

**Supplementary material:** GenBank, JGI, ENSEMBL accession numbers of the amino acid sequences used for the phylogenetic analyses.

Hexokinase (HK)		Phosphoglucose isomerase (PGI)		Phosphofructokinase (PFK)	
<i>Homo sapiens</i>	P19367, P52789, P52790, P35557	<i>Homo sapiens</i>	AAH04982	<i>Homo sapiens</i>	P16118, O60825, Q16877, Q01813
<i>Mus musculus</i>	P17710, O08528, XP_127381, P52792	<i>Mus musculus</i>	AAH88995	<i>Mus musculus</i>	AAH57594, Q7TS91, P70265, XP_284750
<i>Gallus gallus</i>	NP_989432, NP_989543, AAM83106	<i>Gallus gallus</i>	NP_00100612	<i>Gallus gallus</i>	Q91348, XP_414257, XP_417979, XP_416472
<i>Rattus norvegicus</i>	P05708, P27881, P27926, P17712	<i>Rattus norvegicus</i>	AAH62005	<i>Rattus norvegicus</i>	P47858, Q9JJH5, P47860, P30835
<i>Xenopus laevis</i>	AAH72832, BQ734748, 2210326	<i>Xenopus laevis</i>	AAH73315	<i>Xenopus laevis</i>	AAH70579, AAH84893, AAH70776,
<i>Xenopus tropicalis</i>	ENSXETP00000018649, ENSXETP00000019458, ENSXETP00000041217, ENSXETP00000042536	<i>Xenopus tropicalis</i>	AAH90090	<i>Xenopus tropicalis</i>	ENSXETP00000037288, ENSXETP00000039305, ENSXETP00000020639, ENSXETP00000047683
<i>Danio rerio</i>	ENSDARP00000049485, ENSDARP00000024665	<i>Danio rerio</i>	CAC83782, AAH44450	<i>Danio rerio</i>	ENSDARP00000020245, ENSDARP00000036459, ENSDARP00000065761, ENSDARP00000020946
<i>Takifugu rubripes</i>	SINFRUP00000130243, SINFRUP00000175342, SINFRUP00000171538, SINFRUP00000132593, SINFRUP00000154946	<i>Mugil cephalus</i>	CAC83778, CAC83779	<i>Takifugu rubripes</i>	SINFRUP00000143959, SINFRUP00000154096, SINFRUP00000159206, SINFRUP00000162973, SINFRUP00000157362, SINFRUP00000166112, SINFRUP00000145680
<i>Tetraodon nigroviridis</i>	GSTENP00031116001, GSTENP00029591001, GSTENP00025793001, GSTENP00004899001, GSTENP00025792001	<i>Oncorhynchus mykiss</i>	BX083050, BX075627	<i>Tetraodon nigroviridis</i>	GSTENP00006196001, GSTENP00013641001, GSTENP00027279001, GSTENP00023398001, GSTENP00013249001, GSTENP00023654001, GSTENP00013249001
<i>C. elegans</i>	F14B4.2a.1	<i>Oryzias latipes</i>	sca751, sca4041	<i>C. elegans</i>	Q27483
<i>D. melanogaster</i>	CG3001	<i>Takifugu rubripes</i>	SINFRUP00000145974, SINFRUP00000159975	<i>D.melanogaster</i>	P52034
		<i>Tetraodon nigroviridis</i>	CAG01218, CAG14252	<i>Ciona intestinalis</i>	ENSCINP00000010042
		<i>C. elegans</i>	NP_493380.1		
		<i>D .melanogaster</i>	CG8251		

**Supplementary material:** GenBank, JGI, ENSEMBL accession numbers of the amino acid sequences used for the phylogenetic analyses.

Fructose-bisphosphate aldolase (FBA)		Triosephosphate isomerase (TPI)		Glyceraldehyde-3-phosphate dehydrogenase (GAPDH)	
<i>Homo sapiens</i>	AF054987, M11560, X02747	<i>Homo sapiens</i>	NM_000365	<i>Homo sapiens</i>	P04406, O14556
<i>Mus musculus</i>	BC008184, Y00516, BC036132	<i>Mus musculus</i>	NM_009415	<i>Mus musculus</i>	P00354
<i>Gallus gallus</i>	BX929868, M10946	<i>Gallus gallus</i>	NM_205451	<i>Gallus gallus</i>	NP_032111, P16858
<i>Rattus norvegicus</i>	M63656, M14420, M10149	<i>Rattus norvegicus</i>	NM_022922	<i>Rattus norvegicus</i>	NP_989636
<i>Xenopus laevis</i>	AAB31152, BAA19524, AAH44676	<i>Xenopus laevis</i>	BC046864	<i>Rattus norvegicus</i>	NP_076454, NP_058704
<i>Xenopus tropicalis</i>	AAH67946, AAH74643, AAH61442	<i>Xenopus tropicalis</i>	ENSXETP00000043527	<i>Danio rerio</i>	ENSDARP00000049709, ENSDARP00000009462
<i>Acipenser baerii</i>	AB111405, AB111404, AB111403, DQ497981	<i>Danio rerio</i>	AF387820, AF387819	<i>Takifugu rubripes</i>	SINFRUP00000156120, SINFRUP00000142721
<i>Cephaloscyllium umbrat.</i>	BAD17931, BAD17932, BAD17933	<i>Oryzias latipes</i>	AB183488, AB111387	<i>Tetraodon nigroviridis</i>	GSTENP00035345001, GSTENP00015338001
<i>Danio rerio</i>	BC053192, AY394966, AY394965, XP_707430, XP_690284	<i>Takifugu rubripes</i>	AL834781	<i>Crassostrea gigasgi</i>	CAD67717
<i>Lethen. camtschaticum</i>	D38620, D38619	<i>Tetraodon nigroviridis</i>	CAA1007830, GSTENP00005289001	<i>Schistosoma mansoni</i>	P20287
<i>Polypterus ornatipinnis</i>	BAD17924, BAD17925, BAD17926, DQ497983	<i>Xiphophorus maculatus</i>	AAK85205, AAK85204	<i>C. elegans</i>	K10B3.7.1, T09F3.3.1
<i>Potamotrygon motoro</i>	BAD17938, BAD17939, BAD17940	<i>C. elegans</i>	NM_064162	<i>D. melanogaster</i>	CG8893, P07486
<i>Takifugu rubripes</i>	SINFRUP00000154393, SINFRUP00000144527, SINFRUP00000136751	<i>D. melanogaster</i>	NM_176589	<i>Ciona intestinalis</i>	ENSCINP00000005672
<i>Tetraodon nigroviridis</i>	CAG0049, CAG0759, CAG0627, CAG0895	<i>Ciona intestinalis</i>	ENSCINP00000013486		
<i>Typhlonectes natans</i>	DQ497982				
<i>C. elegans</i>	NP_741281				
<i>D. melanogaster</i>	AAS65220				
<i>Ciona intestinalis</i>	Scf235				

**Supplementary material:** GenBank, JGI, ENSEMBL accession numbers of the amino acid sequences used for the phylogenetic analyses.

Phosphoglycerate kinase (PGK)		Phosphoglycerate mutase (PGAM)		Enolase (ENO)	
<i>Homo sapiens</i>	Q8NI87, NP_620061	<i>Homo sapiens</i>	NP_002620, NP_000281, AAA51840	<i>Homo sapiens</i>	P06733, P09104, P13929
<i>Mus musculus</i>	P09411, AAH61054	<i>Mus musculus</i>	NP_075907, NP_061358 BAC31541	<i>Mus musculus</i>	P21550, P17182, P17183
<i>Gallus gallus</i>	P51903	<i>Gallus gallus</i>	CAG31362, CAG32689	<i>Gallus gallus</i>	P51913, P07322, P51913
<i>Rattus norvegicus</i>	AAH6316, XP_576525	<i>Rattus norvegicus</i>	NP_445742, NP_059024 AAH62240	<i>Rattus norvegicus</i>	P04764, P07323, P15429
<i>Equus caballus</i>	P00559 Q8MIF	<i>Xenopus laevis</i>	AAH70630, AAH82455 AAH73185	<i>Xenopus laevis</i>	AAH45082, CAA68706
<i>Sus scrofa</i>	Q7SIB7	<i>Xenopus tropicalis</i>	NP_001004858, AAH74692, AAH67978	<i>Xenopus tropicalis</i>	AAH96516, AAH61287
<i>Bos taurus</i>	XP_581328	<i>Danio rerio</i>	ENSDART00000016350, ENSDART00000008287, NP_957318, NP_001002630	<i>Acipenser baerii</i>	DQ497984, DQ497987
<i>Macropus eugenii</i>	P29408			<i>Danio rerio</i>	AAH59434, AAM88901, AAH72713, AAQ97775
<i>Xenopus laevis</i>	AAH43781			<i>Eptatretus burgeri</i>	BAA88479
<i>Xenopus tropicalis</i>	CR760747	<i>Takifugu rubripes</i>	SINFRUP00000143399, SINFRUP00000144165, SINFRUP00000168929, SINFRUP00000139469	<i>Lethenteron reissneri</i>	BAA88483, BAA88482
<i>Rana sylvatica</i>	Q9DG72			<i>Polypterus senegalus</i>	DQ497985, DQ497988
<i>Danio rerio</i>	AAH65888	<i>Tetraodon nigroviridis</i>	GSTENP00029715001, GSTENP00016506001, GSTENP00026289001, GSTENP00011651001	<i>Takifugu rubripes</i>	SINFRUP00000150208, SINFRUP00000131536, SINFRUP00000156170, SINFRUP00000169571
<i>Oryzias latipes</i>	BAD17900			<i>Tetraodon nigroviridis</i>	CAF8980, CAF9382, CAG0691, CAF9063
<i>Takifugu rubripes</i>	SINFRUP00000160355	<i>C. elegans</i>	NP_492409	<i>Typhlonectes natans</i>	DQ497986, DQ497989
<i>Tetraodon nigroviridis</i>	GSTENP00014631001	<i>D. melanogaster</i>	NP_524546	<i>C. elegans</i>	NP_001022349
<i>Lepisosteus osseus</i>	BAD17907	<i>Ciona intestinalis</i>	ENSCINP00000016603	<i>D. melanogaster</i>	EAL33991
<i>Acipenser baerii</i>	BAD17922			<i>Ciona intestinalis</i>	ENSCINP00000015064
<i>Ciona intestinalis</i>	ENSCINP00000004571				
<i>C. elegans</i>	NP_491245				
<i>D. melanogaster</i>	CG3127				

**Supplementary material:** GenBank, JGI, ENSEMBL accession numbers of the amino acid sequences used for the phylogenetic analyses.

---

<b>Pyruvate kinase (PK)</b>	
<i>Homo sapiens</i>	NP_000289, NP_872270
<i>Mus musculus</i>	ENSMUSP00000034834, ENSMUSP00000035417
<i>Gallus gallus</i>	P00548
<i>Rattus norvegicus</i>	ENSRNOP00000015398, ENSRNOP00000027700
<i>Xenopus laevis</i>	Q92122, AAH60485
<i>Xenopus tropicalis</i>	ENSXETP00000011367, ENSXETP00000028820
<i>Danio rerio</i>	ENSDARP00000006300, ENSDARP00000017190, ENSDARP000000061565
<i>Takifugu rubripes</i>	SINFRUP00000128238, SINFRUP00000129186, SINFRUP00000141035
<i>Tetraodon nigroviridis</i>	GSTENP00012066001, GSTENP00015375001, GSTENP00025632001
<i>C. elegans</i>	NP_492458
<i>D. melanogaster</i>	O62619
<i>Ciona intestinalis</i>	ENSCINP00000008552

---