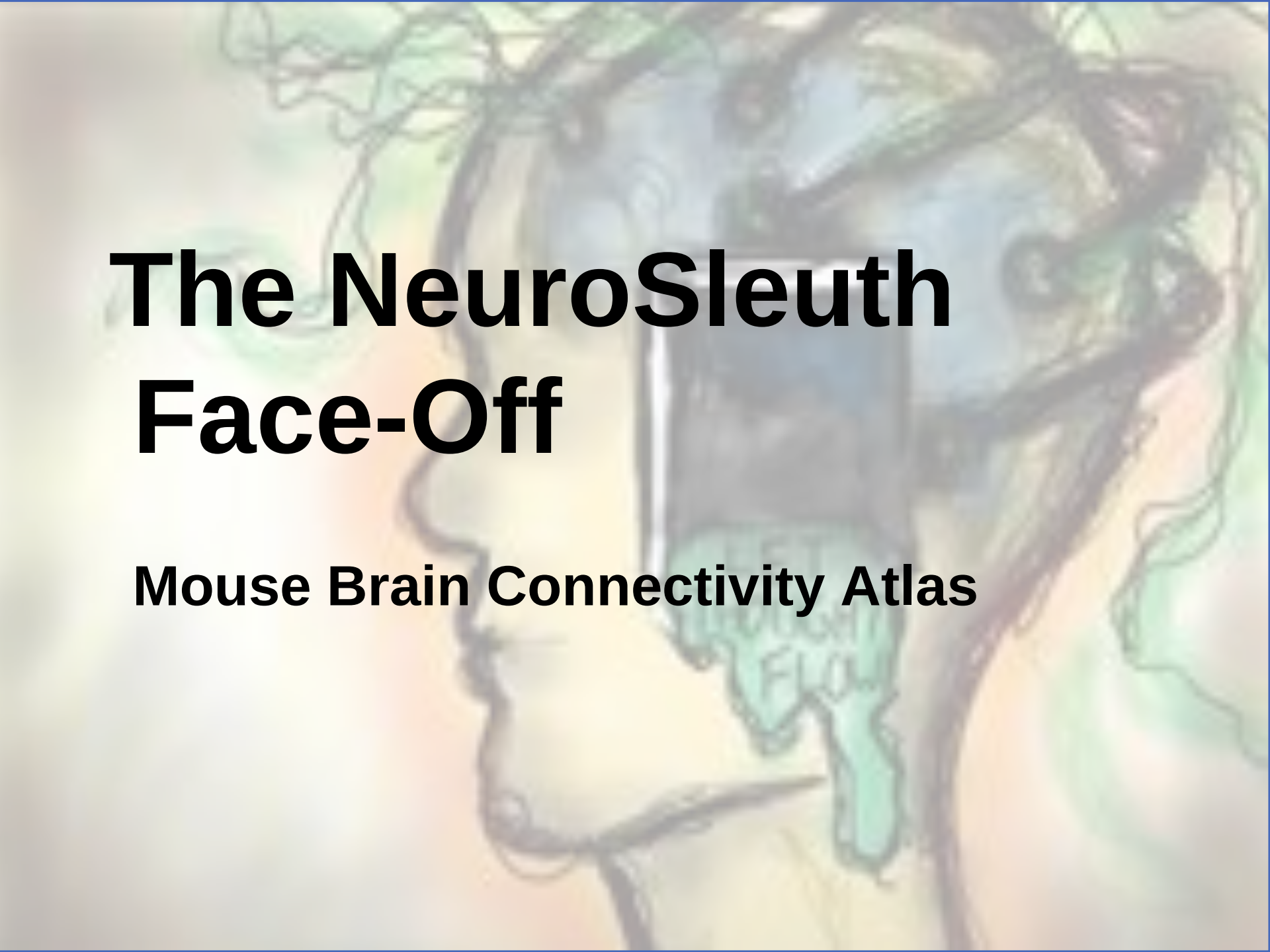
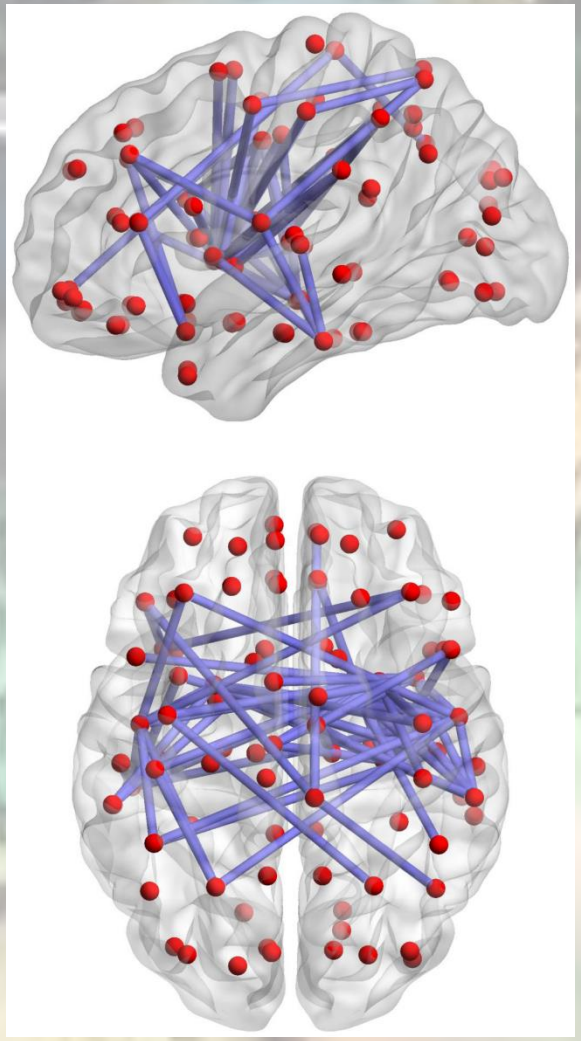


The NeuroSleuth Face-Off

Mouse Brain Connectivity Atlas

The brain is composed of networks that perform different functions

- There are brain areas that perform certain functions (e.g., recognize shapes, control movement)
- Most activities require the coordinated activities of several brain areas
- Brain areas combine to form networks that accomplish specific functions (e.g., reading, drawing)



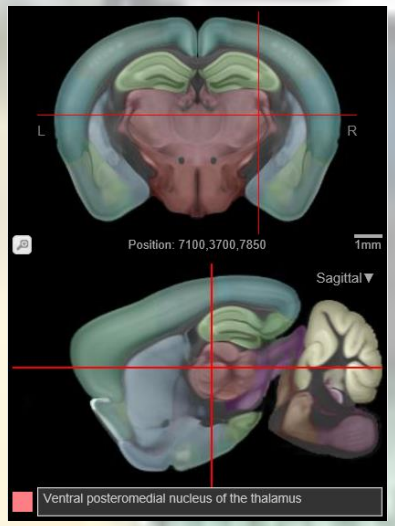
A trip to the grocery store offers a good analogy to brain networks

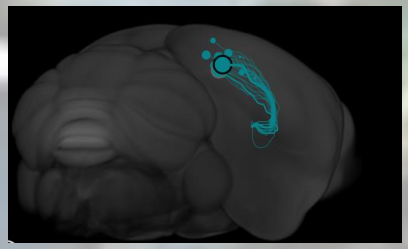
Sections of the store with different foods are like different brain areas that perform different functions

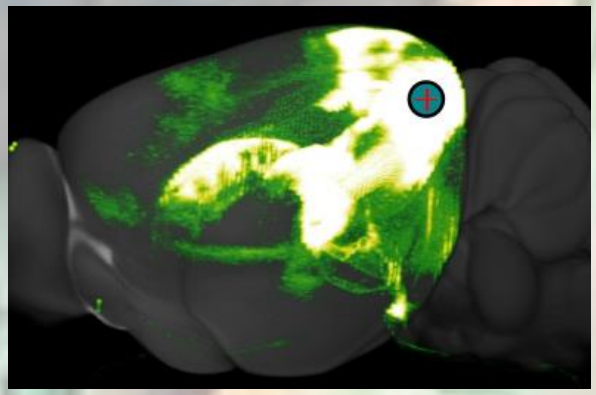
- **Shopper 1 wants to bake a cake, they will go to certain sections of the store - their path through the store is like the brain network for one activity (e.g., riding a bicycle)**
- **Shopper 2 is making hamburgers, their path will be different, like the brain network for a different activity (e.g., telling a story)**

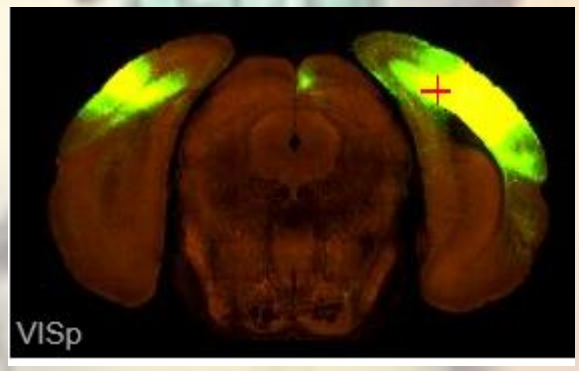
The Mouse Brain Connectivity Atlas is a tool for analyzing brain networks

- Based on over 1,000 studies
- Virus injected into specific areas of the brain that caused a green fluorescent signal to be emitted
- Fluorescent signal shows the connections to other areas of the brain (i.e., brain networks)









Access the website for the Mouse Brain Connectivity Atlas

Search Google for "Mouse Brain Connectivity Atlas"

or

Enter the web address

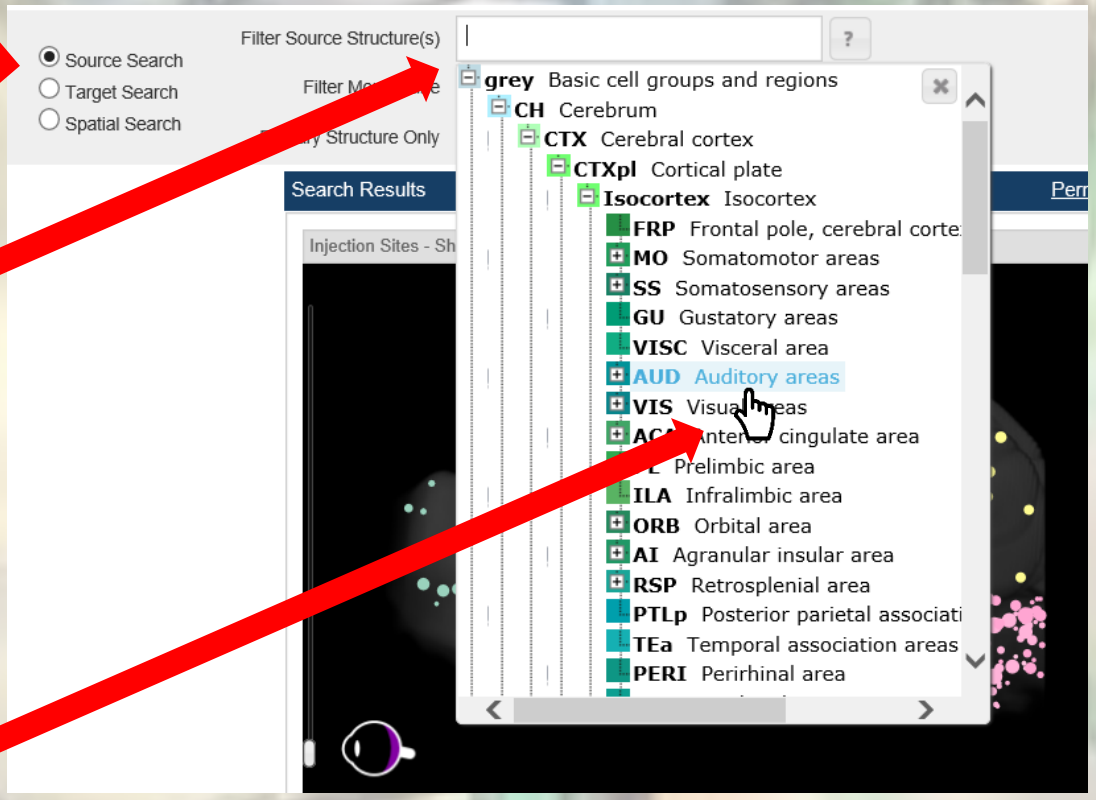
"connectivity.brain-map.org"

How to find studies where injections went into a specific brain region

Assure “Source Search” is selected

Delete the entries in the Filter Source Structures field

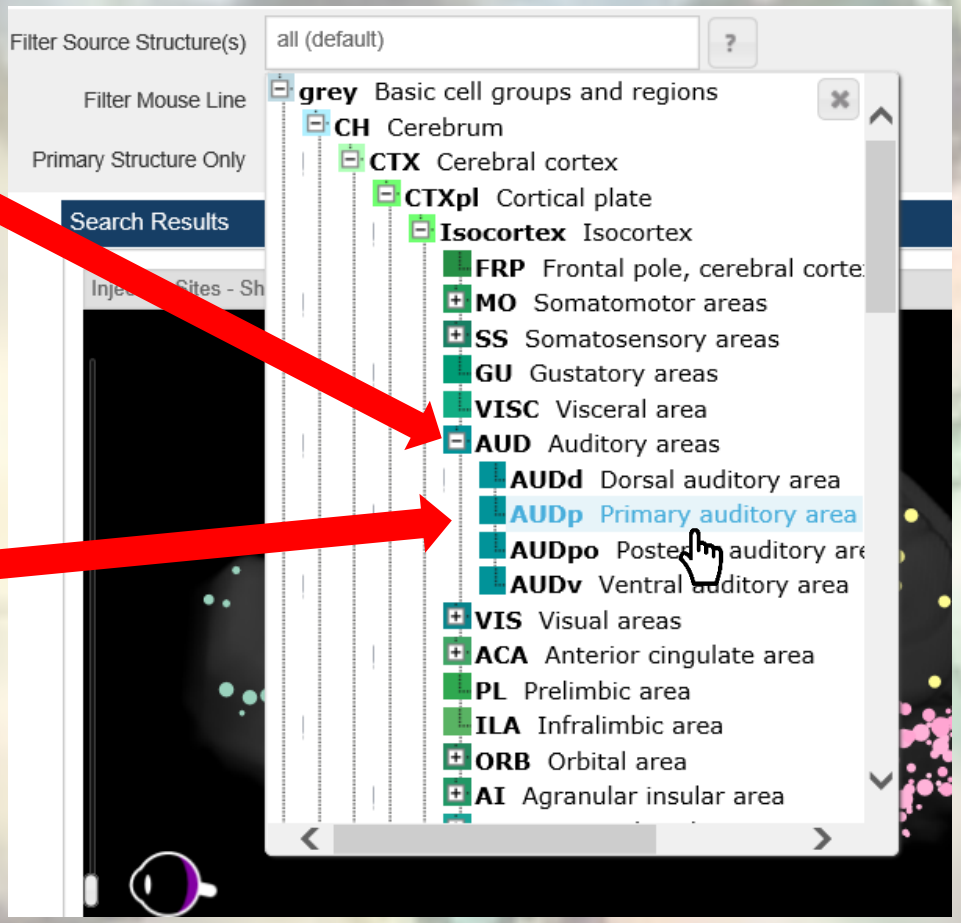
From the pulldown menu, select “AUD Auditory Areas”



The list for a given brain region may be expanded

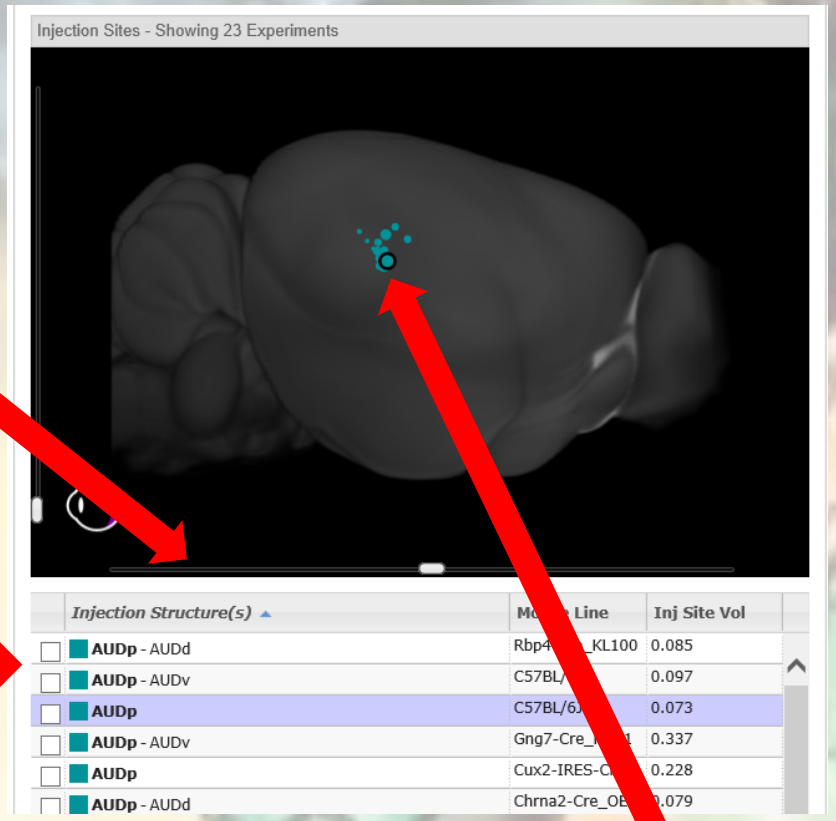
Click on the “+” to expand the list and show subregions of the Auditory Area

Select the “AUDp Primary Auditory Area”



Dots on the brain image each correspond to a different study

Use the slider to rotate the brain image to find a good perspective for viewing the location for different studies

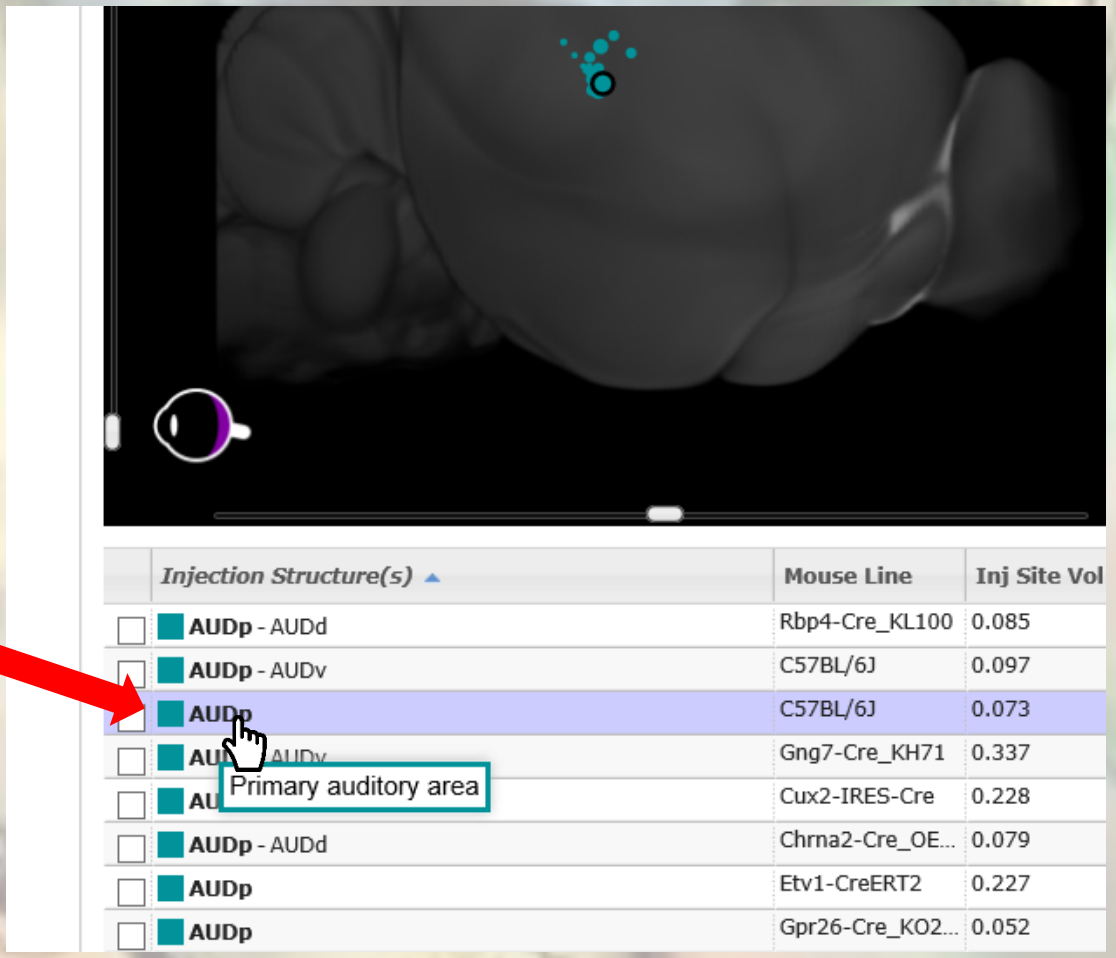


The list below the brain image shows each of the studies

Double click on a study to select the study – the dot for the selected study will be outlined

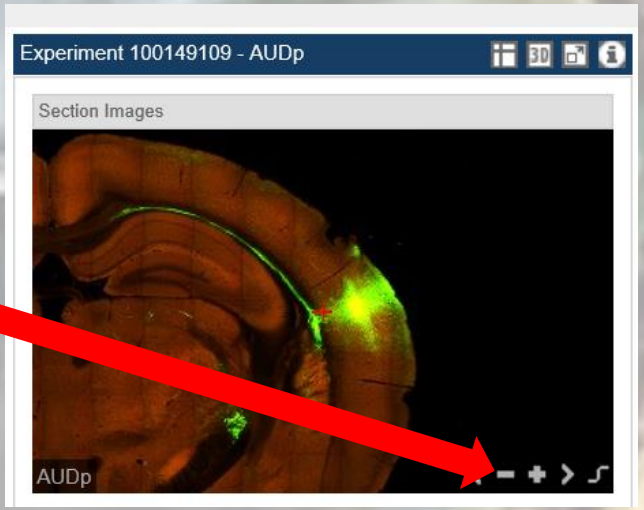
Hovering the mouse over the abbreviation for a brain region shows its name

Hover the mouse over the abbreviation for the brain region targeted in the selected study to see the name of the brain region

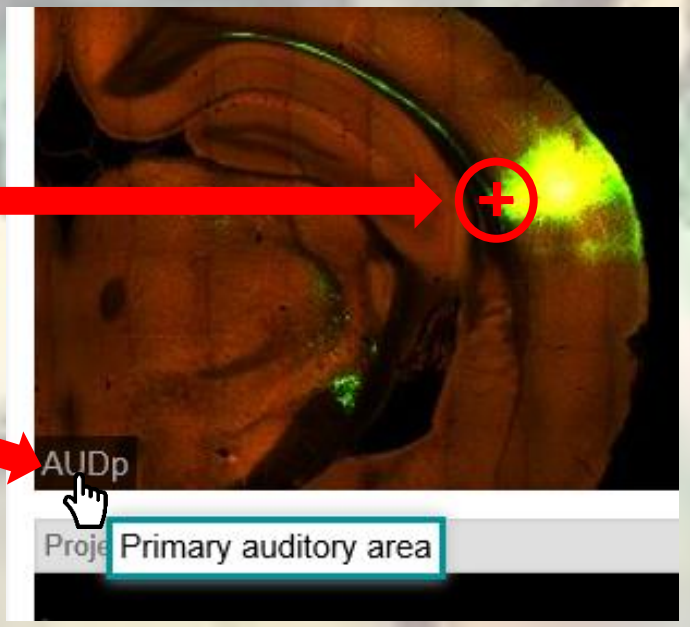


The upper right panel shows a coronal slice for the study

Use the plus and minus buttons to increase and decrease the magnification

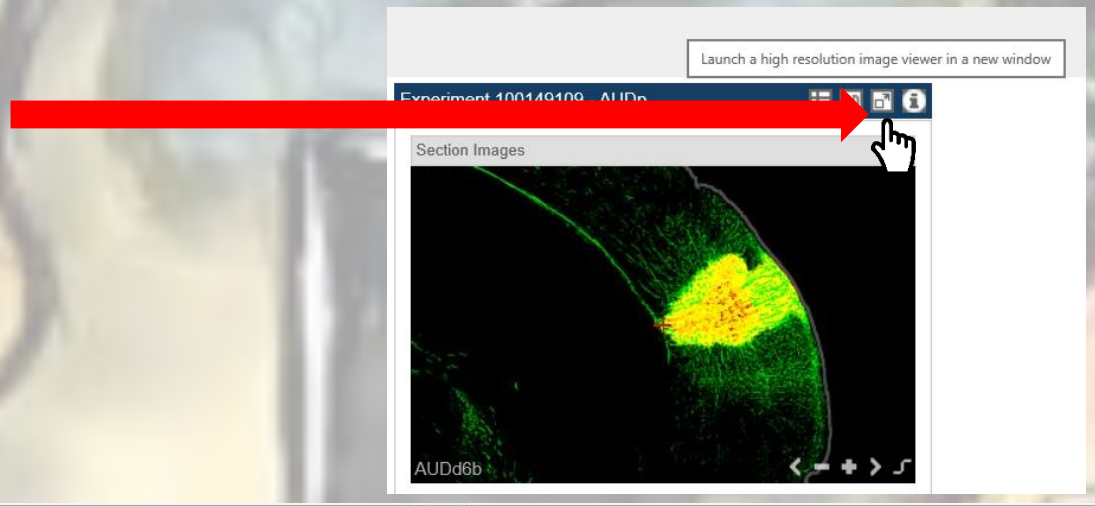


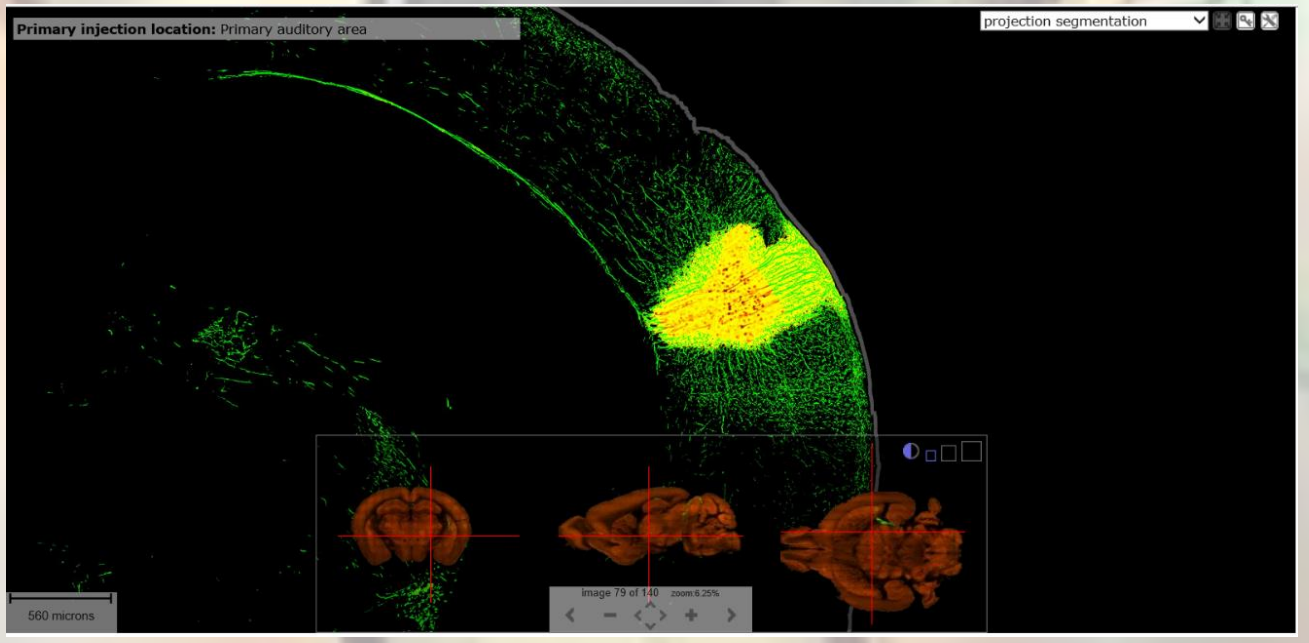
The red “+” designates a specific location, with the name of the brain region shown in the bottom right corner



Images may be displayed in a high resolution viewer

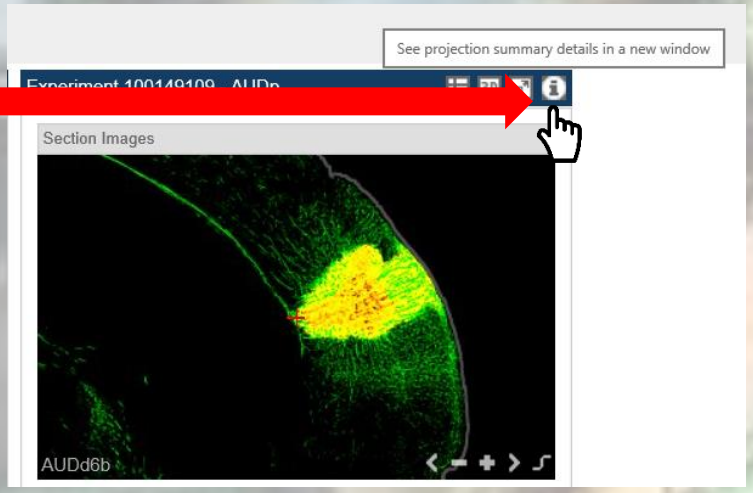
Click on the button for the high resolution viewer to open a new window with a more detailed image





The projection summary shows the extent of connections to other brain areas

Select the Projection Summary button to open a new window with a summary of connections

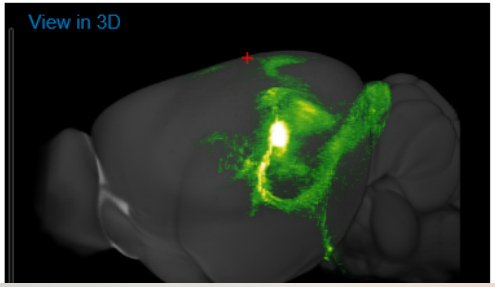


Manual Injection Summary

Experiment	**100149109**
Primary Structure	**Primary auditory area**
Coords. (AP,ML,DV,∠)	**Bregma(-2.46, 4.25, 0.81, 0)**
Mouse Strain	**C57BL/6J**

Quantified Injection Summary

AUDp



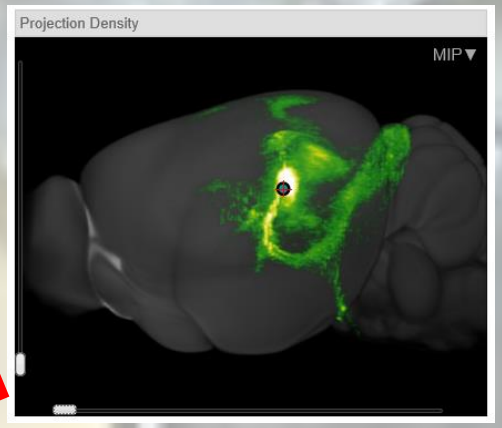
Projection Volume ▼ 0.0050 / 1.8578 mm³

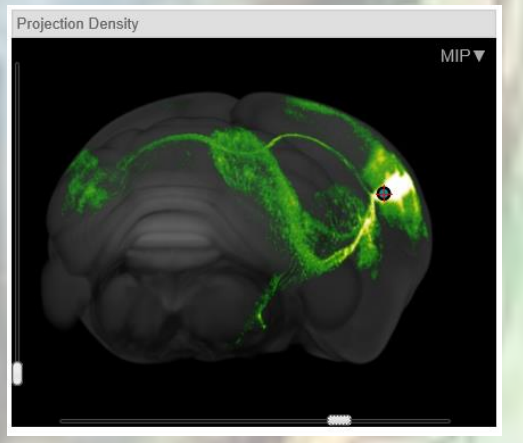
search for structures

Structure	Left Hemisphere	Right Hemisphere
grey	0.1848	1.6995
Isocortex	0.1700	0.9524
MOp	0.0008	0.0182
MOs	0.0007	0.0166
SS	Primary motor area	0.0392
SSp-tr	0.0031	0.0164
SSp-un	0.0001	0.0057
SSs	0.0004	0.0166
AUDd	0.0573	0.2377
AUDp	0.0693	0.3197
AUDv	0.0084	0.0724
VISal	0.0040	0.0205
VISam	0.0057	0.0207
VISl	0.0006	0.0074
VISp	0.0007	0.0141

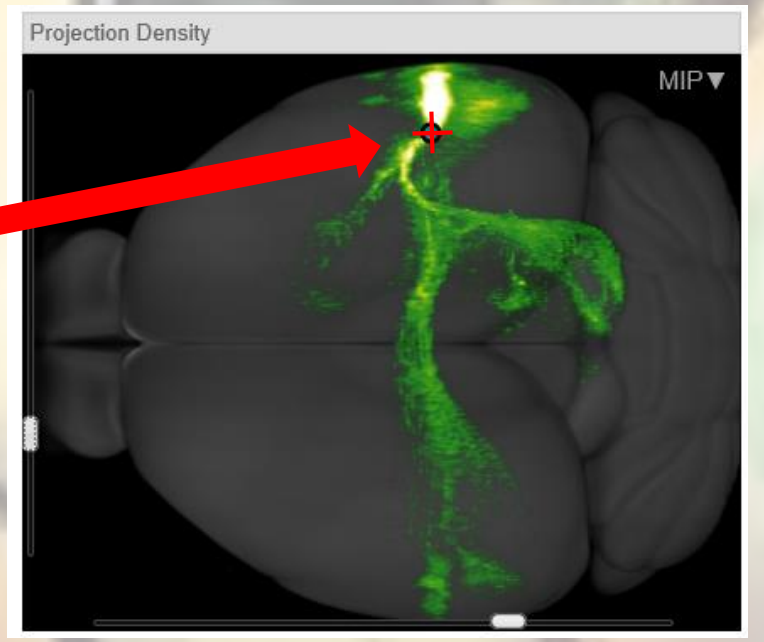
The bottom right panel shows a three-dimensional image

Move the two sliders to see the image from different perspectives





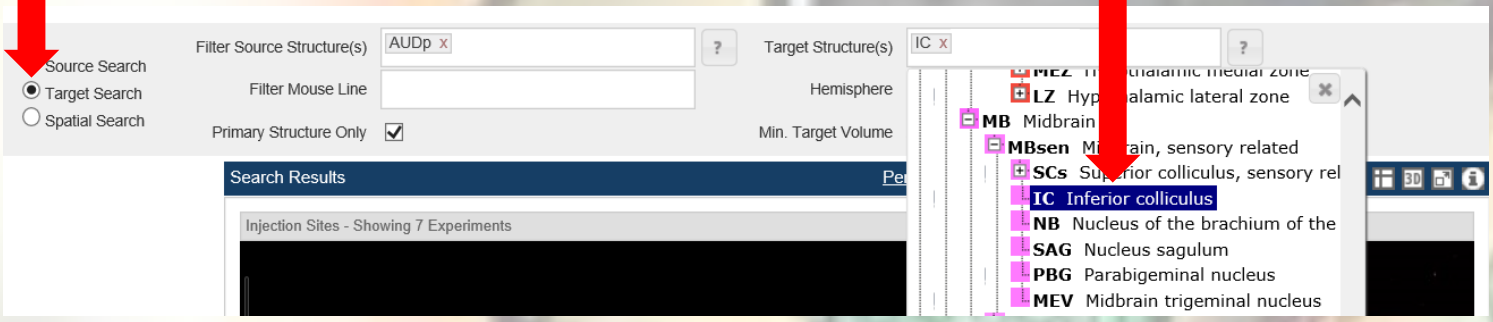
By clicking on the image to move the red "+," the names of brain regions receiving connections may be identified



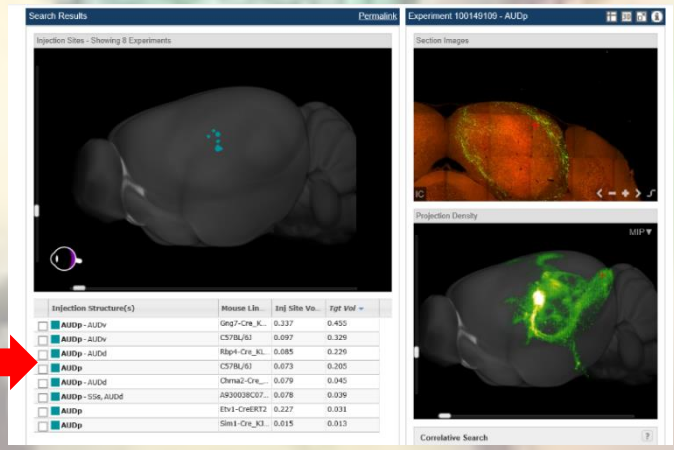
Studies may be found where there are connections to specific brain regions

Select the Target Search button

In the Target Structures field, select Inferior Colliculus (under Midbrain and then, Midbrain, sensory related)

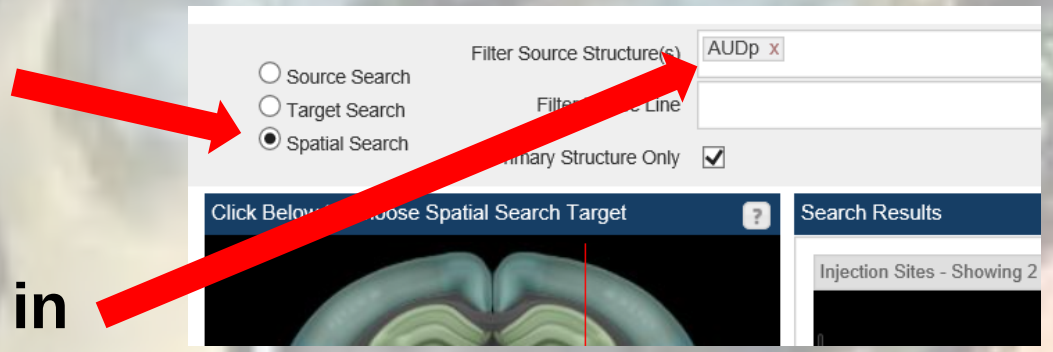


Click on different studies to compare the results



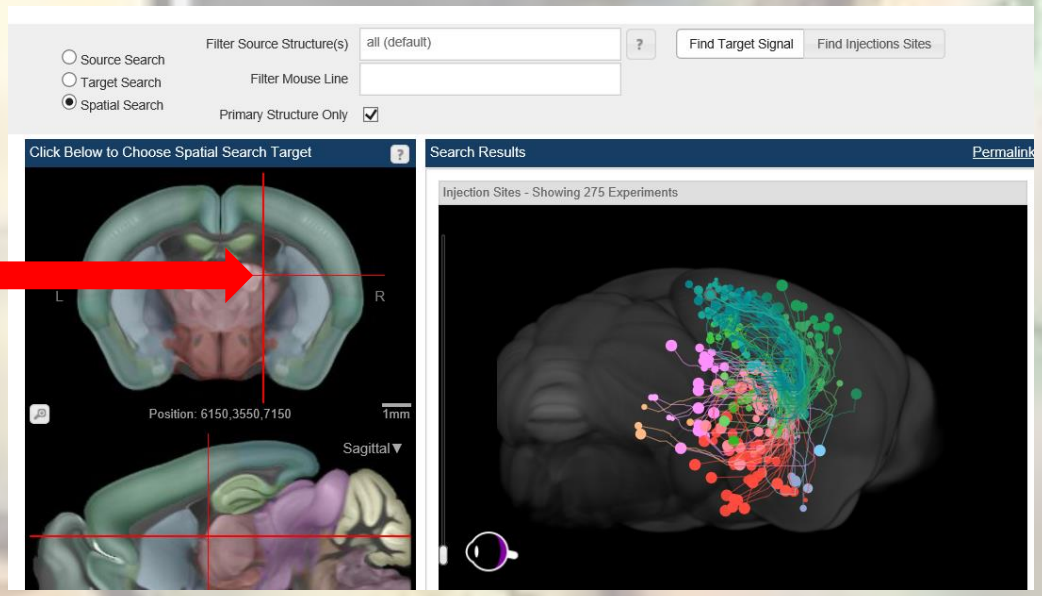
Using spatial search, studies may be found where a selected location was the target

Click on the Spatial Search radio button



Delete any entries in the Filter Sources Structures field

Click on a brain location in one of the images showing the brain sections to see studies in which the area was a target



Spatial search may also be used to find injection sites

Click on the Filter Injection Sites button

Adjust the slider to widen or shrink the area considered