

	10	20	30	40	50	60	70	80	90	100
Pufferfish		MITTLITHILNPLAFIVP	VLLAVAF	TLLERKVLGYMQLRKGNIVGPYGLLQPIADGVKLF	FIKEPVRPSTSSPILFILT	PMLALT	TLAMTLWAP	LPLPY		
Fugu		MTTMLITHILNPLTIIP	VLLAVAF	TLLERKVLGYMQLRKGNIVGPYGLLQPIADGVKLF	FIKEPVRPST	SAPILFIIAPT	LALT	TLAMMMWT	PMPLPY	
Stickleback		MMSTIITHIINPLTFIVP	VLLAVAF	TLLERKVLGYMQLRKGNIVGPYGLLQPIADGKLF	FIKEPIR	PSTASPL	FLLAPILALT	LALALWAP	MP	IPHP
Large_yellow_croaker		MIHTLMTHIINPLTLIVP	VLLAVAF	TLLERKVLGYMQLRKGNIVGPYGLLQPIADGKLF	FIKEPIR	PSTSSPILFIIT	PMLALT	LALT	TLWAP	MP
Goldfish		MLNTLMTHLINPLAYIVP	VLLAVAF	TLLERKVLGYMQLRKGNVVG	GPYGLLQPIADGVKLF	FIKEPVRPSTSSPFL	F	LAAPVLALT	TLAMTLWAP	MP
Medaka		MLSKILSYLINPLVIMIF	VLLAVALLTL	VERKVLGYMQLRKGNVVG	GPYGLLQPFADGKLF	FTKEPVRPSTSSP	ALFLITP	IMALTLALT	TLWAP	PLPFP
Salmon		MTTTLITHIINPLAYIVP	VLLAVAF	TLLERKVLGYMQLRKGNIVGPYGLLQPIADGKLF	FIKEPVRPSTSSPFL	F	LATPMLALT	LALT	TLWAP	MP
Rainbow_trout		-MITLITHVINPLAYIVP	VLLAVAF	TLLERKVLGYMQLRKGNIVGPYGLLQPIADGKLF	FIKEPVRPSTSSPFL	F	LATPMLALT	LALT	TLWAP	MP
sea_trout		MITTLITHVVNPLAYIIP	ILLAVAF	TLLERKVLGYMQLRKGNIVGPYGLLQPIADGKLF	FIKEPVRPSTSSPFL	F	LATPMLALT	LALT	TLWAP	MP
Cutthroat_trout		MITTLITHVINPLAYIIP	VLLAVAF	TLLERKVLGYMQLRKGNIVGPYGLLQPIADGKLF	FIKEPVRPSTSSPFL	F	LATPMLALT	LALT	TLWAP	MP
Zebrafish		MLDILTSHLINPLAYAVP	VLIAVAF	TLVERKVLGYMQLRKGNVVG	GRGLLSVADGVKLF	FIKEPIRPSMASPIL	F	LTA	PVLALILAM	MLWAP
Frog		-MSTLITHLINPLLYMVP	ILLAVAF	TLLERKVLGYMQH	RKGNIVGPMGLLQPIADGVKLF	VEPIR	PSTSSQAL	FLLAPT	MAFALAM	SIWAP
Amphioxus		---MILSVIHIFLYFVP	VLLAVAF	TLTERKVI	GYVQLRKGNVVG	GPYGLLQPIADGVKLF	FIKEPIK	PSSSNPSVFFF	APMLALILALL	LWMPVPLMDA
	110	120	130	140	150	160	170	180	190	200
Pufferfish		VLDLNLAILFILALSS	LAVYSILGSGWASNSKYALV	GALRAVAQTISYEVSLGLILLSLIIFTGGFTLQTFNTAQ	ESIWLII	PAWPLAAMWYIST	LAETN			
Fugu		ILDNLAILFVLAISS	LAVYSILGSGWASNSKYALM	GSLRAVAQMISYEVSLGLILLSLIIFTGNFTLQTFNVTQ	ESIWLII	PTWPLAAMWYIST	LAETN			
Stickleback		VIDLNLGIMFILALSS	LAVYSVLGSGWASNSKYALIGALRAVAQTISYEVSLGLILLNIIIFTGGFTLQTFNVAQ	ESVWLIIP	PAWPLAAMWYIST	LAETN				
Large_yellow_croaker		LIDLNLGILFILALSS	LAVYSILGSGWASNSKYALIGALRAVAQTISYEVSLGLILLCTIIFTGGFTLQTFNTAQ	ESIWLII	PAWPLAAMWYIST	LAETN				
Goldfish		VTDLNLGILFILALSS	FAVYSILGSGWASNSKYALIGALRAVAQTISYEVSLGLILLSVIIIFS	GGYTLQTFNTTQ	ESIWLLIP	PAWPLAAMWYIST	LAETN			
Medaka		IADLNLGVLFILALSS	LAVYSILGSGWASNSKYALIGALRAVAQTISYEVSLGLILLNAIVFTGGFTLQTFSTAQ	EATWLLL	PAWPLAAMWYIST	LAETN				
Salmon		ITDLNLGVLFVLALSS	LAVYSILGSGWASNSKYALIGALRAVAQTISYEVSLGLILLSVIIIFTGGFTLQTFNVAQ	ESIWLLVP	PAWPLAAMWYIST	LAETN				
Rainbow_trout		VTDLNLGVLFVLALSS	LAVYSILGSGWASNSKYALIGELRAVAQTISYEVSLGLILLSVIIIFTGGFTLQTFNVAQ	ESIWLLVP	PAWPLAAMWYIST	LAETN				
sea_trout		ITDLNLGVLFILALSS	LAVYSILGSGWASNSKYALIGALRAVAQTISYEVSLGLILLSVIIIFTGGFTLQTFNVAQ	ESIWLLVP	PAWPLAAMWYIST	LAETN				
Cutthroat_trout		VTDLNLGVLFVLALSS	LAVYSILGSGWASNSKYALIGALRAVAQTISYEVSLGLILLSVIVITGGFTLQTFNVAQ	ESIWLLVP	PAWPLAAMWYIST	LAETN				
Zebrafish		VLDLNLGILFIMAIS	LAVYSILGSGWASNSKYALIGALRAVAQTISYEVSLGLILLSAMIFS	GGYTLQTFNTTQ	EDTWLLL	PLWPLAIMWFIST	LAETN			
Frog		LADLNLGILFILALSS	LVYITILGSGWSSNSKYALIGALRAVAQTISYEVTLGLILLCMIMLTGGFTLQTFNNTQ	EHMWLVIP	GWPMAMWYIST	LAETN				
Amphioxus		FIELNFAVL	FVLAISSLSVYSIMASGWSSNSKYALLGALRAVAQ	MVSYEVSLGLIILSLICLVGGFNLAQFFSAQEEV	MLMLSCWPLGIMWFIST	VAETN				
	210	220	230	240	250	260	270	280	290	300
Pufferfish		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYANILFMNTLSASLFLGASHIPMLPELTTMNLMTKAAVLSLVFLWVRASYPRFRYDQLMHLIWKNFL							
Fugu		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYANILLMNTLSTILFLGALHMPALPELTSINLMSKTAI	LSLIFLWARASYPRFRYDQLMHLTWKNFL						
Stickleback		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYANILLMNTLSATLFLGAYHIPSFELTAVNMTKAALLSVVFLWVRASYPRFRSDQLMHLIWKNFL							
Large_yellow_croaker		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYANILLMNTLSATLFLGASHIPTIPELTAMNIMTKAALLSVLFLWVRASYPRFRYDQLMHLIWKNFL							
Goldfish		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYANILLMNTLSAVLFLGASHIPNMPPELTTINLMTKAALLSILFLWVRASYPRFRYDQLMHLVWKNFL							
Medaka		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYGNILLMNTLSAVLFLGTSTYHNLPELSATLLMLKATLLSVVFLWVRASYPRFRYDQLMHLIWKNFL							
Salmon		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYANILLMNTLSAILFLGASHIPAFPELTAVNMTKAALLSVVFLWVRASYPRFRYDQLMHLVWKSFL							
Rainbow_trout		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYANILLMNTLSAVLFLGASHIPAFPELTALNMTKAALLSVVFLWVRASYPRFRYDQLMHLVWKSFL							
sea_trout		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYANILLMNTLSTILFLGASHIPAFPELTAVNMTKAALLSVVFLWVRASYPRFRYDQLMHLVWKSFL							
Cutthroat_trout		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYANILLMNTLSAVLFLGASHIPAFPELTAMNMTKAALLSVVFLWVRASYPRFRYDQLMHLVWKSFL							
Zebrafish		RAPFDLTEGESELVSGFNVEYAGGPFALFFLA	EYSNILLMNTLSTVFLGASFTPDAPPELMTISIA	TKTAMLSILFLWMRASYPRFRYDQLMHLIWKNFL						
Frog		RAPFDLTEGESELVSGFNVEYAGGPFVLF	FLAEYANILLMNTLSTILFLGSSFI-DTPELTTISIMFKASLLSLLFLWVRASYPRFRYDQLMHLVWKNFL							
Amphioxus		RSPFDLTEGESELVSGFNVEYSGGPFALFFLA	EYANILFMNVLSALLFLAAHFS-----LLGVAVKVGLLAGLYLWFRASYPRFRYDQLMHLAWKSFL							
	310	320	330	340	350	360	370	380	390	400
Pufferfish		PLTLALVIWHLALPITFAGLPPQMMSPYITASLLFG	LLLGTTITATSSHWLI	AWMGLEINTLAIIP	PLMAQHHHPRAVEATTKYFLTQATAAAMLLFASTT					
Fugu		PLTLAFIIVHLALPTTMAGLPPQMMNPYITASLLFG	LLLGTTITTTSTHWLI	AWMGLEINTLAIIP	PLMAQHHHPRAIEATTKYFLTQAAAAATLLLAATT					
Stickleback		PLTLALVIWHLALPIAFAGLPPQVMNPFILATLLFG	LGLGTTITFASSHWLLAWMGLEMN	TLAIIP	PLMAQHHHPRAVEATTKYFLTQATGAAMLLFASTT					
Large_yellow_croaker		PLTLALVIWHLALPIALAGLPPQAMNPVSC	TLLITLGLGTTITFASSHWFLAWMGLEINTLAIIP	PLMAQHHHPRAIEATTKYFLTQATAASTLLFATTT						
Goldfish		PLTLAFVLWHTALPIALAGLPPQLMNPVLMILL	SSLGLGTTITFASSHWLLAWMGLEINTLAIIP	PLMAQHHHPRAVEATTKYFLTQATAAAMILFASTT						
Medaka		PLTLALVIWHLALPISFISILLMGLGLGTTVT	FASSHWLLAWMGLEMN	TLAIIP	PLMAQHHHPRAVEAATKYFLIQSAAATILFASST					
Salmon		PLTLALVLWHLALPTAMAGLPPQLMNPVLT	ILLSSGLGTTILTFASSHWLLAWMGLEINTLAIIP	PLMAQHHHPRAIEATTKYFLTQATAAAMILFASTT						
Rainbow_trout		PLTLALVLWHLALPIALAGLPPQLMNPVLT	ILLSSGLGTVLTFASSHWLLAWMGLEINTLAIIP	PLMAQHHHPRAIEATTKYFLTQATAAAMILFASTT						

sea_trout	PLTLALVLWHLALPTATAGLPPQLMNPYVLTILLSSLGGLGTVLTFASSHWLLAWMGLLEINTLAIIPIMAQQHHPRAIEATTKYFLTQATAAAMILFASTT
Cutthroat_trout	PLTLALVLWHLALPIALAGLPPQLMNPYVLTILLSSLGGLGTVLTFASSHWLLAWMGLLEINTLAIIPIMAQQHHPRAIEATTKYFLTQATAAAMILFASTT
Zebrafish	PITLVLVLWHIALPIALAGLPPQTMNPYVLMILMSSSLGGLGTTLTFSSSHWLLAWMGLLEINTLAIIVPIMAQQHHPRAVEATTKYFLIQAAAAAMILFTSTT
Frog	PITLAMTLWHISLPISLSGLPPQMMNPIALSMILSSLAGLGTILTSSSHWFLAWMGLLEINTLAIIPIMAQQHHPRAVEASTKYFLTQAAASALLLFSALN
Amphioxus	PLSLGGLMLNFSPLTFSGIGGGLMSPYISPLFSITMMSVMLISSSGHWVFMWLGLLELGTAFIPILVWVHSSLEVEATVKYFIVQAMAAVFFLGGMV
	410 420 430 440 450 460 470 480 490 500
Pufferfish	NAWLTGQWELQQMTHPLPSTLIILALALKIGLAPLHTWLP EVLQGLDLTTGLVLSTWQKLAPFALLLQLQPNN-PTLLVILGVLSTLIGWGGLNQTQLR
Fugu	NAWMTGQWELQQATHPVPTTMITIALALKIGLAPLHTWLP EVMQGLDLTTGLILATWQKIAPFALLLQIQPNN-QTLLILLAILSMVLVGGWGGLNQTQVR
Stickleback	NAWMTGQWELIQMTHPLPMTLITLALALKIGLAPLHSWLP EVLQGLDLTTGLIMSTWQKLAPFALLLHLDPSN-STLLVVLGLTSTLVGGWGGLNQTQLR
Large_yellow_croaker	NAWLNQWDIQHMTPLPITLFTIALALKIGLAPPTIWLPEVLQGLDLITGLIMSTWQKLAPFALLLQIYPAN-STLLIMLGLTSTLIGWGGLNQTQLR
Goldfish	NAWMTGEWNITDLSPLANTMFMTALALKIGLAPMHFWMP EVMQGLDLTTGLILSTWQKLAPFALLIQTQANI DP LLLTLLGVTSTLVGGWGGLNQTQLR
Medaka	NAWLSGQWDIQHITHPLPTVMITIALSLKLGAPLHAWLP EVVQGLDLTTGLVLSTWQKLAPFALLLQISP EI -PLLITSLGLISMLAGWGGLNHTQLR
Salmon	NAWLVGWEIHLQSHPLATTTVMLALALKLGLAPVHFWLP EVLQGLELTTGLILSTWQKLAPFALMIQVAPTINSSLLIAMGLLSTLVGGWGGLNQTQLR
Rainbow_trout	NAWLVGWEIHLQSHPLATTTVMLALALKLGLAPVHFWLP EVLQGLELTTGLILSTWQKLAPFALMIQVAPTINSSLLVTIGLLSTLVGGWGGLNQTQLR
sea_trout	NAWLVGWEIHLQSHPLATTTAMLALALKLGLAPVHFWLP EVLQGLELTTGLILSTWQKLAPFALMIQVAPTINSSLLIAMGLLSTLVGGWGGLNQTQLR
Cutthroat_trout	NAWLMGEWEIHLQSHPLATTTVMLALALKLGLAPVHFWLP EVLQGLELTTGLILSTWQKLAPFALMIQVAPTINSSLLVAIGLLSTLVGGWGGLNQTQLR
Zebrafish	NAWISGQWDVTGMPGPATSTAMMFALALKIGLAPMHFWLP EVLQGLDLTTGLILSTWQKLAPMALIIQTTQTDDPLILTSGLIASSLIGWWSGLNQTQLR
Frog	NAWFTGEWSIMNLTNSISCTTMTIAICMKLGLAPFHFWLP EVLQGLNLTGGLILSTWQKLAPMAILYQISPSMNTSLLLLIGLTSTLIGWGGLNQTQLR
Amphioxus	SLSGDFMGGVNQLMGNI GDMIMLAVVTKLGLAPFHYWVVDVVQGLNYIPGAVLLTWQKVPGLAVLTQLATCNNSSMLLLFGMVSALVGGGLGGLGQTQMR
	510 520 530 540 550 560 570 580 590 600
Pufferfish	KILAYSSIAHLGWMILILQFSPTLTLTLMLYLIMTSSAFLTIFILNKTTTTINALATSWAKTPILTSLLPLVLLSLGGLPPLTGFMPPKWLILQELTKHDLA
Fugu	KILAYSSIAHLGWMVILQFSPTLAVMTLALYIIMTSSSTFLAFMMNKTTTTIGTLTISWAKTPIISSLMPLILLSLGGLPPLTGFMPPKWLILQELTKQDLG
Stickleback	KILAYSSIAHLGWMTLVMHFSPSLTLTLIMYFIMTFPAFLVFKLNNSTTINSLATSWAKAPALTSPTFILLSLGGLPPLVGFMPKWLILQELTKQELA
Large_yellow_croaker	KILAYSSIAHLGWMILVLQFSPALTLTLTFMYIIMTFSTFLVFNLNATNINTLATTWAKTPALTALTPLLLLSLGGLPPLSGFMPPKWLILQELAKQDLA
Goldfish	KILAYSSIAHMGWMIIVIQYAPQLTLIALGTYIIMTSSAFLTLMKSLTTLTATTWAKSPILTATLALVLLSLGGLPPLTGFMPPKWLILQELTKQDLP
Medaka	KVLAYSSVAHLGWMVMVQFSTSLTALALLMYIIMTSSAFLTFKLLKSTDMNSLAMSWAKTPSVTALAPMMLLSLGGLPPLSGFLPKWLIQELTKQELG
Salmon	KILAYSSIAHLGWMVILQYAPSLTLLSLFLYIIMTSSAFLTLTNNSLTINTLATSWTKSPTLAALTALVLLSLGGLPPLSGFMPPKWLILQELTKQGLP
Rainbow_trout	KILAYLPPIAHLGWMVILQFAPSLTLLSLSLYIIMTSSAFLTLTNNSLTINTLATSWTKSPTLAALTALVLLSLGGLPPLSGFMPPKWLILQELTKQGLP
sea_trout	KILAYSSIAHLGWMVILQYAPSLTLLSLFLYIIMTSSAFLTLTNNSLTINTLATSWTKSPTLAALTALVLLSLGGLPPLSGFMPPKWLILQELTKQELP
Cutthroat_trout	KILAYSSIAHLGWMVILQFAPSLTLLSLSLYIIMTSSAFLTLTNNALTINTLATSWTKSPTLAALAALVLLSLGGLPPLSGFMPPKWLILQELTKQGLP
Zebrafish	KILAYSSIAHMGWMIIVIQYAPQLTLIALGTYIFMTSSAFLTLLKVLSTATKINTLTTTWPKSPILAAIATLVMLSLGGLPPLTGFMPPKWLILQELTKQDLP
Frog	KILAFSSIAHLGWMASILPIMPQLMILNLIYIIMTSTLFLTLTKTISSTKISTLATSWPKTPTTTALTLTLLSLGGLPPLSGFMPPKWLILQELTNQNTPT
Amphioxus	KLLAFSSISHLGWLVGCVAGSLLGLSYFTLYVVLISPLFSILMLN GGHNLQRLTGLMFNPLMSVLLGVGFSLGGLPPFFGFFGKWLTLTFVQGQLL
	610 620 630 640 650 660 670 680 690 700
Pufferfish	PTATLAALSALLSLFYLRLSYAMTLTIAPNNLTGLTPWRTQTTQPNMMTATMTASSILLPMTGPILTLFN--IMAITRFFFSTNHKDIGTLYLVFGAW
Fugu	MTATLAALSALLSLFYLRLSYAMTLTISPNNLTGLTPWRTQTNKKTLPATALLSSSILLPLTPEVLTILFN--TMAITRFFFSTNHKDIGTLYLVFGAW
Stickleback	AVATLAFAALLSLFYLRLSYAMALTMSPNSTTATTPWRYSQSATLPLAISTTATLLLLPLAPAAIALFT--IMAITRFFFSTNHKDIGTLYLVFGAW
Large_yellow_croaker	LTATLAALTALLSLFYLRLSYALALTMFPNNPTGTPPWRLQSPQIVYPLALSITATLTLPLPTITAMLT--PMTITRFFFSTNHKDIGTLYLIFGAW
Goldfish	IIATIMALAALISLYFYLRLCYAMTLTISPNTTNTSTTPWRTQTTQTSMPALFTMATLGLLPMPTILMLAT--MAITRFFFSTNHKDIGTLYLVFGAW
Medaka	LVATVAALSALLSLFFYLRCYCLTFTSSPNNLAGVAPWRLESKQISLPLATSTSLSILLPISPAILSLTLPLFMAITRFFFSTNHKDIGTLYLIFGAW
Salmon	LSATLAAMTALLSLFYLRLCYAMTLTIYPNTLTATAPWRLNFTLITLPLSIITILALGLLPLTPAVTTLT--LMAITRFFFSTNHKDIGTLYLVFGAW
Rainbow_trout	LSATLAAMTALLSLFYLRLCYALTLTIIYPNTLTATAPWRLNFTMITLPLSIITILALGLLPLTPAVTAMLA--LMAITRFFFSTNHKDIGTLYLVFGAW
sea_trout	LSATLAAMTALLSLFYLRLCYAMTLTIYPNTLAATTPWRLNFTFITLPLSIVTILALGLLPLTPAVTAMLT--LMAITRFFFSTNHKDIGTLYLVFGAW
Cutthroat_trout	LSATLAAMTALLSLFYLRLCYALTLTIIYPNTLTATAPWRLNFTMITLPLSIITILALGLLPLTPAVTAMLA--LMAITRFFFSTNHKDIGTLYLVFGAW
Zebrafish	ATATIMALTALLSLFFYLRLCHAMTLTTSPTINSAPHWRVQTTQNSPLTISVTVMGLLPLTPAILMLTT--MTITRFFFSTNHKDIGTLYLVFGAW
Frog	ILATMLALSALLSLFFYLRLSYSITLTSSPNTSNSPLTWRHNSKQPTLLSLMLISSFFLLPISP---LMMS---MAITRWLFSTNHKDIGTLYLVFGAW
Amphioxus	GVSVVLITGTLISLFYLRVSYLCIVVLGPPQIMSGLNWRK--MQLSGLMSGLLVLNMLGLFLVGGASCLPK---MYITRWLFSTNHKDIGTLYFIFGAW
	710 720 730 740 750 760 770 780 790 800
Pufferfish	AGMVGTALSLLIRAELSQQGALLGDDQIYNVIVTAHAFVMIFFMVMPIMI GGFGNWLVLPMIGAPDLAFPMWSNMSFWLLPPSFLLLLASSGVEAGAGTG
Fugu	AGMVGTALSLLIRAELSQQGALLGDDQIYNVIVTAHAFVMIFFMVMPIMI GGFGNWLIPLMIGAPDMAFPBMNMSFWLLPPSFLLLLASSGVEAGAGTG

Stickleback	AGMVGTALSLLIRAELSQPGALLGDDQIYNVIVTAHAFVMIFFMVMPIMI	GGFGNWLIPLMIGAPDMAFPRMNNMSFWLLPPSFLLLLASSGVEAGAGTG
Large_yellow_croaker	AGMVGTALSLLIRAELSQPGSLLGDDQIFNVIVTAHAFVMIFFMVMPVMI	GGFGNWLVPMLIGAPDMAFPRMNNMSFWLLPPSFLLLLASSGVEAGAGTG
Goldfish	AGMVGTALSLLIRAELSQPGSLLGDDQIYNVIVTAHAFVMIFFMVMPILI	GGFGNWLVPMLIGAPDMAFPRMNNMSFWLLPPSFLLLLASSGVEAGAGTG
Medaka	AGMVGTALSLLIRAELSQPGSLLGDDQIYNVIVTAHAFVMIFFMVMPIMI	GGFGNWLIPLMIGAPDMAFPRMNNMSFWLLPPSFLLLLASSGVEAGAGTG
Salmon	AGMVGTALSLLIRAELSQPGALLGDDQIYNVIVTAHAFVMIFFMVMPIMI	GGFGNWLIPLMIGAPDMAFPRMNNMSFWLLPPSFLLLLASSGVEAGAGTG
Rainbow_trout	AGMVGTALSLLIRAELSQPGALLGDDQIYNVIVTAHAFVMIFFMVMPIMI	GGFGNWLIPLMIGAPDMAFPRMNNMSFWLLPPSFLLLLSSSGVEAGAGTG
sea_trout	AGMVGTALSLLIRAELSQPGALLGDDQIYNVIVTAHAFVMIFFMVMPIMI	GGFGNWLIPLMIGAPDMAFPRMNNMSFWLLPPSFLLLLASSGVEAGAGTG
Cutthroat_trout	AGMVGTALSLLIRAELSQPGALLGDDQIYNVIVTAHAFVMIFFMVMPIMI	GGFGNWLIPLMIGAPDMAFPRMNNMSFWLLPPSFLLLLSSSGVEAGAGTG
Zebrafish	AGMVGTALSLLIRAELSQPGALLGDDQIYNVIVTAHAFVMIFFMVMPILI	GGFGNWLVPMLIGAPDMAFPRMNNMSFWLLPPSFLLLLASSGVEAGAGTG
Frog	AGMVGTALSLLIRAELSQPGTLLGDDQIYNVIVTAHAFIMIFFMVMPIMI	GGFGNWLIPLMIGAPDMAFPRMNNMSFWLLPPSFLLLLASSGVEAGAGTG
Amphioxus	AAMVGTAMSLIRAELSQPGALLGDDHLYNVIVTAHAFVMIFFMVMPIMI	GGFGNWLVPMMIGAPDMAFPRMNNMSFWMLPPSFLLLLASSAVEAGVGTG

	810	820	830	840	850	860	870	880	890	900
										
Pufferfish	WTVYPPLAGNLAHAGASVDLTIFSLHLAGVSSILGAINFITTIINMKPPAISQYQTPLFVWAVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Fugu	WTVYPPLAGNLAHAGASVDLTIFSLHLAGVSSILGAINFITTIINMKPPAISQYQTPLFVWAVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Stickleback	WTVYPPLSGNLAHAGASVDLTIFSLHLAGISSILGAINFITTIINMKPPAISQYQTPLFVWSVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Large_yellow_croaker	WTVYPPLAGNLAHAGASVDLAIFSLHLAGVSSILGAINFITTIINMKPPGITQYQTPLFVWAVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Goldfish	WTVYPPLAGNLAHAGASVDLTIFSLHLAGVSSILGAINFITTIINMKPPAISQYQTPLFVWSVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Medaka	WTVYPPLSGNLAHAGASVDLTIFSLHLAGISSILGAINFITTIINMKPPAISQYQTPLFVWAVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Salmon	WTVYPPLAGNLAHAGASVDLTIFSLHLAGISSILGAINFITTIINMKPPAISQYQTPLFVWAVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Rainbow_trout	WTVYPPLAGNLAHAGASVDLTIFSLHLAGISSILGAINFITTIINMKPPAISQYQTPLFVWAVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
sea_trout	WTVYPPLAGNLAHAGASVDLTIFSLHLAGISSILGAINFITTIINMKPPAISQYQTPLFVWAVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Cutthroat_trout	WTVYPPLAGNLAHAGASVDLTIFSLHLAGISSILGAINFITTIINMKPPAISQYQTPLFVWAVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Zebrafish	WTVYPPLAGNLAHAGASVDLTIFSLHLAGVSSILGAINFITTTINMKPPTISQYQTPLFVWAVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Frog	WTVYPPLAGNLAHAGASVDLTIFSLHLAGVSSILGAINFITTTINMKPPAMSQYQTPLFVWSVLITAVLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									
Amphioxus	WTVYPPLSSNIAHAGASVDLAIFSLHLAGVSSILGAINFITTIINMR-ASIEWNRVPLFVWSIWTAYLLLLSLPVLAAAGITMLLTDRNLNTTFFDPAGG									

	910	920	930	940	950	960	970	980	990	1000
										
Pufferfish	GDPILYQHLFWFFGHPEVYILILPGFGMISHIVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
Fugu	GDPILYQHLFWFFGHPEVYILILPGFGMISHIVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
Stickleback	GDPILYQHLFWFFGHPEVYILILPGFGMISHIVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
Large_yellow_croaker	GDPILYQHLFWFFGHPEVYILILPGFGMVSHIVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
Goldfish	GDPILYQHLFWFFGHPEVYILILPGFGIISHVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
Medaka	GDPILYQHLFWFFGHPEVYILILPGFGMISHIVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
Salmon	GDPILYQHLFWFFGHPEVYILILPGFGMISHIVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
Rainbow_trout	GDPILYQHLFWFFGHPEVYILILPGFGMISHIVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
sea_trout	GDPILYQHLFWFFGHPEVYILILPGFGMISHIVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
Cutthroat_trout	GDPILYQHLFWFFGHPEVYILILPGFGMISHIVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
Zebrafish	GDPILYQHLFWFFGHPEVYILILPGFGIISHVAYYAGKKEPFGYMGMVWAMMAIGLLGFIVWAHHMFTVGMDDVDRAYFTSATMIIAIPITGVKVFSWLA									
Frog	GDPVLYQHLFWFFGHPEVYILILPGFGMISHIVYYSAGKKEPFGYMGMVWAMMSIGLLGFIVWAHHMFTVDLNVDRAYFTSATMIIAIPITGVKVFSWLA									
Amphioxus	GDPILYEHFWFFGHPEVYILILPGFGIISHIIHYAGKLRSFGYLGMTWAMFTIGLLGFVWVAHHMFTVGMDDVDRSYFTAATMVIAPTGVKVFSWLA									

	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100
										
Pufferfish	TLHGG-SIKWETPMLWALGFIFLFTVGGLTGIVLANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIMGAFVHWFPFLFSGYTLHSTWTKIHFGVMFVGNLT									
Fugu	TLHGG-SIKWETPMLWALGFIFLFTVGGLTGIVLANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIMGAFVHWFPFLFSGYTLHSTWTKIHFGVMFVGNLT									
Stickleback	TLHGG-SIKWETPLLWALGFIFLFTVGGLTGIVLANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIAGFVHWFPFLFSGYTLHSTWTKVHFVGMFAGVGNLT									
Large_yellow_croaker	TLHGG-DLKWEAPLLWALGFIFLFTVGGLTGIVLANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIMGGFVHWFPPLFTGYTLHSTWTKAHFTIMFMGVNIT									
Goldfish	TLHGG-SIKWETPMLWALGFIFLFTVGGLTGIVLSNSSLDIVLHDTYYVVAHFHYVLSMGAVFAIMAAAFVHWFPPLFTGYTLHSAWTKIHFGVMFVGNLT									
Medaka	TLHGG-SIKWETPLLWALGFIFLFTVGGLTGIVLANSSLDIMLHDTYYVVAHFHYVLSMGAVFAIMGAFVHWFPFLFSGYTLHGTWTKIHFGVMFVGNLT									
Salmon	TLHGG-SIKWETPLLWALGFIFLFTVGGLTGIVLANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIMGAFVHWFPPLFTGYTLHSTWTKIHFGIMFVGNLT									
Rainbow_trout	TLHGG-SIKWETPLLWALGFIFLFTVGGLTGIVLANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIMGAFVHWFPPLFTGYTLHSTWTKIHFGIMFVGNLT									
sea_trout	TLHGG-SIKWETPLLWALGFIFLFTVGGLTGIVLANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIMGAFVHWFPPLFTGYTLHSTWTKIHFGIMFVGNLT									
Cutthroat_trout	TLHGG-SIKWETPLLWALGFIFLFTVGGLTGIVLANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIMGAFVHWFPPLFTGYTLHSTWTKIHFGIMFVGNLT									
Zebrafish	TLHGG-AIKWETPMLWALGFIFLFTVGGLTGIVLANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIMGAFVHWFPPLFTGYTLNSVWTKIHFGVMFVGNLT									
Frog	TMHGG-TIKWDAPMLWALGFIFLFTVGGLTGIVLANSSLDIVLHDTYYVVAHFHYVLSMGAVFAIMGGFVHWFPPLFTGYTLHETWAKIHFGVMFAGVGNLT									

Salmon
Rainbow_trout
sea_trout
Cutthroat_trout
Zebrafish
Frog
Amphioxus

1510 1520 1530 1540 1550 1560 1570 1580 1590 1600

Pufferfish
Fugu
Stickleback
Large_yellow_croaker
Goldfish
Medaka
Salmon
Rainbow_trout
sea_trout
Cutthroat_trout
Zebrafish
Frog
Amphioxus

1610 1620 1630 1640 1650 1660 1670 1680 1690 1700

Pufferfish
Fugu
Stickleback
Large_yellow_croaker
Goldfish
Medaka
Salmon
Rainbow_trout
sea_trout
Cutthroat_trout
Zebrafish
Frog
Amphioxus

1710 1720 1730 1740 1750 1760 1770 1780 1790 1800

Pufferfish
Fugu
Stickleback
Large_yellow_croaker
Goldfish
Medaka
Salmon
Rainbow_trout
sea_trout
Cutthroat_trout
Zebrafish
Frog
Amphioxus

1810 1820 1830 1840 1850 1860 1870 1880 1890 1900

Pufferfish	FFLGFFWAFYHSSLAPTPELGGCWPPPTGIVPLNPFVPLLNTAVLLASGVTVTWAHHSIMEGERKQAIHSLTLTILLGFYFTFLQAMEYYEAPFTIADGV
Fugu	FFLGFFWAFYHASLAPTPELGGCWPPPTGIPLNPFVPLLNTAVLLASGVTVTWAHHSIMEGERKQAIQSLTLTILLGFYFTFLQAMEYYEAPFTIADGV
Stickleback	FFLGFFWAFYHASLAPTPELGGCWPPPTGITTLDPFVPLLNTAVLLASGVTVTWAHHSIMEGERKQAIQSLALTILLGFYFTFLQAMEYYEAPFTIADGV
Large_yellow_croaker	FFLGFFWAFYHSSLAPTPELGGCWPPPTGITTLDPFVPLLNTAVLLASGVTVTWAHHSIMEGEREQAIHSLTLTILLGFYFTFLQAMEYYEAPFTIADGV
Goldfish	FFLGFFWAFYHSSLAPTPELGGCWPPPTGITPLDPFEVPLLNTAVLLASGVTVTWAHHSIMEGERKQAIQSLALTILLGLYFTALQAMEYYEAPFTIADGV
Medaka	FFLGFFWAFYHSSLAPTPELGGCWPPPTGITTLDPFVPLLNTAVLLASGVTVTWAHHSIMEGQRKQAIQSLTLTILLGFYFTFLQAMEYFEAPFTIADGV
Salmon	FFLGFFWAFYHSSLSPTPELGGCWPPPTGIITLDPFVPLLNTAVLLASGVTVTWAHHSIMEGERKQTIQALTTLTILLGFYFTFLQAMEYYEAPFTIADGV
Rainbow_trout	FFLGFFWAFYHASLAPTPELGGCWPPAGITTLDPFVPLLNTAVLLASGVTVTWAHHSIMEGERKQTIQALTTLTILLGFYFTFLQAMEYYEAPFTIADGV
sea_trout	FFLGFFWAFYHSSLAPSPPELGGCWPPPTGIITLDPFVPLLNTAVLLASGVTVTWAHHSIMEGERKQTIQALTTLTILLGFYFTFLQAMEYYEAPFTIADGV
Cutthroat_trout	FFLGFFWAFYHASLAPTPELGGCWPPPTGITTLDPFVPLLNTAVLLASGVTVTWAHHSIMEGERKQTIQALTTLTILLGFYFTFLQAMEYYEAPFTIADGV
Zebrafish	FFLGFFWAFYHSSLAPTPELGGCWPPPTGLTTLDPFVPLLNTAVLLASGVTVTWAHHSIMEGERKQAIQSLALTILLGLYFTALQAMEYYEAPFTIADGV
Frog	FFIGFFWAFYNSSLAPTYELGECWPPTGITPLNPFVPLLNTAVLLASGVTVTWAHHSIMHGNRKEAIQSLGLTILLGLYFTALQAMEYYEAPFTIADGV
Amphioxus	FFLAFFWAFHHSSLAPTVELGVTWPPGVHPLNAFAVPLLNTAVLLSSGVTVTWAHHALMEGKRTEAIQSLAITVMLGLYFTGLQAWYYEAPFTIADSV

	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
										
Pufferfish	YGSTFFVATGFHGLHVII	GSTFLAICLLRQIRYHFTSEHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLLLITLITLISLILAIVSFWLPLMTPD								
Fugu	YGSTFFVATGFHGLHVII	GSTFLAVCLLRQIRHFHFTSEHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLLTTLITLITLISLILMTVSFWLPAITPD								
Stickleback	YGSSFFVATGFHGLHVII	GSFLAVCFLRQIRHHFTAHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLVTTTVSITAALSLVLALVSFWLPQMTPD								
Large_yellow_croaker	YGSTFFVATGFHGLHVII	GSTFLAVCLLRQVQYHFTSGHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLVMVILIIATLLSALLATVSFWLPQMTPD								
Goldfish	YGSTFFVATGFHGLHVII	GSTFLAVCLLRQVQYHFTSEHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLIMTILITLITLISLILATISFWLPQMNPD								
Medaka	YGSTFFVATGFHGLHVII	GSTFLAVCLLRQVQYHFTSEHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLVMVTLISLVLATVLAISFFLPQMTPD								
Salmon	YGSTFFVATGFHGLHVII	GSTFLAICLLRQIQYHFTSEHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLITITITITITLISAVLATISFWLPQMTPD								
Rainbow_trout	YGSTFFVATGFHGLHVII	GSTFLAVCLLRQVQYHFTSEHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLITITITITITLISAVLATISFWLPQISPD								
sea_trout	YGSTFFVATGFHGLHVII	GSTFLAVCLLRQIQYHFTSEHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLITITITITITLISAVLATISFWLPQITPD								
Cutthroat_trout	YGSTFFVATGFHGLHVII	GSTFLAVCLLRQVQYHFTSEHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLITITITITITLISAVLATISFWLPQISPD								
Zebrafish	YGSTFFVATGFHGLHVII	GSTFLAVCLLRQVLFHFTSDHHFGFEAAAWYWHFVDVWVFLYISIIYWGSMNLFATILIMTTLISLVLALVSFWLPQMNSD								
Frog	YGSTFFVATGFHGLHVII	GSFLSVCFIRQIQYHFTSKHHFGFEAAAWYWHFVDVWVFLYISIIYWGSM--TATILAIATLSLILLTVSFWLPMMPD								
Amphioxus	YGSTFFVATGFHGLHVII	GSTFLMVCLGRQVFYHYTSSHHFGFEAAAWYWHFVDVWVFLYVCIIYWGSMLSLTYIVGIASALVIILLVGLLPSVMPD								

	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
										
Pufferfish	YQKLSPYECGFDPLGSARLPFSIRFFLVAILFLLFDLEIALLLPLPWGDQLPS-PMFTLLWASALLIMLTGLIYEWLQGGLEWAEMTPIQFTFSSAFLL									
Fugu	YQKLSPYECGFDPLGSARLPFSIRFFLVAILFLLFDLEIALLLPLPWGDQLPS-PTLTLMWTSALLILLTIGLAYEWLQGGLEWAEMTLIQLSFTSVFLL									
Stickleback	HEKLSPYECGFDPLGSARLPFSIRFFLVAILFLLFDLEIALLLPLPWGDQLAS-PLFTFLWATAVLTLLTLGLIYEWQGGLEWAEMTPVHFAFSSAFML									
Large_yellow_croaker	HEKLSPYECGFDPLGTARLPFSIRFFLIAILFLLFDLEIALLLPLPWGDQLAS-PLTFFWATAVLLLLTLGLVYEWLQGGLEWAEMTPHFAFSSAFIL									
Goldfish	AEKLSPYECGFDPLGSARLPFSIRFFLVAILFLLFDLEIALLLPLPWGDQLNN-PTGTFFWATTVLILLTLGLIYEWTQGGLEWAEMTPVHFSFSSAFIL									
Medaka	YEKLSPYECGFDPLGSARLPFSIRFFLVAILFLLFDLEIALLLPLPWGDQLSS-PLMTFFWASAILMLLTGLIYEWLQGGLEWAEMTLHYAFSSSYFM									
Salmon	AEKLSPYECGFDPLGSARLPFSIRFFLIAILFLLFDLEIALLLPLPWGDQLTT-PALTLAWSAAVLALLTLGLIYEWTQGGLEWAEMTPVHFSFSSAFIL									
Rainbow_trout	AEKLSPYECGFDPLGSARLPFSIRFFLIAILFLLFDLEIALLLPLPWGDQLHT-PTLTLIWSTAVLALLTLGLIYEWTQGGLEWAEMTPVHFSFSSAFIL									
sea_trout	AEKLSPYECGFDPLGSARLPFSIRFFLIAILFLLFDLEIALLLPLPWGDQLAT-PALTLAWSAAVLALLTLGLIYEWTQGGLEWAEMTPVHFSFSSAFIL									
Cutthroat_trout	AEKLSPYECGFDPLGSARLPFSIRFFLIAILFLLFDLEIALLLPLPWGDQLNT-PTLTLIWSTAVLALLTLGLIYEWTQGGLEWAEMTPVHFSFSSAFIL									
Zebrafish	TEKLSPYECGFDPLGSARLPFSIRFFLVAVLFPLFDLEIALLLPLPWGDQLNN-PMETLFWAMTVLILLTLGLAYEWAQGGLEWAEMTPHFSLNAAFML									
Frog	SEKLSPYECGFDPLGSARLPFSMRFFLIAILFLLFDLEIALLLPSPWAAQLNS-PTTTIIWATLIITLLTLGLIYEWIQGGLEWAEMTLVHFSFCSAFIL									
Amphioxus	NEKLSAYECGFDPMGNARLPFSIRFFLVAILFLLFDLEIALILPYPLGVVFSENTFYNYWLVMLLVVLTFTGLMYEWLKGGLWTEMLIMIL----IFLI									

	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200
										
Pufferfish	GLSGLAFHRTHLLSALLCLEGMMLSLFIALSLWTLQSSISFSSAPMLLLAFAACEASVGLALMVATARTHGSDDLQGLNLLQCMLKILIPTVMLIPTAW									
Fugu	GLFGLAFYRVHLLSALLCLESMMLALFLALSTWSLQMSSTSFAAPLLLLAFAACEAGVGLALMVATARTHGSDDLQGLNLLQCMLKILIPTTMLILATW									
Stickleback	GLTGLAFHRTHLLSALLCLEGMMLSLFIALSLWTLQLDSTNFSGAPMLLLAFAACEASAGLALLVAAARTHGTDDLQGLNLLQCMLKILIPTLMLIPTTW									
Large_yellow_croaker	GLAGLAFHRTHLLSALLCLEGMMLSLFIALSLWTLQLDSTLSASPMLLAFAACEASTGLALLVATTRTHGTDRQLQSLNLLQCMLKILIPTLMLIPTTW									
Goldfish	GLMGLAFHRTHLLSALLCLEGMMLSLFIALALWALQFESTGFSTAPMLLLAFAACEASTGLALLVATARTHGTDRQLQGLNLLQCMLKVLIPTFMLFPTIW									
Medaka	SFLGLIFYRKHLLSALLCLEAMMLILFISLCLWGLILASTVFSAGPMILLAFSAACEASAGLALLVAMARTHGTDRQLNLSLLRCMLMVLAPTMMLLPMIW									
Salmon	GLMGLAFHRTHLLSALLCLEGMMLSLFIALSLWALQMEATGYSVAPMLLLAFAACEASAGLALLVATARTHGTDRQLQSLNLLQCMLKILIPTLMLFPTIW									
Rainbow_trout	GLMGLAFHRTHLLSALLCLEGMMLSLFIALSLWALQMEATGYSVAPMLLLAFAACEASAGLALLVATARTHGTDRQLQSLNLLQCMLKILIPTLMLFPTIW									
sea_trout	GLMGLAFHRTHLLSALLCLEGMMLSLFIALSLWALQMEATGYSVAPMLLLAFAACEASAGLALLVATARTHGTDRQLQSLNLLQCMLKILIPTLMLFPTIW									
Cutthroat_trout	GLMGLAFHRTHLLSALLCLEGMMLSLFIALSLWALQMEATGYSVAPMLLLAFAACEASAGLALLVATARTHGTDRQLQSLNLLQCMLKILIPTLMLFPTIW									

Zebrafish	GLAGLTFHRVHLLSALLCLEGMMLSLFISMALWTLKTESMSLSTAPMLLLAFSACEASAGLALLVATARTHGSDDHMKNLNLLQCMLKVLIPTIMLFPTIW
Frog	GLTGLALHRAHLLSALLCLEGVMLSMYVGLSSWPTQISLFSFSLVPMMLTFSACEAGTGLALMVATTTHGTGTDNLHNLNLLQCMLKILIPTLMIPSTW
Amphioxus	ALLGLGLSQTHLLSVLLCLEMMMVSLYLGLGMVSISGLHYPLMIA-LVLLTFSACEASSGLALLVLISRSHGSDLLKSFNLS--MNHVLVGYVGLVIGVI
	2210 2220 2230 2240 2250 2260 2270 2280 2290 2300
Pufferfish	
Fugu	LAPAKWLWPTTLLHSLIIALASLSWLKNASETGWSSLNPMATDPLSTPLLILSCWLLPLMILASQNHHTAHPEPINRQRMYSLLTSLQFFLILAFSATEM
Stickleback	LTTPKWLWPSSLLNSLLIALTSLLWLKNASETGWTFNLNYPYLATDPLSTPLLILSCWLLPLMILASQNHHTSHPEPINRQRMYSLLTSLQFFLILAFSATEM
Large_yellow_croaker	LTKPNWLWPSTLAHSLIIAVFSLTWANMSETGWTSLNYYLATDSLSTPLLVLTCWLLPLMIIASQNHHTAAEPENRQRVYITLLTSLQIFLILAFSATEI
Goldfish	LTPAKWLWPTTLMHSLIIALASLSWLKSLSETGWTSLNLYMATDPLSTPLLVLTCWLLPLMILASQNHHTSEPINRQRMYSLLTSLQIFLILAFGATEM
Medaka	LTSPKWLWTATTAHSLIIASISLWMFKWTSETGWTSSNTYLATDPLSTPLLVLTCWLLPLMILASQNHINPEPISRQRLYITLLASLQAFLLIMAFGATQT
Salmon	LCSAHLWTSALAHSMATIALISLWLCLPMEAGWSSLNFTVATDPLSTPLLVLTCWLLPLMILASQNHMAKEPINRQRTYISLLVSLQIFLVLAFGATEM
Rainbow_trout	FSPAKWLWTTISIAQSLVIALASLSWLKWSSETGWSSSNLYLATDPLSTPLLVLTCWLLPLMVLASQNHISPEPLNRQRTYISLLVSLQMFLLILAFGATEI
sea_trout	LSPAKWLWTTISIAQSLIIALASLSWLKWSSETGWSSSNLYLATDPLSTPLLVLTCWLLPLMILASQNSHLSPEPLNRQRAYISLLVSLQTFVLVAFGATEI
Cutthroat_trout	LSPAKWLWTTISIAQSLVIALASLSWLKWSSETGWSSSNLYLATDPLSTPLLVLTCWLLPLMILASQNHISPEPLNRQRTYISLLVSLQTFLLILAFGATEI
Zebrafish	LSSSKWLWTTTTMNSFLIAFISLTWLKWTSDTGWNASNSYMAADPLSTPLLVLTCWLLPLMILASQNHINSEPVNRQRMYSLLTSLQTFMIMAFGATKI
Frog	LINKKWLWPSLTSQSLIISLLSLSWFFNQTEETHFS-NHLMISIDQLSTPLLILTCWLLPLMILASQNHLSPEPISRQRTFITMLVFLQLSLIMAFSATEL
Amphioxus	VTKKSMVWRVGVQGSVLLMLPATVLVN--NMMTISNVSYMMSDFVSLGLTVLSIWLLPLMLLASQNHMVSESLIYQRVFVGCQVFLT GALVLAFMASDL
	2310 2320 2330 2340 2350 2360 2370 2380 2390 2400
Pufferfish	
Fugu	IMFYVMFEATLIPTLILITRWGNQTERLNAGTYFLFYTLAGSLPLLVAALLLQNSNGSLSLTLLHSTPPQLSTYADKIWWTGCI LAFLVKMPLYGVHLW
Stickleback	IMFYVMFEATLIPTLILITRWGNQAERLNAGTYFLFYTLAGSLPLLIAALLLQNSNGSLSLMLPHLGQLELTSYADKIWWAGCI LAFLVKMPLYGVHLW
Large_yellow_croaker	IMFYVMFEATLIPTLVIIITRWGNQTERLNAGVYFLFYTLAGSLPLLVAALLLQNSTGTLSLLTIQYSDPHLSTFADKLWWASCLLAFLVKMPLYGVHLW
Goldfish	IMFYVMFEATLIPTLFLITRWGNQAERLNAGTYFLFYTLAGSLPLLVAALLLQNSTGTLSLLTLQLSGPTMLISFADKLWWAGCLLAFLVKMPLYGVHLW
Medaka	IMFYIMFEATLIPTLIIITRWGNQTERLNAGTYFLFYTLAGSLPLLVAALLLQNSTGTLSMLVLQYSQPLQLNSWGHMIWWAGCLLAFLVKMPLYGVHLW
Salmon	IMFYIMFEATLIPTLIIITRWGNQTERLNAGTYFLFYTLAGSLPLLVAALLLQNSTGTLSFLTQFFPPLQLHTEASKFWWAGCLLAFLVKMPLYGAHLW
Rainbow_trout	IMFYIMFEATLLPTLIIITRWGNQTERLNAGTYFLFYTLAGSLPLLVAALLLQNDSGTLSMFTLQYTQPMHLLTWGNKLWWAACLLAFLVKMPVYGVHLW
sea_trout	IMFYVMFEATLLPTLIIITRWGNQTERLNAGTYFLFYTLAGSLPLLVAALLMQNDNGTLSMFTLQYTQPLHLLTWGDKLWWAACLLAFLVKMPLYGVHLW
Cutthroat_trout	IMFYIMFEATLLPTLIIITRWGNQTERLNAGTYFLFYTLAGSLPLLVAALLMQNDNGTLSMFTLQYTQPLHLLTWGDKLWWAACLLAFLVKMPLYGVHLW
Zebrafish	IMFYIMFEATLIPTLIIITRWGNQAERLNAGTYFLFYTLAGSLPLLVAALLLQNSTGTLSMLVLQYSQPLLLNSWGHKIWWAGCLLAFLVKMPLYGMHLW
Frog	ILFYIMFEITLIPTLIIITRWGNQAERLNAGTYFLFYTLAGSLPLLVAALLSLYSYTGTLSSLQLLPNHIPLSWANKLWWFACLLAFMVKMPLYGTHLW
Amphioxus	LLFYIAFEESTLLPTLMLITRWGAQKERYQAGTYFMFFTLVGSPLLIICLIGQYQMVGSALDLDS--YEGVFQLSYLVNFWVWGCILAFVLKPLPYGVHLW
	2410 2420 2430 2440 2450 2460 2470 2480 2490 2500
Pufferfish	
Fugu	LPKAHVEAPIAGSMVLA AVLKLGGYGMMRILMTLEPLTKELSYFFIILALWGVI MTGSICMRQTDLKS LIAYSSVSHMGLVVG GILIQTPWGFTGALIL
Stickleback	LPKAHVEAPIAGSMVLA AVLKLGGYGMMRILVLDPLTKELSYFFIVLALWGVI MTGSICMRQTDLKS LIAYSSVSHMGLVVG GILIQTPWGFTGALIL
Large_yellow_croaker	LPKAHVEAPVAGSMILA AVLKLGGYGMMRIMIPILDPLTKELGYFFIIFALWGVI MTGSICLRQTDLKS LIAYSSVSHMGLVVAAILIQTPWSLSGALIL
Goldfish	LPKAHVEAPIAGSMILA AVLKLGGYGMMRILPMLEPLTKELSYFFIIFALWGVI MTGSICLRQTDLKS LIAYSSVSHMGLVVG GILIQTPWGFTGALIL
Medaka	LPKAHVEAPVAGSMVLA AVLKLGGYGMMRMMVMDPLSKELAYPFIILALWGIIMTGSICLRQTDLKS LIAYSSVSHMGLVAG GILIQTPWGFSGAILL
Salmon	LPKAHVEAPIAGSMVLA AVLKLGGYGMMRIIIILDPLTKQLSYFFIILALWGVI MTGSICLRQTDLKS LIAYSSVSHMGLVAA GILIQTPWGFTGALIL
Rainbow_trout	LPKAHVEAPIAGSMILA AVLKLGGYGMMRMMVMDPLTKELAYPFIIVLALWGIIMTGSICLRQTDLKS LIAYSSVGHMGLVAG GILIQTPWGFTGAILL
sea_trout	LPKAHVEAPIAGSMILA AVLKLGGYGMMRMMVMDPLTKELAYPFIIVLALWGIIMTGSICLRQTDLKS LIAYSSVGHMGLVAG GILIQTPWGFTGAILL
Cutthroat_trout	LPKAHVEAPIAGSMILA AVLKLGGYGMMRMMVMDPLTKELAYPFIIVLALWGIIMTGSICLRQTDLKS LIAYSSVGHMGLVAG GILIQTPWGFTGAILL
Zebrafish	LPKAHVEAPVAGSMILA AVLKLGGYGMMRMMVMDPLSKQLAYPFIILALWGVI MTGLVCLRQTDLKS LIAYSSVGHMGLVAG GILIQTPWGFTGAILL
Frog	LPKAHVEAPIAGSMVLAAILKLGGYGIIRISITLTPAMKDLAYPFLILSLWGIIMTSSICLRQTDLKS MIAYSSVSHMGLVISAAMIQTPWSLTGAMIL
Amphioxus	LPKAHVEAPIAGSMVLAGVLLKLGGYGMMRVSLMWGATAMLSSEVFLALALWGIVVMGGICLRQTDLKS LIAYSSVGHMALVVG GVLTVGAWGYN GAVML
	2510 2520 2530 2540 2550 2560 2570 2580 2590 2600
Pufferfish	
Fugu	MIAHGLTSSALFCLANTNYERTHSRTMLLARGLQMALPLMTAWWFITSLANLALPPLPNLMGELMIVTSLFNWSWWTIALTGLGMLITASYSLYMFLMTQ
Stickleback	MIAHGLTSSALFCLANTSYERTHSRTMLLARGMQMILPLMAAWWFIASLANLALPPLPNLMGELMIITSLFNWSPWTIGLTGLGTLITAGYSLYMFLMTQ
Large_yellow_croaker	MIAHGLASSALFCLANTNYERTHSRTLLLGRGLQMALPLMTTWFIASLANLGLPPLPNLMGELMIITSLFSWSWWTALTAGAGTLITVSYSLYMFIMTQ

Goldfish	MIAHGLVSSALFCLANTAYERTHSRTMILARGLQIIFPLTAVVWFIANLANLALPPLPNLMGELMIITTLFNWSPWTILLTGLGTLITAGYSLYMFLMSQ
Medaka	MIAHGLTSSALFCLANTNYERTHSRTMLLARGLMILPLLATWWFLFTLANLALPPLPNLMGELMIITSLFNWSNWTLLLTGAGTLITASYSLYHFLTQ
Salmon	MIAHGLASSALFCLANTSYERTHSRTMLLARGMQMILPLMTTWWFVASLANLALPPLPNLMGELMIITSMFNWSHWTLTLLTGLGTLITASYSLYLFLMTQ
Rainbow_trout	MIAHGLASSALFCLANTSYERTHSRTMLLARGMQMILPLMTTWWFVASLANLALPPLPNLMGELMIITSMFNWSYWTLLTGLGTLITASYSLYLFLMTQ
sea_trout	MIAHGLASSALFCLANTSYERTHSRTMLLARGMQMILPLMTTWWFVASLANLALPPLPNLMGELMIITSMFNWSHWTLTLLTGLGTLITASYSLYLFLMTQ
Cutthroat_trout	MIAHGLASSALFCLANTSYERTHSRTMLLARGMQMILPLMTTWWFVASLANLALPPLPNLMGELMIITSMFNWSYWTLLTGLGTLITASYSLYLFLMTQ
Zebrafish	MIAHGLTSSALFCLANTSYERTHSRTMILARGLMVPLATVWVFIANLANLALPPLPNLMGELMIITAFNWSPTIIITGMGTLITANYSLYMFLTSQ
Frog	MIAHGLISSALFCLANTNYERTHSRALLLSRGLQSILPLMGTWLLSNLANMALPPSPNLMGEITIMTALFNWSNWTIIILTGI GTLLTASYSLYMFLITQ
Amphioxus	MIAHGLVSSCLFCLANLWYERSSTRNLSGSRGLIMIFPLISSGWFLMSLMNMALPPAINLFGEIVAMVALYNWSPYSIVYMSLGAVLTAAYSLYLFGMSQ
	2610 2620 2630 2640 2650 2660 2670 2680 2690 2700
Pufferfish	
Fugu	RGPLPSHIMALEPSHTREHLLIALHLLPLLLILKPELIWGWAV-MHSTPLIMTSSLVIIFTLLIYPILTTLSPSPQSPDWALKQVKTAVKLAFLVSLLP
Stickleback	RGPAPSHLLALEPSHTREHLLIALHLLPLILIIITKPELIWGWTA-MHSTPLIMTSTLIIIFALLIYPVLTTFSPKPQNPWALIQVKTAVKYAFLVSLLP
Large_yellow_croaker	RGPLPAHMIALDPSHTREHLLIALHLLPLLLVLKPELVGWAT-MWQTPSVLYSGMIIILVLSFALLSALVQGNVNLQTVPNITSAVKLSFFISLLP
Goldfish	RGPLPAHIMALEPSHSREHLLAALHLLPLILLILKPELIWGWTA-MHTTSLIMTSSLITMLLLLAYPVLTTLSNPQGPDWLSQVKTAVKLAFVVSLLP
Medaka	RGPTPNHITGLQPFHTREHLLMTLHLVPVILLVTKPELMWGWCY--MT-LIMHSSLLLIFFILVYPLLTTLNPNQQG-SNMAGMTKIAVSSAFFISLLP
Salmon	RGPVTSPPVAIEPTHREHLLMVLHLLPLLLVLKPTLIWGWTL-MHLLTMMVLSSSLLTIFSIILPVLGTLNPSPPGSLWATNSVKTAVKVAFFVSLLP
Rainbow_trout	RGPLPSHIIALEPTHREHLLITLHLLPIIILLILKPELMWGWCF-MHPTTLILSSTLLMIFALLIYPLITTLNPTPQQENWALTHVKTAIKMAFLVSLLP
sea_trout	RGPLPSHIIALEPTHREHLLITLHLLPIIILLILKPELMWGWCF-MHPTTLILSSTLLMIFALLIYPLITTLNPTPQQENWALTHVKTAVKMAFLVSLLP
Cutthroat_trout	RGPLPSHVIALEPHTREHLLIILHLTPIALILKPELMWGWCFMHPPTTLILSSTLLMIFALLIYPLVTTLTPTPQHKNWALTHVKTAIKMAFLVSLLP
Zebrafish	RGSIPEHITNLSPSHTREHLLMTLHLPIIILLMLKPELMWGWCF--MTDMIMPLTLILIFAVLSYPLLKPKSYSKSN-NSFQAWNVAHVVS--FLISLIP
Frog	RGPTPEHLLTAITPTHTREHLLMTLHLPIIPLMMKPELIWGLFF--MNLPLIFNSSLMITITITLLTPIL--LASTSLNTQHLHKMIKTAVKTSFFISLIP
Amphioxus	WGNTMKNYKNLYTITSREYLLTTLHLVPAIYLIIFYLGLMFMLEL---WGVLSTSLGVMVIFLFSKIKSSFAESVKYAGYMN-----AVLL
	2710 2720 2730 2740 2750 2760 2770 2780 2790 2800
Pufferfish	
Fugu	LFLFLNEGAEAVITNWSWMNTHTFDINISLKFHDYSIIFTPVALYVTSILEFASWYMHADPFMNRFFKYLLTFLIAMIIILVTANNMFQLFIGWEGVGIM
Stickleback	LCLHLNEGTEIITNLNWMNTLTDFDINISLKFDSYSIIFTPVALYVTSILEFASWYMHSDPFMNRFFKYLLVFLIAMIIILVTANNMFQLFIGWEGVGIM
Large_yellow_croaker	LFMFFNEGAETIVSSWTWMNTTCFEINLSFKFDQYSVIFTTVALYVTSILEFASWYMHSDPNISRFFKYLLIFLAMMLTLVTANNMFQLFIGWEGVGIM
Goldfish	LFLFLNEGAETIVTNWTWMNTLTDFDINISFKFDHYSIIFTPIALYVTSILEFASWYMHADPNMNRFFKYLLIFLIAMVILVTANNMFQLFIGWEGVGIM
Medaka	LMIFLNLKTEGIITNWQWMNTQTDFVNISFKFDHYSIIFVPIALYVTSILEFALWYMHSDPYIDRFFKYLLTFLVAMIIILVTANNMFQLFIGWEGVGIM
Salmon	LFIFLDQGETETIVTNWQWMNTTTFDINLSFKFDHYSIIFTPIALYVTSILEFASWYMHADPNMNRFFKYLLFLIAMIIILVTANNMFQLFIGWEGVGIM
Rainbow_trout	LFVFLDQGETETIVTNWQWMNTTTFDINLSFKFDHYSIIFTPIALYVTSILEFASWYMHADPNMNRFFKYLLFLIAMIIILVTANNMFQLFIGWEGVGIM
sea_trout	LFIFLDQGETETIVTNWQWMNTTTFDINLSFKFDHYSIIFTPIALYVTSILEFASWYMHADPNVNRFFKYLLFLIAMIIILVTANNMFQLFIGWEGVGIM
Cutthroat_trout	LFVFLDQGETETIVTNWQWMNTTTFDINLSFKFDHYSIIFTPIALYVTSILEFASWYMHADPNMNRFFKYLLFLIAMIIILVTANNMFQLFIGWEGVGIM
Zebrafish	LTMMLYKESDHVVMCWSWMNTQAFNVDSFKFDYYSVTFTSIALFVTSILEFASWYMASYPQKELFYKYLLFLMSMIILVTANNLQFLFIGWEGVGIM
Frog	LSIFLDQGLESIITNFHWMNINSFDINMSFKFDIYSSIFLPIALFVTSILEFATWYMASDPLITRFFKYLLTFLVAMVILVTANNFFQLFIGWEGVGIM
Amphioxus	SILLMSDESEMLFLKWEWVKLGGYSLMISFRFDLYTCCFFVVGLYVTWNILMFSFYMMSTDPRIIDLFCKYLGFLFIAMLLLVSAESLQLLIGWEGVGIM
	2810 2820 2830 2840 2850 2860 2870 2880 2890 2900
Pufferfish	
Fugu	SFLLIGWWYARADANTAALQAVLYNRVGDIGLVFSMAWMATHLNSWEIQQIFFSSKDMDLTLPLIALILAATGKSAQFGLHPWLPSAMEGPTPVSALLHS
Stickleback	SFLLIGWWYARADANTAALQAVIYNRVGDIGLIAMAWMATLNSWELQQIFFSTKNMDMTLPLVALILAATGKSAQFGLHPWLPSAMEGPTPVSALLHS
Large_yellow_croaker	SFLLIGWWGRADANTAALQAVVYNRIGDIGLIFAMAWMATKLNSWEIQQIFVASKDFDLTFPLLGLIVAAAGKSAQFGLHPWLPSAMEGPTPVSALLHS
Goldfish	SFLLIGWWYGRADANTAALQAVLYNRVGDIGLIFAMAWMATNLNSWEMQQMFTTAKNQDLTFPLLGLILAATGKSAQFGLHPWLPSAMEGPTPVSALLHS
Medaka	SFLLIGWWHGRADANTAALQAVIYNRVGDIGLIMTMAWFAMNLNSWEIQQIFVLSKNFDLTIPLMGLALATATGKSAQFGLHPWLPSAMEGPTPVSALLHS
Salmon	SFLLIGWWFGRADANTAALQAVVYNRVGDIGLILAMAWMAVNLNSWDMQQLFSMTTNQDMTLPLLGLVLAATGKSAQFGLHPWLPSAMEGPTPVSALLHS
Rainbow_trout	SFLLIGWWYGRADANTAAMQAVIYNRVGDIGLILSMAWFATNLNSWEIQQMFASSKELDLTLPLMGLILAATGKSAQFGLHPWLPSAMEGPTPVSALLHS
sea_trout	SFLLIGWWHGRADANTAAMQAVIYNRVGDIGLILSMAWFATNLNSWEIQQMFASSKGLDLTLPLMGLILAATGKSAQFGLHPWLPSAMEGPTPVSALLHS
Cutthroat_trout	SFLLIGWWHGRADANTAAMQAVIYNRVGDIGLILSMAWFATNLNSWEIQQMFASSKGLDLTLPLMGLILAATGKSAQFGLHPWLPSAMEGPTPVSALLHS
Zebrafish	SFLLIGWWFGRTEANTASLQAVIYNRMGDIGFILTLAWMAMYNLSWDIQQIFILSKDFDMTIPQIGLIIAATGKSAQFTLHPWLPSAMEGPTPVSALLHS
Frog	SFLLIGWWYARADANTAALQAVIYNRVGDIGLILSMAWVAMNLNSWEMQQVFMLNPE-NLTLPPLGLILAATGKSAQFGLHPWLPAAMEGPTPVSALLHS
Amphioxus	SYLLISWWYARS DANTAALQAIIFYNRVGDIGLLIMLWMSLVTLGDSFTGLYA--LDFVNTFFLLGVVLAAGKSAQLGLHPWLPAAMEGPTPVSSLLHS

2910 2920 2930 2940 2950 2960 2970 2980 2990 3000

Pufferfish
Fugu
Stickleback
Large_yellow_croaker
Goldfish
Medaka
Salmon
Rainbow_trout
sea_trout
Cutthroat_trout
Zebrafish
Frog
Amphioxus

3010 3020 3030 3040 3050 3060 3070 3080 3090 3100

Pufferfish
Fugu
Stickleback
Large_yellow_croaker
Goldfish
Medaka
Salmon
Rainbow_trout
sea_trout
Cutthroat_trout
Zebrafish
Frog
Amphioxus

3110 3120 3130 3140 3150 3160 3170 3180 3190 3200

Pufferfish
Fugu
Stickleback
Large_yellow_croaker
Goldfish
Medaka
Salmon
Rainbow_trout
sea_trout
Cutthroat_trout
Zebrafish
Frog
Amphioxus

3210 3220 3230 3240 3250 3260 3270 3280 3290 3300

Pufferfish
Fugu
Stickleback
Large_yellow_croaker
Goldfish
Medaka
Salmon
Rainbow_trout

Stickleback	MPV E HPFIIIGQVASVLYFS L FLVL P GAAVMEN K M L EW
Large_yellow_croaker	MPV E HPFIIIGQVASVLYF A LFLIFLPVAGWLEN K ILE-
Goldfish	MPV E HPFIIIGQIASVLYF A LFLVL F PLAGWLEN K AL K W
Medaka	MPV E HPFIIIGQIASFLYF S LFLIMAPAAGWLEN K VL K W
Salmon	MPV E HPFIIIGQIASVIYFTIFLVLAPLAGWAEN K AL E W
Rainbow_trout	MPV E HPFIIIGQVASVIYFTIFLVL S PLAGWAE I KAL Q W
sea_trout	MPV E HPFIIIGQVASVIYFTIFLVLAPLAGWAEN K AL E W
Cutthroat_trout	MPV E HPFIIIGQVASVIYFAIFLVL S PLAGWAEN K AL Q W
Zebrafish	MPV E HPYIIIGQMASILYF S LFLVL F PITGILEN K AL Q W
Frog	QPV E D P YIMIGQLASVIYFAIFLVL I PTIGWVEN K LL N W
Amphioxus	QPV E YPYIFLGQAASVIYFVNILL L LIP I VGYVEN K LL F S