

GEPHE SUMMARY

SOD1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=SOD1#gephebase-summary-title)	Gephebase Gene	GP00001985	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		
Xenobiotic resistance (paraquat) (https://www.gephebase.org/search-criteria?/and+Trait=Xenobiotic+resistance+(paraquat)#gephebase-summary-title)	Trait		
Drosophila melanogaster	Trait State in Taxon A		
Drosophila melanogaster - hypersensitive to paraquat - CA1 allele	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
Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Drosophila+melanogaster#gephebase-summary-title)	Latin Name	Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Drosophila+melanogaster#gephebase-summary-title)	Latin Name
fruit fly	Common Name	fruit fly	Common Name
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster	Synonyms	Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster	Synonyms
species	Rank	species	Rank
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	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)	Parent
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)	NCBI Taxonomy ID	7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

Sod1	Generic Gene Name	P61851 (http://www.uniprot.org/uniprot/P61851)	UniProtKB Drosophila melanogaster
Cu; 24492; CG11793; cSod; cSOD; Cu-Zn SOD; Cu/Zn sod; Cu/Zn SOD; Cu/Zn superoxide dismutase; Cu/ZnSOD; CuSOD; CuZn SOD; CuZn-SOD; CuZn-SOD1; CuZnSOD; Cu[2+]/Zn[2+]SOD; Dmel\CG11793; dsod; dSOD1; G; I(3)108; I(3)68AF; I(3)G; Mn SOD; sod; Sod; SOD; Sod-1; SOD-1; sod1; SOD1; SODC_DROME; To; To-1; Zn Sod; Zn SOD; Zn-SOD; ZnSod	Synonyms	()	GenebankID or UniProtKB
7227.FBpp0305736 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0305736)	String		
Belongs to the Cu-Zn superoxide dismutase family.	Sequence Similarities		
	GO - Molecular Function		

GO:0042803 : protein homodimerization activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0042803>)
GO:0016209 : antioxidant activity (<https://www.ebi.ac.uk/QuickGO/term/GO:0016209>)
GO:0005507 : copper ion binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0005507>)
GO:0004784 : superoxide dismutase activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0004784>)

GO - Biological Process

GO:0008340 : determination of adult lifespan
(<https://www.ebi.ac.uk/QuickGO/term/GO:0008340>)
GO:0007568 : aging (<https://www.ebi.ac.uk/QuickGO/term/GO:0007568>)
GO:0006979 : response to oxidative stress
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006979>)
GO:0019430 : removal of superoxide radicals
(<https://www.ebi.ac.uk/QuickGO/term/GO:0019430>)
GO:0001306 : age-dependent response to oxidative stress
(<https://www.ebi.ac.uk/QuickGO/term/GO:0001306>)
GO:0048167 : regulation of synaptic plasticity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048167>)
GO:1903146 : regulation of autophagy of mitochondrion
(<https://www.ebi.ac.uk/QuickGO/term/GO:1903146>)
GO:2000331 : regulation of terminal button organization
(<https://www.ebi.ac.uk/QuickGO/term/GO:2000331>)

GO - Cellular Component

GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)
GO:0005829 : cytosol (<https://www.ebi.ac.uk/QuickGO/term/GO:0005829>)
GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)
GO:0005777 : peroxisome (<https://www.ebi.ac.uk/QuickGO/term/GO:0005777>)

Presumptive Null

No (<https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No^#gephebase-summary-title>)

Molecular Type

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

Aberration Type

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

Insertion Size

100-999 bp

Molecular Details of the Mutation

Insertion of a 0.68kb truncated P-element 47bp downstream of the transcription start site.

Experimental Evidence

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

Main Reference

Low-activity allele of copper-zinc superoxide dismutase (CuZnSOD) in *Drosophila* increases paraquat genotoxicity but does not affect near UV radiation damage. (2001)
(<https://pubmed.ncbi.nlm.nih.gov/11550893/>)

Authors

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Abstract

Different types of mutations and DNA-damage profiles induced by near-UV radiation and the superoxide anion (O₂⁻) indicate separate lesions and (or) mechanisms of mutagenesis. Despite a wealth of data, it is still unclear whether variations in the activity levels of antioxidant enzymes naturally present in suboptimal concentrations are among the underlying causes of the increase of near UV radiation genotoxicity. We incorporated a low-activity allele of copper-zinc superoxide dismutase (CuZnSOD), recovered from natural populations of *Drosophila melanogaster*, into standard marked strains and employed a somatic mutation and recombination test (SMART) to compare paraquat and near UV radiation genotoxicity in these strains. Our results show that, although the low-activity CuZnSOD allele of *D. melanogaster* confers hypersensitivity to paraquat, the near UV radiation damage was not affected.

Additional References

RELATED GEPHE

Related Genes

19 (Acetylcholinesterase (Ace-2), alcohol dehydrogenase (Adh), Aldehyde dehydrogenase (Aldh), CG11699, Cyp12d1, Cyp28d1, Cyp28d1-Cyp28d2, cyp6d2, cyp6g1, glutamate-gated chloride channel (GluCl), GSS (glutathione synthetase), GSTE1-E10 cluster, kin of irre (kire), para (kdr), PHGPx, resistance to dieldrin, RnrS, Ugt86Dd, CHKov1)
(<https://www.gephebase.org/search-criteria?/or+Taxon ID=~7227^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@TE - <http://flybase.org/reports/FBa0282693>

