
Module 4: Function and Expression (ZFIN)

iii - How Can I Find Possible Molecular Markers for an Anatomical Structure?

Aims

- Describe the ZFIN gene expression search form
- Suggest ways to customize a search for molecular markers for an anatomical structure

Introduction

The zebrafish anatomical dictionary, <http://zfin.org/cgi-bin/webdriver?Mlval=aa-anatdict.apg&mode=search>, plays a central role in our curation of gene expression data. Associating anatomical structure with gene expression patterns supports queries that can locate possible molecular markers for specific anatomical structures.

Finding a possible molecular marker

ZFIN integrates a large number of expression patterns from large scale *in situ* screens. These data provide the best source for molecular markers for anatomical structures. Explore these data using ZFIN's expression query form, <http://zfin.org/cgi-bin/webdriver?Mlval=aa-xpatselect.apg>.

Click here to browse the anatomical dictionary

The screenshot shows the ZFIN website search page. At the top left is the ZFIN logo. Below it is a navigation bar with links: Home, Mutants / Transgenics, Wild-Types, Genes / Markers / Clones, Expression, and Maps. A secondary navigation bar includes: Anatomy, Publications, People, Labs, Companies, and Acc #. The main search area is titled "Search for Gene Expression Data (New Features) NEW" and includes a "Your Input Welcome" button. Search criteria include: Gene/EST name, Genetic background name, MO knockdown: Gene name, and Author, each with a "contains" dropdown. The "Anatomy" section is highlighted with a yellow box and an arrow pointing to it. It contains a text input field with the placeholder "[Enter one anatomical term per line]", a "Include substructures" checkbox (checked), and "Expression in:" options: "Every term entered" (selected) and "Any term entered". To the right, the "Between stages:" section has dropdowns for "Zygote:1-cell" and "Adult", with a "&" symbol between them and a link to "Developmental Staging Series". The "Assay Type" is set to "ANY". The "Filters:" section includes: "Only show figures with images" (unchecked), "Show direct submission data" (checked), and "Show published literature" (checked). At the bottom, there are "Search" and "Reset" buttons. A footer contains: Home, Email ZFIN, About ZFIN, Helpful Hints, and Citing ZFIN. Copyright information: Copyright © University of Oregon, 1994-2005, Eugene, Oregon. ZFIN logo design by Kari Pape, University of Oregon.

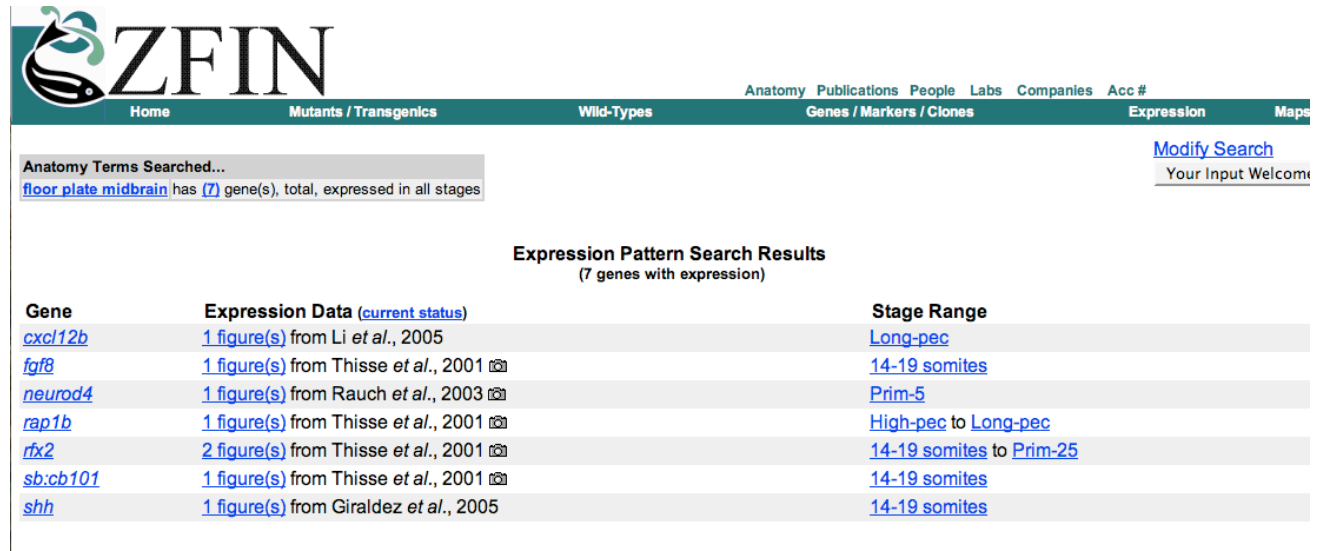
Limit results to

- only figures with images
- direct submission data
- published literature

Search by anatomical structure(s)
A word completion feature will provide you with a list of structures matching what you have entered. Select the desired structure from the list.

Specify the anatomical structure of interest in the **Anatomy** box. A word completion feature will provide you with a list of structures matching your input text as you type. Select the desired structure from the list. If you are unable to find the desired structure, access the anatomy browse feature by clicking on the **Anatomy** link. You will want to restrict your search to data from the large scale *in situ* screens. Be sure the checkboxes under the **Filters** header have checked to request **only figures with images** and **direct submission data**. Do not check **published literature**.

A search for **midbrain floorplate** returns the following:



The screenshot shows the ZFIN (Zebrafish Information Network) website interface. The top navigation bar includes links for Home, Mutants / Transgenics, Wild-Types, Anatomy, Publications, People, Labs, Companies, Acc#, Genes / Markers / Clones, Expression, and Maps. A search bar on the right contains the text 'Anatomy Terms Searched...' and 'floor_plate midbrain has (7) gene(s), total, expressed in all stages'. Below the search bar, the results are displayed under the heading 'Expression Pattern Search Results (7 genes with expression)'. The results are presented in a table with three columns: Gene, Expression Data (current status), and Stage Range.

Gene	Expression Data (current status)	Stage Range
cxcl12b	1 figure(s) from Li <i>et al.</i> , 2005	Long-pec
fgf8	1 figure(s) from Thisse <i>et al.</i> , 2001	14-19 somites
neurod4	1 figure(s) from Rauch <i>et al.</i> , 2003	Prim-5
rap1b	1 figure(s) from Thisse <i>et al.</i> , 2001	High-pec to Long-pec
rfx2	2 figure(s) from Thisse <i>et al.</i> , 2001	14-19 somites to Prim-25
sb.cb101	1 figure(s) from Thisse <i>et al.</i> , 2001	14-19 somites
shh	1 figure(s) from Giraldez <i>et al.</i> , 2005	14-19 somites

Examine the matching figures for a clone that will meet your needs. To facilitate these types of searches, we will be working with the laboratories conducting the large scale *in situs* to include the identification of strong molecular markers for structures.

Exercises

- Find a possible molecular marker for a structure of interest.