

PHGPx (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~PHGPx^#gephebase-summary-title)	Gephebase Gene	GP00001405	GepheID
Published	Entry Status	Prigent	Main curator

Physiology (<a +physiology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Physiology+"#gephebase-summary-title)		Trait Category
Xenobiotic resistance (gemcitabine ; female fertility) (<a +xenobiotic+resistance+(gemcitabine+;+female+fertility)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Xenobiotic resistance (gemcitabine ; female fertility)+"#gephebase-summary-title)		Trait
Drosophila melanogaster more sensitive to gemcitabine		Trait State in Taxon A
Drosophila melanogaster less sensitive to gemcitabine		Trait State in Taxon B
Unknown		Ancestral State
Intraspecific (<a +intraspecific+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intraspecific+"#gephebase-summary-title)		Taxonomic Status
Taxon A		Taxon B
Drosophila melanogaster (<a +drosophila+melanogaster+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Drosophila melanogaster+"#gephebase-summary-title)		Drosophila melanogaster (<a +drosophila+melanogaster+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Drosophila melanogaster+"#gephebase-summary-title)
fruit fly		fruit fly
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster		Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster
species		species
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		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
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)		melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)		7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)
is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No

PHGPx	Generic Gene Name	UniProtKB Drosophila melanogaster
	Synonyms	Q8IRD4 (http://www.uniprot.org/uniprot/Q8IRD4)
anon-WO0257455.17; CG12013; Dmel\CG12013; DmGPx; DmPHGPx; Gpx; GPx; GTPx; Gtpx-1; GTPx-1; PGTPx; phGpx; Tpx1; Dmel_CG12013		38413 (https://www.ncbi.nlm.nih.gov/nucore/38413)
	String	
-		
	Sequence Similarities	
Belongs to the glutathione peroxidase family.		
	GO - Molecular Function	
GO:0004601 : peroxidase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004601)		
GO:0004602 : glutathione peroxidase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004602)		
	GO - Biological Process	

GO:0006979 : response to oxidative stress
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006979>)
GO:0006982 : response to lipid hydroperoxide
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006982>)

GO - Cellular Component

GO:0016021 : integral component of membrane
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)
GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)
GO:0005794 : Golgi apparatus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005794>)
GO:0005739 : mitochondrion (<https://www.ebi.ac.uk/QuickGO/term/GO:0005739>)
GO:0012505 : endomembrane system
(<https://www.ebi.ac.uk/QuickGO/term/GO:0012505>)

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

unknown

Experimental Evidence

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

Main Reference

Using Drosophila melanogaster to identify chemotherapy toxicity genes. (2014) (<https://pubmed.ncbi.nlm.nih.gov/25236447>)

Authors

King EG; Kislukhin G; Walters KN; Long AD

Abstract

The severity of the toxic side effects of chemotherapy shows a great deal of interindividual variability, and much of this variation is likely genetically based. Simple DNA tests predictive of toxic side effects could revolutionize the way chemotherapy is carried out. Due to the challenges in identifying polymorphisms that affect toxicity in humans, we use Drosophila fecundity following oral exposure to carboplatin, gemcitabine and mitomycin C as a model system to identify naturally occurring DNA variants predictive of toxicity. We use the Drosophila Synthetic Population Resource (DSPR), a panel of recombinant inbred lines derived from a multiparent advanced intercross, to map quantitative trait loci affecting chemotoxicity. We identify two QTL each for carboplatin and gemcitabine toxicity and none for mitomycin. One QTL is associated with fly orthologs of a priori human carboplatin candidate genes ABCC2 and MSH2, and a second QTL is associated with fly orthologs of human gemcitabine candidate genes RRM2 and RRM2B. The third, a carboplatin QTL, is associated with a posteriori human orthologs from solute carrier family 7A, INPP4A&B, and NALCN. The fourth, a gemcitabine QTL that also affects methotrexate toxicity, is associated with human ortholog GPx4. Mapped QTL each explain a significant fraction of variation in toxicity, yet individual SNPs and transposable elements in the candidate gene regions fail to singly explain QTL peaks. Furthermore, estimates of founder haplotype effects are consistent with genes harboring several segregating functional alleles. We find little evidence for nonsynonymous SNPs explaining mapped QTL; thus it seems likely that standing variation in toxicity is due to regulatory alleles.

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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), resistance to dieldrin, RnrS, SOD1, 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