

## Lab: Sheep Brain Dissection

Purpose To use a mammalian brain to relate to the three dimensional structure of the human brain

### Materials

- dissection tray (with 4 tools: scalpel, scissors, forceps, probe)
- 10 T-pins prepared with the following labels: cerebrum, corpus callosum, thalamus, hypothalamus, pineal gland, cerebellum, spinal cord, medulla oblongata, pons, midbrain
- gloves
- “The Concise Sheep Brain” dissection guide

### Dissection Photos

- Make a small tag with your full name to include in **each** of your dissection photos.
- Take photos against the blue dissection mat for good contrast.
- The brain should take up **most of the screen** to see maximum detail (all labeling will be done to sides of photo, not on the photo itself).
- Always a good idea to take **several photos** (with flash, without flash but good natural light, different angles) to ensure that at least one will turn out properly. You CANNOT use someone else’s photo in your dissection portfolio.
- If you have a cell phone or tablet handy, take a picture use an app to label the parts while they are still clear in your mind (I have used “photo2text” on my iPhone). This will help label your real photo later on.
- Photos must be printed as a 4 x 6 in colour in high quality (not with a poor quality printer on regular paper)

### Part 1: External Sheep Brain

\*\* Take TWO photos (one of the dorsal surface and one of the ventral surface – see dissection guide for examples):

1. The tough outer covering of the sheep brain is the **dura mater**, one of three **meninges** (membranes) that cover the brain. If present, you will need to remove the dura mater to see most of the structures of the brain. Do so with extreme care to leave other structures intact.
2. The most prominent feature of the brain is the **cerebrum** - which is divided into nearly symmetrical **left** and **right hemispheres** by a deep longitudinal **fissure**.
3. The surface of the cerebrum is covered with large folds of tissue called **gyri**. The grooves between the gyri are **sulci**. The deeper sulci are often termed **fissures**. The fissures are used as landmarks to divide the surface of the cerebrum (the **cerebral cortex**) into regions:
  - a. Locate each of the lobes: **frontal, parietal, occipital, and temporal**
4. The smaller, rounded structure at the back of the brain is the **cerebellum**. The cerebellum has smaller gyri that are roughly parallel to one another. Compare the gyri of the cerebellum to that of the cerebrum. Removing the dura mater from the cerebellum can be tricky business. Look for areas on the side of the brain that you can snip to peel the dura mater off.

5. Turn the brain over so that the cerebrum is down. The most prominent structure on the ventral side of the brain is the optic chiasma, where the two **optic nerves** cross over each other and form an “X” shape. Locate the **optic chiasma**.
6. The **pituitary gland** is a large round structure under the chiasma. If you removed this area with the dura mater, you may need to replace it to see the chiasma and pituitary gland. In some samples, the pituitary gland has been removed along with the dura mater. In these cases, look just behind the optic chiasma is a raised area or bump that indicates the **infundibulum** (also known as the **pituitary stalk**). This is where the pituitary was attached to (which was probably removed with the dura mater).
7. Toward the front of the brain are two prominent round structures, the **olfactory bulbs**.
8. Toward the back of the brain, in order from the optic chiasma are bulges that indicate the **midbrain**, the **pons**, and the **medulla oblongata**.
9. Carefully bend the cerebellum to get an inside glimpse of the brain. The bumps you see (kind of resemble a “butt”) are the **superior colliculi**. The smaller ones underneath are **inferior colliculi**.
10. If you gently push those structures down, you can see the tiny nub of the **pineal gland**.

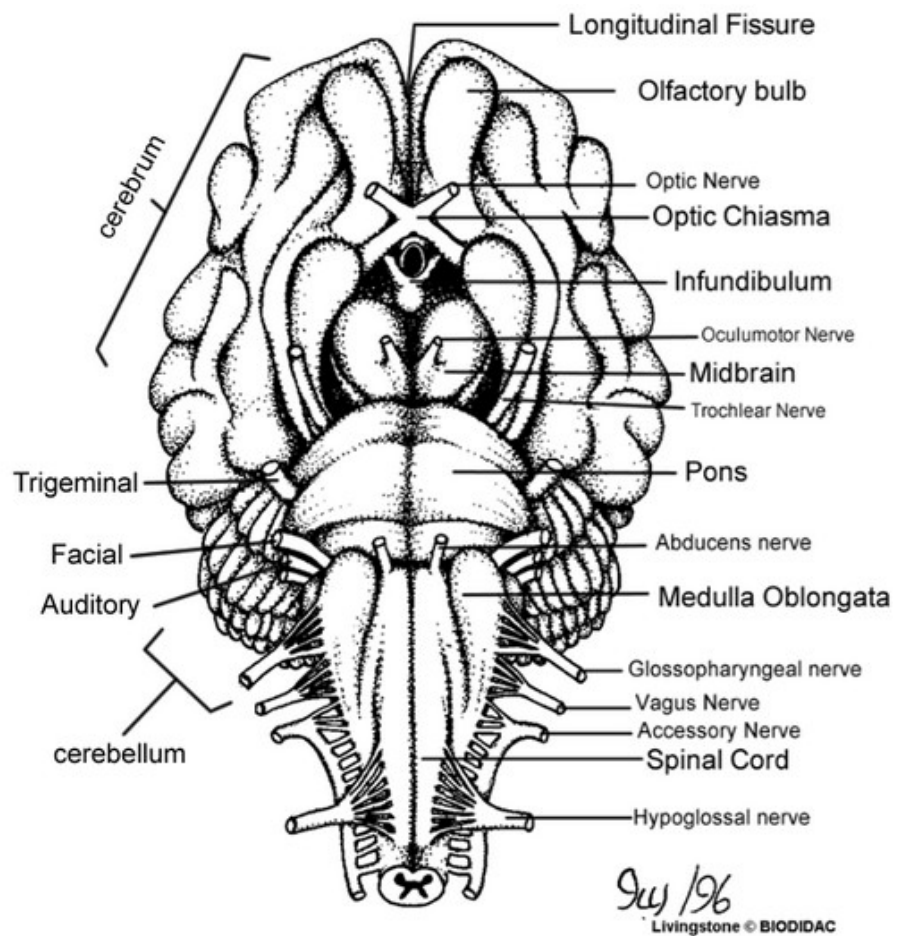
\*\* Ensure you can identify the following structures on your external photo pictures:

Photo 1 [Superior (dorsal) Surface]

- cerebrum
- gyrus
- sulcus
- longitudinal fissure
- transverse fissure
- cerebellum

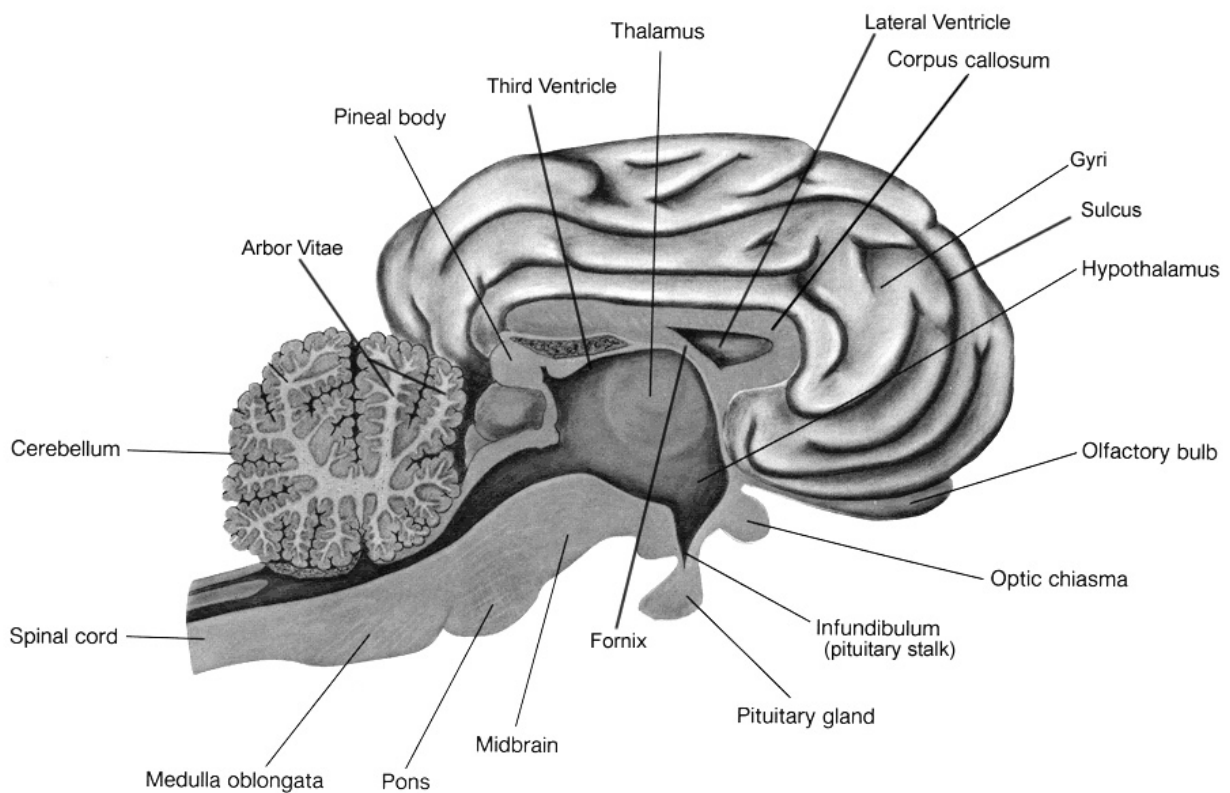
Photo 2 [Inferior (ventral) Surface]

- cerebrum
- olfactory bulbs
- optic nerve
- cerebellum
- pituitary gland
- meninges (dura mater)



## Part 2: Internal Sheep Brain

1. Use a knife or long-bladed scalpel to cut the specimen along the **longitudinal fissure**. This will allow you to separate the brain into left and right hemispheres. You should also cut through the cerebellum.
2. The **corpus callosum** had been connecting the two cerebral hemispheres and can now be clearly seen in the brain section.
3. The tiny space within the corpus callosum (which hold cerebrospinal fluid) is called the **lateral ventricle**. Underneath it, you can find the **third ventricle**. There are other ventricles within the brain, but those are the easiest to locate in a preserved specimen. The white area between those two ventricles is the **fornix**. The **fourth ventricle** is the space under the cerebellum.
4. Inferior to the corpus callosum is a round structure known as the **thalamus**. It seems it almost perfectly centered. Just behind the thalamus is the **pineal body** (gland). The **hypothalamus** is also round shaped but is lower and toward the front of the brain.
5. The **pons**, **medulla oblongata**, **cerebellum** and **spinal cord** are also visible in the side view of the brain. Gently separate the cerebellum at the **transverse fissure**, which separates it from the cerebrum.
6. Within the cerebellum, you can see the **arbor vitae**, named such because the white lines resemble a tree.
7. Use a scalpel to cut a cross section of the cerebrum in the occipital lobe area. You should be able to see the color and texture differences of the **white matter** and the **gray matter**.



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*COMPLETE then HAND IN*

### Practical Lab Marks

Use the T-pins you created at the beginning of the lab to label your half of brain **WITHOUT** assistance from the teacher. Once you are confident your labels are correct, have your teacher mark your labeled brain.

**MARK OUT OF 10 = \_\_\_\_\_**

Identify the five structures on the sample brain provided by your teacher.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

### Clean Up

- Dispose of the brain by placing it into a biohazard bag provided.
- Clean and dry tools and dissection tray. Return to proper cupboard and place in correct order.
- Clean workspace used and help dry counters and sinks once everyone has finished.
- Throw gloves and paper towel into the garbage.
- Wash hands thoroughly up to the elbows.

