

*This document was created to introduce users to the Allen Brain Cell (ABC) Atlas and to provide an example use case of the tool and how to accomplish it. Last updated August 2025.*

## **Vignette Type: Scientific Knowledge**

### **Specific Example: Whole Human Brain**

User:

Career: **Undergraduate Students** | **Graduate Students** | Post-Docs | Senior Scientists/PI | Teachers

Experience of Cell Types: **Novice** | Advanced Beginner | Intermediate | Expert

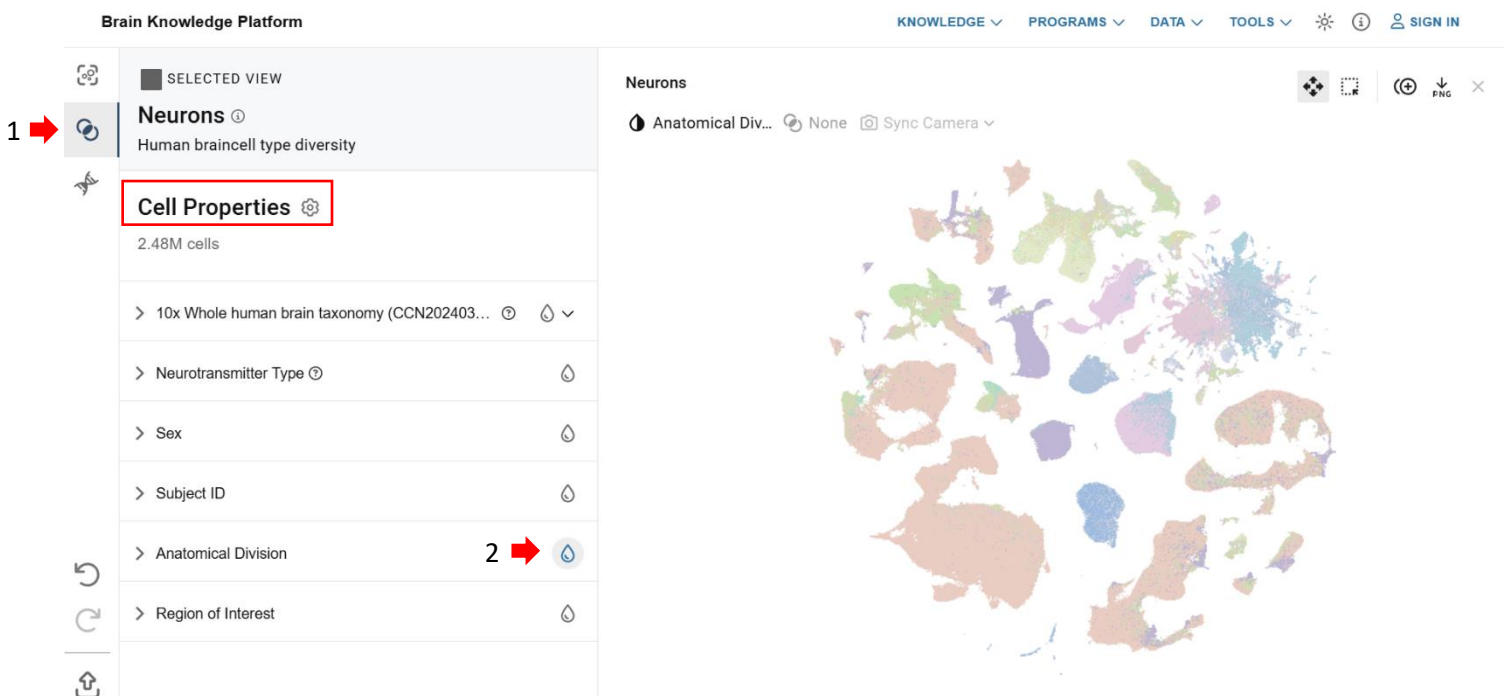
Research: **Basic** | Translational

Research Type: Computational | **Molecular** | Behavior

Experimental Model: Mouse | Rat | Non-Human Primate | **Human** | Invertebrate | Non-Traditional Vertebrate

During journal club, a student was introduced to Siletti et al., 2023, which contains single nucleus RNA seq data from the entire human brain. Prior to journal club, the student had mainly read about cells in the neocortex; the student is now interested in learning more about data from other brain regions.

1. The student read in Siletti et al., 2023 that one of the more diverse areas was the brainstem. To isolate just nuclei from the brainstem, the student first clicks on the “Cell Properties” tab (step 1) and colors by “Anatomical Division” by clicking on the ink drop symbol (step 2). [Link to view in ABC Atlas](#)



The screenshot displays the Brain Knowledge Platform interface. On the left sidebar, under the 'Neurons' section (labeled 'Human braincell type diversity'), the 'Cell Properties' tab is selected and highlighted with a red box. Below this, a list of properties is shown, including '10x Whole human brain taxonomy (CCN202403...', 'Neurotransmitter Type', 'Sex', 'Subject ID', 'Anatomical Division', and 'Region of Interest'. The 'Anatomical Division' property is selected, indicated by a red arrow labeled '2' and a blue ink drop icon. The main panel on the right shows a 3D brain model with various colored regions, representing the 'Neurons' view. The top navigation bar includes links for KNOWLEDGE, PROGRAMS, DATA, TOOLS, and a SIGN IN button.

- To isolate nuclei from specific parts of the brainstem, the student clicks on the arrow (step 1) to display all anatomical divisions and checks the “Pons” box (step 2). [Link to view in ABC Atlas](#)

Brain Knowledge Platform

KNOWLEDGE ▾ PROGRAMS ▾ DATA ▾ TOOLS ▾ SIGN IN

**Neurons** ⓘ  
Human braincell type diversity

**Cell Properties** ⚙️  
107k cells / 2.48M cells  
CLEAR 1 FILTER

1 →

> Sex

> Subject ID

1 →

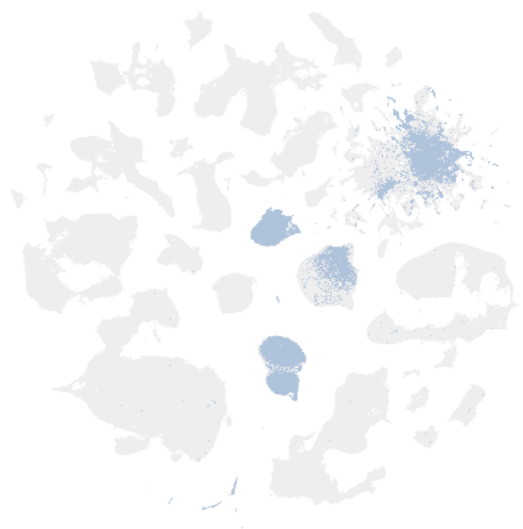
2 →

▼ Anatomical Division ⓘ

☐ Hypothalamus 0
 ☐ Midbrain 0
 ☐ Cerebellum 0
 ☒ Pons 107k
 ☐ Myelencephalon 0
 ☐ Spinal cord 0

Neurons

Anatomical Div...
 1 Filter
 Sync Camera ▾



- To look at the diversity within the pons, the student decides to look at the different clustered taxonomy levels (supercluster, cluster, and subcluster). The student filters by supercluster (the broadest level), by clicking the ink drop next to “10x Whole human brain taxonomy” (step 1) and selecting “Supercluster” in the pop-up menu (step 2). By clicking on the arrow next to “Supercluster” (step 3), the student can see the color-coded names of the superclusters present and the number of nuclei per cluster. [Link to view in ABC Atlas](#)

Brain Knowledge Platform

KNOWLEDGE ▾ PROGRAMS ▾ DATA ▾ TOOLS ▾ SIGN IN

**SELECTED VIEW**

**Neurons** ⓘ  
Human braincell type diversity

**Cell Properties** ⚙️ CLEAR 1 FILTER  
107k cells / 2.48M cells

3 ➔ 10x Whole human brain taxonomy (CCN20... ⓘ 1

➤ Neurotransmitter Type ⓘ

➤ Sex

➤ Subject ID

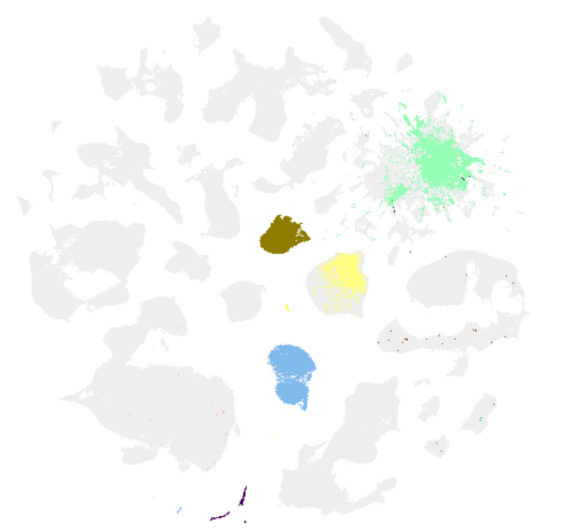
➤ Anatomical Division

**Pons** x

➤ Region of Interest

**Neurons**

🔍 10x Whole huma... > Supercluster 1 Filter Sync Camera ▾



➔ 1

➔ 2

Supercluster

Cluster

Subcluster

3 ➔ 10x Whole human brain taxon... ⓘ + - 🔍 ▾

	➤ Splatter	33.1k
	➤ Mammillary body	1
	➤ Thalamic excitatory	0
	➤ Midbrain-derived inhibitory	3.77k
	➤ Upper rhombic lip	19k
	➤ Cerebellar inhibitory	1.56k
	➤ Lower rhombic lip	49k
	➤ Oligodendrocyte	0

4. To look at the next level, the student clicks the ink drop next to “10x Whole human brain taxonomy” (step 1) and selects “Cluster” in the pop-up menu (step 2). To view the clusters present within the superclusters, the student can see the color-coded names of the clusters by clicking on the arrow next to “Supercluster” (step 3) and then clicking the arrows next to the individual superclusters (step 4), to see the color-coded clusters within each supercluster. [Link to view in ABC Atlas](#)

**Brain Knowledge Platform** KNOWLEDGE ▾ PROGRAMS ▾ DATA ▾ TOOLS ▾ ⚙ ℹ SIGN IN

SELECTED VIEW

Neurons ⓘ  
Human braincell type diversity

Cell Properties ⓘ  
107k cells / 2.48M cells  
CLEAR 1 FILTER

3 →

10x Whole human brain taxonomy (CCN20... ⓘ)

Neurotransmitter Type ⓘ

Sex

Subject ID ⓘ

Anatomical Division ⓘ  
Pons x

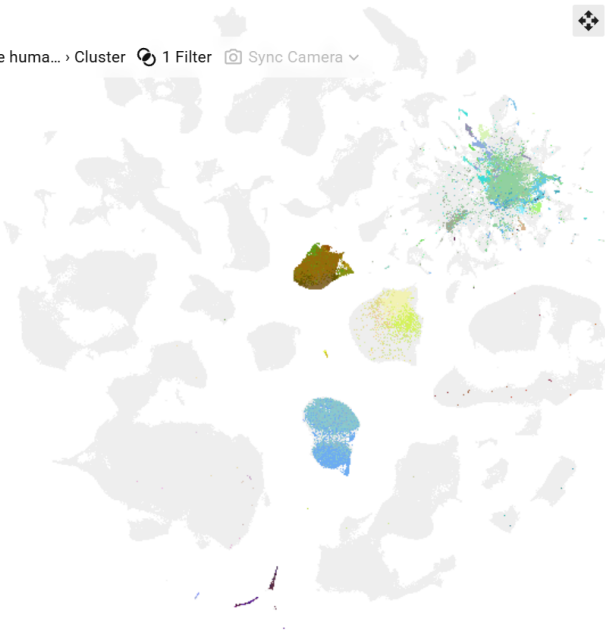
Region of Interest ⓘ

1

2

Neurons

10x Whole huma... > Cluster 1 Filter Sync Camera ▾



3 →

10x Whole human brain taxon... ⓘ

+

-

Q

1

superclusters

☐ > Splatter 33.1k

☐ > Mammillary body 1

☐ > Thalamic excitatory 0

☐ > Midbrain-derived inhibitory 3.77k

☐ > Upper rhombic lip 19k

4 →

☐ > Upper rhombic lip 19k

☐ > URL\_297 0

☐ > URL\_308 94

☐ > URL\_309 332

☐ > URL\_310 8.75k

☐ > URL\_311 7.99k

clusters

5. To look at the most detailed level of the taxonomy (subcluster), the student clicks the ink drop next to “10x Whole human brain taxonomy” (step 1) and selects “Subcluster” in the pop-up menu (step 2). To view the subclusters present within the clusters and superclusters, the student clicks on the arrow next to “Supercluster” (step 3), then clicks the on arrows next to the individual superclusters (step 4) to see the clusters within, and then clicks the on arrows next to the clusters to see the color-coded subclusters within each cluster (step 5). [Link to view in ABC Atlas](#)

**Brain Knowledge Platform** KNOWLEDGE ▾ PROGRAMS ▾ DATA ▾ TOOLS ▾ SIGN IN

**Neurons** 10x Whole huma... ▾ Subcluster 1 Filter Sync Camera ▾

**SELECTED VIEW**

**Neurons** Human braincell type diversity

**Cell Properties** CLEAR 1 FILTER

107k cells / 2.48M cells

3 10x Whole human brain taxonomy (CCN20... 1

Supercluster

Cluster

Subcluster 2

Neurons

10x Whole huma... ▾ Subcluster 1 Filter Sync Camera ▾

3 10x Whole human brain taxon... 4 10x Whole human brain taxon...

superclusters

Upper rhombic lip 19k

Cerebellar inhibitory 1.56k

Lower rhombic lip 49k

clusters

Upper rhombic lip 19k

URL\_297 0

URL\_308 94

URL\_309 332

5 10x Whole human brain taxon...

Upper rhombic lip 19k

URL\_297 0

URL\_308 94

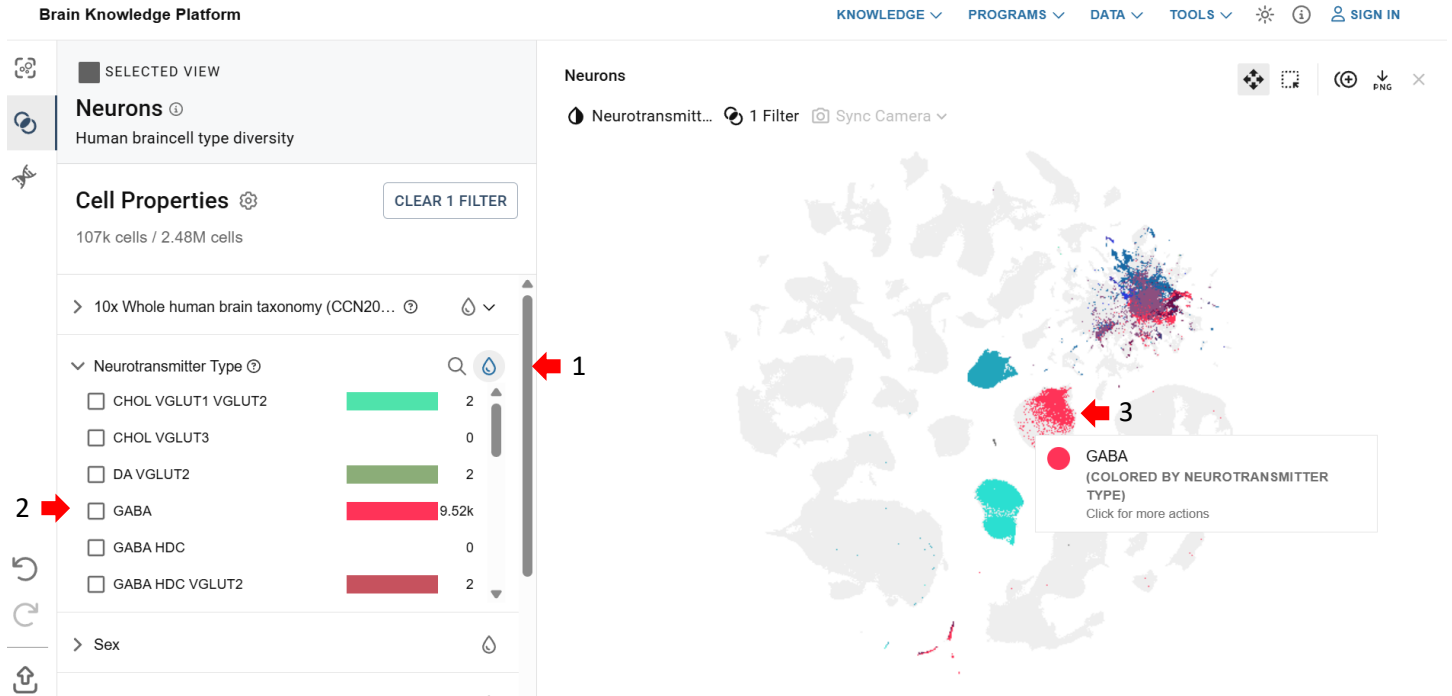
URL\_308\_1 17

URL\_308\_2 8

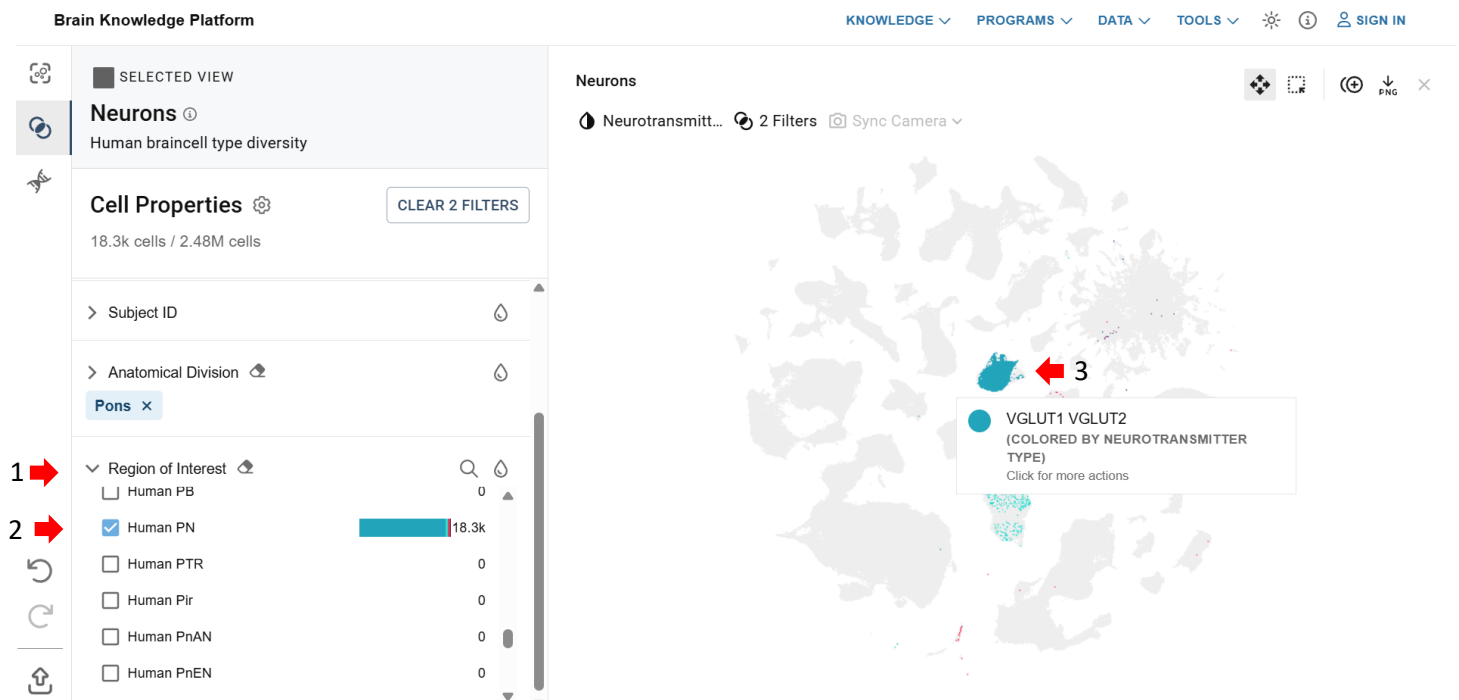
URL\_308\_3 44

subclusters

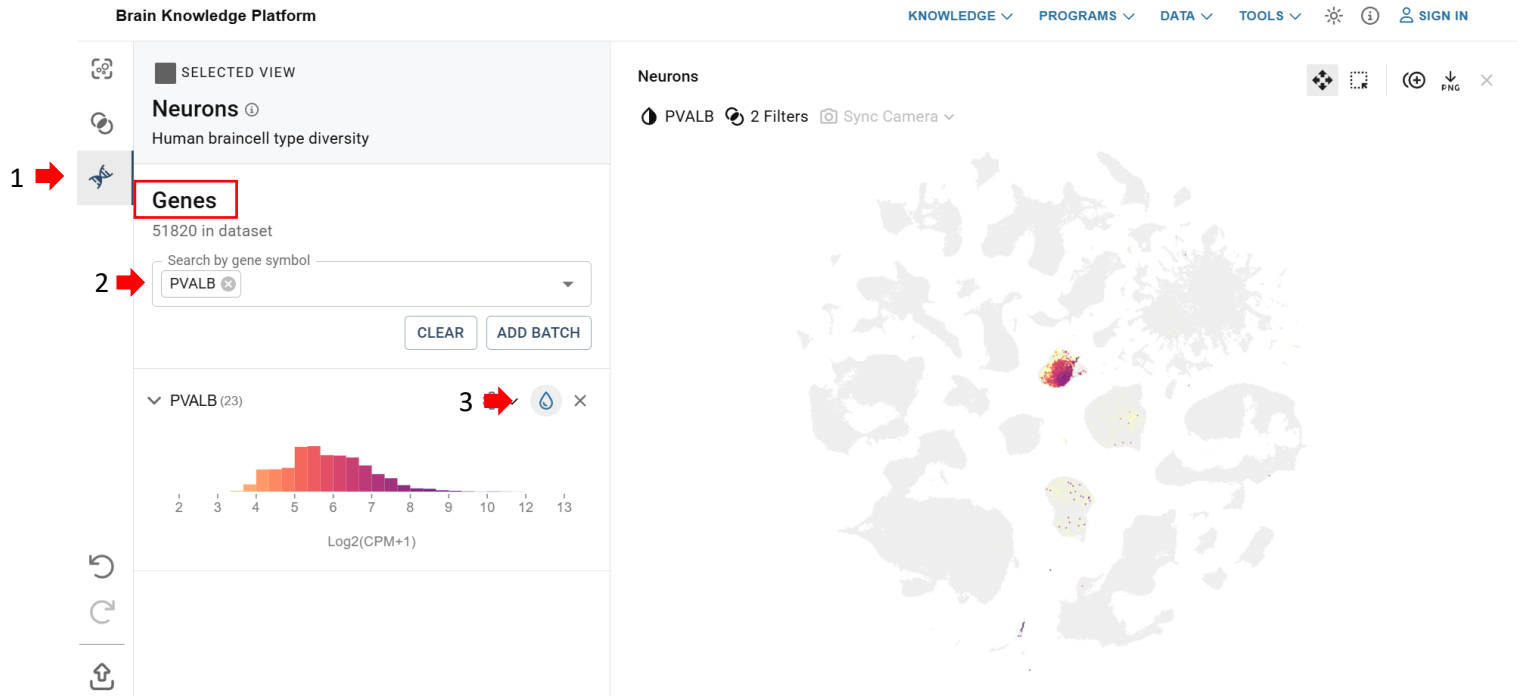
6. To see which neurotransmitters are present in the pons, the student clicks on the ink drop symbol next to “Neurotransmitter Type” (step 1). Clicking the drop arrow next to “Neurotransmitter Type” shows all the color-coded neurotransmitter categories (step 2) and hovering a mouse over the colored t-SNE plot reveals the corresponding neurotransmitter group (step 3). [Link to view in ABC Atlas](#)



7. In Figure 1 of Siletti et al., 2023, the student read that the pons has six regions of interest: DTg, PB, PN, PnAN, PnEN, and PnR. To see if neurotransmitters are region specific, the student clicks on the “Region of Interest” arrow (step 1) and filters for “Human PN” (step 2). By hovering the mouse over the colored part of the t-SNE (step 3), the student learns that the teal VGLUT1 VGLUT2 group is in the PN region. [Link to view in ABC Atlas](#)



8. While reading Siletti et al., 2023, the student noticed that the genes for some calcium-binding proteins were expressed in the pons. To see if they were expressed in the “PN” region, the student clicks on the gene tab (step 1), and types in a gene from the paper, “PVALB” (step 2). The student then colors the plot for *PVALB* gene expression by clicking on the ink drop symbol (step 3) and sees that *PVALB* is highly expressed. [Link to view in ABC Atlas](#)



9. Now that the student has learned a bit more about the pons, they are interested in looking at other brain regions as well; they then use the ABC Atlas to answer more questions.