

GEPHE SUMMARY

sdY (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~sdY~#gephebase-summary-title)	Gephebase Gene	GP00001033	GepheID
	Entry Status	Martin	Main curator
	Published		

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Physiology~#gephebase-summary-title)		Trait Category	
Sex determination (https://www.gephebase.org/search-criteria?/and+Trait=~Sexdetermination~#gephebase-summary-title)		Trait	
Oncorhynchus mykiss		Trait State in Taxon A	
other fishes		Trait State in Taxon B	
Data not curated		Ancestral State	
Interspecific (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Interspecific~#gephebase-summary-title)		Taxonomic Status	
Taxon A		Taxon B	
Oncorhynchus mykiss (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Oncorhynchusmykiss~#gephebase-summary-title)		Teleostei (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Teleostei~#gephebase-summary-title)	Latin Name
rainbow trout		teleost fishes	Common Name
Oncorhynchus nerka mykiss; Parasalmo mykiss; Salmo mykiss; rainbow trout; Oncorhynchus mykiss (Walbaum, 1792); Salmo mykiss Walbaum, 1792; Onchorhynchus mykiss		teleost fishes	Synonyms
species		infraclass	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupeocephala; Euteleosteomorpha; Protacanthopterygii; Salmoniformes; Salmonidae; Salmoninae; Oncorhynchus		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii	Lineage
Oncorhynchus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8016)		Neopterygii () - (Rank: subclass) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 41665)	Parent
8022 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8022)		32443 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32443)	NCBI Taxonomy ID
No		No	is Taxon B an Intraspecies?
			is Taxon A an Intraspecies?

GENOTYPIC CHANGE

sdY	Generic Gene Name	UniProtKB Oncorhynchus mykiss
sdY	Synonyms	GenebankID or UniProtKB
-	String	
-	Sequence Similarities	
-	GO - Molecular Function	
GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)		
GO:0044212 : transcription regulatory region DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0044212)		
-	GO - Biological Process	
-	GO - Cellular Component	

-	Presumptive Null
Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Unknown^#gephebase-summary-title)	
	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
Novel gene evolution by modification of the irf9 gene; unrelated to sex determination	
	Experimental Evidence
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping^#gephebase-summary-title)	
	Main Reference
An immune-related gene evolved into the master sex-determining gene in rainbow trout, <i>Oncorhynchus mykiss</i> . (2012) (https://pubmed.ncbi.nlm.nih.gov/22727696)	
	Authors
Yano A; Guyomard R; Nicol B; Jouanno E; Quillet E; Klopp C; Cabau C; Bouchez O; Fostier A; Guiguen Y	
	Abstract
Since the discovery of Sry in mammals [1, 2], few other master sex-determining genes have been identified in vertebrates [3-7]. To date, all of these genes have been characterized as well-known factors in the sex differentiation pathway, suggesting that the same subset of genes have been repeatedly and independently selected throughout evolution as master sex determinants [8, 9]. Here, we characterized in rainbow trout an unknown gene expressed only in the testis, with a predominant expression during testicular differentiation. This gene is a male-specific genomic sequence that is colocalized along with the sex-determining locus. This gene, named sdY for sexually dimorphic on the Y chromosome, encodes a protein that displays similarity to the C-terminal domain of interferon regulatory factor 9. The targeted inactivation of sdY in males using zinc-finger nuclease induces ovarian differentiation, and the overexpression of sdY in females using additive transgenesis induces testicular differentiation. Together, these results demonstrate that sdY is a novel vertebrate master sex-determining gene not related to any known sex-differentiating gene. These findings highlight an unexpected evolutionary plasticity in vertebrate sex determination through the demonstration that master sex determinants can arise from the de novo evolution of genes that have not been previously implicated in sex differentiation.	
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	Additional References

RELATED GEPHE

	Related Genes
No matches found.	
	Related Haplotypes
No matches found.	

EXTERNAL LINKS

COMMENTS