

GEPHE SUMMARY

Inhibitor of DNA binding 3 (id3) (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase+Inhibitor+of+DNA+binding+3+(id3)+#gephebase-summary-title)	Gephebase Gene	GP00001676	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category+Physiology+#gephebase-summary-title)	Trait Category		
Lifespan (https://www.gephebase.org/search-criteria?/and+Trait=Lifespan+#gephebase-summary-title)	Trait		
Strain with a maximum lifespan of ~1 year	Trait State in Taxon A		
Strain from Zimbabwe with a maximum lifespan of 4-6 months	Trait State in Taxon B		
Taxon A	Ancestral State		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status+Intraspecific+#gephebase-summary-title)	Taxonomic Status		
	Taxon A		Taxon B
	Latin Name		Latin Name
Nothobranchius furzeri (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Nothobranchius+furzeri+#gephebase-summary-title)	Common Name	Nothobranchius furzeri (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Nothobranchius+furzeri+#gephebase-summary-title)	Common Name
turquoise killifish	Synonyms	turquoise killifish	Synonyms
turquoise killifish; Nothobranchius furzeri Jubb, 1971	Rank	turquoise killifish; Nothobranchius furzeri Jubb, 1971	Rank
species	Lineage	species	Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupeocephala; Euteleostomorpha; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percomorphaceae; Ovalentaria; Atherinomorphae; Cyprinodontiformes; Aplocheiloidei; Nothobranchiidae; Nothobranchius	Parent	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupeocephala; Euteleostomorpha; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percomorphaceae; Ovalentaria; Atherinomorphae; Cyprinodontiformes; Aplocheiloidei; Nothobranchiidae; Nothobranchius	Parent
Nothobranchius () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=28779)	NCBI Taxonomy ID	Nothobranchius () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=28779)	NCBI Taxonomy ID
105023 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=105023)	is Taxon A an Intraspecies?	105023 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=105023)	is Taxon B an Intraspecies?
Yes	Taxon A Description	Yes	Taxon B Description
Killifish MZM-0410 strain		Killifish GRZ strain from Zimbabwe	

GENOTYPIC CHANGE

ID3	Generic Gene Name	Q02535 (http://www.uniprot.org/uniprot/Q02535)	UniProtKB Homo sapiens
HEIR-1; bHLHb25; 1R21; BHLHB25; HEIR1	Synonyms		GenebankID or UniProtKB
9606.ENSP00000363689 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=9606.ENSP00000363689)	String	()	
-	Sequence Similarities		
	GO - Molecular Function		
GO:0046983 : protein dimerization activity (https://www.ebi.ac.uk/QuickGO/term/GO:0046983)			
GO:0003700 : DNA-binding transcription factor activity			

(<https://www.ebi.ac.uk/QuickGO/term/GO:0003700>)
GO:0008134 : transcription factor binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0008134>)
GO:0000981 : DNA-binding transcription factor activity, RNA polymerase II-specific
(<https://www.ebi.ac.uk/QuickGO/term/GO:0000981>)
GO:0001085 : RNA polymerase II transcription factor binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0001085>)
GO:0003714 : transcription corepressor activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0003714>)
GO:0019904 : protein domain specific binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0019904>)
GO:1901707 : leptomycin B binding (<https://www.ebi.ac.uk/QuickGO/term/GO:1901707>)
GO - Biological Process

GO:0007275 : multicellular organism development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007275>)
GO:0007417 : central nervous system development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007417>)
GO:0030182 : neuron differentiation (<https://www.ebi.ac.uk/QuickGO/term/GO:0030182>)
GO:0007507 : heart development (<https://www.ebi.ac.uk/QuickGO/term/GO:0007507>)
GO:0000122 : negative regulation of transcription by RNA polymerase II
(<https://www.ebi.ac.uk/QuickGO/term/GO:0000122>)
GO:0045892 : negative regulation of transcription, DNA-templated
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045892>)
GO:0006351 : transcription, DNA-templated
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006351>)
GO:0030903 : notochord development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0030903>)
GO:0007623 : circadian rhythm (<https://www.ebi.ac.uk/QuickGO/term/GO:0007623>)
GO:0009611 : response to wounding (<https://www.ebi.ac.uk/QuickGO/term/GO:0009611>)
GO:0043433 : negative regulation of DNA-binding transcription factor activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043433>)
GO:0045665 : negative regulation of neuron differentiation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045665>)
GO:0030855 : epithelial cell differentiation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0030855>)
GO:0042476 : odontogenesis (<https://www.ebi.ac.uk/QuickGO/term/GO:0042476>)
GO:0043065 : positive regulation of apoptotic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043065>)
GO:0051726 : regulation of cell cycle (<https://www.ebi.ac.uk/QuickGO/term/GO:0051726>)
GO:0043392 : negative regulation of DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043392>)
GO:0007517 : muscle organ development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007517>)
GO:0045662 : negative regulation of myoblast differentiation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045662>)
GO:0045668 : negative regulation of osteoblast differentiation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045668>)
GO:0006275 : regulation of DNA replication
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006275>)
GO:0072750 : cellular response to leptomycin B
(<https://www.ebi.ac.uk/QuickGO/term/GO:0072750>)
GO:0001656 : metanephros development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0001656>)

GO - Cellular Component

GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)
GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

Unknown (<https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#gephebase-summary-title>)

Presumptive Null

Molecular Type

Unknown (<https://www.gephebase.org/search-criteria?/and+Molecular Type=^Unknown^#gephebase-summary-title>)

Aberration Type

Unknown (<https://www.gephebase.org/search-criteria?/and+Aberration Type=^Unknown^#gephebase-summary-title>)

Molecular Details of the Mutation

Signature of selection for id3. upregulated during aging in brain and skin. A radical substitution of a non-polar by a charged aa (A>Q) followed by a 2-aa deletion in the C-terminus

Experimental Evidence

Association Mapping (<https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Association Mapping^#gephebase-summary-title>)

Main Reference

Insights into Sex Chromosome Evolution and Aging from the Genome of a Short-Lived Fish. (2015) (<https://pubmed.ncbi.nlm.nih.gov/26638077>)

Authors

Reichwald K; Petzold A; Koch P; Downie BR; Hartmann N; Pietsch S; Baumgart M; Chalopin D; Felder M; Bens M; Sahn A; Szafranski K; Taudien S; Groth M; Arisi I; Weise A; Bhatt SS; Sharma V; Kraus JM; Schmid F; Priebe S; Liehr T; GÄrlach M; Than ME; Hiller M; Kestler HA; Volff JN; Schartl M; Cellerino A; Englert C; Platzer M

Abstract

The killifish *Nothobranchius furzeri* is the shortest-lived vertebrate that can be bred in the laboratory. Its rapid growth, early sexual maturation, fast aging, and arrested embryonic development (diapause) make it an attractive model organism in biomedical research. Here, we report a draft sequence of its genome that allowed us to uncover an intra-species Y chromosome polymorphism representing-in real time-different stages of sex chromosome formation that display features of early mammalian XY evolution "in action." Our data suggest that *gdf6Y*, encoding a TGF- β family growth factor, is the master sex-determining gene in *N. furzeri*. Moreover, we observed genomic clustering of aging-related genes, identified genes under positive selection, and revealed significant similarities of gene expression profiles between diapause and aging, particularly for genes controlling cell cycle and translation. The annotated genome sequence is provided as an online resource (<http://www.nothobranchius.info/NFINgb>).

RELATED GEPHE

1 (I Kappa B Kinase Interacting Protein (IKBIP)) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=^105023^/and+Trait=Lifespan/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=^105023^/and+Trait=Lifespan/and+groupHaplotypes=true#gephebase-summary-title))

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS

Link with phenotype unclear.