

## GEPHE SUMMARY

	Gephebase Gene		GepheID
srg-36/37 ( <a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~srg-36/37^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~srg-36/37^#gephebase-summary-title</a> )		GP00001076	
	Entry Status	Martin	Main curator
Published			

## PHENOTYPIC CHANGE

	Trait Category		
Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology^#gephebase-summary-title</a> )			
	Trait		
Diapause (resistance to dauer-inducing pheromone) ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=~Diapause+(resistance+to+dauer-inducing+pheromone)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=~Diapause+(resistance+to+dauer-inducing+pheromone)^#gephebase-summary-title</a> )			
	Trait State in Taxon A		
C. elegans - N2			
	Trait State in Taxon B		
C. elegans LSJ2			
	Ancestral State		
Data not curated			
	Taxonomic Status		
Domesticated ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated^#gephebase-summary-title</a> )			
Taxon A		Taxon B	
	Latin Name		Latin Name
Caenorhabditis elegans ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Caenorhabditis+elegans^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Caenorhabditis+elegans^#gephebase-summary-title</a> )		Caenorhabditis elegans ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Caenorhabditis+elegans^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Caenorhabditis+elegans^#gephebase-summary-title</a> )	
	Common Name		Common Name
-		-	
	Synonyms		Synonyms
roundworm; Rhabditis elegans; Caenorhabditis elegans (Maupas, 1900); Rhabditis elegans Maupas, 1900		roundworm; Rhabditis elegans; Caenorhabditis elegans (Maupas, 1900); Rhabditis elegans Maupas, 1900	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis	
	Parent		Parent
Caenorhabditis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6237">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6237</a> )		Caenorhabditis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6237">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6237</a> )	
6239 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6239">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6239</a> )	NCBI Taxonomy ID	6239 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6239">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6239</a> )	NCBI Taxonomy ID
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes		Yes	
	Taxon A Description		Taxon B Description
C. elegans - N2		C. elegans LSJ2	

## GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Caenorhabditis elegans
srg-34		Q9XXQ5 ( <a href="http://www.uniprot.org/uniprot/Q9XXQ5">http://www.uniprot.org/uniprot/Q9XXQ5</a> )	
	Synonyms		GenebankID or UniProtKB
CELE_Y51A2D.12; Y51A2D.12		BX284605 ( <a href="https://www.ncbi.nlm.nih.gov/nucleotide/BX284605">https://www.ncbi.nlm.nih.gov/nucleotide/BX284605</a> )	
	String		
6239.Y51A2D.12 ( <a href="http://string-db.org/newstring.cgi/show_network_section.pl?identifier=6239.Y51A2D.12">http://string-db.org/newstring.cgi/show_network_section.pl?identifier=6239.Y51A2D.12</a> )			
	Sequence Similarities		
Belongs to the nematode receptor-like protein srg family.			
	GO - Molecular Function		
GO:0004888 : transmembrane signaling receptor activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0004888">https://www.ebi.ac.uk/QuickGO/term/GO:0004888</a> )			
	GO - Biological Process		
GO:0007606 : sensory perception of chemical stimulus ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0007606">https://www.ebi.ac.uk/QuickGO/term/GO:0007606</a> )			

GO:0016021 : integral component of membrane  
<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~Yes^#gephebase-summary-title))

Presumptive Null

Gene Loss ([https://www.gephebase.org/search-criteria?/and+Molecular Type=~Gene Loss^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Gene+Loss^#gephebase-summary-title))

Molecular Type

Deletion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=~Deletion^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Deletion^#gephebase-summary-title))

Aberration Type

100-999 bp

Deletion Size

4906bp deletion

Molecular Details of the Mutation

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=~Linkage+Mapping^#gephebase-summary-title))

Experimental Evidence

Parallel evolution of domesticated *Caenorhabditis* species targets pheromone receptor genes. (2011) (<https://pubmed.ncbi.nlm.nih.gov/21849976>)

Main Reference

McGrath PT; Xu Y; Ailion M; Garrison JL; Butcher RA; Bargmann CI

Authors

Evolution can follow predictable genetic trajectories, indicating that discrete environmental shifts can select for reproducible genetic changes. Conspecific individuals are an important feature of an animal's environment, and a potential source of selective pressures. Here we show that adaptation of two *Caenorhabditis* species to growth at high density, a feature common to domestic environments, occurs by reproducible genetic changes to pheromone receptor genes. Chemical communication through pheromones that accumulate during high-density growth causes young nematode larvae to enter the long-lived but non-reproductive dauer stage. Two strains of *Caenorhabditis elegans* grown at high density have independently acquired multigenic resistance to pheromone-induced dauer formation. In each strain, resistance to the pheromone ascaroside C3 results from a deletion that disrupts the adjacent chemoreceptor genes serpentine receptor class g (*srg*)-36 and -37. Through misexpression experiments, we show that these genes encode redundant G-protein-coupled receptors for ascaroside C3. Multigenic resistance to dauer formation has also arisen in high-density cultures of a different nematode species, *Caenorhabditis briggsae*, resulting in part from deletion of an *srg* gene paralogous to *srg*-36 and *srg*-37. These results demonstrate rapid remodelling of the chemoreceptor repertoire as an adaptation to specific environments, and indicate that parallel changes to a common genetic substrate can affect life-history traits across species.

Abstract

Additional References

## RELATED GEPHE

2 (*nurf-1, scd-2*) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=~6239^/and+Trait=Diapause/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=~6239^/and+Trait=Diapause/and+groupHaplotypes=true#gephebase-summary-title))

Related Genes

1 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~srg-36/37^/and+Taxon ID=~6239^/or+Gene Gephebase=~srg-36/37^/and+Taxon ID=~6239^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~srg-36/37^/and+Taxon+ID=~6239^/or+Gene+Gephebase=~srg-36/37^/and+Taxon+ID=~6239^#gephebase-summary-title))

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS

Cluster of paralogous genes