Depression

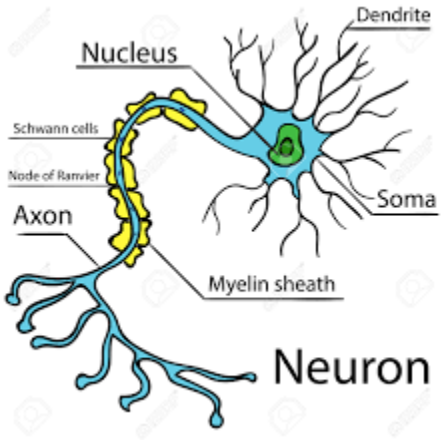
Name

Institutional Affiliation

Depression

Depression is a medical condition affecting the nervous system. It results from stressors that can be either external or internal. When a patient becomes unable to handle tension, it is a sign of a developing depression. This psychiatric condition starts mildly with unnoticeable clinical manifestations, but progresses gradually. If treatment is not provided, the illness may cause some permanent damage to the nervous system affecting the neurons and the synaptic junctions.

Structure and Function



Source: Frodl, 2016

The structure of the neuron was identified to be almost as normal compared to the healthy neuron. However, the differences are at the synaptic junction and the neuron size. Therefore, the cell seems to have atrophied. Below are the functions of its parts:

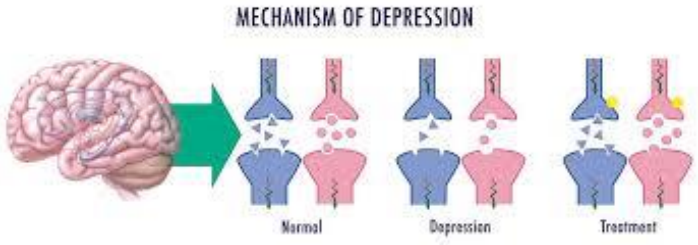
Dendrites. Their function is to receive the electrical impulse from the axon of another neuron and transmit it inside the nerve cell. Dendrites convert these signals into small electrical impulses.

Soma. Also known as the body of the cell, it has nucleus from where synthesis of neuronic proteins and membranes occur.

Axon. It is specialized to conduct a special type of electrical impulse known as the action potential away from the cell towards the axon terminal.

Terminal. Also known as the axon terminal, it is specialized to pass neurotransmitters from the pre-synaptic cell to the post-synaptic one.

Mechanism of Depression and Treatment



Source: Frodl, 2016

In a depressed patient, the neuron is smaller in size with some significant differences at the neural junction. For these nerve cells, when viewed under a microscope, the terminal is physically disproportionate. Despite this, the undamaged neurons may work partly for the broken ones by changing their function via sprouting axons whose connections help neighboring regions take new roles (Cohen et al., 2013). In addition, the body uses electrical impulses to communicate with each organ through the neurons of the nervous system. The electrical impulses are also known as action potential. These systems largely depend on the ion concentration gradient between the inside and outside of the cell (extracellular fluid). In general, neurons have more negative ions than positive, thus making the extracellular fluid positively charged. This is called the resting potential. When the fluid is completely charged, more of Na+ ions appear outside than inside, and more K+ ions are seen inside than outside of the cell. Notably, the cell also tries to maintain the resting membrane potential, but shifting occurs as the

K+ ions freely escape to the outside. In such a case, in order to return to resting phase, the cell pumps K+ ions back. The process is called an action potential.

In the case of depression, the phase of repolarization is frequently delayed, which, in return, leads to the effect of mood changes and adversely influenced behavior. The membranes of these neurons normally keep the distribution of electrically charged ions uneven between the inside of the cells and the outside creating an electrochemical potential (Cohen et al., 2013). Therefore, the brain and nervous system work together to control human behavior.

Overall, depression influences the neurons both physically and in terms of functionality. Due to the inhibited roles, an affected neuron slowly atrophies into a smaller size which is harmful. However, with medication, some of these changes can be prevented or treated permanently. Thus, it is paramount that the affected individuals are properly treated at a time.

References

Cohen, L., Pooley, J. A., Clarke-Stewart, A., Penner, L. A., Roy, E. J., Bernstein, D. A., Provost, S., ... Cranney, J. (2013). *Psychology: An international discipline in context*. Melbourne: Cengage Learning Australia.

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