Module 3: Genes and Sequences
ii. How do I find information about a gene?

Aims

- Introduce the ZFIN Genes/Markers/Clones query form
- Suggest starting points for various queries
- Describe information that can be found pertaining to genes

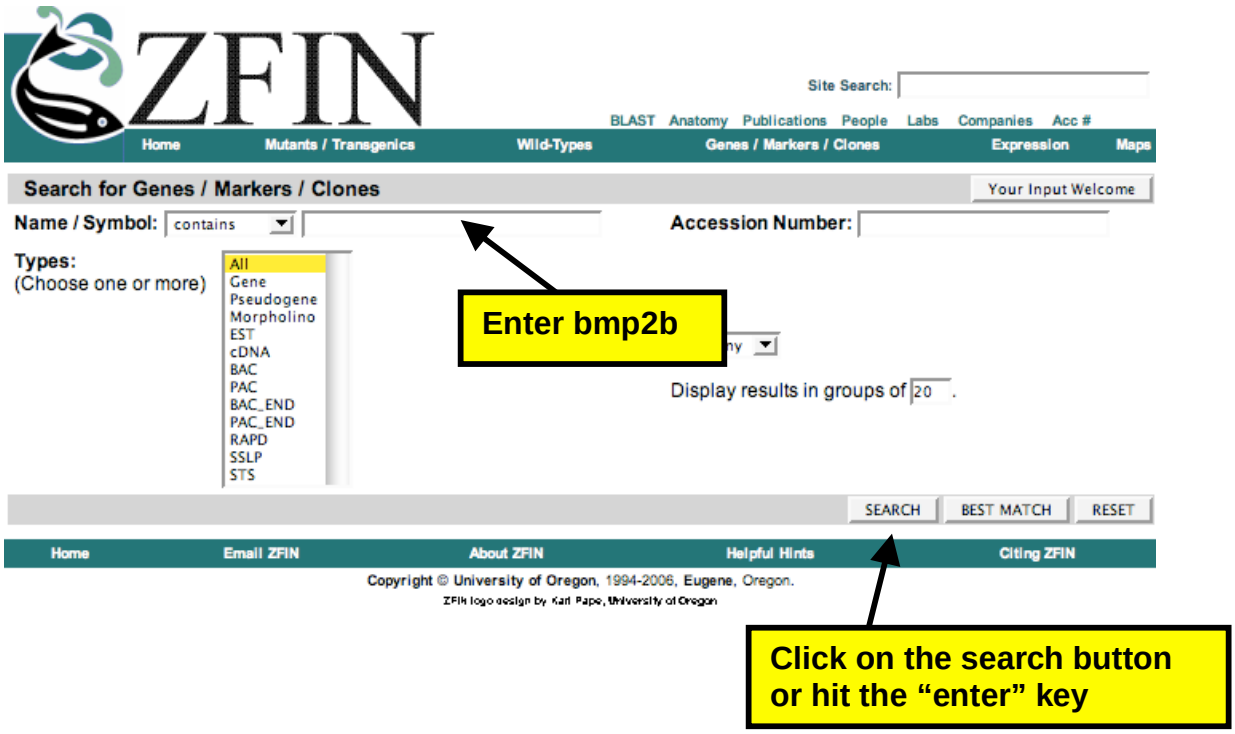
Introduction

ZFIN integrates data for named, published genes as well as unnamed genes identified by the Sanger Institute Vega project, by the zebrafish gene collection project and by various gene expression screens.

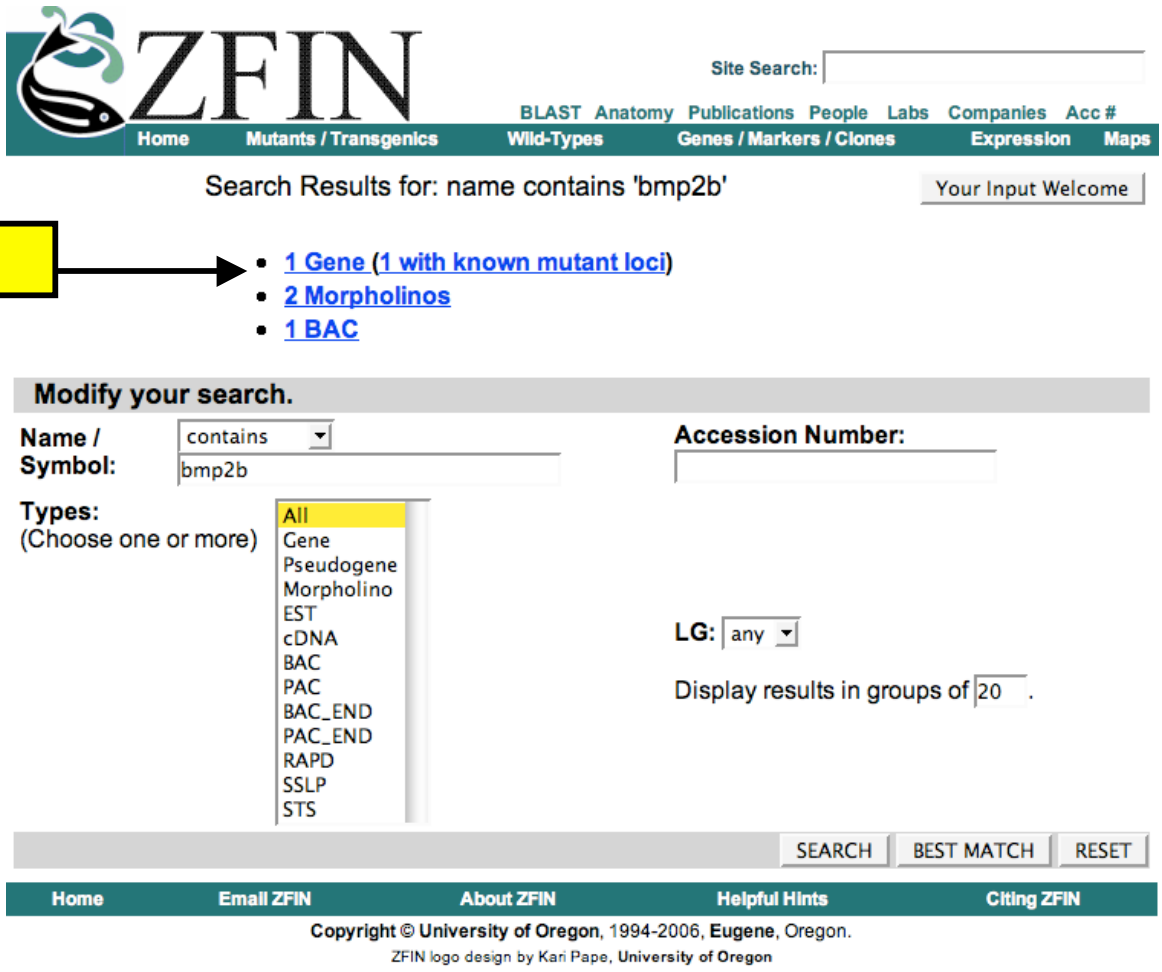
These data may be accessed using the Genes/Markers/Clones query form. A link to this form is available on ZFIN's home page. You may search using the approved name or symbol, other names that have been used for a gene or approved names of orthologs. GenBank accession number searches and LG searches are also possible.

The search results summary will display links to corresponding gene page(s) as well as links to associated BACs, PACs, ESTs and morpholinos.

Genes/Markers/Clones Query Form



Enter bmp2b in the name field and click on the 'search' button. The following results summary is displayed.


ZFIN
Site Search:
BLAST Anatomy Publications People Labs Companies Acc #
Home Mutants / Transgenics Wild-Types Genes / Markers / Clones Expression Maps
Search Results for: name contains 'bmp2b'
Your Input Welcome
Click here
1 Gene (1 with known mutant loci)
2 Morpholinos
1 BAC
Modify your search.
Name / Symbol:
contains
bmp2b
Accession Number:
Types:
(Choose one or more)
All
Gene
Pseudogene
Morpholino
EST
cDNA
BAC
PAC
BAC_END
PAC_END
RAPD
SSLP
STS
LG:
any
Display results in groups of 20 .
SEARCH
BEST MATCH
RESET
Home
Email ZFIN
About ZFIN
Helpful Hints
Citing ZFIN
Copyright © University of Oregon, 1994-2006, Eugene, Oregon.
ZFIN logo design by Kari Pape, University of Oregon

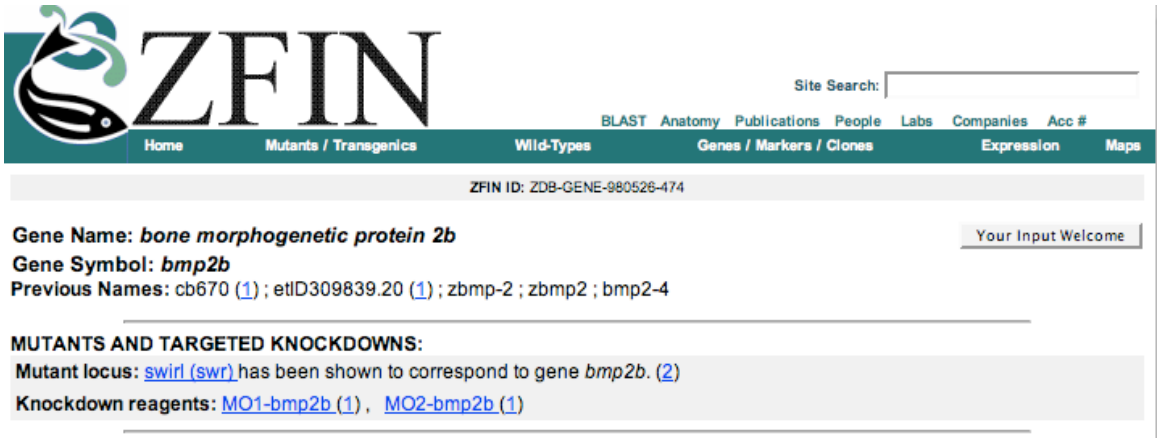
Click on the '1 Gene' link and note the following information as you scroll down the *bmp2b* gene page**:**

Nomenclature

ZFIN curators administer established nomenclature guidelines, http://zfin.org/zf_info/nomen.html, to ensure unambiguous communication and to support comparisons between species. Names and symbols are consistent with mammalian orthologs whenever possible. The 'nomenclature history' link provides a chronology of name changes, splits and merges.

Mutants and Targeted Knockdowns

Links are provided to data for associated mutants and knockdown reagents and to the contributing publications.



Gene Products

Gene product information is displayed as you continue down the *bmp2b* gene page.

Click here for a complete list of GO annotations, supporting evidence codes and publications as well as links to GO term definitions

Gene ontology or GO terms provide insight into gene products and functions. As members of the gene ontology consortium, http://www.geneontology.org/, we help to define terms used to describe the three GO ontologies - molecular function, cellular components and biological processes. These terms apply to all organisms and are valuable for direct comparisons across organisms. The *bmp2b* gene page shows a representative term for each of the three ontologies. To view all terms click the 'All GO terms' link. The *bmp2b* GO details page displays all annotations for *bmp2b*.

Manual curation and a collaboration with Uni-Prot allow us to provide links to protein family and domain sites and to provide a gene product description.

Gene Expression

As you continue to scroll down *the bmp2b* gene page you will find links to gene expression data. Follow these links to view the expression data.

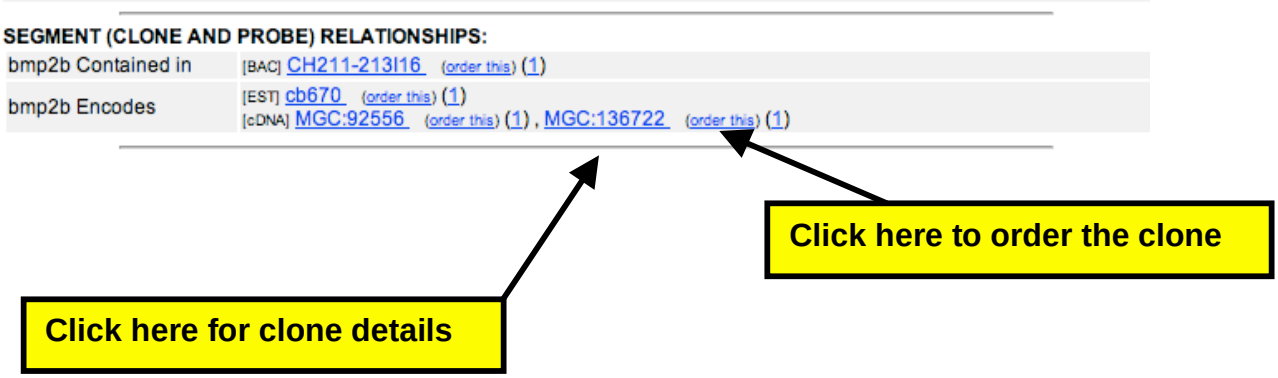
ZFIN displays three kinds of gene expression data:

- annotated images that have been directly submitted to ZFIN by researchers
- annotated data from the current literature, figures and legends are included when copyright permissions are available.
- an index of gene expression data from older publications

ZFIN began to include published figures in 2004. We are currently able to add figures from older publications only on an ad hoc basis. A more complete incorporation of figures from the older literature is a long-term goal.

Segment (clone and probe) Relationships

The next section you will find on the *bmp2b* page describes related molecular segments.



Here we see the BAC used by the Sanger Institute for the annotation of *bmp2b*, an EST for the Thisse expression screen (cb670) encoded by *bmp2b* and two full length cDNAs from the zebrafish gene collection (MGC:92556, MGC:136722) that is encoded by *bmp2b*. The 'Order this' link takes you to a site where you may order this probe. Links to the reference or publication that defines these relationships are provided (number in parentheses).

Sequence Information

Sequence information appears next on the *bmp2b* page. Manual curation and collaborations with NCBI, the Sanger Institute and Uni-Prot allow us to maintain an extensive set of links to sequence information. Representative links are shown here.

SEQUENCE INFORMATION:

Type	Accession #	Length	Analysis
cDNA:	RefSeq:NM_131360 (1)	1732 bp	- Select Tool -
Genomic:	GenBank:AL929237 (1)	205393 bp	- MegaBLAST -
Polypeptide:	SWISS-PROT:O13108 (1)	411 aa	- Select Tool -
Vega Transcript:	Vega_Trans:OTTDART00000007759 (1)	1728	
Sequence Clusters:	UniGene:568 (1)		
All Sequence Information (20)			

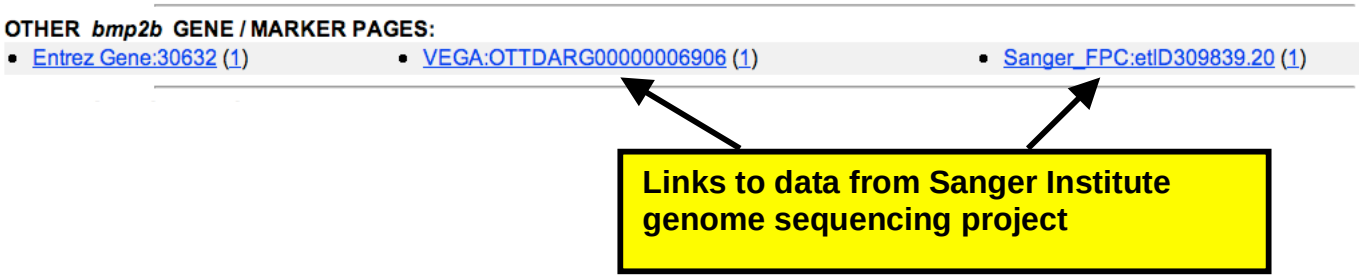
Click here for a complete list of links for all sequences associated with *bmp2b*.

Select sequence analysis tool.

- **ZFIN BLAST**
- **NCBI BLAST**
- **Ensembl**
- **Mega BLAST**
- **SIB BLAST**
- **UCSC BLAT**

Other *bmp2b* gene pages

As you continue down the *bmp2b* page you see links to *bmp2b* gene pages at NCBI Entrez Gene, the Sanger Institute's Vertebrate Genome Annotation database (VEGA) and the marker report from the Sanger Institute's fingerprinting map (Fingerprint Contig or FPC) of the zebrafish genome.



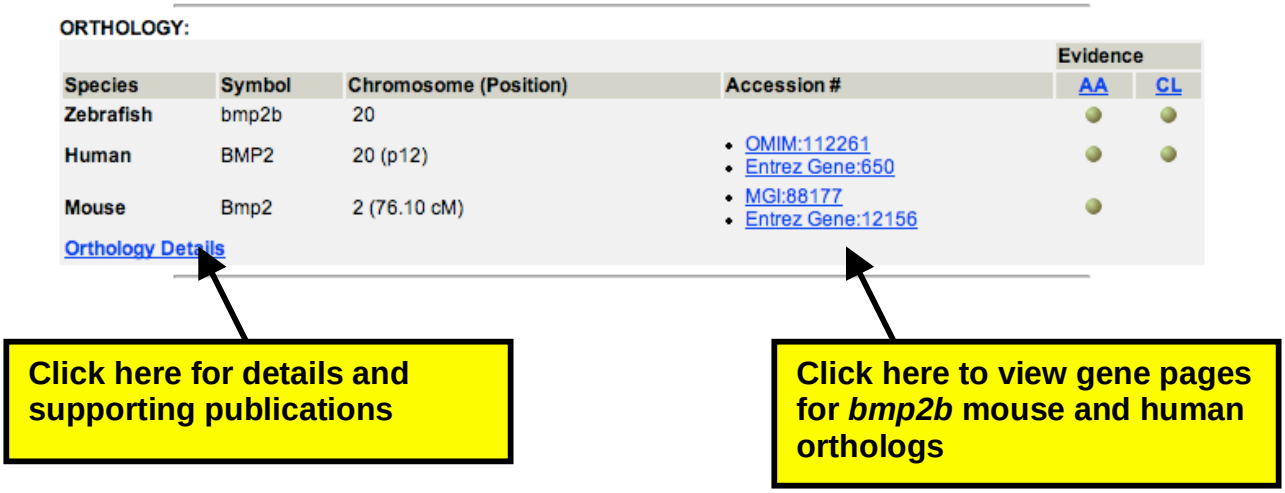
Mapping Information

The next item on the *bmp2b* gene page is mapping information.

bmp2b has been mapped to LG 20. The 'Details' link will take you to detailed mapping information such as mapping panel, location and scoring data http://zfin.org/cgi-bin/webdriver?MIval=aa-mappingdetail.apg&OID=ZDB-GENE-980526-474. Mapping information for related markers and clones is also available on the details page. Links to graphical map views are provided.

Orthology

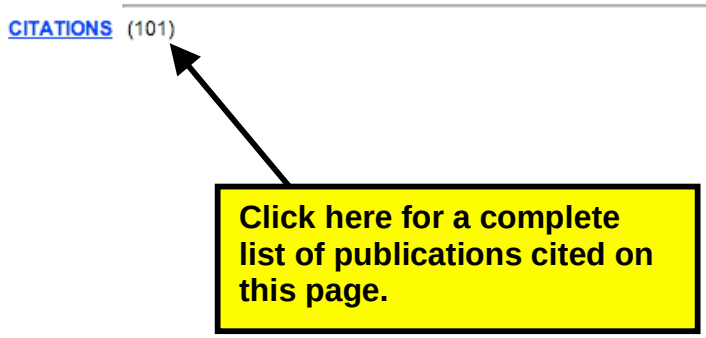
ZFIN curators capture and record orthology data for human, mouse and Drosophila genes. Approved nomenclature symbols and links to the gene page for other species are provided. Continuing down the bmp2b page you find orthology information. Ortholog chromosome (position) provides a quick glance at synteny.



Please see Module 3 section ii for additional details pertaining to orthologs.

Citations

The final item we see on the *bmp2b* gene page is a link to citations. Clicking on this link we find a listing of all publications that contributed data to the ZFIN *bmp2b* gene page. Publications discussing *bmp2b* are listed here. Data that has been entered through collaborations are cited here.



Exercises

- Have any *fgf8* knockdowns been studied?
- How many published studies of fgf8 gene expression have been curated at ZFIN?
- Have any large scale *in situ* screens provided images for *fgf8* gene expression patterns?
- Are mouse or human orthologs known for *fgf8* ?