

Supplementary Material

Table S1. Protein sequences employed for the multiple sequence alignments and/or phylogenetic analyses.

Short-chain dehydrogenase reductase		
Nickname	Organism scientific name	NIH-GenBank accession no.
acorn worm.7	<i>Saccoglossus kowalevskii</i>	XP_006817028.1
apis.7	<i>Apis mellifera</i>	XP_394428.1
bristle worm.7	<i>Capitella teleta</i>	ELT96525.1
canis.7	<i>Canis lupus familiaris</i>	XP_537465.3
ciona.7	<i>Ciona intestinalis</i>	XP_002123111
criter.7	<i>Cricetulus griseus</i>	XP_007618527.1
drosophila.7	<i>Drosophila melanogaster</i>	Q9Y140.1
gallus.7	<i>Gallus gallus</i>	XP_421423.2
homo.7	<i>Homo sapiens</i>	NP_057113.1
lancelet.7	<i>Branchiostoma belcheri</i>	XP_019640821.1
mus.7	<i>Mus musculus</i>	NP_079798.2
oyster.7	<i>Crassostrea gigas</i>	XP_011444744.1
rattus.7	<i>Rattus norvegicus</i>	NP_001258323.1
scallop.7	<i>Mizuhopecten yessoensis</i>	XP_021379944.1
sea cucumber.7	<i>Holothuria glaberrima</i>	MN124283
tilapia.7	<i>Oreochromis niloticus</i>	XP_019204754.1
urchin.7	<i>Strongylocentrotus purpuratus</i>	XP_790920.3
xenopus.7	<i>Xenopus laevis</i>	NP_001085784.2
Other aldehyde dehydrogenases/reductases from the <i>Strongylocentrotus purpuratus</i> genome		
Nickname	Gene	NIH-GenBank accession no.
urchin.1	SDR 1	XP_797581.2
urchin.4	SDR 4	XP_001200926.2
urchin.11	SDR 11	XP_011679965.1
urchin.12	SDR 12	XP_793972.3
urchin.42E	SDR 42E1	XP_011676811.1
urchin.rd7	retinol dehydrogenase 7	XP_786807.3
urchin.rd8	retinol dehydrogenase 8	XP_011671426
urchin.rd11	retinol dehydrogenase 11	XP_011661792.1
urchin.rd12	retinol dehydrogenase 12	XP_790111.3
urchin.Xc	SDR chromosome X	XP_011682059.1

Aldehyde dehydrogenase family 8A1

Nickname	Organism scientific name	NIH-GenBank accession no.
canis.8	<i>Canis lupus familiaris</i>	XP_533415.2
gallus.8	<i>Gallus gallus</i>	XP_419732.1
hamster.8	<i>Cricetulus griseus</i>	XP_016835510.1
homo.8	<i>Homo sapiens</i>	NP_072090.1
horseshoe crab.8	<i>Limulus polyphemus</i>	XP_0222564211
hydra.8	<i>Hydra vulgaris</i>	XP_004206718.1
lancelet.8	<i>Branchiostoma belcheri</i>	XP_019632799.1
mite bee.8	<i>Varroa destructor</i>	XP_022663935.2
mus.8	<i>Mus musculus</i>	NP_848828.1
oyster.8	<i>Crassostrea gigas</i>	XP_011454749.1
rattus.8	<i>Rattus norvegicus</i>	NP_001178017.2
sea cucumber.8	<i>Holothuria glaberrima</i>	MN124284
sea squirt.8	<i>Ciona intestinalis</i>	XP_002126639.1
sea slug.8	<i>Aplysia californica</i>	XP_005105733.1
spider.8	<i>Parasteatoda tepidariorum</i>	XP_015920063.1
starfish.8	<i>Acanthaster planci</i>	XP_022088838
tilapia.8	<i>Oreochromis niloticus</i>	XP_003440690.1
urchin.8	<i>Strongylocentrotus purpuratus</i>	XP_011673512.1
urochord.8	<i>Oikopleura dioica</i>	ANP24208.1
xenopus.8	<i>Xenopus tropicalis</i>	XP_002935852.1

Other aldehyde dehydrogenases from the *Mus musculus* and *Strongylocentrotus purpuratus* genomes

Nickname	Gene	NIH-GenBank accession no.
mus.R1	retinal dehydrogenase 1	NP_038495.2
mus.R2	retinal dehydrogenase 2	NP_033048.2
mus.R3	retinal dehydrogenase 3	AAF86980 .1
urchin.9A1	ALDH 9A1	XP_011676578.1
urchin.16A1	ALDH 16A1	XP_797815.1
urchin.fatty	fatty aldehyde dehydrogenase	XP_011678668.1
	aldehyde dehydrogenase	
urchin.mit	mitochondrial	XP_011675858.1
urchin.NADP	aldehyde dehydrogenase NADP	XP_011679535 .1
urchin.rd12	retinol dehydrogenase 12	XP_790111.3
urchin.Xc	SDR chromosome X	XP_011682059.1