GEPHE SUMMARY

Gephebase Gene
tra-2 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^tra-2^#gephebase-summary-title)

GepheID
GP00001132

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)

Trait
Fertility (self-fertility; hermaphrodite spermatogenesis) (https://www.gephebase.org/search-criteria?/and+Trait=^Fertility (self-fertility; hermaphrodite spermatogenesis)^#gephebase-summary-title)

Trait State in Taxon A
Caenorhabditis briggsae

Trait State in Taxon B
Caenorhabditis elegans

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
Caenorhabditis briggsae (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Caenorhabditis briggsae^#gephebase-summary-title)

Common Name
-

Synonyms
Caenorhabditis briggsae Dougherty & Nigon, 1949

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis

Parent
Caenorhabditis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6237)

NCBI Taxonomy ID
6238 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6238)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Caenorhabditis elegans (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Caenorhabditis elegans^#gephebase-summary-title)

Common Name
-

Synonyms
roundworm; Rhabditis elegans; Caenorhabditis elegans (Maupas, 1900); Rhabditis elegans Maupas, 1900

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis

Parent
Caenorhabditis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6237)

NCBI Taxonomy ID
6239 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6239)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
tra-2

Synonyms
C15F1.3

String
6239.C15F1.3a (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 6239.C15F1.3a)

Sequence Similarities
-

GO - Molecular Function
GO:0004888 : transmembrane signaling receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004888)
GO:0038023 : signaling receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0038023)

GO - Biological Process
GO:0007530 : sex determination (https://www.ebi.ac.uk/QuickGO/term/GO:0007530)
GO:0030154 : cell differentiation (https://www.ebi.ac.uk/QuickGO/term/GO:0030154)

UniProtKB Caenorhabditis elegans
P34709 (http://www.uniprot.org/uniprot/P34709)

GenebankID or UniProtKB
AF491500 (https://www.ncbi.nlm.nih.gov/nuccore/AF491500)

GO:0007548 : sex differentiation (https://www.ebi.ac.uk/QuickGO/term/GO:0007548)
GO:0007283 : spermatogenesis (https://www.ebi.ac.uk/QuickGO/term/GO:0007283)
GO:0040021 : hermaphrodite germ-line sex determination
(https://www.ebi.ac.uk/QuickGO/term/GO:0040021)
GO:0042001 : hermaphrodite somatic sex determination
(https://www.ebi.ac.uk/QuickGO/term/GO:0042001)

GO - Cellular Component

GO:0016021 : integral component of membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0016021)
GO:0005886 : plasma membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005886)
GO:0005737 : cytoplasm (https://www.ebi.ac.uk/QuickGO/term/GO:0005737)
GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)
GO:0048471 : perinuclear region of cytoplasm
(https://www.ebi.ac.uk/QuickGO/term/GO:0048471)
GO:0044214 : spanning component of plasma membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0044214)

Presumptive Null

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

Molecular Type

Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Cis-regulatory^#gephebase-summary-title)

Aberration Type

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

Insertion Size

-

Molecular Details of the Mutation

Tandem duplication of GLD-1 binding sites in 3'UTR; see also fog-2 entry

Experimental Evidence

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

Main Reference

Interspecies comparison reveals evolution of control regions in the nematode sex-determining gene tra-2. (1996) (https://pubmed.ncbi.nlm.nih.gov/8889523)

Authors

Kuwabara PE

Abstract

The Caenorhabditis elegans sex-determining gene tra-2 promotes female development and expresses 4.7-, 1.9- and 1.8-kb mRNAs. The 4.7-kb mRNA encodes the major feminizing activity of the locus, a predicted membrane receptor that mediates cell-to-cell communication, named TRA-2A. The tra-2 gene was characterized from a close relative, C. briggsae. The Cb-tra-2 gene expresses only a 4.7-kb mRNA and alternatively spliced variants, which encode TRA-2A homologues. The Cb-TRA-2A and Ce-TRA-2A sequences are highly diverged, sharing only 43% identity, although their hydropathy profiles remain remarkably similar. Three potential regulatory sites of Ce-tra-2 activity were previously identified by analyzing tra-2(eg), tra-2(gf), and tra-2(mx) mutations. Two of these sites, the EG site and MX region, are conserved in Cb-tra-2. By contrast, the two direct repeat elements in the Ce-tra-2 3' untranslated region, which are disrupted in tra-2(gf) mutants, are absent. Injection of Cb-tra-2 antisense RNA into C.briggsae mimics the Ce-tra-2 loss-of-function phenotype. Thus, antisense RNA permits studies of gene activity in nematodes that lack extensive genetics.

Additional References

Regulatory elements required for development of caenorhabditis elegans hermaphrodites are conserved in the tra-2 homologue of C. remanei, a male/female sister species. (2000) (https://pubmed.ncbi.nlm.nih.gov/10790387)
Independent recruitments of a translational regulator in the evolution of self-fertile nematodes. (2011) (https://pubmed.ncbi.nlm.nih.gov/22106259)

RELATED GEPHE

Related Genes

1 (fog-2) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^6238^/and+Trait=Fertility/or+Taxon ID=^6239^/and+Trait=Fertility/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS