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Tasmanian devil	-----MCSSTHGQSSPYA	TEVMKMKKGELAAGIKDSDGLIQR	LDVYGIFTAEO	KL	SLSYKTNPEK	VTRVLDMLISQGEHACRMFFYP	CLKQLEPDLYH	VI	IRK	YTMGT	EEVIPGAE	111															
Gray short-tailed opossum	-----MCSSTPGRNSPYA	IQVMKMKKEELAAGIKDADLLKRL	VDYGI	FTSE	O	KLALSHYETHLEKVNRLDILISQGEHACOVFFYP	CLKQLEPNLYQI	IR	K	YTMGT	DEIMYRTR	111															
Large yellow croaker	MF-NLLKGFDAQATPNHINPYA	VDVIRAKKMDLVHGISHTE	DL	LDHLVTEGVM	TAAKSI	VLTIRTRQDQNSRVLDILEARGERACR	FFHPCLMLAE	P	K	LYQEIKTYL	SDVNGHIRDTR	119															
Nile tilapia	MW-NKVKGFESHAASNSKNPYA	VDVIRTKRRDLVYGISHTEDLL	N	LVAEGVMTTAKRS	IVLS	IRTHKDQNSRVLDILEARGERACR	FFHPCLMLAE	P	E	LYQRIKTYV	GGMNEHVQDNR	119															
Burton's mouthbrooder	MW-NNVKGFEASHAASNSKNPYA	VDVIRTKRRDLVYGISHTEDLL	N	LVAEGVMTTARRS	IVLS	IRTHKDQNSRVLDILEARGERACR	FFHPCLMLAE	P	E	LYQRIKTYV	RSMQVQDNR	119															
Elephant shark	-----MVLHMPTGIPTNPYA	IEVLQRKKSELVAGIANTD	H	LLDWLIENGLV	SADKRLAVSS	YRTREEKNARLLEMLVSRGERACR	FFYPCLKRV	E	P	ALYNQIRSYV	SEVSGSFGDAR	113															
Atlantic herring	-----MSSTKTTVNPYA	VEVIKTKKEELVGGILNTE	E	LLDLLVDHGI	I	SHDQRLVSSIQ	TQ	E	E	RNSKLLDVLSRGERACR	IFFYPCLKRAEPDLYQ	NMRYV	AGSVNEDIRDAR	110													
Zebrafish	-----MGSTSFNPYA	IEVIQMKRSELVSGILNPE	D	LLDLLIANGV	L	QDPIRVLVSDLTVREKNSR	MLNILSRGERACR	IFFYPCLKRAEPDLYQ	H	MRTYV	GGVNEGIRDAR	109															
Blind cave fish	-----MGSTKFTNPYA	LEVIRTKKEELVGGISNT	E	DL	LLVANGVLLPES	RVLVSCIAARDEKNSR	MLSLVSRGERACR	IFFYPCLKSAEPDLYQ	S	MKTYV	SLNQNIKDTR	109															
African coelacanth	-----MSSRSLFINPYA	IEVLKTKKQELIEGINS	T	D	LLDWLDNAILTPDKK	V	LVSNYRTREEKNSR	VLDLILSRGERACR	FFYPCLKHVEPE	L	YNNIRKYASSIN	VSVGDVR	110														
Western clawed frog	MSTPATQLPAISSTSLFTNPYA	IEVLKMKKQELVEGIKDP	T	LLQSLIDNG	I	M	LSDKKMVLSYKTKTEKNSRLIDLIL	STGERACR	FFHPCLKQVEP	S	LYNSVKNYV	STVND	SVGDGR	120													
American chameleon	-----MGSSIYTNPYA	IEVLKMKKNELVEGIN	N	PDHLLDCLIEYGI	F	T	PEKKLVLSYRTRRAKNSR	VLDILASQGERACR	FFYPCLKEIEP	Y	LYSQIRNYV	SDVNVKIGDAR	109														
King cobra	-----MYSLSLFTNPYA	IEVLKMKKNELVEGIK	N	PDHLLDRLIEK	G	ALTTEK	KMLSYYRTRMAKNSR	VLDILASQGERACR	FFYPCLKEVEP	R	LYSKIRNYV	SDVNEKIGDAR	109														
Common garter snake	-----MYSNLFTNPYA	IEVLKMKKNELVEGIK	N	PDHLLDCLIEKS	I	LSPEKKM	VLSYRTRMAKNSCILDILASQGERACR	FFYPCLKEVEP	R	LYSNIRNYV	SNVNETVGDAR	109															
Chinese alligator	-----MHSTSLFTNPYA	IEVLQTKKEELVEGIN	N	PDHLLNWLITNGI	F	T	PEKKMVMSYRTRIEKNSR	VLDILV	SQGERACR	FFYPCLKQVEP	N	LYNSVRRYV	SDINESIGDAR	110													
Western painted turtle	-----MYLNSLFTNPYA	IEVLKTKKEELVEGLN	N	PDHLLNWLIDNGI	F	T	PEKKMVMSYRTRRAKNSR	VLDILV	SQGERACR	FFYPCLKQVEP	N	LYNR	IKKYVSDVNESIGDAR	110													
Green sea-turtle	-----MYLNNLFTNPYA	IEVLKTKKEELVEGIK	N	PDHLLNWMIDNGI	F	T	PEKKIVMSYRTRIAKNSR	VLDILV	SQGERACR	FFYPCLKQVEP	N	LYNRVKKYV	SDVNESIGDAR	110													
White-throated sparrow	-----MIRHSSSLFTNPYA	IEVLR	T	KKEELVQGIN	D	PEQLLHWLVENGI	F	T	PEKKLVLSFYRTRTAKNSR	VLDILMSQGERACR	FFYPCLKQVEP	K	LYSKIRKYVSEVNESIGDAR	112													
Chicken	-----MHSTSLFTNPYA	IEVLR	T	KKEELIEGIN	D	PDHLLSCLIDNGI	F	A	PEKRMVMSFYRTRTEK	NARVLDTLISQGERACR	FFYPCLKQAE	P	KLYNKMRNYVSEVNESV	RDSDR	110												
Turkey	-----MHSTSLFTNPYA	IEVLR	T	KKEELIEGIN	D	PDHLLSCLIDNDI	F	S	PEKRMVMSFYRTRTEK	NSRVDLILISQGERACR	FFYPCLKQVEP	K	LYNKMRKYVSEVNES	IRDAR	110												
Budgerigar	-----MHSTSLFTNPYA	IEVLR	T	KKEELIEGITH	PDHLLNWLIDNGV	F	T	PEKKMVMSFYRTRTEK	NSRVDLLMSHGERACR	FFYPCLKQVEP	K	LYSKIRKYVSEVNES	IGDAR	110													
Golden eagle	-----MIMHSASLFTNPYA	IEVLR	T	KKEELVEG	I	KDPDRLLNWLIDNGI	F	T	PEKKMVMSFYRTRTQKNSR	VLDLILISQGERACR	FFYPCLKQVEP	K	LYSKIRKYVSEVNES	IEDAR	112												
Barn owl	-----MIVHSVSLFTNPYA	IEVLR	T	KKEELVEG	I	N	PDHLLNWLIDNGI	F	T	PEKKMVMSFYRTRTEK	NSRVDLLISQGERACR	FFYPCLKQVEP	K	LYSKMRKYVSEVNES	IRDAR	112											
Spotted gar	-----MHSNRLFTNPYA	IEVLQTKKRDIEG	I	S	KT	EHLLNLLIDKEVLP	PEKRLVLS	SCR	S	REEKNSRVDL	FLV	SQGERACR	FFYPCLK	LIEP	LYNSIKYV	VG	DNESIGDGR	110									
Asian bonytongue	-----MHSAIFNPYA	TEVHLK	K	KDLIEG	I	S	KTEYLLNLLIDKGV	F	P	PEKKALMSYDR	TREEKNS	E	F	L	V	L	SQGERACR	FFYPCLK	L	VEP	DLYQ	SIR	TYV	GEIN	KV	RDAR	109

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Tasmanian devil	ASKSPEINSLDEAIKILLTAGINAD--SSIVHNAFHDDQDVVIQQLLKYSAA-LPRE	TRELALFEGIRKNLPEVVAALADGGTPLDVQNEHYTPTLLAAEMDRTLCAEVLIQRGSNMEA	452
Gray short-tailed opossum	ASTFPPTNSLEEAIKILLTTGINAD--SGILHNAFHDDQVVIQQLLKHSI-LPSE	TREALFEGIRKNLPRVVTALVDVGTNLNARDHNQYTPLLAAEMDRACANVILIRGANMMA	445
Large yellow croaker	ALFYAVSRNVKTVTIVLLNAGAKVD--YDVINEAIKNESILHLLLDNARGS----	LRETFLFSAVQQNHGDGVAALIDSGADVNMDDKQGYTPLLLSAALGHAEEVFRVAVAKQALDA	462
Nile tilapia	ALFYAVKESNEKMTMTVLLNAGAKAD--YDVINEAINLHQESIQLQLLANARGVLSKDV	LSALFAAVRKNFDGAVSALIDSGADVNMDDGRRYTPLLLSAELGHSEVFSVLVAKNAKMDA	461
Burton's mouthbrooder	ALFYAVKESNEKMTMTVLLNAGAKAD--YDVIEAAILNHQESIQLQLLANARGVLSKDV	LSALFSAVVRMNFDDGAVSALIDSGADVNMDDGRRYTPLLLSAELGHSEVFSVLVAKNAKMDA	462
Elephant shark	PLFYAVSRGHINTAKVLLLEAGAQQVVDG	PLIDAAFSTGDQALIALMLTQARE----VGPATIFRAVERDLPKVVAALAEAGADVNSRDG	440
Atlantic herring	PLCYAVSRGNERTVAVLLQAGAQQVD--SDAMASAFDLNKSMSRLRLQLNAPQGM	TAE SIHSALFRAVERN LGGIITALIDSGADVNTQNNQGYTPLLLAELGNVEAFKALVGKKANLEG	450
Zebrafish	ALHHAVRHGNEKTAAVLLKAGAQQVD--SRIVDAAFQLNRKSLLSLFLQHVHESMSQTE	INAALFKAVQRNLDVVAALIEHGADVNSCNE LGYTPVLLAELGNGEAFKVLVSKAKLDE	439
Blind cave fish	PLFYAISCGHEKTAAVLLQAGAQQVN--SAIIEAAFNLNRESVLSLLLRNINRMSQNEL	KTILFKAVKRNLDGVAALIEGTIDVNVRRD LGYTPLLLATELRNVEVFKMLVSEKAHLDK	444
African coelacanth	ALFHAVSHAFENTVKVLLLEADAYVN--SSIIDAAFNSNNQSFSLIMQYAKG-MSHAT	MVSALFKAVQKNLYGI IASLIDKGIKVVNRNEMEFTPLLLAAEMGKTEAAKILIEKGAKLDE	450
Western clawed frog	ALLYAVSGGHLKTVKMLLEAGASID--SSIIDAAFATNNERIFGLLLEYSKG-LSPD	TMSAVFKAVPLNLYGI INALIDKGTINATND IQYTPLLLAELGKTESAQAALIEKGAQLDV	467
American chameleon	ALGYAVSRGFKTKVLLLEAGAKVD--SSIIDVAFNSNNQSLFRLLLEYANK-MSPE	TMSALFKAVEQNLHGIVAALIERGIDINAHNEMQYTPLLVACEMGKMAESAALIEKGA	437
King cobra	ALSYAASQGHKTKVLLLEGGAKVD--SSIIDAAFNSNHQSLFKLLLEYARG-LSS	EAMVSALFKAVEKDLHGIVAALIERGTDINVRNEEQHTPLLVACKTGKIKSAKVLIEKGANLKD	445
Common garter snake	ALSYAVSQGHEKTKVLLLEGGAKVD--SSIEAAFNSNNQSLFKLLLEYARE-LSS	SMVSFLFAKIEKDLHGIVAALIERGTDVNVNREEQYTPLLMACKTGKIKSAKVLIEKGANLKD	445
Chinese alligator	ALSYAVSRGFETTKVLLLEAGASID--SNVLDVAFDSDNNQSIQFILLYFKG-LSPD	TMSALFKAVQKNLHGIVAALVDRGTDINVRNEMGYTPLLMACELGKTESAALIEKGA	449
Western painted turtle	ALGYAISQGFETTKVLLLEAGASID--SNIIDVAFNNRQSFIRLLEYSKG-LSPD	MMVSALFKAVQKNLHGIVAALVDRGTDINAHNEMQYTPLLMACEMGKTETAEVLIKAGASLEE	451
Green sea-turtle	ALGYAISQGFETTKVLLLEAGASID--SNIIDVAFNNHQSIVRILLEYSKG-LSP	EMVSALFKAVQKNLHGIVAALVDRGTDINAHNEMQSTPLLMACEMGKTETAEVLIKAGASLEE	451
White-throated sparrow	ALSYAVSQSENTAKVLLLEAGATVD--SNTVERAFNSNHPSIFKLLLEYSKD-LP	ADIMELALFRAVQKNLHGIVAALIERGTDVNAHNKHYTPLLLACEMGKAESAALIEKGANLGI	450
Chicken	ALSYTVHQGFENTAEVLLLEAGASVD--SNVVERAFNSNHPSIFKTLLEYSKD-LP	SIMESALFKAVQKNLHGIVAALADRGTIDINAYNEMQYTPLLLACETGKAESAALIEKGANLGI	448
Turkey	ALSYAVSQGFENTAKVLLLEAGASVD--SNVVEKAFNSNHPSIFKTLLEYSKD-LP	ADIMESALFKAVQKNLHGIVAALADRGTIDVNAYNEQYTPLLLACEMGKAESAALIEKGANLGI	448
Budgerigar	PLSHAVSHGSENTAKVLLLEAGASVD--SNIETAFNSNHPSIFKLLLEYSKD-LP	SDIMESALFRAVQKNLPGIVAALIERGTDIDALNHMRYTPLLLACETGKAESAALIEKGANLGI	448
Golden eagle	ALSYAVSQSENTAKVLLLEAGASVD--SNMAERAFNSNHPSIFKLLLEYSKD-L	SSDIMESALFRAVQKNLHGIVAALIERGTDINAYNEMQYTPLLLACETGKAESAALIEKGA	450
Barn owl	ALSYALSQSENTARVLLLEAGASVD--SNMAERAFNSKHPSIFKTLLEYSKD-L	SPDIMESALFRAVQKNLHGIVAALIERGTDINAYNEMQYTPLLLACETGKAESAALIEKGANLGI	450
Spotted gar	ALFHAVHSGFEKTARVLLLEAGAKLD--SSIEAAFNLNSQSMYSLLLQHQAKG-L	SPDIMESALFKAVQKNLQEVIAALIERGTDINARNGMQYTPLLLAELGNLEAVKILVAKASLDE	453
Asian bonytongue	SLFHAVNLRNENTARVLLLEAGAKVD--SDIMEAALNLDKSMFSLILNYAKE-L	PPDAMKSLLFKAVQRNLEWIIAALIDAGTDVNSRNDLQYTPLLLAELGNVYAFNILMSKNASVED	456

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Tasmanian devil	KTSYAESALHLAVKAGGIYTVLELLS GMSPNVQGFNGQTP	PLHVAAWYNKHEMVGLLVQAGAQNILSTE-QNTPLHIASEKGNVDAAIQLIQYKADPNL	KNKLNMTPLHLAAR-AGNKT	570
Gray short-tailed opossum	RTAHLDSALHLAVKAGAVYTVLELLDNGMSPNLAGWNGQTS	LHTAAWYNKHEMVNILLNAGANINALTTE-QNTPLHI	TSERGHVDTAIIQLIQQAADLNMKNKLSMTPLHLAAR-AGNMT	563
Large yellow croaker	TLSDLSSALHLAVQSGSVSIQVTLLEKGMNDPNTGPKAQ	TPHLFAAQCNREMPVDVLLRAGAKVNAVAQD-GLT	PLHIASQGHADSVTQLLQKADPSIKDRLGRTALHWAASSKGEGR	581
Nile tilapia	TLSDLSSALHLAARSQSKPIVQTLLEKGLDPNIKAGKGT	PLHLAAQCDRDPDITGLLLKGAQVNAVSD-GLI	PLHIASRQGHDTDTVIQLLHNKAEFGVKDRLGRTALHWAASSQVDSC	580
Burton's mouthbrooder	TLSDLSSALHLAARSQSKPIVHTLLEKGLDPNIKAGKGT	PLHLAAQCDGPDITGLLLKGAQVNAVVGQD-GLT	PLHIASMQGHTDTVIQLLHNKAEFGVTDRLGRTALHWAASSQVDSC	581
Elephant shark	RAPDLSSALHLAVMSDPSLVHLLLEKGMNDPNTGAGE	QTPHLHAARHRYKMDVLLIGAGSKPNSAAVL-GAT	PLHVASRWGSRQAERLIANKADINAKDRDARRPLHLAAL-VGDTF	558
Atlantic herring	RLSNSTALHLAVQSGNVTITQVLEMGIEPNITGPRDQ	TPLHMAAMHNQ SALVGLLLRAGAQNVAITQD-GHT	ALHLASQRGHSEVVTVLVRKADLSVRDKREGRALHWAASS-QGEAS	568
Zebrafish	RLPNQMSLHLAVQSGSIQIAQIILLHKGIDPNISGPK	QDQTPHLHSASHNQPAMMALLRVGAQNPVITQD-GFT	PLHLASQNGHTEAVAQLEAKADVHAKDKQGRALHWAASS-QGEVA	557
Blind cave fish	KLPNQTSALHLAIQSGSMQITQIILLNKGMNDPNTGPK	QDQTPHLHSAALHNQPTLMLALLRKAQVDAVITQD-GLT	ALHLASQCGHTEAVAQLEKADVHAWDRQSRALHWAASS-QGEAG	562
African coelacanth	RLPNQNTALHLVAQGGNLSVAKLLLEGNLNAVIVSG	GDQTPLHVVAFHNKPAVADILIRAGAKVNAVITKE-SSV	TPLHIASQRGFSFAAQCLIQHRANVAKDKHKSPTPLHFAAA-VGDYP	569
Western clawed frog	RTPNMSTALHLAVQGGDASITKLLIRKGININIA	GPQDQTPLHVAAFHNKQELADVLIAGANVNVITKE-LFT	PLHIASQRGNLHVQSLHLLHKNVNAKDKQSRTPHLHFAAA-GGAYE	585
American chameleon	KTPDSSALHLAVQAGSTSIKMLLHKGMNDPNTGQD	QSPHLVAAFHNKALVVDVLEGGAKIDPVTKE-LHT	PLHLASQYGHTEVAQKLLQNKAKVNLKDKQSKTPHLHFAAA-KGHIA	555
King cobra	KAPNLSPLHLAVEAGAFSIAQMLLQKGDIPNITAQ	GNQTPLHVAAIYNRGA	VLLIEGGAKIDAVTITD-LFTPLHMASDKGHTDVALKLLQHKANVHLKNKRSKTPHLHFAAA-MGNPA	563
Common garter snake	KAPNLSPLHLVVEAGAFSIAQMLLQKGDIPNITAQ	GNQTPLHVAAIYNRGA	VLLIEGGAKIDAVTITD-LFTPLHLASEKGHTDVALKLLQHKANVHLKNKRSKTPHLHFAAA-MGNPA	563
Chinese alligator	KTPSSDTALHLAVQAGAVAITSLLRKGMNDPNTGQ	DQTPLHIAAALRNHGALVLLINAGAKINAVITKE-LVT	PLHVASQRGNADVAQKLLQHKANVNVKDKQSKTPHLHFAAA-LGDCA	567
Western painted turtle	KMPNSNTVHLAVQAGAVSITNLLLRKGMNDPNTS	QGEQTPLHVAAFHNKGSIVDILINAGAKINAVITKE-LVT	PLHVASQRGNVDVAQKLLHKNANVNVKDKQSKTPHLHFAAA-KGDHA	569
Green sea-turtle	KMPNSNTVHLAVQAGAVSITNLLLRKGMNDPNTS	QGEQTPLHVAAFHNKGSIVDILINAGAKINAVITKE-LVT	PLHVASQRGNVDVAQKLLHKNANVNVKDKQSKTPHLHFAAA-KGDHA	569
White-throated sparrow	RTPASDTALHLAVQAGAASTALHLLKGMNDPNTG	AEQTPLHVAAALRNHGALVLLINAGAKINAVITKE-FVT	PLHIASHRGHADAARQLLHKKAVPNAQDKQSKTPHLHFAAA-QGHRT	568
Chicken	KTPASDTALHLAVQAGAASTNLLLHKGMNDPNTG	ADEQTPLHIAALHNSGALVGLLVSAKAKINAVITKE-FVT	PLHVASQRGNADVALQKLLHKNANVNAKDKQSKTPHLHFAAA-RGDKT	566
Turkey	KTPASDTALHLAVRAGAASITNLLLHKGMNDPNTG	DEQTPLHIAALHNSGALVGLLVSAKAKINAVITKE-FVT	PLHVASQRGNADVALQKLLHKNANVNAKDKQSKTPHLHFAAA-RGDKT	566
Budgerigar	RTPASDTALHLAVQAGAASTALHLLKGMNDPNTG	AEQTPLHVAAALRNHGALVLLINAGAKINAVITKE-FVT	PLHIASHRGHADAARQLLHKKAVPNAQDKQSKTPHLHFAAA-RGDRT	566
Golden eagle	KTPASDTALHLAVQAGAASTANLLLHKGMNDPNTG	ADEQTPLHIAALHNSGALVGLLVSAKAKINAVITKE-FVT	PLHIASHRGHADAARQLLHKKAVPNAQDKQSKTPHLHFAAA-RGDKA	568
Barn owl	KTPASDTALHLAVRAGAASITNLLLHKGMNDPNTG	AEQTPLHVAAALRNHGALVGLLVSAKAKINAVITKE-FVT	PLHIASHRGHADAARQLLHKKAVPNAQDKQSKTPHLHFAAA-RGDKA	568
Spotted gar	KLPNHNSALHLAAQSGNLPVLLKLLKGMNDPNTG	PVQDQTPLHLAALHNSKPDVVEVLIIRHGAQVNAVITKE-VLT	PLHIASQGHQEVVEKLIQFKADINAKDKQSRTPHLHFAAA-QGGAS	571
Asian bonytongue	KLPNGNSSLHLAVQSGNMHITKLLLEEGVDANAVGS	QEQTPLHLTALYNQ SALVEELLHVGAHINAVDQK-GLT	PLHVASQGHFDIVSLLIRREADISAKDKQARTALHWAASS-QPQAT	574

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Tasmanian devil	MVELLIHSGSDPNTADKEKKTPLHWASSEGHLVVKT-MLIHKVRFGAKDMGGFSPHYAALKGNVEMVKLFLEAGKKNKINERNIYRKTPLHLAAEQGHGDLIKLLLSCGAAVNALDNN	689
Gray short-tailed opossum	MVELLLHSGADPNVPDRKKTALHWAASAFIKVVY-LNLYKARSGRTRMDGYSPLHYAALKGNVEMVKLFLEAGKKNKINERNIYRKTPLHLAVEQGHGTELIKMLINNGAAVNALDNN	682
Large yellow croaker	VVDLLLSAKANPNA TDNEKKVALHLAAEGKVDDVTS-LMSHKAAGKAGKMDGGSTPLHYAAGGHANVVSALLRLNNKGVDERNTWRKTPLHAAAEKGHDSVVVLLLEAGAKINNFDQG	700
Nile tilapia	VVDLLLSAKADPDATDNEKKTPLHLAAEMEGKVDMAIS-LLSHRAKRRARDMDGSTPLHYAAGGHVSVVTTALLQPLNNKGTEDRNAWRKTPLHTAAEKGHDSVALQLLEAGAKINATDHN	699
Burton's mouthbrooder	VVDLLLSAKADPDATDNEKKTPLHLAAEMEGKVDAIS-LLSHRAKRRARDMDGSTPLHYAAGGHVSVVTTALLQPLNNKGTEDRNAWRKTPLHAAAEKGHDSVALRLEAGAKINATDHN	700
Elephant shark	MADLLSNHADANPLDKEKKTPLHLAAESEGHDFVSL-MLIRKKGFGAKMDGNTPLMYYAASKGHTSVVKAFLLAGRNHNVDKKNVWRRTALHLAAEHGSEDVLELLMSGGAI DALDNA	677
Atlantic herring	VIKLLLSAGADVSA TEKEKKTPLHMAAMEGKAEAVSSLLQKAKVEAKMDGCTSLHYAAANGHIEAATALLSSGKIKSVDDHKNTWRRTPLHAAEQQEALVELLLSAGAKINATDSN	688
Zebrafish	TIQSLLAAGAYSNA SEREKKTPLHLAAEAGHTKAVSA-LLAGKAKVGA KMDGCSPLHYAARNKERAGSVLLASSKSNVDDKNVWRRTALHLAAEHGHEALVGILLENKAKINALDNN	676
Blind cave fish	VIKLLLYAGADANAATKEKKTPLHLAATAGHAEATST-LLAGKANGAAKMDGCSALHYAAGNGHESVAATLLTSGKNKNVDDRNVWRRTPLHLAAEHGQDILVDLLEKQAKINAMDNN	681
African coelacanth	MVELLLNNADPNSTDEKKTSLHVAEEGHSVVEL-MLAKKAKFGAKMDGCTPMHYASIQGNTVEVVKALLAAGKKNVDDKNVWRKTSLHLAAECGHNDMAELLSSGASLNSLDNN	688
Western clawed frog	LVQLLNNKADPNSTTEKDKTPLHIAAAGHIEIVNV-MLKGRARCAVKMDGCTPMHYAAATGSSEITAKALLKAGKKNVDEKNVWRKTPLHLAAEHGHSDLINLLQNGAAINALDNN	704
American chameleon	LVELLLGSNADPNSTADKEKKTPLHLASIGSHLSTIKA-LLAKSRFVGA KMDGCTPMHYAASIGNMEILKALLVAGNYKNINDKNIWRKTPLHLTAEYGHSDMMHYLLSNGSAINALDNN	674
King cobra	MVELLLNFKADPNATDKEKKSPLHSATLGGHFYAVKA-LLAKSRVASKMDGCTPMHYAASIGNMEILKELLVAGDNKNINDKNIWRKTLLHLAAEHGQSNLIDFLLSNGSAINALDNN	682
Common garter snake	MVEMLLNFKADPNATDKEKKTPLHFATLGGHFYAVKA-LLAKSRVASKMDGCTPMHYAASIGNMEILKELLVAGNYKNINDKNIWRKTLLHLAAEHGHSNLDIFLLSNGSAINALDNN	682
Chinese alligator	MVELLINSNADPNVTDREKKTPLHAAALRGHLSIVEL-LLAKKARFVGA KMDGCTPMHYAASIGNMEILKALLVAGNYKNINDKNIWRKTPLHLTAEYGHSDMMHYLLSNGSAINALDNN	686
Western painted turtle	MVELLLSFNADPNAMDKKKTPLHTAAMGGHLNTVKV-LLAQKARFVGA KMDGCTPMHYAASIGNMEILKELLVAGNYKNINDKNIWRKTPLHLAAEHGHSNLDIFLLSNGSAINALDNN	688
Green sea-turtle	MVELLLSFNADPNAMDKKKTPLHTAAMGGHFNVTVKV-LLAQKARFVGA KMDGCTPMHYAASIGNMEILKELLVAGNYKNINDKNIWRKTPLHLAAEHGHSNLDIFLLSNGSAINALDNN	688
White-throated sparrow	LAEMLLKARADPNADKEKKTPLHAAALRGHLSIVEL-LLAKKGRVGA KMDGCTPMHYAASIGNMEILKALLVAGNYKNINDKNIWRKTPLHLTAEYGHSDMMHYLLSNGSAINALDNN	687
Chicken	MVEMLLNANADPNADKEKKTPLHAAALRGHLSIVQV-LLAKKGRVGA KMDGCTPMHYAASIGNMEILKELLVAGNYKNINDKNIWRKTALHIAAEYGHSDLINLLLYGAAINALDNN	685
Turkey	MVEMLLNANADPNADKEKKTPLHAAALRGHLGIQVQ-LLAKKGRVGA KMDGCTPMHYAASIGNMEILKELLVAGNYKNINDKNIWRKTALHIAAEYGHSDLINLLLYGAAINALDNN	685
Budgerigar	VVEMLLNADPNADKEKKTPLHTAARVGHLSIVEV-LLAGKARFVGA KMDGCTPMHYAASIGNMEILKELLVAGNYKNINDKNIWRKTALHIAAEYGHSDLINLLLYGAAINALDNN	685
Golden eagle	MVEMLLNANADPNADKEKKTPLHTAARVGHLSIVKV-LLANKGRVGA KMDGCTPMHYAASIGNMEILKELLVAGNYKNINDKNIWRKTALHIAAEYGHSDLINLLLYGAAINALDNN	687
Barn owl	MVEMLLNANADPNADKEKKTPLHIAAMRGHLSIVKA-LLAEKGRVGA KMDGCTPMHYAASIGNMEILKELLVAGNYKNINDKNIWRKTALHIAAEYGHSDLINLLLYGAAINALDNN	687
Spotted gar	VVQLLLRNGADPNADVDEKKSPLHMAALRGHLSIVEL-LLAGKARFVGA KMDGCTPMHYAASIGNMEILKELLVAGNYKNINDKNIWRKTALHIAAEYGHSDLINLLLYGAAINALDNN	690
Asian bonytongue	VARLLSSTGADANAVDKEKKTPLHFAAMGGHGEVASV-LLARKASFRAKMDGCTPLHYAAGGHLDVAVLLSTGK-KSVNDKNVWRKTALHLASEHGQDSLIDLLMCSGANVNALDNN	692

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Tasmanian devil	RDTPLHCACKTGHWSVTSMINYSQG-----EKFDLQAVNSLGKTPLOVAEGTVIENQEQIVTLLKKKMF LTR	757
Gray short-tailed opossum	RDTPLHCACKTGHWSVTSLINCQSQR-----EKFDLQASNSLGKTPLOVAEGSATQSQEQIVTLLRRKMF LTR	750
Large yellow croaker	KDTPLHCAARGGHQEVVKRLVNWGGHGMGRQKKANLQATNNVDKTPLOVAESGDTPOHEEIVTLLMRKMF L I K	774
Nile tilapia	KDTPLHCAARGGHKVMKILVNWQAGHVGRNKKANLQAKNIGKTPLOVAESKHTPERENTAILLRKMF L M K	773
Burton's mouthbrooder	KDTPLHCAARGGHKVMKILVNWQAGNVGWRNKANLQAKNIGKTPLOVAETKHTPEHENTAILLRKMF L M K	774
Elephant shark	KDTPLHCACRSGNVGAHRLANWAG-----QAKAFHVTTNNVRKTPLOVASESGSDSGHRQIVVLLRRKMM LTR	745
Atlantic herring	KDTPLHCACRTGHLGIVQRLVNWVHK-----EKANLQAINNVKTPLOVAEAGDTLNHTHIVTLLKKKMF L M K	756
Zebrafish	KDTPLHCACKTGHVLTQVRLNVTNG-----ERANLQATNNVKNALQVAEAGDTEAHENISTLLKKKMF L V K	744
Blind cave fish	KDTPLHSACRGGHVDTVQRLVNWVQ-----QRANLHATNNVKTAVQVAESEDSPNHQS IATLLKKKMF I I K	749
African coelacanth	RDTPLHSACRAGDLPTVQMLVNWVQ-----KKGILQARNRSRKIPLEVAQSEGTHHHS I I TFLKKKML L I K	756
Western clawed frog	RDTPLHCACKAGHLSVQTLVSVWQ-----EKANLQATNGLKTPLOVAESSSSDAHQH IATLLKKKML I I R	772
American chameleon	KDTPLHCACKAGHFNVTNLVNSWAG-----EKVNLQATNSLKKTPLOVAESSSTDQQAQIVTLLKKKML L I R	742
King cobra	KDTPLHCACKAGHFDVSRALLNWSAG-----DKANLQAANSLKTPLOVAESSVTEHQAQIVNLLKKKML L I R	750
Common garter snake	KDTPLHCACKAGHFDVSRALLNWSAG-----DKANLQATNSLKKTPLOVAESSVTDQQAQIVNLLKKKML L I K	750
Chinese alligator	KDTPLHCACKAGHFNVSLSVWSQ-----ERANLQATNSLRKTPLOVAEFNTTENQAQIVTFLKKKMF I T K	754
Western painted turtle	KDTPLHCACKAGHFNVSLSVWSQ-----EKANLQATNSLKKTPLOVAEFSTSDNQQAQIVTLLKKKML I R -	755
Green sea-turtle	KDTPLHCACKAGHFNVSLSVWSQ-----EKANLQATNSLKKTPLOVAEFSTSDNQQAQIVTLLKKKML I R -	755
White-throated sparrow	RDTALHCACRAGHLSAVSALLSWARG-----EKANVLAVNSLRKTPLOVAEFHKTENQAQ I I TLLRRKML I A K	755
Chicken	KDTPLHCACKAGHLNVAANSLNWSQ-----EKANLVAANSLKTPLOVAECNKTENQAQ I V TLLKKKML M T K	753
Turkey	KDTPLHCACKAGHLNVAANSLNWSQ-----EKANLVAANSLKTPLOVAECNKTENQAQ I V NLLKKKML M A K	753
Budgerigar	RDTALHCACKAGHLNVAANSLNWSQ-----QRANLLAANSLQKTPLOVAEFNI TENQAQ I V TLLKKKML I T K	753
Golden eagle	KDTPLHCACKAGHFNAANSLNWSQ-----EKANLVAANSLKTPLOVAEFNKAENQAQ I V KLLKKKML I T K	755
Barn owl	KDTPLHCACRAGHFNAANSLNWSQ-----EKANLVAANSLKTPLOVAEFNKTENQAQ I V TLLKKKML I T K	755
Spotted gar	KDTPLHIASRAGHLGTVHRLVNWVQ-----EKVNLQATNSVKKTPLOVAQGTGDTEKHQQAQ I V TLLKKKMF L I K	758
Asian bonytongue	KDTPLHCATRFGHLESVQRLLSWTGG-----TGANLRAKNNVDKTPLOVAQCHHTANHQ I A S L L Q K K M L L I K	760

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Figure S1. Sequence alignment of Caiap gene in different species. (A) Diagram showing the exons/introns organization of zebrafish caiap gene, indicating the position where the Caiap MO and gRNA bind. (B) Multiple alignment of zebrafish Caiap sequence with other identified Caiap sequences. The predicted CARD sequences are black boxed and yellow boxed indicate the ANK domains. (*) Identity in one position; (:) conservative substitutions in one position; (.) semiconservative substitutions in one position. The accession numbers for Caiap sequences are XP_685576 for zebrafish (*Danio rerio*), XP_007259539 for blind cave fish (*Astyanax fasciatus mexicanus*), XP_012694853 for atlantic herring (*Clupea harengus*), XP_006635081 for spotted gar (*Lepisosteus oculatus*), KPP59498 for Asian bonytongue (*Scleropages formosus*), KKF28470 for large yellow croaker (*Pseudosciaena crocea*), XP_006002757 for African coelacanth (*Latimeria chalumnae*), XP_005479286 for Nile tilapia (*Oreochromis niloticus*), XP_007901907 for elephant shark (*Callorhinchus milii*), XP_014189326 for Burton's mouthbrooder (*Haplochromis burtoni*), XP_008107583 for American chameleon (*Anolis carolinensis*), XP_013917140 for common garter snake (*Thamnophis sirtalis*), XP_006025802 for Chinese alligator (*Alligator sinensis*), XP_005284853 for western painted turtle (*Chrysemys picta bellii*), ETE70266 for king cobra (*Ophiophagus hannah*), XP_007059125 for green sea-turtle (*Chelonia mydas*), XP_010714589 for turkey (*Meleagris gallopavo*), XP_004936902 for chicken (*Gallus gallus*), XP_005151355 for budgerigar (*Melopsittacus undulatus*), XP_011570978 for golden eagle (*Aquila chrysaetos canadensis*), XP_009961493 for barn owl (*Tyto alba*), XP_005482422 for white-throated sparrow (*Zonotrichia albicollis*), XP_002931656 for western clawed frog (*Xenopus tropicalis*), XP_003767351 for Tasmanian devil (*Sarcophilus harrisii*), and XP_007480566 for gray short-tailed opossum (*Monodelphis domestica*).