

Neuro-Anatomy and Neuro-Physiology Write-Up

In our class with Ms. Merryweather, we've been learning the basics of neuro-anatomy and neuro-physiology through interesting presentations and activities, such as, brain sculpting, prezi presentations, group activities, questioning and more! We've learned that the brain is composed of primarily two broad classes of cells: Neurons and Glial cells. Our brain contains about 100 billion neurons, they relay messages about what you're thinking, feeling, or doing by transmitting electrical impulses (information) to other nerve cells, muscle cells, or gland cells. Neurons send these impulses (signals) through synapses, which function to transfer electrical activity from one cell to another. However, they wouldn't be able to nearly do the things they are capable of without the help of Glial cells. There are trillions of these support cells in the brain. They transport nutrients, clean brain debris, and digest parts of dead neurons. There are three types of Glial cells, Oligodendrocytes, Microglia and Astrocytes. The Oligodendrocytes provide support and wrap tightly around axons to form the "myelin sheath." These cells speed up electrical impulses. An electrical impulse would travel 30 times slower without the Oligodendrocytes. The Microglia are immune cells found only in the brain that can detect damaged and unhealthy neurons, eating viruses and bacteria. The Astrocytes hold neurons in place, additionally; they supply nutrients and digest parts of dead neurons. There has been research that shows that astrocytes can actually communicate with neurons, modifying electrical signals they send and receive. Thus, meaning that they are much more involved in the processing of information, and the signaling at the synapse.

Furthermore, we've learned about the 4 extremely important lobes that have their respective functions. The Frontal Lobe, The Occipital Lobe, The Parietal Lobe and the Temporal Lobe. The Frontal Lobe is involved in impulse control, motor function, judgement, memory, language, problem solving, initiation, spontaneity, and social and sexual behaviour. The Parietal Lobes have two regions. One involves perception and sensation and the second region is involved with primarily the visual system. The Occipital lobe is responsible for processing visual information from the eyes. It makes sense of visual information so we can understand it. The Temporal Lobe plays an important role in organizing sensory input, auditory perception language and speech production, plus, memory association and formation

We were tasked to think about if there possibly was a reason why the hippocampus and the amygdala were close together. The amygdala is the integrative center for emotions, emotional behavior and motivation. The hippocampus is associated with memory. I believe that the memories from the hippocampus influence the amygdala response, and that is why they are close together.

Commented [B1]: Very well-articulated! I'm glad to see you mentioned the glial cells as well as the neurons, they play important functions in the brain.

Commented [B2]: Apparently, it's only 86 billion. Which doesn't seem like a big difference, but the 14 billion difference is actually approximately the size of a baboon brain!

Commented [B3]: Exactly! They transmit the electrical impulse (which is just the movement of ions, creating an electrical charge) along their "arms and legs" (axons and dendrites). When they communicate with other neurons at the synapse (at the end of an axon), they release chemicals (called neurotransmitters) which then either start another electrical impulse in the next neuron, or stop one from happening.

Commented [B4]: So important!!

Commented [B5]: So true. Oligodendrocytes are found in the central nervous system (brain and spinal cord), and Schwann cells in the peripheral nervous system (these are the nerves that leave the spinal cord to send and receive info to and from the body). They both act to speed up the impulses by creating the myelin sheath in the central and peripheral nervous systems, respectively.

Commented [B6]: Unfortunately, Microglia can have their limitations, and the rest of the body's immune system can't help the brain because of the very strong "Blood Brain Barrier." However, check out this fascinating new research on Alzheimers! <http://www.sciencealert.com/new-alzheimer-s-treatment-fully-restores-memory-function> (there are links to the actual studies. This has just been done on rats, which have thinner skulls and smaller brains... fingers crossed it also helps with humans!)

Commented [B7]: Excellent addition of research!

Commented [B8]: The region involved in sensation is called the "somatosensory cortex" and the other region is actually involved in motor control and is called the "motor cortex." Here is an interesting schema that illustrates how much of the brain is dedicated to each part of the body for the sensations and motor control: https://ecophysio.files.wordpress.com/2011/02/homunculus_1.jpeg

There are lots of other images. Each one is called a "homunculus"

Commented [B9]: This is an interesting thought!

In an article written by Elizabeth A Phelps, JULIUS SILVER PROFESSOR OF PSYCHOLOGY AND NEURAL SCIENCE
NEW YORK UNIVERSITY
DEPARTMENT OF PSYCHOLOGY

She stated that "The hippocampal complex, by forming episodic representations of the emotional significance and interpretation of events, can influence the amygdala response when emotional stimuli are encountered."

Commented [B10]: This doesn't need to be included, but the year does. If the paper was written in 2012, it would be like this:

In an article written by Elizabeth Phelps (2012), she stated that "the hippocampal.....etc"

Commented [B11]: Great addition of research! It just needs an extension, like what is the purpose of this influence? My theory is that fearful responses are important ones to remember, because they affect our survival.

Citations... I don't know how to make a proper bibliography ☹

<http://psych.nyu.edu/phelpslab/whoweare.html>

http://psych.nyu.edu/phelpslab/papers/04_CON_V14.pdf

<http://webspace.ship.edu/cgboer/limbicsystem.html>

<http://www.ncbi.nlm.nih.gov/books/NBK10869/>

<http://learn.genetics.utah.edu/content/addiction/braincells/>

<http://www.dummies.com/how-to/content/examining-the-brains-four-lobes-frontal-parietal-t.html>

<http://biology.about.com/od/anatomy/p/temporal-lobes.htm>

Excellent!, this was an exceptional and outstanding write up. You brought in many extra details not covered in class, demonstrating your ability to go above and beyond, and more importantly, your ability to self-teach. The sources you have included all seem reliable, mostly being sites associated with educational facilities. I have included extensive commenting in track changes above, so be sure to turn on track changes and read all the mark-ups.

All around excellent job on this unit!

Model: Exceeding Expectations

Write up: Exceeding Expectations

Commented [B12]: Great job including your sources!! There are different ways to cite information throughout the text, and to create a reference list (bibliography). Purdue Owl is a fantastic resource for learning how to do it: <https://owl.english.purdue.edu/owl/section/2/>

As you are thinking of going into the sciences, I would recommend learning APA, as that is the style predominantly used in sciences. <https://owl.english.purdue.edu/owl/section/2/10/>

MLA is predominately used in English, and Chicago in history.

Let me know if you have any questions about referencing!