

**ALPHABETICAL BRAIN™ VOCABULARY
HUMANIST FAMILY BRAIN STUDY**

**DETAILS ABOUT YOUR SYNAPSES #7
September 9, 2019**

**WHAT ARE YOUR SYNAPSES?
AND WHY ARE THEY SO IMPORTANT?**

The purpose of your *synapses* is to make possible the transmission of biochemical currents (ionic impulses or signals) from neuron to neuron all around your brain and also up and down your body.

Your synapses are the 1,000 trillions of biochemical switches (electro-chemical junctions) that allow the 100-200 billion neurons in your brain and nervous system to send biochemical signals to and from your senses and to and from your many bodily organs.

Your brain's complicated transduction signaling process is caused by the way your 100-200 billion neurons and your 1,000 trillion synapses are connected at the microscopic quantum level of human existence.

This phenomenal signaling process is known as synaptic plasticity in general and potentiation (long-term potentiation) specifically regarding the biochemical current (electro-chemical process) that ultimately makes possible your conscious self-awareness and adaptable self-identity.

"Postsynaptic potentials are changes in the membrane potential of the postsynaptic terminal of a chemical synapse. Postsynaptic potentials are graded potentials, and should not be confused with action potentials although their function is to initiate or inhibit action potential spikes. They are caused by the presynaptic neuron releasing neurotransmitters from the 'terminal bouton' at the end of an axon into the synaptic cleft." (Source = Wikipedia)

Synapses Image

"The neurotransmitters bind to receptors on the postsynaptic terminal, which may be a neuron or a muscle cell in the case of a neuromuscular junction. These are collectively referred to as postsynaptic receptors, since they are on the membrane of the postsynaptic cell." (Source = Wikipedia)

"One way receptors can react to being bound by a neurotransmitter is to open or close an ion channel, allowing ions to enter or leave the cell. It is these ions that alter the membrane potential. Ions are subject to two main forces, diffusion and electrostatic repulsion. Ions will tend towards their equilibrium potential, which is the

state where the diffusion force cancels out the force of electrostatic repulsion." (Source = Wikipedia)

"When a membrane is at its equilibrium potential, there is no longer a net movement of ions. Two important equations that can determine membrane potential differences based on ion concentrations are the Nernst Equation and the Goldman Equation." (Source = Wikipedia and other online resources mashed together)

Synapse connection Image

During the signaling process, sodium and potassium molecules exchange charged ions through tiny vesicles at the synaptic clefts or gaps in the membranes of the trillions of synapses that attach to the billions of neurons and neuron attachment centers of the muscles, organs, and glands of your body.

This signaling or communication process is involved in the way your memories are formed and stored in scattered parts of your cerebrum, particularly, the insides of your temporal lobes, as well as in your hippocampus, which is a major part of your limbic system.

Note: See in context: working memory #1, neurons #2, dendrites #3, axons #4, nucleus of a neuron #5, glial cells #6, potentiation #8, connectome #9, plasticity #10, cerebrum #11, prefrontal cortex #12, and long-term memory #15.

RECOMMENDATION: You may print this pdf version and read it and edit it by adding or deleting ideas. Then, you can read your edited version of these ideas according to a *reinforcement schedule*, such as a few hours later and a few days later and then several times in the next week or two. This strategy can help you take advantage of the power of the *spaced-repetition method of memorization*. Such deep introspection can change your adaptive self-identity and increase your self-esteem (positive emotions about yourself).

**Remember always:
You are your adaptable memory!**