

Module 3: Genes and Sequences (NCBI)

i - How Do I Find Information About a Gene?

Aims

- Introduce Entrez Gene and other gene-related resources
- Suggest alternative query options
- Provide example searches by text and position
- Show additional sources of functional information in Gene records

Introduction

Information related to a gene of interest can be retrieved from NCBI databases by text, map (position) or sequence queries. Module 2_iii and Module 2_iv contain information on sequenced based searches using BLAST or position searches using Map Viewer.

Entrez Gene can be queried for genes defined by sequence or map data. Queries can be based on gene attributes such as symbols, names, accessions, publications, chromosome, model organism database identifiers (e.g. ZFINid: ZDB-GENE-040421-2), GO terms, conserved domains or E.C. numbers.

From the Entrez Gene record you can follow provided Links to other related records. You can view highly related ESTs and their expression profiles in UniGene or follow the link to Homologene to view pre-computed homology data.

Examples:

- 1. How do I find zebrafish genes involved in axis formation ?**
- 2. How many vitellogenin genes are known in Gene ?**
- 3. How many of the zebrafish vitellogenin genes are mapped to chromosome 22 ?**

To begin: navigate to the Entrez Gene home page:

<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?CMD=search&DB=gene>.

Alternatively, this query could be submitted from the Entrez home page

(<http://www.ncbi.nlm.nih.gov/gquery/gquery.fcgi>),

as demonstrated in Module1_iii, or any other Entrez page by selecting 'Gene' in the database pull-down menu from the search bar at the top of the page.

- 1. How do I find zebrafish genes involved in axis formation ?**

Submit a text query against the Entrez Gene database and view results

Change display options with MyNCBI

NCBI Entrez Gene

All Databases PubMed Nucleotide Protein Genome Structure PMC Taxonomy Books OMIM

Search for [Save Search](#) ☒ current records only

My NCBI [\[Sign In\]](#) [\[Register\]](#)

Limits Preview/Index History Clipboard Details

Display Show Send to

All: 4 Genes Genomes: 0 SNP GeneView: 0

Items 1 - 4 of 4

- ☐ 1: [cha](#)
Official Symbol: cha and **Name:** charon [*Danio rerio*]
Other Aliases: ZDB-GENE-040421-2
GeneID: 406203
- ☐ 2: [NEWENTRY](#)
Record to support submission of GeneRIFs for a gene not in Entrez Gene (zebrafish; Brachydanio rerio; zebra danio; zebra fish; Brachidanio rerio). [*Danio rerio*]
GeneID: 192346
- ☐ 3: [vent](#)
Official Symbol: vent and **Name:** ventral expressed homeobox [*Danio rerio*]
Other Aliases: ZDB-GENE-010108-2, fe36b11, vega2, vent1, wu:fe36b11
Chromosome: 13
GeneID: 64810
- ☐ 4: [vox](#)
Official Symbol: vox and **Name:** ventral homeobox [*Danio rerio*]
Other Aliases: ZDB-GENE-010108-1, vega1
Chromosome: 13
GeneID: 64807

Entrez [SITE MAP](#) [Entrez Help](#)

Gene
About
FAQ
[FTP site](#)
Help
NCBI Handbook
Search
Statistics

My NCBI
My NCBI help

Related sites
BLAST
Entrez Genome
Genome Project
Genomic Biology
GEO
HomoloGene
Map Viewer
OMIM
Probe
RefSeq
UniGene
UniSTS

Feedback
Help Desk
Corrections
About GeneRIFs

Subscriptions
RefSeq
Gene
Map Viewer

Links

Click on symbol to view Gene record details

Provide feedback by following these links

Sign up for a subscription to receive updates for RefSeq, Gene or Map Viewer

gene symbol
and gene name

link to ZFIN

Follow links to
related records
via Links

cha Gene Record

Entrez Gene My NCBI [Sign In] [Register]

All Databases PubMed Nucleotide Protein Genome Structure PMC Taxonomy Books OMIM

Search Gene for Go Clear ☒ current records only

Limits: **Danio rerio**

Display Graphics Show 5 Send to

All: 1 Genes Genomes: 0 SNP GeneView: 0

1: cha charon [*Danio rerio*] updated 23-May-2005

GeneID: 406203 Locus tag: [ZDB-GENE-040421-2](#)

Official Symbol: cha and Name: charon provided by [Zebrafish Nomenclature Committee](#)

Gene type: protein coding

Gene name: cha

Gene description: charon

RefSeq status: Provisional

Organism: [Danio rerio](#)

Lineage: [Eukaryota](#); [Metazoa](#); [Chordata](#); [Craniata](#); [Vertebrata](#); [Euteleostomi](#); [Actinopterygii](#); [Neopterygii](#); [Teleostei](#); [Ostariophysi](#); [Cypriniformes](#); [Cyprinidae](#); [Danio](#)

Bibliography Gene References into Function (GeneRIF): [Submit](#) [help](#) ?

PubMed links

GeneRIFs:

1. Antagonistic interactions between Charon and Nodal (Southpaw) play an important role in L/R patterning in zebrafish.

General gene information

GeneOntology

Provided by [GO](#)

Function

[protein binding](#)

Process

[determination of left/right symmetry](#)

[determination of left/right symmetry](#)

[embryonic heart tube development](#)

[endoderm formation](#)

[mesoderm formation](#)

[negative regulation of signal transduction](#)

[specification of organ axis polarity](#)

Evidence

IPI

IGI

IMP

IMP

IMP

IMP

IMP

IMP

General protein information ?

Name: charon

NCBI Reference Sequences (RefSeq) ?

mRNA Sequence [NM_212969](#)

Source Sequence [AB110416](#)

Product [NP_998134](#) charon

Conserved Domains (1) [summary](#)

[smart00041: CT; C-terminal cystine knot-like domain \(CTCK\)](#)

Location: 148 - 208 Blast Score: 92

Related Sequences ?

Nucleotide Protein

mRNA [AB110416](#) [BAD16586](#)

Additional Links ?

Links

- Conserved Domains
- HomoloGene
- Nucleotide
- Protein
- PubMed
- Taxonomy
- Ensembl
- UCSC
- ZDB-GENE-040421-2
- ZFIN
- UniGene

View
defining
sequences

Click on PubMed
link to view
related papers

View related
functional
information

Restrict the results by adding 'AND "Danio rerio"[organism]' to the search bar or click on the Entrez Limit Tab to restrict your Query by the type of Gene record, sequence, RefSeq status or organism.

Restrict your query by choosing options in Limits

Entrez Gene

My NCBI
Welcome schriml. [Sign Out]

PubMed Nucleotide Protein Genome Structure PMC Taxonomy Books OMIM

Search for vitellogenin [Go] [Clear] [Save Search] [current records only]

Limits Preview/Index History Clipboard Details

Display Summary Show 20 Send to

All: 50 gene homologene: 32 gene mapview: 28 gene nucleotide: 43 gene unigene: 33

Items 1 - 20 of 50 Page 1 of 3 Next

1: [uvl-5](#) Conserved Domains, HomoloGene, Map Viewer, Nucleotide, Protein, PubMed, Taxonomy, UniGene
 unidentified Vitellogenin-linked Transcript (49.0 kD) (uvl-5) [*Caenorhabditis elegans*]
Other Aliases: XE161, CELK06088, F56B6.4a, F56B6.4b, F56B6.4c
Other Designations: unidentified Vitellogenin-linked Transcript (32.2 kD) (uvl-5); unidentified Vitellogenin-linked Transcript (34.5 kD) (uvl-5)
Chromosome: X; **Location:** X;-10.17 cM (interpolated genetic position)
GeneID: 180644

2: [vg3](#) Conserved Domains, HomoloGene, Nucleotide, Protein, PubMed, Taxonomy, UniSTS, UniGene
Official Symbol: vg3 and **Name:** vitellogenin 3, phosvitinless [*Danio rerio*]
Other Aliases: ZDB-GENE-991019-2, cb1001, fb58g02, fb61d01, wu:fb58g02, wu:fb61d01
Other Designations: phosvitinless vitellogenin
Chromosome: 11
GeneID: 30518

3: [vg1](#) MGC cDNA clone, Conserved Domains, HomoloGene, Nucleotide, Full text in PMC, Protein, PubMed, Taxonomy, UniSTS, UniGene
Official Symbol: vg1 and **Name:** vitellogenin 1 [*Danio rerio*]
Other Aliases: ZDB-GENE-001201-1, fb63b05, fb66b04, wu:fb63b05, wu:fb66b04, zfvgl, zgc:109796
Chromosome: 4, 17, 20, 22
GeneID: 64257

Entrez
SITE MAP
Entrez Help

Gene
About
FAQ

Genome Project
Genomic Biology
GEO
HomoloGene
Map Viewer
OMIM
Probe
RefSeq
UniGene
UniSTS

Feedback
Help Desk
Corrections
About GeneRIFs

Customize the output display by specifying subsets of data you want to have displayed with MyNCBI.

My NCBI is an Entrez display tool that allows you to customize the output of your queries or have your Entrez queries archived, and will send you email alerts when new results for your stored query are available.

3. How many of the zebrafish vitellogenin genes are mapped to chromosome 22 ?

vitellogenin AND 22[chr]

The screenshot shows the NCBI Entrez Gene search interface. The search query 'vitellogenin AND 22[chr]' is entered in the search bar. The results are filtered for 'Limits: Danio rerio'. Two results are displayed:

- 1: [vg1](#)**
MGC cDNA clone, Conserved Domains, HomoloGene, Nucleotide, Full text in PMC, Protein, PubMed, Taxonomy, UniSTS, UniGene
Official Symbol: vg1 **and Name:** vitellogenin 1 [*Danio rerio*]
Other Aliases: ZDB-GENE-001201-1, fb63b05, fb66b04, wu:fb63b05, wu:fb66b04, zfv1, zgc:109796
Chromosome: 4, 17, 20, 22
GenelD: 64257
- 2: [vg1l](#)**
HomoloGene, Nucleotide, Taxonomy, UniSTS, UniGene
Official Symbol: vg1l **and Name:** vitellogenin 1, like [*Danio rerio*]
Other Aliases: ZDB-GENE-030131-1298, fb66b04, wu:fb66b04
Chromosome: 22
GenelD: 322578

The left sidebar contains links to various NCBI resources, including Entrez, Gene, and related sites. The top navigation bar includes links to All Databases, PubMed, Nucleotide, Protein, Genome, Structure, PMC, Taxonomy, Books, and OMIM.

Limits: restrict query by organism to retrieve *Danio rerio* only records