# Module 4: Function and Expression (ZFIN)

### ii - How Can I Find Gene Expression Data?

## Aims

- Introduce gene expression data at ZFIN
- Suggest starting points for various queries
- Discuss morpholino curation at ZFIN

## Introduction

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

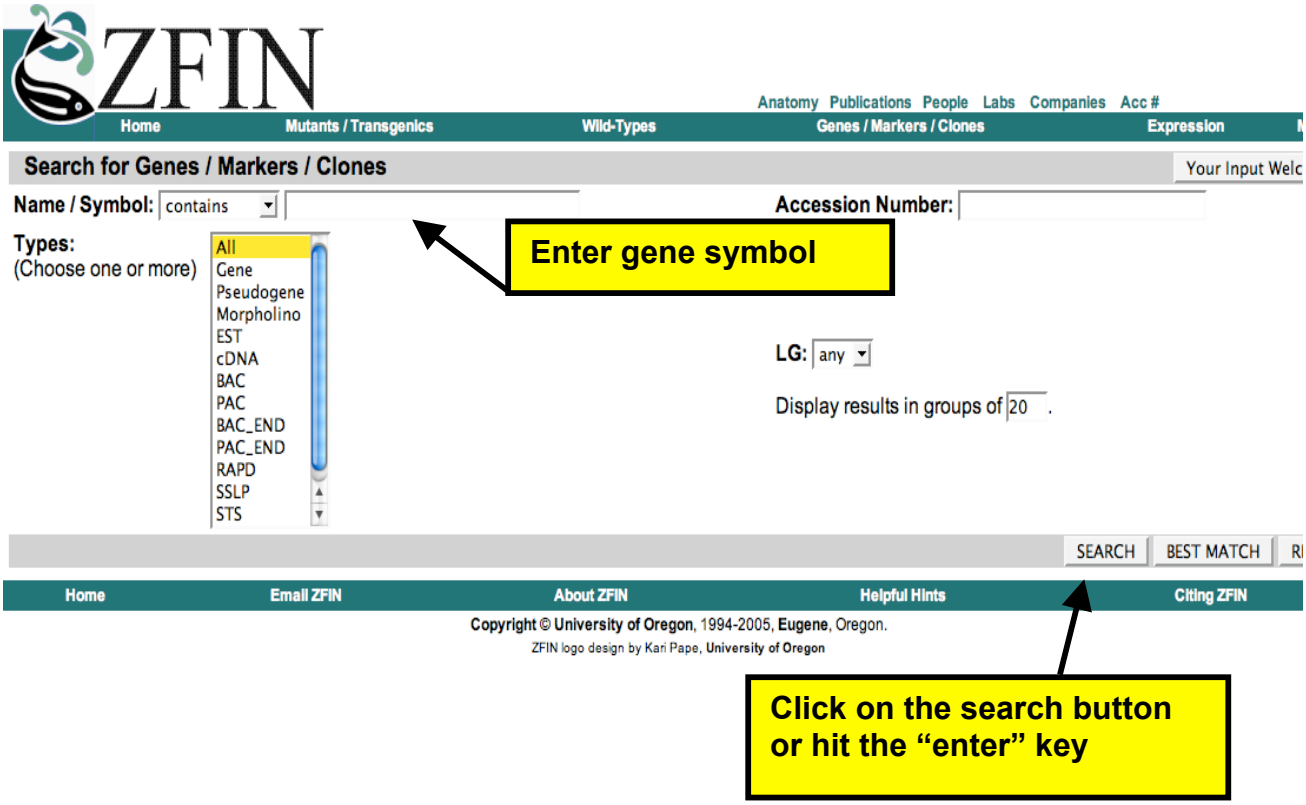
ZFIN began to include published figures in 2004. We are currently able to add figures from older publications only on an ad hoc basis. A more complete incorporation of figures from the older literature is a long-term goal.
The zebrafish anatomical dictionary, http://zfin.org/cgi-bin/webdriver?MIval=aa-anatdict.apg&mode=search, plays a central role in our curation of gene expression data.

### Finding gene expression data

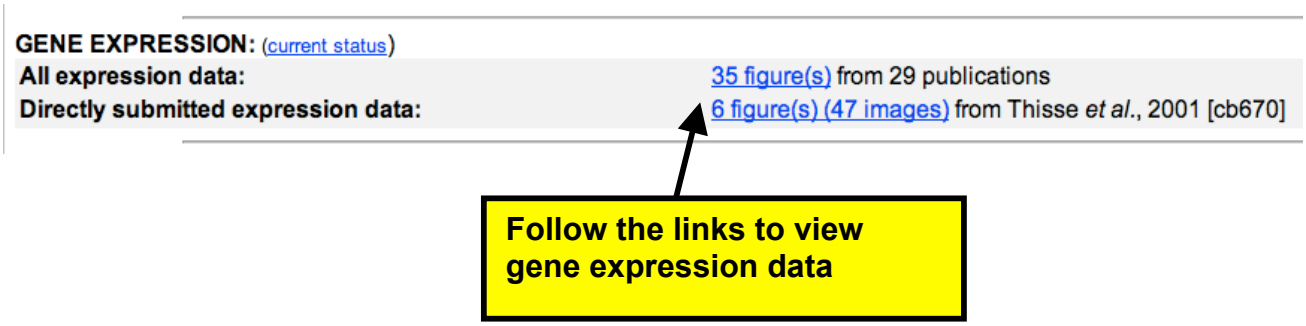
There are three methods for finding gene expression data in ZFIN.

1. Gene Expression data may be found by following the links provided on a gene page.

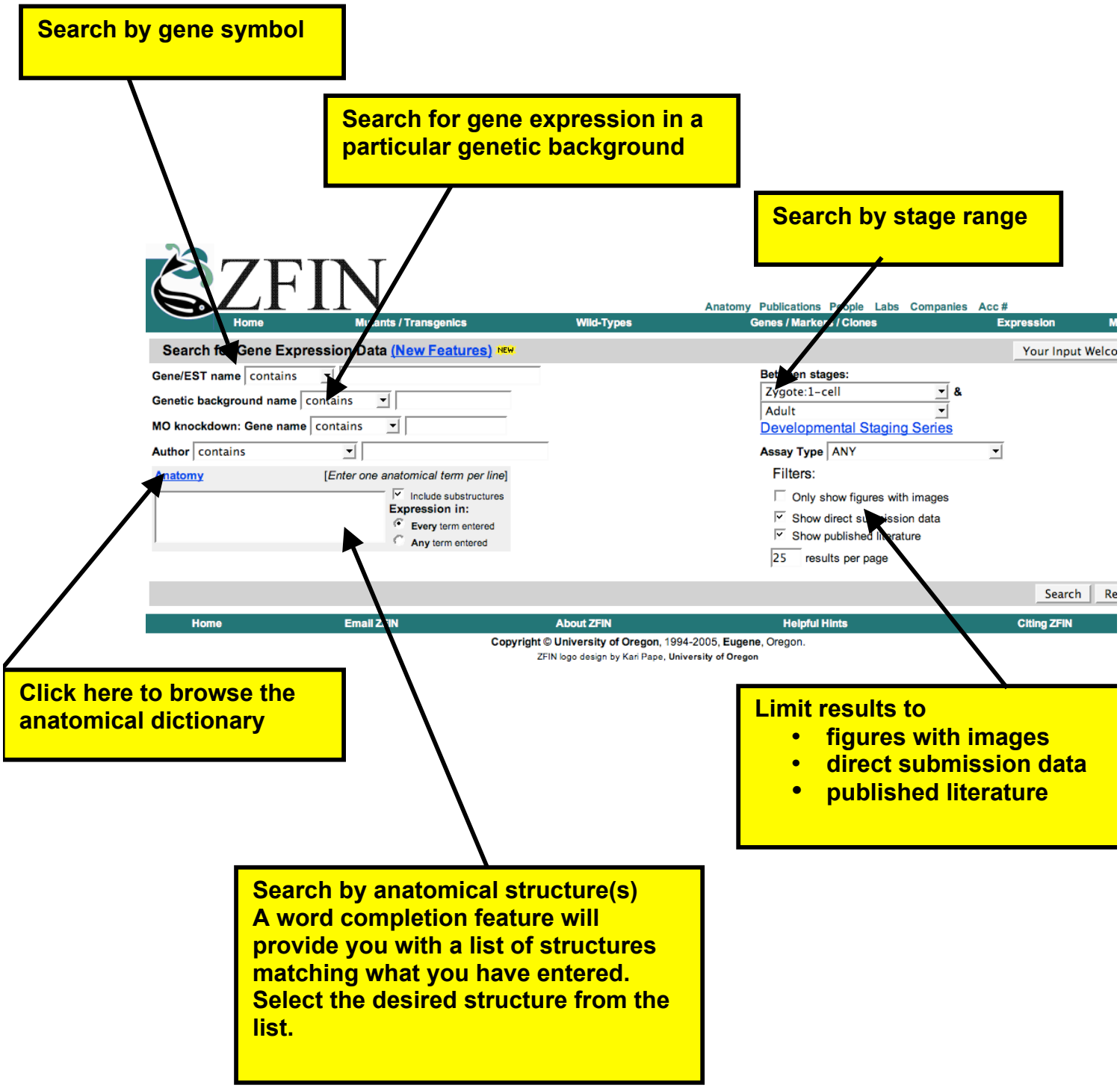
Locate this information using our Genes/Markers/Clones query form, http://zfin.org/cgi-bin/webdriver?MIval=aa-newmrkrselect.apg. Search by specifying your gene of interest.




Scroll to the **Gene Expression** section of the gene page.



2. Gene expression data may also be found using the ZFIN expression query form.



A portion of the return results for a *bmp2b* gene expression search is shown below.

**Expression Pattern Search Results for *bmp2b***
(35 figure(s) with expression from 28 publication(s) )

Modify Search
Your Input Welco

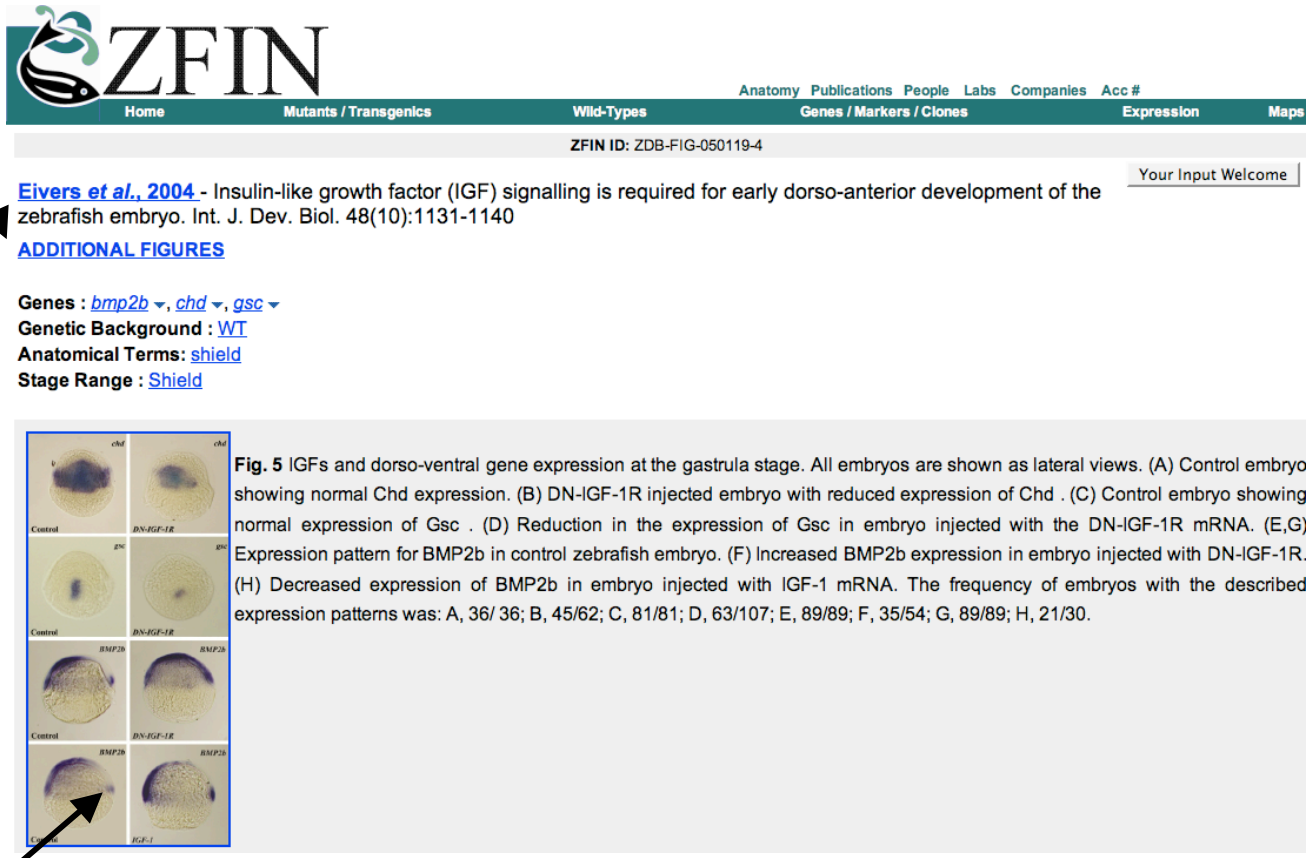
| Publication (current status) | Data | Background(s) | Stage Range | Anatomy |
|---|---|---|---|---|
| Dutta *et al.*, 2005 | Fig. 2  | WT | Bud | non neural ectoderm |
| Leung *et al.*, 2005 | Fig. 7 | WT | Prim-5 | |
| Londin *et al.*, 2005 | Fig. 5 | TL | Sphere to Shield | embryo |
| | Fig. 7 | TL | Sphere | |
| Shimizu *et al.*, 2005 | Fig. 3 | WT | Bud | tail bud |
| | text only | WT | 75%-epiboly | embryo |
| Yimlamai *et al.*, 2005 | Fig. 7 | AB | 50%-epiboly | |
| Cao *et al.*, 2004 | text only | AB | Shield | |
| Crotwell *et al.*, 2004 | Fig. 4 | WT | Days 7-13 to Days 21-29 | fins |
| Eivers *et al.*, 2004 | Fig. 5  | WT | Shield | shield |
| Fürthauer *et al.*, 2004 | text only | WT | Sphere to Shield | |
| Gilardelli *et al.*, 2004 | text only | WT | 50%-epiboly to Prim-5 | |
| Kudoh *et al.*, 2004 | text only | WT | 75%-epiboly | |
| Ramel *et al.*, 2004 | text only | AB, *Df(LG14)wnt8a*$^{w8}$ | Shield | |
| Rentzsch *et al.*, 2004 | Fig. 1  | WT | 75%-epiboly | ectoderm, germ ring |
| Fischer *et al.*, 2003 | text only | *ika*$^{t22030}$, WT | Prim-15 | |
| Leung *et al.*, 2003 | text only | *boz*$^{m168}$, WT | Sphere | |
| Thisse *et al.*, 2001 - Present [cb670] | Fig. 1  | AB/TU | 50%-epiboly to Bud | axis, margin, presumptive epidermis, ventral mesoderm, YSL |
| | Fig. 2  | AB/TU | 1-4 somites to 10-13 somites | Kupffers vesicle, periderm, ventral mesoderm |

**Click here to view the publication abstract**

**Click on the figure number or thumbnail to view expression data**

Click on the Fig.5 link of the Eivers et al. publication for figure image, legend and annotations.

**Click here to view all expression data from this publication**




**Click here to view a larger image**

Continue to scroll down this page. You will find a tabular summary of the expression data discussed in this figure. This table is always available, even when we do not have privileges to display the figure's image and legend.

**Gene expression details**

| Gene | Fish | Stage | Anatomy | Assay |
|---|---|---|---|---|
| *bmp2b* | WT | Shield | shield | ISH |
| *chd* | WT | Shield | shield | ISH |
| *gsc* | WT | Shield | shield | ISH |

**Acknowledgments:**
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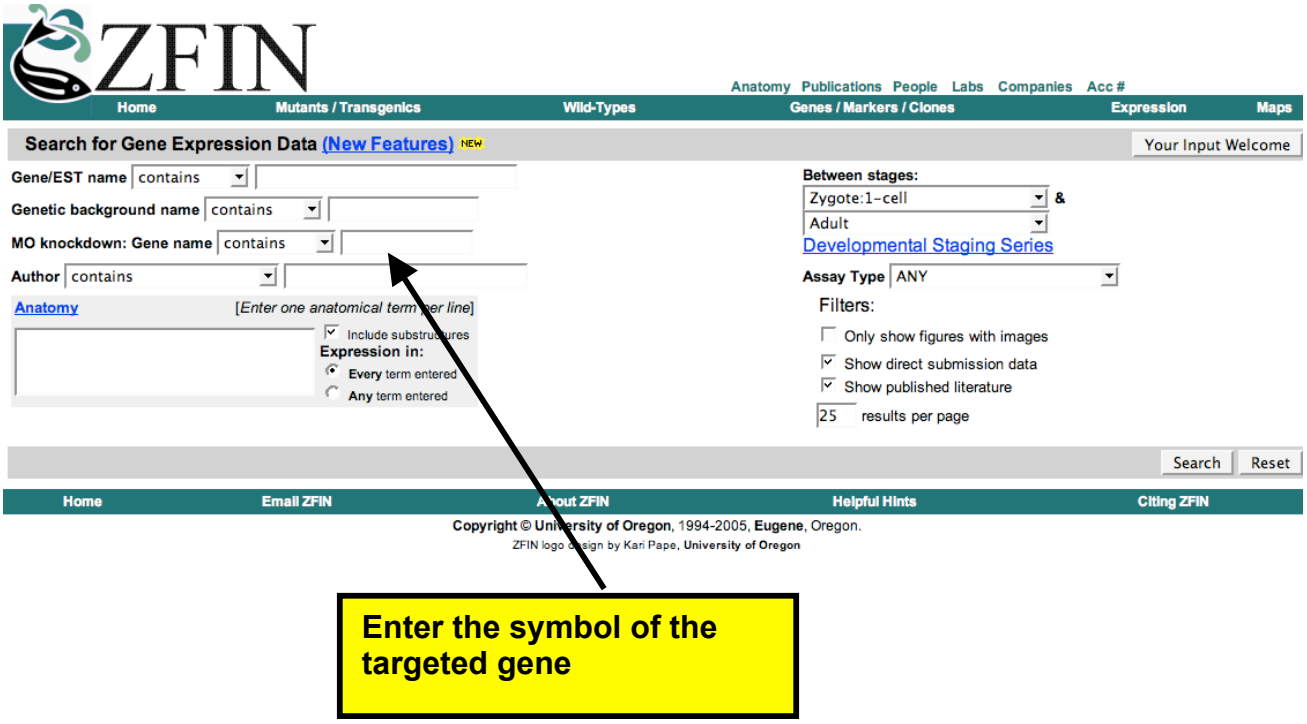
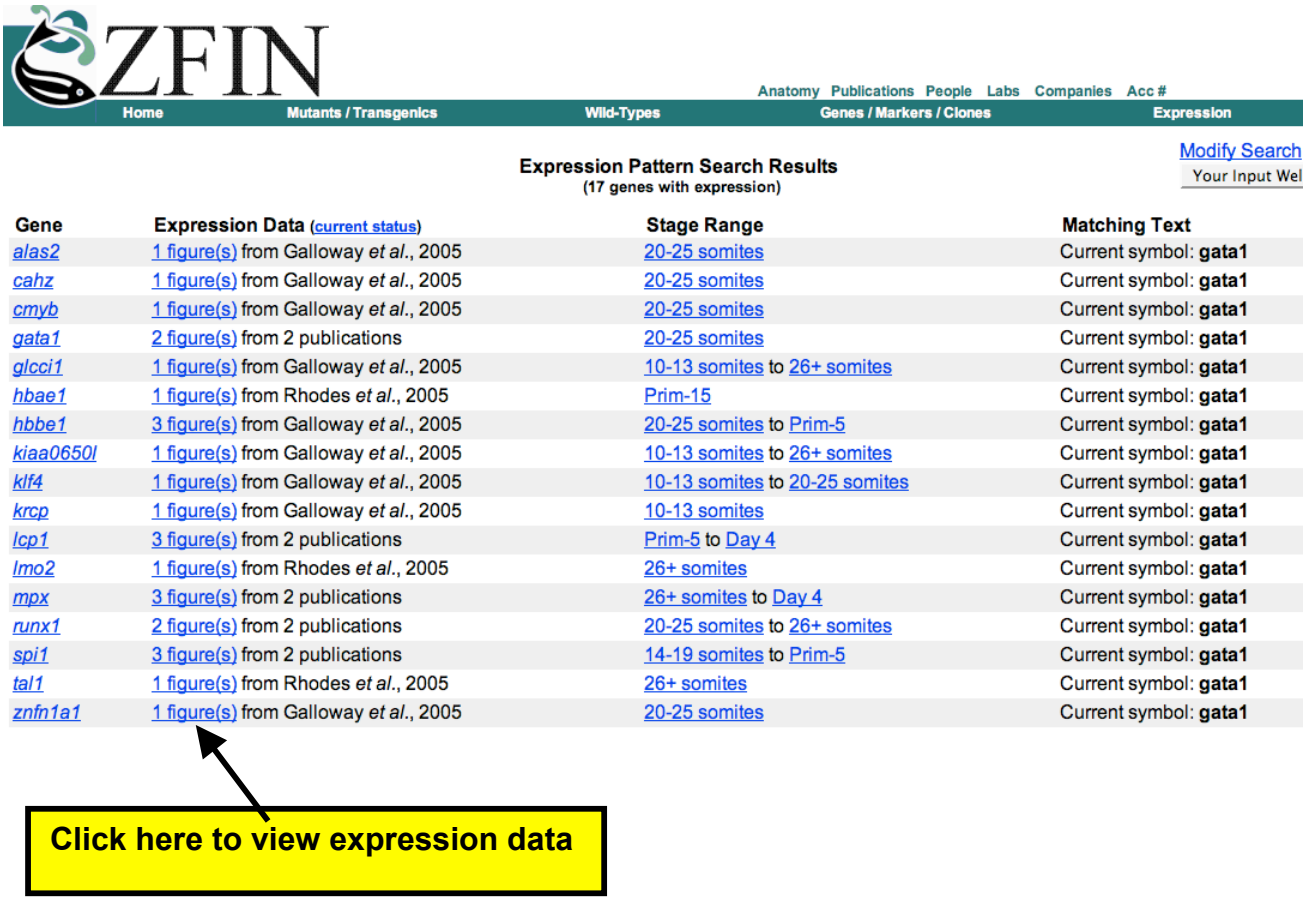
The gene expression query form can also be used to locate expression patterns from studies using knockdown reagents.



A search for *gata1* targeted knockdowns returns the following:




Copyright privileges have not been granted to ZFIN by this journal, however, a detailed table describes the gene expression data presented in this figure. A portion of this table is depicted below.

image not available

**Fig. 1** ZFIN is incorporating published figure images and captions as part of an ongoing project. Figures from some publications have not yet been curated, or are not available for display because of copyright restrictions.

**Gene expression details**

| Gene | Fish | Stage | Qualifier | Anatomy | Assay |
|---|---|---|---|---|---|
| *cmyb* | TU, MO:gata2 | 20-25 somites | | intermediate cell mass of mesoderm | ISH |
| | TU, MO:gata1 | 20-25 somites | | intermediate cell mass of mesoderm | ISH |
| | TU, MO:gata1,gata2 | 20-25 somites | | intermediate cell mass of mesoderm | ISH |
| | TU | 20-25 somites | | intermediate cell mass of mesoderm | ISH |
| *hbbe1* | TU, MO:gata1 | Prim-5 | | intermediate cell mass of mesoderm | ISH |
| | TU | Prim-5 | | intermediate cell mass of mesoderm | ISH |
| *lcp1* | TU, MO:gata2 | Prim-5 | | intermediate cell mass of mesoderm | ISH |
| | | Prim-5 | | unspecified | ISH |
| | TU, MO:gata1 | Prim-5 | | intermediate cell mass of mesoderm | ISH |
| | | Prim-5 | | unspecified | ISH |
| | TU, MO:gata1,gata2 | Prim-5 | | intermediate cell mass of mesoderm | ISH |
| | | Prim-5 | | unspecified | ISH |
| | TU | Prim-5 | | intermediate cell mass of mesoderm | ISH |
| | | Prim-5 | | unspecified | ISH |
| *mpx* | TU, MO:gata2 | 26+ somites | *Not detected* | intermediate cell mass of mesoderm | ISH |
| | | 26+ somites | | unspecified | ISH |
| | TU, MO:gata1 | 26+ somites | | intermediate cell mass of mesoderm | ISH |
| | | 26+ somites | | unspecified | ISH |
| | TU, MO:gata1,gata2 | 26+ somites | | intermediate cell mass of mesoderm | ISH |
| | | 26+ somites | | unspecified | ISH |
| | TU | 26+ somites | *Not detected* | intermediate cell mass of mesoderm | ISH |
| | | 26+ somites | | unspecified | ISH |

**Click here to view morpholino details**

ZFIN

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Home | Mutants / Transgenics | Wild-Types | Genes / Markers / Clones | Expression | Map

**ZFIN ID:** ZDB-MRPHLNO-050208-10

**Morpholino Name: MO1-gata1**

Your Input Welcom

**Previous Names:** MO(T)-gata1 (1) ; gata1 MO (1) ; Gata1 morpholino (1)

**Sequence:** 5' - CTGCAAGTGTAGTATTGAAGATGTC - 3' BLAST IT

(Although ZFIN verifies reagent sequence data, we recommend that you conduct independent sequence analysis before ordering any reagent.)

**Target Gene:** gata1 (1)

**Note:** A translation blocking morpholino targeting *gata1*.
This morpholino sequence was reported with an additional nucleotide in Rhodes et al. 2005 and is correct as displayed here confirmed by author.

CITATIONS (3)

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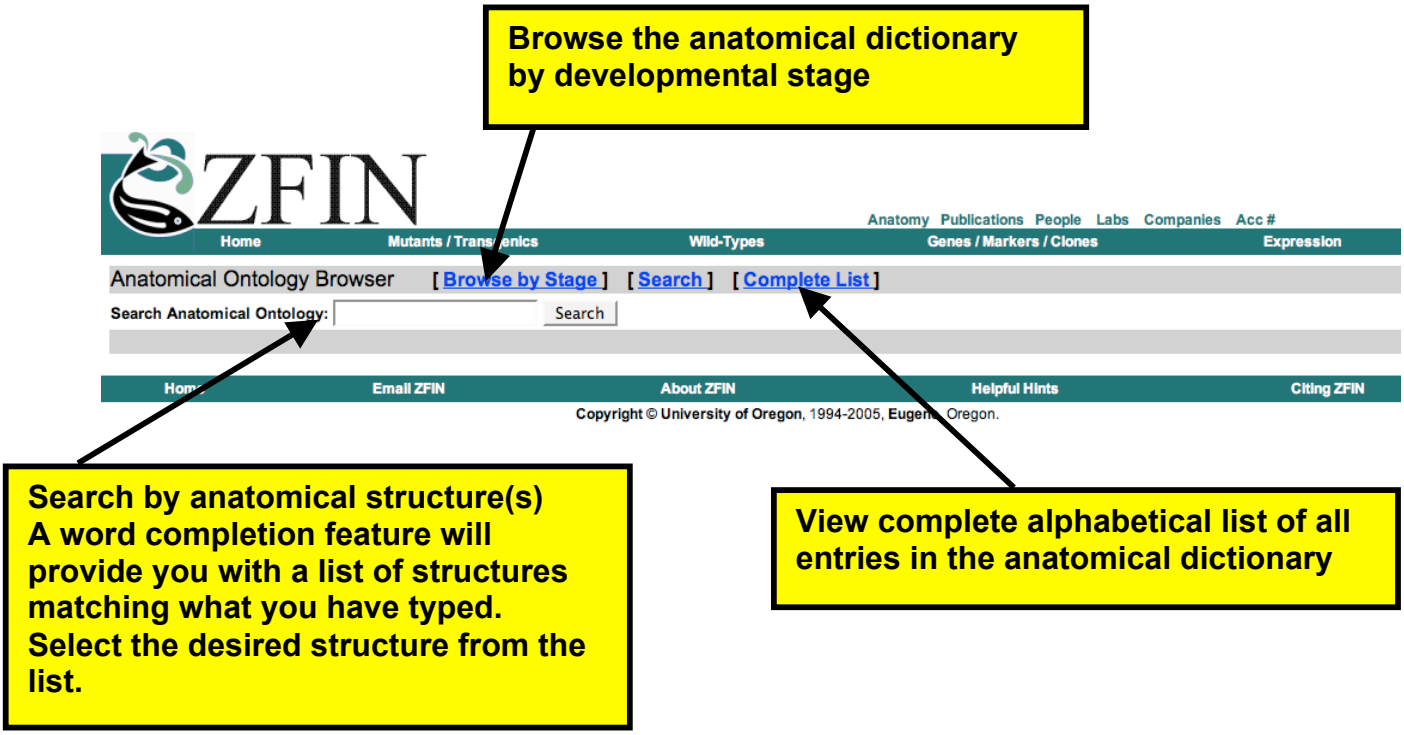
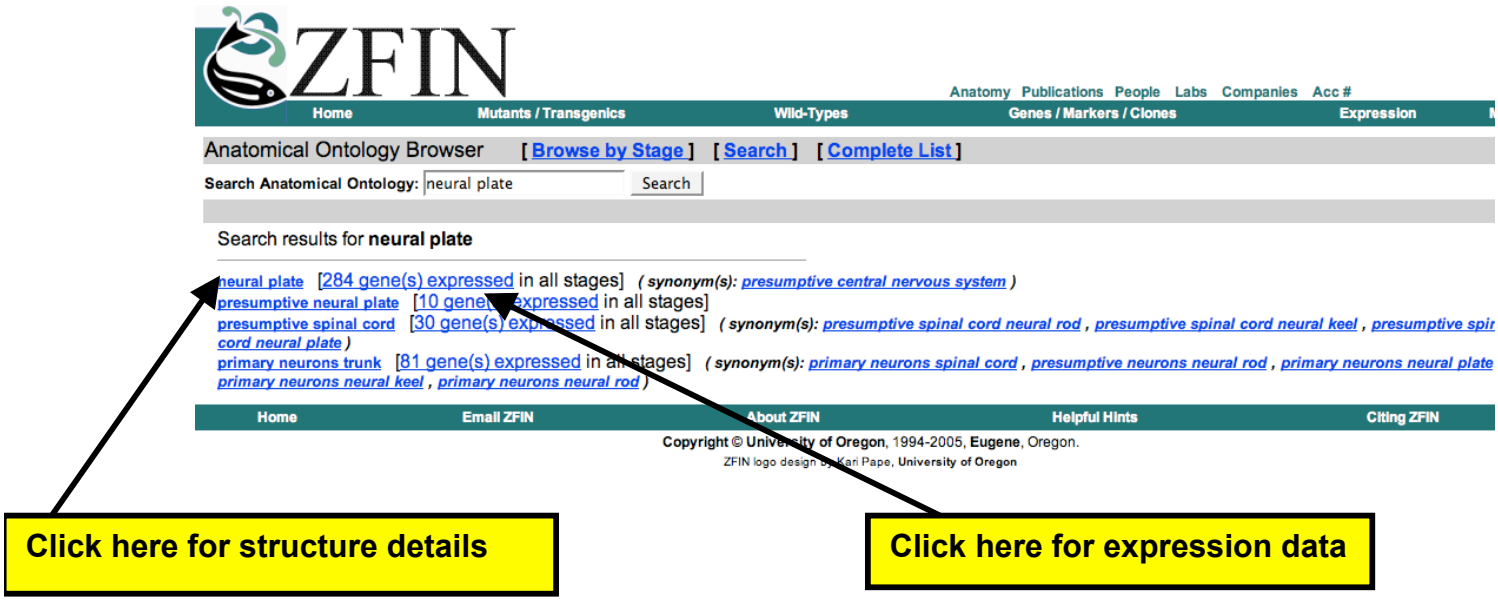
3. Gene expression data may also be found by browsing the anatomical dictionary, http://zfin.org/cgi-bin/webdriver?MIval=aa-anatdict.apg&mode=search




A search for **neural plate** returns the following list:




Looking at the **neural plate** anatomy page, http://zfin.org/cgi-bin/webdriver?MIval=aa-anatomy_item.apg&OID=ZDB-ANAT-010921-5060, notice synonyms and a definition for neural plate, the stages in which the

neural plate is present, links to genes expressed in the neural plate, related structures and a list of publications with neural plate in their abstract.


## Exercises

- How can you find expression patterns for your marker in early wildtype development to determine if the observed change is due to misexpression or a delay in development?
- Can you find any knockdown studies for a gene you are studying?

Use the gene expression query form to find expression data for an anatomical structure during a specified developmental stage range.