

Figure S1. Multiple sequence alignments

ALBUMIN

Human MKWVTFISLLFLFSSAYSRGVFRDRAHKSEVAHRFKDLGEEENFKALVLI AFAQYLQCCPF  
Chimpanzee MKWVTFISLLFLFSSAYSRGVFRDRAHKSEVAHRFKDLGEEENFKALVLI AFAQYLQCCPF  
Bonobo MKWVTFISLLFLFSSAYSRGVFRDRAHKSEVAHRFKDLGEEENFKALVLI AFAQYLQCCPF  
Gorilla MKWVTFISLLFLFSSAYSRGVFRDRAHKSEVAHRFKDLGEEETFKALVLI AFAQYLQCCPF  
Orangutan MKWVTFISLLFLFSSAYSRGVFRDRAHKSEVAHRFKDLGEEKFKALVLI AFAQYLQCCPF  
Gibbon MKWVTFISLLLLFSSAYSRGVFRDRAHKSEIAHRFKDLGEEENFKALVLI AFAQYLQCCPF  
Rhesus MKWVTFISLLFLFSSAYSRGVFRDTHKSEVAHRFKDLGEEHFKGLVLI AFSQYLQCCPF  
Crab-eating macaque MKWVTFISLLFLFSSAYSRGVFRDTHKSEVAHRFKDLGEEHFKGLVLI AFSQYLQCCPF  
Olive baboon MKWVTFISLLFLFSSAYSRGVFRDRAHKSEVAHRFKDLGEEHFKGL-----  
Marmoset MKWVTFISLLFLFSSAYSRGVFRDRAHKSEVAHRFKDLGEEHFKDLVLPFSQYLQCCPF  
Squirrel monkey MKWVTFISLLFLFSSAYSRGVFRDRAHKSEVAHRFKDLGEEENFKALVLI AFSQYLQCCPF  
Tarsier MKWVTFISLLFLFSSAHSRGLFRDRAHKSEIAHRYKDLGETDFKYLVLITFSQYLQKCPF  
Mouse lemur MKWVTFISLLFLFSSAYSRGVFRDTHKSELAHRFNDLGEENFKALVLI VTFSSQFLQKCPF  
Bushbaby MKWVTFISLLFLFSSAYSRGVFRDTHKSELAHRFNDLGEENFKALVLI VTFSSQFLQKCPF  
Chinese hamster MKWVTFISLLFLFSSAYSRGVFRDTHKSEIAHRFKDLGEEENFKGLVLI AFSQYLQCCPF  
Squirrel MKWVTFIFLLFLFSSAYSRGVFRREAGKSEI IKRFREFGEQEFKGLVLI VTFSSQILQKTSY  
Golden hamster MKWVTFLLLLFVSDSAFSGVFRDRAHKSEIAHRFKDLGEGHFKGLVLI AFSQFLQKCPY  
Mouse MKWVTFLLLLFVSGSAFSGVFRREAHKSEIAHRYNDLGEQHFKGLVLI AFSQYLQKCSY  
Rat MKWVTFLLLLFISGSAFSGVFRREAHKSEIAHRFKDLGEGHFKGLVLI AFSQYLQKCPY  
Naked mole rat MKWVTFISLLLLFSSAYSRGVFRREAHKSEIAHRFTDLGEEKHFKGLALITFSQYLQKCSF  
Guinea pig MKWVTFISLLFLFSSVYSRGVFRREAHKSEIAHRFNDLGEHFKGLVLI TLSQHLQKSPF  
Rabbit MKWVTFISLLFLFSSAYSRGVFRREAHKSEIAHRFNDVGEENF IGLVLI TFSQYLQKCPY  
Pika MKWVTFISLLFLVSSAYSRGLIRREAHKSEIAHRFKDVGEENFKGLVLI AFSQYLQKCPF  
Pig MKWVTFISLLFLFSSAYSRGVFRDTHKSEIAHRFKDLGEGYFKGLVLI AFSQHLQKCPY  
Alpaca MKWVTFISLLFLFSSVYSRGVFRDTHKSEIAHRFKDLGEDDFKGLVLI AFSQYLQCCPF  
Bactrian camel MKWVTFISLLFLFSSVYSRGVFRDTHKSEIAHRFKDLGEDDFKGLVLI AFSQYLQCCPF  
Dolphin MKWVTFISLIFL FSSAYSRGVFRDTHKSEIAHRFNDLGEENFKGLVLI AFSQYLQOSP  
Killer whale MKWVTFISLIFL FSSAYSRGVFRDTHKSEIAHRFNDLGEENFKGLVLI AFSQYLQOSP  
Cow MKWVTFISLLLLFSSAYSRGVFRDTHKSEIAHRFKDLGEEHFKGLVLI AFSQYLQCCPF  
Sheep MKWVTFISLLLLFSSAYSRGVFRDTHKSEIAHRFNDLGEENFQGLVLI AFSQYLQCCPF  
Goat MKWVTFISLLLLFSSAYSRGVFRDTHKSEIAHRFNDLGEENFQGLVLI AFSQYLQCCPF  
Horse MQWVTFVSLFLFSSAYSRGVLRDTHKSEIAHRFNDLGEKHFKGLVLI AFSQYLQCCPF  
White rhinoceros MKWVTFISLLFLFSSAYSRGVFRRHSHYKSEIAHRFNDLGEPHFKGLVLI AFSQYLQOQTY  
Cat MKWVTFISLLFLFSSAYSRGVFRREAHQSEIAHRFNDLGEENFRLVLI AFSQYLQCCPF  
Dog MKWVTFISLFLFSSAYSRGLVFRREAYKSEIAHRYNDLGEENFRLVLI AFSQYLQCCPF  
Ferret MKWVTFISLLFLFSSAYSRGVTRREAQOSEIAHRYNDLGEENFRLVLI AFSQYLQCCPF  
Panda MKWVTFISLLFLFSSAYSRGVTRREAQOSEIAHRYNDLGEENFRLVLI AFSQYLQCCPF  
Pacific walrus MKWVTFISLLFLFSSAYSRGVVRRETOQSEIAHRYNDLGEENFRLVLI AFSQYLQOSP  
Weddell seal MKWVTFISLLFLFSSAYSRGVVRREAQOSEVAHRFNDLGEENFRLVLI AFSQYLQCCPF  
Black flying fox MKWVTFISLLFLFSSAYSRGVFRDTHKSEIAHRYNDLGEENFRELVLITFSQYLQCCPF  
Megabat MKWVTFISLLFLFSSAYSRGVFRDTHKSEIAHRYNDLGEEQFRELVLITFSQYLQCCPF  
Hedgehog MKWVTFISLLFLISSAYSRGVIRDRAHKSEIAHRFSDLGEGNFKALVLI TFSQFLQKCPY  
Shrew MKWVTFISLLFLFNSAYSRGVFRDRAHKSEIAHRFKDLGEEENFKGLVLI AFSQYLQKCPF  
Star nosed mole MKWVTFISLLFLFSSAYSRGVFRDRAHKSEIAHRFNDLGEENFRLVLI AFSQYLQKCPF  
Hyrax MKWITFIALLFLFSSASSRGLFRDRAHKSEIAHRYNDLGENIFKGL-LISLAQHL-----  
Elephant MKWVIFISLSFLFSSAYSRGVFRREAYKSEIAHRYKDLGEDLFKGLLLISFAQYLQKSPY  
Manatee MKWVTFISLLFLFSSAYSKGVFRDTHKSEIAHRYNDLGEDLFTGLLLISFSQYLQKSPF  
Cape golden mole MKWVTFISLLFLFSSAYSRGVFRDRAHKSELAHRYTDLGEDVFKGLLLIAFSQYLQKCPY  
Tenrec MKWVTFISLLFLFSSASSRGLFRDRAHKSEIAHRYKDLGEEFKGLLLITFSQYLQKCPY  
Armadillo MKWVIFISLLFLFSSAYSKGVFRDRAHKSEIAHRFNDLGEENFRLTLVMFAQYLQKCPF  
Sloth MKWVTFISL-FLFSSAYSRGVVRREADKSEIAHRFKDLGEEENFRG-----  
Opossum MKWVTFISLIFL FSSVYSRDLFRDAPKSEIAKRYRDLGEENFKALVLI TFAQYLQKCPF  
Tasmanian devil MKWVTFISLIFL FSSVHSREIFRRDAPTSEIAKRYRDLGEENFKGLVLI TFAQYLQKCPF  
Platypus M-----

Human EDHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVATLREY GEMADCCAQEP  
Chimpanzee EDHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVATLREY GEMADCCAQEP  
Bonobo EDHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVATLREY GEMADCCAQEP  
Gorilla EDHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVATLREY GEMADCCAQEP  
Orangutan EDHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVATLREY GEMADCCAQEP

Gibbon EDHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEP  
Rhesus EEHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEP  
Crab-eating macaque EEHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEP  
Olive baboon -----VATLRETYGEMADCCAKQEP  
Marmoset EEHLKLVNEVTEFAKTCVADETAENCDKSLHTLFGDKLCTVATLRETYGDMADCCAKQEP  
Squirrel monkey DDHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVATLRETYGDMADCCAKQEP  
Tarsier QEHVKLMNEVIEFAKTCVADESAENCDKSLHTLFGDKLCTVASLRETYGEMADCCAKQEP  
Mouse lemur EDHVKLVNEITDFAKTCVADESAENCDKSLHTLFGDKLCTVASLRETYGEMADCCAKQEP  
Bushbaby EDHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVASLRETYGEMADCCAKQEP  
Chinese hamster EEHVKLVGEVTEFAKTCVADETAENCDKSLHTLFGDKLCTIATLRETYGDMADCCAKQEP  
Squirrel DDLAKFTTEVTDLAKACVADEFVDCNKPLDTIFGEEACKIATLRDITYGDMADCCANQDL  
Golden hamster EEHVKLVNEVTDFAKTCVADESAENCDKSLHTLFGDKLCAIPTLRDSYGELADCCAKKEP  
Mouse DEHAKLVQEVTDFAKTCVADESAENCDKSLHTLFGDKLCAIPNLRNRYGELADCCTKQEP  
Rat EEHIKLVQEVTDFAKTCVADESAENCDKSIHTLFGDKLCAIPKLRNRYGELADCCAKQEP  
Naked mole rat EEHIKLVKEVTDFAKTCVADESAENCDKSIHTLFGDKLCAIQTLRETYGALADCCAKQEP  
Guinea pig EEHVKLVNEVTDFAKACVADESAQNCGKAIATLFGDKVCAIPSLRETYGELADCCAKEDP  
Rabbit EEHAKLVKEVTDLAKACVADESAENCDKSLHDFGDKICALPSLRDITYGDVADCCCKEKEP  
Pika EEHVKLVNEVTEFAKTCVADESAENCGKSLHDFGDKICAIPTLRDSYGDLAG-CAKQEP  
Pig EEHVKLVREVTEFAKTCVADESAENCDKSIHTLFGDKLCAIPSLRETYGDLADCCCKEKEP  
Alpaca DDHVKLVNEVTEFAKTCVADESAADCDKSLHILFNGNKLCTVASLRETYGEMADCCCKQEA  
Bactrian camel DDHVKLVNEVTEFAKTCVADESAADCDKSLHTLFGDKLCTVASLRETYGEMADCCCKQEP  
Dolphin DEHVKLVNEITDFAKTCVADESAENCDKSLHTLFGDKLCAVASLRETYGEMADCCGKQDP  
Killer whale DEHVKLVNEITDFAKTCVADESAENCDKSLHTLFGDKLCAVASLRETYGEMADCCGKQEP  
Cow DEHVKLVNELTEFAKTCVADESHAGCEKSLHTLFGDELCKVASLRETYGDMADCCCKQEP  
Sheep DEHVKLVKELTEFAKTCVADESHAGCDKSLHTLFGDELCKVATLRETYGDMADCCCKQEP  
Goat DEHVKLVKELTEFAKTCVADESHAGCDKSLHTLFGDELCKVATLRETYGDMADCCCKQEP  
Horse EDHVKLVNEVTEFAKCAADESAENCDKSLHTLFGDKLCTVATLRAITYGELADCCCKQEP  
White rhinoceros EDHVKLVNEVNEFAKCAADESAENCDKSLHTLFGDELCKVATNRETYGELADCCCKEKEP  
Cat EDHVKLVNEVTEFAKGCVADESAANCEKSLHELFGDKLCTVASLRDITYGEMADCCCKEKEP  
Dog EDHVKLAKEVTEFAKACAAESGANCDKSLHTLFGDKLCTVASLRDITYGDMADCCCKQEP  
Ferret EDHVKLVKEMTEFAKCAADQSGADCGKSLHTLFGDKLCTVASLRETYGELADCCCKQEP  
Panda EDHAKLAKEVTEFARGCAADQSGADCGKSLHTLFGDKLCTVASLRETYGELADCCCKQEP  
Pacific walrus EDHVKLAKEVTEFAKCAADQSGADCGKSLHTLFGDRLCTVASLRETYGDLADCCCKQDP  
Weddell seal EDHVKLAKEVTEFAKCAADQSGADCGKSLHTLFGDKLCTVASLRETYGELADCCCKQDP  
Black flying fox DEHSKLTNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVASLRETYGELADCCCKQDP  
Megabat DEHSKLTNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTVASLRETYGELADCCCKQDP  
Hedgehog EEHVKLVKEVTDFAKGCVADESAENCEKSIHTLFGDKLCKMPSLRETYGEMADCCAKQDP  
Shrew EDHVKLVQEVNEFAKCAADESGPNCDSLPTLFGDKLCTVASLRETYGELADCCCKQEP  
Star nosed mole EDQLKLVTDVTEFAKTCVADESAENCDKPLQTLFGDKLCTVASVRETYGELADCCCKEKEP  
Hyrax -----AEFAKTCVADESAADCDHSIHAIFGDKVCAVKAHPDLYADLTECCCKQEP  
Elephant DEHVQSVTAVTDLAKTCAADESAEHCGDSLHTIFGDKLCAVTAHQDITYGEFAECCGKQEP  
Manatee EDQEQSVKEVTEFAKTCVADESAENCDHSLHAIFEDKLCVRAHSDVYAEFVECCCKEKEP  
Cape golden mole EEHVKLVNEVTEFAKTCVADESAENCDKSLHTLFGDKLCTIASLRDITYGELADCCCKQEP  
Tenrec EEHVKLVTEVTDFAKTCVADESAENCGKSLHTLFGDKLCTIASLRDITYGELADCCCKQEP  
Armadillo EEHVKLVNEVTEFAKTCVADESAENCGKSLHTLFGDELCSIANLRDSYGELADCCDKQEP  
Sloth -----HTLLGDKACSVGSLRETYGELADCCGKQEP  
Opossum EDHVKLVDEVVQFAKCAADETAENCGKSLHQLLGDKLCIASLRETYGEMADCCAKEEP  
Tasmanian devil EDHVKLVSEVVEFAKCAADESAENCGKSLHELLGDKLCKVPSLRETYGEMADCCAKEEP  
Platypus -----SLVFAEELCKADHLKDSYAEALAEACCTA

Human ERNECFLOHKDDNPPLPRLVLRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLF  
Chimpanzee ERNECFLOHKDDNPPLPRLVLRPEVDVMCTAFHDNEETFLKKYLYEVARRHPYFYAPELLF  
Bonobo ERNECFLOHKDDNPPLPRLVLRPEVDVMCTAFHDNEETFLKKYLYEVARRHPYFYAPELLF  
Gorilla ERNECFLOHKDDNPPLPRLVLRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLF  
Orangutan ERNECFLOHKDDNPPLPRLVLRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLF  
Gibbon ERNECFLOHKDDNPPLPRLVLRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLF  
Rhesus ERNECFLOHKDDNPPLPRLVLRPEVDVMCTAFHDNEETFLKKYLYEVARRHPYFYAPELLF  
Crab-eating macaque ERNECFLOHKDDNPPLPRLVLRPEVDVMCTAFHDNEETFLKKYLYEVARRHPYFYAPELLF  
Olive baboon ERNECFLOHKDDNPPLPRLV-----  
Marmoset ERNECFLOHKDDKPDLPPLVLRPEVDVMCTAFQEHEDTFLKKYLYEVARRHPYFYAPELLF  
Squirrel monkey ERNECFLOHKDDKPDLPPLVLRPEVDVMCSAFQADETFLKKYLYEVARRHPYFYAPELLF  
Tarsier ERNECFLEHKDDNPPLPSLIRPEADVMTAFQENADMFLGNLYEVARRHPYFYAPPELLY  
Mouse lemur ERNQCFLAHKDDKPDLPPLERPETDVMCTSFQENENRFLG-----  
Bushbaby ERNQCFLDHKDDKPDLPPLVLRPEVDVMCTSFQDNEETFLGHYLYEVARRHPYFYGPELLF  
Chinese hamster ERNECFLOHKDDKPSLPALVLRPEADVMTSFQESENMFLGKLYEVARRHPYFYAPPELLY

Squirrel	ERFQCLIKYKEDTPTIPPLHPIDPDALCISFDESSONVLGHFVYEVARRNPYLCGQKVMY
Golden hamster	ERNECFLLKHKDDHPNLPPFVRPDAEAMCTSFQENAVTFMGHYLHEVARRHPYFYAPELly
Mouse	ERNECFLOHKDDNPDLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELly
Rat	ERNECFLOHKDDNPDLPPFQRPEAEAMCTSFQENPTSFGLGHYLHEVARRHPYFYAPELly
Naked mole rat	ERNECFLEHKEDNPALPPFKRPEPEAMCTSFNEDNQLFMGHYLYEVARRHPYFYAPELly
Guinea pig	DRVECFLOHKDDNPDLPPFERPEPEALCTAFKENNDRFIGQFIFEVSRRHYPYFYAPELly
Rabbit	ERNECFLLHKDDKPDLPFFARPEADVLCFAFHDDKKAFFGHYLYEVARRHPYFYAPELly
Pika	ERNQCFLLKHKDDNPDLPPFVRPDEVLCTAFHDNEKKAFFGHYLYEVARRHPYFYAPELly
Pig	ERNECFLOHKNDNPDIKPKL-KPDPVALCADFQEDKQKFWGKYLIEIARRHPYFYAPELly
Alpaca	ERNECFLOHKNDNPDLKPKL-KPEPEALCTAFQENKRFGGKYLIEIARRHPYFYAPELly
Bactrian camel	ERNECFLOHKSDNPDLKPKL-KPEPEALCTAFQENKRFGGKYLIEIARRHPYFYAPELly
Dolphin	ERNECLLKHKDDNPDLKPKL-KPDPETFCTEFKENEKQFWGKYLIEIARRHPYFYAPELly
Killer whale	ERNECLLKHKDDNPDLKPKL-KPDPETLCTEFKENEKQFWGKYLIEIARRHPYFYAPELly
Cow	ERNECFLLSHKDDSPDLKPKL-KPDPNTLCDEFKADEKQFWGKYLIEIARRHPYFYAPELly
Sheep	ERNECFLLNHKDDSPDLKPKL-KPEPDTLCAEFKADEKQFWGKYLIEVARRHPYFYAPELly
Goat	ERNECFLLKHKDDSPDLKPKL-KPEPDTLCAEFKADEKQFWGKYLIEVARRHPYFYAPELly
Horse	ERNECFLLTHKDDHPNLKPKL-KPEPDAQCAAFQEDPKFLGKYLIEVARRHPYFYGPELLF
White rhinoceros	ERNECFLOHKDDSPNFPPL-KAEADVLCAQFQADEQSFLGKYLIEIARRHPYFYAPELly
Cat	ERNECFLOHKDDNPFGFQLVTPPEADAMCTAFHENEQRFLGKYLIEIARRHPYFYAPELly
Dog	DRNECFLLAHKDDNPFGFPLVAPEPDALCAAFQDNEQLFLGKYLIEIARRHPYFYAPELly
Ferret	ERNECFLLTHKDDNPFGFPLVTPPEVMCTAFQENEQQFLGKYLIEVARRHPYFYAPELly
Panda	ERNECFLLKHKDDNPFGFPLVTPPEPDALCAAFQENEQRFLGKYLIEVARRHPYFYGPELLY
Pacific walrus	ERNECFLLSHKDDNPFGFPLVTPPEPDAICTAFQENEQKFLGKYLIEVARRHPYFYAPELly
Weddell seal	ERNECFLLTHKDDNPFGFPLVTPPEPDAMCAAFQESEQKFLGKYLIEVARRHPYFYAPELly
Black flying fox	ERNECFLLKHKDDNPDLPPVVKPEPEALCTAFQENNKFLENYLYEVARRHPYFYGPELLY
Megabat	ERNECFLLKHKDDNPDLPPIVKPEPEALCTAFQENNKFLENYLYEVARRHPYFYGPELLY
Hedgehog	ERIDCFVQHKDDSPNLPPVVRPDEVMCTAFQEDQLKFAGSYLYEVARRHPYFYAPELly
Shrew	ERADCFASHRDDNPFGFPLMVRPPVDELCSYQADAMFAGKYLIEVARRYPYFYAPELly
Star nosed mole	GRHECFLOHKDDNPGLPRFTRPADALCSAFQENEKFAAHYLYEVARRHPYFYAPELly
Hyrax	ERNECFQKHKDDNPDLPLVLRPTADALCASFHENEKNLLGHYLYEVARRHPYFYAPELly
Elephant	ERNECFLLKHKDDNPALPPLVLRPPADALCASFEENERKFFGVYLYEVARRHPYFYAPELly
Manatee	ERHNCFLQHKDDNPVPPFVVRGADDLCTAFHENEKRFFGKYIYEVARRHPYFYAPELly
Cape golden mole	ERNCFLLTHKDDNPGLPQLVRRPADLCAAFQADEKQFFGEYLYQVARRHPYFYAPELly
Tenrec	ERNECFLLKHRDESPALPPIERP SADVLCTAFEDNEERFFGKYIYEVARRHPYFYGPELLY
Armadillo	ERNECFLLKHKDDNPDLPLVLRPDAEVMCTAYQENEQDFVEIYVHGVARRHPYFYGPELLY
Sloth	ERNQCFLLKHKDDNPDLPPFARPEVAVICASFQENEKFLGHYLYEISRRNPFFYAPELIH
Opossum	ERNQCFLLSHKDDHPDLKPKIVAPEPKLCOEFQENENKVMGYLHQVARRHPYFYAPALLA
Tasmanian devil	ERHRCFLSHKDDQPNLKPKEAPEPETLCKNFQENENRVLGFYLYEVARRHPYFYAPALLA
Platypus	EKAECLLKHKDETPVEPPFTRPEPAVLCKEYEDNRNQFLG-----

Human	FAKRYKAAFTECCQAADKAACLPLKLDLDRDEGKASSAKQRLKCASLQKFGERAFKAWAV
Chimpanzee	FAERYKAAFTECCQAADKAACLPLKLDLDRDEGKASSAKQRLKCASLQKFGERAFKAWAV
Bonobo	FAERYKAAFTECCQAADKAACLPLKLDLDRDEGKASSAKQRLKCASLQKFGERAFKAWAV
Gorilla	FAARYKAAFTECCQAADKAACLPLKLDLDRDEGKASSAKQRLKCASLQKFGERAFKAWAV
Orangutan	FAVRYKAAFTECCQAADKAACLPLKLDLDRDEGKASSAKQRLKCASLQKFGERAFKAWAV
Gibbon	FAERYKAAFTECCQAADKAACLPLKLDLDRDEGKASSAKQRLKCASLQKFGERAFKAWAV
Rhesus	FAARYKAAFAECCQAADKAACLPLKLDLDRDEGKASSAKQRLKCASLQKFGDRAFKAWAV
Crab-eating macaque	FAARYKAAFAECCQAADKAACLPLKLDLDRDQGKASSAKQRLKCASLQKFGDRAFKAWAV
Olive baboon	-----LDELDRDQGKASSAKQRLKCASLQKFGDRAFKAWAV
Marmoset	FAQKYKAAFTECCQAADKGAACLPLKLDLDRDQGKASSAKQRLKCASLQKFGERAFKAWSV
Squirrel monkey	FAQKYKAAFTECCQAADKDAACLTPKLDLDRDQGKASSAKQRLKCASLQKFGERAFKAWVV
Tarsier	YQQKYKAVFTECCQAADKAACLFPK-----AV
Mouse lemur	-----LDELKEEGMASSARQRLKCSSLEKFGERAFKAWAV
Bushbaby	FAEKYKAAFTECCQAADKAACLPLKLDLKEEGMASSAKQRLKCSSLEKFGDRAFKAWAV
Chinese hamster	YAQKYKTALKECCAADKAACLTPKLDLALKEKALFSSAKQRLKCTSIOKFGDRAFKAWAV
Squirrel	FAEKYKGFLECCKAADKGECLTQKTENLKKTIMLSSAKDRFKCSVLEKYEERGLKAWLI
Golden hamster	YAEKYSAIMTECCGEADKAACITPKLDLALKEKALSSVNQRLKCSSLQRFQORAFKAWAV
Mouse	YAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWAV
Rat	YAEKYNEVLTQCCTESDKAACLTPKLDVAVKEKALVAAVRQRMKCSSMQRFGERAFKAWAV
Naked mole rat	YAERYMDVLTTECCQAADKAACLTPKLDLALKEKALTSAAQORLKCASIQKFGERAFKAWAL
Guinea pig	YAEKYKNALTECCQAADKAACLTPKLDLAIKEKALVSSAQORLKCASLQKFGERAFKAWSV
Rabbit	YAQKYKAILTECCQAADKGAACLTPKLDLALKEKALTSAAQERLRCASIQKFGDRAFKAWAL
Pika	YAEKYKAILTECCQAADKGAACLTPKLDLALKEKALTDAFNERLKCASIQKFGDRAFKAWAL
Pig	YAIYKDVFECCQAADKAACLPLKIEHLREKVLTSAAQORLKCASIQKFGERAFKAWSL
Alpaca	YAHQYKHVFECCKEADKAACLPLKIDLEKGM---TSARQRLRCTSIO-FGEEALKAWSV

Bactrian camel	YAHQYKHVFEECCDADKAACLLPKLDALKERILASSARQLRCTS IQKFGDRALKAWSV
Dolphin	FAHQYKGVFGECCQAADKGA CLIPKI--L-EE--ASSARQLKCTS IQKFGERALKAWSV
Killer whale	FAHQYKGVFAECCQAADKGA CLIPKIETVREEVLAASSARQLKCTS IQKFGERALKAWSV
Cow	YANKYNGVFOECCQAEDKGA CLLPKIETMREKVLASSARQLRCASIQKFGERALKAWSV
Sheep	YANKYNGVFOECCQAEDKGA CLLPKIETMREKVLASSARQLRCASIQKFGERALKAWSV
Goat	YANKYNGVFOECCQAEDKGA CLLPKIETMREKVLASSARQLRCASIQKFGERALKAWSV
Horse	HAEYKADFTTECCPADDKAGCLIPKLDALKERILSSAKERLKCSSFQNFGERAVKAWSV
White rhinoceros	YAEYRDDLKECCQAADKAACLLPKI AVLDRDRLVSSAKERLKCASIQKFGERALKAWTV
Cat	YAEYKGVFTECCQAADKAACLLPKIDALREKVLSSAKERLKCASIQKFGERAFKAWSV
Dog	YAQQYKGVFAECCQAADKAACLLPKIEALREKVLSSAKERFKCASIQKFGDRAFKAWSV
Ferret	YTQQYKGVFTECCQAADKAACLLPKTEALREKVLSSARERFKCASIQKFGDRAFKAWSV
Panda	YAQQYKGVFAECCQAADKAACLLPKIDDLREKVLSSAKERFKCASIQKFGDRAFKAWSI
Pacific walrus	YAQQYKQVFAECCQAADKAACLLPKIDALREKVLSSAKERFKCASIQKFGDRAFKAWSV
Weddell seal	YAQQYKQVFAECCQAADKAACLLPKIDALREKVLSSAKERFKCASIQKFGDRAFKAWSI
Black flying fox	YVKQYKAILTECCQAADKATCLAPKAVLKEKLLSSAKQRHKCASIQKFGERAFKAWSI
Megabat	YVKYKAILTECCQAADKATCLAPKAVLKEKLLSSAKQRHRCAS-----SM
Hedgehog	FAAKYKDVLAECCQAADKGA CLTPKMDELK GKALVSAAQORFKCAGLQKFGERAFKAYAV
Shrew	YAQKYKDALAECCSAADKAACLLPKIDDLKESVMTSGAKQRFK CAGIEKFGERAFKAWAV
Star nosed mole	YAKKYRQILAECQAADKGA CLTPKIDELKEVVLSSAKQRFK CASIQKFGERAFKAWSV
Hyrax	YSHEYKDVLECCQAADKACLTPK-----
Elephant	YSEKYKDILTECCHADDKAACLLPKIDALKDTVLSSAARQLKCANIHKFGERAFKAWAV
Manatee	YSYKYREILAECCEAADKAACLLPKINSLKEKVLSSAKERLRCVSI EKFGERAFKAWGV
Cape golden mole	FSQKYKAVLTECCQAADKADCLTPKLDLKEAVLSSAKQRLKCANIEKFGERAFKAWAV
Tenrec	ISAKYKAALTECCHVADKAACLLPKIDELKEHALSSAKQRLRCASIEKFGPRAFNAWAV
Armadillo	YAQQYKVAFKECCQAADKAACLLPKMDALKQSALSSAKQRFK CAGIEKFGERAFKAWGV
Sloth	YTHRYKDALKECCSAEDKAACLLAPKLEKLKEKVLSSAKQRLKCSNLEKFGERPFAWAV
Opossum	YAIQYRDVRECCAAADKATCLNDKLTDLREKVLSSAGAKQRFRCASLDKFGERAVKAGLV
Tasmanian devil	YAHQYKEAVGCCQEADKGA CDFNKL SVLRDKVISSAGAKQRFRCSSLDEFGERAVKAGLV
Platypus	-----LSLQLPELKD KVLVTTAKQRFRC AAYQKFGERAMKAVLV

Human	ARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Chimpanzee	ARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Bonobo	ARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Gorilla	ARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Orangutan	ARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Gibbon	ARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Rhesus	ARLSQKFPKAEFAEVSKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Crab-eating macaque	ARLSQKFPKAEFAEVSKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Olive baboon	ARLSQKFPKAEFAEVSKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Marmoset	ARVSQRFPKADFTEVTKVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Squirrel monkey	ARLSQKFPKADFTEVTKVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Tarsier	ARMSQKFPKADFTEVTKVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Mouse lemur	ARLSQRFPKADFTEVTKVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Bushbaby	ARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Chinese hamster	ALLSQKYPKADFTEITKIATDLTKI IKESCSGDLL ESTHDRVTLANY ICENQDK ISSKLVG
Squirrel	SRLSRKFPQAEFTEITKIATDLTKI IKESCSGDLL ESTHDRVTLANY ICENQDK ISSKLVG
Golden hamster	ARMSQKFPKADFTEITKLATDLTKL TECCCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Mouse	ARLSQTFPNADFTEITKLATDLTKVNKECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Rat	ARMSQRFPNADFTEITKLATDLTKINKECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Naked mole rat	ARMSQKFCFAEFIEISRIVNDLTKVNKECCRGDLL ECADDRADLAKY ICENQDS ISSKLLK
Guinea pig	ARLSQKFPKAEFAEISTIVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Rabbit	VRLSQRFPKADFTEISKIVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Pika	SRLSQEFPKADFMEISKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Pig	ARLSQRFPKADFTEISKIVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Alpaca	GHL SQKFPKADFTEISKIVTDLTKIHK ECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Bactrian camel	GHL SQKFPKADFTEISKIVTDLTKIHK ECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Dolphin	ARLSQKFPKADFTEISKIVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Killer whale	ARLSQKFPKADFTEISKIVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Cow	ARLSQKFPKAEFVEVTKLVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Sheep	ARLSQKFPKADFTEVTKIVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Goat	ARLSQKFPKADFTEVTKIVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Horse	ARLSQKFPKADFTEVTKIVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
White rhinoceros	ARLSQKFPKADFTEISKLVTDLTKIHK ECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Cat	ARLSQKFPKAEFAEISKLVTDLTKIHK ECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK
Dog	ARLSQRFPKADFTEISKVTDLTKVHTECCHGDLL ECADDRADLAKY ICENQDS ISSKLLK



Ferret	ARLSQKFPKADFAEVSKLVTDLTKVHKECCHGDLLCADDRADMAKYICENQDSISTKLLK
Panda	ARLSQKFPKADFAEVSKVVTDLTKVHKECCHGDLLCADDRADLAKYMCENQDSISSKLLK
Pacific walrus	ARMSQKFPKADFAEVTKLVTDLTKIHKECCHGDLLCADDRADLAKYMCENQDSISTKMK
Weddell seal	ALMSQKFPKADFAEVSKLVTDLTKIHKECCHGDLLCADDRADLAKYMCENQDSISSKMK
Black flying fox	ARLSQKFPKADFDLSKLVTDLTKIHKECCHGDLLCADDRADLAKYVCDNQDSFSSKLLK
Megabat	ARVSQKFPKADFMELSKIIVSDLSKIHKECCHGDLLCADDRGDLVKYMCNQDSFSSKLLK
Hedgehog	ARMSQKFPKADFMEISKIVTDLTKIHKECCHGDLLCADDRADLVKYTCENQDTISSKLLK
Shrew	ARLSQKFPNADFAEISKIVTDLTKINKECCHGDLLCADDRVELGKYMCDNKDISISSKLG
Star nosed mole	SRLSQKFPKADFAEISKIVGDLTKVNKECCEGDLLCADDRREALAKYICENQDTISSKLLK
Hyrax	-----AELAKHICDHQGELSSKLLK
Elephant	THLSQKFPKADFAEVSKLATDLGKVYQECCHGDLLCADDRADLAKYICDNQETLSSKLLK
Manatee	SRLSQKFPKAEFTEISKIVADLAKIHQECCHGDLLCADDRADLAKYICDNQDSLSSKLLK
Cape golden mole	SQMSQKFPKAEFSDITKVVLDLAKIHQECCHGDLLCADDRADLAKYMCENQDLFSSKLLK
Tenrec	ARLSQKFPKADFPQISQVTLGAKIHTECCHGDLLCADDRADLAKYTCENQDTISSKLLK
Armadillo	SSTSQKFPKTDFAEVTKIIVTDLTKIHKECCNGDLLCADDRADLAKYICDNQDSISSKLLK
Sloth	ATITQSFSHADFAEITKLVTDYTKINQECQGDLLKADDRADLVKYICENQGSISNKLLK
Opossum	ARLSQKFPKADFAEIHKIVEDLANVHKECCHGDLLCADDRADLSDYVCQNKDISISSKLT
Tasmanian devil	ARLSQKFPKADFAEIHKIVEDLAKIHTECCHGDLLCADDRADLSEYLCNNKETISTKLG
Platypus	AKTSQKFPKADFGDIHKVVEDLAKVVKECCHGDQLECMEDRADLTKYLCDNQDTFSSKLLK

Human	ECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKDVCKNYAEAKDVFLGMFLYEYAR
Chimpanzee	ECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKEVCKNYAEAKDVFLGMFLYEYAR
Bonobo	ECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKEVCKNYAEAKDVFLGMFLYEYAR
Gorilla	ECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKDVCKNYAEAKDVFLGMFLYEYAR
Orangutan	ECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKDVCKNYAEAKDVFLGMFLYEYAR
Gibbon	ECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKDVCKNYAEAKDVFLGMFLYEYAR
Rhesus	ECCDKPLLEKSHCIAEVENDEMPADLPSLAADYVESKDVCKNYAEAKDVFLGMFLYEYAR
Crab-eating macaque	ECCDKPLLEKSHCIAEVENDEMPADLPSLAADYVESKDVCKNYAEAKDVFLGMFLYEYAR
Olive baboon	ECCDKPLLEKSHCIAEVENDEMPADLPSLAADYVESKEVCKNYAEAKDVFLGMFLYEYAR
Marmoset	ECCEKPLLEKSHCIAHVENDEMPADLHALTDDYVESKDVCKNYAEAKDVFMGMFLYEYSR
Squirrel monkey	ECCDKPLLEKSHCLSHAENDDMPADLPAALAEFVESKDVCKNYAEAKDVFLGMFLYEYSR
Tarsier	ECCDKPLLEKSHCLSEVENDDMPANLPALTTDFVEDKEVCKNYAEAKDVFLG-----
Mouse lemur	ECCEKPVLEKSHCLAHVENDDIPADLPSIAADFVEDKEVCKNYAEAKDVFLGTFFLNEYSR
Bushbaby	ECCEKPLLEKSHCLAHVENDDLPTDLAPLAADFVEDKDVCKNYAEAKDVFLGTFFLYEYSR
Chinese hamster	ECCDKPLLEKAHCIAETEHDPPADLAALAEADFVEDKDVCKNYAEAKDVFLGTFFLYEYAR
Squirrel	ECCVKPLLERYHCIIIDLEEDDKLADLPALTADYAEKDVCKNYAEAKDIFLGMFLYEYSR
Golden hamster	ACCDKPVLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEAKDVFLGTFFLYEYSR
Mouse	TCCDKPVLKQKSHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEAKDVFLGTFFLYEYSR
Rat	ACCDKPVLQKSHCLAEIEHDNIPADLPSIAADFVEDKEVCKNYAEAKDVFLGTFFLYEYSR
Naked mole rat	ECCEKPLLEKAHCIMEAERDELPGDLPPELTTDFIEDRVCTHYTGAKDVFLGTFFLFEYSR
Guinea pig	ECCVKPTLQKAHCILEIQDELPTLAVDFVEDKEVCKNYAEAKDVFLGTFFLFEYSR
Rabbit	ECCDKPILKHAHCIVGLHNDELPTAGLPAVAEEFVEDKDVCKNYEEAKDVLGKFLYEYSR
Pika	ECCDKPVLKSHCIAENVHDDTPADLPTLASLDFVEDKDVCKNYQETKDFLGSFLYENAR
Pig	ECCDKPPLLEKSHCIAEAKRDELADLNPLEHDFVEDKEVCKNYEAKDVFLGTFFLYEYSR
Alpaca	ECCEKPLLEKSHCIAEAEERDEIPENLPAITDQFAEDKDVCKNYEAKDVFLGMFLHEYAR
Bactrian camel	ECCEKPLLEKSHCIAEAEERDEIPENLPAITEQFAEDKDVCKNYEAKDVFLGMFLHEYAR
Dolphin	KCCHKPLLEKSHCIAEVEKDELPELNSLLAADFAEDKEVCKNYEAKDVFLGTFFLYDYAR
Killer whale	KCCDKPPLLEKSHCIAEVEKDELPELNSPLAADFAEDKEVCKNYEAKDVFLGTFFLYEYAR
Cow	ECCDKPPLLEKSHCIAEVEKDAIPENLPLTADFAEDKDVCKNYEAKDAFLGSFLYEYSR
Sheep	ECCDKPVLEKSHCIAEVDKDAVPENLPLTADFAEDKEVCKNYEAKDVFLGSFLYEYSR
Goat	ECCDKPVLEKSHCIAEVDKDAVPENLPLTADFAEDKEVCKNYEAKDVFLGSFLYEYSR
Horse	ACCDKPLLQKSHCIAEVEKEDDLPDLPALAADFAEDKEICKHYKDAKDVFLGTFFLYEYSR
White rhinoceros	ACCDKPLLQKSHCIAEVEGDELPSDLPPLAADFAEDKEVCKHFQDAKDVFLGTFFLYEYAR
Cat	ECCGKPVLEKSHCIAEVERDELADLPPAADFVEDKEVCKNYEAKDVFLGTFFLYEYSR
Dog	ECCDKPVLEKSHCLAEVERDELPGDLPPLAADFVEDKEVCKNYEAKDVFLGTFFLYEYSR
Ferret	ECCDKPPLLEKSHCLAEVERDELPGDLPPLAADFVEDKEVCKNYEAKDVFLGTFFLYEYSR
Panda	ECCDKPVLEKSHCLAEVEKDELPGDLPPLAADFVEDKEVCKNYEAKDVFLGTFFLYEYSR
Pacific walrus	ECCDKPPLLEKSHCLAEVERDELPGDLSPLAADFVEDKEVCKNYEAKDVFLGTFFLYEYSR
Weddell seal	ECCDKPPLLEKSHCLAEVERDELPGDLSPLAADFVEDKEVCKNYEAKDVFLGTFFLYEYSR
Black flying fox	ECCDKPPLLEKSHCLAEVENDDLPNDLPSITTFVEDKDVCKNYEAKDVFLGTFFLYEYSR
Megabat	ECCDKPPLLEKSHCLAEVENDDLPNDLPSITTFVEDKDVCKNYEAKDAFLGTFFLYEYSR
Hedgehog	SCCDKPPLLEKSHCLAEVEKEDDLPDLPALAADFAEDKEVCKNYEAKNIFLDTFLHEYAR
Shrew	KCCDKPPLLEKSHCLAEVEKEDDMPADLPSIADFAEDKEVCKNYEAKDVFLGTFFLYEYSR
Star nosed mole	ECCGKPIIEKSHCLAEVEKEDDMPADLPSIADFAEDKEVCKNYEAKDVFLGTFFLYEYSR
Hyrax	TCCDKPVLEKSHCLAEVEKEDDMPADLPSIADFAEDKEVCKNYEAKDAFLGSFLHEYAR

Elephant	ECCDKPVLAKSHCIAELDKDDPPADLPSIVPDYVEDKDVCKNYQEAKDIFLGTFLYEYSR
Manatee	GCCDKPVLEKSHCIEVEKDDVPAGLPPIAETYVEDKDVCKNYHEAKDIFLGTFLYEYSR
Cape golden mole	DCCAQSVLEKSHCISEVEKDDIPADLPSIAVTYVDDKEVKCKNYAETKDLFLGMFLYEYAR
Tenrec	ECCEKPVLEKSHCIAEVENDDIPDDLTPLAADFVEDKEVKCKNYEERDIFMGFLYEYAR
Armadillo	KCCDQPLSEKSHCIELEKDEAPADLPPINVDVDDKDVCKNYAEAKDVFLGMFLYEYAR
Sloth	QCCDKPLLEKSHCIEIEKDDLIADLPALTTDFADDKEVKCKHYAEAKDVFLGTFLYEYSR
Opossum	KCCDKSLVEKSQCIADLENDDLPADLPDFDETYVTSKEACQNYKEAKDLFLANYLYDSAR
Tasmanian devil	ECCDKPLIEKSQCIADLGNDAIPDGLPDLLAEYVNTKDACQNYKEAKDLFLATYLYDNGR
Platypus	TCCDKPLVVRSQCVVDLENDDTPADLPTMASIYVEDKEVCNNYAGAKDLFLATFLYDAR

Human	RHPDYSVLLLLRLAKTYETTLEKCCAAADPHECYAKVFDEFKPLVEEPQNLIKQNCLEFE
Chimpanzee	RHPDYSVLLLLRLAKTYETTLEKCCAAADPHECYAKVFDEFKPLVEEPQNLIKQNCLEFE
Bonobo	RHPDYSVLLLLRLAKTYETTLEKCCAAADPHECYAKVFDEFKPLVEEPQNLIKQNCLEFE
Gorilla	RHPDYSVLLLLRLAKTYETTLEKCCAAADPHECYAKVFDEFKPLVEEPQNLIKQNCLEFE
Orangutan	RHPDYSVLLLLRLAKTYETTLEKCCAAADPHECYAKVFDEFKPLVEEPQNLIKQNCLEFE
Gibbon	RHPDYSVLLLLRLAKAYETTLEKCCAAADPHECYAKVFDEFKPLVEEPQNLIKHNCLEFE
Rhesus	RHPDYSVLLLLRLAKAYEATLEKCCAAADPHECYAKVFDEFQPLVEEPQNLVKQNCLEFE
Crab-eating macaque	RHPDYSVLLLLRLAKAYEATLEKCCAAADPHECYAKVFDEFQPLVEEPQNLVKQNCLEFE
Olive baboon	RHPDYSVLLLLRLAKAYEATLEKCCAAADPHECYAKVFDEFQPLVEEPQNLVKQNCLEFE
Marmoset	RHPDYSAMLLLLRLAKAYEATLEKCCATADPHGCYAKVFDEFQPLVEDPQNLVKHNCLEFE
Squirrel monkey	RHPDYSVLLLLRLAKAYEATLEKCCATADPHGCYAKVFDEFQPLVEDPQNLVKHNCLEFE
Tarsier	-----NLVKQNCLEFE
Mouse lemur	RHPEQSPFVLLRVAKTYEATLEKCCAAADPHACYANV-----
Bushbaby	RHPEYSVLLLLRLAKHYEATLEKCCATDDPHTCYAKVLDELQHDVEEPQNLVKQNCLEFE
Chinese hamster	RHHGDSTLMVLRI-KAYEATLERCCATADPPSCYGVMEEFKALSEEETHNLVKQNCLEFE
Squirrel	RHPEYGSLLLLRIAKAYEAKLEKCCAEADPPACYGKVFEEFEPLATEPQNVVKQNCLEFE
Golden hamster	RHPDYSVALLLRLAKKYEATLEKCCAEADPSACYGKVLDEFQPLVEEPKNLVKANCELEFE
Mouse	RHPDYSVLLLLRLAKKYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNCLEFE
Rat	RHPDYSVLLLLRLAKKYEATLEKCCAEADPPACYGTVLAEFQPLVEEPKNLVKTNCLEFE
Naked mole rat	RNPDYSIGMLLRLAKAYEAKLEKCCAEADPPACYATAFHELQPLIDEPKNLVQNCLEFE
Guinea pig	RHPEYSIGMLLRLAKAYEAKLEKCCAEADPHACYAKVFDRLQPLIDEPKNLVQNCLEFE
Rabbit	RHPDYSVLLLLRLGKAYEATLEKCCATDDPHACYAKVLDEFQPLVDEPKNLVKQNCLEFE
Pika	RHPDYPVTVLLKLAKEYEATLQKCCATDDPHACYAKVLDEFQPLVDEPKALIKQNCLEFE
Pig	RHPDYSVLLLLRIAKTYEATLEDCCAKEDPPACYATVFDKQPLVDEPKNLIKQNCLEFE
Alpaca	RHPEYAVSLMLRIAKYEATLEDCCAKDDPHACYATVFDKLOHLADEPQNLVKQNCLEFE
Bactrian camel	RHPEYAVSLLLRIAKYEATLEDCCAKDDPHACYATVFDKLOHLADEPQNLVKQNCLEFE
Dolphin	RHPEYSVLLLLRIAKGYEATLEDCCAKDDPPACYATVFEKLRPLVEEPKNLIKQNCLEFE
Killer whale	RHPEYSVLLLLRIAKGYEATLEDCCAKDDPPACYATVFEKLRPLVEEPKNLIKQNCLEFE
Cow	RHPEYAVSVLLRLAKYEATLECCAKDDPHACYSTVFDKHLVDEPQNLIKQNCLEFE
Sheep	RHPEYAVSVLLRLAKYEATLEDCCAKEDPHACYATVFDKHLVDEPQNLIKKNCLEFE
Goat	RHPEYAVSVLLRLAKYEATLEDCCAKEDPHACYATVFDKHLVDEPQNLIKKNCLEFE
Horse	RHPDYSVLLLLRLAKTYEATLEKCCAEADPPACYATVFDQFTPLVEEPKSLVKNCLEFE
White rhinoceros	RHPDYSVLLLLRIAKGYEATLEKCCVADDPPACYGKVFDELKTLVDEPVKLVKENCETYE
Cat	RHPEYSVLLLLRLAKYEATLEKCCATDDPPACYAHVFDEFKPLVEEPHNLVKTNCLEFE
Dog	RHPEYSVLLLLRLAKYEATLEKCCATDDPPTCYAKVLDEFKPLVDEPQNLVKTNCLEFE
Ferret	RHPEYSVLLLLRLAKYEATLEKCCATADPPSCYGVFDEFKPLVEEPQNLVKNCELEFE
Panda	RHPEYSVLLLLRLAKYEATLEKCCATDDPPTCYGKVLDEFKPLVEEPQNLVKANCELEFE
Pacific walrus	RHPEYAISSLLLRLAKYEATLEKCCATDDPPSCYGVLDEFKPLVEEPQNLVKTNCLEFE
Weddell seal	RHPEYAISSLLLRLAKYEATLEKCCATDDPPTCYGKVLDEFKPLVEEPQNLVKTNCLEFE
Black flying fox	RHPEYAVSLLLRIAKGYEATLERCCATDDAHACYSKVFDELQPLVDEPQKLMKRNCELEFE
Megabat	RHPEYAISSLLLRIAKGYEATLERCCATDDAHACYSKVFDELQPLVDEPQKLMKRNCELEFE
Hedgehog	RHHDYSVLLLLRLAKTYEAKLEKCCPTADPHMCYGVFDDLKPLVEEPQKLVKENCLEFS
Shrew	RHPEYSVMLLRLAKGYEAVLEKCCATGDPQECYSRV-DELKPLIDEPQNLVKHNCLEFE
Star nosed mole	RHPEYSVLMLLRIAKGYEATLEKCCATDDPHSCYSKVFDELKPLVDEPQTLVKENCALFE
Hyrax	RHLDYSVIMLLRAAKDYEGTLERCCATDDPHACYAKVLDEIQ-LNDEPHNVVQTNCEKFE
Elephant	RHPEYSAFLLLRIAKYEATLERCCAAADPHACYAKVLDAFTPLVEEPQGLVKQNCHEFE
Manatee	RHPDYSMFLLLLRIAKAYEATLEKCCAAADPHACYAKVLDEFKPLIEEPQNLVKQNCLEFE
Cape golden mole	RHPEYSAFLLGRLVKKYEATLEKCCATDDPPTCYGKVLDELNTLVEEPQQRVVKQNCLEFE
Tenrec	RHHDYSVLLLLRLAKTYEAKLEKCCPTADPHMCYGVLEEMKPLIEEPQKLVKKNCDLFE
Armadillo	RHLDYPVALLLRLTKVYEAKLEKCCATDDPHACYSNVLEFQPLIDEPKDMVKNCLEFE
Sloth	RHLDFPITLLLRLAKTYEAKLEKCCATADPHACYSKVFDEFPQPIIDEPKMLVKHNCLEFE
Opossum	RGANLAVTLLLRIAKGYETTLECCATDDPPSCYAKVTLQRKAIIDDSNNLVKQNCLEFE
Tasmanian devil	RHPELAVTLLLRIAKDYETTLECCATADPPTCYAKAGEHRKNFIDESQNLIKENCLEFE
Platypus	RHTDFSSVLLLLRVAKGYQAKLTECCAGDDPNACLAKAAEELKTYVAETKALVKDNCLEFE

Human	QLGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGSKCKHPEAKRMPCAEDYLSVV
Chimpanzee	QLGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGSKCKHPEAKRMPCAEDYLSVV
Bonobo	QLGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGSKCKHPEAKRMPCAEDYLSVV
Gorilla	QLGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGSKCKHPEAKRMPCAEDYLSVV
Orangutan	QLGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGSKCKHPEAKRMPCAEDYLSVV
Gibbon	QLGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGSKCKHPEAKRMPCAEDYLSVV
Rhesus	QLGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGAKCKLPEAKRMPCAEDYLSVV
Crab-eating macaque	QLGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGAKCKLPEAKRMPCAEDYLSVV
Olive baboon	QLGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGAKCKLPEAKRMPCAEDYLSVV
Marmoset	QFGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGTKCKQPEAKRMPCVEDYLSVV
Squirrel monkey	QLGEYKFNALLVRYTKKVPQVSTPTLVEVSRNLGKVGTKCKQPEAKRMPCAEDYLSVV
Tarsier	EQGEYNFNALLVRYTKKVPQVSTPTLVEVSRNLGRVGTCKCKLSETQRMPCAEDY----
Mouse lemur	-----LIVRYTKKAPQVSTPTLVELSRKLGKGGTKCKLDESKRMGCTEDFLALV
Bushbaby	KLGEYGFQNALLVRYTKKVPQVSTPTLVEVSRSLGRVGSKCKMDEAKRMGCAEDYLSVV
Chinese hamster	QLGEYGFQNVLLIHYTKKSPQVQSTLVEIGRKLGSLSRCKHPEASERMHCAEYLSLV
Squirrel	QLGEYKFNALLIRYTKKAPQVSTPTLVEASRNLGRVGTCKCKLPEASHRMPCVEDYLSAI
Golden hamster	KLGEYGFQNALIVRYTKKAPQVSTPTLVEAARNLGRVGSKCKVLPQAQRLPCVEDYLSAI
Mouse	KLGEYGFQNALIVRYTKKAPQVSTPTLVEAARNLGRVGTCKCTLPEDQRLPCVEDYLSAI
Rat	KLGEYGFQNALIVRYTKKAPQVSTPTLVEAARNLGRVGTCKCTLPQAQRLPCVEDYLSAI
Naked mole rat	KLGEYGFQNALVRYTKKIPQISTATLVEASRNLGKVGTKCCALPESKRLPCTENYLAII
Guinea pig	KLGEYGFQNALAVRYTKKAPQVSTPTLVEIARGLGKVGSKCKLPEAERLPCENYLAII
Rabbit	QLGDYFNQNALLVRYTKKVPQVSTPTLVEISRSLGKVGSKCKHPEAERLPCENYLAII
Pika	ELGEYNFNALLVRYTKKAPQVSTPTLVEIARGLGKVGSKCKLPEAERLPCVEDYLSVV
Pig	KLGEYGFQNALIVRYTKKVPQVSTPTLVEVARKLGLVGSRCKRPEEERLSCAEDYLSLV
Alpaca	KLGEYGFQNDILVRYTKKLPQVSTPTLVEVARGLGRVGTCKCTLPESNRMSAEDYLSLV
Bactrian camel	KLGEYGFQNDILVRYTKKLPQVSTPTLVEVARGLGRVGTCKCTLPESNRMSAEDYLSLI
Dolphin	KLGEYQFNALLVRYTKKVPQVSTPTLVEVSRNLGRVGSKCKNPESESRMSAEDYLSLV
Killer whale	KLGEYQFNALLVRYTKKVPQVSTPTLVEVSRNLGRVGSKCKNPESESRMSAEDYLSLV
Cow	KLGEYGFQNALIVRYTRKVPQVSTPTLVEVSRSLGKVGTRCCTKPESESRMPCTEDYLSLI
Sheep	KHGEYGFQNALIVRYTRKAPQVSTPTLVEISRSLGKVGTKCCAKPESESRMPCTEDYLSLI
Goat	KHGEYGFQNALIVRYTRKAPQVSTPTLVEISRSLGKVGTKCCAKPESESRMPCTEDYLSLI
Horse	EVGEYDFQNALIVRYTKKIPQVSTPTLVEIGRTLGRVGSRCKLPESESRLPSENHLALA
White rhinoceros	RLGEYDFQNELIVRYTHKVPQASTPTLVEISRKMGKVGTKCKVSEFPQRLPCSENYSLSLI
Cat	KLGEYGFQNALLVRYTKKVPQVSTPTLVEVSRSLGKVGSKCCTHPEAERLSCAEDYLSVV
Dog	KLGEYGFQNALLVRYTKKAPQVSTPTLVEVSRKLGKVGTKCKKPESESRMSCADDFLSVV
Ferret	KLGEYGFQNALLVRYTKKLPQVSTPTLVEVSRKLGKVGTKCCTKPESESRMSAEDYLAVV
Panda	KLGEYGFQNALLVRYTKKVPQVSTPTLVEVSRKLGKVGTKCCKKPESESRMSAEDYLSVV
Pacific walrus	KLGEYGFQNALLVRYTKKVPQVSTPTLVEVSRKLGKVGTRCCKKPESESRMPCAEDYLSVV
Weddell seal	KLGEYGFQNALLVRYTKKVPQVSTPTLVEVSRKLGKVGTRCCKKPDSESRMPCAEDYLSVV
Black flying fox	NLGAYGFQNALIIRYTKKMPQVSTPTLLVISKELANMGNKCTLPESKRMACAEDYLSLV
Megabat	NLGPYGFQNMILTIRYTKKMPQVSTPTLLVISKELANMGNKCTLPESKRMACAEDYLSLV
Hedgehog	TVGEYQFNALLVRYTKKIPQVSTPTLVDIVRKLGRVGTCCGLPESESRLLCAVDYLSLV
Shrew	NLQYGFQNALIIRYTKKMPQVSTPTLVEVSRNLGKVGTKCCSLAAGERLPCAEDYLSVV
Star nosed mole	NLGEYGFQNALIVRYTKKMPQVSTPSIVEVSRSLGKVGTKCCTRPESNRMACAEDFLSVV
Hyrax	KLGEYDFTNSLLVRYTRKTPQVSTPTLVKVARMGKVGSKCKLADSQRVACAEDY----
Elephant	QLGEYGFQNALIVRYTRKVPQVSTPTLVEVSRKLGKVGSKCKLAEAKRMPCAEDYLSLV
Manatee	HLGEYGFQNALIVRYTRKVPQVSTPTLVEVSRKLGKVGSKCKLAESESRMPCADDFLSVI
Cape golden mole	QLGEYGFQNALVRYTRKLPQVSTPTLVEVSRNLGRVGTCKCKLAETERMSAEDYLSLV
Tenrec	KIGEYGFQNALIIRYTKKMPQVSTPTLVETSRLGRVGTCKCSLPEAQKMPVEDHLSVI
Armadillo	QLGEYGFQNALIIRYTKKMPQVSTPTLVEISRKLGRTGSACCKRPEAERMSCVEEYLTLI
Sloth	QHGDYGFQNTLLIIRYTKKMPQVSTPTLVDISRRLGKTGTWCCCKPESESRLLSCVEEYLNLI
Opossum	KAGEYGFANELVRYTKKMPQVSTPTVVELSQKLAKVGSKCKLSDDEKMGCAEGYLAIIV
Tasmanian devil	KVGEYGFENALLVRYTRKAPQVSTPTLLALGHKLAKVGSKCKVSDNEKLGCAEGYLAIIV
Platypus	KLGEYAFQNTLVRYTRKLPQVSTPTLLDVSSHLLARVGTCCCKLDEGHRLACADDYLALV

Human	LNQLCVLHEKTPVSDRVTKCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTL
Chimpanzee	LNQLCVLHEKTPVSDRVTKCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTL
Bonobo	LNQLCVLHEKTPVSDRVTKCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTL
Gorilla	LNQLCVLHEKTPVSDRVTKCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTL
Orangutan	LNQLCVLHEKTPVSDRVTKCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTL
Gibbon	LNQLCVLHEKTPVSDRVTKCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTL
Rhesus	LNRLCVLHEKTPVSEKVTCKCTESLVNRRPCFSALELDEAYVPKAFNAETFTFHADMCTL
Crab-eating macaque	LNRLCVLHEKTPVSEKVTCKCTESLVNRRPCFSALELDEAYVPKAFNAETFTFHADMCTL

Olive baboon	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALELDEAYVPKAFNAETFTFHADMCTL
Marmoset	LNQLCVLHEKTPVSDRVTKCCESLVNRRPCFSALEVDETYLPKAFNAETFTFHADMCTL
Squirrel monkey	LNQLCVLHEKTPVSDRVTKCCESLVNRRPCFSALTVDETYVPKAFNAETFTFHADMCTL
Tarsier	-----
Mouse lemur	LNRLCVLHEKTPVSDRVTKCCESLADRRPCFSELEADETYVPKPFNAETFTFHADVCTL
Bushbaby	LNRLCVLHEKTPVSDRVTKCCESLVNRRPCFSALEVDETYVPKPFNAETFTFHADMCTL
Chinese hamster	LNKMC LAHEKAPVSDRITKCCESLVNRRPCFSALPPDDTFEPKFEADSFTFHADICTI
Squirrel	LNRTVCMHEKNPVSERITKCCSESVNKRACFSALSVDITYVPKPFHADTFTFHADICTL
Golden hamster	LNRVCVLHEKTPVSEQVTKCCGTVERRPCFSALPVDETYVPKPFKAETFTFHADICSL
Mouse	LNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYVPKPFKAETFTFHSDICTL
Rat	LNRLCVLHEKTPVSEKVTKCCSGSLVERRPCFSALTVDETYVPKPFKAETFTFHSDICTL
Naked mole rat	LNRLCVLHEKTPVSDRVTKCCESLVNRRPCFSALQDDETYVPKQFDTETFTIHADVCTL
Guinea pig	LNRLCILHEKTPVSEKVTKCCESLVNRRPCFSALHVDDETYVPKPFHADSTFTFHADICTL
Rabbit	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALGPDDETYVPKPFNAETFTFHADICTL
Pika	LNRFVCLHEKTPVSEGVTKCCESLVNRRPCFSALTPDSTYVPKPFHVETFTFHADICTL
Pig	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALTPDETYVPKPFVEGTFTHADLCTL
Alpaca	LNRLCVLHEKTPVSPRVTKCCESLVNRRPCFSSLAADETYEPKPFDDKTFTFHADLCSV
Bactrian camel	LNRLCVLHEKTPVSPRVTKCCESLVNRRPCFSSLTAADETYEPKPFDEKTFTFHADLCSV
Dolphin	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALTVDETYEPKAFDEKTFTFHADLCTL
Killer whale	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALTVDETYEPKAFDEKTFTFHADLCTL
Cow	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALTPDETYVPKAFDEKLTFTFHADICTL
Sheep	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALTPDETYVPKPFDEKFTFTFHADICTL
Goat	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALTPDETYVPKPFDEKFTFTFHADICTL
Horse	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALTPDETYVPKPFDEKFTFTFHADICTL
White rhinoceros	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALQDDETYIPKPFNAETFTFHADICTL
Cat	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCF-ALQVDETYVPKPFSAETFTFHADLCTL
Dog	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSGLEVDETYVPKPFNAETFTFHADLCTL
Ferret	LNRLCVLHEKTPVSDRVTKCCESLVNRRPCFSALAGDETYVPKPFNAETFTFHADLCTL
Panda	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALEVDETYVPKPFNAETFTFHADLCTL
Pacific walrus	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALEVDEAYVPKPFNAETFTFHADLCTL
Weddell seal	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALEIDEAYVPKPFNAETFTFHADLCTL
Black flying fox	LNRLCVLHEKTPVSDKITKCCESLVNRRPCFSSLEADETYVPKPFNAETFTFHADVCTL
Megabat	LNRLCVLHEKTPVSDKITKCCESLVNRRPCFSSLEADETYVPKPFNAETFTFHADVCTL
Hedgehog	LNHLCVLHEKTPVSDKITKCCESLVNRRPCFSALEADETYVPKPFSAETFTFHADICTL
Shrew	LNRLCVLHDKTPVSDKITKCCESLVNRRPCFSALEADETYVPKPFNAEMFTFHADICTL
Star nosed mole	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFSALQDDETYVPKPFNAETFTFHADICTL
Hyrax	-----PVSDKITKCCESL-NRRPCFTALE-DDTYVPKPFSAETFTFHADLCTL
Elephant	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFTALQDDETYVPKPFNAETFTFHADLCTL
Manatee	LNRLCVLHEKTPVSEKVTKCCESLVNRRPCFTALHADETYVPKPFNDETFTFHADLCTL
Cape golden mole	LNRLCVLHEKTPVSEKVTCCNSLVYRRPCFSALEVDETYAPKPFSAETFTFHSDLCTL
Tenrec	LNWLCVLHEKTPVSEKVTKCCESLVNRRPCFSALEVDETYVPKPFIPETFTFHAELCTL
Armadillo	LNHLCVLHEKTPVSEVTKCCESLVNIRPCFSALPPNEAYVPKPFSA-TFTFHAELCTL
Sloth	LNRLCVLHEKTPVSEQVTKCCESLVNRRPCFSALPPKEDYVPKPFNATFTFHADICEL
Opossum	VDKLCRQHEKTPVSDKITKCCESLVNRRPCFTALGVDETYEPKAFSADTFTFHADLCTL
Tasmanian devil	IDNLCRLHEKTPVSDRITKCCESLVNRRPCFSALGVDDTYVAKPFSADTFTFHADLCTL
Platypus	LDKMCRLHEKTPVSDRVTKCCESLADRRPCFSALEVDETYVPKPFNAETFTFHADLCTL

Human	SEKERQIKKQ TALVELVKHKPKATKEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Chimpanzee	SEKERQIKKQ TALVELVKHKPKATKEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Bonobo	SEKERQIKKQ TALVELVKHKPKATKEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Gorilla	SEKERQIKKQ TALVELVKHKPKATKEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Orangutan	SEKERQIKKQ TALVELVKHKPKATKEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Gibbon	SEKDRQVKKQ TALVELVKHKPKATKEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Rhesus	SEKEKQVKKQ TALVELVKHKPKATKEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Crab-eating macaque	SEKEKQVKKQ TALVELVKHKPKATKEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Olive baboon	SEKEKQVKKQ TALVELVKHKPKATKEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Marmoset	SEKEKQVKKQ TALVELVKHKPKATNEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Squirrel monkey	SEKAQQVKKQ TALVELVKHKPKATKEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Tarsier	-----ALVELVKHKPKATEEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Mouse lemur	PEKEKQIKKQ TALVELVKHKPKATDEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Bushbaby	PDTEKQIKKQ TALVELVKHKPKATNDQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Chinese hamster	PDTEKQIKKQ TALVELVKHKPKATNDQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Squirrel	PETEQQIKKQ TALVELVKHKPKATIDQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Golden hamster	PEKEKQIKKQ TALVELVKHKPKATGQQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL
Mouse	PEKEKQIKKQ TALVELVKHKPKATAEQLKAVMDDFAAFVEKCKKADKETCFAEEGKKL



Rat	PDKEKQIKKQTALAEVLKHKPKATEDQLKTVMGDFAQFVDKCCKAADKDNCFATEGPNLV
Naked mole rat	PEEEQOIMKQMTLAEVLKHKPKATAEQMKDIMKNFGIFLEKCCHAENKDDCFSEKGSNFV
Guinea pig	PEKEKQVKKQMALVELVKHKPKASEEQMKTVMGDFAAFLKCCDADNKEACFTEDGPKLV
Rabbit	PETERKIKKQTALVELVKHKPHATNDQLKTVVGEFTALLDKCCSAEDKEACFAVEGPKLV
Pika	PQHKREYKKQKALVELVKYKPSATKEQLKVVGDFTAMVEKCCAADDKEACFSEEWKTCV
Pig	PEDEKQIKKQTALVELLKHKPHATEEQLRTVLGNFAAFVQKCCAAPDHEACFAVEGPKFV
Alpaca	SEPEKQIKKQ-ALAEVLKHKPKATDEQLKTVMEKFVAFVEKCCAADVKEGCFVSEGTSC
Bactrian camel	SEPEKQIKKQTALAEVLKHKPKATDEQLKTVMEKFVAFVDKCCAADVKEACFTVEGPLLV
Dolphin	PENEKQIKKQIALVELVKHKPKVTEEQLKTVMGDFAAFVDKCCAADDKEACFALEGPKLV
Killer whale	PENEKQIKKQIALVELVKHKPKVTEEQLKTVMGDFAAFVDKCCAADDKEACFALEGPKLV
Cow	PDTEKQIKKQTALVELLKHKPKATEEQLKTVMENFVAFVDKCCAADDKEACFAVEGPKLV
Sheep	PDTEKQIKKQTALVELLKHKPKATDEQLKTVMENFVAFVDKCCAADDKEGCFVLEGPKLV
Goat	PDTEKQIKKQTALVELLKHKPKATDEQLKTVMENFVAFVDKCCAADDKEGCFLLEGPKLV
Horse	PEDEKQIKKQSALAEVLKHKPKATKEQLKTVLGNFSAFVAKCCGAEDKEACFAEEGPKLV
White rhinoceros	PDDEKKIKKQTALVELVKHKPKATNEQLKAVIEDFAAFINKCCAENKEACFAEEGPKLV
Cat	PEAEKQIKKQSALVELLKHKPKATEEQLKTVMGDFGSFVDKCCAEDKEACFAEEGPKLV
Dog	PEAEKQVKKQTALVELLKHKPKATDEQLKTVMGDFGAFVEKCCAENKEGCFSEEGPKLV
Ferret	PDAEKQVKKQSALVELLKHKPKATEEQLKTVMGDFGAFVDKCCAENKEGCFAEEGPKLV
Panda	PEAEKQVKKQSALVELLKHKPKATEEQLKTVMGDFGAFVDKCCAENKEGCFAEEGPKLV
Pacific walrus	PEAEKQIKKQSALVELVKHKPKATEEQLKTVMGDFGAFVEKCCAEEKEACFAEEGPKLV
Weddell seal	PEAEKQVKKQSALAEVLKHKPKATEEQLKTVMGDFGAFVEKCCAENKEACFAEEGPKLV
Black flying fox	PDHEKHLKTQTALVELLKHKPKAADEQLKTVMGDFSAFIEKCCCTADDKEACFAEEGPKLV
Megabat	PDSEKHLKQTALVELLKHKPKATDEQLKTVMGDFSAFIEKCCCTADDKEACFAEEGPKLV
Hedgehog	PDTEKEIKKQTTLVELLKHKPKATDAQLKTVMGDFTAFLTKCCAEDKEACFAEEGPTCC
Shrew	PDSEKQFKKQAAALVELLKHKPKATEEQLKPVMAEFVAFVEKCCGAEDKEACFATEGPKLI
Star nosed mole	PEAEKQIKKQSALVELLKHKPKATGDQLKTVMGDFGGFIEKCCASDDKETCFSTEGPKLV
Hyrax	PDDQKQSKKQTVLVELLKHKPKATDEQLKVVIGLFAVVEKCCAEDKEACFVGEAKTCY
Elephant	PEDQKQIKKQSVLVELVKHKPKATDEQLKTVTGQFTGMVEKCCAEDKEACFAEEGPKLV
Manatee	PEDQKQIKKQTVLVELLKHKPKATDDKLKTVIGEFVAMVEKCCKADSFEACFTLEGPKLV
Cape golden mole	PEDQKQTKKQTVLVELVKHKPKATDDQLKVVAGEFSAMVEKCCKVEDHEVCFAEEGPKLV
Tenrec	PDDQKQIKKQSVLAEVLKHKPKATATEDALKAVSGEFVIMMEKCCCTDADQEGCFGREGPTCG
Armadillo	P-DE--I---TLVELVKHKPKATYDQIKVVMDFVAMVEKCCKAENKEACFAEEGPKLV
Sloth	SEEEKQIKKQVVLAEVLKHKPKATDEQLKTVKEKVTGFLDKCCHAENKEACFIAEQNIH
Opossum	PEEEKQTKKQTVLAEVLKHKPKITDQLKAVISDFVAFVDKCCKADSQEGCFEEDGPKLV
Tasmanian devil	PEEEKQDKKQGIIVELVKHKPKITDQLKGVITDFTAFVDKCCKADNQEACFAEDGPKLV
Platypus	PEDQKAKKQSVLVELVKHKPKATDDQLKGVITDFTAMVTKCCGEADKEACFATEGANLV

Human	AASQAAL-
Chimpanzee	AASQAAL-
Bonobo	AASQAAL-
Gorilla	AASQAAL-
Orangutan	AASQAAL-
Gibbon	AASQAAL-
Rhesus	AASQAAL-
Crab-eating macaque	AASQAAL-
Olive baboon	AASQAAL-
Marmoset	AASETAL-
Squirrel monkey	AESQAAL-
Tarsier	KASQPSG-
Mouse lemur	KAYQPTL-
Bushbaby	AESQAAL-
Chinese hamster	CATQPAL-
Squirrel	AASQAAL-
Golden hamster	ASSQAAL-
Mouse	TRCKDAL-
Rat	ARSKEAL-
Naked mole rat	QACKDTF-
Guinea pig	AKCQATL-
Rabbit	ESSKATL-
Pika	KQSQTLP-
Pig	TEIRGIL-
Alpaca	CASQPTL-
Bactrian camel	AATRITALA
Dolphin	VKTREAI-
Killer whale	VTREAI-

Cow	VSTQTAL-
Sheep	ASTQAAL-
Goat	ASTQAAL-
Horse	ASSQLAL-
White rhinoceros	AKSQTALL
Cat	AAAQAAL-
Dog	AAAQAAL-
Ferret	AAAQAAL-
Panda	ATAQAAL-
Pacific walrus	ATAQAAL-
Weddell seal	AKAQAALA
Black flying fox	ASSQATLA
Megabat	ASSQATLA
Hedgehog	VVSQPSL-
Shrew	ASSQAALA
Star nosed mole	AAAQAAL-
Hyrax	KASQPTL-
Elephant	TASQAAL-
Manatee	ATSKAAL-
Cape golden mole	AAAQATLA
Tenrec	SVFQPI-
Armadillo	KEAEPTL-
Sloth	NQASPTL-
Opossum	ASAQAAL-
Tasmanian devil	ATTQAAL-
Platypus	TKSKAALA

## VITAMIN D-BINDING PROTEIN (GC)

Human	MKRVLVLLLAVAFGHALERGRDYEKNKVCKEFSHLGKEDFTSLSLVLYSRKFPSGTFEQV
Chimpanzee	MKRVLVLLLAVAFGHALERGRDYEKNKVCKEFSHLGKEDFTSLSLVLYSRKFPSGTFEQV
Bonobo	MKRVLVLLLAVAFGHALERGRDYEKNKVCKEFSHLGKEDFTSLSLVLYSRKFPSGTFEQV
Gorilla	MKRVLVLLLAVAFGHALERGRDYEKNKVCKEFSHLGKEDFTSLSLVLYSRKFPSGTFEQV
Orangutan	MKRVLVLLLAVAFGHALERGRDYEKNKVCKEFSHLGKEDFTSLSLVLYSRKFPSGTFEQV
Gibbon	MKRVLVLLLAVAFGHALERGRDYEKNKVCKEFSHLGKEDFTSLSLVLYSRKFPSGTFEQV
Rhesus	MKRVLVLLLAVAFGHALERGRDYEKNKVCKEFTHLGKEDFTSLSLVLYSRKFPSGTFEQV
Crab-eating macaque	MKRVLVLLLAVAFGHALERGRDYEKNKVCKEFTHLGKEDFTSLSLVLYSRKFPSGTFEQV
Olive baboon	MKRVLVLLLAVAFGHALERGRDYEKNKVCKEFTHLGKEDFTSLSLVLYSRKFPSGTFEQV
Marmoset	MKALVLLLAVAFGHALERGRDYEKDKVCKEFDLGGKDFDFTSLSLVLYSRKFPSGTFEQI
Squirrel monkey	MKKVLVLLLAVAFGHALERGRDYEKDKVCKEFDLGGKEDFTSLSLVLYSRKFPSGTFEQI
Tarsier	MKRVLVLLFAVAFGHALERGRDYEKDKVCKEFTNLGKDDFTSLSLVQYSRKFPSGTFEQV
Mouse lemur	-----RDYEKDKVCKEFANLGGKDDFTSLSLVLYSR-FLS-TFEQV
Bushbaby	-----GRDYEKDKVCKEFAHLGGKDEFDFTSLSLVLYSRKFPSGTFEQV
Chinese tree shrew	MKGVLVLLLAALGHALERGRDYEKEKVKCEFISLGGKEDFTTSLSLVLYSRKFPSGTFEQI
Squirrel	MKRVLVFLAVAFGHALERGRDYEKEKVCQELASLGGKDDFRSLSLVLYSRKFSSGTFEQV
Ground squirrel	MKRVLVFLAVAFGHALERGRDYEKEKVCQELASLGGKDDFRSLSLVLYSRKFSSGTFEQV
Golden hamster	MKRVVALLLVLALGHALERGRDYEKDKVCKELAMLGGKDDFRSLSLVLYSRKFPSGTFEQV
Kangaroo rat	-----RDYEKDKVCKELAMLGGKEDFRSLALVLYSRKFSRGTFEQV
Mouse	MKRVLVLLLALAFGHALERGRDYEKDKVCNELAMLGGKEDFRSLSLVLYSRKFSSSTFEQV
Rat	MKRVLVLLLALAFGHALERGRDYEKDKVCQELSTLGGKDDFRSLSLVLYSRKFSSSTFEQV
Naked mole rat	MKTVLVLLLTVALGHALERGRDYERDKVCKELTQLGGKDDFRSLSLVLYSRKFSSGTFEQV
Guinea pig	MES-LLLCLPVLCLKLGKDFERDKVCKELTNLGGKDEFRTLSLILYSRKFPSGTFEQV
Rabbit	MKRVLVLLLAVVCGHALERGRDYEKDKVCKELATLGGKDDFRSLSLVLYSRKFPSGTFDQV
Pika	MK-ILVLLLALAYGHALERGRDYEKDKVCKELASLGGKDDFRSLSLVLYSRKFPSGTFEQV
Pig	-----RDYEKDKVCKELASLGGKDDFTSLSMVLYSRKFPSGTFEQI
Alpaca	MKRILVFLAVACVRALERGQDYEKDKVCKELASLGGKDDFTSLSMVLYSRKFPSGTFEQV
Bactrian camel	MAKGLSCLLSAVLFSPLQGRDYEKDKVCKELASLGGKDDFTSLSMVLYSRKFPSGTFEQI
Dolphin	MKRILVFLAVAFVHALERGRDYEKDKVCKELASLGGKDDFTSLSMVLYSRKFPSATFEQI
Killer whale	MKRILVFLAVAFVHALERGRDYEKDKVCKELASLGGKDDFTSLSMVLYSRKFPSATFEQI
Cow	MKRILVFLAVAFVHALERGRDYEKDKVCKDLASLGRDDFTSLSMVLYSRKFPSGTFEQI
Sheep	MKRILVFLAVAFVHALERGRDYEKDKVCKELASLGGKEDFTSLSMVLYSRKFPSGTFEQI
Goat	MKRILVFLAVAFVHALERGRDYEKDKVCKELASLGGKEDFTSLSMVLYSRKFPSGTFEQI
Horse	MKRIPVLLAVAFVHALERGRDYEKDKVCKEFTSLGGKDDFTSLSMVLYSRKFPSGTFEQI
White rhinoceros	MKKILAVLLAVAFVHTLERGRDYEKDKVCKELASLGGKDDFATLSMVLYSRKFPSGTFEQI
Cat	MKRILVLLAVAFVHALERGRDYEKDKVCKELANLGGKDDFTSLSMVSYSRKFPSSTFEQI

Dog MKTNIFVLLSII IYSRPOKGRDYEKEKVKCKELANLGKDDFTSLSMVLYSRKFPSSTFEQI  
 Ferret MKGILVLLLAVAVVHALERGRDYEKDKVKCKELANLGKDDFASLSMVLYSRKFPSGTFEQI  
 Panda MKRTLVLVLLAVAFVHALERGRDYEKDKVKCKELANLGKEDFTSLSMVLYSRKFPSSTFEQI  
 Pacific walrus MKVILVLLLAVAFVHALERGRDYEKDKVKCKELASLGKEDFTSLSMVLYSRKFPSGTFEQI  
 Weddell seal MKVILVLLLAVAFVHALERGRDYEKDKVKCKELASLGKEDFTSLSMVLYSRKFPSGTFEQI  
 Megabat -----SAGR DYEKDKVKCKELSNLGKDDFTSLSMVLYSRKFPSGTFEQV  
 David's myotis MKRILFLLLTV---HALERGREYKDKVKCKELNNGKDDFTSLSMVLYSRKFPSGTFEQI  
 Microbat MKRILFLLLTV---HALERGREYKDKVKCKELINFGKDDFTALS MVLYSRKFPSGTFEQI  
 Hedgehog -----KDYEKDKVKCKELAQMKGDDFRSLSI ILYSRKFPSGTFEQI  
 Shrew MKTALILLLALAGVHALERGREYKDKVKCKELAHLGKDGFRS-----NGEFSFGTFEQI  
 Star nosed mole MQRSRHKNVEMMKGTS PDRCDYEKDKVKCKELS ILGKDDFRSLSMVLYSRKFPGGTFEQV  
 Elephant -----GRDYEKDKVKCKELSNLGKDDFRSLSMVLYSRKFPSGTFEQV  
 Hyrax -----GKEDFRSLSMVLYSRKFPSGTFEQV  
 Cape golden mole -----RDYEKDKVKCKELSNLGKDDFRSLSMVLYSRKFPSGTFEQV  
 Tenrec MKGVLGLLLMVSFVHALERGRDYEKSKVCAELSNLGKDDFRSLSMI SYSRKFASGTFEQV  
 Armadillo MKGILFLLFAVGFGHAIERGRDYEKSKVCKELADLGKDDFRFLSMVLYSRKFPSGTFFQV  
 Sloth -----SMVLYSRKFPSGTFEQV  
 Tasmanian devil MSRIMLLLLSVTF IQADYRGRDYEKSKVCKEFANLGKDDFRSLSFVLYSRKFPSGTFEQV  
 Platypus MRGFPILLLTLALAQALHRGRDYEKEKVCREFASLGKDDFRSLSI VMHSSKYPRASFEV

Human SQLVKEVVS L TEACCAEGADPDCYDTRTSALS AKSCESNS PFPVHPGTAECC TKEGLERK  
 Chimpanzee SQLVKEVVS L TEACCAEGADPDCYDTRTSALS AKSCESNS PFPVHPGTAECC TKEGLERK  
 Bonobo SLLVKEVVS L TEACCAEGADPDCYDTRTSALS AKSCESNS PFPVHPGTAECC TKEGLERK  
 Gorilla SQLVKEVVS L TEACCAEGADPDCYDTRTSALS AKSCESNS PFPVHPGTAECC TKEGLERK  
 Orangutan SQLVKEVVS L TEACCVGADPDCYDTRTSALS AKSCESKSPFPVHPGTAECC TKEGLERK  
 Gibbon SQLVKEVVS L TEACCVGADPDCYDTRTSALS AKSCESNS PFPVHPGTAECC TKEGLERK  
 Rhesus SQLVKEVVS L TEACCAEGADPDCYDTRTSALS AKSCESNS PFPVHPGTAECC TTEGLERK  
 Crab-eating macaque SQLVKEVVS L TEACCAEGADPDCYDTRTSALS AKSCESNS PFPVHPGTAECC TTEGLERK  
 Olive baboon SQLVKEVVS L TEACCAEGADPDCYDTRTSALS AKSCESNS PFPVHPGTAECC TREGLERK  
 Marmoset TKLV E EVVS L TETCAEGADPDCYDTRTSALS AKSCERNSPFPVHPGTAECC TKEGLERK  
 Tairair monkey TKLV E EVVS L TETCAEGADPDCYDTRTSALS AKSCESNS PFPVHPGTAECC TKEGLERK  
 Sarsier SQLVNEVVS L TETCCANWADPDCYETQTSALS AKSGENDSPFPVHPGNVECC TKEDQEKK  
 Mouse lemur SQLV - EVVFL TEACCAEA - DDCYDS - -----LERK  
 Bushbaby KQLVTEVVS L TEACCAEGANPDCYDNRTSALS ARS CERDSPFPVHPGTAECCAREGLERK  
 Chinese tree shrew SQLVKEVVS L TETCAEGADPDCYDTRTSALS ARS CESDSPFPVHPGTPECCTKEGLEQK  
 Squirrel SQLVKEVVS L TEDCAEGADPDCYDTRTSALS AKSCESDSPFPVHSGTPECCTKEGLERK  
 Ground squirrel SQLVKEVVS L TEDCAEGADPDCYDTRTSALS AKSCESDSPFPVHSGTPECCTKEGLERK  
 Golden hamster SQLVKEVVS L TEACCAEGADPDCYDTRTSEL SVKSCASDAPFPVHPGTPECCTQEGLERK  
 Kangaroo rat SQLVKDVVS L TEACCAKADPDCYDTRTSEL SVKSCETDSPFPVHPGTSECCSKEGLERK  
 Mouse NQLVKEVVS L TEACCAEGADPDCYDTRTSEL SVKSCESDAPFPVHPGTPECCTKEGLERK  
 Rat SQLVKEVVS L TEACCAEGADPDCYDTRTSEL SVKSCESDAPFPVHPGTPECCTKEGLERK  
 Naked mole rat SQLVQEVVAL TEACCAEGADPDCYDTRTSALS AKSCESDSPFPVHPGTPECCTKEGLERK  
 Guinea pig SQLVQEVVAL TEACCAEGAAPDCYDRTAALS AKSCESDSPFPVHPGTAECCAREGLERK  
 Rabbit MKLVKEVVS L TEDCAEDADPGCYDNRTSALS ATSCESDSPFPVHPGTAECC TKEGLERK  
 Pika TQLVKQVVS L TEDCAEDADPDCYDRTTALS VLS CASDSPFPEHPGTAECC TREGLERK  
 Pig SHLVNEVVS L TEACCAEGADPDCYDNRTSALS DKSCESDSPFPVHPGTAECC TKEGLEKK  
 Alpaca SHLVSEVVS L TEACCTEEADPDCYDNRTSALS AKSCSDSPFPVHPGTAECC TKEGLERK  
 Bactrian camel SHLVNEVVS L TEACCTEEADPDCYDNRTSALS AKSCESDSPFPVHPGTAECC TTEGLERK  
 Dolphin SHLVNEVVS L TEACCAEGADPDCYDNRTSALS AKSCESDSPFPVHPGTPECCTKEGLEKK  
 Killer whale SHLVNEVVS L TEACCAEGADPDCYDNRTSALS AKSCESDSPFPVHPGTPECCTKEGLEKK  
 Cow SHLVNEVVS L TITCCAEGADPDCYDNRTSALS DKSCESNSPFPVHPGTPECCTHEGLEKK  
 Sheep SHLVNEVVS L TITCCAEGADPDCYDNRTSALS DKSCESNSPFPVHPGTPECCTHEGLEKK  
 Goat SHLVNEVVS L TITCCAEGADPDCYDNRTSALS DKSCESNSPFPVHPGTPECCTHEGLEKK  
 Horse SNLVNEVVS L TEACCAEGADPGCYDNRTSALS SVKSCESDSPFPVHPGTPECCTKEGLERK  
 White rhinoceros SNLVNEVVS L TEACCAEGANPDCYDNRTSALS SVKSCESDSPFPVHPGTAECC TKEGLERK  
 Cat SHLVNEVVS L TEACCAEGADPDCYDLRTSALS AKSCESDSPFPVHPGTAECC TKEGLEQK  
 Dog SHLVNEVVS L TETCAEGADPDCYDHRTSALS ARS CEKDSPFPVHPGTAECC TREGLERK  
 Ferret SQLVKEVVS L TETCAEGADPDCYDRRTSALS ARS CEKDSPFPVHPGTAECC TREGLERK  
 Panda SHLVNEVVS L TEACCAEGADPECYDLRTSALS ARS CEKDSPFPVHPGTAECC TREGLERK  
 Pacific walrus CHLVNEVVS L TEACCAEGADPDCYDRRTSALS ARS CEKDSPFPVHPGTAECC TREGLEQK  
 Weddell seal CHLVNEVVS L TEACCAEGADPDCYDRRTSALS ARS CEKDSPFPVHPGTAECC TREGLEQK  
 Megabat SHLVKEVVS L TEACCAEEADPDCYDNRTSALS AKSCESDAPFPVHPGTAECC TQEGLERK  
 David's myotis SHLVKEVVS L TEACCAEGADPDCYDNRTSALS AKSCSDSPFPVHPGTAECC TQEGLERK  
 Microbat SHLVKEVVS L TEACCAEGADPDCYDNRTSALS AKSCESDSPFPVHPGTAECC TQEGLERK  
 Hedgehog SHLVNEVVS L TEACCAEGADSDCYDNRTSALS AKSCESNSPFPVHPGTPECCEA QEGLEQK

Shrew	THHIDEVVSMTEDCCAPGSDPGCYDSRTSALSSEKSCESDSPFPVHPGTSECCASEGLERK
Star nosed mole	QQLVNEVVSLTEDCCAEGADPCYDTRTSALSARSCESDAPFPVHPGTAECCREGLEQK
Elephant	SQLVNEVVSLTEDCCAEGADPCYDTRTSALSISKSCESDSPFPVHPGTAECCTEEGLERK
Hyrax	SQLVNEVVSLTECCAEGADPGCYDNRTSALS SVKSCESDSPFPVHPGTAECCTEEGLERK
Cape golden mole	RKLVEEVVSLTEDCCAEEADPCYDNRTSALS SVKSCESDSPFPVHPGTAECCTEEGLERK
Tenrec	KQLVQAVVSLTEDCCAEGADPNCYDDRTSALSARSCEQGSFPFPVHPGTAECCTEEGLERK
Armadillo	RQLVNEVVSLTEACCADGADPCYDNRTSALS AKSCERDSPFPVHPGTAECCTEEGLERK
Sloth	SQLVNEVVSLTECCAEGADPCYDKRTSALS AKSCESDSPFPVHPGTAECCTEEGLERK
Tasmanian devil	KALVNEVVSLTETCCDVNADPNCYDTRTSELS AKSCEKDAPYKHPETDKCCTFEGLERK
Platypus	IALVNEVVSLTETCCAQADPCYDEGASALS AKSCEKDSFPFRHPDVAECCAKGGLERK

Human	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Chimpanzee	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Bonobo	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Gorilla	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Orangutan	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Gibbon	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Rhesus	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Crab-eating macaque	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Olive baboon	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Marmoset	LCMAALKHPPPEEFPSYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Squirrel monkey	LCMAALKHPPPEEFPSYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Tarsier	LCMVALKHRPQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Mouse lemur	LCM-ALKHPPQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Bushbaby	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Chinese tree shrew	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Squirrel	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Ground squirrel	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Golden hamster	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Kangaroo rat	LCMAALSHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Mouse	LCMAALSHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Rat	LCMAALSHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Naked mole rat	LCMAALSHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Guinea pig	LCMAALSHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Rabbit	LCMAALKHPPPEEFPSYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Pika	LCMAALKHPPPEEFPSYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Pig	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Alpaca	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Bactrian camel	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Dolphin	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Killer whale	LCMAALKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Cow	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Sheep	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Goat	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Horse	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
White rhinoceros	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Cat	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Dog	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Ferret	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Panda	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Pacific walrus	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Weddell seal	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Megabat	LCMASLKHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
David's myotis	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Microbat	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Hedgehog	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Shrew	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Star nosed mole	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Elephant	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Hyrax	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Cape golden mole	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Tenrec	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Armadillo	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Sloth	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK
Tasmanian devil	LCMAALRHQEQEFPTYVEPTNDEICEAFRKDPKEYANQFMWEYSTNYGQAPLSLLVSYTK



Platypus LCMAALMQPPQEFPTYVEPSNDETCEAFKKDPKGFQFLYEYSSNYGQAPLRLLLGYTK

Human SYLSMVGSCCTSASPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSNLIKLA  
Chimpanzee SYLSMVGSCCTSASPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSNLIKLA  
Bonobo SYLSMVGSCCTSASPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSNLIKLA  
Gorilla SYLSMVGSCCTSASPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSNLIKLA  
Orangutan SYLSMVGSCCTSASPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSNLIKLA  
Gibbon SYLSMVGSCCTSASPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSNLIKLA  
Rhesus NYLSMVGSCCTSESPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSNLIKLA  
Crab-eating macaque NYLSMVGSCCTSESPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSNLIKLA  
Olive baboon NYLSMVGSCCTSENPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSNLIKLA  
Marmoset SYLSMVGSCCTISANPTVCFLNERLQIKHLSLLTTLNVRVCSQYAAAYGEKKSRLSNLIKLA  
Squirrel monkey SYLSMVGSCCTISANPTACFLNERLQIKHLSLLTTLNVRVCSQYAAAYGEKKSRLSNLIKLS  
Tarsier SYLSMVGSCCTSTSPVCFLKERLQMKHLSLLTTLNVRVCSQYVAYGEKKSRLSOLIKLA  
Mouse lemur SYLSMVGSCCTSASPTVCFLKERLQSKHLSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Bushbaby SYLSMVGSCCTSPSPTVCFLKERLQMKPVSLLTTLNVRVCSQYAAAYGEKKSRRSHLIKLA  
Chinese tree shrew SYLSMVGSCCTSASPTVCFLKERLQSKQLSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Squirrel SYLSMVGTCCTTSASPTVCFLKERLHMRQFSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Ground squirrel SYLSMVGTCCTTSASPTVCFLKERLHMRQFSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Golden hamster SYLSMVGSCCTSASPTVCFLKERLQIKHLSLLTTLNVRVCSQYAAAYGEKKSRLSYLIKLA  
Kangaroo rat SYLSMVGSCCTSANPTVCFLKERLQIKHLSLLTTLNVRVCSQYAVYGEKLRSLSHLIKLA  
Mouse NYLSMVGSCCTSANPTVCFLKERLQMKHLSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Rat SYLSMVGSCCTSAKPTVCFLKERLQMKQLSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Naked mole rat IYLSMVGSCCTSPSPNVCFLKERLQIRHLSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Guinea pig SYLSMVGSCCTSPNPTVCFLKERLQIRHLSLLTTLNVRVCSQYAVNGEKSQISHLIKLA  
Rabbit SYLSMVGTCCTTSASPTVCFLKERLQIKHLSLLTTLNVRVCSQYAAAYGEKKSRRSHLIKLA  
Pika SYLSMVGTCCTSPNPTVCFLKERLQIKHLSLLTTLNVRVCSQYAVYGEKKSRRSHLIKLA  
Pig SYLSMVGSCCTSPSPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGKDKSRLSHLIKLA  
Alpaca SYLSMVGSCCTSPSPTVCFLRERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSHLIKFA  
Bactrian camel SYLSMVGSCCTSPSPTVCFLRERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSHLIKFA  
Dolphin SYLSMVGSCCTSPNPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSHLIKFA  
Killer whale SYLSMVGSCCTSPNPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSHLIKFA  
Cow SYLSMVGSCCTSPNPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSHLIKFA  
Sheep SYLSMVGSCCTSPNPTACFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSHLIKFA  
Goat SYLSMVGSCCTSPNPTACFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSHLIKFA  
Horse SYLSMVGSCCTSPSPTVCFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
White rhinoceros SYLSMVGSCCTSPSPTACFLKERLQKHLSSLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Cat SYLSMVGSCCTSPSPTVCFLKERLQMKHLSLLTTLNVRVCSQYAAAYGEKKSRLSHLVKLA  
Dog SYLSMVGSCCTSSSPTACFLKERLQMKHLSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Ferret SYLSMVGSCCTSPHPTVCFLKERLQMKHLSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Panda SYLSMVGSCCTSPSPTVCFLKERLQMKHLSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Pacific walrus SYLSMVGSCCTSPIPTVCFLKERLQMKHLSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Weddell seal SYLSMVGSCCTSPSPTVCFLKERLQMKHLSLLTTLNVRVCSQYAAAYGEKKSRLSHLIKLA  
Megabat SYLSMVGSCCTSSSPTVCFLKERLQIKHLSLLTTLNVRVCSQYAAAYRKEKSRLSHLIKLA  
David's myotis SYLSMVGSCCTSSSPTVCFLKERLQIKHLSLLTTLNVRVCSQYAAAYEKEKSRLSHLIKLA  
Microbat SYLSMVGSCCTSSSPTVCFLKERLQIKHLSLLTTLNVRVCSQYAAAYEKEKSRLSHLIKLA  
Hedgehog SYLSMVGSCCTSPNPTICFLKERLQIKHLSLLTTLNVRVCSQYVAYGEKKSRLSHLIKFA  
Shrew TYLSMVGSCCTSSSPTVCFLKERLQMKHLSLLTTLNVRVCSQYVAYGEKKSRLSLFIKLA  
Star nosed mole SYLSMVGSCCTSPNPTVCFLKERLQIKHLSLLTTLNVRVCSQYVAYGEKKSRLSHLIKLA  
Elephant SYLSMVGSCCTSSSPTVCFLKERLQIKHLSLLTTLNVRVCSQYVAYGEKKSRLSHLIKLA  
Hyrax SYLSMVGSCCTSSNPTVCFLKERLQIKHLSLLTTLNVRVCSQYVAYGEKKSRLSHLIKLA  
Cape golden mole SYLSMVGSCCTSSRPIECFLKERLQIKHLSLLTTLNVRVCSQYVAYGKDKSRLSHLIKLA  
Tenrec SYLSMVGSCCTSSSTVCFLKERLQIKHLSLLTTLNVRVCSQYVAYGKDKSRLSHLIKLA  
Armadillo SYLSMVASCTSRSTICFLKERLQMKYLSLLTTLNVRVCSQYAAAYGKERSRLSHLIKLA  
Sloth SYLSMVASCTSSSNVV---ERLQIKHLSLLTTLNVRVCSQYTVYGEKKSRLSHLIKLA  
Tasmanian devil NYLSMVGTCCTSANPTACFLAERLQNKHLSLLTTLNVRVCSQYVAYGKDKSRLSHLIKLA  
Platypus SYLSMVGTCCTSPKNTCFLHEKLSQKQISVLTTLNVRVCSQYVAYGKDKSRLSHLIKLA

Human QKVPTADLEDVPLAEDITNILSKCCESASEDCMAKELPEHTVKLCDNLSTKNSKFEDCC  
Chimpanzee QKVPTADLEDVPLAEDITNILSKCCESASEDCMAKELPEHTVKLCDNLSTKNSKFQDCC  
Bonobo QKVPTADLEDVPLAEDITNILSKCCESASEDCMAKELPEHTVKLCDNLSTKNSKFQDCC  
Gorilla QKVPTADLEDVPLAEDITNILSKCCESASEDCMAKELPEHTVKLCDNLSTKNSKFEDCC  
Orangutan QKVPTADLEDVPLAEDITNILSKCCESASEDCMAKELPEHTVKLCDNLSTKNSKFEDCC

Gibbon	QKVPTADLEDVPLAEDITNLSKCCESSEDMAKELPEHTVKLCDNLSTKNSKFEDCC
Rhesus	QKVPTADLEHVLPLAEDVTNLSKCCESASEDCMAKELPEHTVKLCDNLSSKNSKFEECC
Crab-eating macaque	QKVPTADLEHVLPLAEDVTNLSKCCESASEDCMAKELPEHTVKLCDNLSSKNSKFEECC
Olive baboon	QKVPTADLEHVLPLAEDVTNLSKCCESASEDCMAKELPEHTVKLCDNLSSKNSKFEECC
Marmoset	QKVPTADLEDVPLVAEDITNLSKCCESSTDDCMAKELPLHTVKICEHLSTKNSKFEDCC
Squirrel monkey	QKVPTADLEDVPLVAEDITNLSKCCESISDDCMAKELPLHTVKICEHLSTKNSKFEDCC
Tarsier	QKVPTADLEDVPLAEDLTNLSKCCESSEDMAKELPEYTVKICDNLSTKNSKFEDCC
Mouse lemur	QKVPAVDLEDILPLAEDVTNLSKCCQSTSEDMAKELPEYTIKICDNLSTKNSKFGDCC
Bushbaby	QKVPTADLEDVPLAEDVTNLTCCPSTSEDMAKELPEHTVKVCEHLSTKSSKFGDCC
Chinese tree shrew	QKVPTAELEDVPLAEDINKILSKCCESTAEDCMAKELPEHTVKICDNLSTKNSKFEDCC
Squirrel	QKVPTADLEAVLPLAEDITRILSKCCESSEDMAKELPEHTVKICDNLSTKNSKFEDCC
Ground squirrel	QKVPTADLEAVLPLAEDITRILSKCCESSEDMAKELPEHTVKICDNLSTKNSKFEDCC
Golden hamster	QKVPTANLEDVPLAEDLTQILSRCCESSEDMAKELPEHTLKICDNLSTKNSKFEECC
Kangaroo rat	QKAPAAELDHVLPLAEDATNILARCCESSEDMAKELPEYTVKICDNLSSVSAKIKDCC
Mouse	QKVPTANLENVPLAEDFTEILSRCCESSEDMAKELPEHTIKICQNLSSKNSKFEECC
Rat	QKVPTANLEDVPLAEDLTEILSRCCSTSEDMAKELPEHTLKICGNLSSKNSKFEECC
Naked mole rat	QKVPTADLKDVPLVAEDMTAILSKCCESSEDMAKELPEYTVRVCNLSKNSKFEFNC
Guinea pig	QKAPTADLKDVLSLAEDITLILSKCCESSEDMAKELPEYTVRVCNLSKNSKFEFNC
Rabbit	QKAPTAALKEVPLAEDITNLSKCCESSEDMAKELPEHTVKICDSLSTKNPKFEFNC
Pika	QKVPTADLK-----LPEHTVKICDSLSTKNPKFEFNC
Pig	QKVPTANLEDVPLAEDVATILSKCCDSASEDCMAKELPEYTVKICDNLSSKNSKFTDCC
Alpaca	QKVPTADLKDVPLAEDVTTILSKCCGSASEDCMAKELPEYTVKICDSLSTKNPKFKDCC
Bactrian camel	QKVPTADLEDVPLAEDVTTILSKCCGSASEDCMAKELPEYTVKICDSLSTKNPKFKDCC
Dolphin	QKVPTANLEDVPLAEGVTTILSKCCESASEDCMAKELPEYTVKICDNLSTKNSKFKDCC
Killer whale	QKVPTANLEDVPLAEGVTTILSKCCESASEDCMAKELPEYTVKICDNLSTKNSKFKDCC
Cow	QKVPTAHLEDVPLAEDITLILSKCCDSVSEDCI-KELPEYAVKLCDNLSTKNSKFKDCC
Sheep	QKVPTAHLEDVPLAEDITLILSKCCESASEDCMPKELPEYTVKLCDNLSTKNSKFKDCC
Goat	QKVPTAHLEDVPLAEDITLILSKCCESASEDCMPKELPEYTVKLCDNLSTKNSKFKDCC
Horse	QKVPTADLEDVPLAEDITLILSKCCESSEDMAKELPEYSLKICDKLSTKNSKFKHDCC
White rhinoceros	QKVPTADLEDVPLAEDITLILSTCCSTSEDMAKELPEYSLKICDKLSTKNSKFKHDCC
Cat	QKVPTADLEDVPLAEEITLILSKCCESSEDMAKELPEYTVKICDNLATKNSKFKDCC
Dog	QKVPTAELEDVPLAEEINTVLSKCCESSEDMAKELPEYTVKICDNLSTKNSKFKDCC
Ferret	QKVPTAELEDVPLAEEINTVLSKCCESSEDMAKELPEYTVKICDNLSTKDSKFKDCC
Panda	QKVPTAELEDVPLAEEINTLILSKCCESSEDMAKELPEYTVKICDNLSTKNSKFKDCC
Pacific walrus	QKVPTANLEDVPLAEEINTLILSKCCESSEDMAKELPEYTVKICDNLSTKNSKFKDCC
Weddell seal	QKVPTANLEDVPLAEEINTLILSKCCESSEDMAKELPEYTVKICDNLSTKNSKFKDCC
Megabat	QKVPTADLEDVPLAEDVTTILSKCCESSEDMAKELPEHTIKICDNLSTKNSKFNDC
David's myotis	QKAPTANLEDVPLAEDVTTILSKCCGSTSEDMAKELPEHTVKICDNLSTKNDKFRDCC
Microbat	QKAPTANLEDVPLAEDVTTILSKCCGSTSEDMAKELPEHTVKICDNLSTKNDKFRDCC
Hedgehog	QKVPTADLKEVPLAEGITLILSKCCESSEDMAKELPEHTVKICNSLSSKNSKFKDCC
Shrew	QKVPTADLKDVPLAEDITRILSKCCESSEDMAKELPEHTVKLCDNLSSKNSKFKDCC
Star nosed mole	QKVPTADLKDVPLAEDATAILSKCCESTTEGCMKELPEHTVKICDNLSTKDSKFKDCC
Elephant	QKAPTADMGDVPLAEDVTNLSKCCESSEDMAKELPEHTVKICDNLSTKNSKFKDCC
Hyrax	QKAPSADLGDVPLAEDITNLSKCCESSEDMAKQLPEHTVKICDNLSTKNSKFEDCC
Cape golden mole	QKAPTADLEDVPLAEDVTNLSKCCESASEDCMAKELPEHTVKICDNLSTKNSKFEDCC
Tenrec	QKAPTAALQDVPLAEDLTNLSKCCESPSEDMAKELPEHTVKICDKLSTKNSKFEDCC
Armadillo	QKAPTADLEDVLLAEDITEILSKCCDSPSEDCLPKEVGESTIIITHLLRRHSS----
Sloth	QKVPTADLEDILPLVEDISEILSKCCGSSEDCMAKELPEHTVKICDNLATKNSKFEDCC
Tasmanian devil	QKVPTAALEDVVELAEDMTNVLSDCCNSILEDMANELADHTVKVCEKLSKDKRFEHCC
Platypus	QKVPSADFKDAEFLSEDSIRMLSKCCSDAEDCMA--LLPEHVEKVCDRLSTKDSQIQSC

Human	QEKAMDFVFCYFMPAAQLPELDPVELPTNKDVCDPGNTKVMKDYTFELSRRTHLPEVF
Chimpanzee	QEKAMDFVFCYFMPAAQLPELDPVELPTNKDVCDPGNTKVMKDYTFELSRRTHLPEVF
Bonobo	QEKAMDFVFCYFMPAAQLPELDPVELPTNKDVCDPGNTKVMKDYTFELSRRTHLPEVF
Gorilla	QEKAMDFVFCYFMPAAQLPELDPVELPTNKDVCDPGNTKVMKDYTFELSRRTHLPEVF
Orangutan	QEKAMDFVFCYFMPAAQLPELDPVELPTNKDVCDPGNTKVMKDYTFELSRRTHLPEVF
Gibbon	QEKAMDFVFCYFMPAAQLPELDPVELPTNKDVCDPGNTKVMKDYAFELSRRTHLPEVF
Rhesus	QEKAMDIFVFCYFMPAAQPPELPEVELPTNKDVCDQGNTKVMKDYTFELSRRTHLPEVF
Crab-eating macaque	QEKAMDIFVFCYFMPAAQPPELPEVELPTNKDVCDQGNTKVMKDYTFELSRRTHLPEVF
Olive baboon	QEKAMDIFVFCYFMPAAQPPELPEVELPTNKDVCDQGNTKVMKDYTFELSRRTHLPEVF
Marmoset	QEKTPMDVFCYFMPAAQPELDPVELPTNKDVCDSGNTKALDKYTFELSRRTHLPEVF
Squirrel monkey	QEKTPMDVFCYFMPAAQPELDPVELPTNKDVCDSGNTKALDKYTFELSRRTHLPEVF
Tarsier	QEKTPMDIFVFCYFMPAAQPPELDPVELPTNKDVCEQGNTKARDQYAFELSRRTHLPEVF
Mouse lemur	QEKTPMDIFMCTYFMPAAQPPELDPVKLPTSKDVCNPGSTKAMDQYTFELSRRTQVPEVF
Bushbaby	QEKTPMDVFMCTYFMPAAQPPELDPVKLPTGRDVCDHGNTKAVDQYTFELSRRTHVPEVF

Chinese tree shrew	REKTPMDIFVCTYFMPAAQPPELPIEMPTNKDVCQGHARVLDQYTFQLSRRTHVPEVF
Squirrel	QEKTPMDIFMCTYFMPAAQPPQLPDVQFPTNKDVCDANKTKAMDQYAFELSRRTHIPEVF
Ground squirrel	QEKTPMDIFMCTYFMPAAQPPQLPDVQFPTNKDVCDANKTKAMDQYAFELSRRTHIPEVF
Golden hamster	QEKTPMDIFMCTYFMPAAEPLQPLVIKLPTETDLGQSTTQAMDRYTFELSRTRVPEVF
Kangaroo rat	QEKTPMDIFVCTYFMPALQPAQLLPVKLPVTQDLNQQNTKAVARYTFELNKRNTNIPEVF
Mouse	QENTPMNIFMCTYFMPAAEPLQPLPAIKLPTGKDLGQSTTQAMDQYTFELSRRTQVPEVF
Rat	YETTPMGIFMCSYFMPATAEPLQPLPAIKLPTSKDLGQSATQAMDQYTFELSRRTQVPEVF
Naked mole rat	QEEAPLGIFTCIYFMPAALPLELPAIELPTSTEICDQRNTKALDQYTFELTRRTPIPEVF
Guinea pig	REETPLGIFTCVYFMPAAPQVKLQAVELPTNTEVCGQKSTKALDQYTFELSRRTPIPEVF
Rabbit	QEKTPMDIFVCTYFMPAAQPPEPANVELPTS KDVCDSKNINVMQYTFELSRKTHIPEVF
Pika	NEKTPMGIFVCTYFMPAAQPPELPAVKLPTS KDVCDSSTNTNVMQYTFELGRRTQIPEVF
Pig	QEKTPMDIFICTYFMPAARPELDPVKLPTNKDVCDKGNPKVLDQYIFELSRKTHIPEVF
Alpaca	QEKTPMDIFVCTYFMPAAPTPELDPVKLPTNKDVCDKENTEVLDQYAFELSRKTHIPEVF
Bactrian camel	QEKTPMDIFVCTYFMPAAPTPELDPVKLPTNKDVCDKENTKVLQYAFELSRKTHIPEVF
Dolphin	QERTPMDIFVCTYFMPAANPDLDPVKLPTNKDVCDKGNTKVLDQYAFDLSRKTHIPEVF
Killer whale	QERTPMDIFVCTYFMPAAQNPDLDPVKLPTNKDVCDKGNTKVLDQYTFDLSRKTHIPEVF
Cow	QEKTPMEIFVCA YFMPASPNEP LDPVKLPMNKDVCDGENTKVLQYIFELSRKTRIPEVF
Sheep	QEKTPMDIFVCA YFMPASP NKLPD VQLPTNKDVCDKGN TNVLDQYIFELSRKTQIPEVF
Goat	QEKTPMDIFVCA YFMPASP NKLPD VQLPTNKDVCDKGN TNVLDQYIFELSRKTQIPEVF
Horse	QEKTPMDVFCY YFMPAAQSP ELPDVELPTNKDVCDKGN TKPIDQYIFELSRTHIPEVF
White rhinoceros	QEKTPMGIFVCTYFMPAAQPLELDPVELPTNKEVCSKGN TKALDQYTFELSGRTHIPEVF
Cat	QEKTPMDVFMCA YFMPAAPTPELPAVELPTGQDLCDKGN TKAIQYIFELSRRTPLPEVF
Dog	QEKTPMDIFVCA YFMPAAPTPELPAIELPANADVCDKGN TKAIQYIFELSRRTHLPEVF
Ferret	LEKTPMDVFCY YFMPAAPTPELPAIELPTNSDVCDKGN TKAIQYIFELSRRTHLPEVF
Panda	QEKTPMDVFCY YFMPAAPTPELPAVELPTSTDVCDKGN TKAIQYIFELSRRTHLPEVF
Pacific walrus	QEKTPMDVFCY YFMPAAPTPELPAIEWPTNTDVCDKGN AKAIQYIFELSRRTHLPEVF
Weddell seal	QEKTPMDVFCY YFMPAAPTPELPAIEWPTNTDVCDKGN AKAIQYIFELSRRTHLPEVF
Megabat	QEKTPMDIFMCI YFTPAAQPELPEVEMPTNKDMCGN TRAMDKYAFELSRRTHIPEVF
David's myotis	QERTPMDIFMCI YFTPATQPELPEVALPTS KDVC GGN TKAMDRTYTFELSRRTDVEVF
Microbat	QERTPMDIFMCI YFTPATQPELPEVELPTS KDVC GGN TKAMDRTYTFELSRRTDVEVF
Hedgehog	QEKTPMDVFCY YFMPAAPTPELPAIEWPTNTDVCDKGN AKAIQYIFELSRRTHLPEVF
Shrew	QEKTPMDVFCY YFMPAAPTPELPAIEWPTNTDVCDKGN AKAIQYIFELSRRTHLPEVF
Star nosed mole	QEKTPMDVFCY YFMPAAPTPELPAIEWPTNTDVCDKGN AKAIQYIFELSRRTHLPEVF
Elephant	QEKTPMDIFVCTY FMPAAQPPELPAVELPTNKEVCDKESTKATDQYIFELSRRTHIPEVF
Hyrax	EKTPMDVFCY YFMPAAQPLELPAELPTNKDVCDKENT EATDQYIFELSRRTHIPEVF
Cape golden mole	QEKTPMDIFVCTY FMPAAQPLKQAVELPTEKDMCNKGN TKAKDQYIFELSRRTHIPEVF
Tenrec	QEKTPMDIFVCA YFMPAAQPPELPAVDLPTNKAVCSRENTKAKEQYAFELSRRTQIPEVF
Armadillo	----QLLFTCIVF--SINPHKYPNEILFIYLQLKESHYFFSYGRYAFQLSRSSH IPEVF
Sloth	QEKTPMDVFCY YFMPAAQPPELPAVELPTNKD ICDKGN TKATDQYTFQLSRRTHIPEVF
Tasmanian devil	GESSPMDIFLCI YSMPAAQALKLSEFIKPSHEE ICSTENNKALDRYMYEQSRRKN IPEVF
Platypus	QENTPMDIVLCLYSKPPAKSPKPADLPRPTNEDMCSTENPKALDRYIFEIGRRYHVPEVF

Human	LSKVLEPTLKSLGECDDVEDSTTCFNAKGPLLKKE LSSFIDKGQELCADYSENTFTTEYKK
Chimpanzee	LSKVLEPTLKSLGECDDVEDSTTCFNAKGPLLKKE LSSFIDKGQELCADYSENTFTTEYKK
Bonobo	LSKVLEPTLKSLGECDDVEDSTTCFNAKGPLLKKE LSSFIDKGQELCADYSENTFTTEYKK
Gorilla	LSKVLEPTLKSLGECDDVEDSTTCFNAKGPLLKKE LSSFIDKGQELCADYSENTFTTEYKK
Orangutan	LSKVLEPTLKSLGECDDVEDSTTCFNAKGPLLKKE LSSFIDKGQELCADYSENTFTTEYKK
Gibbon	LSKVLEPTLKSLGECDDVEDSTTCFNAKGPLLKKE LSSFIDKGQELCADYSENTFTTEYKK
Rhesus	LKVLEPTLKSLGECDDVEDSTTCFNTKGPLLKQELSS FIDKGQKLCAGYSENTFTTEYKK
Crab-eating macaque	LKVLEPTLKSLGECDDVEDSTTCFNTKGPLLKQELSS FIDKGQKLCAGYSENTFTTEYKK
Olive baboon	LKVLEPTLKSLGECDDVEDSTTCFNTKGPLLKQELSS FIDKGQKLCAGYSENTFTTEYKK
Marmoset	LSKVLDPTLKRLGECDDVEDSTACFNKGP LKKE LASFIDKGQELCADYSENTFTTEYKK
Squirrel monkey	LSKVLDPTLKRLGECDDAKDSTACFNKGP LKKE LASFIDKGQELCADYSENTFTTEYKK
Tarsier	LSKVLEPTLKSLGECCTVEDSATCFNAKGPLLKKE LSSFINKGQELCEDYSENTFTTEYKK
Mouse lemur	LSKILEPTLKSLGECDDLKDP TACLKAKSPLLTKELSS FISKGQELCADYSENTFTTEYKK
Bushbaby	LSKVLEPTLKSLGECDDLEDPATCLTAKGPQLEKELSS FIAKGQELCADYSENTFTTEYKK
Chinese tree shrew	LSKILEPTLKSLGECVSEDSTACFNAKGPLLKKE LSSFVHKGQELCADYSENTFTTEYKK
Squirrel	LSKILTLTLKTLSECCDSQNPASCFVTKGSLMKRQSLFLDKGQELCADYSENTFTTEYKK
Ground squirrel	LSKILTLTLKTLSECCDSQNPASCFVTKGSLMKRQSLFLDKGQELCADYSENTFTTEYKK
Golden hamster	LSKVLETTLKSLSSECCDAQDSMACFSTQSPILKKQLTSFIERGQEMCADYSENTFTTEYKK
Kangaroo rat	LSKILEPTLKSLSSECCDLQDPSTCFNDKNPQLTVV LNSFLGKVHVELCADYSENTFTTEYKK
Mouse	LSKVLEPTLKTLECCDTQDSVACFSTQSP LKRLQTSFIEKGQEMCADYSENTFTTEYKK
Rat	LSKVLDTTLKTLECCDTQDSVACFSTQSP LKRLQTSFIEKGQEMCADYSENTFTTEYKK
Naked mole rat	LSKIVETTLRSLNECCDWEDSAACFTDKGSQLK KKLSSFIEKGQEV CADYSENTFTDYKK
Guinea pig	LSKILEPTLKSLSNECCDSEDSACFTDKGSQLK KKLSSFIEKGQELCADYSENTFTTEYKK

Rabbit LSKVLEPTLKSLSDECCHSADSTACLNAKGPVLKKEVSSFIDKGQELCAGYSENTFFTEYKK  
Pika LSKVLEPTLKSLSDECCHSADSTACLNAKGPVLLKELSSFIDKGQELCKDYSENTFFTEYKK  
Pig LSKILEPTLKSLSDECCHSSEDSTACFKAKGPQFKKELSSFIEKGQELCADYSENTFFTEYKK  
Alpaca LSKILEPTLRGLAECCNSGESTACLNEKGPQLKELSSFIEKGQELCADYSENTFFTEYKK  
Bactrian camel LSKILEPTLRGLAECCNSGESTACLHEKGPQLKELSSFIAKGQELCADYSENTFFTEYKK  
Dolphin LSKILEPTLKSLSDECCHSESDAACFNAKGPQLTRELSSFIEKGQELCADYSENTFFTEYKK  
Killer whale LSKILEPTLKSLSDECCHSESDSTACFNAKGPQLTRELSSFIEKGQELCADYSENTFFTEYKK  
Cow LTKILESTLKSLSDECCHSESDSTACFNAKGPQLTRELSSFIEKGQELCADYSENTFFTEYKK  
Sheep LSKILEPTLKSLSDECCHSESDAACLNEKGPQLTRELSSFIEKGQELCADYSENTFFTEYKK  
Goat LSKILEPTLKSLSDECCHSESDAACLNEKGPQLTRELSSFIEKGQELCADYSENTFFTEYKK  
Horse LSKILDSTLKNLDECCHSESDSTACFNAKGPQLKELSSFIEKGQELCADYSENTFFTEYKK  
White rhinoceros LSKILEPTLKSLSDECCHSESDAACFKAKGPQLKELSSFIDKGQELCGDYSENTFFTEYKK  
Cat LSKILEPTLKSLSAECCSESDAACINTQGPQLKELSSFIDKGQKLCADYSENTFFTEYKK  
Dog LSKILEPTLKSLSAECCSESDSTGCMNAQGPQLKELSSFIDKGQKLCADYSENTFFTEYKK  
Ferret LSKILEPTLKSLSDECCHSSEDSTGCMNAQGPQLKELSSFIEKGQKLCADYSENTFFTEYKK  
Panda LSKILEPTLKSLSAECCSESDSTGCMNAQGPQLKELSSFIDKGQKLCADYSENTFFTEYKK  
Pacific walrus LSKILEPTFKLSAECCSESDATGCMNAQGPQLKELSSFIDKGQKLCADYSENTFFTEYKK  
Weddell seal LSKILEPTFKLSAECCSESDATGCMNAQGPQLKELSSFIDKGQKLCADYSENTFFTEYKK  
Megabat LSKILAPTLKSLADCCSESDAACFNAKVPQLKELSSFIDKGQELCADYSENTFFTEYKK  
David's myotis LSKILEPTFKTLGECCKSKDPAVCFDAKVPQLKELSSFIDKGHEL CADYSENTFFTEYKK  
Microbat LSKILEPTFKSLGECCKSKDPAVCFDAKVPQLKELSSFIDKGHEL CADYSENTFFTEYKK  
Hedgehog LSKILEPTLKSLSDECCHSESDSTCFNMEAPLLKELSTFIENGQELCADYSENTFFTEYKK  
Shrew LSKILEPTLKSLSDECCHSSEDSTGCMNAQGPQLKELSSFIEKGQELCADYSENTFFTEYKK  
Star nosed mole LSKILVPTLKSLSAECCSESDSTACFNAKGPQLKELSSFIEKGQELCADYSENTFFTEYKK  
Elephant LTTVLEPTLISLGECCSESDSTCFNTKGPLLKELSSFIEKGQMCADYSENTFFTEYKK  
Hyrax LSKALQPTLKGELGECCKSESDSTACFNTKGPQLKELSSFIEKGQELCADYSENTFFTEYKK  
Cape golden mole LSKALEPTLKSLSAECCSESDYACFLAKGPLLKELSSFIEKGQELCADYSENTFFTEYKK  
Tenrec LSKALDATLTSLECCSGDAAACLQAKGPLLQKELSSFIEKGQELCADYSENTFFTEYKK  
Armadillo LSKILDPTLKSLSDECCKDSTACFKAKAPLLQKELSSFIDKGQELCADYSENTFFTEYKK  
Sloth LSKILEPTLKSLSDECCKDSTACFKAKAPLLQKELSSFIEKGQELCADYSENTFFTEYKK  
Tasmanian devil VTKLHGLMFKVMSDCKSVEPEACLRQRPLARNEMALFFTKAEELCGDFSQHTFFTEYKK  
Platypus LSKILDGITRAVSGCCSGEDPHTCGLGVVRSQMKREMVVYLAKAKELCGDYSELFFTEYKK

Human KLAERLKAKLPDATPTELAKLVNKRSDFASNCCSINSPPLYCDSEIDAELKNIL  
Chimpanzee KLAERLKAKLPDATPTELAKLVNKRSDFASNCCSINSPPLYCDSEIDAELKNIL  
Bonobo KLAERLKAKLPDATPTELAKLVNKRSDFASNCCSINSPPLYCDSEIDAELKNIL  
Gorilla KLAERLKAKLPDATPTELAKLVNKRSDFASNCCSINSPPLYCDSEIDAELKNIL  
Orangutan KLAERLRKAKLPDATPTELAKLVNKRSDFASNCCSINSPPLYCDSEIDAELKNIL  
Gibbon KLAERLRKAKLPDATPTELAKLVNKRSDFASNCCSINSPPLYCDSEIDAELKNIL  
Rhesus KLAEQLRKAKLPDATPTELAELVNKRKRAFASNCCFTNSPPLYCGSEIDAELKNIL  
Crab-eating macaque KLAEQLRKAKLPDATPTELAELVNKRKRAFASNCCFTNSPPLYCGSEIDAELKNIL  
Olive baboon KLAEQLRKAKLPDATPTELAELVNKRKRAFASNCCFTNSPPLYCDSEIDAELKNIL  
Marmoset KLAERLGAKLPDVTPKLAELVDRRSDFASHCCSVNSPPLYCDSEIDTELKNIL  
Squirrel monkey KLSERLRKAKLPDVTPKELAGLVDRRSDFASHCCSVNSPPLYCDSEIDTELKNIL  
Tarsier KLAERLKAKLPDATPTELAELVNKRSDFASKCCSINSPPLYCDSEIDAEMKNAL  
Mouse lemur -----  
Bushbaby KLAERLRKAKLPDAEPTLEALLEKRSDFASKCCFVNSPPLYCDSQFGVHPLPLNV  
Chinese tree shrew KLAERLAAKQPDATPSQLAKLVEERSDFASKCCSINSPPLYCDSEIDAVMKNI-  
Squirrel KLEERLRKAKMPNATPMELTGVVDKLSDFASKCCSINSPPLYCGSQIDAEMKDIL  
Ground squirrel KLEERLRKAKMPNATPMELTGVVDKLSDFASKCCSINSPPLYCGSQIDAEMKDIL  
Golden hamster KLAERLRKAKMPNATPMELTGVVDKLSDFASKCCSINSPPLYCDSQIDAEMKDIL  
Kangaroo rat KLTERLRKAKYPDVMPDYLEALVHRNSDFASKCCSMNSPPLYCDSLIDNEMKDV  
Mouse KLAERLRKAKMPNATPMELTGVVDKLSDFASKCCSINSPPLYCDSQIDAEMIDTL  
Rat KLAERLRKAKMPNATPMELTGVVDKLSDFASKCCSINSPPLYCDSQIDAEMRDIL  
Naked mole rat KLSERLRKAKLPDATPTELAGLVDRRSDFASKCCSINSPPLYCDSQIDAEMKDIL  
Guinea pig KLTERLRKAKLPDATPTELAGQVERHSDFASKCCSINSPPLYCDAQVRRHRNVLL  
Rabbit KLSQQLRAKLPDATSMELADVKNKHSDFASKCCSINSPPLYCDSEIDAELKNIL  
Pika KLSQQLRAKLPDATSMELADVKNKHSDFASKCCSINSPPLYCDSE-----  
Pig KLAERLRGKLPDATPTELEELVDRRSDFASKCCSINSPPLYCDSEVNHDIPISS  
Alpaca KLAERLRGKLPDATPTELEELVDRRSDFASKCCSINSPPLYCDSEIDAEMNTL-  
Bactrian camel KLAERLRGKLPDATPTELEELVDRRSDFASKCCSINSPPLYCDSEIDAEMNTL-  
Dolphin KLAERLRGKLPDATPTELEELVDRRSDFASKCCSINSPPLYCNSEIDAEMNTLQ  
Killer whale KLAERLRGKLPDATPTELEELVDRRSDFASKCCSINSPPLYCNSEIDAEMNTLQ  
Cow KLAERLRGKLPDATPTELEELVDRRSDFASKCCSVNSPPLYCNSEIDAEMINTLQ  
Sheep KLAERLRGKLPDATPTELEELVDRRSDFASKCCSINSPPLYCSEIDAEMINTLQ



Goat	KLAERLRGKFPDATETDLQELVAKLSDFASKCCSINSPPLYCSSEIDAEINTLQ
Horse	KLAERLRAKLPDAAATELEELVGKRSDFASKCCSINSPPLYCDSEIDAEMK--N
White rhinoceros	KLAERLRAKLPDATATELEELVEKRSDFASKCCCTINSPPLYCDSEIDAEMK--N
Cat	KLAERLSAKLPDVSALELQGLIDKRSDFASKCCSINSPPLYCDSEV-----
Dog	KLAEGLKAQFPDASATDLQGLIDKRSDFASKCCSINSPPIYCDSET-LKAKEIR
Ferret	KLAEQLKAQLPDASALELQGLIDKRSDFASKCCSINSPPLYCDSEIDVEMKNIL
Panda	KLAEQLKAQMPDASSMDLQGLIDRRSDFASKCCSINSPPLYCDSEVR-KFNPLL
Pacific walrus	KLAEQLRAQFPDASAVELQGLIDKRSDFASKCCSINSPPLYCDSEIDVEMKNIL
Weddell seal	KLAEQLRAQLPEASAMELQGLIDKRSDFASKCCSINSPPLYCDSEIDVEMKNIL
Megabat	KLAERLKAKLPDATATELEGLVDRSDFASKCCSLNSPPLYCDSEIDAEMKNTL
David's myotis	KLTERLRAKLPDAPDTELEELVEKRSDFASKCCSINSPPLYCDAKIDAEMKNTL
Microbat	KLTERLRAKLPDAPDTELEELVNKRSDFASKCCSINSPPLYCDAEIDAEMKNTL
Hedgehog	KLAGRLRKTLPDATDAQLEELIEKRSDFASKCCSINSPPLYCNS-----
Shrew	KLAGRLRAKLPDASDSELEELVDRSDFATKCCSMNSPPLYCDSEIDAEMKNTL
Star nosed mole	KLAERLRAKLPDATDTELEELVDRSDFATKCCSINSPPLYCDSELGNQLTFLV
Elephant	KLAERLRAKLPDATPTDLADLVDRSDFASKCCSINSPPLYCNSQVGFANSLLT
Hyrax	KLAERLKAKLPDVAPADLAELADKRSDFASKCCSVNSPPLYCDAEIDAQMKILP
Cape golden mole	KLAERLRAKLPDPTPTDLAKLVKHSDFASKCCYINSPPLYCDSEVGANTIQLL
Tenrec	KLTERLRAKLPDTSATDLAQLVDRSDFASKCCSINSPPLHCDSEIEAEMKNIL
Armadillo	KLAERLRAKLPDPTSTDLGELVNKFSDFASKCCFINSPPIYCSSEIDAQMNS--
Sloth	KLAERLRAKLSDATSTDLELVDFKFSDFASKCCSINSPPLYCDSE-----
Tasmanian devil	RLTEHFKTKFPETNSKIIEKEMVENRTDFASKCCLMNSPPLYCNTQIDTEIKNFC
Platypus	GLTEKFSQKQPDASPATIKELVERRATFASSCCISNAPPRYCSTQVPAPRPLSF

## ALPHA-FETOPROTEIN

Human	MKWVESIFLIFLLNFTESTRTLHRNEYGIASILDSYQCTAEISLADLATIFFAQFVQEATY
Chimpanzee	MKWVESIFLIFLLNFTESTRTLHRNEYGIASILDSYQCTAEINLTDLATIFFAQFVQEATY
Bonobo	MKWVESIFLIFLLNFTESTRTLHRNEYGIASILDSYQCTAEINLTDLATIFFAQFVQEATY
Gorilla	MKWVESIFLIFLLNFTESTRTLHRNEYGIASILDSYQCTAEISLADLATIFFAQFVQEATY
Orangutan	MKWVESIFLIFLLNFTESTRTLHRNEYGIASILDSYQCAAEINLTDLATIFFAQFVQEATY
Gibbon	MKWVESIFLIFLLNFTESTRTLHRNEYGIASILDSYQCTAEINLADLATIFFAQFVQEATY
Rhesus	MKWVESIFLIFLLNFTESTRTLHRNEYGIASILDSYQCTAEINLPDLATIFFAQFVQEATY
Crab-eating macaque	MKWVESIFLIFLLNFTESTRTLHRNEYGIASILDSYQCTAEINLPDLATIFFAQFVQEATY
Olive baboon	MKWVESIFLIFLLNFTESTRTLHRNEYGIASILDSYQCTAEINLPDLATIFFAQFVQEATY
Marmoset	MKWVGSIFLIFLLNFTESTRPHRNEYGIASILDSYQCTAEINLTDLATIFFAQFIQEATY
Squirrel monkey	MKWVGSIFLIFLLNFTESTRPLRNEYGIASILDSYQCTAEINLTDLATIFFAQFVQEATY
Tarsier	MKWVESIFLIFLLSFAESRTLHRNEYGIASILDSSQCKEEVNLANLATIFYAQFFQVATY
Mouse lemur	MKWVESIFLIFLLSFAESRTLHRNEYGIASILDSSQCTADMNLADLATIFFAQFVQEATY
Bushbaby	MKWVELFVLIIFLLSFTESRTLHRNAYGIASILDSSRCSTEVNLADLATIFFAQFIQEAPY
Chinese tree shrew	MRWLVSISLILLNFTESTRTLHNAYGIASVLDSSQCSAEVNLVNIATIICAQFVKEATY
Squirrel	MKWVVSIFLAFLLTFTESTRTLHNAYGIASVLDSSQCSAEVNLVLDLTTIFFAQFVHGATY
Golden hamster	MEWRVAIFFVFLNVAESRMLHKHEFGIASTLDSSQCSTEKNMLSLATITFSQFVPEATF
Kangaroo rat	MKYAIPILLISLLSLSSEKTLHRNAYGKDSTLDSSQCSKKNLVNLATIFLAQFVEKATY
Mouse	MKWITPASLILLLHFAASKALHENEFGIASTLDSSQCVTEKNVLSIATITFTQFVPEATE
Rat	MKWSASISFLLLLNFAEPRVLHTNEFGIESTLDSSQCPTEKNMNFVATIVVAQFVQDATK
Naked mole rat	MKWLVSILILIFLLRFTDSRTLHNAYGIASVLDSSQCSSEMNLADLATIFFAQFVQEATY
Guinea pig	MKLVASVILVFLLCFTDSKTLHNAYGIASVLDSSQCSSEMNLANVATILFSQFVQDATY
Rabbit	MKWVVSIFLL-LLNFTESTRTLHRNAYGIASILDSSKCSAGMNLVLDLATIFVTQFAQEATY
Pika	MKSVISMFLFLLSVAESRTLHTNEYGIASILDSSLQCSAEKNLVLDLATISLAQFVPEATY
Pig	MKWVVSIFLIVLLNFTESTRMHNAYGIASILDSSQCSAEMNLVLDLATIFFAQFVQEATY
Alpaca	MKWIVSIFLIFLLNFTESTRMHKNAYEIASILDSSQCSAEMNLVGLATIFFAQFVQEATY
Bactrian camel	MKWIVSIFLIFLLNFTESTRMHKNAYEIASILDSSQCSAEMNLVGLATIFFAQFVQEATY
Dolphin	MKWEVSIFLIFLLNFTESTRMQKNAYGIASILDSSPCSAEMNVLDLATIFFAQFVQEATY
Cow	MKWVVSFLLFLLNFSDSRTMHKNAYGIDSILDSSPCSSGTLNVGLATIFFAQSVQEATY
Horse	MKWVVSILLIFLLNFTESTRMHSNAYGIASALDSFQCSPEMNLVLDLATIFFAQFVQEATY
Cat	MKWVISIFLIFLLNFSEPRMHRNAYGIASILDSSQCSAEMNVLDLATIFFAQFVQEATY
Dog	MKWVVSFFSIFLLNFSESRMHRNAYGIASILDSSQCSAEMNLVLDLATIFFAQFVQEATY
Ferret	MKWVVSIFLIFLLNFSESRMHRNAYGIVSILDSSQCSAEVNLVLDLATIFFAQFVQEATY
Panda	MKWVVSISLIYLLNFSESRMHRNAYGIASILDSSQCSAEMNLADLATIFFAQFVQEATY
Pacific walrus	MKWVVSISLIFLLNCSERSTMHRNAYGIASILDSSQCSAEMNLVLDLSTIFFAQFVQEATY
Weddell seal	MKWVVSISLIFLLNFSESRMHRNAYGIASILDSSQCSAEMNLVLDLATIFFAQFVQEATY
Black flying fox	MKWALSIFL-ILLNITESRSTMHSNMYGMASILNSSQCSAEVNLVLDLATIFFAQFVQEATY
Megabat	MKWALSIFL-----SILNSSQCSAEVNLVLDLATIFFAQFVQEATY

Microbat MKWVVSILLIFLLNTTESRTHHNNAYGIASILDSSQCSAEVNLADLATIFFAQFVQEATY  
Hedgehog MKWVVSIAFFIFLLSFSESRTHHRNAYGIASILDSSQCTMEVNLDDAFTILFAQFVQDASY  
Shrew MKWVVSIFLIFLLSFTESTRALYKTVSGAASMLNSSQCFSETNLVNLATIFFAQFVIEEAY  
Hyrax MKLVVAIFLIFVFNFTDSRTLHKNAYGVASLLNSSICSEMNLVDLATIFFAQFVQEATY  
Elephant MKWIVAISLISLLNFAESRTLHKNAYGIASVLNSSQCSYKTNLADIATIFFAQFVQEATY  
Cape golden mole MKWLV-ILLISLLRFTESTRTHHNNAYGIASVLNSPQCSSEMNIDDLATIFFAQFVPKATY  
Tenrec MKWVVSIFVIFLLNFSESRTHMHTNAYGIASVLHSFQCSTEMDLVDLATIFFAQFIQEATY  
Armadillo MKWVVSIFVIFLLNFSESRTHMHTNAYGIASVLHSFQCSTEMDLVDLATIFFAQFIQEATY  
Sloth MKWVVSIFVIFLLNFSESRTHMHTNAYGIASILHSSQCSSEMMDLVDLSTIFFAQFVQEATY  
Opossum MKWEASIFLLLFLSFAESKLLHTSALELGSTSNPSHSITEANLRDLATIFFVQFIPPEATY  
Tasmanian devil MKWETSILLLLILFGFAEPKILHSSSSDIVSTTNPPQCSTEGNLVDIATIFFAQFIPEATY  
Wallaby MKWETSILLLVLLGFAESKILHTGTSGIASAPSSPQCTTEGNLADIATIFFAQFIPEATY

Human KEVSKMVKDALTAIEKPTGDEQSSGCLNQLPAFLEELCHEKEILEKYGHSDCCSQSEEG  
Chimpanzee KEVSKMVKDALTAIEKPTGDEQSSAGCLNQLPAFLEELCREKEILEKYGHSDCCSQSEEG  
Bonobo KEVSKMVKDALTAIEKPTGDEQSSAGCLNQLPAFLEELCHEKEILEKYGHSDCCSQSEEG  
Gorilla KEVSKMVKDALTAIEKPTGDEQSSAGCLNQLPAFLEELCHEKEILEKYGLSDCCSQSEEG  
Orangutan KEVSKMVKDALTAIEKPTGDEQSSAGCLNQLPAFLEELCHEKEILEKYGLSDCCSQSEEG  
Gibbon KEVSKMVKDVLTAI----GDEQSSAG-KYFLLPAFLEELCHEKEILEKYGLSDCCSQSEEG  
Rhesus KEVSKMVKDVLTAIEKPTGDEQSSAGCLNQLPAFLEELCHEKIDILEKYGLSDCCSQSEEG  
Crab eating macaque KEVSKMVKDVLTAIEKPTGDEQSSAGCLNQLPAFLEELCHEKIDILEKYGLSDCCNQSEEG  
Olive baboon KEVSKMVKDVLTAIEKPTGDEQSSAGCLNQLPAFLEELCHEKIDILEKYGLSDCCSQSEEG  
Marmoset MEVSKMVKDVLTAIEKPAGEEQSAGCLNQLPAFLEEMCHEKEILEKYGLSDCCSQSEEG  
Squirrel monkey MEVSKMVKDVLTAIEKSTGEEQSAECFENQLPVFLEEMCHEKEILEKYGLSDCCSQSEEG  
Tarsier EEVSKMVKDVLTTIKKST----DNGCFENQLFTFLEEICHDKIESEKYGLSDCCSQSEEG  
Mouse lemur KEVSKMVKDVLAVIEKPT--ERTAGCFENQISVFLIEICHEKEISEKYGLSHCCSHSEEG  
Bushbaby REISKMVKDVLTVIEKPTGSGQASGCSENQISIFLIEICHEKEISEKYGLSDCCSQSDED  
Chinese tree shrew EEVSKMVKDVLTVIEKPTGSEQASGCFENQLPAFLEEICHEKEISEKYGLSDCCSRSEKE  
Squirrel PEIRKMTNHVLAIVIKKPTDE----CLENQMSAFLEEICHEKEIFEKYGLSDCCSRGEE  
Golden hamster EEINKMTNDVLTAIKKPTSEEQHGCLNQLMSVFLDEICHEKELSDKHGSHCCSQSGEE  
Kangaroo rat EEVSKMVTDLTVIKKPTDSEQPEGCLESPFAFMDIECHHEEISEKGLSDCCCKQSGEE  
Mouse EEVSKMVTSDVLAAMKNSGD----GCLESQSVFLDEICHETELSNKYGLSDCCSQSGVE  
Rat AEVSKMSSDALAAMKENTGD----GCLNQLSVFLDEICHETELSNKYGLSDCCNQSGVE  
Naked mole rat EEVSKMVTDLTLTVVKKPTGSEQPAECFENRLSAFLEEICHERAIAAGKYGLADCCAHSEEG  
Guinea pig EEVRKMVTDLTVIKKPTGSEQLAECLNQLSTFLEEICHERATHEKYGLADCCSRS-EE  
Rabbit EEISKMVRDVLTIKAPNKDSSASWLISLKLPAFLEEICHETEISEKGLAECCRQGGDD  
Pika EEVSKMTRDVLAVIEKASNSELPAGCLNQLPAFLEEICHETEISEKYGLAECCRQSGQE  
Pig KEVNQMVKDVLTVEIKSTGSEQPAAGCLNQLVSVFLIEICHEEEIPEKYGLSHCCSQSGEE  
Alpaca KEVSKMVRDVLTVIEKSTGSEKPTGCLNQLVSAFLEEICHEREIPEKYGLSDCCNQSGEE  
Bactrian camel KEVSKMVRDVLTVIEKSTGSEKPTGCLNQLVSAFLEEICHEREIPEKYGLSDCCNQSGEE  
Dolphin KEVSKMVKDVLTVIEKSTGSEQPAAGCLNQLVSAFLEEICHEKEIPKYGLSDCCSQSGEE  
Cow EEVSKMVKDVLTVIEKPTGSEQPAAGCLNQLVSAFLEEICHEKEIPEKYGLSDCCSQSGEE  
Horse KEVSKMVKDVLTVIEKSTGSEQPTGCSENRLSAFLEEICHEEEIPEKYGLSDCCSQSGEE  
Cat KEVSKMVKDILTVIEKSTGSEQPVGCLNQLSAFLEEICHEKEISEKYGLSDCCSQSEEG  
Dog KEVSKMVKDILTVIEKSTGSEQPGCLNQLPAFLEEICHEKEISEKYGLADCCSQREEE  
Ferret KDVSKMVKDILTVIEKSTGSEQPVGCLNQLVSAFLEEICHEKEISEKYGLSDCCSQSDEE  
Panda KEVSKMVKDILTVIEKSTGSEQPVGCLNQLSAFLEEICHEKEISEKYGLSDCCSQSEEG  
Pacific walrus KEVSKMVKDILTVIEKSTGSEQPVGCLNQLVSAFLEEICHEKEISEKYGLSDCCSQSEEG  
Weddell seal KEVSKMVKDILTVIEKSTGSEQPVGCLNQLVSAFLEEICHEKEISEKYGLSDCCSQSEEG  
Black flying fox KEVNKMVKDVLTVIEKPTGSEQPAAGCLNQLVSAFLEEICHEKEIPEKYGLSDCCSQREEE  
Megabat KEVNKMVKD-LTKIY----AEEKIGCAEILLSAFLEEICHEKEIPEKYGLSDCCSQREEE  
Microbat QEVNKMVKDVLTVIEKPTGSEQPAAGCLNQLVSAFLEEICHEKEISEKYGLSDCCSQSEEG  
Hedgehog PEVSKMAKDVLTVEIKPTGSEQPAAGCLNQLVSAFLEEICHEKEIPEKYGLSDCCSQSGQE  
Shrew PEVRKMVKDVLTVIEKPLGSDQPVGCLDQLSAFLEEICHEKEIVGKYGLSDCCNQNGKE  
Hyrax QEVNKM-----LSSFLDEICHEKEISDKYRFSDDCKTEEE  
Elephant QEVNKMILIDRIASLKE-----LYNNLSAFLEEICHEKEICEKYGLSDCCSQREEE  
Cape golden mole QEVTKMSKDVLTVIEKPTGSEQHAECAENQLSAFLEEICHEKEISEKYGLSDCCSKNEEE  
Tenrec QEVNKMVTNDVVAIVIKKPTGSEQHGECSDNQLSAFLEEMCHEKIDISEKYGLSDCCSKNEEE  
Armadillo KEVSKMVKDVLTVIEKPTGSEQPAAGCLNQLVSAFLEEICHEKEISEKYGLSDCCSKNEEE  
Sloth KEVSKMVKDILTVIEKSTGSEQPAAGCLNQLVSAFLEEICHEKEISEKYGLSDCCSKNEEE  
Opossum EEVDKLVKDFLADFERPVANEDPKDCLERQLSALLEEICHDKDISDKHGLADCCSVGSD  
Tasmanian devil QEVSKLVKDFLADFERPVANEDPKDCLERQLSALLEEICHDKDISDKHGLADCCSKAGN  
Wallaby QEIGKLVKDFLADFERPVANEDPKDCLERQLSALLEEICHDKDISDKHGLADCCSKAGN

Human RHNCFLAHKKPTASIPLFQVPEPVTSCAEYEDRETFMNFIIYEIARRHPFLYAPTILL

Chimpanzee RHNCFLAHKKPTPASIPFLQVPEPVTSCAYEEDRETFMKNFIYEIARRHPFLYAPTILL  
Bonobo RHNCFLAHKKPTPASIPFLQVPEPVTSCAYEEDRETFMKNFIYEIARRHPFLYAPTILL  
Gorilla RHNCFLAHKKPTPASIPFLQVPEPVTSCAYEEDRETFMKNFIYEIARRHPFLYAPTILL  
Orangutan RHNCFLAHKKPTPASIPFLQVPEPVTSCAYEEDRETFMKNFIYEIARRHPFLYAPTILL  
Gibbon RHNCFLAHKKPTPASIPFLQVPEPVTSCAYEEDRETFMKNFIYEIARRHPFLYAPTILL  
Rhesus RHNCFLAHKKPTPASIPVQVPEPVTSCAYEEDRETFMNRFIYEIARRHPFLYAPTILL  
Crab eating macaque RHNCFLAHKKPTPASIPVQVPEPVTSCAYEEDRETFMNRFIYEIARRHPFLYAPTILL  
Olive baboon RHNCFLAHKKPTPASIPVQVPEPVTSCAYEEDRETFMNRFIYEIARRHPFLYAPTILL  
Marmoset RHSCFLAHKKPTPTSMQLFQVPEPVVSCAYEEDRETFMKNFIYEIARRHPFLYAPTILL  
Squirrel monkey RHSCFLAHKKPTPTSMQLFQVPEPVMSCAYEEDRETFMKNFIYEIARRHPFLYAPTILL  
Tarsier RHKCLLAHRKTAPASIPPFQVPEPVTSCQAYKEDIETYMNRFIYEIVARRHPFLYAPTLLA  
Mouse lemur RLSCFLAHKKAAPASIPAFQVPEPVASCKAYEEDRETFLN-----  
Bushbaby RLNCLLTHKKPTPVSIIPFQVPEPILSCKAYEEDRAAFINRYIYEIARRNPFLYAPVVLS  
Chinese tree shrew RHDCMLSHKKATPASIPPHQVLEPATSCKAYEENRETFINKYIYEISRRHPFLYAPTILS  
Squirrel RHSCLLAHKKAAPA-LPPFQVPEPATSCKAYEEDRETFMNRFIYEISRRHPFLYAPTILS  
Golden hamster RHQCLLARKKTASASVLPFSFPEAAESCKAYKENREMFMRNVIYEVSRRFPFMYAPAILS  
Kangaroo rat RHKCFLAHKRAAPASITPFGPDPKRICQAYEENKETFINRYIYDVSRRHPFLYSPTVLS  
Mouse RHQCLLARKKTAPASVPPFQVPEPAESCKAHEENRAVFMNRFIYEVSRRNPFPMYAPAILS  
Rat RHQCLLARKKTAPDSVPPFHFPEAESCAYEENRAMSINTFIYDVSRRNPFLYAPTILY  
Naked mole rat RHKCFLARKKAATVSIPLQVPEPVTSCVYEEENREMFINKYIYEVSRRHPFLYPTALS  
Guinea pig RHKCLLTRKRAAPASIPPLQVPMVTSCAYEENRETVLNKYIYEVSRRHPFLYPTALS  
Rabbit RHRCFLAHKKAHASIPPFQVPEPVSGCKAYEENREAFMNRFIYEISRRHPFLYAPTILS  
Pika RHRCFLAHKKAATAASIPPFQVPEADTGCKAYEENREASVNRFIYEISRRHPFLYAPTILS  
Pig RHNCFLARKKAAPASIPPFQVPEPVTSCAYEENRELFMTRYIYEIARRHPFLYAPTILS  
Alpaca RHNCFLAHKKATPASIPPFQVPEPVTSCAYEENREWFMRNFIYEIARRHPFLYAPTILS  
Bactrian camel RHNCFLAHKKATSASIPPFQVPEPVTSCAYEENREWFMRNFIYEIARRHPFLYAPTILS  
Dolphin RHDCFLAHKKAAPASIPPFQVPEPVTSCAYEEDRELFMNRVYIYEIARRHPFLYAPTILS  
Cow RHDCFLAHKKAAPASIPPFVLEPVTSCSKYKENRELFINRYIYEIARRHPVLYAPTILS  
Horse RHNCLLARKKDSASIPPFQVPEPVTSCAYEENREMFNRVLYIYEIARRHPFLYSSTALY  
Cat RHNCLLAHKKATPSSIIPPFQVPEPVTSCAYEENRDMFNRYIYEIARRHPFLYAPTILS  
Dog RHNCFLAHKKAAPSIIPPFQVPEPVTSCAYEENRDMFMNRFIYEIARRHPFLYAPTILS  
Ferret RQNCLLAHKKAAPASIPPLQVPEPVTSCAYEENRDMFMNRFIYEIARRHPFLYAPTILS  
Panda RHNCLLGHKKAAPATIPPFQVPEPVTSCAYEENRDMFMNRFIYEIARRHPFLYAPTILS  
Pacific walrus RHNCLLTHKKAAPASIPPFQVPEPVTSCAYEENRDMFMNRFIYEIARRHPFLYAPTILS  
Weddell seal RHNCLLAHKKAAPASIPPFQVPEPVTSCAYEENRDMFMNRFIYEIARRHPFLYAPTILS  
Black flying fox RHNCLLTHKNAAPASIPPFQVPEPVTSCAYEESREIFMNRFIYEIARRHPFLYAPTILS  
Megabat RHNCLLTHKNAAPASIPPFQVPEPVTSCAYEESREIFMNRFIYEIARRHPFLYAPTILS  
Microbat RHNCFLAHKKAAPASIPPFQVPEPVTSCAYEESREIFMNRFIYEIARRHPFLYAPTILS  
Hedgehog RHDCLLAHKKAAPASIPAFQVPEPVSSCKAFEENRGAFMRNFIYEIARRHPVLYAPAILY  
Shrew RHSCLLARKKAASDFVSPFQVPEPVSSCKAYEENRETFMNRFIYDIARRHPFLYAPTILS  
Hyrax RHNCLLAHKKAAPASIPPFQVPEPVTGCKEYEEENRDMFMNRFIYEIVARRHPFMYAPTIVLL  
Elephant RHNCLLARKKAAPASIPPFQVPEPVTSCAYEENREMFMRNFIYEIARRHPFLYAPTIVLL  
Cape golden mole RHNCLLAHKKAAPATIPPFQVPEPVTGCKEYEEENRDMFMNRFIYEIARRHPFLYAPTIVLL  
Tenrec RHNCLLAHKKAAPATIPPFQVPEADAGCRAYEENRESFLNRFIYELARRHPFLYAPTILF  
Armadillo RHNCLLARKKAAPASIPPFQVPEPVTSCQAYEENQKFMNRFIYEIARRHPFLYAPTILS  
Sloth RPNCFLAHKKAALASIPPLQVPEPVTSCAYEENRKAFMNRFIYETARRYPFLYAPKILS  
Opossum RLGCLLAHKRGSAAASIPFQVPEAVHSCKAHGENPATFMNRFIYEITRRHPFLYAPTILS  
Tasmanian devil RLECLLAHKRSSAAASIPFQVPEPVTGCKEYEEENRDMFMNRFIYEISRRHPFLYAPAILS  
Wallaby RLECLLDHKGNAASIPFQVPEPVTGCKEYEEENRDMFMNRFIYEISRRHPFLYAPAILS

Human WAARYDKIIPSCCKAENAVECFQTKAATVTTELRESLLNQHACAVMKNFGTRTFQAITV  
Chimpanzee WAARYDKIIPSCCKAENAVECFQTKAATVTTELRESLLNQHACAVMKNFGTRTFQAITV  
Bonobo WAARYDKIIPSCCKAENAVECFQTKAATVTTELRESLLNQHACAVMKNFGTRTFQAITV  
Gorilla WAARYDKIIPSCCKAENAVECFQTKAATVTTELRESLLNQHACAVMKNFGTRTFQAITV  
Orangutan WAARYDKIIPSCCKAENAVECFQTKAATVTTELRESLLNQHACAVMKNFGTRTFQAITV  
Gibbon WAARYDKIIPSCCKAENAVECFQTKAATVTTELRESLLNQHACAVMKNFGTRTFQAITV  
Rhesus LAARYDKIIPSCCKAENAVECFQTKAASITKELRESLLNQHACAVMKNFGTRTFHAIIV  
Crab eating macaque LAARYDKIIPSCCKAENAVECFQTKAASITKELRESLLNQHACAVMKNFGTRTFHAIIV  
Olive baboon LAARYDKIIPSCCKAENAVECFQTKAASITKELRESLLNQHACAVMKNFGTRTFHAIIV  
Marmoset LAARYDKIIPSCCKVENAVECFQTKGASITKELRENSLFNQHACAVMKNFGLOTFQAITI  
Squirrel monkey LAARYDKIIPSCCKVANAVECFQTKGASITKELRENSLFNQHACAVMKNFGLOTFQAITI  
Tarsier LAGRYDKIIPSCCKADNAVECFQTKAASITKELKESLLNEHVCAVMKDFGPRTSQAITV  
Mouse lemur -----TV  
Bushbaby FAARYDKIIPSCCKAANAIECFQMKAAPIITKELRESLLNQHTCAVMKTFGPRTFQAIIV  
Chinese tree shrew LAARYDKIIPSCCKAENAVECFQTKGAPIAKELRESLLNQHCAVMKTRTFEPRTFQAITV  
Squirrel LAAGYDKIIPSCCKAENAAECFQTKTTSITKELKESLLNQHVCAVKRTFEPLIFQAITV

Golden hamster	LAAQYDKTVPVCCAENMEECFQAKRASIAKELKEGSLLEHVCVIRKFGSRNLQATTI
Kangaroo rat	SAARYAKIMPLCCKAENAAECFQTKTASINKELRESSLLNQHICAVMKHGDGPOTLQE---
Mouse	LAAQYDKVVLACCADNKEECFQTKRASIAKELREGSMLNEHVCSVIRKFGSRNLQATTI
Rat	LAAQYDKAVPACCKADNKEECFQTKRASMAKELREGSMLNEHVCSVIRKFGSRNLQAVLI
Naked mole rat	LAARYDKIFPSCCKAENAAECFQQAATSITKDLSESSLNQHVCVIRNFGPRNFQAVTI
Guinea pig	LAARYDKIFPSCCKAENAAECFQTEVAPITKDLQESSLLNQHACAVMRNFGPRTFQAITI
Rabbit	LATRYDKIIPCCKAENAVECFQTKAAPITKELREVSSLNQHVCVSMRNFSPPLTFQAITV
Pika	LAARYDKIIPSCQ TENALECFQTKAAPITKELREVSSLNQHVCVSMRNFEPPLTFQAVTV
Pig	LAAQYDKIIPCCKAENAVECFQTKAASITKELRESSLLNQHMCTVMRQFGARTFRAITV
Alpaca	LAAQYDKVIPPCCKAENAVECFQTKAASITKELRESS-LNQHTCAVTRNFGPRTLQAITI
Bactrian camel	LAAQYDKVIPPCCKAENAVECFQTKAASITKELRESSLLNQHTCAVTRNFGPRTLQAITI
Dolphin	LAAQYDKVIPPCCKAENAVECFQTKAASITKELRESSLLNQHICAVMRKFGPRTFRAITV
Cow	VANQYNKIIPHCCKAENATECFETKVTSITKELRESSLLNQHICAVMGKFGPRTFRAITV
Horse	LASHYDKIISACCKSENAVECFQSKAATITKELRETSLLNQHVCAVIRNFGPRTLQAITV
Cat	LATHYGKIIPCCCKTENAVECFQTKTALITKELRESSLLNQHICAVMRNFGPRTFRAITV
Dog	LAAHYGKIIPCCKAENAVECFQTKTSLITKELRESSLLNQHICAVMRNFGPRTFRAITV
Ferret	LAGHYGKMIPACCKAENAVECFQTKTALITKELRDSLLNQHICAVMKNFGPRTFRAITV
Panda	LAAHYGKIIPCCKAENAVECFQTKTALITKELRDSLLVNHQICAVMKNFGPRTFRAITV
Pacific walrus	LAAHYGKIIPHCCVENAVECFQTKTALIIKELRDSLLNQHICAVMKNFGPRTFRAITV
Weddell seal	LAAHYSKIIPHCCKAENAVECFQTKTALIIKELRDSLLNQHICAVMKNFGPRTFRAITV
Black flying fox	LASHYDKIIPCCKAENAVECFQTKAASITKELKESLLNQHICVSMRNFSGPRTFQAITI
Megabat	LASHYDKIIPCCKAENAVECFQTKAASITKELKESLLNQHICVSMRNFSGPRTFQAITI
Microbat	LAAHYDKIIPCCKAENAVECFQQAASITKELRESSLLNQHVCAVMRNFGPRTFQAITI
Hedgehog	LAGHYAKIISCC-AENPVECFQTKAPVTKELRENSLLNQHMCAVRRNFEFQVFAII
Shrew	LAARFDKIIPCCQAENAVECFQTKGAPLTKELRENSLLNQHVCSVLRKFGSPTFPALIA
Hyrax	FASRYDKMISLCC- DNATECFQSKAASLTKEIKESLLNQHVCAVIRKFEFRNIQSII
Elephant	LASRYDKIIPCCKAENATECFQTKGASITKQLGESSLLNQHVCAVIRKFEFRNIQSII
Cape golden mole	AASYDKIIPCCKAENAVECFQTKAAPVTKELRENSLLNQHVCAVIRNFEFRTFQAITV
Tenrec	LASQYDKMIPCCCKADDAECFQTKAASITKELRENSLLNQHVCAVIRNFEFRTFQAITV
Armadillo	LAAHYDKIIPCCCKTENAVECFQTKAASITKELRESSLLNQHICAVMRNFGPRTFRAITL
Sloth	LAALYDKIIPSCCKAENAVECFQTKTASITKELRESSLANQHTCAVMRNFGIRTFOAMTL
Opossum	LAARYDKIISTCCQAENAVECFHNQAAPVTKDLREKSLISQHVCDVLRKFGERSFKAILL
Tasmanian devil	LAARYDQIIFNCCQAENAVECFHTKAAPVTKDLRESSISQHICGILRKFGRDRTFKAILL
Wallaby	-----AAPVTKELRENSLISQHLGCVRRKFGERTFKA----

Human	TKLSQKFTKVNFTETIQKLVLDVAHVHEHCRCRGDVLDCLODGEKIMSYICSQDITLSNKIT
Chimpanzee	TKLSQKFTKVNFTETIQKLVLDVAHVHEHCRCRGDVLDCLODGEKIMSYICSQDITLSNKIT
Bonobo	TKLSQKFTKVNFTETIQKLVLDVAHVHEHCRCRGDVLDCLODGEKIMSYICSQDITLSNKIT
Gorilla	TKLSQKFTKVNFTETIQKLVLDVAHIHEHCRCRGDVLDCLODGEKIMSYICSQDITLSNKIT
Orangutan	TKLSQKFTKVNFTETIQKLVLDVAHVHEHCRCRGDVLDCLODGEKIMSYICSQDITLSNKIT
Gibbon	TKLSQKFTKVNFTETIQKLVLDVAHVHEHCRCRGDVLDCLODGEKIMSYICSQDITLSNKIT
Rhesus	TKLSQKFTKVNFTETIQKLVLDVAHVHEHCRCRGDVLDCLODGEKIMSYICSQDITLSNKIT
Crab eating macaque	TKLSQKFTKVNFTETIQKLVLDVAHVHEHCRCRGDVLDCLODGEKIMSYICSQDITLSNKIT
Olive baboon	TKLSQKFTKVNFTETIQKLVLDVAHVHEHCRCRGDVLDCLODGEKIMSYICSQDITLSNKIT
Marmoset	TKLSQKFTKVNFTETIRKLVLDVAHVHEHCRCRGDVLDCLODGEKIIISYICSQDITLSNKIA
Squirrel monkey	TKLSQKFTKVNFTETIHKLVLDAHVHEHCRCRGDVLDCLODGEKIIISYICSQDITLSNKIT
Tarsier	TKLSQKFTKVNFTETIQKLVLDVTHVHEQCRCRGDVLDCLODGEKIIISVCSQDITLSNKIA
Mouse lemur	TKLSQKFTKVNFTETIQKLVLDVAHVHEQCRCRGDVLDCLODGERIMSYICSQDITLSNKIA
Bushbaby	TKLSQKFTRVNFTETIQKLVLDVAHIHEQCRCRGDVLDCLODGEKIMSYICSQDITLSNKIA
Chinese tree shrew	TKLSQKFTTRANFTETIQKLVLDVAHVHEECRCGNMLECLODGEKIMSYICSQDITLSNKIG
Squirrel	AKLSQKFPKANFTETIQKLVLDVAHIHEECRCGNVLECLODGEKIMSYICSRQDITLSNKIA
Golden hamster	IKMSQKFPKANFTETIEKLVLDVAHIHEECRCGNVLECLODGEKIMSYICSRQDITLSNKIA
Kangaroo rat	-----EKIMSYLCSQDITLSNKIA
Mouse	IKLSQKLTANFTETIQKLALDVAHIHEECRCGNVLECLODGEKIMSYICSQDITLSNKIA
Rat	IKLSQKFPKANFTETIRKLVLDVAHIHEQCCHGNVLECLODGEKIMSYICSQDITLSNKIA
Naked mole rat	TKLSQKFPKANFTETIQKLVLDVAHIHEECRCGNVLECLODGEKIMSYICSKQDITLSNKIA
Guinea pig	TKLSQKFPKANFSEMQLVLDAHVHEECRCGNVLECLODGEKIMSYICSKQDITLSNKIA
Rabbit	VKMSQKLPKANFTETIQKLVLDVAHTHECCRCGNVLECLODGERIMSYICSQDITLSNKIA
Pika	TKLSQS--QANFTETIQKLVMDVAHIHQCCRCGNVLECLODGEKIMSYICSQDITLSNKIA
Pig	TKLSQKFPKANFTETIQKLVLDVAHIHEECRCGNVLECLODGEKIMSYICSQDITLSNKIA
Alpaca	TKLSQKFPKANFTETIQKLALDVVHTHEECRCGNVLECLODGEKIMSYICSRQDITLSNKIA
Bactrian camel	TKLSQKFPKANFTETIQKLALDVVHTHEECRCGNVLECLODGEKIMSYICSRQDITLSNKIA
Dolphin	TKLSQKFPKANFTETIQRLVVDVAHVHEECRCGNVLECLODGEKIMSYICSRQDITLSNKIA
Cow	TKVSQKFPKANFTETIQKLVMDVAHIHEECRCGNVLECLODGERVMSYICSQDITLSNKIA
Horse	TTLRSQRYSKANFTETIQKLVLDVAHAHEECRCGNVLEECVODGEKIMSYICSRQDITLSNKIA
Cat	TKLSQKFSKANFTETIQKLVLDVAHIHEECRCGNVLECLODGEKIMSYICSRQDITLSNKIA



Dog	TKLSQKFSKANFTEIQKLVLDVAHIHEECCRGVLECLQDGEKIMSYICSQQDILSSKIA
Ferret	TKLSQKFSKANFTEIQKLVLDVAHIHEECCGGVLECLQDGEKIMSYICSQQDILSSKIA
Panda	TKLSQKFSKANFTEIQKLVLDVAHIHEECCRGVLECLQDGEKIMSHICSQQDILSSKIA
Pacific walrus	TKLSQKFSKANFTEIQKLVLDVAHIHEECCRGVLECLQDGEKIMSYICSQQDILSSKIA
Weddell seal	TKLSQKFSKANFTEIQKLVLDVAHIHEECCRGVLECLQDGEKIMSYICSQQDILSSKIA
Black flying fox	TKLSQKFSKANFTEIQKLVLDVAHIHEECCRGVLECLQDGGKIMSYICSQQATLSSKIA
Megabat	TKLSQKFSKANFTEIQKLVLDVAHIHEECCRGVLECLQDGGKIMSYICSQQATLSSKIA
Microbat	TKLSQKFPQTNFTEIHKLVLDVAHIHEECCRGVLECLQDAEKIMFYICSQQDTLSSKIA
Hedgehog	AKMSQRFPRANFTEIQKLVLDVHHEECCRGVLECLQDGGKIMSYICSQQDALSSKIT
Shrew	AKLSQKFPKANFSEIEKLVLDVAHVHEECCRGVLECLQDGGKIMSYICSQQDFLSSKMQ
Hyrax	TKISQKFPANFTEIQKLVLDVAHIHEECCRGVLDLHHEGQIMSYICSQQDALSSREIA
Elephant	TKMSQKFPANFTEIQKMTLDSAHIHEECCRGVLECLHDGQEVMSYICSQQDALSSKIA
Cape golden mole	TKLSQKFTKANFTEIQKLVLDVAHIHEECCRGVLECLHDGQEVMSYICSQQDNLSSKIA
Tenrec	SKLTQKFPKANFTEIQKLVLDVHHEECCRGVLECLQDGGQAMMSYICSQQENLSSKIA
Armadillo	TKLSQKFSKANFTEIQKLVLDVAHIHEECCRGVLECLHDGQEVMSYICSQQDTLSSKIA
Sloth	TKLSQKFSKANFTEIQKLVLDVAHIHEECCRGVLECLQHEQEIMSYICSQQDTLSSKIA
Opossum	TKISQKFPKANFTVIRDLVLDGAHAHIECKGNVLECLQDRNEIMSYICSQQDVLSSKIQ
Tasmanian devil	TKLSQKFPKANFTVIQNLVLDGAHVHMECCNGVPECLQDKNEIMSYVCSQKDILSNQVQ
Wallaby	-----NEIMSYICSQKDSLSSKIQ

Human	ECCKLTTLERGQCI IHAENDEKPEGLSPNLNRFGLDRDFNQFSSGEKNI FLASFVHEYSR
Chimpanzee	ECCKLTTLERGQCI IHAENDEKPEGLSPNLNRFGLDRDFNQFSSGEKNI FLASFVHEYSR
Bonobo	ECCKLTTLERGQCI IHAENDEKPEGLSPNLNRFGLDRDFNQFSSGEKNI FLASFVHEYSR
Gorilla	ECCKLTTLERGQCI IHAENDEKPEGLSPNLNRFGLDRDFNQFSSGEKNI FLASFVHEYSR
Orangutan	ECCKLTTLERGQCI IHAENDEKPEGLSPNLSRFLGDRDFNQFSSGEKNI FLASFVHEYSR
Gibbon	ECCKLTTLERGQCI IHAENDEKPEGLSPNLNRFGLDRDFNQFSSGEKNI FLASFVHEYSR
Rhesus	ECCKLTTLERGQCI IHAENDEKPEGLSPNLNRFGLDRDFNQFSSGEKNI FLASFVHEYSR
Crab eating macaque	ECCKLTTLERGQCI IHAENDEKPEGLSPNLNRFGLDRDFNQFSSGEKNI FLASFVHEYSR
Olive baboon	ECCKLTTLERGQCI IHAENDEKPEGLSPNLNRFGLDRDFNQFSSGEKNI FLASFVHEYSR
Marmoset	ECCKLTTLERGHCVINAENDEKPEGLSPNLNRFGLDKDFNQFSSSEKNI FLASYVHEYSR
Squirrel monkey	ECCKLTPLERGHCVINAENDEKPEGLSPNLNRFGLDKDFNQFSSSEKNI FLASYVHEYSR
Tarsier	ECCKLP ILELGQCI IHAENDEKPEGLSPNLNRFGLDRDFNQFSSGEKNI FLASFVHEYSR
Mouse lemur	ECCKLP TLELGQCI IHAENDEKPEGLSPNLNRFGLDRDFNQFSSGEKNI FLASFVHEYSR
Bushbaby	DCCTMPLLEFGQCI IHAENDDRPEGLSLNLRFLGDRDFNQFSSSTEKNI FLASFVHEYSR
Chinese tree shrew	KCKLP ILELGQCVIHTENDDQPEGLSPNLNRFGLDRDFNQFSSREKNI FLASFVHEYSR
Squirrel	ECCKLP TLELGHC I IHAENDDKPEGLSPTLNRFGLDRDFNQFSSAERNI FLASFVHEYSR
Golden hamster	ECCKLP TLELGYC I IHAENDDKPEGLSPSLDGVLDGRNFGQLSSEKIMSMARFLYEYSR
Kangaroo rat	ECCKLPVLELGHC I IHAENDDKPEGLSPTLNRFGLDRDFNQFSSSEKIMFLASFVHEYSR
Mouse	ECCKLPMIQLGFC I IHAENGVKPEGLSLNPSQFLGDRNFAQFSSSEKIMFMAFLHEYSR
Rat	ECCKLP TLELGYC I IHAENGDKPEGLTLNPSFLGDRNFAQFSSSEKIMFMAFLHEYSR
Naked mole rat	ECCKLP LLELGHC I IHAENDDKPEGLSSDLSKFLGDRDFGRFSPGKTMFLASFVHEYSR
Guinea pig	ECCKLPVLELGHC I IHAENDETPAGLSPELEGLGDRDFSRFTPGKTMFLASFVHEYSR
Rabbit	ECCKLP ILELGHC I IHAENDDKPEGLSPHLHRFLGDRDFNQFSSQKNI FLASFVHEYSR
Pika	ECCKLP ILELGHCVI IHAENDDKPEGLSPNLSGLLDRDFNQFSSQEKNI FLASFVHEYSR
Pig	ECCKLP TLELGQCI IHAENDDKPEGLSPNLNRFGLGERDFNQFSSREKDLFMAFVHEYSR
Alpaca	ECCKLP TLELGHC I IHAENDDKPEGLSPNLNRLGERDFNQFSSREKDFSLARFVHEYSR
Bactrian camel	ECCKLP TLELGHC I IHAENDDKPEGLSPNLNRLGERDFNQFSSREKDFSLARFVHEYSR
Dolphin	ECCKLP TLELGHC I IHAENDDKPEGLSPTLNRFGLGETDFNQFSSREKDLFMAFVHEYSR
Cow	ECCKLP TLELGHC I IHAENDDKPEGLSPVNRFLGDRDFNQFSSRDKDLFMAFVHEYSR
Horse	ECCKLP TVELAQCI IHAENDDKPEGLSPNLNRLGERDFNQFSSREKDLFMAFVHEYSR
Cat	ECCKLP ILELGQCI IHAENDDTPEGLSPNLNRFGLGERDFNQFSSREKDLFMAFVHEYSR
Dog	DCCKLP ILELGQCI IHAENDDKPEGLSPNLNRFGLGERDFNQFSSREKDLFMAFVHEYSR
Ferret	ECCKLP MLELGQCI IHAENDDKPEGLSPNLNRFGLGERDFNQFSSREKDLFMAFVHEYSR
Panda	ECCKLP ILELGQCI IHAENDDRPEGLSPNLNRFGLGERDFNQFSSREKDLFMAFVHEYSR
Pacific walrus	ECCKLP ILELGQCI IHAENDDKPEGLSPNLNRFGLGERDFNQFSSREKDLFMAFVHEYSR
Weddell seal	ECCKLP ILELGQCI IHAENDDKPEGLSPNLNRFGLGERDFNEFSSREKDLFMAFVHEYSR
Black flying fox	ECCKLP ILELGQCI IHAENDDKPEGLSPTLNRFGLGERDFNQFSSRDKDLFMAFVHEYSR
Megabat	ECCKLP ILELGQCI IHAENDDKPEGLSPTLNRFGLGERDFNQFSSRDKDLFMAFVHEYSR
Microbat	ECCKLP TLELGQCI IHAENDDKPEGLSPTLNRFGLGERDFNQFSSREKDLFMAFVHEYSR
Hedgehog	ECCKLP MLELGQCI IHAENDDKPEGLSPTLNRFGLGERDFNQFSSREKDLFMAFVHEYSR
Shrew	ECCKLP ILELGQCI IHAENDDKPEGLSPTLNRFGLGERDFNQFSSREKDLFMAFVHEYSR
Hyrax	GCKLP TLELGHC I IHAENDDKPRGLSPNINRFLGDRDFNQFSSLEKDLFMAFVHEYSR
Elephant	ECCKLP TLELAHCI IHAENDDKPEGLSPNINRFLGDRDFNQFSSLEKDLFMAFVHEYSR
Cape golden mole	ECCKLP ALELGHC I IHAENDDKPEGLSPNLGRFLGDRDFNQFSPLEKDLFMAFVHEYSR
Tenrec	ECCKLP PLELACY I IHAENDDQPEGLSPNLSRFLGDRDFKQFALKEKDLFMAFVHEYSR
Armadillo	ECCKLP ILELAQCI IHAENDDKPEGLSPNLKRFLGDRDFHQFSSVEKDLFLARYTVEYSR

Sloth ECCKLPTLELAQCI IHAENDDKPEGLSPNLNRF LGDRDFNQFSSVEKDFFLGRFAYEYSR  
Opossum ECCSLPLRDQGDICVNAENDDQPEGLSPDLRRFLGERKFNLYSSEEKDLFLARFVVEYSR  
Tasmanian devil ECCSLPLRDRGECIVGAENDGQPEGLSPNLRGFLEETKFHLYSSAEKDLFLARFVVEYSR  
Wallaby ECCTLPLQEQGECIVSAENDNRPEGLSPDLRRFLGERKFHLHSSEEKDLFLA-----

Human RHPQLAVSVILRVAKGYQELLEKCFQ TENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Chimpanzee RHPQLAVSVILRVAKGYQELLEKCFQ TENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Bonobo RHPQLAVSVILRVAKGYQELLEKCFQ TENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Gorilla RHPQLAVSVILRVAKGYQELLEKCFQ TENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Orangutan RHPQLAVSVILRVAKGYQELLEKCFQ TENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Gibbon RHPQLAVSVILRVAKGYQELLEKCFQ TENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Rhesus RHPQLAVSVILRVAKGYQELLEKCFQ TENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Crab eating macaque RHPQLAVSVILRVAKGYQELLEKCFQ TENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Olive baboon RHPQLAVSVILRVAKGYQELLEKCFQ TENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Marmoset RHPQLAVSIIILRVAEGYQELLEKCFQ TENPLECQDKREEELQKYIQESQALAKQSCGLFR  
Squirrel monkey RHPQLAVSIIILRVAEGYQELLEKCFQ TENPLECQDKGEEELQKYIQESQALAKQSCGLFQ  
Tarsier RHPQLAVPVILRVAKGYQELLEKCFQ SENPLQCQDKGEEKELQKYIQESQALAKRSCGLFQ  
Mouse lemur RHPDLAVSVILRVAKGYQELLEKCFQ SENALECQDKGEEELQRYIQESQALAKRSCGLFQ  
Bushbaby RHPDLAVPVILRVAKGYQELLEKCFQ SENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Chinese tree shrew RHLELAVPVILRVAKGYQEVLEKCFQ SENPLECQDKG---VVQKYIQES-AL-KQTCGLFQ  
Squirrel RHPCLAVPVILRVVVKGYQEVLEKCFQ QSEKPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Golden hamster RHTKFAVSVILRVAKTYQEMMEKCFQ TENPNVVCQDNNGEEVQKHIIESQALAKQSCALYQ  
Kangaroo rat RHTNLPVSVILRVATGYKEVVEKCFQ TENPLECQDKGEEELQKYVQEQALAKQSCALYQ  
Mouse THPNLPVSVILRIAKTYQEIILEKCSQSGNLPQCQDNLEELQKHIIESQALSKQSCALYQ  
Rat NHPNLPVSVILKTAKSYQEIILEKCSQSETPSKCQDNMEEELQKHIIESQALAKQSCDLYQ  
Naked mole rat RHTELAVSIIILRVANGYQELLEKCFQ SENTLECQNKGEQELQKYVQESQTMATRSCSLFQ  
Guinea pig RHTALAVSIIILRIANGYQELLEKCFQ SKNPLECQNKGEQELQKFIQESQAMATRSCGLYQ  
Rabbit RHPCLPVTIVILRTKGYQELLEKCFQ TGNPLECQDKGEEELQKYIQESQAVVKRSCDLYQ  
Pika RHPCLPVTIVILRTAKGYQEQLEKCAQDENPLACQNKGEEELQKYIQESQEVVKRSCDLYQ  
Pig RHPKLAVPVILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Alpaca RHTKLAVPVILRVAKGYQELLEKCSQSEHPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Bactrian camel RHTKLAVPVILRVVVKGYQELLEKCSQSEHPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Dolphin RHTKLAVPIILRVARGYQELLEKCSQSGNPPECQDKGEEELQKYIQESQALAKRSCGLFQ  
Cow RHTKLAVPIILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Horse RHTKLAVPVILRVAKGYQEFLEKCSQSENPLECQDKGEEELQKYIQEQALAKRSCGLFQ  
Cat RHTKLAVPVILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Dog RHTKLAVPVILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Ferret RHTKLAVPVILRVAKGYQELLEKCSQSENPLDCRDKGEEELQKYIQESQALAKRSCGLFQ  
Panda RHTKLAVPVILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Pacific walrus RHTKLAVPVILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Weddell seal RHTKLAVPVILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Black flying fox RHPKLAVPVILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Megabat RHTKFAVPVILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Microbat RHTKFAVPVILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQENQALAKRSCGLFQ  
Hedgehog RHLELAIPVILRVIKTYLEMEKCAQSENPLECQDKGEEELQKHIIESQALSKRSCGLFQ  
Shrew RHSELSTSAILRSAEFFQKLENCQSENPLECQDKGEIEMEKHTQESRAFAKRSCGTFR  
Hyrax RHPCLAVPIVILRVAKGYEELLEKCSHSENHLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Elephant RHPCLAVPVILRVVVKGYQELSEKCSQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Cape golden mole RHPKLAVPVILRVAKGYQELLEKCSQSENHLECQDKGEEELQKYIQESQTLAKRSCDLFQ  
Tenrec RHPCLAVPVILRVAKGYQELLEKCSQSENPLECQDKGEEELQKYIQESRALAKRSCGLFQ  
Armadillo RHPEFAVTVILRVAKGYQELLENCQSENPLECQDKGEEELQKYIQESQTIAKRTCGFLFQ  
Sloth RNTDLAIPVILRVTKGYQELLENCQSENPLECQDKGEEELQKYIQESQALAKRSCGLFQ  
Opossum RHQDLAVPVILRVAKGYQEALEKCSKTENPSECQDKGEEELQKHYVQDSQALAKRSCGLFQ  
Tasmanian devil RHQELPVPVILRIAKGYQIALEKCPQ TENPLECRDKGEEELQKHYVQDSQALAKRSCGLFQ  
Wallaby -----EEEINKYVQDSQALAKRSCGLFQ

Human KLGEYYLQNAFLVAYTKKAPQLTSSSELMAITRKMAATAATCCQLSEDKLLACGEGAADI I  
Chimpanzee KLGEYYLQNAFLVAYTKKAPQLTSSSELMAITRKMAATAATCCQLSEDKLLACGEGAADI I  
Bonobo KLGEYYLQNAFLVAYTKKAPQLTSSSELMAITRKMAATAATCCQLSEDKLLACGEGAADI I  
Gorilla KLGEYYLQNAFLVAYTKKAPQLTSSSELMAITRKMAATAATCCQLSEDKLLACGEGAADI I  
Orangutan KLGEYYLQNAFLVAYTKKAPQLTSSSELMAITRKMAATAATCCQLSEDKLLACGEGAADI I  
Gibbon KLGEYYLQNAFLVAYTKKAPQMTSSSELMAITRKMAATAATCCQLSEDKLLACGEGAADI I  
Rhesus KLGEYYLQNAFLVAYTKKAPQLTSSSELMAITRKMAATAATCCQLSEDKLLACGEGAADI I  
Crab eating macaque KLGEYYLQNAFLVAYTKKAPQLTSSSELMAITRKMAATAATCCQLSEDKLLACGEGAADI I  
Olive baboon KLGEYYLQNAFLVAYTKKAPQLTSSSELMAITRKMAATAATCCQLSEDKLLACGEGAADI I

Marmoset	KLGEYYLQNVFLIAYTKKAPQLTSSSELVAITRMAATAATCCQLSEDELLACGEGAADII
Squirrel monkey	KLGEYYLQNVFLIAYTKKAPQLTSSSELVAITRMAATAATCCQLSEDELLACGEGAADII
Tarsier	KLGEYYLQNAFLVAYTKKAPQLTSSSELIAFTRKMAAAGATCCQLSDDKLLACGEGAADLI
Mouse lemur	KLGEYYLQNAFLVAYTKKAPQLTSSSELMAALTRKMATAGATCCQLSEDRQLACGEGAADLI
Bushbaby	KLGEYYLQNAFLVAYTKKAPQLTSAELMAFTRKMATAGATCCQLSEDRQLACGEGAADLI
Chinese tree shrew	KLGEYHLQTAFLVYTKKAPQLTSSSELLANTRRMVTAATCCQLSEDKQSACIETATDLI
Squirrel	KLGEYYLQNAFLVSYVKKVPQMTLTELMAALTRKMAATAATCCQLSEDKQLACGEGAADLI
Golden hamster	KLGEYYLQKVFLLIAYTRKVPQLTSAELIDLTSKMVSIASSTCCQLSEENWSACGEGAADLF
Kangaroo rat	KLGDYFFQN-----CCPL--EDKRLACGEGAADLI
Mouse	TLGDYKQLQNLFLIGYTRKAPQLTSAELIDLTKMVSIASTCCQLSEKWSGCGEGMADIF
Rat	KLGPYYLQNLFLIGYTRKAPQLTSAELIDLTKMVSIASTCCQLSEKRSACGEGGLADIY
Naked mole rat	KLGEYYLQNAFLIAYTKKAPQLTSSSELMAFTRKMTAATAATCCQLSGDKQLACGEGAADLI
Guinea pig	KLGEYHLQNSFLIYTKKAPQLTSSSELMAFTRKMTAATAATCCQLSGDKQLACGEGAADLI
Rabbit	KLGEYFNQNVFLVSYTKKAPQLTSPELIALTRKMAAKAACCHLSEDKRLACETAADLV
Pika	KSGHYFLQNAFLVAYTKKAPQLTSAELMAFTRKMTAATAATCCQLSEDKRLACSETADLV
Pig	KLGEYYLQNAFLVAYTKKAPQLTPELMALTRKMATGAACCHLSEDRQLACGEGAADLI
Alpaca	KLGEYYLQNAFLVAYTKKAPQLSPELMALTRKMATGATCCHLSEDKQLACGEGAADLI
Bactrian camel	KLGEYYLQNAFLVAYTKKAPQLTPELMALTRKMATGATCCHLSEDKQLACGEGAADLI
Dolphin	KLGEYYLQNAFLVAYTKKAPQLTSAELMTLTRKMATGATCCHLSEDKQLACGEGSADLI
Cow	KLGEYYLQNAFLVAYTKKAPQLTSPELMALTRKMANAGAI CCHLSEDKQLACGEGVADLI
Horse	KLGDYLLQNAFLVAYTKKAPQLTPELIALTRKMATATAATCCQLSEDKQLACGEGVAGLI
Cat	KLGEYYLQNAFLVAYTKKAPQLTPELMAFTRKMATATAATCCQLSEDKQLACGEGAADLI
Dog	KLGEYYLQNAFLVAYTKKAPQLTPELMAFTRKMATATAATCCQLSEDRQLACGEGAADLI
Ferret	KLGEYYLQNAFLVAYTKKAPQLTPELMAFTRKMATATAATCCQLSEDKQLACGEGAADLI
Panda	KLGEYYLQNAFLVAYTKKAPQLTPELMAFTRKMATATAATCCQLSEDKQLACGEGAADLI
Pacific walrus	KLGEYYLQNAFLVAYTKKAPQLTPELMAFTRKMATATAATCCQLSEDKQLACGEGAADLI
Weddell seal	KLGEYYLQNAFLVAYTKKAPQLTPELMAFTRKMATATAATCCQLSEDKQLACGEGAADLI
Black flying fox	KLGEYYLQNAFLVAYTKKAPQLTPELMAATRKMATAATAATCCQLSEDKQLACGEGAADLI
Megabat	KLGEYYLQNAFLVAYTKKAPQLTPELMAATRKMATAATAATCCQLSEDKQLACGEGAADLI
Microbat	KLGEYYLQNAFLVAYTKKAPQLTPELMTYTRKMASAAATCCRLSEKQLACGEGAADVI
Hedgehog	KLGEYYLQNAFLVAYTKKAPQLTPELMTFTKMATATAATCCQLSEDKQLACGEGAAAADLI
Shrew	KLGNYYLQNTFLVAYTKKAPQMPAPELMVFTREMARAAAACCHLSEDKQLACGEGAADLI
Hyrax	KLGEYYLQNAFLVAYTKKAPQLTRELIAVTRQMAATGATCCHLSEDKQLACGEGAADLI
Elephant	KLGEYYLQNAFLVAYTKKAPQLTPELIALTRKMAATGATCCHLSEDKQLACGENAADLI
Cape golden mole	NLGEYYLQNEFLVAYTKKAPQLTPELALTRKMAATGTACCHLSEKQLACGEGAADLI
Tenrec	KLGEYFFQNALVAYTKKAPQLTPELIALTRTMAATGASCCQLGEDKQLACGENAADLI
Armadillo	KLGEYPLQNVFLVAYTKKAPQLTSSSELMAFTRKMAAAAVACCQLREDKQLACGEGEADQI
Sloth	KLGEYQLQN-FLVAYAKKAPQLTFQELIAFTRKMAAAATCCQLGEDKQLSCGEEAADQI
Opossum	KLGEYHLQNVFLVAYTKKAPQLISQELISFTTKMAATASLCCQLSEDKQLACGEGAADLI
Tasmanian devil	KLGEYHLQNGFLVYTKKAPQLTAEELIGYTKKMAATASVCCQLSEDRQLACGESAADLI
Wallaby	KLGEYHLQN-----

Human	IGHLCIRHEMTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSDDKFI FHKDLCQA
Chimpanzee	IGHLCIRHETTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSDDKFI FHKDLCQA
Bonobo	IGHLCIRHEMTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSDDKFI FHKDLCQA
Gorilla	IGHLCIRHEMTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSDDKFI FHKDLCQA
Orangutan	IGHLCIRHETTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSDDKFI FHKDLCQA
Gibbon	IGHLCIRHEMTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSDDKFI FHKDLCQA
Rhesus	IGHLCIRHETTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSDDKFI FHKDLCQA
Crab eating macaque	IGHLCIRHETTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSDDKFI FHKDLCQA
Olive baboon	IGHLCIRHETTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSDDKFI FHKDLCQA
Marmoset	IGHLCIRHDTTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSGDKFI FHKDLCQT
Squirrel monkey	LGHLCIRHETTPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSGDKFI FHKDLCQT
Tarsier	LGQLCIRHAATPVNPVGQCCTSSYANRRPCFSSLVVDETYVPPAFSADKFI FHKDLCQA
Mouse lemur	IGQLCIRHEATPVNPVGHCCTSSYANRRPCFSSLVVDETYVPPAFSDDKFI FHKDLCQA
Bushbaby	LGQLCIRHDTAAVNPVGAQCCAASYANRRPCFSSLVLDPTYIPPLFSADKFI FHKDLCQA
Chinese tree shrew	IGQLCIRHETTPINPGIGQCCTSSYANRRPCFSSFLDPTYIPPLFSADKFI FHKDLCQA
Squirrel	IGHLCIRHEVNPVNPVGHCCNSSYANRRPCFSSLVVIDEYVPPAFSADKFI FHKDLCQP
Golden hamster	IGHLCIRHEAKPLNPGIGHCCNSSYANRRPCITSLVMDESYVPPAFSADKFTLNKDLCA
Kangaroo rat	IGQLCIRHAATPLNPGVGRCCSSYANRRPCFSSLVVDDTYVPPAFSDDKFI FHKDLCQA
Mouse	IGHLCIRNEASPVNSGIVHCCNSSYANRRPCITSLFRDETYVPPAFSADKFI FHKDLCQA
Rat	IGHLCIRHEANPVNSGIVHCCNSSYANRRPCITSLFRDETYVPPAFSADKFI FHKDLCQA
Naked mole rat	IGQLCIRHDASPVNPVGVICCNSSYANRRPCFSSLVVDETYVPPAFSADKFI FHKDLCQA
Guinea pig	IGQLCIRHEARPVNPVGVGRCCSSYANRRPCFSSLVVDETYVPPAFSADKFI FHKDLCQA
Rabbit	LGQLCIRHEATPVNPVGQCCTSSYANRALCFNKLVLDDETYVPPAFSADKFI FHADLCQA

Pika LGQLCIRHEATPLNPGVIGHCCTSSYANRALCFHKLVLDETYVPPPF SADKFV FHKDLCQA  
Pig IGQLCIRHEEMPINPGVGQCCTSSYANRRPCFSSLVLDDETYVPPPF SDDKFI FHKDLCQA  
Alpaca IGQLCIRHEETPVNPGVGQCCTSSYANRRPCFSSLVMDDETYVPPPF SDDKFI FHKDLCQA  
Bactrian camel IGQLCIRHEETPVNPGVGQCCTSSYANRRPCFSSLVMDDETYVPPPF SDDKFI FHKDLCQA  
Dolphin IGLLCIRHEETPVNPGVGQCCTSSYANRRPCFSSLVVDDETYVSPPF SDDKFI FHKDLCQA  
Cow IGHLICIRHEENPINPGVDQCCTSSYANRRPCFSSLVVDDETYVPPPF SDDKFI FHKDLCQV  
Horse IGQLCIRHEESPINPGVGQCCTSSYANRRPCFSSLVVDDETYVPPPF SDDKFI FHKDLCQA  
Cat IGQLCIRHEETPVNPGVGLCCTSSYANRRPCFSSLVVDDETYVPLPF SADRFI FHKDLCRA  
Dog IGQLCIRHEETPVNPGVGQCCTSSYANRRPCFSSLVVDDETYVSPPF SADKFI FHKDLCQA  
Ferret IGQLCIRHEETPVNPGVGQCCTSSYANRRPCFSSLVVDDETYVSPPF SADKFI FHKDLCQA  
Panda IGQLCIRHEETPVNPGVGQCCTSSYANRRPCFSSLVVDDETYVSPPF SADKFI FHKDLCQA  
Pacific walrus IGQLCIRHEETPVNPGVGQCCTSSYANRRPCFSSLVVDDETYVSPPF SADKFI FHKDLCQA  
Weddell seal IGQLCIRHEETPVNPGVGQCCTSSYANRRPCFSSLVVDDETYVSPPF SDDKFI FHKDLCQA  
Black flying fox IGQLCIRNEETPVNPSVGQCCTSSYASRRPCFSSLVVDDETYVPPPF SDDKFI FHKDLCQA  
Megabat IGQLCIRNEETPVNPSVGQCCTSSYASRRPCFSSLVVDDETYVPPPF SDDKFI FHKDLCQA  
Microbat IGQLCIRHGETPINAAGVQCCTSSYANRRPCFSSLVVDDETYVPPPF SDDKFI FHKDLCQA  
Hedgehog -GHLICIRHEETPINSVGQCCTSSYANRRPCFSSLVVDDETYVPPPF SADKFI FHKDLCQP  
Shrew IGHLICIRHEEAPINARVGHCCSSYANRRPCFSSLVMDDEAYVPPPF SADKFI FHTDLCQA  
Hyrax IGHLICIRHEETP-DAGVTRCCNYTYAIRRPCFSSLVVDDETYVPPA-SADKFL FHKDLCQA  
Elephant IGQLCIRHEETPVNPGVGHCCSSYANRRPCFSSLVVDDETYVPPAFSAKFL FHKDLCQA  
Cape golden mole IGQLCIRHEATPVNPGVGQCCTSSYANRRPCFSSLVLDDETYVPPPEFSAKFL FHKDLCQA  
Tenrec IGQLCIRHETSPVNPVGQCCTSSYANRRPCFSSLVVDDETYVPPPEFSAKFL FHKDLCQA  
Armadillo IGQLCIRHEATPVNPGVGRCCSSYANRRPCFSSLVVDDETYVPPAFSAKFL FHKDLCQA  
Sloth IGELCIRHEATPVNPGVGHCCSSYANRRPCFSSLVVDDETYVPPSAKFL FHKDLCQA  
Opossum IGQLCARHEAQPINDGVGHCCSSYANRRPCFSSLVVDDETYVPPSHDQFNFRQDLCHA  
Tasmanian devil IGQLCARHEAQPINDGVAHCCDFSYAHRPCFSSLVVDDETYVPPSYEQFKFQDLCQA  
Wallaby -----

Human QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKRLF  
Chimpanzee QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKLI  
Bonobo QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKLI  
Gorilla QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKLI  
Orangutan QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKLI  
Gibbon QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKLI  
Rhesus QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGRRLF  
Crab eating macaque QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKLI  
Olive baboon QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKLI  
Marmoset EGLALHTMIQEFLINLVKQKPQITEEQLGAVTADFAGMLEKCCQGQEQEVCFAEEGQQLI  
Squirrel monkey EGLALHTMIQEFLINLVKQKPQITEEQLGTITADFAGMLEKCCRGQEREVCLAEEGQQLV  
Tarsier QGVALQTMKQEFLINLVKQKPQITEEQLEAVITDFSSLLEKCCQGQEQEVCFAE-GPKLI  
Mouse lemur QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKLI  
Bushbaby QGIALQTTKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKLI  
Chinese tree shrew QGVALQTMKQEFLINLVKQKPQITEEQLGAVTADFSSLLEKCCQGQEQEVCFAEEGKLI  
Squirrel QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGKLI  
Golden hamster QGRALQTMKQEFLINLVKQKPDMTEEQHEAVTADFSSFLEKCCQDQEQEDCFEEGPKLI  
Kangaroo rat QGRALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPKLI  
Mouse QGKALQTMKQEFLINLVKQKPELTEEQLAAVTADFSSLLEKCCQDQEQEVCFAEEGPKLI  
Rat QGRALQTMKQEFLINLVKQKPEMTEEQHAAVTADFSSLLEKCCQDQEQEVCFAEEGPKLI  
Naked mole rat HGVALQEMKQEFLINLVKQKVQITEEQLEAVIADFSGLLEKCCQHHEQEQEVCFAEEGPKLI  
Guinea pig QGAALQEMKQEFLINLVKQKVQITEEQLEAVIADFSGLLEKCCQHHEQEQEVCFAEEGPKLI  
Rabbit QGIALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQHHEQEQEVCFAEEGPKLI  
Pika QGTALQTMKQEFLINLVKQKQITEEQLEAVIADFSGLLEKCCQHHEQEQEVCFAEEGPKLI  
Pig QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Alpaca QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Bactrian camel QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Dolphin QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Cow QGVPLQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Horse QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Cat QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Dog QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Ferret QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Panda QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Pacific walrus QGVALQRMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Weddell seal QGVALQRMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Black flying fox QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPALI  
Megabat QGVALQTMKQEFLINLVKQKPQITEEQLEAVIADFSGLLEKCCQGQEQEVCFAEE-----

Microbat	QGVALQTMKQOFLINLVKQKPOISEEQLEAVIADFSGLLEKCCQGQEQEVCFAEEGPKLI
Hedgehog	QGVALQTMKQOFLINLVEQKPOITEEQLEAVTADFSALMDKCKGVEVHEACVTEEGPKLI
Shrew	QGVALQTKKQOFLINLVKQKPOITEEQLEAVTADFSALLEKCCRSEKQDVCFAEEGPKLI
Hyrax	QGVALQWMKQOFLINLV-----
Elephant	QGVALQSMKQOFLINLVKQKLOITEEQLEAVIADFSGLLETCCQGQEQEVCFAEEGPKLI
Cape golden mole	PGVALQTMKQOFLINLVKQKPOIREEQLEIVITDFCGLLEKCCQAQEQEDCFAKEGPKLI
Tenrec	QGVALQMRKQOFLINLVKQKPOIREEQLEAVIADFCGLLETCCQAQDQDVCFAEEGPKLI
Armadillo	QGVELQTRKQOFLINLVKQKLOITEEQLEAVTADFSGLLEKCCQDQEQEDCFAEEGPKLI
Sloth	QGVALQMMKQOFLINLVKHKLOITEEQLEAAIADFSHLLKCCQSQEQEVCFAEEGHKLI
Opossum	QGEELOKQKQOFLINLVKQKPHITEEQLKAVTDFTGLENCCKGKQEQEACFAEEGPKLI
Tasmanian devil	QGEELOKQKQOFLINLVKQKPNITEEQLKAVIADFTGLENCCKGK-EEACFEEEGPKLI
Wallaby	-----I

Human	SKTRAALGV
Chimpanzee	SKTRAALGV
Bonobo	SKTRAALGV
Gorilla	SKTRTALGV
Orangutan	SKTRAALGV
Gibbon	SKTRAALGV
Rhesus	SKTRAALGV
Crab eating macaque	SKTRAALGV
Olive baboon	SKTRAALGV
Marmoset	SKSRAALGV
Squirrel monkey	SKTRAALEV
Tarsier	SKTRAALRV
Mouse lemur	SKTRAALGV
Bushbaby	--TDLILSV
Chinese tree shrew	SKTRAALGV
Squirrel	SRTRAALGV
Golden hamster	SRTRAALGV
Kangaroo rat	SKTRAALGV
Mouse	SKTRDALGV
Rat	SKTREALGV
Naked mole rat	SKTRTSLGV
Guinea pig	SKTRTSLGV
Rabbit	SKTRAALEV
Pika	SKTRAALGV
Pig	SKTRASLGV
Alpaca	SKTRTALGV
Bactrian camel	SKTRTALGV
Dolphin	SKTRAALGV
Cow	SKTRAALGV
Horse	SKTRAALGV
Cat	SKTRAALGV
Dog	SKTRAALGV
Ferret	SKTRAALGV
Panda	NSAEWIERI
Pacific walrus	AKTRAALGV
Weddell seal	AKTRAALGV
Black flying fox	SKTRAALEV
Megabat	-----
Microbat	SKTRAALGV
Hedgehog	SKTRAALGV
Shrew	SKTRAALGA
Hyrax	-----
Elephant	SKTRAALGV
Cape golden mole	SKTRAALGA
Tenrec	AKTRAALGA
Armadillo	SRTRAALGV
Sloth	SKTRAALGV
Opossum	AKTQEALGV
Tasmanian	SKTQEAF--
Wallaby	AKTQALGA



# AFAMIN

Human MKLLKLTGFIFFLFFLTESLTLTPQPRDIENFNSTQKFIEDNIEYITIIAFAQYVQEATF  
 Chimpanzee MKLLKLTGFIFFLFFLTESLTLTPQPRDVENFNSTQKFIEDNIEYITIIAFAQYVQEATF  
 Bonobo MKLLKLTGFIFFLFFLTESLTLTPQPRDVENFNSTQKFIEDNIEYITIIAFAQYVQEATF  
 Gorilla MKLLKLTGFIFFLFFLPESLTLTPQPRDVENFNSTQKFIEENIEYITIIAFAQYVQEATF  
 Orangutan MKQLKLTGFIFFLFFLTESLTLTPQPDVFNSTQKFIEENIEYITIIAFAQYVQEATF  
 Gibbon MKQLKLTGFIFFLFFLTESLTLPIQPQDVDFNSTQKFIEENVEYITIIAFAQYVQEATF  
 Rhesus -----TGFIFFLCFLTESLTLTPQPDVDFNSTQKFIEENLEIYITIIAFAQYVQEATF  
 Crab-eating macaque MKQLKFTGFIFFLCFLTESLTLTPQPDVDFNSTQKFIEENLEIYITIIAFAQYVQEATF  
 Olive baboon MKQLKLTGFIFFLCFLTESLTLTPQPDVDFNSTQKFIEENLEIYITIIAFAQYVQEATF  
 Marmoset MKQLKLTGFIFYLFFLTESLMLPTELQDLDFNITQKFIEENVEYITIIAFAQYVQEATF  
 Squirrel monkey MKQLKLTGFIFFLFFFTESLMLPTELQDLDFNITQKFIEENVEYITIIAFAQYVQEATF  
 Tarsier MKQLKLTGFVFFLFFVTESLTLPAKPDVDYFTSTQKYIEENVEYITIIAFAQYVQEATF  
 Mouse lemur -----TQKFIEENIEYITIIAFAQYVQEATF  
 Bushbaby MKHFKLSGFIFFLFFFTESLTLTPKPEDVDDFEITQKFVEDNI-----  
 Chinese tree shrew MKQLELTSFVLFLLFFLTESLPLTPKPDADDFSVIQKFIEENVEYITTIMFSQYIQEAVAF  
 Squirrel MKQLKFSGFIFLLFFLTESLTLTETQDVSFGITQKFIEENTGSITIIAFAQYVQEATF  
 Golden hamster MKHIKFIGFIFFLFSLTESLALPTKPDIDPFLDTHKFIEENTAYLTIIVAQYVQEVSF  
 Kangaroo rat MKQFKLTAFIFSLFFWTESLALPINPWDIDDFSTQKFIEENIGSLVIITFAQYVQEATF  
 Mouse MRHLKLTGFIFLLPLTESLALPTKPDVDHFNATQKFIDENTTYLAI IAFS QYVQEASF  
 Rat MRHLKLTGFIFLLSLTESLALPTKPDVDHFNATQKFINENVAYLTI IASAQYVQEASF  
 Naked mole rat MQQLKLTGFFLVSFLIDSLTLTPQPDIGNFNVNQKFIEENITPFTIIAFSRYVQEATF  
 Guinea pig MQQLKFTGFIFFLFILIESTLTLTQLOEVDNFNVTQKFIENTASMTIIAFAQYVQEATF  
 Rabbit MKQLNLGIVFFSFLIASLTLTPKPDVDDFSVTQKFIEENAGYITIIAFAQYVQEATF  
 Pika MRQLNLTDVFFFLFSLTESLTLTPKPDVDDSSVTQNFIDENTGYLTIIEFAQYVQEATF  
 Pig MKQLKLTGFVIFFFLFFLTESLTLTPKPDIDDVRIKKFIEDNVVYITIIAFAQYVQEASF  
 Alpaca MKQLKLTGFVIFFFLFFLTESLTLTPKPDVENSNSTQNFLEYVYVLF-TIIAFAQYVQEASF  
 Bactrian camel MKQLKLTGFVIFFFLFFLTESLTLTPKPDVDDVSVTKKFIEENVEYITIIAFAQYVQEASF  
 Dolphin MKQLKLTGF-LFFFFLTESLTLTPKPDVDDVSIQKFIEDNIGYITIIAFAQYVQEASF  
 Killer whale MKQLKLTGF-LFFFFLTESLTLTPKPDVDDVSIQKFIEDNIGYITIIAFAQYVQEASF  
 Cow MKQLKLTGFVIFFFLFFLTESLTLTPQPDVDDVRIQKFIEDNIGYITIIAFAQYVQEASF  
 Sheep MKQLKLTGFVIFFFLFFLTESLTLTPQPDVDDVRIQKFIEDNVGYITIIAFAQYVQEASF  
 Goat MKQLKLTGFVIFFFLFFLTESLTLTPQPDVDDVRIQKFIEDNVGYITIIAFAQYVQEASF  
 Horse MKQLTLTGFVIFLFFLFFLTESLTLTKLQDVDDASITQKFIEENIGYITIIAFAQYVQEASF  
 White rhinoceros MKQLKLIGFVIFLFFLFFLTESLTLTKLQDVDDASITQKFIEKNIGYITIIAFS QYVQEASF  
 Cat MKQLKLTGFVIFLFFLFFLTESLTLTKPDVDDVSIQKFIEENVEYITIIIFAQYVQEASF  
 Dog MKQLKLTGFVIFLFFVPESLTLTPQPDVDDVSIQKFIEENVEYITIIIVFAQYVQEASF  
 Ferret MKQLKLTGFVIFLFFVPESLTLTPQPDVDDVSIQKFIEENVEYITIIIVFAQYVQEASF  
 Panda MKQLKLTGFVIFLFFVPESLTLTPQPDVDDVNIQKFIEENVEYITIIIVFAQYVQEASF  
 Pacific walrus MKQLKLTGFVIFLFCVPESLTLTPQPDVDDVSIQKFIEENVEYITIIAFAQYVQEVSF  
 Weddell seal MKQLKLTGFVIFLFFVPESLTLTPQPDVDDVSIQKFIEENVEYITIIAFAQYVQEVSF  
 Megabat -----DFRITQKFIEENVEYITIIAFAQYVQEASF  
 Microbat MKQLKLTGFVIFLFFLFFLTESLTLTKPDVDDFNIQKFIEDNVGYITIIITFAQYVQEASF  
 Elephant -----  
 Hyrax MK-LKLAGFV-FLFFWTETLALLIQPPDV-----  
 Tenrec MEWFKLAGFVICLLFLSESLTLTPNPQADHLKTTQTFIQDNTEYITIIAFAQYVQEATF  
 Opossum MKSIRTFGPVFLFFYLAESLTLPRAPQTKDYLNATQKFLENNIRDVTVAFAQYVQEATY  
 Tasmanian devil MKSIKSIGAVILFFSLAESVTLPEVPOQED-RNATQKFLENNIRDVTVAFAQYVQEATY  
 Wallaby MSQ---IGPVILFFLVESLTLPAKPDQEDYLNVTQKFLENNIRDV-----  
 Platypus -----QEASY

Human EEMEKLVKDMVEYKDRCMADKTLPECSKLPNNVLQEKICAMEGLPQKHNFSHCCSKVDAQ  
 Chimpanzee EEMEKLVKDMVEYKDRCMADKTLPECSKLPNNVLQEKICAMEGLPQKHNFSHCCSKVDAQ  
 Bonobo EEMEKLVKDMVEYKDRCMADKTLPECSKLPNNVLQEKICAMEGLPQKHNFSHCCSKVDAQ  
 Gorilla EEMEKLVKDMVEYKDRCMADKTLPECSKLPNNVLQEKICAMEGLPQKHNFSHCCSKVDAQ  
 Orangutan EEMEKLVKDMVEYKDRCMADKTLPECSKLPNNVLQDKICAMEGLSQKHNFSHCCSKVDSQ  
 Gibbon EEMEDLVKDMVEYKDRCMADKTLPECSKLPNNVLQEKICAMEGLPQKHNFSHCCSKVDDE  
 Rhesus EEMEKLVKDMVEYKDRCMADKTLPECSKLPNNFLQEKMCAMEGLPQKHNFSHCCSKVGAE  
 Crab-eating macaque EEMEKLVKDMVEYKDRCMADKTLPECSKLPNNFLQEKMCAMEGLPQKHNFSHCCSKVGAE  
 Olive baboon EEMEKLVKDMVDYKDGCMADKTLPECSKLP-----  
 Marmoset EEMEKLVKDMVEYKDSMANSMLPKCSKLPNDVLQEAICAMEGLPQKHNFSHCCSKADAE  
 Squirrel monkey EEMEKLVKDMVEYKDSMANSMLPKCSKLPNDVLQEAICAMEGLPQKHNFSHCCSKADTE  
 Tarsier EEMEMLTKDMKEYRDRCLADRTLPECAKLVNNVLQERFCAMEGLPQKHNFSHCCSKADFE  
 Mouse lemur EDVEILVKDMVEYKDRCVANKTLPECFKLP-----

Bushbaby -----NDVLQEKICAMKGLPQKYNFSSHCCGN-DFE  
Chinese tree shrew EELQVMINNMVEYRDKCVADRTLPECSKSANEIFQEKTCMEGLPQKYNFSSHCCSKVD FE  
Squirrel DEMEILVKDIEYRDCLAHRTLPECAEIAINVLOGKICSIIEGLPQKYNFSSHCCSKMGLE  
Golden hamster DEVEMLVKVMMDYRDCLANRTLPECSKIANKVIQDMICATEGLPQKHNFSHCCSKTDF A  
Kangaroo rat DELEMLVKVNI--KERCLTNLRLPECSEIAKTAL-EITCAGEGSPQKYNFSQCCSKVDV E  
Mouse DEVETLVKVMLDYRDRCWADNTLPECSKTANDAIQDMLCDMEGLPQKHNFSHCCGKAGFP  
Rat EEVEMLVKVMLDYKDRCLADSTLPECSKIANDAIQDMLCDMKGLPQKHNFSHCCRQAGFQ  
Naked mole rat DDMEILIKDVMKYKDKCLANKTLLECSKPANNVLQDMICSVIEGLPQKHNFSHCCSKVD FE  
Guinea pig DDMEMLIKDMMKYKDKCLGDKTLPECSKLANNVLQEMMSMEGLPQKYNFSSHCCRKVD FK  
Rabbit EEVQMLMKDMLEYKDKCLADKTLPECAETANNILQEKICAMEGLSQRHNFSHCCSKVD FE  
Pika EEVERLMDMLEHRRKCMADKTLSECSSETNNILQEKMCAMEGLPQRYNFSHCCSKVD FE  
Pig EEVEMLVKAMKEYRDRCLADMTLPECSKLANDVLLENICAMEGLPQKYNFSHCCCHKVD FE  
Alpaca EEVEMLAKAMTEYRDKCLADRTLPECSKLANDVLLENICAMEGLPQKHNFLHCCRKIDV E  
Bactrian camel EEVEMLAKAMTEYRDKCLADRTLPECSKLANDVLLENICAMEGLPQKHNFLHCCRKIDV E  
Dolphin EEVEMLVKAMTEYRDKCLADMTLPECSKLANDVLLENICTMEGLPQKHNFSHCCCHKAD FE  
Killer whale EEVEMLVKAMTEYRDKCLADMTLPECSKLANDVLLENICTMEGLPQKHNFSHCCCHKAD FE  
Cow EEVEMLVKAMTEYRDKCLADRTLPECSKLANEVLLENICAMEGLPQKYNFSHCCCHKVD FE  
Sheep EEVEMLVKTMAEYRDKCLADRTREPCSCLTNEVLLENICAMEGLPQKYNFSHCCRKVD FE  
Goat EEVEMLVKTMAEYRDKCLADRTREPCSCLTNEVLLENICAMEGLPQKYNFSHCCRKVD FE  
Horse EEVDRLVKIMTKYKGQCSGEVTLPCPRLTNDILLEKTCVAVKGLPQKYNFSHCCSMVD LE  
White rhinoceros EEVEILVKIMTKYGEQCLDEV TIPDCPRLTNDILLERTCAVKGGLPQKYNFSHCCSMVD LE  
Cat EEVEMLVKTMTTEYRDKCLADMTLPECSKLANDVLLENICALEGLPQKHNFSHCCSKVD LE  
Dog EEVEMLVKAMTEYRDKCLVDMTLPVCSKLANDVLLENICALEGLPQKHNFSHCCSKVD LE  
Ferret EEVEVLVNAMKEYRDKCLGDVTLMLCSKSANDVLLENICALEGLPQKHNFSHCCSKVD LE  
Panda EEVEVLVKAMTEYRDKCLGDVTLVPCSKLATDVLLENICALEGLPQKHNFSHCCSKVD LE  
Pacific walrus EEVEVLVKAMTEYRDKCLGDVTLPMCYKLANDVLLENICALEGLPQKHNFSHCCSKVD LE  
Weddell seal EEVEVLVKAMTEYRDKCLGGMTLPMCSKLANDVLLENICALEGLPQKHNFLHCCGKVD LE  
Megabat EEAEMLRKAMTEYKDQCLANMTLPMCSKLPNDVLQEMICAIEGLPQKHNFSHCCNKVD FE  
Microbat EEVEMLAKTMTEYRDQCLANSKLPQCSKLPNDALQEAICAMEGVPQKHNFSYCCNKGG FE  
Elephant -----  
Hyrax -----  
Tenrec EEVEMFAKEMMALKDKCVADMALPECSGLPNDILOKSI CAVEGLPQKYNFSSHCCA KSDLE  
Opossum EEITGLVKQMILYRDKCVADMQQPECSELAIYVMQDKICRVKELSDKYGLSECCTKNSTN  
Tasmanian devil EEITELVKQMIHYIDKCMANMELPECSRLANDVIQDKICEVKELSEKYGFSECCTEDISK  
Wallaby -----  
Platypus EDISKMVENLVALKNRCTAQEKLPECSKTEVGESEDEMAGKELSEKYGYADCCSQDEKN

Human RRLCFFYNKKSVDVGLPPFPPTLDPEEKQAYESNRESLLNHFLYEVARRNPFV FAPTLT L  
Chimpanzee RRHCFYFNKKSVDVGLPPFPPTLDPEEKQAYESNRESLLNHFLYEVARRNPFV FAPTLT L  
Bonobo RRHCFYFNKKSVDVGLPPFPPTLDPEEKQAYESNRESLLNHFLYEVARRNPFV FAPTLT L  
Gorilla RRLCFFYNKKSVDVGLPPFPPTLDPEEKQAYESNRESLLNHFLYEVARRNPFV FAPTLT L  
Orangutan RRLCFFYNKKA DVGFLPPFPPTLDPEEKQAYESNRESLLNHFLYEVARRNPFV FAPTLT L  
Gibbon RRLCFFYNKKA DVRFLLPPFPPTLDPEEKQAYESNRESLLNHFLYEVARRNPFV FAPTLT L  
Rhesus RRLCFFYNKKA DVGFLPPFPPTLDPEEKQSYESNRESLLNHFLYEVARRNPFV FAPTLT L  
Crab-eating macaque RRLCFFYNKKA DVGFLPPFPPTLDPEEKQSYESNRESLLNHFLYEVARRNPFV FAPTLT L  
Olive baboon -----  
Marmoset RRICFFYNKKANVGFLPPFPPTLDPEEKQAFKNNKESFLNHVYEVARRNPFV FAPTLT L  
Squirrel monkey RRLCFLYNKKANVGFLPPFPPTLDPEEKQAFKNNKESFLNHVYEVARRNPFV FAPTLT L  
Tarsier RRLCFFFNKKA DVVEFLPPFPPTWDPEEKQAYKNNRESFLNHMYEVARRYPFV FAPTLT L  
Mouse lemur -----  
Bushbaby RRSCFFLNKKG VGLPPFPPTLDPEEKQAFKKSSESFLNHVYEVARRNPFV FAPTLT L  
Chinese tree shrew RRLCFFYNKKG DGEFQSPFPPTLDPEEKQAYQNVKPYL-----  
Squirrel RRLCFLYNKKA DVGFLPPFPPTLDPEEKQAYKNNRESFLNRYTHEVARRNPFV FAPTLT L  
Golden hamster RRLCFFYNKKA KTGFLPPFPPTLDPEEKQAYKNNNGSFLNLYMYEVARRNPFV FAPTLT L  
Kangaroo rat RR--FLYKKSSTVGLPPFPPTLDPEEKQAYKNDRESFINCYSHELATRNPFV FASILLM  
Mouse RRLCFFYNKKANVGFLPPFPPTLDPEEKQAYKNNSESFLHLYMYEVARRNPFV FAPVLLA  
Rat RRLCFFYNKKANVGFLPPFPPTLDPEEKQAYKNNSESFLNLYMYEVARRNPFV FAPVLLN  
Naked mole rat RRHCFYFNKKA DVGFLPPFPPTLDPEEKQAYKNNRESFLNQCMEYEVARRNPFV FAPTLT L  
Guinea pig RRLCFFYNKKANVGFLPPFPPTLDPEEKQAYKNNRESFLNQCMEYEVARRNPFV FAPTLT L  
Rabbit RRLCFFYNKKA DVGFLPPFLPTLDPEEKQAYKNSRDSFLNHYIYEVARRNPFV FAPTLT L  
Pika RRLCFFYNKKA DVGFLPPFLPTLDPEEKQAYKNNRESFLNHYIYEFARRNPFV FAPTLT L  
Pig RRLCFLHNKKA EVGFLPPFLPTLDPEEKQTYKTNKESFLNHYIYEVARRNPFV FAPTLT L  
Alpaca RRLCFLHNKKA DVGFLPPFLPTLDPEEKQTFKNNRESFLNHYIYEVARRNPFV FAPTLT L  
Bactrian camel RRLCFLHNKKA DVGFLPPFLPTLDPEEKQTFKNNRESFLNHYIYEVARRNPFV FAPTLT L  
Dolphin RKHCFYFNKKA DVGFLPPFLPTLDPEEKQTYKNNRESFLNHYIYEVARRNPFV FAPTLT L

Killer whale RKHCFLHNKKADVGLPPLPTLDPEEKQOTYKNNRESFLNNYIYEVSRNPFFVAPLLT  
Cow RRLCFFHNKKADIGLLPPLPTLDPEEKQOTYKNNRESFLNNYVYEVSRNPFFVAPLLT  
Sheep RRLCFFHNKKADIGFLPPLPTLDPEEKQOTYKNNRESFLNNYIYEVSRNPFFVAPLLT  
Goat RRLCFFHNKKADIGFLPPLPTLDPEEKQOTYKNNRESFLNNYIYEVSRNPFFVAPLLT  
Horse RERCFFHNKSDVGLPPLPTLDLEEKQOTYKNNRESFLNNCIYEVSRNPFFVAPLLT  
White rhinoceros RERCFFHNKSDIGFLPPLPTLDLEEKCLTYKNNRESFLNN-----  
Cat KKLCFFHHKKADVGLPPLPTLDPEEKQOTYKNNRESFLNNYIYEVSRNPFFVAPLLT  
Dog RKLCCFFHNKKADAGFLPPLPTLDPEEKQOTYKSNRESFLNNYIYEVSRNPFFVAPLLT  
Ferret RKLCCFFHNKKADVGLPPLPTLDPEEKQOTYKNNRESFLNNYVYEVSRNPFFVAPLLT  
Panda RKLCCFLHNKKTVDVGLPPLPTLDPEEKQOTYKNNRESFLNNYIYEIARRNPFFVAPLLT  
Pacific walrus RKLCCFFHNKKADVGLPPLPTLDPEEKQOTYKNNRESFLNNYIYEVSRNPFFVAPLLT  
Weddell seal RKLCCFFHNKKADVGLPPLPTLDPEEKQOTYKNNRESFLNNYIYEVSRNPFFVAPLLT  
Megabat RRLCFFRNKKAGVEFLPSPLPTLDPEEKQAYKNNSESFLNNYIYEVSRNPFFVAPLLM  
Microbat RRLCFFRNKKADVGLPPLPTLDPEVKCQAYKNNSESFLSNYIYEVSRNPFFVFTPTLLT  
Elephant -----  
Hyrax -----  
Tenrec RRGCFYLNKKADVGLPPLPMADAEEKKQOYKQKDLFLKYLVEVARRNPFFVFTLLS  
Opossum RLPCCFFQRKSADASFLTPFQGPDEKACQOYEAEDPEAFLNHFIEIARQNPFFGAPLLS  
Tasmanian devil SRLCFFERKRTDVSFLTPFQIPDPEKGCQOYEADQETFLNHYIYEIARRNPFFIFAPLLA  
Wallaby -----YVYEIARQNPFFLAPLLS  
Platypus RHRCFFLRKRVDLGFLLHYD-LKPEEECKAYKDDPEAVWNQYIYEIARRQPFVLYTPTLLF

Human VAVHFEEVAKSCCEEQNKVNCLQTRAIPTVQYLKAFSSYQKHVCGALLKFGTKVVFHYI  
Chimpanzee VAAHFEEVAKSCCEEQNKVDFQTRAIPTVQYLKAFSSYQKHVCGALLKFGTKVVFHYI  
Bonobo VAAHFEEVAKSCCEEQNKVDFQTRAIPTVQYLKAFSSYQKHVCGALLKFGTKVVFHYI  
Gorilla VAAHFEEVAKSCCEEQNKVDFQTRAIPTVQYLKAFSSYQKHVCGALLKFGTKVVFHYI  
Orangutan VAAHFEEVAKSCCEEQNKVDFQTRAIPTVQYLKAFSSYQKHVCGALLKFGTKVVFHYI  
Gibbon VVAHFEEVAKTCCCEEQNKVDFQTRAIPTVQYLKAFSSYQKHVCGALLKFGTKVVFHYI  
Rhesus VAAHFEEVAKSCCEEQNKVDFQTRAIPTVQYLKAFSSYQKHVCGALLKFGTKVVFHYI  
Crab-eating macaque VAAHFEEVAKSCCEEQNKVDFQTRAIPTVQYLKAFSSYQKHVCGALLKFGTKVVFHYI  
Olive baboon -----AIPVIQYLKAFSSYQKHVCGALLKFGTKVVFHYI  
Marmoset VAAHFEDVATSCCEEQNKVDFQTRAVPVMQYLKAFSSYQNNVCGTLLKFGTKIINSINI  
Squirrel monkey VAAHFGDVTSCCEEQNKVDFQTRAVPVMQYLKAFSSYQNNVCGVLLKFGTKIINSINI  
Tarsier VATRFEEVAKPCCCEEQYRVDFQTRVAPVTQYLKTVSSYSKNVCGAYFKFGPKVLNSINV  
Mouse lemur -----TRAAPVIQYLKAFSSYQKNVCGAYLKFGTKVLNFINI  
Bushbaby AATRFAEAAGACCEDQREVGCQKRAAPIMQYLRAFSSYQKNVCGALLKFGPEGLNSINI  
Chinese tree shrew -----AAPITRYLKASSYQKTLCGAYMKFGPKILKINSINV  
Squirrel VAARFEEVAKTCCCEEQKANCFOAKAAPITQYLKAMSSYQKTVCGAFLKFGPKVLNSINI  
Golden hamster VAARFEEAATTCCEEQKATCFQAKVVPITQYLKASSYQGTVCGALMKFGPKVLNSINT  
Kangaroo rat AAASFEEELAKRCGEQO-KDNCFQTNV-----NI  
Mouse VAAWFEEAATTCCEEQKATCFQAKAAPITQYLKASSYQKNVCGALIKFGPKVLNSINV  
Rat VAARFEEAATTCCEEQKATCFQAKAAPITQYLKALSSYQKNVCGALLKFGPKTLNSINI  
Naked mole rat VAARFEEVVKTCCEAEHQKANCFOAMATPVTQYLKAFSSYQKNVCGALMKFGPKVLNSINI  
Guinea pig VAARFEEVAKTCCCEEQKANCFOEKATPITQYLKAFSSYQKNVCGALMKFGPKVLNSINI  
Rabbit VAAQFEELTNRCCCEEQHKASCFGVRAAPVTQYLKAMSSYQKNVCGAFLKFGSNVLSMNI  
Pika VAARFEEVSTCCCEEQHKASCFGVRAAPVTQYLKALSSYQKNVCGAFMKFGPQVLNSINI  
Pig VAARFEEAETCCCEEQKANCFRSKAEPFIQYLKALSSYQKNVCGALLKFGPQILQINSINI  
Alpaca VAARFEEMTKTCCEEQEKAYCFRTKAEHFIQYLKALSSYQKNVCGALMKFGPQILQINSINT  
Bactrian camel VAARFEEMTKTCCEEQEKAYCFRTKAEHFIQYLKALSSYQKNVCGALMKFGPQILQINSINT  
Dolphin AARFEEMTKTCCEEQEKANCFRTKAETFIQYLKALSSYQKNVCGALMKFGPQILKINSINI  
Killer whale AARFEEMTKTCCEEQEKANCFRTKAETFIQYLKALSSYQKNVCGALMKFGPQILKINSINI  
Cow VAARFEEMTKTCCEEQEKANCFRTKAEPFIYLLKALSSYQKNACRALMKFGPQILQINSINI  
Sheep VAARFEEMTKTCCEEQEKANCFRTKAEPFIYLLKALSSYQKNVCGALMKFGPQILQINSINI  
Goat VAARFEEMTKTCCEEQEKANCFRTKAEPFIYLLKALSSYQKNVCGALMKFGPQILQINSINI  
Horse VATRFEEMAKTCCEEQDKANCFRTKAEPVIQYLKALSSYQKNVCGALVKFGPQVLKINSINI  
White rhinoceros -----AESVIQYLKALSSYQKNVCGALMKFGLQVLKINSINL  
Cat VAARFEEMTKTCCEEQDKANCFRTKAEPVIQYLKASSFQKNVCGALIKFGLQVLESINV  
Dog VAARFEEMTKTCCEEQDKANCFRTKAELVIQYLKASSFQKNVCGALMKFGLQVLESINV  
Ferret VAARFEEMTKTCCEAQDKANCFRTKAEPVIQYLKASSFQKNVCGAFMKFGPQVLGLINV  
Panda VAARFEEMTKTCCEEQDKANCFRTKAEPVIQYLKASSFQKNVCGALMKFGLQVLESINV  
Pacific walrus VVARFEEMTKTCCEEQDKANCFRTKAEPVIRYLKASSFQKNVCGALMKFGLQVLESINV  
Weddell seal VVARFEEMTKTCCEEQDKANCFRTKAEPVIQYLKASSFQKNVCGALMKFGLQVLESINI  
Megabat LAARFEEVITKTCCEEQDKANCFRTKAKSVIQFLKALSSYQKNVCGAFLKFGQVLNSINI  
Microbat VMGLIEEMAKTCCEEQDKANCFRKAVPVIQYLKAFSSFQKNVCGAFLRFGPTVLKSIYI  
Elephant -----YI

Hyrax -----YI  
 Tenrec VATRFEDVAKTCCEEEEDKASCFO TKASPVIKYLKENS AFEKTL CGASMRFGPRIITLINA  
 Opossum GAAIYKEAITRCCQEENKHECFHLKVTPITNGLKERSASQKNTCGVLMKYGPKVLKHLKLV  
 Tasmanian devil LVARYKEVSTSCCQEENKHECFRIKATPITNDLKEISAKQONICGVLKRGKFGPKGVK  
 Wallaby LAACYKEVSTSCCQEENKHECFH-TATTITNNLKELSAKQ-NLCGVLMHFGPKGVKHLHA  
 Platypus HAQEYKVVQACCSEENKLCQFQTKGTLVTNDLRWIHEIHKHLCRIAMGFGKRALRSGKV

Human AILSQKFPKIEFKELISLVEDVSSNYDGCCEGDVVQCIRDTSKVMNHICSKQDSISSKIK  
 Chimpanzee VILSQKFPKIEFKELISLVEDVSSNYDGCCEGDVVQCIRDTSKVMNHICSKQDSISSKIK  
 Bonobo AILSQKFPKIEFKELISLVEDVSSNYDGCCEGDVVQCIRDTSKVMNHICSKQDSISSKIK  
 Gorilla AILSQKFPKIEFKELISLVEDVSSNYDGCCEGDVVQCIRDTSKVMNHICSKQDSISSKIK  
 Orangutan AVLSQKFPKIEFKELISLVEDVSSNYDGCCEGDVVQCIRDTSKVMNHICSKQDSISSKIK  
 Gibbon AVLSQKFPKIEFKELISLVEDVSSNYDGCCEGDVVQCIRDTSKVMNHICSKQDSISSKIK  
 Rhesus AVLSQKFPKIEFKELISLVEDISSNYEGCCEGDVVQCIRDTSQVA-----  
 Crab-eating macaque AVLSQKFPKIEFKELISLVEDISSNYEGCCEGDVVQCIRDTSKVMNHICSKQDSISSKIK  
 Olive baboon AVLSQKFPKIEFKELISLVEDISSNYEGCCEGDVVQCIRDTSKVMNHICSKQDSISSKIK  
 Marmoset AILSQKFPKIEFEELISLIEDVSSNYDECCEGDVVHCIRHMSKIMNHICSKQDAFSSKIK  
 Squirrel monkey AILSQKFPKIEFKELISLIEDVSSTYDECCEGDVVHCIRHMSKIMNHICSKQDAVSSKIK  
 Tarsier ATLSQSLPKMNFKDLTSLVEVSSIYDGCCEGDVVQCIRD MNKFM SHLCSKPVSNSSKIK  
 Mouse lemur AVLSQKFPKIEFKELTSLIEDVSSKYDGCCEGDVVQCVRDTSKVMNHICSKQGSISSKIQ  
 Bushbaby AVLSQKFPKVEFQELTSLLEDVSSFYDACCEGDVVGCIRSSSKVASRICSKQESISSKIK  
 Chinese tree shrew AVFSQKFPKIEFKELLSLIEEISSKYDGCCEGDVAVQIRDSAKVMNHICSKQDSISTKIK  
 Squirrel AVFSKFPKIEFKELTSLLEDVSSMYDGCCEGDVLCIRYQSQVM SHICSKQESISSKIK  
 Golden hamster AVFSKFPKIGFQNLTSLLEDVSTMYDVCCEGDVVQCIRSQ-----  
 Kangaroo rat VVLGRKFPKRKFHELTSLLKDVLSMYDGCCLGDFVNCIHAQNQVYRYICSEQDSISSKIK  
 Mouse AVFSKFPKIGFKDLTTLLEDVSSMYEGCCEGDVVHCIRSQSQVNHICSKQDSISSKIK  
 Rat AVFSKFPKIGFEDLTSLLEDVSSMYDGCCEGDVVQCIRSQSQVMHHCISKQDSISSKIK  
 Naked mole rat AVFSKFPKIEFKELTSLLEQVSSMYDGCCEGDALQCIHDQSKVMRHIFSKQDSISSKIK  
 Guinea pig AVFSKFPKIEFKELTSLLEDVSSMYGCEGDVLCIHDQSKVM SHICSKQDSISSKIK  
 Rabbit AVLSQKFPKIGFKELTSLLEDVSSTYDGCCEGDVVHCITYGMGKIM SHICSKQDSISSKIK  
 Pika AILSQKFPKIGFKELTSLLEDVSSKYDGCCKGDVIHC IHGMDKV SHICSKQDSISSKIK  
 Pig AVLSQKFPKIEFKELTSLLEDISSKYDGCCEGDVVHCIRGRSKVM SHICSKQDSISSKIK  
 Alpaca AVLSQKFPKIEFKELTSLLEDVSSKYDGCCEGDVVECIHGRSKIM SHICSKQDSISSKIK  
 Bactrian camel AVLSQKFPKIEFKELTSLLEDVSSKYDGCCEGDVVECIHGRSKIM SHICSKQDSISSKIK  
 Dolphin AVLSQKFPKIEFKELISLLEDVSSKYDGCCEGDVVQCIHGRSKVM SHICSKQDSISSKIK  
 Killer whale AVLSQKFPKIEFKELISLLEDVSSKYDGCCEGDVVQCIHGRSKVM SHICSKQDSISSKIK  
 Cow AILSQKFPKIGFKQLTSLLEDVSSKYDGCCEGDVVQCIRGRSKVM SHICSKQDSISSKIK  
 Sheep AILSQKFPKIGFKQLTSLLEDVSSKYDGCCEGDVVQCIHGRSKVM SHICSKQDSISSKIK  
 Goat AILSQKFPKIGFKQLTSLLEDVSSKYDGCCEGDVVQCIRGRSKVM SHICSKQDSISSKIK  
 Horse AILSQKFPKIEFKELTSLLEDVSSKYEGCCEGDAVKCIRRRSKIM SHICSKQDSISSKIK  
 White rhinoceros AILSQKFPKIEFKELTSLLEDISSKYEACCEGDVQCIHGRSKVM SHICSKQDAISSKIK  
 Cat AILSQKFPKIEFKELTSLLEDVSSKYDGCCEGDVQCIHGRSKVM SHICLQDSISSKIQ  
 Dog AILSQKFPKIEFKELTSLLEDVSSKYNGCCEGDAVQCIHGRSKVM NHICSKQDSISSKIR  
 Ferret AILSQKFPKIEFKELISLLEDVSSNYHGCEGDVQCIHGRSKVLSHICSKQDSISSKIK  
 Panda AILSQKFPKIEFKELTSLLEDVSSKYDGCCEGDVQCIHGRSKVM SHICSKQDSISSKIK  
 Pacific walrus AILSQKFPKIEFKELTSLLEDVSSKYDGCCEGDAMQCIHGRSKVM SHICSKQDSISSKIK  
 Weddell seal AILSQKFPKIEFKELTSLLEDVSSKYDGCCEGDVQCIHGRSKVM SHICSKQDSISSKIK  
 Megabat AILSQKFPKIEFKELTSLLEDVSSKFNCGCEGDAVHCIRGWSKVM DHICSKQDSISSKIK  
 Microbat AIFSQKFPKTEFEELTSLIEDVSSKYDGCCEGDVQCIHGRSKVLSHICSKQDSISSKIK  
 Elephant AVLSRKFPEIEF-EFISLLEDVASKYDGCCEGDTVECIQAMNNVM SHICTKQDPISSKVK  
 Hyrax ARFRQDMP-TEFKK--PLLADISSKFDGCPKGD-VHCV-VTSKIVSHICTKQDSISSKIK  
 Tenrec AIIIGQKFPKIEFKELTSTVKHISSTDGCCEGDVQCIHGRSMVNHICTNQDSISTKVK  
 Opossum VEFQKFPKIDFKDLGILLENMDHLFDECCEGDVVQCFRNEAKILNYICSKPDSISSKII  
 Tasmanian devil VEISQKFPKIDFSLNKLLEDIPNMV DGCCEGDVVHCFRLEAKIINHICSRPDSLSSKIR  
 Wallaby VEISQKFPKIP-KELDILPKDIPIMIDGCWEGDVVYCLHSAKAKITNYLCSKPDSSISSKIR  
 Platypus LYFSQQFPKMELATLLNVM PDLLEGDGCCEGDVIECFRSRAELVSSMCSNQKAISSQFS

Human ECCEKKIPERGQCI INSNKDDRPKDL SLREGKFTDSENVQERDADPDTFFAKFTFEYSR  
 Chimpanzee ECCEKKIPERGQCI INSNKDDRPKDL SLREGKFTDSENVQERDADPDTFFAKFTFEYSR  
 Bonobo ECCEKKILERGQCI INSNKDDRPKDL SLREGKFTDSENVQERDADPDTFFAKFTFEYSR  
 Gorilla ECCEKKILERGQCI INSNKDDRPKDL SLREGKFTDSENVQERDADPDTFFAKFTFEYSR  
 Orangutan ECCEKKIPERGQCI INSNKDDRPKDL SLREAKFTDSENVQERDADPDTFFAKFTFEYSR  
 Gibbon ECCEKKIPERGQCI INSNKDDRPKDL SLREAKFTDSENVQERDADPDTFFAKFTFEYSR

Rhesus	-----CLEEVFSNPFDCRFTFEYSR
Crab-eating macaque	ECCEKKIPERGQCIINSNKDDRPKDLREAKFTDSENVQERDADPDIFFAKFTFEYSR
Olive baboon	ECCEKKIPERGQCIINSNKDDRPKDLREAKFTDSENVQERDADPDITFFAKFTFEYSR
Marmoset	ECCEKKIPERDQCIINSNKDDRPKDLREAKFTDSENVQERDADPDITFFAFAFNFEYSR
Squirrel monkey	ECCEKKIPERDQCIINSNKDDRPKDLREAGKFTDSENVQERDADPDITFFAFAFNFEYSR
Tarsier	ECCEKKPLERDECIMNTSKEDRTKDLREAKFTDSENVQERDTPDNFFTEFTFEYSR
Mouse lemur	ECCEKKIPERGECIINSNKDDRPEDL--REAKFTDSETLCQERDTPDNFFAFTFEYSR
Bushbaby	ECCEKEVPERGECIINSNKDDRPKDLSPGEAKFTDSENVQGRDADPDNFFAFTFEYSR
Chinese tree shrew	DCCGKKMLER-----FTFEYSR
Squirrel	ECCEKMPEREACIINSNKDGRPQDLSLREAKFTDNENVCQERDTPGNFFAFTFEYSR
Golden hamster	-----FTDSENVQERDSDNODGLLNEFTFEYSR
Kangaroo rat	KCCEKDILECEECIINSNKDDMP--YSLGSKYTGSENVQEKDTPDSFFAE--IYKNSK
Mouse	VCCEKKTLEREACIINANKDDRPEDLSLREAKFTDSENVQERDSDPKFFAFTFEYSR
Rat	ACCEKKPPERADCIINANKDDRPEDLSLREAKFTDSENVQERDSEQDKFFAFTFEYSR
Naked mole rat	QCCEKKIPEREDCIINLNKDDRPKNVSLTEAKFIHIEHMCQERETDPEHFFAFTFEYSR
Guinea pig	ECCEKKIPEREDCIINSNKDDRPKNVSLTEAKLTGSEHLQERDTPDNFFAFTFEYSR
Rabbit	ECCEKKIPERGECIINSNKDDRPKDLREAKLTDNENLCEERDTPDNFFAFTFEYSR
Pika	ECCEKKIQERGECILNSNKDEKPKYSSREAKFTDNENLCEERDTPDNFFAFTFEYSR
Pig	ECCEKKIPERGECIINSNKDDRPNDLSPREAKFTDSENVCEERDADPETFLAFTFEYSR
Alpaca	GCCEKKIPERGECIINSNKDDRPNDLSPREAKFTDSENVCEERDADRGNFKTEFTFEYSR
Bactrian camel	GCCEKKIPERGECIINSNKDDRPNDLSPREAKFTDSENVCEERDADRGNFKTEFTFEYSR
Dolphin	ECCEKKIPERGECIINSNKDDRPNDLSPREAKFTDSENVCEERDADQENFMAFTFEYSR
Killer whale	ECCEKKIPERGECIINSNKDDRPNDLSPREAKFTDSENVCEERDADQENFMAFTFEYSR
Cow	DCCEKNIPERGECIINSNKDDRPNDLSPREAKFTDSENVCEERDADQANFMAFTFEYSR
Sheep	DCCEKNIPERGECIINSNKDDRPNDLSPREAKFTDSENVCEERDADQANFMAFTFEYSR
Goat	DCCEKNIPVREGECIINSNKDDRPNDLSPREAKFTDSENVCEERDADQANFMAFTFEYSR
Horse	DCCEKIPKRGECIINSNKDDRPKDLREAKFTDSENVCEERDADQANFMAFTFEYSR
White rhinoceros	ECCEKIPKRGECIINSNKDDRPKDLREAKFTDSENVCEERDADQDTFMAFTFEYSR
Cat	ECCEKKIPERGECIINSNKDDRPKDLREAKFTDSENVCEERDANQTSFMAFTFEYSR
Dog	ECCEKKMPERGECIINSNKDDRPKDLGLREAKFTDSENVCEERDANQTIFFMAFTFEYSR
Ferret	ECCEKKIPERGECIINSNKDDRPEDLALREAKFTDSENVCEERDANQTIFFMAFTFEYSR
Panda	ECCEKKMPERGECIINSNKDDRPKDLALREVKFTDSENVCEERDANQTIFFMAFTFEYSR
Pacific walrus	ECCEKKMPERGECIINSNKDDRPKDLALREVKFTDSENVCEERDANQTIFFMAFTFEYSR
Weddell seal	ECCEKKMPERGECIINSNKDDRPKDLALREVKFTDSENVCEERDANQTIFFMAFTFEYSR
Megabat	ECCEKKIPERGECIINSNKDDRPKDLKTKFTENKNVCEERDADQDIFMAFTFEYSR
Microbat	ECCEKKIPERGECIINSNKDDRPKDLKTKFTENKNVCEERDADQDIFMAFTFEYSR
Elephant	ECCE--KNPDLGECIINSNKDDRPKDLKTKFTENKNVCEERDADQDIFMAFTFEYSR
Hyrax	QCSGK--TSEHHEC-----KEEKPKGLSLREVRFT--KDVQHRDADQENF-----
Tenrec	ECCDKPILERGDCIIVNLGRDEKPSDLSPREAKFTDSENVQHRDADQENFMIEFTFEYSR
Opossum	DCCQLTIPQGGECIINSNKDDKPEDLSPRAERFTEGDDVQCQLHEDKENFQAKFTFEYSR
Tasmanian devil	DCCQLTIPERGECIINSNKDDKPEDLSPRVERFTEGDDVQCQLHEDKENFLIEFTFEYSR
Wallaby	DCCQLAVP--RGEI-----SLRAEIFTGDDVQCQLHEDKENFLT-----
Platypus	NCCDKPVPERGECIFRSVREDAPQDLPPTEEFIRAQDVCQRYADKKGDFLDEFVFEYSR

Human	RHPDLSIPPELLRIVQIYKDLLRNCNTENPPGCYRYAEDKFNETTEKSLKMVQOQCKHFQ
Chimpanzee	RHPDLSIPPELLRIVQIYKDLLRNCNTENPPGCYRYAEDKFNETTEKSLKMVQOQCKHFQ
Bonobo	RHPDLSIPPELLRIVQIYKDLLRNCNTENPPGCYRYAEDKFNETTEKSLKMVQOQCKHFQ
Gorilla	RHPDLSIPPELLRIVQIYKDLLRNCNTENPPGCYRYAEDKFNETTEKSLKMVQOQCKHFQ
Orangutan	RHPDLSIPPELLRIVQIYKDLLRNCNTENPPGCYRYAEDKFNETTEKSLKMVQOQCKHFQ
Gibbon	RHPDLSIPPELLRIVQIYKDLLRNCNTENPPGCYRYAEDKFNETTEKSLKMVQOQCKHFQ
Rhesus	RHPDLSIPGLLRIVQIYKDLLRNCNTENPPGCYRYAEDKFNETTEKSLKMVQOQCKHFQ
Crab-eating macaque	RHPDLSIPGLLRIVQIYKDLLRNCNTENPPGCYRYAEDKFNETTEKSLKMVQOQCKHFQ
Olive baboon	RHPDLSIPGLLRIVQIYKDLLRNCNTENPPGCYRYAEDKFNETTEKSLKMVQOQCKHFQ
Marmoset	RHPDLSIPQLLRVQMYKDLLRNCNTENPPDCYRYAEDKFNEATEKSLKKIQOQCKHFSQ
Squirrel monkey	RHPDLSIPQLLRVQMYNDLLRNCNTENPPDCYRYAEDKFNETTEKSLKKIQOQCKHFSQ
Tarsier	RHSDLSIPQLLRITNVYKDLLQNCCKTENPPDCYRYAEDKFNETTEKSLKMVQOQCKRFR
Mouse lemur	NHPDLSIPPELLRIAHVYKDVLSNCCNTQNPDCYRYAEDKFNETTEKSHKIVQRECEHFQ
Bushbaby	NHPDLSIPPELLRITHEYKALLTSCNTENPPDCYRYAEDRFFKTTTEKSLKIVQRECEHFQ
Chinese tree shrew	RHQDLSIPPELLRISQVYEDLLGNCNTENPPDCYRYAEDKFNETTEKSLKIVQOQCKHFSQ
Squirrel	RHPDLSIPPELLRIARVYEDLLADCCSNTENPPDCYRYAEDKFNETTERSLRMVQOQCEQLQ
Golden hamster	RHNYLSTPELLRITKMYEDLLEDCCSNTENPPDCYRYAEDKFNETTEKSLAMVQOQCKLFFQ
Kangaroo rat	RHPDLSASTLLQITKMYEDLLEDCCSNTENPPDCYRYAEDKFNETTERSLAMVQOQCKLFFQ
Mouse	RHPDLSIPPELLRITKMYEDLLEDCCSNTENPPDCYRYAEDKFNETTERSLAMVQOQCKLFFQ
Rat	RHTELSTPELLRITKMYEDLLEDCCSNTENPPDCYRYAEDKFNETTERSLAMVQOQCKLFFQ
Naked mole rat	RHPDLSIPSELLRTAGVSEDFLRDCCSRETLTDCYRYAEDKFNETTERSLAMVQOQCKLFFQ

Guinea pig RHPDLSTSELLRITGVYEDFLGDCCSRETPTDCYRHVEGKFNETTGKSLQIVQOQECKHFQ  
Rabbit RHQDLSIVELLRIAIEVYKNLMENCCSTENPLNCYHSVEEKFNETTEKSLKMVQOQECKRFQ  
Pika RHPHLSILELLRIAIEVYEDVIENCCNTEHPPSCYHNVEDKFNETTEKSLKMVQOQECKRFQ  
Pig RHPDELSTPELLRIAIEVYEDLLRECCNSQTPPDCYKDAEKKFNETTEKSLKIVQRECEHFQ  
Alpaca RHTELSIPPELLRIAETIEDLLGECCNTENPPDCYRDAENRFNETTEKSLKIVQOQECEHFQ  
Bactrian camel RHTELSIPPELLRIAETIEDLLGECCNTENPPDCYRDAENRFNETTEKSLKIVQOQECEHFQ  
Dolphin RHPDELSTPELLRIAIEVYEDLLRECCNTENPPDCYRHAENKFNETTEKSLKIVQRECEHFQ  
Killer whale RHPDELSTPELLRIAIEVYEDLLRECCNTENPPDCYRHAENKFNETTEKSLKIVQRECEHFQ  
Cow RHPDELSTPELLRIAKVYKDLLKECCNMENPPECYRHAENRFNETTEKSLKIVQRECEHFQ  
Sheep RHPDELSTPELLRIAKVYEDLLKECCNMENPPECYRRAENRFNETTEKSLKIVQRECEHFQ  
Goat RHPDELSTPELLRIAKVYEDLLKECCNMENPPECYRRAENRFNETTEKSLKIVQRECEHFQ  
Horse RHPDELSTPELLRIARVYEDLLECCSTENPPDCYGNAEYKFNETTQORSLKIVQRECEHFQ  
White rhinoceros RHPDELSTSELLRIARVYKDLLLECCSTENPPDCYGNAEYKFNETTQORSLKIVQRECEHLQ  
Cat RHPDELSTPELLRIAIEVYEDLLKECCNTENPPDCYRHAENRFNETTEKSLKIVQRECEHSQ  
Dog RHPDELSTPELLRIAIEVYEDLLKECCNTENPPDCYRRAEYKFNETTEKSLKIVQRECEHFQ  
Ferret RHLELSVPELLRIAIEVYEDLLKECCNTENPPDCYRHAENRFNETTEKSLKIVQRECEHFQ  
Panda RHPDELSTPELLRIAIEVYEDLLKECCNTENPPDCYRRAENKFNETTEKSLKIVQRECEHFQ  
Pacific walrus RHPDELSTPELLRIAIEVYEDLLKECCNTENPPDCYRHAENRFNETTEKSLKIVQRECAHFQ  
Weddell seal RHPDELSTPELLRIAIEVYEDLLKECCNTENPPDCYRHAENRFNETTEKSLKIVQRECEHFQ  
Megabat RHPDELSTPELLRIASVYDILLKECCNTENPPDCYRHAENRFNETTEKSLRIVQRECEHFR  
Microbat RHQELSTPELLRIARVYDILLRECCNAENPPDCYSTMENKFNETTEKSLKIVQRECEHFQ  
Elephant RH-DLSTPEYLR-----LLECCCKREKTSDCYGHAEKSN-TTEESLEMVKECEHFQ  
Hyrax -----  
Tenrec RHQDLSPEILRIGEVYENLLDCCCKENPSCYSHAGEKFNYYTTEKSLQMPQDFEALQ  
Opossum RHPDELPSVLLRIGVYENLLECCCKTENPKECYQAEHEEFQKI IAKSWTLVKTECYFYQ  
Tasmanian devil QHLELPHSVLLRIAVIYEELLEKCCCKTENPKECYSHGEEFLNITMKTHAVAKLQCDFFQ  
Wallaby -----  
Platypus KHQKVSQVPIRRVLEKYQDLEKCCQADPHQCYSRGEEEFQKILQESQARVQEDCAHFQ

Human NLGKDGLKYHYLIRLTKIAPQLSTEELVSLGKEMVTAFTTCCTLSEEFACVDNLADLVFG  
Chimpanzee NLGKDGLKYHYLIRLTKIAPQLSTEELVSLGKEMVTAFTTCCTLSEEFACVDNLADLVFG  
Bonobo NLGKDGLKYHYLIRLTKIAPQLSTEELVSLGKEMVTAFTTCCTLSEEFACVDNLADLVFG  
Gorilla NLGKDGLKYHYLIRLTKIAPQLSTEELVSLGKEMVTAFTTCCTLSEEFACVDNLADLVFG  
Orangutan NLGKDGLKYHYLIRLTKIAPQLSTEELVSLGKEMVTAFTTCCTLSEEFACVDNLADLVFG  
Gibbon NLGKDGLKYHYLIRLTKIAPQLSTEELVSLGKEMVTAFTTCCTLSEEFACVDNLADLVFG  
Rhesus NLGKDGLTYQYLIRLTKIAPQLSSEELVSLGKEMVTAFTTCCTLSEEFACVDNLADLVG  
Crab-eating macaque NLGKDGLTYQYLIRLTKIAPQLSSEELVSLGKEMVTAFTTCCTLSEEFACVDNLADLVG  
Olive baboon NLGKDGLTYQYLIRLTKIAPQLSSEELVSLGKEMVTAFTTCCTLSEEFACVDNLADLVG  
Marmoset NLGKDGLKYHYLIRFTKIAPQLSTEELVSLGKEMVTVFTTCCTLSEEFACVDNLADLVG  
Squirrel monkey NLGKDGLKYHYLIRLTKIAPQLSTEELVSLGKEMVTVFTTCCTLSEEFACVDNLADLVG  
Tarsier NLGKDGLKYHYLSLTKIAPQLSTEELVSLGKEMVTVFTTCCTLSEEFACVDNLADLVG  
Mouse lemur LWGKDGKYYLIRLTKIAPQLSTEELISLGKEMAMALATCCTLSEEFACVDNLADLVG  
Bushbaby NWGENGLKYR-L-KITS-GFQLS-----VLDLVG  
Chinese tree shrew NLGKEDLKYHLLIRMTKVPQLSTEELIFLGKEMVTVLTTCTQSEEFACVDNLADLVG  
Squirrel NLGKDGLKYHSLIELTKIAPQLSTEELISLGKEMVIALTTCTLSEEFACVDNLADLVG  
Golden hamster GLEKDALLLHYLVKFTKAAPQLSLEELIYLSKGMTEALTTCTLSEEFACVDNLADLVG  
Kangaroo rat -----SIIKLTKIAPQLPTEQLVYL-----ITTCCTLS--FACVANWADPVLG  
Mouse ELGKDTLQRHFLVKFTKAAPQLPMEELVSLSKEMVAALTTCTLSEEFACVDNLADLVG  
Rat ELGKDALQRHFLVKFTKAAPQLPMEELVSLSKEMVAALATCCTLSEEFACVDNLADLVG  
Naked mole rat NLGKDGLKHHYLIKLTKIAPQLSTEELISLGKEMVIALTTCTLSEEFACVDNLADLVG  
Guinea pig NLGEDGLKYHYLIKLTKIAPQLSTEELISLGKEMVIALTTCTLSEEFACVDNLADLVG  
Rabbit NLGKDGLKYHYLIKLTKIAPQLSTEELISLGKEMVIALTTCTLSEEFACVDNLADLVG  
Pika NLGKDGLAYYYLIKLTKSAPQLPTEELISLGKETVIALTTCTLSEEFACVDNLADLVG  
Pig NLGKDDLKYHYLARLTKIAPQLSDELTFGLGKEMIALATCCTLSEEFACVDNLADLVG  
Alpaca NLGKDDLKYHYLIKLTKIAPQLSTEELTFGLGKEMIALTTCTLSEEFACVDNLADLVG  
Bactrian camel NLGKDDLKYHYLIKLTKIAPQLSTEELTFGLGKEMIALTTCTLSEEFACVDNLADLVG  
Dolphin ISGKDDLKYHYLINLTKLAPQLSTEELTFGLGKEMVIALTTCTLSEEFACVDNLADLVG  
Killer whale ISGKDDLKYHYLINLTKLAPQLSTEELTFGLGKEMVIALTTCTLSEEFACVDNLADLVG  
Cow NLGKDDLKYHYLINLTKLAPQLSTEELTFGLGKEMVIALTTCTLSEEFACVDNLADLVG  
Sheep NLGKDDLKYHYLINLTKLAPQLSTEELTFGLGKEMVIALTTCTLSEEFACVDNLADLVG  
Goat NLGKDDLKYHYLINLTKLAPQLSTEELTFGLGKEMVIALTTCTLSEEFACVDNLADLVG  
Horse NLGKDDLKYHYLIKLTKIAPQLSTEELTFGLGKEMVIALTTCTLSEEFACVDNLADLVG  
White rhinoceros NLGKDGLKYHYLIKLTKIAPQLSTEELTFGLGKEMVIALTTCTLSEEFACVDNLADLVG  
Cat NLGKEDLKYHYLIKLTKIAPQLSTEELTFGLGKEMVIALTTCTLSEEFACVDNLADLVG  
Dog NLGKDDLKYHYLIKLTKIAPQLSTEELTFGLGKEMVIALTTCTLSEEFACVDNLADLVG



Ferret	NLGKDDLKYYYLIKLTKIAPQLSTEELTFLGKEMVTALATCCTLSEEFACVDNLMDLVLG
Panda	NLGKDDLKHYIYLIKLTKIAPQLSTEELTFLGKEMVTALATCCTLSEEFACVDNLMDLVLG
Pacific walrus	DLGKDDLKYYYLIKFTKIAPQVSTEELTFLGKEMVTALATCCTLSEEFACVDNLMDLVLG
Weddell seal	NLGKDDLKYYYLIKLTKIAPQLSTEELTFLGKEMVTALATCCTLSEEFACVDNLMDLVLG
Megabat	NLGKDDLKHYIYLIKLTKIAPQLSTEELTFIGEEMVTALATCCTLSEEFACVDNLAKLIFG
Microbat	NLREDVLKY-----
Elephant	-----
Hyrax	-----FACVDHLAKLFLG
Tenrec	NLWKEDLKYYHHLVKVKKMTHQVSTKKLSLFSKDEPALAMCCAQSEEFACMDNLMNLVLG
Opossum	NLGEEGFLNQCLLPLTKKAPQLPPQELISHSKLASFFAKCCPLGEEFACVDNAVSLTIG
Tasmanian devil	QLGEEGFFTQCLLFLTKKAPQLSSQELISHSQKLVTSFSKCCFLKEEFACVDNLAGLVLG
Wallaby	-----CLLVLTKRAPQLPPQELISQMOKFHASFTKCCPLGEEFARVHH-VHLILG
Platypus	KLGEDLYRQKYAISFTKQAPLPLTELTVHVERKTNDAAHCCMQPDETACIERSANLLYG

Human	ELCGVNEENRTINPAVDHCCKTNFAFRRPCFESLKADKTYVPPPPFSQDLFTFHADMCQSQN
Chimpanzee	ELCGVNEENRTINPAVDHCCKTNFAFRRPCFESLKADKTYVPPPPFSQDLFTFHADMCQSQN
Bonobo	ELCGVNEENRTINPAVDHCCKTNFAFRRPCFESLKADKTYVPPPPFSQDLFTFHADMCQSQN
Gorilla	ELCGVNEENRTINPAVDHCCKTNFAFRRPCFESLKADKTYVPPPPFSQDLFTFHADMCQSQN
Orangutan	ELCGVNEENRTINPAADHCCKTFAFRRPCFESLKADKTYVPPPPFSQDLFTFHADMCQSQN
Gibbon	ELCGVNEENRTINPAVDHCCKTNFAFRRPCFESLKADKTYVPPPLSQDIFTFHADMCQSQN
Rhesus	ELCGVNEENRTINPAVDHCCKTNFAFRRPCFESLKADKTYVPPPPFSQDLFTFHADMCQSQN
Crab-eating macaque	ELCGVNEENRTINPAVDHCCKTNFAFRRPCFESLKADKTYVPPPPFSQDLFTFHADMCQSQN
Olive baboon	ELCGVNEENRTINPAVDHCCKTNFAFRRPCFESLKADKTYVPPPPFSQDLFTFHADMCQSQN
Marmoset	ELCGVNEENRTINPAVDHCCKSNAFRRPCFESLTHKTYVPPPPFSQDLFTFHADMCQSQN
Squirrel monkey	ELCGVNEENRTINPAVDHCCKSNAFRRPCFESLTAHKTYYVPPPPFSQDLFTFHADMCQSQN
Tarsier	ELCGVNLNRTINPAVDRCCRTNFAFRTPCFKDLKTDKTYVPPPTSQDLFTFHADLCAQON
Mouse lemur	ELCGINENRTINPAVDHCCKTNFAFRRHCFEGLKADETYVPPPTTKDLFTFNADLCAQON
Bushbaby	ELCGVHKNRTINPAVDHCCRTNFAFRRYCFEGLEVDTTYVPPPTSKDLFTFPADLCAQAN
Chinese tree shrew	EFCGINKNRTINPAVDHCCLTNFAFRRHCFESLEADKTYVPPPTSRLDIFHTDLCQAPN
Squirrel	ELCGINKNRTINPAVDHCCKANFAFRRLCFKELKGDEMYEPPS-SQGFFTSCVDWCQAOQ
Golden hamster	DLCGVNEENRTINPAVDHCCRTNFAFRRHCFEHLKADKTYVPPPLSVALISALRSDMCHN
Kangaroo rat	ELCGINENQTINPAVDHCCKANFAFRRHCFEGLEADKMYVPPPLVSEDSFAFHDEWCMQON
Mouse	ELCGVNTNRTINPAVDHCCKTDFAFRRHCFEHLKADTTYELPSVSALVSALHTDWCQPRK
Rat	ELCGINKNRTINPTVDHCCRADFAFRPCFHEHLKADTTYALPSVSALVSALRADWCQPLK
Naked mole rat	ELCGINENQTINPAMDHCC--NFAFRRHCFEGLKADKTYVPPPLSQDLVFPVWDWCQSQN
Guinea pig	ELCGINENRTINPAVDHCCANFAFRPCFESLKPDKTYIPPLSQDLVFPVWDWCQSQN
Rabbit	ELCGIKENRTINPAVDHCCQTNFAFRPCFEGLEADKTYVPPPTSQDLVFPVWDWCQDQK
Pika	DLCGVNEENRTINPAVGRCCQTSFAFRPCLEGLEADPTYVPPPIVQDVFAFRADWCQTQD
Pig	ELCGINKNRSINPTVDHCCKTNFAFRSCFEGLEADKTYVPLPPSQGLFTFPDLCAQAHN
Alpaca	QLCGINENRNINPAVDHCCKTNFAFRSCFEGLEADKAYVPLPTSQGLFTFHADLCAQAHN
Bactrian camel	ELCGINEYHNINPAVDHCCKTNFAFRSCFEGLEADKAYVPPPTSQGLFTFHADLCAQAHN
Dolphin	ELCGINENRSINPAVDHCCKTNFAFRSCFEGLEADKTYVPPPTSQGLFTFHADLCAQAHN
Killer whale	ELCGINENRSINPAVDHCCKTNFAFRSCFEGLEADKTYVPPPTSQGLFTFHADLCAQAHN
Cow	ELCGINENRNINPAVDHCCKTNFAFRSCFESLEADKTYVPPPTSQGLFTFHADLCAQAHN
Sheep	ELCGINENRNINPAVDHCCKTNFAFRSCFESLEADKTYVPPPTSQGLFTFHADLCAQAHN
Goat	ELCGINENRNINPAVDHCCKTNFAFRSCFESLEADKTYVPPPTSQGLFTFHADLCAQAHN
Horse	ELCGINENRSINPAVDHCCKTDFAFRRPCFEGLEADKTYVPPPTSQGLFTFHADWCQAHK
White rhinoceros	ELCGINENRSINPAVDHCCKTDFAFRRPCFEGLEADKTYVPPPTSQGLFTFHADLCAQAHK
Cat	ELCGINENRNINPDVDHCCKTNFAFRSCFEGLEADKAYVPPSTFQGLFTFHADLCAQAHK
Dog	ELCGINENRNINPDVDHCCKTNFAFRPCFEGLEADKTYVPPPTSQDLFTFHADLCAQAHN
Ferret	ELCGLNENRNINPDVDHCCKTNFAFRPCFEGLEADKTYKPPCTPQDLFVVFHTDLCQSHN
Panda	ELCGINENRNINPDVDHCCKTNFAFRPCFEGLEADKTYVPPPTSQDLFTFHADLCAQAHN
Pacific walrus	ELCGINENRNINPDVDHCCKTNFAFRPCFEGLEADKTYVPPSTPQDLFTFHADLCAQAHN
Weddell seal	ELCGINENRDINPDVDHCCKTNFAFRPCFEGLEADKTYVPPSTPQDLFTFHADLCAQAHN
Megabat	ALCRRHEAEPINDGVGHCCDSSYAFRKPCFDDLHVDRTYISPPLSCDLSALE-ELCKAE-
Microbat	EICGVNGNRTINPAVDHCCKTNFAFRRHCFEALADKTYVPPSASQGLFTFHADLCAQAHN
Elephant	-----
Hyrax	VLCRRHEAKPINAGVGHCCDASYAFRKPCFDDLSADETYIAPSLSCDVISLKEDLCKPQE
Tenrec	ELCGVIRNPTVNRAVDQCSKSHFAFRG-CLENLKQDGKVVPPSTTQGWSTFH-DWYQAQN
Opossum	ELCGINRNRTINPGVNDCCSSYAFSSMCFKDLTDETYTSPFTFLPELFTFNLTLCQK-
Tasmanian devil	ELCGINKNRTINPTVDNCCASSYAFRPLCFNDLPEDETYTTPFTFLPEMFTFNLTLCQ-E-
Wallaby	EICGVNKN-TINPNVDNCCSSLVFRSWCFNLLTADETFIPPTFTPEVFTFNITLCQ-K-
Platypus	QICGFFANRSINPGVTNCCS-FAFKEPCFPSLVDETYTPPAFSPFLFTPNEDWCQLPD

Human	EELQRKTTDRFLVNLVVKLKHELTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Chimpanzee	EELQRKTTDRFLVNLVVKLKHELTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Bonobo	EELQRKTTDRFLVNLVVKLKHELTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Gorilla	EELQRKTTDRFLVNLVVKLKHELTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Orangutan	EELQRKTTDRFLVNLVVKLKHELTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Gibbon	EELQRKTTDRFLVNLVVKLKHELTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Rhesus	EELQRKTTDRFLVNLVVKLKHELTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Crab-eating macaque	EELQRKTTDRFLVNLVVKLKHELTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Olive baboon	EELQRKTTDRFLVNLVVKLKHELTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Marmoset	EELQKTTDRFLVNLVVKLYEVANEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Squirrel monkey	EELQKTTDRFLVNLVVKLYEVANEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Tarsier	EELQRKKDRFLVNLVVKRKPGLTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Mouse lemur	EELQRKKDRFLVNLVVKRKPGLTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Bushbaby	EELQRKKDRFLVNLVVKRKPGLTDEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Chinese tree shrew	EELQKTTDRFLVNLVVKLYEVANEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Squirrel	EELQKTTDRFLVNLVVKLYEVANEELQSLFTNFANVVDKCKCAESPEVCFNEESPKIGN
Golden hamster	EDLQNKHRFLVNLVVKWMPFITAKERLCLFTKFTAVGEEKCEEVQEPETCFRPDPGTVP
Kangaroo rat	EELQSMKNRFLIDLVKWKPALTDQEKLRSLF-----
Mouse	EDLQNKHRFLVNLVVKWMPFITDEERLCLFTKFTAAAREECSEVQEPESCFSPESSKTG-
Rat	EDLQNKHRFLVNLVVKWMPFITDEERLCLFTKFTAAAREECSEVQEPESCFSPESSKTG-
Naked mole rat	EVPQGGKYRFLIKLVRLKPLTDEELLSLLTNFTSAVEKCKVPEPEACFHEE-----
Guinea pig	EELQKTKYRFLIKLVRLKPLTDEELLSLLTNFTSAVEKCKVPEPEACFHEE-----
Rabbit	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Pika	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Pig	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Alpaca	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Bactrian camel	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Dolphin	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Killer whale	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Cow	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Sheep	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Goat	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Horse	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
White rhinoceros	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Cat	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Dog	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Ferret	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Panda	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Pacific walrus	EELQKTKYRFLIKLVRLKPLTDEELLSLLTNFTSAVEKCKVPEPEACFHEE-----
Weddell seal	EELQKTKYRFLIKLVRLKPLTDEELLSLLTNFTSAVEKCKVPEPEACFHEE-----
Megabat	EEFQ--TEKFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Microbat	EELQRKKDRFLVNLVVKLPELANQEVQSLFINFTDTLEKCCNAKPEACFNQERPKIGS
Elephant	-----
Hyrax	DKLQSKAE-FLVELVVKLMPHPT-EELWSLITDFTNVLEKCKLEGPEASFSDE-----
Tenrec	GALQSKKERLFRVSVKMKSORPD-ELPSWLTAFAPGVNRCGE-EGPEPCFNEECPTGSQ
Opossum	EEQKKRRELMVHLLQKPHLQVQVMPPLSDFSKMTD-CCEVEEKETCFKEEHSKLYN
Tasmanian devil	MELQRKKRELIVNLVVRQKPVLETQVQVMQMSDFPTLIN-CCKTEERESCFCKEEHSKLYN
Wallaby	TEQQRKR-MLIMNLVVKQPLLAQVIVQLLDFS-----CCEAEERVTCFKEE-----
Platypus	MELQRKKKLLINLVKHKPQTPDDQLQALTDFSDVVKCCQASGPGACFVAEGPNLIA

**Legend:**

■ : Positively selected site in the whole phylogeny

■ : Lineage-specific positively selected site

**Table S1. List of mammalian species.**

<b>Common name</b>	<b>Scientific name</b>
Alpaca	<i>Vicugna pacos</i>
Armadillo	<i>Dasypus novemcinctus</i>
Bactrian camel	<i>Camelus ferus</i>
Black flying fox	<i>Pteropus alecto</i>
Bonobo	<i>Pan paniscus</i>
Bushbaby	<i>Otolemur garnettii</i>
Cape golden mole	<i>Chrysochloris asiatica</i>
Cat	<i>Felis catus</i>
Chimpanzee	<i>Pan troglodytes</i>
Cow	<i>Bos taurus</i>
Crab-eating macaque	<i>Macaca fascicularis</i>
Dog	<i>Canis lupus familiaris</i>
Dolphin	<i>Tursiops truncatus</i>
Elephant	<i>Loxodonta africana</i>
Ferret	<i>Mustela putorius furo</i>
Gibbon	<i>Nomascus leucogenys</i>
Goat	<i>Capra hircus</i>
Golden hamster	<i>Mesocricetus auratus</i>
Gorilla	<i>Gorilla gorilla</i>
Ground squirrel	<i>Spermophilus citellus</i>
Guinea Pig	<i>Cavia porcellus</i>
Hedgehog	<i>Erinaceus europaeus</i>
Horse	<i>Equus caballus</i>
Human	<i>Homo sapiens</i>
Hyrax	<i>Procavia capensis</i>
Kangaroo rat	<i>Dipodomys ordii</i>
Killer whale	<i>Orcinus orca</i>
Lesser hedgehog tenrec	<i>Echinops telfairi</i>
Manatee	<i>Trichechus inunguis</i>
Marmoset	<i>Callithrix jacchus</i>
Megabat	<i>Pteropus vampyrus</i>
Microbat	<i>Myotis lucifugus</i>
David's Myotis	<i>Myotis davidii</i>
Mouse	<i>Mus musculus</i>
Mouse Lemur	<i>Microcebus murinus</i>
Naked mole rat	<i>Heterocephalus glaber</i>
Olive Baboon	<i>Papio anubis</i>
Opossum	<i>Monodelphis domestica</i>
Orangutan	<i>Pongo abelii</i>
Panda	<i>Ailuropoda melanoleuca</i>
Pig	<i>Sus scrofa</i>
Pika	<i>Ochotona princeps</i>
Platypus	<i>Ornithorhynchus anatinus</i>
Rabbit	<i>Oryctolagus cuniculus</i>
Rat	<i>Rattus norvegicus</i>
Rhesus macaque	<i>Macaca mulatta</i>
Rhinoceros	<i>Ceratotherium simum</i>
Sheep	<i>Ovis aries</i>
Shrew	<i>Sorex araneus</i>
Sloth	<i>Choloepus hoffmanni</i>
Squirrel	<i>Ictidomys tridecemlineatus</i>
Squirrel monkey	<i>Saimiri boliviensis</i>
Star-nosed mole	<i>Condylura cristata</i>
Tarsier	<i>Tarsius syrichta</i>
Tasmanian devil	<i>Sarcophilus harrisii</i>
Tree Shrew	<i>Tupaia belangeri</i>
Wallaby	<i>Macropus eugenii</i>
Walrus	<i>Odobenus rosmarus</i>
Weddell seal	<i>Leptonychotes weddellii</i>

**Table S2. Positively selected sites in the human and chimpanzee lineages.**

Gene	Lineage	Codon	Ancestral AA	Human/chimpanzee AA	Pr <sup>a</sup>	Other methods <sup>b</sup>
<i>ALB</i>	Human	183	Glu	Lvs	0.765	
		314	Leu	Ile	0.776	MEME
	Chimpanzee	49	Ile	Val	0.764	
		107	Thr	Lys	0.950	MEME-BEB
		156	Glu	Gly	0.913	MEME-BEB
	166	Ile	Val	0.908	MEME	
<i>AFP</i>	Human	42	Asn	Ser	0.875	MEME
		44	Thr	Ala	0.873	MEME
	Chimpanzee	100	His	Arg	0.842	
<i>AFM</i>	Human	29	Val	Ile	0.777	
		183	Ala	Val	0.876	
		202	Phe	Leu	0.887	MEME
	Chimpanzee	200	Phe	Leu	0.829	
		241	Gln	His	0.906	

<sup>a</sup> Posterior probability of  $\gamma > 1$  as detected by gammaMap.

<sup>b</sup> Other methods that identified the same codon as positively selected

**Table S3. Nucleotide diversity and Tajima's D for the albuminoid genes.**

Gene	Population	S <sup>a</sup>	$\Theta_w$ ( $\times 10^{-4}$ )		$\Pi$ ( $\times 10^{-4}$ )		Tajima's D	
			value	rank <sup>b</sup>	value	rank <sup>b</sup>	value	rank <sup>b</sup>
GC	YRI	244	7.15	0.63	7.72	0.63	0.26	0.54
	CEU	142	4.15	0.41	4.23	0.32	0.07	0.26
	CHBJPT	122	3.57	0.52	5.77	0.61	2.02	0.77
ALB	YRI	45	4.91	0.25	5.94	0.39	0.65	0.76
	CEU	32	3.48	0.26	5.57	0.51	1.81	0.89
	CHBJPT	28	3.04	0.39	5.67	0.60	2.55	0.91
AFP	YRI	90	7.57	0.69	7.02	0.54	-0.23	0.25
	CEU	57	4.78	0.56	4.52	0.36	-0.17	0.20
	CHBJPT	32	2.68	0.30	4.73	0.47	2.29	0.85
AFM	YRI	63	6.03	0.44	5.85	0.38	-0.09	0.33
	CEU	36	3.43	0.26	4.92	0.42	1.31	0.73
	CHBJPT	22	2.10	0.17	3.66	0.32	2.13	0.80

<sup>a</sup> Number of segregating sites

<sup>b</sup> percentile rank relative to a distribution of ~3000 randomly selected genes

**Table S4. Variant vitamin D-binding proteins.**

Variant Name	rs4588	rs7041	Frequency		
			YRI	CEU	CHBJPT
GC*1F	Thr (C)	Asp (T)	0.89	0.22	0.50
GC*1S	Thr (C)	Glu (G)	0.08	0.58	0.25
GC2	Lys (A)	Asp (T)	0.03	0.20	0.25