



UNIVERSITY OF
NEW ENGLAND

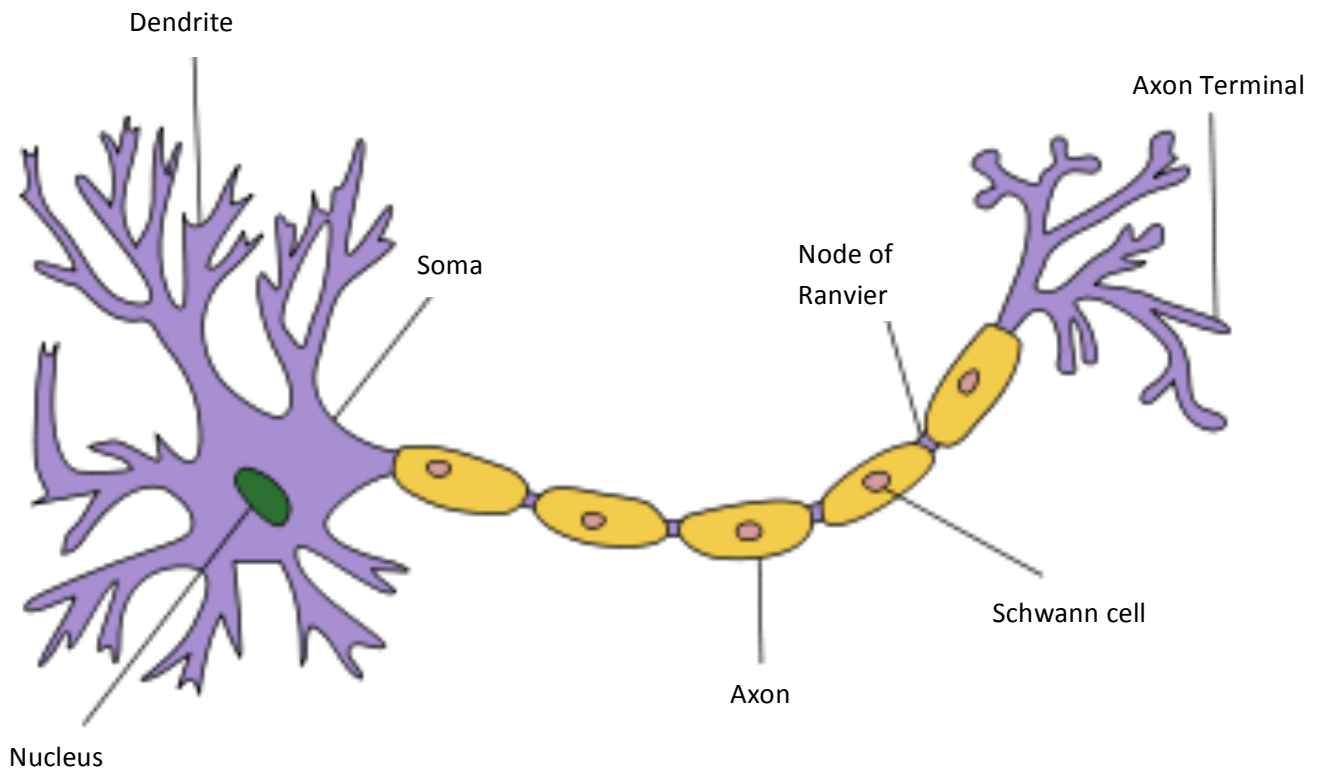
Center for Excellence
in the Neurosciences

CEN Outreach Neuroanatomy (Grades 6-12)



Neuroanatomy

What does a Neuron look like?



The yellow part of the neuron is called the **myelin sheath**. Its main purpose is to increase the speed of signals that travel across the axon. The signal gets sent from the dendrite through the nucleus, to the axon, and then goes to the axon terminal.

Dendrite- The branching process of a neuron that conducts signals towards the cell.

Soma- The body of an organism, or “cell body”.

Nucleus- Oval shaped, membrane bound structure, also contains genetic material in the form of chromosomes.

Axon- A long, slender projection of a nerve cell, it conducts electrical impulses away from the soma.

Node of Ranvier- A gap occurring at regular intervals between segments of myelin sheath along the nerve axon.

Schwann Cell- A cell of the peripheral nervous system that wraps around a nerve fiber, forming the myelin sheath.

Axon terminal- Endings by which the axons make synaptic contacts with other nerve cells.

Lobes of the Brain

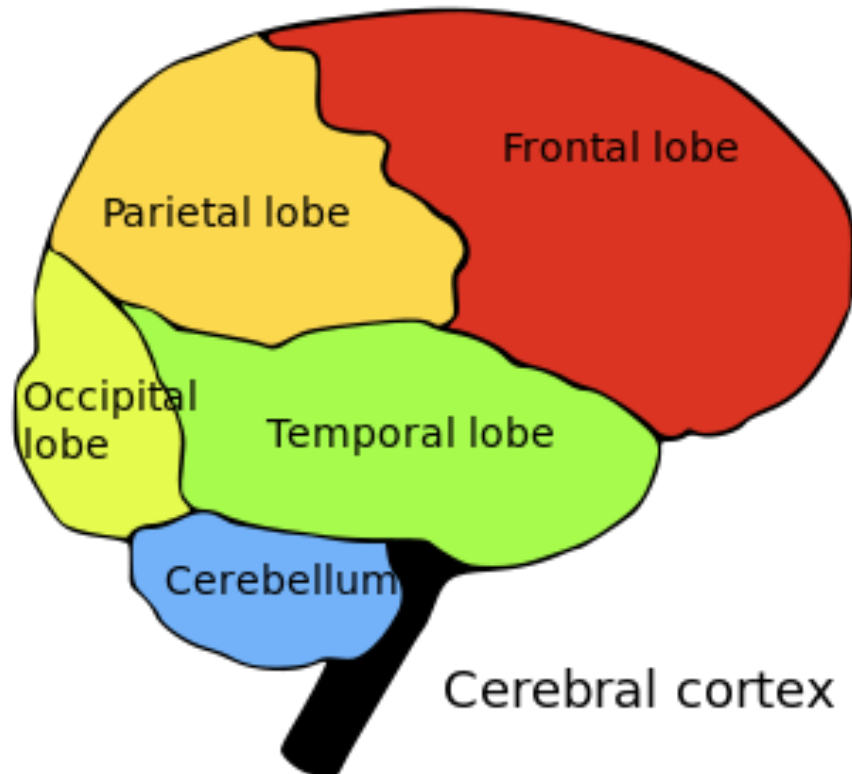
Frontal Lobe– The frontal lobe controls conscious thought, executive thinking, and decision-making. This is most unique to humans and more developed in humans than in animals. If you damage this, you will have trouble working socially and creatively as well as a decreased functioning in problem solving skills.

Parietal Lobe– This lobe plays important roles in integrating sensory information from the various senses (touch, smell, taste, sight, hearing). It is also responsible for visuospatial processing.

Occipital Lobe– This lobe is responsible for sense of sight. Lesions in this area can produce hallucinations and blindness.

Temporal Lobe – Controls senses of smell and sound. It also processes complex stimuli like faces. It is important in processing of semantics in both speech and vision.

Cerebellum – Plays an important role in motor control, it may be involved in some cognitive functions such as attention, language and in regulating fear and pleasure responses. It contributes to coordination, precision and accurate timing.



Cerebrospinal fluid (CSF) – This is the liquid surrounding the brain. It acts as a cushion or buffer for the brain, and allows for the brain to be buoyant. When the brain is suspended in CSF it is much lighter than it would be without the fluid.

If you damage one of your lobes, you can possibly lose the function of that lobe. For example, if you damage the frontal lobe, you can still go on living, but you would have impaired higher-level thinking and poor decision making skills. You may also have personality changes.

Comparative Animal Anatomy

You will have a rat, mouse, sheep brain, and a human brain model.

Compare the olfactory bulbs, the cortex, and size of the brain versus the size of the animal. Most animals compare to each other except for humans and other ape derivatives

Activity: Sheep Brain Dissection

Please be able to point out the following structures:

All of the lobes	Cerebellum	Brain Stem
Ventricles	Optic Chiasm	Olfactory bulb

Brain Stem – Controls all things required to live. This includes: respiration rate, change of heart rate, etc.

Optic Chiasm – The point at which the signal is sent to the brain. Where optic nerves partially cross.

Ventricles – Provides support for the brain, without the cerebrospinal fluid the brain's weight would close upon itself, it is also the place where blood turns into cerebrospinal fluid.

Olfactory Bulb – Place where the sense of smell is sent to the brain to be identified.

List of Supplies-

- Dissection pan
- Sheep Brain
- Dissection kit- scalpel, probe and scissors
- Gloves

For the sheep brain dissection, please view this video.

<http://www.youtube.com/watch?v=y7gEWzPqm94>