEPWM
Wolf NILGRTWIGWEPWM
Human NILGRTWEGWEPWM
Chimpanzee NILGRTWEGWEPWM
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