Module 1: Where do I start?

ii. ZFIN, the zebrafish model organism database

Aims

- Introduce ZFIN web site
- Suggest starting points for different types of queries
- Describe methods for contacting ZFIN

Introduction

ZFIN is the zebrafish model organism database and as such we work towards integrating zebrafish biology with its genome. Data are updated daily by the ZFIN curatorial staff who extract relevant information from your publications. Large datasets submitted by zebrafish labs, routine data exchanges with organizations such as NCBI, the Sanger Institute and Swiss-Prot, as well as data submissions from individual investigators provide additional data for ZFIN. ZFIN also participates with the Sanger Institute in annotation of the whole genome sequence.

ZFIN Home Page

Query forms for mutants, genes, markers, clones, mapping and gene expression data facilitate integrated analysis of these data. These forms are available from the ZFIN home page, http://zfin.org.

As you scroll down the ZFIN home page, take note of the links to query forms for:

- Mutants/Transgenes
  Search by name, map location, mutation type or phenotype
- Genes/Markers/Clones
  Search by name, accession number, LG, vector or sequence type
- Gene Expression
  Search by gene name, mutant background, author, developmental stage, anatomical structure or knockdown reagent gene name.
- BLAST
  Search for sequence alignment against ZFIN and zebrafish datasets
- Genetic Map
  Generate an integrated view of mapping panels or a consolidated map.
- Anatomy
Search the zebrafish anatomical dictionary.

- Mutants and Transgenes
- Gene Expression Patterns
- Anatomical Dictionary with links to associated gene expression patterns
- Genes
  - Function
  - Protein Families and Domains
  - Probes
  - Expression Patterns
  - Orthologs
  - Sequence Data
  - Mapping Data
- Search for sequence alignment
- Graphical representation of mapping panels
- Zebrafish Research Community Contact Information
Links to additional resources are provided on the ZFIN home page side bar.

Send questions and suggestions to ZFIN

Download ZFIN data files for use in Excel or other databases

Meetings and Jobs

Zebrafish Newsgroup
- Submit questions
- Share protocols

Nomenclature guidelines

Zebrafish International Resource Center
- Order Fish, Probes
- Submit Lines
- Pathology Services
Site Search
Site Search is a quick way to search the entire ZFIN website. It’s easy – you’ll find the search box in the upper right hand corner of every ZFIN page - just enter words in the search box and press return.

The features of site search are shown in this example search for cartilage. The top of the results page displays a box where results are sorted into several different data categories. Categories help you narrow your search. The currently-selected category is marked with an arrowhead (▶). The number beside each category is the number of pages found. Look inside the categories box. Next to “All”, you can see that there are 353 ZFIN pages containing the word “cartilage”. 28 of these are Mutant/Transgenic pages.

Click the Mutants/Transgenics category to find mutant fish pages containing the word “cartilage”. The dirty south locus page is in this group because the word “cartilage” is contained in the phenotype description.

Locus: dirty south
... some ventral cartilages reduced or absent), underdeveloped liver/gut. CITATIONS (1) Home Email ZFIN About ZFIN Helpful Hints ...

The Gene Ontology (GO) category is a good place to look for genes related to cartilage. Here you see that sox9b has been annotated with the GO term ‘cartilage development’. Follow the GO details link for sox9b to learn that this annotation was inferred from deficiency mutant phenotypes and morpholino experiments.

GO Details: sox9b
... s) Molecular Function DNA binding IEA 1 Biological Process cartilage development IMP MO3-sox9b MO2-sox9b 1 cartilage development IMP Df(LG03)sox8,sox9b b971 1 embryonic pectoral fin morphogenesis ...

Cartilage appears many times in the zebrafish anatomical ontology. Follow the links in the Anatomy category to view definitions, possible probes and expressed genes.

Anatomical Structure: ceratobranchial
... Definition: Ceratobranchials are bilaterally paired cartilage bones that form part of the ventral ... with the epibranchials. Ceratobranchials 1-5 ossify in the ceratobranchial cartilages. Appears ...
You might even find a cartilaginous job with Site Search – check the Jobs/Meetings category.

**Site Search vs. Topic Specific Search**

Site Search complements ZFIN’s topic specific searches but it is important to understand the differences. Site search looks for word matches on ZFIN web pages. It’s fast and it covers the entire database, but it’s not very smart. The domain-specific searches are smart – they are designed take advantage of domain-specific associations between terms. For example, if you enter “brain” in the anatomy field of the domain-specific Gene Expression search page, your results will include all figures with cerebellar gene expression. Gene Expression search “knows” that the cerebellum is part of the brain. In contrast, the expression category of a Site Search for “brain” will return figures only if the word “brain” appears in figure captions, gene names or anatomical structures, as shown in the example below:

For a more detailed search, follow the ‘Advanced search: Expression’ link to the ZFIN topic specific gene expression search. As a convenience, “brain” will be automatically entered into the anatomy field of the expression search form.

**Synonyms**

When a synonym or previous name is entered into Site Search, you are provided with an Alternative search suggestion link. Click this link to start a fresh Site Search using the primary name of the term. This is worth a try, because it will typically provide you with overlapping and complementary results. Examples below:

*pou2* is a previous name for *pou5f1*. Site search for *pou2* produces *pou2* results and an optional alternative search for *pou5f1*:
Follow the alternate search link to find matches to **pou5f1**.

Exactly Match: **pou5f1**

**Gene: pou5f1**

... factor 1 Gene Symbol: **pou5f1** Previous Names: chunp6868 ; pou2 ... KNOCKDOWNS: Mutant locus: spiel ohne grenzen (spg) has been shown to correspond to gene **pou5f1** ... SEGMENT (CLONE AND PROBE) RELATIONSHIPS: **pou5f1** Encodes [EST] cb197 (order this ), fd18x06 ... 

Similarly, entering a previous/alternate name for an anatomy term (“isthmus”) will provide an alternative search using the primary anatomical structure name.

**Gene: pax2a**

... Nomenclature History MUTANTS AND TARGETED KNOCKDOWNS: Mutant locus: no isthmus ...

**Allele: b593 (no isthmus)**

... ZDB-FISH-011017-10 Name: no **isthmus** Abbreviation: no b593 Previous names: Affected Gene: paired box gene 2a (pax2a) has been shown to correspond to locus no **isthmus** , (2 ) Images ... 

**Contacting ZFIN**

ZFIN is your database. We welcome your comments and suggestions. Please use the **Contact Us** on our home page or the **Your Input Welcome** button provided on every data page to contact us.