

Spotted Gar γ -like	-----MVISKKA-----
Asian Arowana γ -like	-----MPPKK-----
Coelacanth ASIC1	-----MAAPCHSSDSV-----LSPYDSKDRE-----
Catfish ASIC1	-----MVTLTTTTREPVE-----NNGSKAPKAG-----
E. Lamprey ASIC1	-----MDLKGAPSDE-----
E. Shark ASIC1	-----MDLKPPAE-----
J. Medaka ASIC1	-----MDLKADSD-----EMDYKRPAPI-----
Black Rock Cod ASIC1	-----MDLKADSE-----DMDYKRPAPI-----
Lancelet γ -like	-----MS-----
Lancelet α -like	-----MPRT-----
E. Shark α	-----
Frog δ	-----MES-----TEKEKKEGLI-----
Coelacanth α	-----MSE-----KKEEKSKGLI-----
S. Lamprey α	-----PPTVLEFWR-----GSVT-----
J. Lamprey α	-----
W. Lungfish α	-----MPNKEENA-----ENGKKKEGLF-----
A. Lungfish α	-----MTDKEEEA-----EGGKKKEPMI-----
Ropefish α	-----MSTTD-----DKQERKEGLL-----
Frog α	-----MTK-----EEKNEKEALI-----
Salamander α	-----MTEE-----KKEKEGLI-----
Cow α	-----MKGDKPEEPGPGPEPSGPPPTEEEEALL-----
Human α	-----MEGNKLEEQDSSPPQSTPGLMKGNKREEQGLGPEPAAPQQPTAEEEALI-----
Chicken α	-----MGTASRGGSVKAEMPEGEKTRQCKQETE-----QQQKEDEREGLI-----
Turtle α	-----MHQVVAVKAENVVGERLRRCKQEAQKQKVEEVAEKLEKECQGLI-----
Cow δ	-----MENGRLMAQVGRPGWGQAKWWAGAPLSLTSQMQAEGTGQTVGGGPGTWTCPQASPP
Human δ	MAEHRSMMDGRMEAATRGGSHLQAAAQTPPRGPPSAPPPPPKEGHQEGLV-----
Coelacanth δ	-----CLQSLKM-----AQEEDKEEAVI-----
Chicken δ	-----MEQEAAAR-----EEEERKEGLI-----
Turtle δ	-----MEQEWV-----NEEMGDEGLI-----
S. Lamprey β	-----MKIRKYLT-----RSLHRLQ-KG-----
J. Lamprey β	-----MANMKIRKYLT-----RSLHRLQ-KG-----
E. Shark β	-----MLWVSARRCLS-----QALRRLQ-DG-----
Coelacanth β	-----MSVRKYFT-----RALHRLQ-KG-----
Ropefish β	-----MGVQKYLT-----YALHRIQ-KG-----
W. Lungfish β	-----MSFLKRFCV-----RSWHRIK-KG-----
A. Lungfish β	-----MFLKRWFI-----RALHRLQ-KG-----
Frog β	-----MIHGKMKRLKRYFT-----RALHRIQ-KG-----
Cow β	-----MHVKKYLL-----KGLHRLQ-KG-----
Human β	-----MHVKKYLL-----KGLHRLQ-KG-----
Chicken β	-----MNLKRYFV-----RALHRLQ-KG-----
Turtle β	-----MFTGMTMNFKRYFI-----RVLHRLQ-KG-----
S. Lamprey γ	-----MASEGDSKRVLH-----RVKDTLKIDG-----
J. Lamprey γ	-----MASEGDSNKRVLH-----RVKDTLKIEG-----
Ropefish γ	-----MESVAKKLPK-----KVKEKLPVTG-----
E. Shark γ	-----MESVGAMEPGKRKLSA-----KIMEKLPVTG-----
W. Lungfish γ	-----MKNTKKFKE-----SVKKQLPLTG-----
A. Lungfish γ	-----MGHGRRISE-----SIKKQLPVTG-----
Coelacanth γ	-----ATMTSRKKSLPE-----KIKENLPVTG-----
Frog γ	-----MSKSGKKLTQ-----KLKKNLPVTG-----
Cow γ	-----MAPGEKIKAK-----KIKKNLPVTG-----
Human γ	-----MAPGEKIKAK-----KIKKNLPVTG-----
Chicken γ	-----MAPGKITA-----RIKKTLPVRG-----
Turtle γ	-----MEPPRPGDTRELNMAPGKTIKA-----KIKKTLPVTG-----

Spotted Gar γ -like	-----TLQSI C RET L IHT S A H G V SSILRS-RSNHQKNCWIIFFVVVVVGCML- W QC
Asian Arowana γ -like	-----PGAMTSLWMLRDDI Q HT T A H G I PNIFRA-RHWFRSLWAMFVIFAFC C AI- W QC
Coelacanth ASIC1	-----KRNHSLKQITIAFV K NS K F H G I RYIFAYHISKQRRAIWFLAFFIATGL L AI W SL
Catfish ASIC1	-----FERMSSMAKITLAFV F RT K V H GLRYVFAADKSKPR R FFWLVAICVCLALL F I W SC
E. Lamprey ASIC1	-----SLDQARPSSVATFAD S CT L H G I RHIFSPGGLSVRRL L WLLAF L GSLS L LV- L QS
E. Shark ASIC1	-----DGVSNHPASVEAF A KT S T L H G I SHIFTYER F S F KRIIWTLAF L GSLS F LV- H TC
J. Medaka ASIC1	-----EVFATRST L H G I SHMFTYERMCL K RTLWILFF M LSVGV L V- M VC
Black Rock Cod ASIC1	-----EVFASRST L H G I SHMFTYERMCI K RTLWILFF L SSVGV L V- M VC
Lancelet γ -like	-----EKRP S VRSTLRKY G ENTS A H G I PRAV T T-KSLPRRLFW T CLFLASFSY F L- Y QA
Lancelet α -like	-----TDNKVASALLE-FADTT T H G V PRAV G S-SSLLRKICW T VAFVAS L GY F L- Y QA
E. Shark α	-----MDLARALALS R REA I C H PAP R K P ----- W R-
Frog δ	-----EFYDSFEDMLTFFC D NT T I H G T VR L NC S RKN K M K TTFWLV L YFVSFAM M Y- W QF
Coelacanth α	-----EFYSSYS D L F Q F FC S TT T I H G A IR L VC T ERN K M K TA F WS M LFV A S F GL M Y- W QF
S. Lamprey α	-----DFYDSYDEME F FC D NT T I H G T IR L VC S KRN K L K TA F WS L L F TV T VIL F Y- Y TS
J. Lamprey α	-----MFEFFC D NT T I H G A IR L VC S KRN K L K TA F WS L L F IV T VIL F Y- Y TS
W. Lungfish α	-----EFYDS F QEL F EFFC I NT T I H G T IR M VC S KH N M K TA F WT I L F IAT F GIM Y - W QF
A. Lungfish α	-----GFYDSYQEL F EFFC N NT T I H G T IR M VC S KH N M K TV S WT I L F IT T FGV M Y- W QF
Ropefish α	-----EFYTSYS D L N FFC S NT T I H G A IR L VC S EN R M K TA F W I L F PGT V AIL Y - W QF
Frog α	-----EFFSSYREL F EFFC S NT T I H G A IR L VC S RR N M K TA F W L V L VT F GL M Y- W QF
Salamander α	-----EFYSSYREL F EFFC N NT T I H G A IR L VC S AH N M K TA F W V V L F I AS F GL L Y- W QF
Cow α	-----EFHRSYREL F EFFC N NT T I H G A IR L VC S QH N M K TV F W A V L W L CT F G M Y- W QF
Human α	-----EFHRSYREL F EFFC N NT T I H G A IR L VC S QH N M K TA F W A V L W L CT F G M Y- W QF
Chicken α	-----EFYGSYQD V FQ F FC S NT T I H G A IR L VC S K K N K M K TA F W S V L F I L T FGL M Y- W QF
Turtle α	-----EFHKSYHEL F Q F C N NT T I H G A IR L VC S KRN K M K TA F W S V L FF L T F GL M Y- W QF
Cow δ	LP EEEE HGERLVELHAS F REL V TTFFC T NT I H G T IR L VC S SQN R L K TA S W G LL S L A G L V L Y- W QF
Human δ	-----ELPAS F RELLTFFC T NT I H G A IR L VC S RGN R L K TT S W G LL S L A G L VAL C - W QL
Coelacanth δ	-----EFYDS F KD L FQ F CA H TT V H G G IR L IC S ERN M M K TA F W I L F FA S FGL M Y- W QF
Chicken δ	-----EFYDS F KD M FEFFC K NT T I H G T IR L VC S SN K M K TA F W T LL L LA S FGL M Y- W QF
Turtle δ	-----EFYSS F KD M FEFFC K NT T I H G T VR L VC S SN R M K TA F W T LL L FA S FGL M Y- W QF
S. Lamprey β	-----PVA-SVSE L LYWYCM T NT H G C KR I V V Y--GKKRVLWFL I TI I MLGV L - W QW
J. Lamprey β	-----PVA-SVSE L LYWYCM T NT H G C KR V V V Y--GKKRVLWFL I TI I MLGV L - W QW
E. Shark β	-----PGE-SYRE L LVWYC E TT S H G P KR I L T E--GPKKR L WLL L TL L LG V V C - W QW
Coelacanth β	-----PGY-TYKE L LVWY C DNT H G P KR I I E --GPKKQ V LWFL I TL T FTAL I F- W QW
Ropefish β	-----PGY-TYKE L LVWY C NNT H G P KR I V T E--GPKKR L WFL I TL V FAAL V F- W QW
W. Lungfish β	-----PGY-GYAE L FHWY C DNT H G P KR L I E --GPKKK A MWGL L TI T FA C L V F- W NW
A. Lungfish β	-----PGY-GYSE L FVWY C NNT H G P KR L I E --GPKKK T LWS L FT V TFA C L V F- W QW
Frog β	-----PGY-TYKE L LVW F C D NT H G P KR I I E --GPKKR V MWFL I TL V FA G L V F- W QW
Cow β	-----PGY-TYKE L LVWY C DNT H G P KR I I E --GPKKK A MW F VL L TL L FAAL V C- W QW
Human β	-----PGY-TYKE L LVWY C DNT H G P KR I I E --GPKKK A MW F LL L TL L FAAL V C- W QW
Chicken β	-----PGY-TYKE L LVWY C DNT H G P KR I I E --GPKKK V MW F FL L TL L FA S L V F- W QW
Turtle β	-----PGY-TYKE L LVWY C DNT H G P KR I I E --GPKKK V IW F FL L TL L FA S L V F- W QW
S. Lamprey γ	-----PDP-SITD L LD F YL N NT N H G M RR I AVS-KG P IK T IW I V F SL I AV A M V F- W QG
J. Lamprey γ	-----PDP-SITD L LD F YL N NT N H G M RR I AVS-KG P IK T IW I V F SL I AV A M V F- W QG
Ropefish γ	-----PYA I TVKEL M VWY C NY T NT H G C RR I V S -RG R LRRW I W T VL T LSA V AL I S- W QC
E. Shark γ	-----PQAL S MS E LARWY C YNT T H G F RR I V S -RG R LRRG A W V LL T G C AAS L I V - W QC
W. Lungfish γ	-----PES R TVK D LDWY C NNT T H G C RR I AVS-RG H LRRW I W I C F TL T AV A I I F- W QY
A. Lungfish γ	-----PEA P TVK N LDWY L NNT T H G C RR I AVS-RG Y LRRW I W I C F TV S SVG M I F - W QW
Coelacanth γ	-----PQAL S I S ELMRWY C YNT T H G C L R I V AS-RG R LRRW I W I LL T LSA V AL I F- W QC
Frog γ	-----PQAP T LYEL M QWY C LN T NT H G C RR I V S -KG R LRRW I W I SL T LC A V A V I F- W QC
Cow γ	-----PQAP N IKEL M QWY C LN T NT H G C RR I V S -RG R LRR L W I FL T LT A V A L I F- W QC
Human γ	-----PQAP T IKELMRWY C LN T NT H G C RR I V S -RG R LRR L W I G F TL T AV A L I L- W QC
Chicken γ	-----PQAP T LR E LMRWY C LN T NT H G C RR I V S -RG R LRR F IW I LL T LS A V G L I L- W QC
Turtle γ	-----PQAP T VS E LMHWY C MNT T H G C RR I V S -RG R LRR F IW I LL T LS A V G L I L- W QC

Spotted Gar γ -like	-----
Asian Arowana γ -like	-----
Coelacanth ASIC1	-----YWLDDLHQDLSVNDQSLGVL-----
Catfish ASIC1	-----YWIDIMHANHSVNRQSMAMLK-----
E. Lamprey ASIC1	-----ELLALLDERMEIVEPRFADAQVIAQLRK-----
E. Shark ASIC1	-----ELLTLLNNRYEIPDPHLAERHILEALVE-----
J. Medaka ASIC1	-----ELLALLNGRYEIRDPHLVEENVLQVLRE-----
Black Rock Cod ASIC1	-----ELLALLNGRYEIRDPHMVEEHVLQILKE-----
Lancelet γ -like	AFQNGAGFIPKQP-----QGQNNPNSNGSTPATGSTTVATAPTTTQNSTS----
Lancelet α -like	PPSPGPRRKRGVDTSQDNRPEYDV----DWEDPYPPREESAEHELLRERRETGSSAGSADSQG
E. Shark α	-----
Frog δ	APESGQQVVDLQD-LLNNLTGQVN-GGFYLDESIVLLKLQENGSGPALPG-----
Coelacanth α	TSQHGTSDDSMQSDIRRSNRIILS----APDRVPLQVLDEPAAEHARTENQMAGT-----
S. Lamprey α	PPATKAAGTAAAP-----GIRLDTGVVLERTGPD-----
J. Lamprey α	PPATQSAGTAAAP-----GIRLDTGVVLERTGPD-----
W. Lungfish α	PANSNQSACNNTS-NKQDS-----NNKYIPLFELTYNDTQSGYPFKGTTNGSSSFN----
A. Lungfish α	PLTSGNQSACNSS-STAGTRAFDE-----SYMKLEFLNDENTAYS GPVKGATNSTSPVN----
Ropefish α	FSKKVQONSTSH-TATEKSRNSN-PL--FNKKFVLEVLNRETSVNFNTPEKKGNGHV-----
Frog α	-----STGVQ-GWIPNNQRVKRD-AGLPYLLELLPPGSETHRVSRSVIEELQVK-----
Salamander α	SSGMDALYHESRRER-----RSATFPLFPLERLSPEQGAGGVRRSSGAAVREEEL
Cow α	-----SSKTLV-AHARSRRDLR-----EPLPHPLQRLPVPAPPHAARGVRRAGSSM-----
Human α	-----SFTTLV-AGSRSRRDLR-----GTLPHPLQRLRVPPPHGARRARSVASSL-----
Chicken α	MSLARS DGSAQFS-HRRTSRSLH-----HVQRHPLRRQKRDNLVSLPENS PSVD-----
Turtle α	MSLVQSNWAAQSS-RKRSRSLSH-----HVHRHPLRRHKRDEPASLKGNSPVVD-----
Cow δ	FSDSMDALGAEVP---GPEPAFH----LDRRIQLQLRPLDQGNR-----
Human δ	LSKGRAALSATVP---RHEPPFH----LDREIRLQRLSHSGSRVR-----
Coelacanth δ	ASEDITPNDISIGDGAGHGKINISDNMNITLDQSIPLVLIRDKDSLSSSAHSFPLD-----
Chicken δ	TSASLFHVNEKSI-HVRDLPSTGNHNGSSFKLSQKFSLLRTTEFNNRT-----
Turtle δ	TSIFSSRYKKDIS-VKGGSANLSS-SSFQLN RHISLVMLKEPDTGSR-----
S. Lamprey β	DSSTPSAYDTSYAVG-----PWQEIPLVLIDRRDPNRTVVTEVMCSRAAVGIETH
J. Lamprey β	DSSTPSPYNTSYA-KA-----PWQDIPLVLIDRRDPNRTVVTEVSKQSYLINGSID
E. Shark β	QNRTLPPPMDDLEDKWSRGGAGLG----PGPLVPLVIEQTEKGEEVLVRILGDAESDVP----
Coelacanth β	ERHSLTPVWKTNL-KKLLILPKTSQACVYLQKPQFLYLVSFNKHILKIVVLPL-----
Ropefish β	ISGKVPPELPLMA----NTSLVSV----FLQNIPLVIMDES DVNNPAIISLFENGTDGF-----
W. Lungfish β	QSGTLPDPLD TT-SRNATGQNL-----LWYHLPLVIIDETDGDNPV IINILGPNNLTSTNGTT
A. Lungfish β	TNGTLPVVFPDMR-SS-YLTGDPP----PWYQIPLVMIDETDADNPTVTNVLGTDAL-----S
Frog β	QNQGNFTTHNNQT-RQ-NVTLDPA----LWNH IPLVVIDETDPRNP I IHNIFDNNAVYSKN--S
Cow β	LSQVNDTRALNLS-----IWHHTPLVFINEQNPHHPVVDLDFEDNFNGSASNSP
Human β	LSHANATRNLNFS-----IWNHTPLVLIDERNPHHPMVLDLFGDNHNGLTSSSA
Chicken β	HGDPISPLLLNNS-NA-TEGLDLD----LWNQIPLVLIDEQDKDNPVIVEIFETNQSAAGNQ-T
Turtle β	HGATISAPPLNSS-ETVSQQLDLK----LWNQIPLVLIDESDPDHPV IIDL FETDQSGSGTRPN
S. Lamprey γ	TNLSAAKRDD-----EPLPIPLVWLDTTVTNQTVVTDVISGKFHVVPKVE
J. Lamprey γ	TNLSAAKRDD-----EPLPMPVWLDTTVTNQTVVTDVISGKFHVVPGEVE
Ropefish γ	EPTEKRKRRLVTDKHAEDGQVVS N---LLKDIPLFWLDKKTFSAAFAPN---NRKRTYPEKFL
E. Shark γ	DAEDDGGEVRPQH-E-AEPGEGSR-PS--LFQNIPL LQIQARGPEYSIVSNLLSRQRHVRNGTVS
W. Lungfish γ	TDGSGNFSSRSL-SLDDIPVKTRSLN--LLQDMSLIKVETAKDGQLVASDIVTDLQYRISGTAI
A. Lungfish γ	TGCSNRKRLRSVLL-NEAPEEDSGV-AK--LLQDMPLMKFEVIKEDHVI VSELSSNRQYRINNTFI
Coelacanth γ	LDDNESHVLRSTE-TSLNSES DKE-VL--FSRSLPL LKIEEME QNYTIVSDVFS DVKQRVNAPLM
Frog γ	EPLIRSKRDVG VNVENSTEDI-----FLKQIPLYRLESVKGSQ LVVSDLKTKKRTRMSAKVI
Cow γ	EITSRKRREAQSW-SSVRKGTDPK----FLNLAPLMAFEKGDTGKA--RDFFTGRKRKV NARI I
Human γ	E--SRKRREAESW-NSVSEGKQPR----FSHRIPL LIFDQDEKGKA--RDFFTGRKRKV GGSII
Chicken γ	EGKT KVRRRAAGDWNGETSL-----FFRHVPLLRFE---NSFRAATDLRSGRKRKVEGSVF
Turtle γ	EGKS KVRRDADDWNATESK-----FFEI IPLKFE--DLSKKTVTEIPSGNKRKIETS VF

Spotted Gar γ -like	-----TDYANSS Q NQKAY-----	
Asian Arowana γ -like	-----AQRWNSTGY P GA---TRDTN-RCA-NSF-----S-	
Coelacanth ASIC1	-----REDTKQKILQ L S-----NFTQY-----TP	
Catfish ASIC1	-----HSRHRERLMR L L-----DFSDY-----VP	
E. Lamprey ASIC1	-----HADFRVH-----KP	
E. Shark ASIC1	-----KANFRNF-----KP	
J. Medaka ASIC1	-----RADFESY-----KP	
Black Rock Cod ASIC1	-----RANFDNY-----KP	
Lancelet γ -like	-----DEDDD-D Y DYDGY-----HG	
Lancelet α -like	SSDSSDSSDSSD-----SSDSSDSSDSS D SSDSSDSSDSS S DYASYMYGGTWSSHYGQDGSS	
E. Shark α	-----SP	
Frog δ	-----EKKFK-VGFK L C---NSSRD-DCYYKVF-----WS	
Coelacanth α	---DINN P ALY-----KGEFRKIGFK L C---NASGL-SCFYQAY-----SS	
S. Lamprey α	-----VGFK L C---NATGG-DCFYQSY-----GS	
J. Lamprey α	-----VGFK L C---NATGG-DCFYQSY-----GS	
W. Lungfish α	-----NSEFYRVGF K VC---NDTDG-VCFYQ I Y-----SS	
A. Lungfish α	-----HTEFYRIGFK L C---NATGE-DCFYQ T Y-----SS	
Ropefish α	---AKNN P PLH-----NQN W Q-IGFK L C---NASGQ-DCYFQAY-----SS	
Frog α	-----RREWN-IGFK L C---NETGG-DCFYQ T Y-----TS	
Salamander α	PID-----SISWN-IGFK L C---NDSGK-DCFYQ K Y-----SS	
Cow α	---RDNN P QVN-----RKDWK-IGFQ L C---NQNK S -DCFYQ T Y-----SS	
Human α	---RDNN P QVD-----WKDWK-IGFQ L C---NQNK S -DCFYQ T Y-----SS	
Chicken α	-----KNDWK-IGFV L C---SENNE-DCF H Q T Y-----SS	
Turtle α	-----KSDWK-IGFI L C---NETNE-DCF H Q T Y-----SS	
Cow δ	-----VGFK L C---NSTGG-DCVERAY-----SS	
Human δ	-----VGFR L C---NSTGG-DCFYRGY-----TS	
Coelacanth δ	-----KKGFR-VGFR L C---NVTGK-DCFYQSY-----SS	
Chicken δ	-----GKRQSLVGFR L C---NATGG-NCFYKTY-----SS	
Turtle δ	-----KKHFK-VGFK L C---NATGG-NCFYKAY-----SS	
S. Lamprey β	VDNRVF-----HIGFCKSALG V C---CDSAGDKCFYSEY-----LS	
J. Lamprey β	TVSVPPPERAAADATSSLIPHLGKDVR-IGFR L C---DTAGD-KCFYSEY-----LS	
E. Shark β	---RDAKLGRG-----PRSYK-VALH L C---SKDGR-DCLYRNF-----TT	
Coelacanth β	-----ANEKKQKVS V LCKDERMGKKK S SVYFT-----NA	
Ropefish β	---VQNN P PHP-----TSDLK-VAIK L C---NANKT-ECLYW N F-----TS	
W. Lungfish β	AGYPI P -----PRRYK-VAFEL C ---NASGS-DCFYK N F-----SS	
A. Lungfish β	PTNNSTTNSSTE-----ARRYK-VAFH L C---NTNGT-DCFYK N F-----SS	
Frog β	SIRNSSEDQTSY-----SQRYK-VAMK L C---TNNNT-QCVYR N F-----TS	
Cow β	APGRPC-----SAHRCKVAMR L C---SHNGT-TCTFR N F-----SS	
Human β	SEKIC-----NAHGCKMAMR L C---SLNRT-QCTFR N F-----TS	
Chicken β	AAPPAPANVTSE-----EKKYK-LAVK L C---SHQGSNNCTYR N F-----TS	
Turtle β	NSSPALS N VTSE-----VKKHK-VAVK L C---HHKDIPQCMYW N F-----TS	
S. Lamprey γ	MRSYFSQNY-----QSSEPLIAIE V C---GEER--KCIY N AF-----TS	
J. Lamprey γ	MRSYFSQNY-----QSSEPLIAIE V C---GEEK--KCIY N AF-----TS	
Ropefish γ	SKSGSRLRF-----HEAQRQAGFQ L C---NSTNVTD C VVYAF-----DT	
E. Shark γ	THSLGNADIL N Q-----EHL---VGFK L CEGGDIDSS-DCTIY T F-----TS	
W. Lungfish γ	TRMYNNMDLTSL-----GGQGH-VGFK V C---NQGQD-NCVIY T F-----NS	
A. Lungfish γ	TRMYNNMDLATV-----GEQ---VGFK I C---DANKS-NCIIY T F-----NS	
Coelacanth γ	RKMFENVAIEN Q -----GEL---VGFK L C---DTNGS-DCAIY T F-----NS	
Frog γ	HRDAESV-----QDPGNMVGFK L C---DPKNSSDCTI T FTF-----SS	
Cow γ	HKASDVMHI-----HNSKEVVGFQ L C---SNDTS-DCAVY T F-----SS	
Human γ	HKASN V MHI-----ESKQVVGFQ L C---SNDTS-DCATY T F-----SS	
Chicken γ	HKDSSIVNS-----GDSNDIIGFQ L C---DANNSS E CALY T F-----SS	
Turtle γ	HQGSSMVNT-----GDPQDVVG F Q L C---DPNNSSD C AVY T F-----SS	

Spotted Gar γ -like	-----IEDSNQL-----GF--LLSKLN-----PDQQAEGHQLEDMLISCHFHEKCD-K-----
Asian Arowana γ -like	-----KFASEFNRLS-----DEEKLDMGHQLEDMLLFCNYHGQPCN-T-----
Coelacanth ASIC1	PAQ-----YQL-----NTTDLINRL-----GHQMEEMLLCRRFQGETCT-S-----
Catfish ASIC1	PPR-----FHL-----NTTEMIGRLS-----HQLEDMLLLCRRFRGESCT-Y-----
E. Lamprey ASIC1	RPFSMREFFYE-----RAGHELREMLLHCKFHGMNCT-P-----
E. Shark ASIC1	KPFNMREFYA-----RAGHDMKDMLLHCIFKGEFCT-A-----
J. Medaka ASIC1	RSFNMRIFYD-----RTGHDIKDMLLSCSYRGTECS-A-----
Black Rock Cod ASIC1	RPFNMRIFYD-----RTGHDIKEMLLSCSYRGVECS-A-----
Lancelet γ -like	DFEMVN-----SFMGLLVQLT-----ASMRQSLGHQGRDFIQECQFDGRTCS-H-----
Lancelet α -like	SSDYMSEDYHHEFELVQNFSSSILGLN-----RTSRRTMGHQYQDLVLECAVDGRSCS-R-----
E. Shark α	G-----RSSEFIRSCKFNRVSCD-N-----
Frog δ	GVNALHEWYKF-----HYINIMSNIP-----AVLNIANNFSKDFILTCHFNEVPCD-E-----
Coelacanth α	GMDAVREWYMF-----HYVNIMQVP-----MVTNPLQETHIRDFVFSCKFNHASCN-Q-----
S. Lamprey α	GVQAVTEWYTF-----QYVNIMSQVP-----SYIKQSDDANIEDFIFSCMFSGMPCS-D-----
J. Lamprey α	GVQAVTEWYTF-----QYVNIMSQVP-----SYIKQSDDANIGDFIFSCMFSGMPCS-D-----
W. Lungfish α	GVDALREWYKY-----QYVNIMGNAIP-----LSTYQEDNPQISNFVYACEFNKISCG-S-----
A. Lungfish α	GVDALREWYKF-----QYINIMAQIP-----SQSNQEDDSQISNFVYACEFNKVSCG-V-----
Ropefish α	GVDAIREWYKY-----HYINIMAQMSMNALADDDSNPKADINNFVFACSFNGAVCS-K-----
Frog α	GVDAIREWYRF-----HYINILARVP-----QEAAIDGEQLENFIFACRFNEESCT-K-----
Salamander α	GVDAIREWYRF-----HYINILARVP-----ATSGVPLNEDSFQNFIFACRFNEDSCS-E-----
Cow α	GVDAVREWYRF-----HYINILSRRR-----QDTSPSLEEDVLGKFIFTCRFNQDSCN-E-----
Human α	GVDAVREWYRF-----HYINILSRLP-----ETLPSLEEDTLGNFIFACRFNQVSCN-Q-----
Chicken α	GVDAVREWYSF-----HYINILAQMP-----DAKDLDESDFENFIYACRFNEATCD-K-----
Turtle α	GVDAVREWYSF-----HYINILARMP-----NTKALDESNFENFIYACRFNEVTCD-K-----
Cow δ	GVVAAREWYRF-----HYINILALLP-----AAHEDSHGSHFVFSCRYDDRDCH-A-----
Human δ	GVAAVQDWYHF-----HYVDILALLP-----AAWEDSHGSDQGHFVLSQSYDGLDCQ-A-----
Coelacanth δ	VMDAIQEWYKF-----HFINIMSQVS-----PMTNVSDSSPIGNVIYSCQYNGKSCS-G-----
Chicken δ	GMDAILEWYRF-----HYMNIMSQQP-----VIINISDHEEKIEDMVYSCQYDGEPCR-P-----
Turtle δ	GVDTIQEWYRF-----HYMNIMSQLP-----VIINISSHEEHIQNLVYSCQYDGEPCR-E-----
S. Lamprey β	GMTAVKQWFHF-----NLLSLLGNLS-----TEEKNLSSSGDELIRSCLFSSDTC-S-A-----
J. Lamprey β	GMTAVKQWFHF-----NLLSLLGELS-----NEEKNLSSSGDELIRSCLFSDNACN-A-----
E. Shark β	GLQAVNEWYSL-----HYMSLMANVS-----LEDRTAMGEHGQDFILSCNFGGHPCD-L-----
Coelacanth β	FLSRVTHNYVQ-----NFFFT-----DSSLVYAPTEGRSLFLQVHYG-EMCA-YFSWTL
Ropefish β	GVDAVNEWYSL-----HFMDIMSKFS-----INEKKQMAYSGKEFILTCLFGNQPCS-Y-----
W. Lungfish β	SLEAVKEWYTL-----HYLNIMLRIP-----LAEKAAMGYSGKDLILTCLFFGGIACD-Y-----
A. Lungfish β	SLEAVKEWYTL-----QYIDIISKLP-----LSQKVEMGYSGKDFILTCLFGGEACN-Y-----
Frog β	GVQALREWYLL-----QLSSIFSNNP-----LSGRIDMGFKAEDLILTCLFGGQPCS-Y-----
Cow β	ATQAVTEWYTL-----QATNIFAQVP-----NQELVAMGYPAERLILACLFGAEPN-Y-----
Human β	ATQALTEWYIL-----QATNIFAQVP-----QQELVEMSYPGEQMILACLFGAEPN-Y-----
Chicken β	AAQAVTEWYIL-----QSTSILSKVP-----LQERIRMGYQAEDMILACLFGAEPN-Y-----
Turtle β	AAQAVTEWYIL-----QSTSILSKVP-----LQERIRMGYQPEDMILACLFGAEPN-Y-----
S. Lamprey γ	AIDAVIQWYRL-----HFINIMAIVP-----EKDKDKLGYSADEFIIDCLFSGTVCDPS-----
J. Lamprey γ	AIDAVMQWYRL-----HFINIMAIVP-----EKDKDKLGYSADEFIIGCLFSGTVCDPS-----
Ropefish γ	GISAVQEWYWL-----HFNNIIAQQS-----LETLEVEMGYSAEEFISTCTFNEAMCS-L-----
E. Shark γ	GMAAVQEWYQL-----HYNNLLAQVP-----PEDKRAMGYSADDLFLTCLYDGLPCD-S-----
W. Lungfish γ	GITALQEWYRL-----NFIDIMAQVP-----NEKKAEMGYSADELIVSCMYDGQACD-S-----
A. Lungfish γ	GVTAILEWYRL-----NYLNIMAQIP-----NEKKLEMGYSADDLIVTCMYDGQSCD-S-----
Coelacanth γ	GITAIQEWYRL-----HYINIMAQVS-----WEKKQEMGYSADDLIVTCFYNGMPCN-S-----
Frog γ	GVNAIQEWYRL-----HYTNILAKIS-----MEDKIAMGYKADELIVTCFFDGLSCD-A-----
Cow γ	GVNAIQEWYKL-----HYMNIMAQVS-----QEKKINMSYSADELLVTCFFDGVSCD-A-----
Human γ	GINAIQEWYKL-----HYMNIMAQVP-----LEKKINMSYSAEELLVTCFFDGVSCD-A-----
Chicken γ	GVNAIQEWYKL-----HYMNIMAQIP-----LETKEELSYSADDLTLTCFFDGLSCD-K-----
Turtle γ	GVNAIQEWYKL-----HYMNIMAQIP-----LETKVNMSYSAEDLLTLTCFFDGLSCD-T-----

Spotted Gar γ -like
Asian Arowana γ -like
Coelacanth ASIC1
Catfish ASIC1
E. Lamprey ASIC1
E. Shark ASIC1
J. Medaka ASIC1
Black Rock Cod ASIC1
Lancelet γ -like
Lancelet α -like
E. Shark α
Frog δ
Coelacanth α
S. Lamprey α
J. Lamprey α
W. Lungfish α
A. Lungfish α
Ropefish α
Frog α
Salamander α
Cow α
Human α
Chicken α
Turtle α
Cow δ
Human δ
Coelacanth δ
Chicken δ
Turtle δ
S. Lamprey β
J. Lamprey β
E. Shark β
Coelacanth β
Ropefish β
W. Lungfish β
A. Lungfish β
Frog β
Cow β
Human β
Chicken β
Turtle β
S. Lamprey γ
J. Lamprey γ
Ropefish γ
E. Shark γ
W. Lungfish γ
A. Lungfish γ
Coelacanth γ
Frog γ
Cow γ
Human γ
Chicken γ
Turtle γ

---SFFNAFFNHHKFGN**CYTFNS**SLTKMENRGRLMR-RDVLNATKAGFSYGLT**MELSIEQDEYIEQF**
---SFFSGFINYKFGN**CYTFNS**SHKQTDIRGRPIK-SESLNTTKAGFMYGLHLELF**IQQNEYVRDI**
---RNF**TP**IF-TRYGK**CYTFNS**-----G--KDG**N**PL**L**TLKGGM**G**NGLEIMLD**I**QDDY**L**PVW
---KN**F**TT**I**Y-TRYGK**CYTFNS**-----G--LDG**N**PL**L**TLKG**G**TGNGLEIMLD**I**QDEY**L**PVW
---QD**F**QTVY-TRYGK**CYTFNS**-----G--KDG**R**PL**L**TS**M**KGGMGNGLE**M**LD**I**QDEY**L**PVW
---QD**F**KIVF-TRYGK**CYTFNS**-----GQIKD-QPIL**T**LEGGTGN**G**LE**M**LD**I**QDEY**L**PVW
---EN**F**KVIF-TRYGK**CYTFNS**-----G--KDG**Q**PL**M**VT**M**KGGTGN**G**LE**M**LD**I**QDEY**L**PVW
---DN**F**KVIF-TRYGK**CYTFNS**-----G--QDGRPL**M**VT**M**KGGMGNGLE**M**LD**I**QDEY**L**PVW
---RN**F**TT**F**EDSTYGN**CFTFNK**-----D--KDGEVLHTATSAG**PLHGLSLILYIEQDEYIPAI**
---TD**F**GRILDEKYGN**CYTFNS**-----D--K--VLQ**R**KVRDPGPAH**GLQLTLYIEQDEYVPAV**
---NNY**T**TF**S**HPRYGT**CYTLNT**-----G-----PVSWRVLG**P**GSANGL**T**LT**L**QVGE**G**--LR**F**L
---REY**I**H**F**HHPIYGN**CFTINN**-----H--GK-EN**S**WYSPR**P**GKQYGL**S**MV**V**KADLHD**N**MP**L**L
---GN**Y**TYFN**H**PVYGN**CYTFNG**-----G--ST-GN**L**WSSTK**P**GRE**N**GL**S**LL**R**TEQNDY**IPFL**
---SEY**S**RFH**H**PTYGN**CYTFNS**-----A--NS-SKL**W**QASK**P**GRD**Y**GL**S**LI**L**RT**E**QNDY**IPFL**
---SEY**S**RFH**H**PTYGN**CYTFNS**-----A--NS-SKL**W**QASK**P**GRD**Y**GL**S**LI**L**RT**E**QNDY**IPFL**
---GN**Y**TQFN**H**PQYGS**CYTFND**-----G--DD-NN**P**WISFSP**G**VESGL**S**LV**L**RT**E**QND**F**L**P**YL
---EN**Y**TRFR**H**PVYGN**CYTYND**-----G--QS-AT**P**WAS**F**VP**G**VGN**G**LS**L**V**L**RT**E**QND**F**L**P**FL
---GN**Y**TT**F**HH**P**MYGN**CYTFNS**-----W--ED-GHEWSV**S**TP**G**VESGL**S**LL**R**TEQND**F**I**P**LL
---AN**Y**SS**F**H**H**AIYGN**CYTFNQ**-----N**Q**SDQ-SN**L**WSS**M**PGIK**N**GL**T**VL**R**TEQHDY**IP**LL
---AN**Y**TH**S**H**H**PLYGN**CYTFNE**-----D**H**SRN-DS**R**WASS**M**PGIN**Y**GL**S**LV**L**RT**E**QNDY**IP**LL
---AN**Y**SH**F**H**H**PMYGN**CYTFND**-----K--NS-SN**L**W**M**SS**M**PGV**N**NGL**S**LT**L**RT**E**QND**F**I**P**LL
---AN**Y**SH**F**H**H**PMYGN**CYTFND**-----K--NN-SN**L**W**M**SS**M**PGIN**N**GL**S**LM**L**RAEQND**F**I**P**LL
---AN**Y**TH**F**H**H**PLYGN**CYTFND**-----NS-SS**L**WT**S**SL**P**GIN**N**GL**S**LV**V**RT**E**QND**F**I**P**LL
---AN**Y**TH**F**H**H**PIYGN**CYTFND**-----GN-SS**L**WT**S**SL**P**GIN**N**GL**S**LV**R**TEQNDY**IP**LL
---QH**F**QTS**H**HPT**Y**GS**CYTFNG**-----V**W**AAQ**R**PGV**T**HR**I**SL**V**LR**A**EQ**L**DH**L**P**L**L
---RQ**F**RT**F**H**H**PT**Y**GS**CYTVDG**-----V**W**T**A**Q**R**PG**I**TH**G**V**G**LV**L**RV**E**Q**Q**PH**L**P**L**L
---SEY**E**H**F**H**H**PVY**G**I**CYIFKS**-----N--GS-D**T**FW**E**TSK**P**GI**A**YGL**S**LI**I**G**T**KQED**F**I**P**LL
---SDY**V**H**F**H**H**VP**F**GS**CYTFNS**-----K--GT-D**P**FW**T**ATK**P**GI**P**YGL**S**LI**L**RAEQ**K**DH**I**P**L**L
---SDY**I**H**F**H**H**QVY**G**S**CYTFNS**-----E--GT-D**L**FW**K**ASK**P**GI**S**YGL**S**LI**L**KAEQ**N**D**R**L**P**LL
---TN**F**TT**F**HH**P**MYGN**CFIFNW**-----G--EN-ET**V**MQ**V**SN**P**GVEY**GL**KL**V**LS**I**DQDEY**IPFL**
---TN**F**TT**L**Y**H**PMYGN**CFIFNW**-----G--EN-ET**V**MQ**V**SN**P**GVEY**GL**KL**V**LS**I**DQDEY**IPFL**
---RN**F**TR**L**F**H**PT**Y**GN**CYIFNW**-----G--SS-G**S**VL**T**VS**N**P**G**AE**F**GL**K**V**L**DISQEDY**N**P**L**L
LTVIN**F**TQ**M**F**H**PT**Y**GN**CYIFNW**-----G--QD-GN**A**LIS**S**NP**G**AD**F**GL**K**L**V**L**D**INQEEY**IPFL**
---KN**F**SQ**I**F**H**HFYGN**CYIFNW**-----G--LH-D**K**AIS**S**NP**G**GE**F**GL**N**V**V**L**D**INQ**E**Y**IPFL**
---TN**F**TQ**I**Y**H**PSYGN**CYIFNW**-----G--LD-GN**V**AV**S**SN**P**G**V**GF**GL**Q**L**V**D**VN**Q**EEY**IPFL**
---DN**F**TQ**F**Y**H**SSYGN**CVFNW**-----G--LD-GN**V**LIV**S**NP**G**VGF**GL**Q**L**A**L**DVN**Q**EEY**IPFL**
---RN**F**TH**I**YDADYGN**CYIFNW**-----G--QE**G**ENT**M**SSAN**P**GAD**F**GL**K**L**V**L**D**IEQGEY**L**P**L**L
---RN**F**TP**I**F**H**PDYGN**CYIFNW**-----G--MT-E**K**AL**P**SAN**P**GTE**F**GL**K**L**I**L**D**MGQEDY**V**P**L**L
---RN**F**TS**I**FY**P**HYGN**CYIFNW**-----G--MT-E**K**AL**P**SAN**P**GTE**F**GL**K**L**I**L**D**IGQEDY**V**P**L**L
---KN**F**TQ**I**Y**H**PDHGN**CYIFNW**-----G--MD-KE**A**L**N**SSNP**G**AE**F**GL**K**L**I**L**D**ISQQDY**IPYL**
---RN**F**TQ**I**Y**H**PDHGN**CYIFNW**-----G--MD-EE**A**LIS**S**NP**G**AE**F**GL**K**L**I**L**D**ISQQDY**IPYL**
---TS**F**KK**L**Q**H**PILGN**CFTFND**-----G--SD-G**K**SLD**I**ASAG**I**DYGL**H**MV**L**N**T**RQDN**S**L**P**YL
---TS**F**KK**L**Q**H**PILGN**CFTFND**-----G--RD-G**K**SLD**I**ASAG**I**DYGL**H**M**I**L**N**T**R**QDN**A**L**P**YL
---RN**F**TQ**S**Y**H**PT**L**GN**CYTFNS**-----G--YD-GE**I**IQ**S**STAG**I**K**N**GL**I**V**V**L**N**L**G**L**E**DY**N**P**L**L
---RN**F**SL**H**Q**H**PLHGN**CFTFNG**-----G--EN-GR**V**LIT**R**TG**S**Q**N**GL**K**V**T**L**H**LDEDEY**N**P**YL**
---RN**F**TL**F**Q**H**PLHGN**CYTFNS**-----G--ND-GN**I**LQ**T**LIG**G**N**A**RGL**K**L**I**LYT**E**ND**D**Y**N**P**L**L
---RN**F**TL**F**Q**H**PLHGN**CYTFNS**-----G--DD-GN**I**LQ**T**L**T**GGSEY**GL**K**L**T**L**YLEND**D**Y**N**P**YL**
---RN**F**TL**F**Q**H**PVYGN**CYTFNS**-----G--AD-G**S**IL**K**T**S**TE**A**SE**F**GL**N**V**I**LYID**H**KD**Y**N**P**L
---RN**F**TL**F**H**H**PLYGN**CYTFNS**-----A--ER-GN**L**L**V**SS**M**GA**E**YGL**K**V**V**LYID**E**DEY**N**P**YL**
---RN**F**TL**F**H**H**PMYGN**CYTFNN**-----R--Q**N**-ET**I**L**S**T**S**MG**S**E**F**GL**Q**V**I**LYIN**E**E**E**Y**N**P**L**
---RN**F**TL**F**H**H**PMHGN**CYTFNN**-----R--EN-ET**I**L**S**T**S**MG**S**EY**GL**Q**V**I**LY**IN**E**E**E**Y**N**P**L**
---RH**F**TR**F**H**H**PLHGN**CYTFNS**-----G--EN-G**T**V**L**ST**S**TG**S**EY**GL**Q**V**V**LY**IDE**A**DY**N**P**L**
---RN**F**TP**F**H**H**PLHGN**CYTFNS**-----G--EN-G**K**V**L**TT**S**TG**S**EY**GL**Q**V**V**LY**IE**E**A**D**Y**N**P**L**

Spotted Gar γ -like
Asian Arowana γ -like
Coelacanth ASIC1
Catfish ASIC1
E. Lamprey ASIC1
E. Shark ASIC1
J. Medaka ASIC1
Black Rock Cod ASIC1
Lancelet γ -like
Lancelet α -like
E. Shark α
Frog δ
Coelacanth α
S. Lamprey α
J. Lamprey α
W. Lungfish α
A. Lungfish α
Ropefish α
Frog α
Salamander α
Cow α
Human α
Chicken α
Turtle α
Cow δ
Human δ
Coelacanth δ
Chicken δ
Turtle δ
S. Lamprey β
J. Lamprey β
E. Shark β
Coelacanth β
Ropefish β
W. Lungfish β
A. Lungfish β
Frog β
Cow β
Human β
Chicken β
Turtle β
S. Lamprey γ
J. Lamprey γ
Ropefish γ
E. Shark γ
W. Lungfish γ
A. Lungfish γ
Coelacanth γ
Frog γ
Cow γ
Human γ
Chicken γ
Turtle γ

SQA-----AGIRLIIHDQKDMPPFEDDGVNIPPGQESDIAIVKVHVHRLRAPYSSCTCTGDGDIH
THS-----AGIRMLIHDHLATPFPEDEGVNIPPGTETDIGITKVGIRRLKHPYGSNCTDGEGIT
KETDETSLEAGIKVQIHSQEEPPFIDQLGFGVAPGFQTFVSCQQQKLMYLPFPWGDCKATPINSE
GDTDETSYEAGIKVQIHSQDEPPFIDQLGFGVAPGFQTFVSCQQQLLYLPFPWGDQCSTAMNSE
GETDETSFEAGIRVQIHSQDEPPFIDQLGFGVAPGFQTFVSCQEQRLLTYLPYPWGDCKDTPPESE
GETDETSFEAGIKVQIHSQSEPPFIDQLGFGVPPGFQTFVACQEQRLLRYLPFPWGDCKSTPMDSD
GETDETSFEAGIKVQIHTQEEPPFIDQLGFGVAPGFQTFVSCQEQRLLTYLPFPWGDCKSTPMDSD
GETDETSFEAGIKVQIHTQDEPPFIDQLGFGVAPGFQTFVSCQEQRLLTYLPFPWGDCKASAMSDSD
AEK-----AGARVVIHNPYVFPFPESEGFDAAPGFLTSAGLRLTSITRLGGVYGNCT-NGQG--
TPA-----AGVRVVIHQPGEWPPFAEEGFVDVGPYSTSISGLQVTTIRRLGGKYGNCT-DGRDKD
TPG-----FGVRLMVHDPKQTPILEDGIDLLPGLTSSVSLRLESVRLGGGLSDCTKDGGKVE
SQA-----AGARIMIHNPNQPPLVEHEGFDIQPGTETSISVKQEEVIRLGGKYSQCTSDGSDLS
STV-----AGARVMIHRQNQPFFMEDEGFNIRPGVETSISMKKVSRQQLGGLYSCTEDGSDIG
STV-----AGARIMVHDQSEPPFMEEGGFDMRPGFETSLGIRMLEATRMPPYGNCTEDGSDNP
STV-----AGARIMVHDQSEPPFMEEGGFDMRPGIETSLGIRMLEATRMPPYGNCTEDGSDVP
SNV-----AGARVMVHDQNQPFFMEDSGDIRPGVETSIGIKKEIISRLGGVYGNCTADGSDIN
STV-----AGARVLVHDQNQPFFMEDSGDIRPGVETSIGMKKEIISRLGGVYGNCT-DGSDID
STV-----AGARVMVHSQNHVPFFMEDGGFDIKPGVETSIGLRQEVFQRLGGEYGDCL-DGTDLD
SSV-----AGARVLVHGHEKFAFMDDNGFNIPPGMETSIGMKKETINRLGGKYSDCEDGSDVD
STT-----AGARVIIQAPDEFVLLNEGGFNIQPGVETSISMTKETMDRLGGAYSDCTEDGSDVE
STV-----TGARVMVHERDEFAFMDDAGFNLRPGVETSISMSKEAVDRLLGGDYGDCTKNGSEVP
STV-----TGARVMVHGQDEFAFMDDGGFNLRPGVETSISMRKETLDRLLGGDYGDCTKNGSDVP
STV-----TGARVMVHDQNEFAFMDDGGFNVRPGIETSISMRKEMTERLGGSYSDCTEDGSDVP
STV-----TGARVMVHEQNEFAFMDDGGFNVRPGMETSIGMRKETMRLGGSYSDCTEDGSDVL
STK-----AGIKVMIHQDHTPFLEHGQFSIRPGTETTIDIREDEVHRLGSPYGCMDSTGSVD
STL-----AGIRVMVHGRNHTPFLGHHSFSVRPGTEATISIREDEVHRLGSPYGHCTAGEGVE
STV-----AGTRVMIHKQDQPAFMEDEGLNIKPGTETSIGMKQDEVNRLAGNYGCCTFDGTDVK
STV-----AGVKVMIHNHNQTPFLEHEGFDIRPGIATTIGIQQDKVNRLGGNYGKCTTDGSDVK
STV-----AGVQVMIHNHNQTPFLEHEWFDIRPGIATNIGIRQDEVHRLGGNYGKCTVDGADVD
TTI-----AGAVIMVHDQNTYFFLSDLGVFVKTGVEITSVGIEVGQLQRQAPYSDCTMDGTDLP
TTI-----AGAVIMLHDQNTYFFLSNQGFVVKGAETSVGIEVGQLQRQAPYSDCTMDGTDLP
SMA-----AGAKFMLHQQNTFFFLRDLGMYAKAGTESITIFADEIERLGGVYSRCLNPSATE
TTS-----AGARLMLHDQNTFFFLKDLGMYAMAGSQTSIGILVDEIQRIGAPYSQCTPYGSDVP
STT-----AGARLLVHEQRSFPFLKDLGIFVLPGTETSIGISVDKIERMEAPYSDCTQNGSDVP
TTS-----AGVRFLLDHQKTFPFVETMGYIALVGTVTSVEILVDEVMRMEQPYGTCTADGSDVP
TTR-----AGARFLLDHTQNTFFPFVETMGYIALVGTVTSVGLVDEVQRMGPYGTCTTDGLDVP
QTT-----AAARLILHQQRSFPFVKDLGIYAMPGTETSISVLVDQLEHMEAPYSSCTVNGSDIP
TST-----AGARLMLHEQRSYFFIKEEGYIYAMAGMETSIGVLVDKLQRKGEPYSQCTKNGSDVP
AST-----AGVRLMLHEQRSYFFIRDEGIYAMSGTETSIGVLVDKLQRMGEPYSPCTVNGSEVP
SSA-----AGARLMLHQQSFPPFLKDQGIYAMAGTETSIGVLVDELERMGYPYSDCTANGSDVP
TST-----AGARLMLHEQSFPPFLKDQGIYAMSGTETSIGVLVDELERMGYPYSDCTMNGSDVP
AMG-----AGAKIGIHLQNTTFFIEAVGIDIPPAMESSLGLRVNDVQKLGPYSDCTMDGSDID
AMG-----AGAKIGIHLQNTTFFIEAVGINIPPATESSLGLRVNDVQKLGPYSDCTMDGSDID
SSS-----EGAIIMIHNQNEHPFIEDLGIMIQTAKETSIGLQFMESHKLGPYSSCTEDGTDVS
VTS-----TGAKIVVHDQSEHPFVEDLGIAIPAGMETSIGLDLTESHKLGGPYSDCIE---DLP
FTS-----MGAKVIVTDQNEYPLIDDVGLEVQTAMETLVGLQLTDSAKLSQPYSDCTVDGSDVM
FTS-----MGAKIVHDQTEYPLVDDVGLEIQTATETLIGLQVTTSAKLSKPYSDCTMDGSDVL
VTS-----TGAKVVIHDQNEHPFIEDMGLEVETATETSIGLQLTESHRLSSPYSNCTEDGSDVP
STA-----AGAKILVHDQDEYFFIEYLGTELETATETSIGMQLTESAKLSDPYSDCTMDGRDVS
VSS-----TGAKVIIHQDEYPFVEDVGTEIETAMATSIGMHLTESFKLSDPYSDCTEDWSDVQ
VSS-----TGAKVIIHQDEYPFVEDVGTEIETAMVTSIGMHLTESFKLSEPYSDCTEDGSDVP
VTS-----TGAKIVHDQDEYPFIEDIGTEIETAAATSIGMHFTRSRKLSKPYSDCTETGADIP
VTS-----TGAKIVHDQNEYPFIEDIGTEIETATATSIGMHFTRSHKLSKPYSDCTETGTDIP

Spotted Gar γ -like	NY Y R--DV Y K-VG Y SR-----EACKKTCGQMYIIKNCGCGMWEFPV P KDV K V P FCNITNKNI-
Asian Arowana γ -like	NFY H --DL H G-FK Y TR-----EACKRTCAQQSIMKDCGCSHWEFAV L PDLQ Y PKCNFSSPAT-
Coelacanth ASIC1	-----FF-ST Y SI-----TACRIDCETRYLVENCNCK--MVHMPGNAK V --CTPDQ Y --
Catfish ASIC1	-----FF-ST Y SI-----TGCRIDCETRYLLENCNCR--MVHMPGTST V --CTPEQ Y --
E. Lamprey ASIC1	-----FF-DT Y SI-----AACQIDCETRYLVENCNCR--MVHMPGDAP Y --CTPEQ Y --
E. Shark ASIC1	-----FF-DT Y SI-----TACRIDCETRYLVENCNCR--MVHMPGDAP Y --CTPEQ Y --
J. Medaka ASIC1	-----FF-NS Y SI-----TACRIDCETRYLVENCNCR--MVHMPGDAP Y --CSPEQ Y --
Black Rock Cod ASIC1	-----FF-NT Y SI-----TACRIDCETRYLVENCNCR--MVHMPGDAP Y --CTPEQ Y --
Lancelet γ -like	RHLL----Y P -QM Y SQ-----QNCLATCHQEHMVEICGCADVTFLQ P N-----
Lancelet α -like	--NL----Y R -SK Y ST-----KTCLHTCFQRL L VEKCGCGRFIP L PK K V P A--CPV P I----
E. Shark α	IENL----Y D -SS Y SQ-----QTCVRSCFQALMTLRNC S YFFYNK P KNSH Y --CNSRSH P DW
Frog δ	IKIL----Y N -TS Y TM-----QACLNSCFQYKMIEMCGCGYFYPL P PGME Y --CNYNKY P GW
Coelacanth α	VENL----Y N -SN Y TQ-----QACVRSCFQVTLVQRCGCGHYFYPL P EGAQ Y --CNYKKH K TW
S. Lamprey α	VLNL----Y S -SAYTV-----QVPECSCFQ L ALVEACGCGYFYPL P PNAS Y --CSYNN-TAW
J. Lamprey α	VLNL----Y S -SAYTV-----QACVRSCFQ L ALVEMCGCGHYFYPL P PNAA Y --CSYNN-TAW
W. Lungfish α	VENL----Y N -SD Y TQ-----QACIRSCFQATIVERC G CGYFYPL P PAGAT Y --CTNTK H RGW
A. Lungfish α	VVNL----Y N -SD Y NQ-----QACVRSCFQATIVQ Q CGCGYFYPL P SGAE Y --CSYSRN K SW
Ropefish α	IENL----Y E -SS Y TQ-----QACIRSCFQLIMVKRCGCAYFYPL P KGAS Y --CNYNRH I AW
Frog α	VKNL----F Q -SE Y TE-----QVCVRSCFQ A AMVARC G CGYAFYPL S PGDQ Y --CDYNKH K SW
Salamander α	VKNL----F N -KK Y TQ-----QACVRSCFQANMVQRCGCAYFYDPL P PGEE Y --CDYHKQ P NW
Cow α	VENL----Y N -TK Y TQ-----QVCIHSCFQESMIKECGCAYIFYPRPDGVE F --CDYRKH N SW
Human α	VENL----Y P -SK Y TQ-----QVCIHSCFQESMIKECGCAYIFYPRPQ N VE Y --CDYRKH S SW
Chicken α	VQNL----Y S -SR Y TE-----QVCIRSCFQLNMVKRCS C AYFYPL P DGAE Y --CDYTKH V AW
Turtle α	VQNL----Y S -SR Y TE-----QVCIRSCFQSSMVERC G CAYFYPL P SGAE Y --CDYTKH I AW
Cow δ	VQLL----Y N -TS Y TR-----QACLVS C FQHLMVETCSCGYFYPL P PAGAE Y --CSYMRH P AW
Human δ	VELL----H N -TS Y TR-----QACLVS C FQQLMVETCSCGYLHPL P PAGAE Y --CSSARH P AW
Coelacanth δ	IK-L----Y N -TP Y SV-----QACVRSCFQYLLIQECGCGYFYPL P PGAQ Y --CNYNKY P SW
Chicken δ	VKLL----Y N --SYTL-----QACLHSCFQHIMVQKCGCGYFYPL P PGAEE Y --CNYNKQ P AW
Turtle δ	VKLL----Y N -SS Y TL-----QACLHSCFQDKMVERC G CGYFYPL P PGAEE Y --CNYNKH P AW
S. Lamprey β	ITNL----YNGTAYSV-----QACLRS C FQTKMIEMCGCGYLYPL P PGEK Y --CQNQNFTGW
J. Lamprey β	ITNL----YNGTAYSV-----QACLRS C FQTKMIEMCGCGYLYPL P PGEK Y --CQNQNFTGW
E. Shark β	VTTL----Y N -TS Y SM-----QTCLRSCHQAHMVRLCGCAYHHYPL S EGAQ Y --CNNQDHPGW
Coelacanth β	VPNL--YSI Y N-TS Y SM-----QNCLYSLQAKLVEKCGCGNYLHPL P DGAH S --CNNEDN P SW
Ropefish β	ITDLFYKMYE-TS Y SV-----QSCLRS C FQMNLVKMC G CAYNLYPL P PAEAP Y --CNFGDH P EW
W. Lungfish β	VNNL--YSS Y N-LS Y SM-----QSCLWS C FQ A QMVKRCGCAYLYPL L DGAN Y --CDTQNN S DW
A. Lungfish β	IDNL--YSQ Y N-LS Y TM-----QSCLWS C FQIQMVNSC G CAYLYPL P EGAT Y --CNNQNN S DW
Frog β	VQNL--YAE F N-SS Y SI-----QSCLRS C YQEEMVKTCKCAHYQYPL P NGSE Y --CTNMKH P DW
Cow β	IQNL--YSN Y N-TT Y SI-----QACIRSCFQE H MIREC G CGHYLYPL P HKR K Y--CNNQE F PDW
Human β	VQNF--YSD Y N-TT Y SI-----QACLRS C FQDHMIRNCNCGHYLYPL P RGEK Y --CNNRDF P DW
Chicken β	VKNL--YSE Y N-TS Y SIQLPLSFFQACLRS C FQNHMT E ICGCGHYMFPL P EGVT Y --CNNEDN P GW
Turtle β	VKNL--YNE Y N-TS Y SI-----QACLRS C FQ A QMFENC G CGHYLFPL P EGV N Y--CNNEDD P DW
S. Lamprey γ	VKSL----Y D -SP Y SV-----QTCQNSCFQWEMIKSCGCANYEQPL P EGSR F --CNYDNN P GW
J. Lamprey γ	VKSL----Y D -SP Y SV-----QTCQNSCFQLEMIKSCGCANYEQPL P EGSL F --CNYDNN P GW
Ropefish γ	VNNL----Y N -KT Y SL-----QVCLHSCFQKEMTLQCGCAHFHYPL P AEAQ Y --CNYNAF P DW
E. Shark γ	EDNL----Y N -KS Y SL-----QMCLHSCFQKEMVQTCGCGHYEKL P PGAQ Y --CDYNRFPGW
W. Lungfish γ	EENL----Y N -KS Y SL-----QICLHSCFQKEMVN S CGCAYYEQL P PGAEE Y --CSYEK F PGW
A. Lungfish γ	EQNL----Y N -TS Y SL-----QICLHSCFQTEMI S NCGCAYYEQL P SGAE Y --CYYEK Y PGW
Coelacanth γ	MQNL----Y N -TT Y SF-----QMCLYSCFQKEMVQSCGCAHYEYPL P VDTE Y --CDYKK Y PGW
Frog γ	VENL----Y N -KK Y TL-----QICLNSCFQREMVRSCGCAHYDQPL P NGAK Y --CNYEE Y PSW
Cow γ	ITNI----Y N -AT Y SL-----QICLHSCFQAKMVENC G CAQYSQPL P RGAD Y --CNYQQH P NW
Human γ	IRNI----Y N -AA Y SL-----QICLHSCFQTKMVEKCGCAQYSQPL P PAAN Y --CNYQQH P NW
Chicken γ	VENL----Y N -KS Y SL-----QICLHSCFQKAMVESC G CAQYAQPL P NGAE Y --CNYKK N PNW
Turtle γ	VANL----Y N -KS Y SL-----QICLHSCFQ A RAMVDT C GCAQYAQPL P PGAEE Y --CNYKK Y PNW

Spotted Gar γ -like
Asian Arowana γ -like
Coelacanth ASIC1
Catfish ASIC1
E. Lamprey ASIC1
E. Shark ASIC1
J. Medaka ASIC1
Black Rock Cod ASIC1
Lancelet γ -like
Lancelet α -like
E. Shark α
Frog δ
Coelacanth α
S. Lamprey α
J. Lamprey α
W. Lungfish α
A. Lungfish α
Ropefish α
Frog α
Salamander α
Cow α
Human α
Chicken α
Turtle α
Cow δ
Human δ
Coelacanth δ
Chicken δ
Turtle δ
S. Lamprey β
J. Lamprey β
E. Shark β
Coelacanth β
Ropefish β
W. Lungfish β
A. Lungfish β
Frog β
Cow β
Human β
Chicken β
Turtle β
S. Lamprey γ
J. Lamprey γ
Ropefish γ
E. Shark γ
W. Lungfish γ
A. Lungfish γ
Coelacanth γ
Frog γ
Cow γ
Human γ
Chicken γ
Turtle γ

--NKCVQLYEDKFAHDELEC--NCPLQCEEEIFELTLSSSQWPSAVYMNEFARKLRQSG-----
--RRCLELYEYKFAQDILPC--HCPLQCKEELYSLTVSGSQWPATAFLDKFSSNLRGKG-----
--KNCADPALDFLVEKD-NDYVCVQTPCNMTRYGKELSMVKIPSKASAKYLAKKFNKTE-----
--KDCADPALDFLVEKD-NNYVCVPTPCNMTRYGKELSMVKIPSKASAKYLAKKFNKSE-----
--KECANPALMFLVEKD-DDYCACEMPCKNIKRYAKELSMVKVPSQASAKYLAKKFNKTE-----
--KECADPALDFLVEKD-SVFCTCETPCNMTRYGKELSMVKIPSKASAKYLAKKYNKSE-----
--KECADPALDFLVERD-NDYVCVETPCNLTRYGKELSFVKIPSKASAKYLAKKFNKTE-----
--KDCADPALDFLVERD-NDYVCVETPCNMTRFGKEMS FVKIPSKASAKYLAKKFNKTE-----
--VDCEEKVQQLGNGNLTC--QCPISCMDRIYRKAIGLSEWPADSYVSTVLNKLKTKR-----
--NSCEQRWISEMRNGRIWC--DCPPSCVDNTLSMTFGFSEWPADSYEKSRLRQKLSKLD-----
--GHCYYKLYEEFIAEKLNCFEKCPKLCQDQSLYHITVGHSHKWPSPQVESWMPFLLSNKK-----
--GHCIFYQLYEKMLDHTLICFTQCPKQCKQTQYHLAAGTAKWPSFVSKA--IQLLSLQE-----
--GHCYYRLYKEFKANDLGCFTKCRKRCLESEYHQMGTGYSKWPAKDSGKWIHHILAKQN-----
--AGHCYYKLYRQFISDELGCVDKCAQPCCTTKRFAVTPGYAAWPDSSSEKWI FNLLSLQN-----
--AGHCYYKLYRRFISDELGCVDKCAQPCCTTKRFAVTPGYATWPDSSSEKWI FNLLSLQN-----
--GYCYYKLYKAFAADELGCFFKRCPKPCIVAEYVKTAGYSKWPSSSSETWIAKVLSQES-----
--GYCYYKLYKAFAADELGCFFRCRKPCCQYTDYKMTAGYAQWPSVSVESWITSILSQEN-----
--GHCYYKLYNEFSLDNLGCSTKCRRPCQDTEYTM TAGYATWPTKASKNWI FNVLNKNQ-----
--GHCYYKLIIEFTSNKLGCF TKCRKPCLVSEYQLTAGYSKWPNRVSQDWVLHTLSR-----
--GHCYYKLENEFVSDDLQCF TKCRKPCQLSEYHLSAGYSRWPSDVSKSWVFHMLSQQN-----
--GYCYYKLQDAFSSDRLGCF TKCRKPCSVTIYKLSASYSQWPSATSQDWVFQMLSRQN-----
--GYCYYKLQVDFSSDHLGCF TKCRKPCSVTSYQLSAGYSRWPSVTSQEWVFQMLSRQN-----
--GYCYYKLLAEFKADVLGCFHCKRKPCKMTEYQLSAGYSRWPSAVSEDWVFYMLSQQN-----
--GHCYYKLQVEFKSNVLGCFSKCRKPCVTEYQLSAGHSHWPSVTVSEDWVSHMSRQN-----
--GHCFHHLYQKLKTHQLPCTTRCPRPCRESSYKLSAGTSRWPSSTADWVLAVLGEPSRRNPWP
--GHCFYRLYQDLETHRLPCTSRCPRCRESAFKLSTGTSRWPSAKSAGWTLATLGEQG-----
ETGHCYYKLYKKFVAGDSGCFQKCPKPCQEFKYKLTTGISKWPSQNAENWIFHLLSHHN-----
--GHCFYQLYSRLRNHHLNCFDQCPKPCRESLYKVSAGTAKWPSRKSQDWIRQALRHQN-----
--GHCFYQLYNRLADHHLSCFAKCPKPCWESWYKLSAGTAKWPSSTKSQDWVRQILSRQK-----
--RYCYYKLYEQFVEEDMDCYTI CKQPCIESEYKMSISMSDWPSQSSSEDWIFHILSKER-----
--RYCYYKLYDQFVEEDMDCYTI CKQPCIESEYKMSISMSDWPSQSSSEDWIFHILSKER-----
--AYGYHHLKEQIESENSECLTSCIPPNCNDTLYRLTISMAEWPSQASEEWIYQILSYER-----
--AYCYYSGLDSSSEYKD-SCLQICEQPCNETQYRLTISMAEWPSSESSEDWIFHVLSYER-----
--VYCYHKWKKS-AESELLCLQTCQSCNESCQHLLTVSMADWPSSESSEDWIFHVLSYER-----
--VYCYHHLQDSTDANE-ECIQICELPCIENQFRISTSMADWPSSESSEDWIFHVLSHER-----
--AYCYLLQDQSKDHKN-ECLQTCIQTCNELQFRISTSMADWPSSESSEDWIFHVLSYER-----
--VPCYYSRLDSVAIRE-NCISLCOQPCNDTHYKMVISMAEWPSAGAEDWIFHVLSYEK-----
--AHCYSALRISLAQRE-TCIYACKESCNDTQYKMTISMAVWPSEASEDWIFHVLSQER-----
--AHCYSDLQMSVAQRE-TCIGMCKESCNDTQYKMTISMAEWPSASEASEDWIFHVLSQER-----
--AYCYSSLRSSIRHRQ-ICIDSCKETCNDTQYKMTISMAEWPSASEASEDWIFHILSYER-----
--AYCYSSLRSSIRHRQ-FCIDSCKETCNDTQYKMTISMAEWPSASEASEDWIFHILSYER-----
--EYCYRRLYDMYIKEELKCIQVCRQICSETEHEVTL SLADWPSKASKGWLLRAL SKEQ-----
--EYCYRRLYDMYIKEELKCIQVCRQICSETEHEVTL SLADWPSKASKGWLLRAL SEER-----
--MVCYSKLHAKFLQEELNCQKTCCKGTCHTKEWILTESVAQWPSVNSEKWVLQTLRFNG-----
--IYCYRRLRDRFHREQLVCQELCRQACHCKEWTLMTSVAQWPAQSAEDWVLRLLSWER-----
--IYCYQLQDKFVNRLPCQDVCKEPCNSKDFEITKSLAQWPSGASEAWVIRLLDWER-----
--IYCYQLQDKFVNRLACQDICKETCNSKDWDLT KSLARWPSVASKDWVLNLLNWER-----
--IYCYKLRGKFAQEQLCCQVCKEACNSKEWALT KSLAHWPSLASEDWILRALNLQG-----
--IYCYFKVYKQFVQEELGCQSACRES CSFKEWTLTRSLAKWPSLNSEEWMLRVLSWEL-----
--MYCYQLHQA FVREELGCQSVCKEACSFKEWTLTTS LAQWPSSEVSEKWLLSILTWDQ-----
--MYCYQLHRA FVQEELGCQSVCKEACSFKEWTLTTS LAQWPSVVSEKWL LPVLTWDQ-----
--MYCYRLHEKFVKEQLGCQQICKDACSFKEWALTTSIAQWPSVTVSEDWMLRVLSWDK-----
--MYCYKLHET FVKEQLGCQQICK EACSFKEWTLTTS LAQWPSVSVSEDWMLRVLSWDK-----

Spotted Gar γ -like	-----GKLAKVADK---VRD-----	NLVKVI INYQQLNYELIEEI
Asian Arowana γ -like	-----GQLKAIADNPQDIRD-----	NMVKVVVVYQKLNIEHISEE
Coelacanth ASIC1	-----DYIA-----E-----	NILVLDDIFFEALNYETIEQK
Catfish ASIC1	-----QYIG-----E-----	NILVLDDIFFEALNYEKIEQK
E. Lamprey ASIC1	-----AYIA-----E-----	NVLVLDDIFFEALNYETIEQK
E. Shark ASIC1	-----DYIG-----E-----	NILVLDDIFFEALNYETIEQK
J. Medaka ASIC1	-----QYIA-----D-----	NILVLDDIFFEALNYETIEQK
Black Rock Cod ASIC1	-----QYIS-----D-----	NLLVLDDIYFEALNYETIEQK
Lancelet γ -like	-----RGPGTGILDDRDEFKK-----	NLLKLNIYYEALNYETITES
Lancelet α -like	-----EESQEKLQTSHDARR-----	NLLKLSVYFEQLNQQTISES
E. Shark α	-----DFNV-----RK-----	DFAKLNVYFEALSRYEIEEI
Frog δ	-----RYNSTSE---RS-----	DVSKINVYEEELSYRSVEET
Coelacanth α	-----QYNFTTN---SRE-----	DVSKLTVYFQELHHKTVGES
S. Lamprey α	-----NYSVTTV---RN-----	DVAKLNVYFRELNMKTISES
J. Lamprey α	-----NYSVTTV---RN-----	DVAKLNVYFRELNMKTISES
W. Lungfish α	-----PYS-TSA---RK-----	VIAKLNIYFYELSYKTGTGES
A. Lungfish α	-----QYNMTSG---RK-----	NIAKLNVYFYELNYQTMGES
Ropefish α	-----GYNITSD---RN-----	DIAKVNIYFEDLNRYTFGES
Frog α	-----QYNLT-D---RN-----	GIAKLNIYFEELNYKTILES
Salamander α	-----QYNFTSD---RS-----	GVAKLNIYFSEMTYKSTVES
Cow α	-----NYTIKKN---RD-----	GVAKLNIFFKELNYKSNSSES
Human α	-----NYTVNNK---RN-----	GVAKVNIFFKELNYKTNSSES
Chicken α	-----KYNITSK---RN-----	GVAKVNIFFEEWNYKTNGES
Turtle α	-----KYNITSK---RN-----	GVAKVNIFFEEWNYKTNGES
Cow δ	SSASIKSWPLPLPSSPSRA---RTEGPTSRSGAQPLSPEPCPSISLAKVNIFYQELNYRTVDET	
Human δ	-----LPHQSHRQ---RS-----	SLAKINIVYQELNYRSVEEA
Coelacanth δ	-----GKNLTNN---RR-----	DVSKLNIFFQKLSYESFDET
Chicken δ	-----GYNSTSN---RK-----	DIAKVTIYYKQLNYQSVNES
Turtle δ	-----GYNSTHN---RR-----	DIAKVNIFYQQLNYQSVDES
S. Lamprey β	-----KHNVSRI-FNRKQ-----	DI IKLNLFFQEFNSMTISES
J. Lamprey β	-----KHNVSRQ-----	DI IKVNLFFQEFNSMTTSES
E. Shark β	-----DSSPKVTVN---RN-----	SILKLNMYFKENNFRTISES
Coelacanth β	-----DLAINRTMN---RN-----	GALKLNLYFQEFNYRTISES
Ropefish β	-----DFSSNVTIN---RD-----	GVMKMNLIFYKEINYSITES
W. Lungfish β	-----DNSSDITMN---SD-----	GVLRLNIFYFNEFNRYRIVES
A. Lungfish β	-----DDSTNITMK---RD-----	GVLKLNLYFKEFNRYRVITES
Frog β	-----DSSHNITVN---RN-----	GIVRLNIYFQEFNYRSISES
Cow β	-----DQSSNITLS---RK-----	GIVKLNIFYQEFNYRTIEES
Human β	-----DQSTNITLS---RK-----	GIVKLNIFYQEFNYRTIEES
Chicken β	-----DMSTNVTLN---RN-----	GI IKLNIYFQEYNYRTISES
Turtle β	-----DLSTNVTLN---RN-----	GI IKLNIYFQEYNYRTISES
S. Lamprey γ	-----GLPANDTLK---PS-----	DIAIVNIYFKDLTQKTISES
J. Lamprey γ	-----GLPANDTLK---PS-----	DIAIVNIYFKDLNQKTISES
Ropefish γ	-----VLKKKQNIS---KE-----	NFAKFSIFYKDLNLKTTITES
E. Shark γ	-----GRDGNKTLS---TS-----	ELASLDIYYADLSVRNITEK
W. Lungfish γ	-----GLNGTSL---KN-----	DLVNLAIFYQDLNWRSLSES
A. Lungfish γ	-----GLNNTLN---KN-----	DLASIAIFYQDLNLRSLSES
Coelacanth γ	-----SLKGNKGLS---KN-----	DLVNLGIFYKDLNLRSLSES
Frog γ	-----GEKLNKNLT---KN-----	DLANLNIFYQDLNRSRISSES
Cow γ	-----SQQIKKKLN---KT-----	DLAKLLIFYKDLNQRSIMEN
Human γ	-----GRQVNKKLN---KT-----	DLAKLLIFYKDLNQRSIMES
Chicken γ	-----GQKINKKLN---KT-----	DLANLMVIFYKDLNERFISEN
Turtle γ	-----GQKINKMLN---KT-----	DLANLVVIFYKDLNERFISEN

Spotted Gar γ -like	PSFQVIDLVSSIGGLVGLWIGVSICTVAEFVE-LFLKVIIFIIKRVIR-----
Asian Arowana γ -like	PFITDIDLFSSVGGLVGLWVGVSILCTLAEFLE-FAVNVVLIVARGCLS-----
Coelacanth ASIC1	KAYEVAGLLGDI GGQMG LFIGASILTILEILD-YLYEVFKDQVLGYFK----RKKRPKRSH----
Catfish ASIC1	KAYEVAGLLGDI GGQMG LFIGASVLTILEIFD-YLYEVFKDKVLGYFLR-KGRPRRSASDN----
E. Lamprey ASIC1	RAYEVAGLLGDI GGQMG LFIGASILTILEIFD-YLYEIIKYRILYYFR----RNKKQRNIS----
E. Shark ASIC1	KAYEVAGLLGDI GGQMG LFIGASLLTILELEFD-YVYEVLKHKMCGVLR--MGKQQKRNNND----
J. Medaka ASIC1	KAYELAGLLGDI GGQMG LFIGASILTIVLELFD-YLYEILKYKLCRCMK---KKHKSRNNND----
Black Rock Cod ASIC1	KAYELAGLLGDI GGQMG LFIGASLLTILELEFD-YLYEVIKYKLCRCVK---KKHKGRNNND----
Lancelet γ -like	PAYEVENLLGDLGGQLGLWVGMSCLSAMELLE-FLVDIAIIL-----WKKMSNR-----
Lancelet α -like	PAYRVENLLGDLGGQLGLWVGVSVMTILEVLE-LIVDVTQILLS-----KARGKKKTRV-----
E. Shark α	SAISVMELLSSLGGEVSVWFGGSSVLSGFELLE-LLDFLVLSIALL---KASVWRGH-----
Frog δ	PTMSVNVLLSSMGGLWSWFGGSSVLSVAEIAE-LVLDTAAMVTIVYQ--WKKQRANRNDG----
Coelacanth α	PSINAATLLSNLGSQWSLWFGGSSVLSVIEMVE-LLIDFFVLSTILLFR--HYCIQREENQD----
S. Lamprey α	AATNVIWLLSNLGSQWSLWFGGSSVLSWLEVGE-LGIDCCIMVFVLAYR--RRRSRAERRRA----
J. Lamprey α	AATNVIWLLSNLGSQWSLWFGGSSVLSWLEVGE-LGIDCCIMVFVLAYR--RRRSCAERRRRARGTE
W. Lungfish α	PSFNVVTLLSNMGSQWSLWFGGSSVLSVVEGE-LVIDLIAVGIIIVLRR---RQREKTAT----
A. Lungfish α	PSFTVVVTLLSNMGSQWSLWFGGSSVLSVVEGE-LVFDLIAVGIVIVLRR---RRREKCQAS----
Ropefish α	PAFTAVMLLSNLGSQWSLWFGGSSVMSVVELAE-LVFDLVAITLIFSAQ--KYFQWKNTESKVNTD
Frog α	PTINMAMLLSLLGSQWSLWFGGSSVLSVVEMLE-LVIDFVIIGVMILLHRYYYKKANEGET----
Salamander α	PAINMVLVLLSLLGSQWSLWFGGSSVLSVVEMAE-LLFDVAAITVILYLQ--RRRKRQMDSV-----
Cow α	PSVTMTVLLSNLGSQWSLWFGGSSVLSVVEMAE-LIIDLLVITFLMLLRFRSRYWSPGRGG----
Human α	PSVTMTVLLSNLGSQWSLWFGGSSVLSVVEMAE-LVFDLLVIMFLMLLRFRSRYWSPGRGG----
Chicken α	PAFTVVVTLLSQLGNQWSLWFGGSSVLSVMELE-LILDFTVITFILAFR--WFRSKQ-----
Turtle α	PAFTVVVTLLSQLGNQWSLWFGGSSVLSVVELAE-LILDFAITFILSFR--WLSRQ-----
Cow δ	PVYSVPQLLSAMGSLWSLWFGGSSVLSVVEVLE-LLLDIAIALTLLLCCR--WLCGSRGQPRA----
Human δ	PVYSVPQLLSAMGSLCSLWFGASVLSLLELE-LLLDASALTIVLGGR--RLRRAWFSWPR----
Coelacanth δ	PSISAVTILSQMGNLWSFWMGSSVLSVIELIE-LILDVIAMSFILTFK--WHKLKK-----
Chicken δ	PLLSDNLLSSMGSLWSLWFGGSSVLSVVEMLE-LLIDTLVLSLLFCYQ--RFRSKTLNVAR----
Turtle δ	PVYTVNLLSNMGSQWSLWFGGSSVLSVVEFLE-LLLDIMVLSLIFCYR--RFKAKKTLKMA----
S. Lamprey β	PAQTIVTLLSNLGGQFGFWMGGSVLCIIIEFIE-IIIDCVWIGMIKASN--DVRERRKTSRK----
J. Lamprey β	PAQTIVTLLSNLGGQFGFWMGGSVLCIIIEFIE-IIIDCVWIGIIKASH--DVRERRKTSRK----
E. Shark β	KAQTLVWLLSNLGGQFGFWMGGSVLCIVELLE-VMLDCVWIMAIRGAR--LYMGHRRRRSL----
Coelacanth β	AATDISWLVSNLGGQFGFWMGGSVLCIIIEFLE-IIIDCVWITIIKLVI--WYDRDKHKKAQ----
Ropefish β	ASTTVVWLLSNLGGQFGFWMGGSVICIVFGE-IIIDCLWITIIKLIM--WNRNWKLKKAQ----
W. Lungfish β	AATNVVWLLSNLGGQFGFWMGGSVLCIIIEFGE-IIIDCIWIAIIRFVI--WQKNRKKMQLP----
A. Lungfish β	VATNVVWLLSNLGGQFGFWMGGSVLCIIIEFGE-VFIDCIWIAVIRFVK--WYKNRKERQVQ----
Frog β	EATNVVWLLSNLGGQFGFWMGGSVLCIIIEFGE-IIIDCMWITILKFLA--WSRNRQRQRKR----
Cow β	AANNIVWLLSNLGGQFGFWMGGSVLCIIIEFGE-IIIDFVWITIIKLVA--LAKSVRQKRAQ----
Human β	AANNIVWLLSNLGGQFGFWMGGSVLCIIIEFGE-IIIDFVWITIIKLVA--LAKSLRQRRRAQ----
Chicken β	AATTIVWLLSSLGGQFGFWMGGSVLCIIIEFGE-IIIDSLWITVINIIS--WCKGLKQKRVR----
Turtle β	AATTIVWLLSSLGGQFGFWMGGSVLCIIIEFGE-IIIDFLWITINIIS--WCKGLKQKRAR----
S. Lamprey γ	PASSIVTLLSNLGGLLGLWLSCSMLCVVEVLEIFCVDFPWILLKKLLT--TCSSAFASLIR----
J. Lamprey γ	PASSIVTLLSNLGGLLGLWLSCSMLCVVEVLEIFCVDFPWILLKKLLA--TCRRTFASLVR----
Ropefish γ	PLNNIVTLLSNVGGQLGLWLSCSIVCVIEIIEVFFLDAPWILVRQIIR--SCQIRCRRERQQ----
E. Shark γ	PANTMTVLLSNFGGQLGLWMSCSVICVIEIIEVLLVDALWVLVRSAGQ--RVRRWW-----
W. Lungfish γ	PANSIVTLLSNFGGQNGLWMSCSVVCFIEIIEVFLVDILTILVRNWFR--KAKLWNNKKKE----
A. Lungfish γ	PANSIATLLSNMGGQLGLWMSCSIVCFLEMWEVFLVDILTIIARYWLH--RGRQWWRKRKE----
Coelacanth γ	PANNIVTLLSNFGGQLGLWLSCSVVCVLEIIEVFFIDAFWIVLRQTTQ--KARDWWTKRK-----
Frog γ	PTYNIVTLLSNFGGQLGLWMSCSMICVLEIIEVFFIDSFVVLRQRWR-----NWWENRKE----
Cow γ	PANSIEQLLSNIGGQLGLWMSCSVVCVIEIIEVFFIDSLSI IARHQWH--KAKGWW----A----
Human γ	PANSIEMLLSNFGGQLGLWMSCSVVCVIEIIEVFFIDFSSI IARRQWQ--KAKEWW----A----
Chicken γ	PANTLVILLSNFGGQLGLWMSCSVVCVIEIIEVFFIDSFIVMRRQWQ--KAKKWWNHRKR----
Turtle γ	PANNIVILLSNFGGQLGLWMSCSVVCVIEIIEVFFIDSFIVTRRRWQ--KAKKWWDRKA----

Spotted Gar γ -like	-KNKEAPLNPYM-----IAHQTFKSSV-----
Asian Arowana γ -like	-SRSQGPASSAL-----
Coelacanth ASIC1	-SDNLSTCDTLR-----SHSDSLGFTPNMLPR-----
Catfish ASIC1	-LDYSENPTSPG-----VTPNHTPRAHATH-----
E. Lamprey ASIC1	-DNSVPMTSSYA--APQGHTQAAIH-----
E. Shark ASIC1	-KGVTLSLDDIK--RHNPC-----ESLRGHPTGMSYTANMLPH-----
J. Medaka ASIC1	-RGAVLSLDDVK--RHAPCE-----NLRTPSTYPGNMLPH-----
Black Rock Cod ASIC1	-RGAVLSLDDVK--HHDPCD-----NLRTPSTYPGNMLPH-----
Lancelet γ -like	-EKTTSRNNVVN--VAETG-----KIGTSNGHTIPIHMEVM-----
Lancelet α -like	-----IDISGHM-----
E. Shark α	-----
Frog δ	-MNGSNAASNVC-----SVPYIDSKTFSTPQTGLSE-----
Coelacanth α	-PEITISTVSYP--HYANE-----NSEFNSEESMGNHFDVVAD-----
S. Lamprey α	-RGTGDSEAAPP-----
J. Lamprey α	DSEAAPPPPSF--REALGCANAAVDGANDGADDG-----HDGDGGGVAIGGPTERPPPWRRGS
W. Lungfish α	-DDTEDNSPSET--YVHPRQENS-----DNEHRERAPNRIEVAEIS-----
A. Lungfish α	-SDGEGTSDSTA--GTHRGQ-----ENASRSGRDVACNRFVVVA-----
Ropefish α	GHQEPNTHNAVSNENHQEFDSLGVNFAFEADATHSIQSIIPSDSPNVEMTTSFQFDVVAD-----
Frog α	-TVVPTPAPAF--DLEQ-----QVPHIPRGDLSQRQISVVA-----
Salamander α	-EDSQAPTPTLP--RFEGHGNPEFQ-----SEEEPSHQFRVVADIT-----
Cow α	-KGTQEVASTPA--ASLPSS-----FCPHPAFFSSSPDPAPISP-----
Human α	-RGAQEVASTLA--SSPPSH-----FCPHPMSLSLSQPGPAPSP-----
Chicken α	-WHSSPAPPNS-----HDNTAFQ-----DEASGLDAPHRFTVEAVVT-----
Turtle α	-LLASAVPPPGA-----HDNTAFQ-----PEPSGPSAPHRFTVEAVVT-----
Cow δ	-ATRVHPPSQRP-----ASGPVAADTTSN-----
Human δ	-ASPASGASSIK--PEAS-----QMPPPAGGTSDDPEPSGPH-----
Coelacanth δ	-----
Chicken δ	-TPSIPSVSLTL--ESYRVVQEAGN-----GTAPAHGHTSGVPMAVANS-----
Turtle δ	-QPLAISSVTLTLENYRAVHEDLAADWNSIWTNQN-----VGTVAKTKNGDLFPHSICN-----
S. Lamprey β	-PRYSDEPPTLS--SIVQQQGNSGFEMEERGPPG-----EAPANGSAAQPPAAAAEQ-----
J. Lamprey β	-PRYSDEPPTLS--SIVQQQGNSGFEMEEREPPR-----EAPDANGSAAQPPATAAEQ-----
E. Shark β	-ARHPPPVPPTVA-----QCVEEQEHRAQSERP-----
Coelacanth β	-AQYSGPPPSVS--QLARAHTDTGFQ-----HD-----STDINYGTEAYCNEAYIPP-----
Ropefish β	-SQYMGPPPSIS--QLAEGHMNTGFE-----PD-----NVTSDSGQSLQTMSSCEHP-----
W. Lungfish β	-QLYNDPPPTVS--ELVEGISNQGFQ-----PDIINSCTSQQPPDLHIP-----
A. Lungfish β	-AQYADPPPTVS--ELVEGYTNQGFQ-----PDIINSCSPQAQPPDLYLPL-----
Frog β	-PQYSDPPPTVS--ELVEAHTNSGFQ-----HDDGDHVPVD-----
Cow β	-ARYEGPPPTVA--ELVEAHTNFGFQ-----PD-----LATPGPDVE--AYPHEQNPP-----
Human β	-ASYAGPPPTVA--ELVEAHTNFGFQ-----PD-----TAPRSPNTG--PYPSEQALP-----
Chicken β	-ARYPDTPPTVS--ELVEAHTNLGFQ-----HEEAGTETQGEALPP-----
Turtle β	-AQYPDTPPTVS--ELVEAHTNLGFQ-----HE-----DTNITPCDE--VPPPGALPP-----
S. Lamprey γ	-GPDPAPSVHFP--VQLPVGGSPA-----EDPPTFHTAMQCPREPIPM-----
J. Lamprey γ	-GPDPAPSVHFP--VQLPVGGSPA-----EDPPTFHTAMQCPREPIPT-----
Ropefish γ	----RPTLPTVS--GGIPVD-----EDPPTFNALRLPQPNLLE-----
E. Shark γ	---QRPEQEEVP--AHGTAHGITVYL-----ED-----EDPPTFNAALRLP--RQCP-----
W. Lungfish γ	-GQ--EQVYN--Q--NRHTGHDNPVCV-----ED-----EDPPTFHTAMQLPCVQTGE-----
A. Lungfish γ	-RQMQQPSP--P--DHDTGHHPVCI-----DD-----EDPPTFHTAMQLPCVQTGP-----
Coelacanth γ	-VRQAQPSLAAP--TDYAGQHNPVYVSD-----EDPPTFSTAVHLPHSESCP-----
Frog γ	-NQAEDTPEIPV--PTMTGHDNPLCVDNPICLGE-----EDPPTFNALQLPQSQSDSH-----
Cow γ	-RRRAPACPEAP--RAPQGRDNPSLD-----ID-----DDLPTFTSALSPLPAPGSQ-----
Human γ	-WKQAPPCPEAP--RSPQGQDNPALD-----ID-----DDLPTFNALHLPPALGTQ-----
Chicken γ	-DETGKPPVGD--AEQQGHDPAC-----SD-----EDLPTFNTALRLPLPQEGH-----
Turtle γ	-APAQVNAPAKE-----GHDNPVCID-----EDLPTFNTALHLPLPQENH-----

Spotted Gar γ -like	-----
Asian Arowana γ -like	-----MAGREGPPS-----
Coelacanth ASIC1	-----HPPLGNFEEFAC-----
Catfish ASIC1	-----SGVTRTASDSRRTCYLVTSL-----
E. Lamprey ASIC1	-----PHGAHAKYEDFTC-----
E. Shark ASIC1	-----HPPRNTFEDFTC-----
J. Medaka ASIC1	-----HPGQGNFEDFTC-----
Black Rock Cod ASIC1	-----HPGQANFEDFTC-----
Lancelet γ -like	-----
Lancelet α -like	-----
E. Shark α	-----
Frog δ	-----KELESKTNDPKFNGEINTFS-----
Coelacanth α	-----VSAPPAYETLDDLPPSAAQCITGCKCV
S. Lamprey α	-----PPPSF-----
J. Lamprey α	LTRNACSFVVDISCPPAAAKPVVGASREDAAAPEALPPDYGSLRRVPEGYVAVSSDPGGPP
W. Lungfish α	-----PPPAYDSLELDTFVACSADCSCTRM
A. Lungfish α	-----EISPPPAYDTLQLDVPVACAPDCECTQHV
Ropefish α	-----ISPPPAYDSLNLCCSSLSQTIKGCNAEC
Frog α	-----DITPPPAYESLDLRSVGTLSRSSSMRSN
Salamander α	-----PPPAYDSLELHAREECDDSCSCSHRS
Cow α	-----ALSAPPAYATLGPHAPSPGLAEASTSAHA
Human α	-----ALTAPPAYATLGPRSPGGSAGASSSTCP
Chicken α	-----TLPSYNSLEPCGPKDGETGLE----
Turtle α	-----TLPSYNSLELCGQNRDAEIGVE----
Cow δ	-----APGPGCLHLPRCCRDFSRSLG-----
Human δ	-----LPRVMLPGVLAGVSAEESWAGPQPLETLDT
Coelacanth δ	-----
Chicken δ	-----SDPHPAQLSSKAIPHEHCPDVVLNGFRYM
Turtle δ	-----KTPTPELNPDVVLNGFRHIKDHSIEIDL
S. Lamprey β	-----QPDVPGTPPPHYDTLRISKTELHDEINSDDDGE
J. Lamprey β	-----QDVPGTPPPHYDTLRISKTELHDEINSDDDSE
E. Shark β	-----VPSTPPPRYDSLHICSLTEPGPPEAGGKIV
Coelacanth β	-----REPTPGTPPPNYDSLRLVQPVENTEQISDSEEN-
Ropefish β	-----VHPIPGTPPPHYDSLRLKSVRVNNE-----
W. Lungfish β	-----TTLEVPGTPPPHYDSLRIQPIDMEQQSDNEDF--
A. Lungfish β	-----TTLEIPGTPPPKYDSLRLVHPIDTEHHSDEDL--
Frog β	-----IPGTPPPNYDSLRLVNTAEFVSSDEEN----
Cow β	-----IPGTPPPNYDSLRLQPLDVIESDSEGDAI-
Human β	-----IPGTPPPNYDSLRLQPLDVIESDSEGDAI-
Chicken β	-----EPGTPPPNYDSLRLVQPSHNPGTDSIECEE
Turtle β	-----EPGTPPPNYDSLRLVDPRAIDSDSDAEAS-
S. Lamprey γ	-----PNTPPPQYNTLRLRQIAGYVPDGGSDGE-
J. Lamprey γ	-----PNTPPPQYDTLRLRQIAGYVPDEGSDGED
Ropefish γ	-----VPKTPPPNYNTLRIHNVFSHMNDEDEHDTI
E. Shark γ	-----PTAPPNNYEMLQQCHGFNGGPPEERF----
W. Lungfish γ	-----VPSTPPPQYDALRIQNVFDEQFSDTEVN--
A. Lungfish γ	-----VPSTPPPQYNALRIQSVFDEQVSDTEVN--
Coelacanth γ	-----VPKTPPPTYDALRIQTAFAEQISDTEDENEY
Frog γ	-----VPRTPPPKYNTLRIQSAFQLETIDSDEDEVE
Cow γ	-----VPGTPPPRYNTLRLERAFSSQLTDTQTTFP
Human γ	-----VPGTPPPKYNTLRLERAFSNQLTDTQMLDE
Chicken γ	-----PPRTPPPNYSTLRLETAFTQEPDPTLEAGQ
Turtle γ	-----VPRTPPPNYSTLKLDAAFDTPDPTLEGSC

Spotted Gar γ -like	-----
Asian Arowana γ -like	-----
Coelacanth ASIC1	-----
Catfish ASIC1	-----
E. Lamprey ASIC1	-----
E. Shark ASIC1	-----
J. Medaka ASIC1	-----
Black Rock Cod ASIC1	-----
Lancelet γ -like	-----
Lancelet α -like	-----
E. Shark α	-----
Frog δ	-----
Coelacanth α	HCASFISHEVEDLMSDLAGDP-----
S. Lamprey α	-----
J. Lamprey α	RRGAGAPLLSPRVSALAASGKEVLRRRSASLNVVSFAIEEA
W. Lungfish α	SQTSIKSHTSNSSNTEESTSEGPTAL-----
A. Lungfish α	SHASVHSQAPCSSQPEQEASEGPTVL-----
Ropefish α	QCSRRLCEINEKD-----
Frog α	RSYYEENGGRN-----
Salamander α	SIRSNMSVHSRASSAATNA-----
Cow α	PGEP-----
Human α	LGGP-----
Chicken α	-----
Turtle α	-----
Cow δ	-----
Human δ	-----
Coelacanth δ	-----
Chicken δ	KDSSLGGEINH-----
Turtle δ	NS-----
S. Lamprey β	FV-----
J. Lamprey β	FVS-----
E. Shark β	VEVGEEAGEEWGEEGCRL-----
Coelacanth β	-----
Ropefish β	-----
W. Lungfish β	-----
A. Lungfish β	-----
Frog β	-----
Cow β	-----
Human β	-----
Chicken β	QRPAANHGDASVWAE-----
Turtle β	-----
S. Lamprey γ	-----
J. Lamprey γ	-----
Ropefish γ	TPIDDSIVHDNTMTINQRRRKENPFLII-----
E. Shark γ	-----
W. Lungfish γ	-----
A. Lungfish γ	-----
Coelacanth γ	-----
Frog γ	RL-----
Cow γ	H-----
Human γ	L-----
Chicken γ	H-----
Turtle γ	H-----