

GEPHE SUMMARY

gfzf (https://www.gephebase.org/search-criteria/?and+Gene Gephebase=^gfzf^#gephebase-summary-title)	Gephebase Gene	GP00000392	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

	Trait Category
Physiology (https://www.gephebase.org/search-criteria/?and+Trait Category=^Physiology^#gephebase-summary-title)	Trait
Hybrid incompatibility (F1 male lethality) (https://www.gephebase.org/search-criteria/?and+Trait=^Hybrid+incompatibility+(F1+male+lethality)^#gephebase-summary-title)	Trait State in Taxon A
Drosophila melanogaster	Trait State in Taxon B
Drosophila simulans	Ancestral State
Data not curated	Taxonomic Status
Interspecific (https://www.gephebase.org/search-criteria/?and+Taxonomic Status=^Interspecific^#gephebase-summary-title)	

Taxon A	Latin Name	Taxon B	Latin Name
Drosophila melanogaster (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title)	Common Name	Drosophila simulans (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Drosophila+simulans^#gephebase-summary-title)	Common Name
fruit fly	Synonyms	-	Synonyms
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster	Rank	species	Rank
species	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Acalyptratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup	Lineage
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)	Parent	melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)	NCBI Taxonomy ID
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)	NCBI Taxonomy ID	7240 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7240)	is Taxon B an Infraspecies?
No	is Taxon A an Infraspecies?	No	

GENOTYPIC CHANGE

Generic Gene Name	UniProtKB Drosophila melanogaster
gfzf	Q6NP69 (http://www.uniprot.org/uniprot/Q6NP69)
Synonyms	GenebankID or UniProtKB
cg10065; CG10065; CG31329; CG31492; CG33546; dGFZF; Dmel\CG33546; GFZF; l(3)84Cc; Su(Kpn); Dmel_CG33546	0
String	
7227.FBpp0290855 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0290855)	
Sequence Similarities	
Belongs to the GST superfamily.	
GO - Molecular Function	
GO:0003676 : nucleic acid binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003676)	
GO:0043295 : glutathione binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043295)	
GO:0004364 : glutathione transferase activity	

GO:0006749 : glutathione metabolic process

(<https://www.ebi.ac.uk/QuickGO/term/GO:0006749>)

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

Presumptive Null

Unknown ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=%5EUnknown%5E%23gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive%20Null=%5EUnknown%5E%23gephebase-summary-title))

Molecular Type

Unknown ([https://www.gephebase.org/search-criteria?/and+Molecular Type=%5EUnknown%5E%23gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular%20Type=%5EUnknown%5E%23gephebase-summary-title))

Aberration Type

Unknown ([https://www.gephebase.org/search-criteria?/and+Aberration Type=%5EUnknown%5E%23gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration%20Type=%5EUnknown%5E%23gephebase-summary-title))

Molecular Details of the Mutation

unknown

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%5ELinkage Mapping%5E%23gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental%20Evidence=%5ELinkage%20Mapping%5E%23gephebase-summary-title))

Main Reference

An essential cell cycle regulation gene causes hybrid inviability in Drosophila. (2015) (<https://pubmed.ncbi.nlm.nih.gov/26680200>)

Authors

Phadnis N; Baker EP; Cooper JC; Frizzell KA; Hsieh E; de la Cruz AF; Shendure J; Kitzman JO; Malik HS

Abstract

Speciation, the process by which new biological species arise, involves the evolution of reproductive barriers, such as hybrid sterility or inviability between populations. However, identifying hybrid incompatibility genes remains a key obstacle in understanding the molecular basis of reproductive isolation. We devised a genomic screen, which identified a cell cycle-regulation gene as the cause of male inviability in hybrids resulting from a cross between *Drosophila melanogaster* and *D. simulans*. Ablation of the *D. simulans* allele of this gene is sufficient to rescue the adult viability of hybrid males. This dominantly acting cell cycle regulator causes mitotic arrest and, thereby, inviability of male hybrid larvae. Our genomic method provides a facile means to accelerate the identification of hybrid incompatibility genes in other model and nonmodel systems.

Copyright © 2015, American Association for the Advancement of Science.

Additional References

RELATED GEPHE

Related Genes

6 (Hybrid male rescue, JYalpha, Lethal Hybrid rescue, Nup160, Nup96, tyrosyl-tRNA synthetase (mt-TyrRS)) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=%5E7227%5E%23Trait=Hybrid incompatibility/or+Taxon ID=%5E7240%5E%23Trait=Hybrid incompatibility/groupHaplotypes=true%23gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+TaxonID=%5E7227%5E%23Trait=Hybrid%20incompatibility/or+TaxonID=%5E7240%5E%23Trait=Hybrid%20incompatibility/groupHaplotypes=true%23gephebase-summary-title))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

Loss-of-function of gfzf sufficient to rescue hybrid viability