

Fig. S56. A molecular phylogeny of ACLY (ATP citrate lyase, E.C. 2.3.3.8), inferred from maximum-likelihood analysis (1601 nucleotide sites were used; GTR+ Γ). Numbers indicate approximate bootstrap values from 1,000 LR-ELW (the Expected-Likelihood Weights applied to Local Rearrangements of tree topology) tests that support for the nodes.

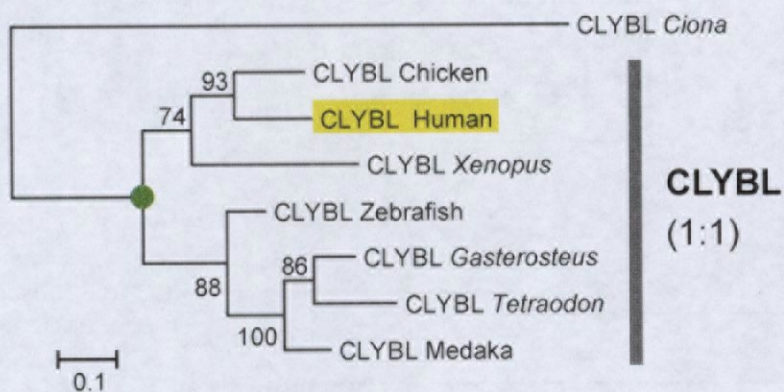
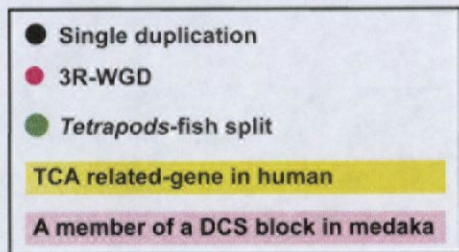


Fig. S57. A molecular phylogeny of CLYBL (citrate lyase beta like, E.C. 4.1.3.6), inferred from maximum-likelihood analysis (257 amino acid sites were used; JTT+ Γ). Numbers indicate approximate bootstrap values from 1,000 LR-ELW (the Expected-Likelihood Weights applied to Local Rearrangements of tree topology) tests that support for the nodes.

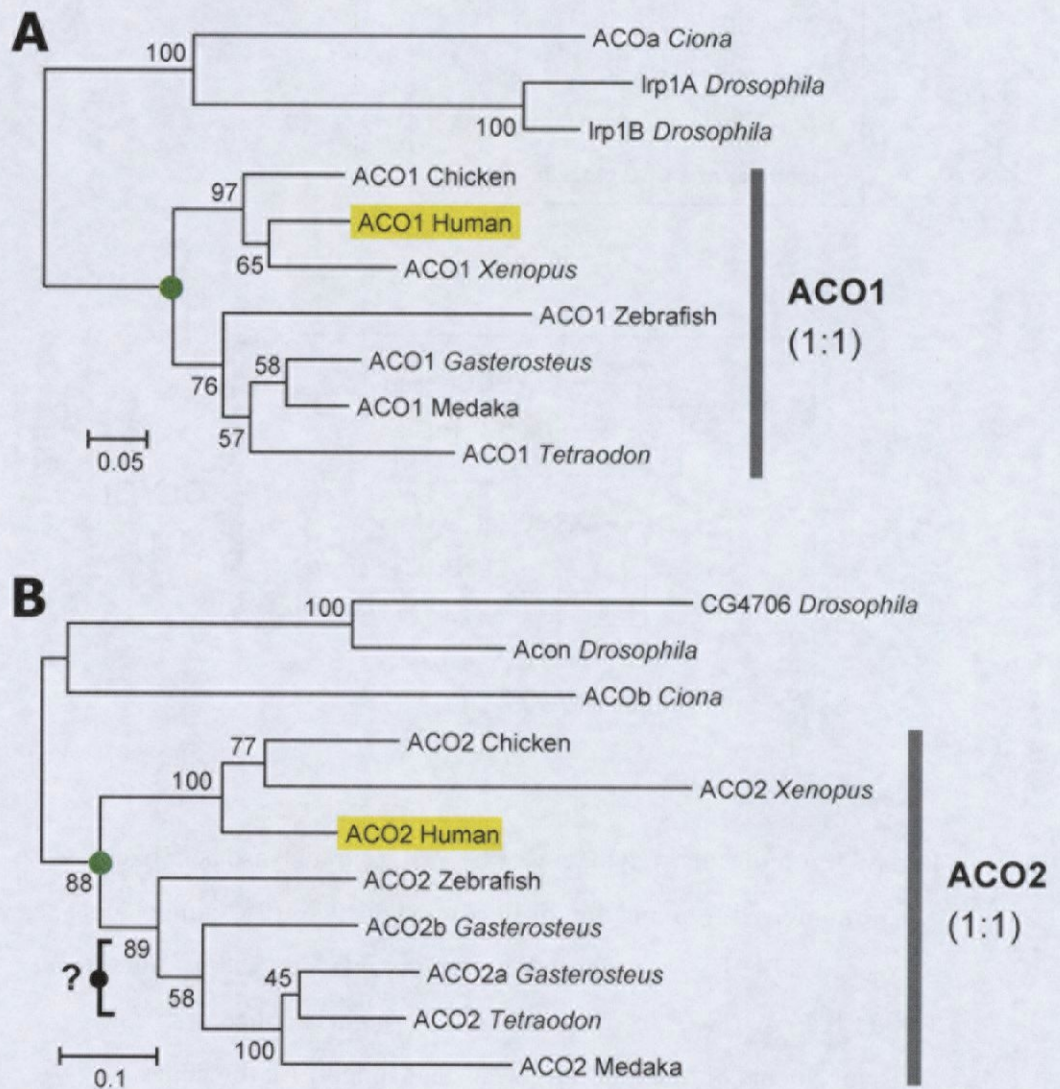
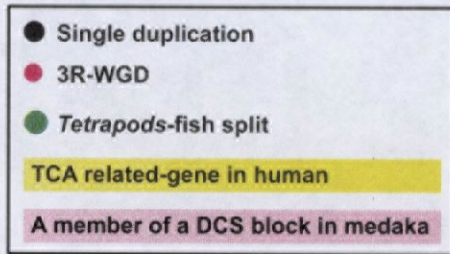


Fig. S58. A molecular phylogeny of ACO (aconitase, E.C. 4.2.1.3), inferred from maximum-likelihood analysis (panel A: 488 amino acid sites were used with WAG+ Γ ; panel B: 2184 nucleotide sites were used with GTR+I+ Γ). Numbers indicate approximate bootstrap values from 1,000 LR-ELW (the Expected-Likelihood Weights applied to Local Rearrangements of tree topology) tests that support for the nodes.

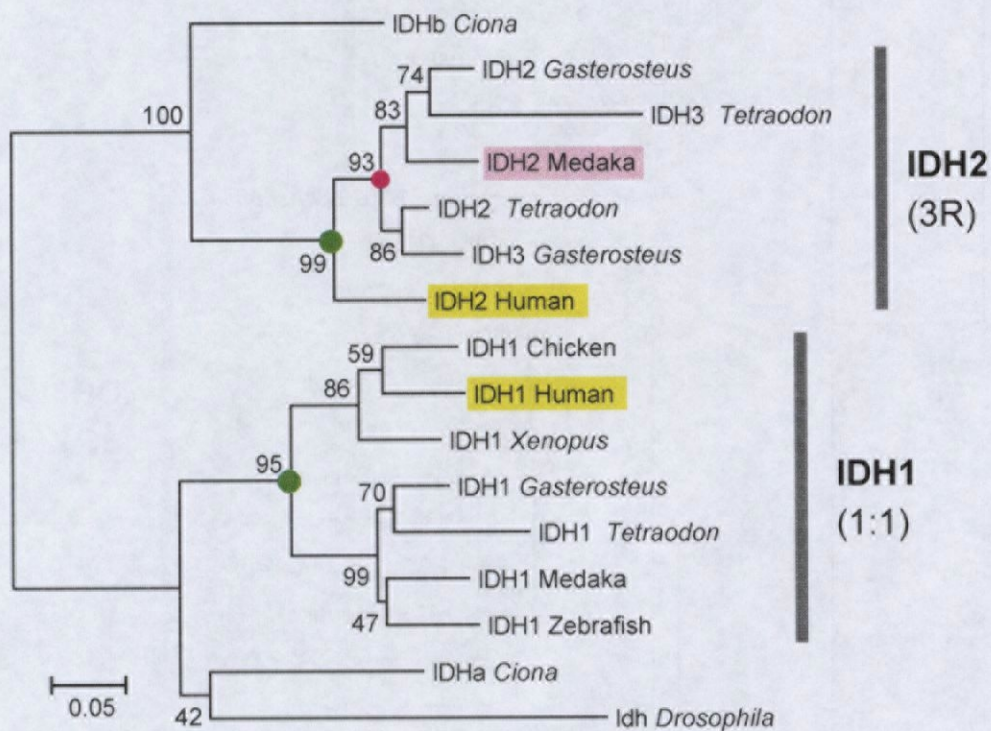
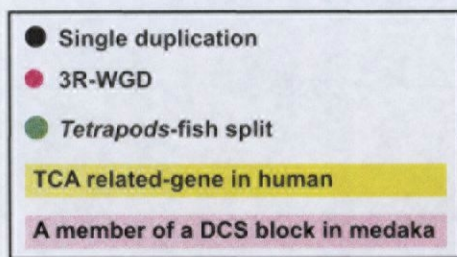


Fig. S59. A molecular phylogeny of E.C. 1.1.1.42 IDH1 (isocitrate dehydrogenase 1 [NADP+], soluble, E.C. 1.1.1.42), inferred from maximum-likelihood analysis (380 amino acid sites were used; WAG+Γ). Numbers indicate approximate bootstrap values from 1,000 LR-ELW (the Expected-Likelihood Weights applied to Local Rearrangements of tree topology) tests that support for the nodes.

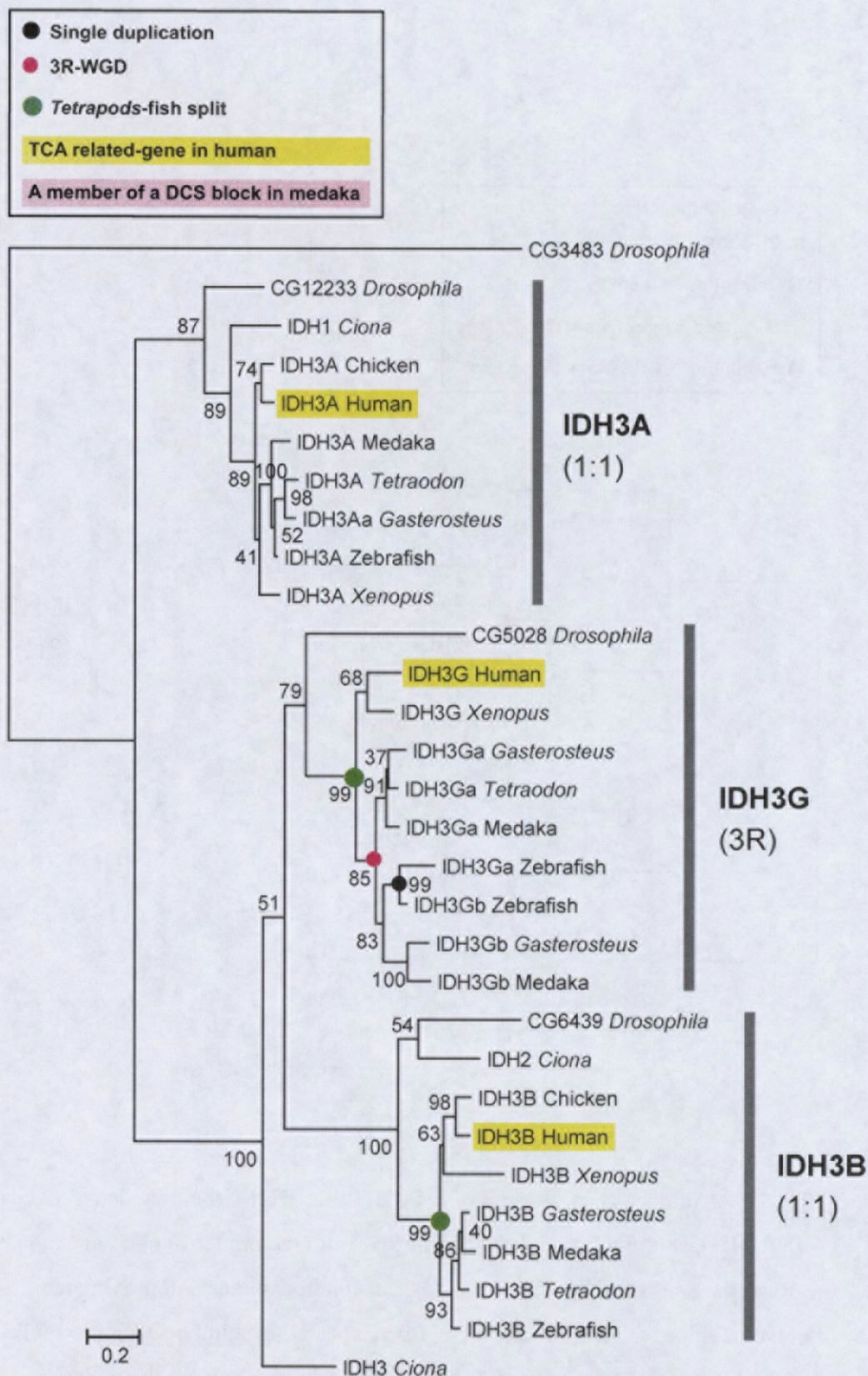


Fig. S60. A molecular phylogeny of IDH3 (isocitrate dehydrogenase 3 [NAD⁺], E.C. 1.1.1.41), inferred from maximum-likelihood analysis (303 amino acid sites were used; WAG+Γ). Numbers indicate approximate bootstrap values from 1,000 LR-ELW (the Expected-Likelihood Weights applied to Local Rearrangements of tree topology) tests that support for the nodes.

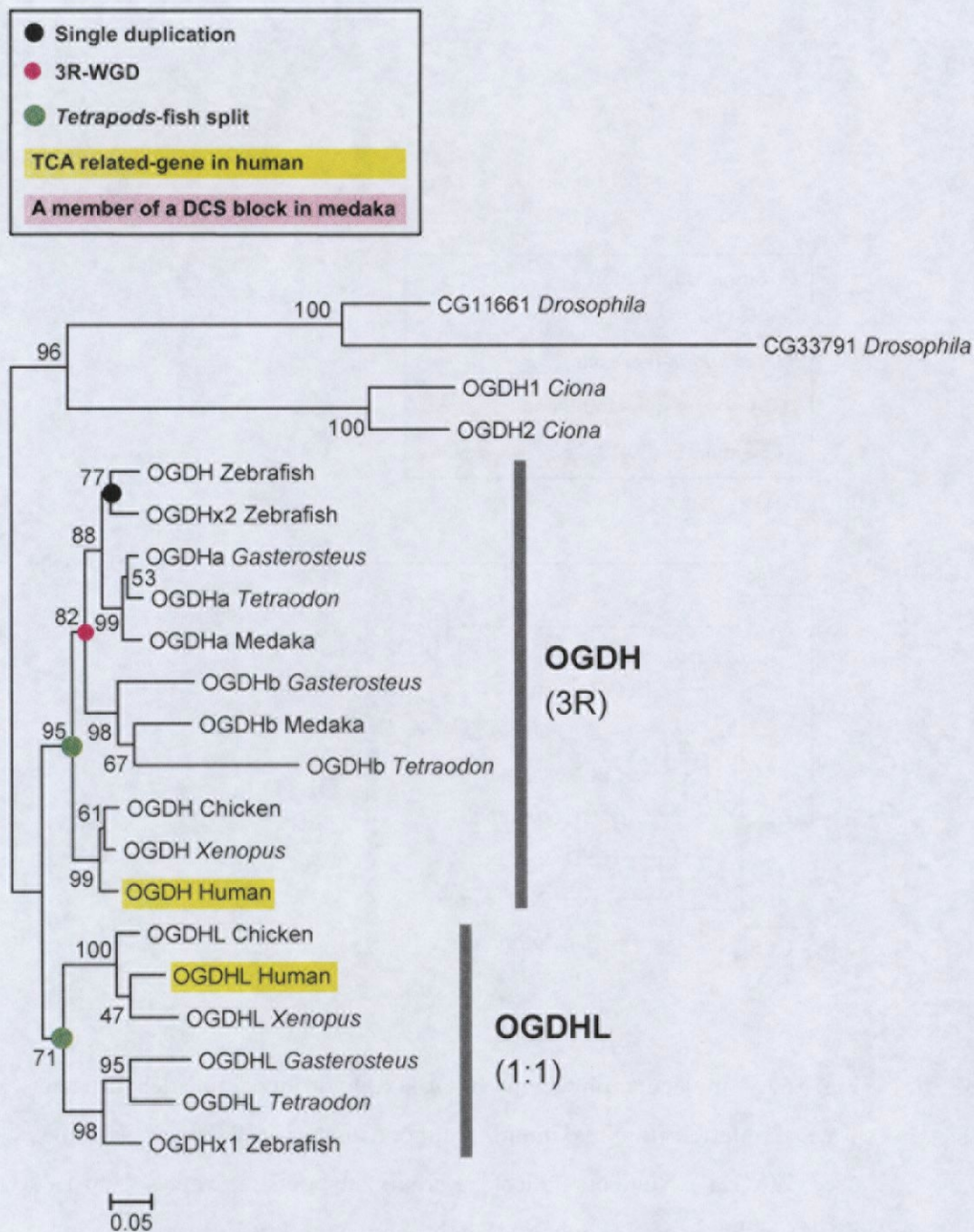


Fig. S61 A molecular phylogeny of OGDH (oxoglutarate dehydrogenase [lipoamide], E.C. 1.2.4.2), inferred from maximum-likelihood analysis (353 amino acid sites were used; JTT+ Γ). Numbers indicate approximate bootstrap values from 1,000 LR-ELW (the Expected-Likelihood Weights applied to Local Rearrangements of tree topology) tests that support for the nodes.

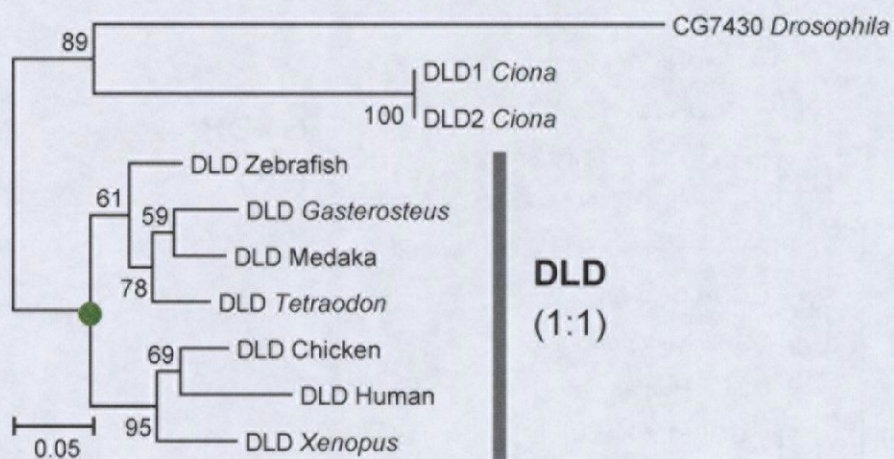
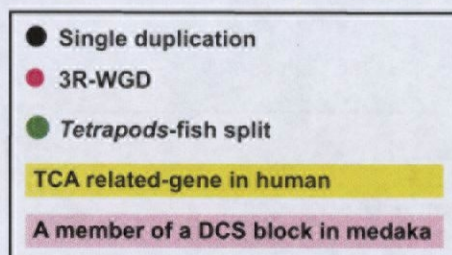


Fig. S62. A molecular phylogeny of DLD (dihydrolipoamide dehydrogenase, E.C. 1.8.1.4), inferred from maximum-likelihood analysis (393 amino acid sites were used; WAG+ Γ). Numbers indicate approximate bootstrap values from 1,000 LR-ELW (the Expected-Likelihood Weights applied to Local Rearrangements of tree topology) tests that support for the nodes.

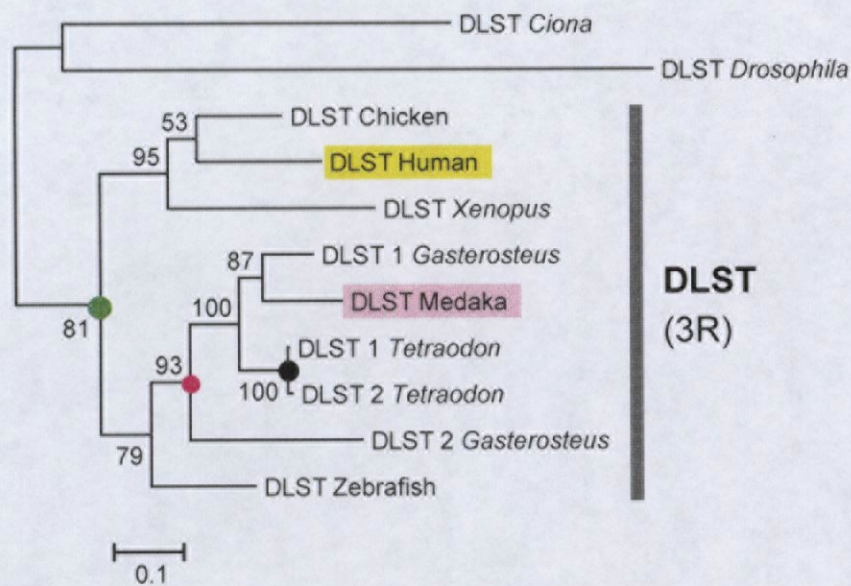
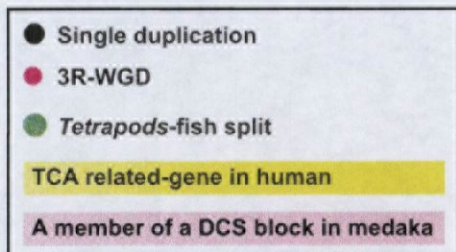


Fig. S63. A molecular phylogeny of DLST (dihydrolipoamide S-succinyltransferase, E2 component of 2-oxo-glutarate complex, E.C. 2.3.1.61), inferred from maximum-likelihood analysis (1170 nucleotide sites were used; GTR+I+ Γ). Numbers indicate approximate bootstrap values from 1,000 LR-ELW (the Expected-Likelihood Weights applied to Local Rearrangements of tree)

Appendix 2. Full list of genes analyzed in the final maximum-likelihood phylogenetic inferences performed in Chapter 2, with their Ensembl IDs and gene names denominated according to Ensembl annotations and inferred gene phylogenies shown in the Appendix 1.

Supplementary file 1 (to be continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
AMPA (GRIA, glutamate receptor, ionotropic, AMPA)				
GRIA1_H	Human	ENSP00000285900	906	
GRIA2_H	Human	ENSP00000264426	883	
GRIA1a_T	Tetraodon	GSTENP00014672001	800	
GRIA1b_T	<i>Tetraodon</i>	GSTENP00031632001	879	
GRIA1_M	Medaka	ENSORLP00000009669	931	
GRIA2_M	Medaka	ENSORLP00000025223	890	
GRIA1_G	<i>Gasterosteus</i>	ENSGACP00000024435	963	
GRIA2_G	<i>Gasterosteus</i>	ENSGACP00000023886	863	
Gria2_Z	Zebrafish	ENSDARP00000071976	875	
Gria1a_Z	Zebrafish	ENSDARG00000032714	917	
Gria1b_Z	Zebrafish	ENSDARP00000043920	914	
GRIA1_X	<i>Xenopus</i>	ENSXETP00000004107	900	
GRIA1_C	Chicken	ENSGALP00000006483	902	
GRIA2_C	Chicken	ENSGALP00000038049	883	
AC1/8 (ADCY1/8, adenylate cyclase 1 and 8 (brain) [EC:4.6.1.1])				
ADCY1_H	Human	ENSP00000373834	1119	
ADCY8_H	Human	ENSP00000286355	1251	
ADCY1a_T	<i>Tetraodon</i>	GSTENP00012275001	1085	
ADCY1b_T	<i>Tetraodon</i>	GSTENP00004784001	788	
ADCY8_1_T	<i>Tetraodon</i>	GSTENP00012568001	1108	
ADCY8_2_T	<i>Tetraodon</i>	GSTENP00015280001	971	
ADCY8_3_T	<i>Tetraodon</i>	GSTENP00030377001	1077	
ADCY1a_M	Medaka	ENSORLP00000016126	720	Program WISE2 was applied
ADCY1b_M	Medaka	ENSORLP00000021485	1030	
ADCY8_1_M	Medaka	ENSORLP00000001387	1091	
ADCY8_2_M	Medaka	ENSORLP00000008051	902	
ADCY8_3_M	Medaka	ENSORLP00000017064	1061	
ADCY1a_G	<i>Gasterosteus</i>	ENSGACP00000006434	1028	
ADCY1b_G	<i>Gasterosteus</i>	ENSGACP00000017294	1094	
ADCY8_G	<i>Gasterosteus</i>	ENSGACP00000013316	1049	
ADCY8_1_Z	Zebrafish	ENSDARP00000041443	755	partial
ADCY8_2_Z	Zebrafish	ENSDARP000000082160	933	
ADCY8_4_Z	Zebrafish	ENSDARP00000045039	723	Program WISE2 was applied
ADCY1_X	<i>Xenopus</i>	ENSXETP00000021578	945	
ADCY1_C	Chicken	ENSGALP00000020295	1090	
ADCY8_C	Chicken	ENSGALP00000026243	1079	
ADCY1_D	<i>Drosophila</i>	CG7978-PA	1307	
ADCYA_D	<i>Drosophila</i>	CG17176-PA	1112	
ADCYB_D	<i>Drosophila</i>	CG17174-PA	1114	
ADCYC_D	<i>Drosophila</i>	CG5983-PA	1130	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
ADCYE_D	<i>Drosophila</i>	CG17178-PA	1117	
ADCY_Ci	<i>Ciona</i>	ENSCINP00000014863	1095	
NMDAR (GRIN, glutamate receptor, ionotropic, N-methyl D-aspartate)				
GRIN1_H	Human	ENSP00000360616	959	
GRIN1b_T	<i>Tetraodon</i>	GSTENP00011452001	1223	
GRIN1a_M	Medaka	ENSORLP00000017802	964	
GRIN1b_M	Medaka	ENSORLP00000020601	967	
GRIN1a_G	<i>Gasterosteus</i>	ENSGACP00000023949	941	
GRIN1x_G	<i>Gasterosteus</i>	ENSGACP0000000304	196	partial
GRIN1a_Z	Zebrafish	ENSARP00000041868	846	Program WISE2 was applied
GRIN1b_Z	Zebrafish	ENSARP00000038151	854	
GRIN1_X	<i>Xenopus</i>	ENSXETP00000049601	904	
GRIN1_C	Chicken	ENSGALP00000039569	901	
Nmdar1_D	<i>Drosophila</i>	CG2902-PA	997	
GRIN2A_H	Human	ENSP00000332549	1464	
GRIN2B_H	Human	ENSP00000279593	1484	
GRIN2C_H	Human	ENSP00000293190	1233	
GRIN2D_H	Human	ENSP00000263269	1336	
GRIN2Aa_T	<i>Tetraodon</i>	GSTENP00015754001	1563	
GRIN2Ab_T	<i>Tetraodon</i>	GSTENP00021857001	1403	
GRIN2Ba_T	<i>Tetraodon</i>	GSTENP00010391001	1391	
GRIN2Bb_T	<i>Tetraodon</i>	GSTENP00020497001	1548	Program WISE2 was applied
GRIN2Ca_T	<i>Tetraodon</i>	GSTENP00021266001	968	
GRIN2Cb_T	<i>Tetraodon</i>	GSTENP00027026001	960	
GRIN2D_T	<i>Tetraodon</i>	GSTENP00033737001	1379	
GRIN2Aa_M	Medaka	ENSORLP00000011524	1303	
GRIN2Ab_M	Medaka	ENSORLP00000015929	1368	
GRIN2Ba_M	Medaka	ENSORLP00000005277	1588	
GRIN2Bb_M	Medaka	ENSORLP00000018670	1614	
GRIN2Ca1_M	Medaka	ENSORLP00000001076	847	
GRIN2Cb_M	Medaka	ENSORLP00000013759	842	
GRIN2D_M	Medaka	ENSORLP00000014337	810	
GRIN2Ca2_M	Medaka	UTOLAPRE05100105506	1114	
GRIN2Aa_G	<i>Gasterosteus</i>	ENSGACP00000021959	1446	
GRIN2Bb_G	<i>Gasterosteus</i>	ENSGACP00000009530	1629	
GRIN2Ba_G	<i>Gasterosteus</i>	ENSGACP00000021088	1485	
GRIN2Cb_G	<i>Gasterosteus</i>	ENSGACP00000004275	834	
GRIN2Ca_G	<i>Gasterosteus</i>	ENSGACP00000019778	837	
GRIN2D_G	<i>Gasterosteus</i>	ENSGACP00000014091	805	
GRIN2Bb_Z	Zebrafish	ENSARP000000087045	970	
GRIN2Ba_Z	Zebrafish	ENSARP000000047093	1604	
GRIN2C_Z	Zebrafish	ENSARP000000083814	839	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
GRIN2A_X	<i>Xenopus</i>	ENSXETP00000017540	1447	
GRIN2C_X	<i>Xenopus</i>	ENSXETP00000014979	892	
GRIN2D_X	<i>Xenopus</i>	ENSXETP00000023239	1271	
GRIN2A_C	Chicken	ENSGALP00000011779	1437	
GRIN2B_C	Chicken	ENSGALP00000019247	1370	

VDCC (CACNA1C, calcium channel, voltage-dependent, L type, alpha 1C subunit)

CACNA1C_H	Human	ENSP00000329877	2208	
CACNA1C_T	<i>Tetraodon</i>	GSTENP00014510001	1327	partial
CACNA1C_M	Medaka	ENSORLP00000017938	2017	
CACNA1C_G	<i>Gasterosteus</i>	ENSGACP00000026026	2046	
CACNA1C_Z	Zebrafish	ENSDARP00000019929	2196	
CACNA1C_X	<i>Xenopus</i>	ENSXETP00000034191	855	Program WISE2 was applied
CACNA1F_X	<i>Xenopus</i>	ENSXETP00000015655	1581	
CACNA1C_C	Chicken	ENSGALP00000021218	1447	partial
Ca_alpha1D_D	<i>Drosophila</i>	CG4894-PC	2552	
CACNA1C_Ci	<i>Ciona</i>	ENSCINP00000015609	1645	

mGluR (GRM, glutamate receptor, metabotropic)

GRM1_H	Human	ENSP00000282753	1194	
GRM5_H	Human	ENSP00000306138	1212	
GRM1a_T	<i>Tetraodon</i>	GSTENP00023057001	961	
GRM1b_T	<i>Tetraodon</i>	GSTENP00035748001	1223	
GRM5b_T	<i>Tetraodon</i>	GSTENP00018905001	1209	
GRM1a_M	Medaka	ENSORLP00000017804	1207	
GRM1b_M	Medaka	ENSORLP00000023504	855	partial
GRM5a_M	Medaka	ENSORLP00000013639	1229	
GRM5b_M	Medaka	ENSORLP00000005680	1213	
GRM1a_G	<i>Gasterosteus</i>	ENSGACP00000015408	1133	
GRM1b_G	<i>Gasterosteus</i>	ENSGACP00000015341	1136	
GRM5a_G	<i>Gasterosteus</i>	ENSGACP00000010565	1247	
GRM5b_G	<i>Gasterosteus</i>	ENSGACP00000027224	1213	
GRM1b_Z	Zebrafish	ENSDARP00000048545	1117	
GRM1a_Z	Zebrafish	ENSDARP00000033374	1150	
GRM5a_Z	Zebrafish	ENSDARP00000086408	966	
GRM5b_Z	Zebrafish	ENSDARP00000042766	933	
GRM1_X	<i>Xenopus</i>	ENSXETP00000017306	1245	
GRM5_X	<i>Xenopus</i>	ENSXETP00000025701	1188	
GRM1_C	Chicken	ENSGALP00000020069	1160	
GRM5_C	Chicken	ENSGALP00000027813	1242	

Protein kinase, cAMP-dependent, catalytic, alpha/beta/gamma [EC:2.7.11.11]

PRKACA_H	Human	ENSP00000309591	351	
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Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
PRKACB_H	Human	ENSP00000359723	351	
PRKACG_H	Human	ENSP00000297734	351	
PRKACA_T	<i>Tetraodon</i>	GSTENP00019760001	336	
PRKACBa_T	<i>Tetraodon</i>	GSTENP00016205001	395	
PRKACBb_T	<i>Tetraodon</i>	GSTENP00022860001	338	
PRKACA_M	Medaka	ENSORLP00000008832	348	
PRKACBa_M	Medaka	ENSORLP00000021647	351	
PRKACBb_M	Medaka	ENSORLP00000007943	351	
PRKACA_G	<i>Gasterosteus</i>	ENSGACP00000013822	351	
PRKACBa_G	<i>Gasterosteus</i>	ENSGACP00000023579	351	
PRKACBb_G	<i>Gasterosteus</i>	ENSGACP00000012693	351	
PRKACA_Z	Zebrafish	ENSDARP00000002825	351	
PRKACBa_Z	Zebrafish	ENSDARP00000023805	395	
PRKACBb_Z	Zebrafish	ENSDARP000000076580	351	
PRKACA_X	<i>Xenopus</i>	ENSXETP00000049427	311	partial
PRKACB_X	<i>Xenopus</i>	ENSXETP00000018929	337	
PRKACB_C	Chicken	ENSGALP00000014351	398	
PkaC1_D	<i>Drosophila</i>	CG4379-PA	353	
PKAC_Ci	<i>Ciona</i>	ENSCINP00000024366	357	

Protein kinase, X-linked/Y-linked [EC:2.7.11.11]

PRKX_H	Human	ENSP00000262848	358	
PRKY_H	Human	ENSP00000310643	277	
PRKX_T	<i>Tetraodon</i>	GSTENP00027088001	344	
PRKX_M	Medaka	ENSORLP00000025578	358	
PRKX_G	<i>Gasterosteus</i>	ENSGACP00000020058	303	
PRKX_1_X	<i>Xenopus</i>	ENSXETP00000010923	369	
PRKX_C	Chicken	ENSGALP00000029643	302	
PRKX_1_Z	Zebrafish	ENSDARP000000080286	306	
PRKX_Ci	<i>Ciona savignyi</i>	ENSCSAVP00000017283	302	

IPP1 (I-1, PPP1R1A, protein phosphatase 1, regulatory (inhibitor) subunit 1A)

IPP1_H	Human	ENSP00000257905	171	
IPP1_T	<i>Tetraodon</i>	GSTENP00027617001	123	
IPP1_M	Medaka	ENSORLP00000004271	164	
IPP1_G	<i>Gasterosteus</i>	ENSGACP00000015367	97	
IPP1_X	<i>Xenopus</i>	ENSXETP00000009351	184	
IPP1C_C	Chicken	ENSGALP00000014453	115	
IPP1a_Ci	<i>Ciona</i>	ENSCINP00000029740	448	
IPP1b_Ci	<i>Ciona</i>	ENSCINP00000013063	315	

EPAC1 (RAPGEF3, Rap guanine nucleotide exchange factor (GEF) 3)

EPAC1_H	Human	ENSP00000373863	881	
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Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
EPAC1_T	<i>Tetraodon</i>	GSTENP00023559001	980	
EPAC1_M	Medaka	ENSORLP00000019634	889	
EPAC1_G	<i>Gasterosteus</i>	ENSGACP00000014548	874	
EPAC1_Z	Zebrafish	ENSDARP00000079343	846	
EPAC1_X	<i>Xenopus</i>	ENSXETP00000009345	856	
EPAC1_C	Chicken	ENSGALP00000010246	766	
EPAC1_D	<i>Drosophila</i>	CG3427-PA	861	
Rap1 (RAP1A, RAP1A, member of RAS oncogene family)				
Rap1_H	Human	ENSP00000348786	184	
Rap1b_T	<i>Tetraodon</i>	GSTENP00013536001	225	
Rap1a_M	Medaka	ENSORLP00000007312	185	
Rap1a_G	<i>Gasterosteus</i>	ENSGACP00000008153	185	
Rap1_X	<i>Xenopus</i>	ENSXETP00000029726	185	
Rap1_C	Chicken	ENSGALP00000002236	188	
Rap1a_Z	Zebrafish	ENSDARP00000075571	185	
Rap1b_Z	Zebrafish	ENSDARP00000050670	185	
R_D	<i>Drosophila</i>	CG1956-PA	184	
PP1 (protein phosphatase 1)				
PPP1R12A_H	Human	ENSP00000261207	1028	
PPP1R12A_T	<i>Tetraodon</i>	GSTENP00023775001	1007	
PPP1R12A_M	Medaka	ENSORLP00000020423	1035	
PPP1R12A_G	<i>Gasterosteus</i>	ENSGACP00000026440	1030	
PPP1R12A_X	<i>Xenopus</i>	ENSXETP00000046417	979	
PPP1R12A_C	Chicken	ENSGALP00000016789	1029	
PPP1R12A_Z	Zebrafish	ENSDARP00000034186	1117	
PPP1Rx_D	<i>Drosophila</i>	CG32156-PC	1145	
PPP1CA_H	Human	ENSP00000365936	330	
PPP1CC_H	Human	ENSP00000335084	323	
PPP1CAa_T	<i>Tetraodon</i>	GSTENP00027785001	326	Program WISE2 was applied
PPP1CAb_T	<i>Tetraodon</i>	GSTENP00035052001	325	
PPP1CC_T	<i>Tetraodon</i>	GSTENP00021602001	328	
PPP1CAa_M	Medaka	ENSORLP00000002503	330	
PPP1CAb_M	Medaka	ENSORLP00000007368	325	
PPP1CC_M	Medaka	ENSORLP00000019963	323	
PPP1CAb_G	<i>Gasterosteus</i>	ENSGACP00000009804	327	
PPP1CAa_G	<i>Gasterosteus</i>	ENSGACP00000017909	332	
PPP1CC_G	<i>Gasterosteus</i>	ENSGACP00000017831	323	
PPP1CAa_Z	Zebrafish	ENSDARP00000002360	331	
PPP1CC_X	<i>Xenopus</i>	ENSXETP00000052896	323	
PPP1CC_C	Chicken	ENSGALP00000007265	323	
PPP1_1_Ci	<i>Ciona</i>	ENSCINP00000001310	329	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
PPP1_2_Ci	<i>Ciona</i>	ENSCINP00000009413	343	
PPP1CB_H	Human	ENSP00000351298	327	
PPP1CBa_T	<i>Tetraodon</i>	GSTENP00031983001	299	
PPP1CBb_M	Medaka	ENSORLP00000013924	328	
PPP1CBa_M	Medaka	ENSORLP00000016746	327	
PPP1CBa1_G	<i>Gasterosteus</i>	ENSGACP00000010813	331	
PPP1CBa2_G	<i>Gasterosteus</i>	ENSGACP00000013643	327	
PPP1CBb_G	<i>Gasterosteus</i>	ENSGACP00000026494	334	
PPP1CB_Z	Zebrafish	ENSDARP00000064810	310	
PPP1CB_C	Chicken	ENSGALP00000031272	327	
PPP1CB_D	<i>Drosophila</i>	CG2096-PB	330	
PPP1CB_Ci	<i>Ciona</i>	ENSCINP00000011235	327	

CaMK2 (calcium/calmodulin-dependent protein kinase (CaM kinase) II [EC:2.7.11.17])

CAMK2A_H	Human	ENSP00000305090	489	
CAMK2B_H	Human	ENSP00000258682	666	
CAMK2D_H	Human	ENSP00000339740	499	
CAMK2G_H	Human	ENSP00000307082	529	
CAMK2A_T	<i>Tetraodon</i>	GSTENP00014562001	523	
CAMK2D_T	<i>Tetraodon</i>	GSTENP00033048001	424	
CAMK2Gc_T	<i>Tetraodon</i>	GSTENP00014312001	512	
CAMK2x_T	<i>Tetraodon</i>	GSTENP00009461001	564	
CAMK2Bb_T	<i>Tetraodon</i>	GSTENP00029080001	596	
CAMK2Ba_T	<i>Tetraodon</i>	GSTENP00025360001	597	
CAMK2A_M	Medaka	ENSORLP00000016108	513	
CAMK2D_M	Medaka	ENSORLP00000006417	490	
CAMK2Gc2_M	Medaka	ENSORLP00000000306	642	
CAMK2Gc1_M	Medaka	ENSORLP00000001096	455	Program WISE2 was applied
CAMK2Ga_M	Medaka	ENSORLP00000005224	559	
CAMK2Gb_M	Medaka	ENSORLP00000013394	646	
CAMK2A_G	<i>Gasterosteus</i>	ENSGACP00000027643	514	
CAMK2Dc_G	<i>Gasterosteus</i>	ENSGACP00000002103	511	
CAMK2Da_G	<i>Gasterosteus</i>	ENSGACP00000021218	441	
CAMK2Ga_G	<i>Gasterosteus</i>	ENSGACP00000014406	569	
CAMK2Gb_G	<i>Gasterosteus</i>	ENSGACP00000003791	562	
CAMK2Bb_Z	Zebrafish	ENSDARP00000039570	477	
CAMK2Ba_Z	Zebrafish	ENSDARP00000044836	540	
CAMK2Db_Z	Zebrafish	ENSDARP00000040799	424	
CAMK2Da_Z	Zebrafish	ENSDARP00000044895	418	
CAMK2Ga_Z	Zebrafish	ENSDARP00000073113	514	
CAMK2Gb_Z	Zebrafish	ENSDARP00000044752	507	
CAMK2D_X	<i>Xenopus</i>	ENSXETP00000033918	403	
CAMK2B_X	<i>Xenopus</i>	ENSXETP00000041159	608	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
CAMK2G_X	<i>Xenopus</i>	ENSXETP00000014165	643	
CAMK2A_C	Chicken	ENSGALP00000009006	489	
CAMK2Db_C	Chicken	ENSGALP00000036906	483	
CAMK2Da_C	Chicken	NSGALP00000019616	456	
CAMK2G_C	Chicken	ENSGALP00000008145	517	
CaMKIIRD_D	<i>Drosophila</i>	CG18069-PD	530	
CAMK2_Ci	<i>Ciona</i>	ENSCINP00000004087	475	

CaN (calcium binding protein P22 and protein phosphatase 3)

CHP_H	Human	ENSP00000335632	195	
CHP_T	<i>Tetraodon</i>	GSTENP00035813001	232	
CHP_M	Medaka	ENSORLP00000011997	195	
CHP_G	<i>Gasterosteus</i>	ENSGACP00000016117	194	
CHP_X	<i>Xenopus</i>	ENSXETP00000057366	193	
CHP_C	Chicken	ENSGALP00000032005	195	
CHP_Z	Zebrafish	ENSDARP00000069277	194	
CG2185_D	<i>Drosophila</i>	CG2185-PA	189	
PPP3CA_H	Human	ENSP00000320580	521	
PPP3CB_H	Human	ENSP00000353881	524	
PPP3CC_H	Human	ENSP00000240139	512	
PPP3CA_T	<i>Tetraodon</i>	GSTENP00019008001	571	
PPP3CCa_T	<i>Tetraodon</i>	GSTENP00010354001	520	
PPP3CA_M	Medaka	ENSORLP00000006587	519	
PPP3Cx1_M	Medaka	ENSORLP00000007763	508	
PPP3Cx2_M	Medaka	ENSORLP00000012226	520	
PPP3CCb_M	Medaka	ENSORLP00000020174	505	
PPP3CA_G	<i>Gasterosteus</i>	ENSGACP00000026029	524	
PPP3Cx1_G	<i>Gasterosteus</i>	ENSGACP00000024669	513	
PPP3CCb_G	<i>Gasterosteus</i>	ENSGACP00000006856	447	
PPP3CCa_G	<i>Gasterosteus</i>	ENSGACP00000001534	454	
PPP3Cx2_G	<i>Gasterosteus</i>	ENSGACP00000027321	514	
PPP3Cx2_Z	Zebrafish	ENSDARESTP00000041461	431	Program WISE2 was applied
PPP3CCb_Z	Zebrafish	ENSDARP00000015405	510	
PPP3CCa_Z	Zebrafish	ENSDARP00000074861	500	
PPP3Cx1_Z	Zebrafish	ENSDARP00000024334	496	
PPP3Cx3_Z	Zebrafish	ENSDARP00000032726	452	
PPP3CA_X	<i>Xenopus</i>	ENSXETP00000024402	499	
PPP3CB_X	<i>Xenopus</i>	ENSXETP00000024405	530	
PPP3CC_X	<i>Xenopus</i>	ENSXETP00000023087	489	
PPP3CA_C	Chicken	ENSGALP00000020041	421	
PPP3CB_C	Chicken	ENSGALP00000039533	522	
PPP3C2_D	<i>Drosophila</i>	CG9819-PA	584	
PPP3C1_D	<i>Drosophila</i>	CG1455-PA	622	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
PPP3C3_D	<i>Drosophila</i>	CG9842-PA	570	
PPP3C_Ci	<i>Ciona</i>	ENSCINP00000021645	493	
PPP3R1_H	Human	ENSP00000234310	160	
PPP3R2_H	Human	ENSP00000342600	173	
PPP3R_T	<i>Tetraodon</i>	GSTENP00007813001	169	
PPP3R_M	Medaka	ENSORLP00000002910	169	
PPP3R_X	<i>Xenopus</i>	ENSXETP00000037793	169	
PPP3R_C	Chicken	ENSGALP00000014233	170	
PPP3R_Z	Zebrafish	ENSDARP00000022350	169	
CanBRA_D	<i>Drosophila</i>	CG4209-PA	170	
CanB2_D	<i>Drosophila</i>	CG11217-PA	170	
CAM (calmodulin)				
CALML6_H	Human	ENSP00000304643	181	
CALM1_H	Human	ENSP00000349467	149	
CALM2_H	Human	ENSP00000272298	149	
CALM3_H	Human	ENSP00000315299	149	
CALMx1_T	<i>Tetraodon</i>	GSTENP00018439001	149	
CALMx2_T	<i>Tetraodon</i>	GSTENP00006151001	165	
CALMx3_T	<i>Tetraodon</i>	GSTENP00031732001	174	
CALMx4_T	<i>Tetraodon</i>	GSTENP00014816001	148	
CALMx1_M	Medaka	ENSORLP00000008598	149	
CALMx2_M	Medaka	ENSORLP00000001797	149	
CALMx3_M	Medaka	ENSORLP000000022187	149	
CALMx1_G	<i>Gasterosteus</i>	ENSGACP00000012669	151	
CALMx2_G	<i>Gasterosteus</i>	ENSGACP00000003417	151	
CALMx3_G	<i>Gasterosteus</i>	ENSGACP00000016676	154	
CALMx4_G	<i>Gasterosteus</i>	ENSGACP00000006811	149	
CALMx1_Z	Zebrafish	ENSDARP000000065391	148	
CALMx2_Z	Zebrafish	ENSDARP000000035027	148	
CALMx3_Z	Zebrafish	ENSDARP000000041779	148	
CALMx4_Z	Zebrafish	ENSDARP000000053797	148	
CALMx5_Z	Zebrafish	ENSDARP00000018820	148	
CALM1a_X	<i>Xenopus</i>	ENSXETP000000034284	148	
CALM2b_X	<i>Xenopus</i>	ENSXETP00000000663	148	
CALM1_C	Chicken	ENSGALP00000036828	148	
CALM3_C	Chicken	ENSGALP00000013706	149	
CALM2_C	Chicken	ENSGALP00000037503	149	
CALM6_C	Chicken	ENSGALP00000011046	143	
CALMx1_D	<i>Drosophila</i>	CG17769-PA	148	
CALMx3_D	<i>Drosophila</i>	CG30378-PA	148	
CALMx2_D	<i>Drosophila</i>	CG8472-PA	149	
CALMx_Ci	<i>Ciona</i>	ENSCINP00000025381	161	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
Ras (v-Ha-ras Harvey rat sarcoma viral oncogene homolog)				
HRAS_H	Human	ENSP00000309845	189	
KRAS_H	Human	ENSP00000256078	189	
NRAS_H	Human	ENSP00000358548	189	
HRAS_T	<i>Tetraodon</i>	GSTENP00021499001	189	
KRAS_T	<i>Tetraodon</i>	GSTENP00022812001	189	
NRAS_T	<i>Tetraodon</i>	GSTENP00003165001	107	partial
HRAS_M	Medaka	ENSORLP00000023599	189	
KRAS_M	Medaka	ENSORLP00000014318	189	
xRAS_M	Medaka	ENSORLP00000014157	186	
HRAS_Z	Zebrafish	ENSDARP00000016622	189	
xRAS_Z	Zebrafish	ENSDARP00000064608	187	
NRAS_Z	<i>Zebrafish</i>	ENSDARP00000055741	188	
KRAS_Z	<i>Zebrafish</i>	ENSDARP00000021124	188	
HRAS_G	<i>Gasterosteus</i>	ENSGACP00000014989	189	
KRAS_G	<i>Gasterosteus</i>	ENSGACP00000015443	193	
xRAS1_G	<i>Gasterosteus</i>	ENSGACP00000017051	187	
xRAS2_G	<i>Gasterosteus</i>	ENSGACESTP00000015169	188	
HRAS_X	<i>Xenopus</i>	ENSXETP00000013308	189	
KRAS_X	<i>Xenopus</i>	ENSXETP00000007368	189	
NRAS_X	<i>Xenopus</i>	ENSXETP00000013310	186	
HRAS_C	Chicken	ENSGALP00000011140	189	
XRAS_C	Chicken	ENSGALP00000022686	188	
NRAS_C	Chicken	ENSGALP00000003258	193	
Ras85D_D	<i>Drosophila</i>	CG9375-PA	189	
Raf (v-raf murine sarcoma 3611 viral oncogene homolog [EC:2.7.11.1])				
ARAF_H	Human	ENSP00000366244	606	
BRAF_H	Human	ENSP00000288602	766	
ARAF_T	<i>Tetraodon</i>	GSTENP00020048001	671	
BRAF_T	<i>Tetraodon</i>	GSTENP00013902001	771	
ARAF_M	Medaka	ENSORLP00000020929	606	
BRAF_M	Medaka	ENSORLP00000012350	768	
ARAF_G	<i>Gasterosteus</i>	ENSGACP00000004834	609	
BRAF_G	<i>Gasterosteus</i>	ENSGACP00000025456	810	
ARAF_Z	Zebrafish	ENSDARP00000071167	608	
RAFx_Z	Zebrafish	ENSDARP00000076954	688	
BRAF_Z	Zebrafish	ENSDARP00000048390	817	
ARAF_X	<i>Xenopus</i>	ENSXETP00000049610	327	partial
BRAF_X	<i>Xenopus</i>	ENSXETP00000010512	804	
BRAF_C	Chicken	ENSGALP00000020950	760	
phIRA_D	<i>Drosophila</i>	CG2845-PA	739	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
Q4H2W3_Ci	<i>Ciona</i>	ENSCINP00000007716	451	
RAF1_H	Human	ENSP00000251849	648	
RAF1_T	<i>Tetraodon</i>	GSTENP00023725001	704	
RAF1_M	Medaka	ENSORLP00000014365	662	
RAF1_G	<i>Gasterosteus</i>	ENSGACP00000000078	629	
RAF1_X	<i>Xenopus</i>	ENSXETP00000043489	636	
RAF1_C	Chicken	ENSGALP00000007991	647	
RAF1_Z	<i>Zebrafish</i>	ENSDARP00000076954	688	
phlRA_D	<i>Drosophila</i>	CG2845-PA	739	
MEK1/2 (MAP2K, mitogen-activated protein kinase kinase [EC:2.7.12.2])				
MAP2K1_H	Human	ENSP00000302486	393	
MAP2K2_H	Human	ENSP00000262948	400	
MAP2K1_T	<i>Tetraodon</i>	GSTENP00016020001	462	
MAP2K2_T	<i>Tetraodon</i>	GSTENP00004843001	370	
MAP2K1_M	Medaka	ENSORLP00000008701	394	
MAP2K2_M	Medaka	ENSORLP00000006223	397	
MAP2K1_G	<i>Gasterosteus</i>	ENSGACP00000006553	394	
MAP2K2a_G	<i>Gasterosteus</i>	ENSGACP00000016808	399	
MAP2K2b_G	<i>Gasterosteus</i>	ENSGACP00000020149	395	
MAP2K1_Z	<i>Zebrafish</i>	ENSDARP00000008018	394	
MAP2K2_Z	<i>Zebrafish</i>	ENSDARP00000014914	394	Program WISE2 was applied
MAP2K1_X	<i>Xenopus</i>	ENSXETP00000034662	395	
MAP2K1_C	Chicken	ENSGALP00000012448	395	
MAP2K2_C	Chicken	ENSGALP00000001932	398	
Dsor1RA_D	<i>Drosophila</i>	G15793-PA	396	
MAP2K_Ci	<i>Ciona</i>	ENSCINP00000008465	377	
ERK1/2 (MAPK, mitogen-activated protein kinase [EC:2.7.11.24])				
MAPK1_H	Human	ENSP00000215832	360	
MAPK3_H	Human	ENSP00000263025	379	
MAPK1_T	<i>Tetraodon</i>	GSTENP00028566001	366	
MAPK3_T	<i>Tetraodon</i>	GSTENP00021811001	358	
MAPK3_M	Medaka	ENSORLP00000015020	389	
MAPK1_G	<i>Gasterosteus</i>	ENSGACP00000019049	369	
MAPK3_G	<i>Gasterosteus</i>	ENSGACP00000017345	339	
MAPK1_Z	<i>Zebrafish</i>	ENSDARP00000038550	369	
MAPK3_Z	<i>Zebrafish</i>	ENSDARP00000055552	392	
MAPK1_X	<i>Xenopus</i>	ENSXETP00000040234	361	
MAPK1_C	Chicken	ENSGALP00000039208	321	
Rsk (RPS6KA, ribosomal protein S6 kinase, 90kDa, polypeptide [EC:2.7.11.1])				
RPS6KA6_H	Human	ENSP00000262752	745	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
RPS6KA1_H	Human	ENSP00000363277	744	
RPS6KA2_H	Human	ENSP00000265678	733	
RPS6KA3_H	Human	ENSP00000368884	740	
RPS6KA6_T	<i>Tetraodon</i>	GSTENP00029331001	719	
RPS6KA1_T	<i>Tetraodon</i>	GSTENP00032087001	732	
RPS6KA2_T	<i>Tetraodon</i>	GSTENP00025809001	694	
RPS6KA6_M	Medaka	ENSORLP00000010672	702	
RPS6KA1_M	Medaka	ENSORLP00000018054	732	
RPS6KA2_M	Medaka	ENSORLP00000012525	717	
RPS6KA3_M	Medaka	ENSORLP00000003184	716	
RPS6KA6_G	<i>Gasterosteus</i>	ENSGACP00000024513	745	
RPS6KA1_G	<i>Gasterosteus</i>	ENSGACP00000012601	702	
RPS6KA2_G	<i>Gasterosteus</i>	ENSGACP00000021164	739	
RPS6KA3_G	<i>Gasterosteus</i>	ENSGACP00000016938	725	
RPS6KA6_Z	Zebrafish	ENSDARP000000047992	732	
RPS6KA1_Z	Zebrafish	ENSDARP000000050094	700	
RPS6KA2_Z	Zebrafish	ENSDARP000000051816	708	
RPS6KA3a_Z	Zebrafish	ENSDARP000000051545	732	
RPS6KA3b_Z	Zebrafish	ENSDARP000000075154	699	
RPS6KA6_X	<i>Xenopus</i>	ENSXETP000000031774	634	
RPS6KA1_X	<i>Xenopus</i>	ENSXETP000000026921	697	
RPS6KA2_X	<i>Xenopus</i>	ENSXETP000000022660	694	
RPS6KA3_X	<i>Xenopus</i>	ENSXETP000000022653	482	partial
RPS6KA6_C	Chicken	ENSGALP000000011476	728	
RPS6KA1_C	Chicken	ENSGALP000000000497	752	
RPS6KA2_C	Chicken	ENSGALP000000018680	708	
RPS6KA3_C	Chicken	ENSGALP000000026406	697	
RPS6KA_Ci	<i>Ciona</i>	ENSCINP00000011581	747	

CREB (ATF4, activating transcription factor 4, tax-responsive enhancer element B67)

ATF4_H	Human	ENSP00000336790	351	
ATF4a_T	<i>Tetraodon</i>	GSTENP00021675001	315	
ATF4b_M	Medaka	ENSORLP00000013351	375	
ATF4a_M	Medaka	ENSORLP00000016837	352	
ATF4a_G	<i>Gasterosteus</i>	ENSGACP00000010811	369	
ATF4b_G	<i>Gasterosteus</i>	ENSGACP000000026215	392	
ATF4a_Z	Zebrafish	ENSDARP000000055608	396	
ATF4b_Z	Zebrafish	ENSDARP000000042969	339	
ATF4_X	<i>Xenopus</i>	ENSXETP000000050104	343	
ATF4_C	Chicken	ENSGALP000000037099	354	
Q4H3V8_Ci	<i>Ciona</i>	ENSCINP000000022333	340	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
CBP (CREB binding protein [EC:2.3.1.48])				
CREBBP_H	Human	ENSP00000262367	2442	
EP300_H	Human	ENSP00000263253	2414	
EP300b_T	<i>Tetraodon</i>	GSTENP00011900001	2730	
EP300a_T	<i>Tetraodon</i>	GSTENP00024248001	2539	
CREBBPa_T	<i>Tetraodon</i>	GSTENP00013510001	2473	
CREBBPb_T	<i>Tetraodon</i>	GSTENP00026318001	982	partial
EP300a_M	Medaka	ENSORLP00000003103	2290	
CREBBPa_M	Medaka	ENSORLP00000010434	2297	
CREBBPb_M	Medaka	UTOLAPRE05100117230	1864	
EP300b_M	Medaka	ENSORLP00000017525	2420	
CREBBPa_G	<i>Gasterosteus</i>	ENSGACP00000014994	2319	
CREBBPb_G	<i>Gasterosteus</i>	ENSGACP00000024794	2397	
EP300a_G	<i>Gasterosteus</i>	ENSGACP00000006405	2344	
EP300b_G	<i>Gasterosteus</i>	ENSGACP00000010236	2411	
CREBBPa_Z	Zebrafish	ENSDARP00000086311	1777	partial
EP300a2_Z	Zebrafish	ENSDARP00000083887	2401	
CREBBPb_Z	Zebrafish	Chr22 31620000-31710000+	2326	Program WISE2 was applied
EP300a3_Z	Zebrafish	ENSDARP00000081212	1908	
EP300a1_Z	Zebrafish	ENSDARP00000084542	2423	
CREBBP_X	<i>Xenopus</i>	ENSXETP00000022709	2427	
EP300_X	<i>Xenopus</i>	ENSXETP00000049701	2138	Program WISE2 was applied
CREBBP_C	Chicken	ENSGALP00000012573	2432	
EP300_C	Chicken	ENSGALP00000019537	2451	
nejRB_D	<i>Drosophila</i>	CG15319-PB	3276	
CREBBP_Ci	<i>Ciona</i>	ENSCINP00000018331	1463	
CaMK4 (calcium/calmodulin-dependent protein kinase IV [EC:2.7.11.17])				
CaMK4_H	Human	ENSP00000282356	473	
CaMK4_M	Medaka	ENSORLP00000017485	324	
CaMK4_G	<i>Gasterosteus</i>	ENSGACP00000017983	360	
CaMK4_X	<i>Xenopus</i>	ENSXETP00000015124	328	
CaMK4_C	Chicken	ENSGALP00000024483	388	
CaMK4_Z	Zebrafish	ENSDARP00000037747	364	
CaMKIRA_D	<i>Drosophila</i>	CG1495-PA	405	
PKC (protein kinase C [EC:2.7.11.13])				
PRKCA_H	Human	ENSP00000284384	672	
PRKCB_H	Human	ENSP00000305355	673	
PRKCG_H	Human	ENSP00000263431	697	
PRKCAb_T	<i>Tetraodon</i>	GSTENP00026368001	656	Program WISE2 was applied
PRKCAa_T	<i>Tetraodon</i>	GSTENP00033392001	740	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
PRKCBa_T	<i>Tetraodon</i>	GSTENP00021867001	633	
PRKCBb_T	<i>Tetraodon</i>	GSTENP00009847001	825	
PRKCBb_M	Medaka	ENSORLP00000010930	666	
PRKCAa_M	Medaka	ENSORLP00000011078	578	
PRKCAb_G	<i>Gasterosteus</i>	ENSGACP00000024481	667	
PRKCAa_G	<i>Gasterosteus</i>	ENSGACP00000015453	670	
PRKCBa_G	<i>Gasterosteus</i>	ENSGACP00000018940	671	
PRKCBb_G	<i>Gasterosteus</i>	ENSGACP00000022148	664	
PRKCBb_Z	Zebrafish	ENSDARP00000024929	668	
PRKCB_X	<i>Xenopus</i>	ENSXETP00000037655	668	
PRKCG_X	<i>Xenopus</i>	ENSXETP00000022125	659	Program WISE2 was applied
PRKCA_C	Chicken	ENSGALP00000006278	674	
PRKCB_C	Chicken	ENSGALP00000009662	608	
Pkc53E_D	<i>Drosophila</i>	CG6622-PB	679	
PRKCx_Ci	<i>Ciona</i>	ENSCINP00000017438	779	

Gq (GNAQ, guanine nucleotide binding protein (G protein), q polypeptide)

GNAQ_H	Human	ENSP00000286548	359
GNAQ_T	<i>Tetraodon</i>	GSTENP00029406001	502
GNAQ_M	Medaka	ENSORLP00000007128	358
GNAQ_G	<i>Gasterosteus</i>	ENSGACP00000010461	362
GNAQ_X	<i>Xenopus</i>	ENSXETP00000007815	359
GNAQ_C	Chicken	ENSGALP00000024446	359
GNAQ_Z	Zebrafish	ENSDARP00000020119	373
Q8WSR9_Ci	<i>Ciona</i>	ENSCINP00000022318	380

PLCβ (phospholipase C, beta [EC:3.1.4.11])

PLCB1_H	Human	ENST00000338037	7093 (bp)
PLCB2_H	Human	ENST00000389812	3546 (bp)
PLCB1b_T	<i>Tetraodon</i>	GSTENT00018741001	4386 (bp)
PLCB1a_T	<i>Tetraodon</i>	GSTENT00020281001	2361 (bp)
PLCB2_T	<i>Tetraodon</i>	GSTENT00032419001	2115 (bp)
PLCB1a_M	Medaka	ENSORLT00000012252	3432 (bp)
PLCB2_M	Medaka	UTOLAPRE05100101470	3159 (bp)
PLCB1b_G	<i>Gasterosteus</i>	ENSGACT00000015673	3504 (bp)
PLCB1a_G	<i>Gasterosteus</i>	ENSGACT00000016555	3657 (bp)
PLCB2_G	<i>Gasterosteus</i>	ENSGACT00000008512	4020 (bp)
PLCB1_X	<i>Xenopus</i>	ENSXETT00000012140	1410 (bp)
PLCB2_X	<i>Xenopus</i>	ENSXETT00000029321	3537 (bp)
PLCB1_C	Chicken	ENSGALT00000014420	3306 (bp)
PLCB2_C	Chicken	ENSGALT00000007647	4007 (bp)
PLCB3_H	Human	ENST00000279230	3705 (bp)
PLCB3_T	<i>Tetraodon</i>	GSTENT00003549001	3714 (bp)

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
PLCB3_M	Medaka	ENSORLT00000006894	3381 (bp)	
PLCB3_G	<i>Gasterosteus</i>	ENSGACT00000026168	3390 (bp)	
PLCB3_Z	Zebrafish	ENSDART00000073670	3423 (bp)	
PLCB3_X	<i>Xenopus</i>	ENSXETT00000015647	3618 (bp)	
Plc21C_D	<i>Drosophila</i>	CG4574-RD	5749 (bp)	
PLCB4_H	Human	ENST00000278655	5488 (bp)	
PLCB4_T	<i>Tetraodon</i>	GSTENT00020282001	1593 (bp)	
PLCB4_M	Medaka	ENSORLT00000012106	3552 (bp)	
PLCB4_G	<i>Gasterosteus</i>	ENSGACT00000016591	3543 (bp)	
PLCB4_X	<i>Xenopus</i>	ENSXETT00000032998	1925 (bp)	
PLCB4_C	Chicken	ENSGALT00000014481	4095 (bp)	
norpA_D	<i>Drosophila</i>	CG3620-RA	4225 (bp)	
PLCB_Ci	<i>Ciona savignyi</i>	ENSCSAVT00000004146	2640 (bp)	

IP3R (ITPR3, inositol 1,4,5-triphosphate receptor, type 3)

ITPR3_H	Human	ENSP00000363435	2671	
ITPR1_H	Human	ENSP00000349029	2758	
ITPR2_H	Human	ENSP00000370744	2703	
ITPR3_T	<i>Tetraodon</i>	GSTENP00005900001	2848	
ITPR1a_T	<i>Tetraodon</i>	GSTENP00014091001	2743	
ITPR1b_T	<i>Tetraodon</i>	GSTENP00027211001	2336	
ITPR2_T	<i>Tetraodon</i>	GSTENP00022806001	2747	
ITPR3_M	Medaka	ENSORLP00000022924	2606	
ITPR1a_M	Medaka	ENSORLP00000015946	2772	
ITPR1b_M	Medaka	ENSORLP00000018255	2714	
ITPR2a_M	Medaka	ENSORLP00000014246	2411	
ITPR2b_M	Medaka	UTOLAPRE05100114864	2212	
ITPR3_G	<i>Gasterosteus</i>	ENSGACP00000000328	2609	
ITPR1b_G	<i>Gasterosteus</i>	ENSGACP00000000845	2765	
ITPR1a_G	<i>Gasterosteus</i>	ENSGACP00000015790	2747	
ITPR2_G	<i>Gasterosteus</i>	ENSGACP00000015473	2694	
ITPR3a_Z	Zebrafish	ENSDDARP000000082620	2688	
ITPR3b_Z	Zebrafish	ENSDDARP000000077685	2368	
ITPRx3_Z	Zebrafish	ENSDDARP000000081374	1214	partial
ITPR2_Z	Zebrafish	ENSDDARP000000061133	2624	
ITPR1b2_Z	Zebrafish	ENSDDARP000000033695	2345	
ITPR1b1_Z	Zebrafish	ENSDDARP000000080167	2715	
ITPR1b3_Z	Zebrafish	ENSDDARP000000080191	2685	
ITPR3_1_X	<i>Xenopus</i>	ENSXETP000000033593	839	partial
ITPR3_2_X	<i>Xenopus</i>	ENSXETP000000040538	488	partial
ITPR1_X	<i>Xenopus</i>	ENSXETP000000011267	2692	
ITPR2_X	<i>Xenopus</i>	ENSXETP000000035890	2105	
ITPR3_C	Chicken	ENSGALP00000004972	2665	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
ITPR1_C	Chicken	ENSGALP00000013490	2751	
ITPR2_C	Chicken	ENSGALP00000022744	2703	
Itpr83A_D	<i>Drosophila</i>	CG1063-PB	2837	
ITPR_Ci	<i>Ciona</i>	ENSCINP00000015029	2054	Program WISE2 was applied

Gα (guanine nucleotide binding protein, alpha transducing)

GNAT3_H	Human	OTTHUMT00000138730	342
GNAS_H	Human	ENSP00000265620	395
GNAT3b_T	<i>Tetraodon</i>	GSTENP00028189001	336
GNAT3a_T	<i>Tetraodon</i>	GSTENP00027493001	350
GNASb_T	<i>Tetraodon</i>	GSTENP00022571001	301
GNASa_T	<i>Tetraodon</i>	GSTENP00013542001	352
GNAT3a_M	Medaka	ENSORLP00000023702	350
GNASa_M	Medaka	ENSORLP00000007194	398
GNAT3a_G	<i>Gasterosteus</i>	ENSGACP00000016355	350
GNAT3b_G	<i>Gasterosteus</i>	ENSGACP00000010234	352
GNASa_G	<i>Gasterosteus</i>	ENSGACP00000008323	394
GNASb_G	<i>Gasterosteus</i>	ENSGACP00000008186	380
GNAT3a_Z	Zebrafish	ENSDARP00000064895	350
GNAT3b_Z	Zebrafish	ENSDARP00000062362	354
GNASa_Z	Zebrafish	ENSORLP00000004563	379
GNAT1_X	<i>Xenopus</i>	ENSXETP00000015940	350
GNAT3_X	<i>Xenopus</i>	ENSXETP00000004299	354
GNAT3_C	Chicken	ENSGALP00000013713	373
GNAS_C	Chicken	ENSGALP00000012126	379

GNβ (guanine nucleotide binding protein, beta polypeptide 1 and 3)

GNB1_H	Human	ENSP00000367872	340
GNB3_H	Human	ENSP00000229264	340
GNB1_T	<i>Tetraodon</i>	GSTENP00027506001	340
GNB3_T	<i>Tetraodon</i>	GSTENP00015314001	346
GNB1_M	Medaka	ENSORLP00000004503	340
GNB3a_M	Medaka	ENSORLP00000015882	340
GNB3b_M	Medaka	ENSORLP00000008043	349
GNB1a_G	<i>Gasterosteus</i>	ENSGACP00000016084	340
GNB1b_G	<i>Gasterosteus</i>	ENSGACP00000007206	394
GNB3a_G	<i>Gasterosteus</i>	ENSGACP00000013068	370
GNB3b_G	<i>Gasterosteus</i>	ENSGACP00000012473	342
GNB1_Z	Zebrafish	ENSDARP00000018443	321
GNB3a_Z	Zebrafish	ENSDARP00000017443	340
GNB3b_Z	Zebrafish	ENSDARP00000005843	338
GNB1_X	<i>Xenopus</i>	ENSXETP00000042401	341
GNB3_X	<i>Xenopus</i>	ENSXETP00000020865	340

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
GNB1_C	Chicken	ENSGALP00000039570	340	
GNB3_C	Chicken	ENSGALP00000023365	340	
GNG (guanine nucleotide binding protein, gamma polypeptide 3 and 13)				
GNG3_H	Human	ENSP00000294117	75	
GNG13_H	Human	ENSP00000248150	67	
GNG3_T	<i>Tetraodon</i>	GSTENP00020393001	75	
GNG13_T	<i>Tetraodon</i>	GSTENP00008081001	67	
GNG13_2_T	<i>Tetraodon</i>	GSTENP00036646001	42	partial
GNG13a_M	Medaka	ENSORLP00000010987	67	
GNG13b_M	Medaka	ENSORLP00000020790	67	
GNG3_G	<i>Gasterosteus</i>	ENSGACP00000026804	75	
GNG13_G	<i>Gasterosteus</i>	ENSGACP00000022136	67	
GNGx1_G	<i>Gasterosteus</i>	ENSGACP00000005598	75	
GNGx2_G	<i>Gasterosteus</i>	ENSGACP00000015903	75	
GNG3_Z	Zebrafish	ENSARP00000015972	75	
GNG13_Z	Zebrafish	ENSARP00000036461	67	
GNG2_Z	Zebrafish	ENSARP00000073854	71	
GNGx1_Z	Zebrafish	ENSARP00000068714	75	
GNGx2_Z	Zebrafish	ENSARP00000055268	67	
GNG13_X	<i>Xenopus</i>	ENSXETP00000012710	67	
GNG13_C	Chicken	ENSGALP00000008472	67	
GNGx1_C	Chicken	ENSGALP00000020180	71	
Ggamma1_D	<i>Drosophila</i>	CG8261-PA	70	
GNG13_D	<i>Drosophila</i>	CG3694-PA	72	
AC6 (adenylate cyclase [EC:4.6.1.1])				
ADCY6_H	Human	ENSP00000311405	1168	
ADCY6a_T	<i>Tetraodon</i>	GSTENP00029196001	1772	
ADCY6b_T	<i>Tetraodon</i>	GSTENP00028124001	1208	
ADCY6a_G	<i>Gasterosteus</i>	ENSGACP00000001602	873	partial
ADCY6b_G	<i>Gasterosteus</i>	ENSGACP00000011337	1166	
ADCY6c_G	<i>Gasterosteus</i>	ENSGACP00000003999	1148	
ADCY6a_M	Medaka	ENSORLP00000012232	1193	
ADCY6b_M	Medaka	ENSORLP00000008753	1170	
ADCY6c_M	Medaka	ENSORLP00000015500	1192	
ADCYx2_Z	Zebrafish	ENSARP00000034426	747	partial
ADCY6c_Z	Zebrafish	ENSARP00000005946	1175	
ADCY6_C	Chicken	ENSGALP00000019099	1212	
ADCY1_D	<i>Drosophila</i>	CG7978-PA	1307	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
PDE1A (phosphodiesterase 1A, calmodulin-dependent [EC:3.1.4.17])				
PDE1A_H	Human	ENSP00000350858	535	
PDE1A_T	<i>Tetraodon</i>	GSTENP00037899001	151	partial
PDE1A_M	Medaka	ENSORLP00000017334	543	
PDE1A_G	<i>Gasterosteus</i>	ENSGACP00000010793	557	
PDE1A_Z	Zebrafish	ENSDARP00000080640	476	
PDE1A_C	Chicken	ENSGALP00000014423	509	
Pde1cRA_D	<i>Drosophila</i>	CG14940-PA	605	
CACNA (calcium channel, voltage-dependent, P/Q type, alpha 1A subunit)				
CACNA1A_H	Human	ENSP00000353362	2505	
CACNA1B_H	Human	ENSP00000360423	2339	
CACNA1Aa_T	<i>Tetraodon</i>	GSTENP00021312001	1615	
CACNA1Ab_T	<i>Tetraodon</i>	GSTENP00023728001	2040	
CACNA1B_T	<i>Tetraodon</i>	GSTENT00009266001	1485	
CACNA1A_M	Medaka	ENSORLP00000013836	2310	
CACNA1B_M	Medaka	ENSORLP00000017325	1393	
CACNA1A_G	<i>Gasterosteus</i>	ENSGACP00000016841	2000	
CACNA1Ba_G	<i>Gasterosteus</i>	ENSGACP00000023871	2373	
CACNA1Bb_G	<i>Gasterosteus</i>	ENSGACP00000004380	1557	Program WISE2 was applied
CACNA1Aa_Z	Zebrafish	ENSDARP00000023232	1940	
CACNA1Ab_Z	Zebrafish	ENSDARP00000005825	1751	
CACNA1B_Z	Zebrafish	ENSDARP000000047718	1279	
CACNA1B_C	Chicken	ENSGALP00000013765	2356	
cacRE_D	<i>Drosophila</i>	CG1522-PE	1851	
CACNA1x1_Ci	<i>Ciona</i>	ENSCINP00000004981	1813	
TRPM5 (transient receptor potential cation channel, subfamily M, member 5)				
TRPM5_H	Human	ENSP00000155858	1165	
TRPM5_T	<i>Tetraodon</i>	GSTENP00018196001	1082	Program WISE2 was applied
TRPM5_M	Medaka	ENSORLP00000001370	1132	
TRPM5_G	<i>Gasterosteus</i>	ENSGACP00000022654	1113	
TRPM5_Z	Zebrafish	ENSDARP00000077915	1139	
TRPM5_C	Chicken	ENSGALP00000010522	1120	
TRPM_D	<i>Drosophila</i>	CG30078-PA	1131	
TRPM_CIS	<i>Ciona savignyi</i>	ENSCSAVP00000015105	941	
KCN (KCNB1, potassium voltage-gated channel, Shab-related subfamily, member 1)				
KCNB1_H	Human	ENSP00000360806	858	
KCNB1_T	<i>Tetraodon</i>	GSTENP00027468001	792	
KCNx2_T	<i>Tetraodon</i>	GSTENP00033644001	528	
KCNB1_M	Medaka	ENSORLP00000000766	749	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
KCNB1_G	<i>Gasterosteus</i>	ENSGACP00000001736	826	
KCNx2_G	<i>Gasterosteus</i>	ENSGACP00000019593	533	Program WISE2 was applied
KCNB1_X	<i>Xenopus</i>	ENSXETP00000034901	875	
KCNx_X	<i>Xenopus</i>	ENSXETP00000025847	709	
KCNB1_C	Chicken	ENSGALP00000033591	855	
KCNB1_Z	Zebrafish	ENSDARP00000078796	831	
ShabRB_D	<i>Drosophila</i>	CG1066-PB	1015	
AC3 (ADCY3, adenylate cyclase 3 [EC:4.6.1.1])				
ADCY3_H	Human	ENSP00000260600	1144	
ADCY3b1_T	<i>Tetraodon</i>	GSTENP00012767001	928	
ADCY3b2_T	<i>Tetraodon</i>	GSTENP00012928001	982	
ADCY3a_T	<i>Tetraodon</i>	GSTENP00021989001	1292	
ADCY3_M	Medaka	ENSORLP00000021102	1135	
ADCY3a_M	Medaka	ENSORLP00000003093	923	
ADCY3a_G	<i>Gasterosteus</i>	ENSGACP00000018535	1153	
ADCY3b_G	<i>Gasterosteus</i>	ENSGACP00000017710	1132	
ADCY3_Z	Zebrafish	ENSDARP00000012983	1052	
ADCY3_X	<i>Xenopus</i>	ENSXETP00000045792	1079	
ADCY3_C	Chicken	ENSGALP00000026753	1133	
rutRA_D	<i>Drosophila</i>	CG9533-PA	2248	
CNGB1 (cyclic nucleotide gated channel beta 1)				
CNGB1_H	Human	ENSP00000251102	1251	
CNGB1_T	<i>Tetraodon</i>	GSTENP00007198001	743	
CNGB1_G	<i>Gasterosteus</i>	ENSGACP00000023240	594	Program WISE2 was applied
CNGB1a_Z	Zebrafish	ENSDARP00000089356	613	
CNGB1b_Z	Zebrafish	ENSDARP00000061711	614	
CNGB1a_X	<i>Xenopus</i>	ENSXETP00000030119	1067	
CNGB1b_X	<i>Xenopus</i>	ENSXETP00000030000	689	
CNGB1_C	Chicken	ENSGALP00000001491	713	partial
CNGA (cyclic nucleotide gated channel alpha)				
CNGA3_H	Human	ENSP00000272602	694	
CNGA4_H	Human	ENSP00000369268	575	
CNGA3a1_T	<i>Tetraodon</i>	GSTENP00025775001	563	
CNGA3b_T	<i>Tetraodon</i>	GSTENP00027057001	468	
CNGA3a2_T	<i>Tetraodon</i>	GSTENP00032742001	563	
CNGA4_T	<i>Tetraodon</i>	GSTENP00010054001	511	
CNGA3a_M	Medaka	ENSORLP00000019723	613	
CNGA3b_M	Medaka	ENSORLP00000025597	515	
CNGA4_M	Medaka	ENSORLP00000012922	575	
CNGA3_G	<i>Gasterosteus</i>	ENSGACP00000018154	720	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
CNGA4_G	<i>Gasterosteus</i>	ENSGACP00000002781	611	
CNGA3b_Z	Zebrafish	ENSDARP00000022566	622	
CNGA3a1_Z	Zebrafish	ENSDARP00000069528	735	
CNGA3a2_Z	Zebrafish	ENSDARP00000069652	666	
CNGA3_X	<i>Xenopus</i>	ENSXETP00000052592	737	
CNGA4_X	<i>Xenopus</i>	ENSXETP00000023078	518	
CNGA3_C	Chicken	ENSGALP00000026992	731	
CNGA4_C	Chicken	ENSGALP00000035597	530	
Cng_D	<i>Drosophila</i>	CG7779-PA	665	
CNG_Ci	<i>Ciona</i>	ENSCINP00000010344	541	
ARRB2 (arrestin, beta 2)				
ARRB2_H	Human	ENSP00000269260	409	
ARR1_T	<i>Tetraodon</i>	GSTENP00021161001	575	
ARRB2a_T	<i>Tetraodon</i>	GSTENP00006671001	303	Program WISE2 was applied
ARRB2b_T	<i>Tetraodon</i>	GSTENP00014682001	386	
ARRB1_M	Medaka	ENSORLP00000025743	409	
ARRB2b_M	Medaka	ENSORLP00000016469	418	
ARRB1_G	<i>Gasterosteus</i>	ENSGACP00000006046	415	
ARRB2a_G	<i>Gasterosteus</i>	ENSGACP00000000965	407	
ARRB2b_G	<i>Gasterosteus</i>	ENSGACP00000002368	403	
ARR1_Z	Zebrafish	ENSADRESTP00000025319	382	Program WISE2 was applied
ARRB2b2_Z	Zebrafish	ENSDARP00000024694	401	
ARRB2b1_Z	Zebrafish	ENSDARP000000057290	406	
ARRB1_X	<i>Xenopus</i>	ENSXETP00000021181	404	
ARR_C	Chicken	ENSGALP00000006752	359	
krzRA_D	<i>Drosophila</i>	CG1487-PA	470	
Q8MYB1_Ci	<i>Ciona</i>	ENSCINP00000025095	418	
GRK (ADRBK2, adrenergic, beta, receptor kinase 2 [EC:2.7.11.15])				
ADRBK2_H	Human	ENSP00000317578	688	
ADRBK2_T	<i>Tetraodon</i>	GSTENP00025383001	697	
ADRBK2_M	Medaka	ENSORLP00000001399	600	
ADRBK2_Z	Zebrafish	ENSDARP00000007164	370	Program WISE2 was applied
ADRBK2a_C	Chicken	ENSGALP00000008839	625	
ADRBK2b_C	Chicken	ENSGALP00000028987	465	
Gprk1_D	<i>Drosophila</i>	CG40129-PA	513	
ADRBK_Ci	<i>Ciona</i>	ENSCINP00000002847	511	
Phd (PDC, phosducin)				
PDC_H	Human	ENSP00000342033	246	
PDCa_T	<i>Tetraodon</i>	GSTENP00033630001	235	
PDCa_M	Medaka	ENSORLP00000011833	242	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
PDCb_M	Medaka	ENSORLP00000017422	259	
PDCa_G	<i>Gasterosteus</i>	ENSGACP00000009882	254	
PDCb_G	<i>Gasterosteus</i>	ENSGACP00000019408	240	
PDCb_Z	Zebrafish	ENSDARP00000017670	245	
PDCa_Z	Zebrafish	ENSDARP00000010853	261	
PDC_X	<i>Xenopus</i>	ENSXETP00000037837	229	
PDC_C	Chicken	ENSGALP00000008117	249	
GNAL (Golf, G protein, alpha activating activity polypeptide, olfactory type)				
GNAL_H	Human	ENSP00000269162	381	
GNAL1_T	<i>Tetraodon</i>	GSTENP00007449001	357	
GNAL2_T	<i>Tetraodon</i>	GSTENP00027664001	343	
GNAL1_M	Medaka	ENSORLP00000024591	391	
GNAL2_M	Medaka	ENSORLP00000004678	396	
GNAL1_G	<i>Gasterosteus</i>	ENSGACP00000001495	377	
GNAL2_G	<i>Gasterosteus</i>	ENSGACP00000021927	379	
GNAL1_Z	Zebrafish	ENSDARP000000066781	379	
GNAL_X	<i>Xenopus</i>	ENSXETP00000042648	379	
GNAL_C	Chicken	ENSGALP00000022345	379	
Gsalpha60A_D	<i>Drosophila</i>	CG2835-PB	385	
GNAL_Ci	<i>Ciona</i>	ENSCINP00000011969	381	
PKG (protein kinase, cGMP-dependent, type I and type II [EC:2.7.11.12])				
PRKG1_H	Human	ENSP00000327642	671	
PRKG1_C	Chicken	ENSGALP00000006027	685	
PRKG1a_T	<i>Tetraodon</i>	GSTENP00016387001	726	
CGK1_T	<i>Tetraodon</i>	GSTENP00005488001	831	
PRKG1a_M	Medaka	ENSORLP00000007952	684	
PRKG1a_G	<i>Gasterosteus</i>	ENSGACP00000012095	684	
CGK1_G	<i>Gasterosteus</i>	ENSGACP00000013540	586	
PRKG1a_Z	Zebrafish	ENSDARP00000024589	667	
PRKG1b_Z	Zebrafish	ENSDARP00000043235	329	Program WISE2 was applied
Pkg21D_D	<i>Drosophila</i>	CG3324-PA	768	
CGKI_Ci	<i>Ciona</i>	ENSCINP00000025733	580	
PRKG2_H	Human	ENSP00000264399	762	
PRKG2_C	Chicken	ENSGALP00000017721	755	
PRKG2_X	<i>Xenopus</i>	ENSXETP00000046551	788	
CGK2_X	<i>Xenopus</i>	ENSXETP00000014175	608	
PRKG2_T	<i>Tetraodon</i>	GSTENP00006641001	293	partial
PRKG2_M	Medaka	ENSORLP00000022254	768	
CGK2_M	Medaka	ENSORLP00000001301	766	
PRKG2_G	<i>Gasterosteus</i>	ENSGACP00000002402	457	partial
PRKG2_Z	Zebrafish	ENSDARP00000071397	769	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
CGK2_Z	<i>Zebrafish</i>	ENSDARP00000085704	763	
PRKG_Ci	<i>Ciona</i>	ENSCINP00000007393	725	
PDE1C (phosphodiesterase 1C, calmodulin-dependent 70kDa [EC:3.1.4.17])				
PDE1C_H	Human	ENSP00000284920	769	
PDE1Ca_T	<i>Tetraodon</i>	GSTENP00034501001	695	
PDE1Cb_T	<i>Tetraodon</i>	GSTENP00009446001	601	
PDE1C_M	Medaka	ENSORLP00000022278	433	
PDE1A_M	Medaka	ENSORLP00000017334	543	
PDE1Ca_G	<i>Gasterosteus</i>	ENSGACP00000022683	554	
PDE1C_1_G	<i>Gasterosteus</i>	ENSGACP00000000002	525	
PDE1C_2_G	<i>Gasterosteus</i>	ENSGACP00000001141	508	
PDE1C_3_G	<i>Gasterosteus</i>	ENSGACP00000001232	463	
PDE1C_4_G	<i>Gasterosteus</i>	ENSGACP00000001336	246	partial
PDE1C_5_G	<i>Gasterosteus</i>	ENSGACP00000001443	420	
PDE1C_6_G	<i>Gasterosteus</i>	ENSGACP00000001564	564	
PDE1C_7_G	<i>Gasterosteus</i>	ENSGACP00000014854	472	
PDE1C_8_G	<i>Gasterosteus</i>	ENSGACP00000020708	498	
PDE1A_Z	<i>Zebrafish</i>	ENSDARP00000080640	476	
PDE1C_Z	<i>Zebrafish</i>	ENSDARP00000067654	395	partial
PDE1C_X	<i>Xenopus</i>	ENSXETP00000050616	662	
PDE1C_C	Chicken	ENSGALP00000019935	601	
PDE1A_C	Chicken	ENSGALP00000014423	509	
Pde1c_D	<i>Drosophila</i>	CG14940-PA	605	
GCAP (GUCA, guanylate cyclase activator)				
GUCA1A_H	Human	ENSP00000053469	201	
GUCA1B_H	Human	ENSP00000230361	200	
GUCA1C_H	Human	ENSP00000261047	209	
GUCA1A_T	<i>Tetraodon</i>	GSTENP00027319001	190	
GUCA1B_T	<i>Tetraodon</i>	GSTENP00023626001	177	
GUCA1A_M	Medaka	ENSORLP00000019893	191	
GUCA1B_M	Medaka	ENSORLP00000016751	197	
GUCA1B_G	<i>Gasterosteus</i>	ENSGACP00000004424	197	
GUCA1A_X	<i>Xenopus</i>	ENSXETP00000003235	203	
GUCA1B_X	<i>Xenopus</i>	ENSXETP00000003231	159	
GUCA1C_X	<i>Xenopus</i>	ENSXETP00000020214	187	
GUCAx_X	<i>Xenopus</i>	ENSXETP00000008239	191	
GUCA1A_C	Chicken	ENSGALP00000028327	199	
GUCA1B_C	Chicken	ENSGALP00000002158	198	
GUCA1C_C	Chicken	ENSGALP00000029794	187	
GUCA1A_Z	<i>Zebrafish</i>	ENSDARP00000063553	198	
GUCA1B_Z	<i>Zebrafish</i>	ENSDARP00000019977	197	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
CG7646_D	<i>Drosophila</i>	CG7646-PA	186	
GUCA1_Ci	<i>Ciona</i>	ENSCINP00000004308	155	
GUCA2_Ci	<i>Ciona</i>	ENSCINP00000027731	194	
pGC (Gucy, guanylate cyclase)				
Gucy2d_H	Human	ENSP00000369550	1103	
Gucy2f_H	Human	ENSP00000218006	1108	
Gucy2f_T	<i>Tetraodon</i>	GSTENP00005625001	1071	
GUCY2d1_T	<i>Tetraodon</i>	GSTENP00022134001	1037	
GUCY2d2_T	<i>Tetraodon</i>	GSTENP00004053001	1154	
Gucy2f_M	Medaka	ENSORLP00000011929	1133	
GUCY2d1_M	Medaka	ENSORLP00000009861	1126	
Gucy2f_G	<i>Gasterosteus</i>	ENSGACP00000024728	1109	
GUCY2d1_G	<i>Gasterosteus</i>	ENSGACP00000026963	1148	
GUCY2d2_G	<i>Gasterosteus</i>	ENSGACP00000001536	1057	
GUCY2d1_Z	Zebrafish	ENSDARP00000030649	1055	Program WISE2 was applied
Gucy2f_Z	Zebrafish	ENSDARP00000012115	1045	
Gucy2f_X	<i>Xenopus</i>	ENSXETP00000003311	999	
GUCY2d_X	<i>Xenopus</i>	ENSXETP00000019910	956	
Gucy2f_C	Chicken	ENSGALP00000001168	1307	
CG31183_D	<i>Drosophila</i>	CG31183-PA	1417	
CLCA (chloride channel, calcium activated)				
CLCA1_H	Human	ENSP00000234701	914	
CLCA2_H	Human	ENSP00000359596	943	
CLCA4_H	Human	ENSP00000263723	919	
	<i>Tetraodon</i>			No significant BLAST hit
	Medaka			No significant BLAST hit
	<i>Gasterosteus</i>			No significant BLAST hit
CLCA1a_Z	<i>Zebrafish</i>	ENSDARP00000023466	830	
CLCA1b_Z	<i>Zebrafish</i>	ENSDARP000000051965	925	
CLCA1a_X	<i>Xenopus</i>	ENSXETP00000001081	855	
CLCA1b_X	<i>Xenopus</i>	ENSXETP00000001090	886	
CLCA1c_X	<i>Xenopus</i>	ENSXETP00000001100	933	
CLCA1d_X	<i>Xenopus</i>	ENSXETP00000006708	872	
CLCA_C	Chicken	ENSGALP00000010208	929	
CLCA2_C	Chicken	ENSGALP00000010207	930	
CLCA1a_Ci	<i>Ciona</i>	ENSCINP00000006772	674	Program WISE2 was applied
CLCA1b_Ci	<i>Ciona</i>	ENSCINP00000006764	1075	
EC 6.4.1.1 (PYC, pyruvate carboxylase)				
PYC_H	Human	ENSP00000347900	1178	
PYC_T	<i>Tetraodon</i>	GSTENP00006675001	462	partial

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
PYC_M	Medaka	ENSORLP00000006680	719	partial
PYC_G	<i>Gasterosteus</i>	ENSGACP00000026084	1179	
PYC_X	<i>Xenopus</i>	ENSXETP00000018435	1179	
PYC_C	Chicken	ENSGALP00000035230	167	partial
PYCa_Z	Zebrafish	ENSДАРP00000001575	1181	
PYCb_Z	Zebrafish	ENSДАРP00000045088	1181	
PYC_Ci	<i>Ciona</i>	ENSCINP00000015427	1154	
PYC_D	<i>Drosophila</i>	CG1516-PI	1197	

EC 4.1.1.32 (PCK, phosphoenolpyruvate carboxykinase 1, soluble)

PCK1_H	Human	ENSP00000319814	622
PCK2_H	Human	ENSP00000216780	640
PCK1_T	<i>Tetraodon</i>	GSTENP00032465001	611
PCK2_T	<i>Tetraodon</i>	GSTENP00009627001	638
PCK1_M	Medaka	ENSORLP00000016033	623
PCK2_M	Medaka	ENSORLP00000007893	646
PCK1_G	<i>Gasterosteus</i>	ENSGACP00000004885	627
PCK2_G	<i>Gasterosteus</i>	ENSGACP00000002900	635
PCK1_Z	Zebrafish	ENSДАРP00000018261	630
PCK2_Z	Zebrafish	ENSДАРP00000005448	636
PCK1_X	<i>Xenopus</i>	ENSXETP00000024598	624
PCK2_X	<i>Xenopus</i>	ENSXETP00000031961	643
PCK1_C	Chicken	ENSGALP00000012342	622

EC 1.1.1.37 (MDH, malate dehydrogenase, NAD, soluble)

MDH1_H	Human	ENSP00000233114	334
MDH2_H	Human	ENSP00000327070	338
MDH1a_T	<i>Tetraodon</i>	GSTENP00018705001	301
MDH1b_T	<i>Tetraodon</i>	GSTENP00003840001	393
MDH2_T	<i>Tetraodon</i>	GSTENP00035367001	337
MDH1a_M	Medaka	ENSORLP00000003135	335
MDH1b_M	Medaka	ENSORLP00000003630	350
MDH2_M	Medaka	ENSORLP00000007226	337
MDH1a_G	<i>Gasterosteus</i>	ENSGACP00000001268	340
MDH1b_G	<i>Gasterosteus</i>	ENSGACP00000025915	333
MDH2_G	<i>Gasterosteus</i>	ENSGACP00000008052	337
MDH1a_Z	Zebrafish	ENSДАРP00000015862	326
MDH1b_Z	Zebrafish	ENSДАРP00000023121	333
MDH1_X	<i>Xenopus</i>	ENSXETP00000028520	333
MDH2_X	<i>Xenopus</i>	ENSXETP00000019672	338
MDH1_C	Chicken	ENSGALP00000014374	334
MDH2_C	Chicken	ENSGALP00000003012	337
MDH1_Ci	<i>Ciona</i>	ENSCSAVP00000018939	346

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
MDH2_Ci	<i>Ciona</i>	ENSCINP00000017905	345	
MDH_D	<i>Drosophila</i>	CG5362-PA	337	
MDH2a_D	<i>Drosophila</i>	CG10748-PA	349	
MDH2b_D	<i>Drosophila</i>	CG10749-PA	347	
MDH2c_D	<i>Drosophila</i>	CG7998-PA	336	

EC 4.2.1.2 (FH, fumarate hydratase)

FH_H	Human	ENSP00000355518	510	
FH_T	<i>Tetraodon</i>	GSTENP00028793001	455	
FH_M	Medaka	ENSORLP00000021207	499	
FH_G	<i>Gasterosteus</i>	ENSGACP00000015073	494	
FH_X	<i>Xenopus</i>	ENSXETP00000014278	450	
FH_C	Chicken	ENSGALP00000021472	507	
FH_Z	Zebrafish	ENSDARP00000090090	425	
FH_Ci	<i>Ciona</i>	ENSCINP00000016516	491	

EC 1.3.5.1 (SDH, succinate dehydrogenase complex)

SDHA_H	Human	ENSP00000264932	664	
SDHA_T	<i>Tetraodon</i>	GSTENP00035332001	696	
SDHA_M	Medaka	ENSORLP00000007754	676	
SDHA_G	<i>Gasterosteus</i>	ENSGACP00000007705	662	
SDHA_Z	Zebrafish	ENSDARP00000076193	661	
SDHA_X	<i>Xenopus</i>	ENSXETP00000050574	664	
SDHA_C	Chicken	ENSGALP00000021475	643	
SDHA_Ci	<i>Ciona</i>	ENSCINP00000008911	681	
Scsfp_D	<i>Drosophila</i>	CG17246-PA	661	
CG5718_D	<i>Drosophila</i>	CG5718-PA	651	
SDHB_H	Human	ENSP00000364649	280	
SDHBa_T	<i>Tetraodon</i>	GSTENP00020587001	281	
SDHBb_T	<i>Tetraodon</i>	GSTENP00027350001	282	
SDHBa_M	Medaka	ENSORLP00000000328	280	
SDHBb_M	Medaka	ENSORLP000000022930	283	
SDHBa_G	<i>Gasterosteus</i>	ENSGACP00000006746	281	
SDHBb_G	<i>Gasterosteus</i>	ENSGACP00000001466	288	
SDHB_Z	Zebrafish	ENS DARESTP00000005408	252	
SDHB_X	<i>Xenopus</i>	ENSXETP00000029442	284	
SDHB_C	Chicken	ENSGALP00000000693	290	
SDHB_Ci	<i>Ciona</i>	ENSCINP00000014095	292	
SDHBa_D	<i>Drosophila</i>	CG3283-PA	297	
SDHBb_D	<i>Drosophila</i>	CG7349-PA	437	
SDHC_H	Human	ENSP00000356952	150	
SDHD_H	Human	ENSP00000374435	159	
SDHC_T	<i>Tetraodon</i>	GSTENP00005575001	129	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
SDHC_M	Medaka	ENSORLP0000003332	172	
SDHD_M	Medaka	ENSORLP00000012701	158	
SDHC_G	<i>Gasterosteus</i>	ENSGACP00000023373	170	
SDHCa_Z	Zebrafish	ENSDARP00000056369	143	
SDHCb_Z	Zebrafish	ENSDARP00000088976	169	
SDHD1_Z	Zebrafish	ENSDARP00000039864	158	
SDHD2_Z	Zebrafish	ENSDARP00000072578	155	
SDHC_X	<i>Xenopus</i>	ENSXETP00000005600	167	
SDHD_X	<i>Xenopus</i>	ENSXETP000000057629	152	
SDHD_C	Chicken	ENSGALP00000012780	157	
SDH_Ci	<i>Ciona</i>	ENSCINP00000018372	166	
CG10219_D	<i>Drosophila</i>	CG10219-PA	182	

EC 6.2.1.4 (SUCLG, succinate-CoA ligase, GDP-forming)

SUCLG1_H	Human	ENSP00000295783	333	
SUCLG1_T	<i>Tetraodon</i>	GSTENP00003696001	311	
SUCLG1_M	Medaka	ENSORLP00000007663	324	
SUCLG1_G	<i>Gasterosteus</i>	ENSGACP00000023741	325	
SUCLG1_Z	Zebrafish	ENSDARP00000069096	324	
SUCLG1_X	<i>Xenopus</i>	ENSXETP00000047436	325	
SUCLG1_C	Chicken	ENSGALP00000031379	331	
SUCLG1_CiS	<i>Ciona savignyi</i>	ENSCSAVP00000015074	325	
Scsalphad_D	<i>Drosophila</i>	CG1065-PA	328	
CG6255_D	<i>Drosophila</i>	CG6255-PA	342	
SUCLG2a_H	Human	ENSP00000307432	432	
SUCLG2b_H	Human	ENSP00000343752	431	
SUCLG2_T	<i>Tetraodon</i>	GSTENP00021008001	431	
SUCLG2_M	Medaka	ENSORLP00000010034	383	
SUCLG2_G	<i>Gasterosteus</i>	ENSGACP00000012380	430	
SUCLG2_Z	Zebrafish	ENSDARP00000081954	406	
SUCLG2_X	<i>Xenopus</i>	ENSXETP00000005372	347	
SUCLG2_C	Chicken	ENSGALP00000012380	432	
SUCLG2a_Ci	<i>Ciona</i>	ENSCINP00000015047	432	
SUCLG2b_Ci	<i>Ciona</i>	ENSCINP00000015522	447	
Sucb_D	<i>Drosophila</i>	CG10622-PA	416	

EC 6.2.1.5 (SUCLA2, succinate-CoA ligase, ADP-forming, beta subunit)

SUCLA2_H	Human	ENSP00000367923	463	
SUCLA2_F	<i>Fugu</i>	SINFRUP00000131566	459	
SUCLA2_M	Medaka	ENSORLP00000017625	467	
SUCLA2_G	<i>Gasterosteus</i>	ENSGACP00000010656	463	
SUCLA2_X	<i>Xenopus</i>	ENSXETP00000001184	460	
SUCLA2_C	Chicken	ENSGALP00000027401	463	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
SUCLA2_Z	Zebrafish	ENSDARP00000021652	467	
SUCLG2b_Ci	<i>Ciona</i>	ENSCINP00000015522	447	
CG11963_D	<i>Drosophila</i>	CG11963-PA	502	
EC 2.3.3.1 (CS, citrate synthase)				
CS_H	Human	ENSP00000342056	466	
CS_T	<i>Tetraodon</i>	GSTENP00023547001	469	
CS_M	Medaka	ENSORLP00000019361	469	
CS_G	<i>Gasterosteus</i>	ENSGACP00000014392	469	
CS_X	<i>Xenopus</i>	ENSXETP00000020990	468	
CS_Z	Zebrafish	ENSDARP00000094021	468	
CS_Ci	<i>Ciona</i>	ENSCINP00000014102	203	partial
CS_D	<i>Drosophila</i>	CG3861-PB	522	
EC 2.3.3.8 (ACLY, ATP citrate lyase)				
ACLY_H	Human	ENSP00000253792	1101	
ACLYa_T	<i>Tetraodon</i>	GSTENP00012949001	615	partial
ACLYb_T	<i>Tetraodon</i>	GSTENP00012625001	962	
ACLYa_M	Medaka	ENSORLP00000004628	1103	
ACLYb_M	Medaka	ENSORLP00000017406	1095	
ACLYa_G	<i>Gasterosteus</i>	ENSGACP00000011639	1092	
ACLYb_G	<i>Gasterosteus</i>	ENSGACP00000008249	1093	
ACLYa_Z	Zebrafish	ENSDARP00000044161	1062	
ACLYb_Z	Zebrafish	ENSDARP00000072500	1093	
ACLY_X	<i>Xenopus</i>	ENSXETP00000004892	1102	
ACLY_C	Chicken	ENSGALP00000005492	1100	
EC 4.1.3.6 (CLYBL, citrate lyase beta like)				
CLYBL_H	Human	ENSP00000316738	340	
CLYBL_T	<i>Tetraodon</i>	GSTENP00027917001	261	Program WISE2 was applied
CLYBL_M	Medaka	ENSORLP00000013986	340	
CLYBL_G	<i>Gasterosteus</i>	ENSGACP00000002457	261	Program WISE2 was applied
CLYBL_Z	Zebrafish	ENSDARP00000091837	343	
CLYBL_X	<i>Xenopus</i>	ENSXETP00000040951	380	
CLYBL_C	Chicken	ENSGALP00000027213	324	Program WISE2 was applied
CLYBL_Ci	<i>Ciona</i>	ENSCINP00000011879	356	
EC 4.2.1.3 (ACO, IREB, aconitase)				
ACO1_H	Human	ENSP00000369255	889	
ACO1_T	<i>Tetraodon</i>	GSTENP00009462001	894	
ACO1_M	Medaka	ENSORLP00000025589	912	
ACO1_G	<i>Gasterosteus</i>	ENSGACP00000002197	894	
ACO1_X	<i>Xenopus</i>	ENSXETP00000020189	893	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
ACO1_Z	Zebrafish	ENSDARP00000013136	494	
ACO1_C	Chicken	ENSGALP00000003381	889	
ACOba_Ci	<i>Ciona</i>	ENSCINP00000019424	888	
Irp1A_D	<i>Drosophila</i>	CG4900-PA	902	
Irp1B_D	<i>Drosophila</i>	CG6342-PA	899	
ACO2_H	Human	ENSP00000216254	780	
ACO2_T	<i>Tetraodon</i>	GSTENP00024238001	801	
ACO2_M	Medaka	ENSORLP00000003264	846	
ACO2a_G	<i>Gasterosteus</i>	ENSGACP00000006295	785	
ACO2b_G	<i>Gasterosteus</i>	ENSGACP00000010099	779	
ACO2_Z	Zebrafish	ENSDARP00000028117	782	
ACO2_X	<i>Xenopus</i>	ENSXETP00000015081	760	
ACO2_C	Chicken	ENSGALP00000019468	785	
ACOb_Ci	<i>Ciona</i>	ENSCINP00000018216	793	
CG4706_D	<i>Drosophila</i>	CG4706-PA	783	
Acon_D	<i>Drosophila</i>	CG9244-PB	787	

EC 1.1.1.42 (IDH1, isocitrate dehydrogenase 1 (NADP+), soluble)

IDH1_H	Human	ENSP00000260985	414	
IDH2_H	Human	ENSP00000331897	452	
IDH1_T	<i>Tetraodon</i>	GSTENP00021781001	410	
IDH2_T	<i>Tetraodon</i>	GSTENP00035635001	415	
IDH3_T	<i>Tetraodon</i>	GSTENP00021458001	438	
IDH1_M	Medaka	ENSORLP00000024665	383	partial
IDH2_M	Medaka	ENSORLP00000015781	453	
IDH1_G	<i>Gasterosteus</i>	ENSGACP00000012105	417	
IDH2_G	<i>Gasterosteus</i>	ENSGACP00000021754	454	
IDH3_G	<i>Gasterosteus</i>	ENSGACP00000014348	452	
IDH1_Z	Zebrafish	ENSDARP000000092112	429	
IDH1_X	<i>Xenopus</i>	ENSXETP00000017597	415	
IDH1_C	Chicken	ENSGALP00000014317	418	
IDHa_Ci	<i>Ciona</i>	ENSCINP00000006115	414	
IDHb_Ci	<i>Ciona</i>	ENSCINP00000017691	446	
Idh_D	<i>Drosophila</i>	CG7176-PC	469	

EC 1.1.1.41 (IDH3A, isocitrate dehydrogenase 3 [NAD+])

IDH3A_H	Human	ENSP00000299518	366	
IDH3B_H	Human	ENSP00000370223	385	
IDH3G_H	Human	ENSP00000217901	393	
IDH3A_T	<i>Tetraodon</i>	GSTENP00015984001	366	
IDH3B_T	<i>Tetraodon</i>	GSTENP00020960001	357	
IDH3Ga_T	<i>Tetraodon</i>	GSTENP00028116001	388	
IDH3A_M	Medaka	ENSORLP00000023646	369	

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
IDH3B_M	Medaka	ENSORLP00000010582	390	
IDH3Ga_M	Medaka	ENSORLP00000008916	400	
IDH3Gb_M	Medaka	ENSORLP00000020890	391	
IDH3Aa_G	<i>Gasterosteus</i>	ENSGACP00000013662	366	
IDH3Ab_G	<i>Gasterosteus</i>	ENSGACP00000023148	109	partial
IDH3B_G	<i>Gasterosteus</i>	ENSGACP00000012012	392	
IDH3Ga_G	<i>Gasterosteus</i>	ENSGACP00000011512	384	
IDH3Gb_G	<i>Gasterosteus</i>	ENSGACP00000014059	382	
IDH3A_Z	Zebrafish	ENSODARP00000094415	365	
IDH3B_Z	Zebrafish	ENSODARP00000065776	382	
IDH3Ga_Z	Zebrafish	ENSODARP00000035380	374	
IDH3Gb_Z	Zebrafish	ENSODARP00000093079	343	
IDH3A_X	<i>Xenopus</i>	ENSXETP00000021498	368	
IDH3B_X	<i>Xenopus</i>	ENSXETP00000032718	373	
IDH3G_X	<i>Xenopus</i>	ENSXETP00000001625	393	
IDH3A_C	Chicken	ENSGALP00000038881	360	
IDH3B_C	Chicken	ENSGALP00000023363	385	
IDH1_Ci	<i>Ciona</i>	ENSCINP00000014956	369	
IDH2_Ci	<i>Ciona</i>	ENSCINP00000009125	345	
IDH3_Ci	<i>Ciona</i>	ENSCINP00000015369	398	
CG3483_D	<i>Drosophila</i>	CG3483-PA	391	
CG12233_D	<i>Drosophila</i>	CG12233-PB	377	
CG6439_D	<i>Drosophila</i>	CG6439-PA	370	
CG5028_D	<i>Drosophila</i>	CG5028-PA	402	

EC 1.2.4.2 (OGDH, oxoglutarate (alpha-ketoglutarate) dehydrogenase, lipoamide)

OGDH_H	Human	ENSP00000222673	1023	
OGDHL_H	Human	ENSP00000363216	1010	
OGDHa_T	<i>Tetraodon</i>	GSTENP00010753001	1070	
OGDHb_T	<i>Tetraodon</i>	GSTENP00025361001	1005	
OGDHL_T	<i>Tetraodon</i>	GSTENP00016462001	1054	
OGDHb_M	Medaka	ENSORLP00000001203	1039	
OGDHa_M	Medaka	ENSORLP00000021894	949	
OGDHL_M	Medaka			
OGDHb_G	<i>Gasterosteus</i>	ENSGACP00000000295	989	
OGDHa_G	<i>Gasterosteus</i>	ENSGACP00000001427	1017	
OGDHL_G	<i>Gasterosteus</i>	ENSGACP00000010888	1010	
OGDH_Z	Zebrafish	ENSODARP00000009474	1020	
OGDHx1_Z	Zebrafish	ENSODARESTP00000010149	509	Program WISE2 was applied
OGDHx2_Z	Zebrafish	ENSODARESTP00000010682	1019	Program WISE2 was applied
OGDH_X	<i>Xenopus</i>	ENSXETP00000041195	1021	
OGDHL_X	<i>Xenopus</i>	ENSXETP00000012378	1018	
OGDH_C	Chicken	ENSGALP00000028857	635	Program WISE2 was applied

Supplementary file 1 (continued).

Gene name	Species	Ensembl ID	Length (aa)	Notes
OGDHL_C	Chicken	ENSGALP00000003546	1014	
OGDH1_Ci	<i>Ciona</i>	ENSCINP00000012074	1010	
OGDH2_Ci	<i>Ciona</i>	ENSCINP00000012122	694	partial
CG33791_D	<i>Drosophila</i>	CG33791-PB	1282	
CG11661_D	<i>Drosophila</i>	CG11661-PF	1017	

EC 1.8.1.4 (DLD, dihydrolipoamide dehydrogenase)

DLD_H	Human	ENSP00000205402	509	
DLD_T	<i>Tetraodon</i>	GSTENP00007788001	470	
DLD_M	Medaka	ENSORLP00000000566	397	partial
DLD_G	<i>Gasterosteus</i>	ENSGACP00000010969	508	
DLD_X	<i>Xenopus</i>	ENSXETP00000026823	496	
DLD_C	Chicken	ENSGALP00000012869	508	
DLD_Z	Zebrafish	ENSDARP00000017217	507	
DLD1_Ci	<i>Ciona</i>	ENSCINP00000016324	503	
DLD2_Ci	<i>Ciona</i>	ENSCINP00000027133	503	
CG7430_D	<i>Drosophila</i>	CG7430-PA	504	

EC 2.3.1.61 (DLST, dihydrolipoamide S-succinyltransferase, E2 component of 2-oxo-glutarate complex)

DLST_H	Human	ENSP00000335304	453	
DLST_1_T	<i>Tetraodon</i>	GSTENP00032331001	461	
DLST_2_T	<i>Tetraodon</i>	GSTENP00032333001	417	
DLST_M	Medaka	ENSORLP00000020806	465	
DLST_1_G	<i>Gasterosteus</i>	ENSGACP00000009989	460	
DLST_2_G	<i>Gasterosteus</i>	ENSGACP00000013932	450	
DLST_X	<i>Xenopus</i>	ENSXETP00000029054	453	
DLST_C	Chicken	ENSGALP00000016718	461	
DLST_Z	Zebrafish	ENSDARP00000006973	458	
DLST_Ci	<i>Ciona</i>	ENSCINP00000014023	449	
DLST_D	<i>Drosophila</i>	CG5214-PA	468	