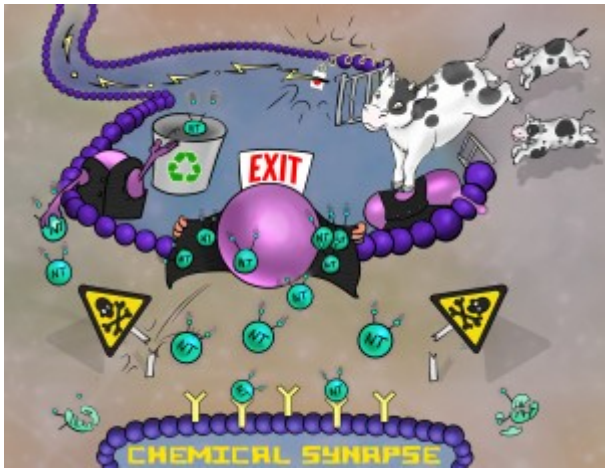
Chemical Synapse

Chemical synapse describes the location in which one neuron stimulates or inhibits another neuron. It is located in the space between the nerve terminal of the pre-synaptic cell and the dendrites of the post-synaptic cell. Calcium-gated voltage channels open in the nerve-terminal due to action potential propagation resulting in calcium influx into the cell. This triggers vesicle-membrane fusion in which the vesicle containing neurotransmitter fuses with the cell membrane. This results in the exocytosis of neurotransmitter, which is the process of neurotransmitter release into the synapse. The neurotransmitter binds membrane receptors on the post-synaptic cell and either excites or inhibits the next neuron. There are two possible fates of the neurotransmitter after it has bound the receptor and released. The neurotransmitter can be broken down or can undergo reuptake with the pre-synaptic neuron to be used again at next action potential generation.



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Voltage-Gated Calcium Channels Open
Voltage Gate Opens
Voltage-gated calcium channels open in response to the depolarization wave traveling down the axon to the nerve terminal.

Ca2+ Influx
Cows come in
The opened calcium channels allow for calcium influx into the cell.

Vesicle-Membrane Fusion
Vest-ball and Membrane Fusing
Vesicles containing neurotransmitters fuse with the membrane and release their contents into the synapse.

Exocytosis of Neurotransmitter
Vest-ball releasing NT-balls through Exit-sign
The process of releasing neurotransmitter to the synapse from the nerve terminal is called exocytosis.

Neurotransmitter Binds Post-Synaptic Receptors
NT-balls Binding to Post Receptors
The neurotransmitter released binds to post-synaptic membrane receptors on the post-synaptic neuron, causing either depolarization or hyperpolarization of the next neuron.

Neurotransmitter Breakdown
NT-balls Broken
After binding to receptors and releasing, one possible fate for the neurotransmitter is breakdown.

Neurotransmitter Reuptake
NT-balls being Recycled
The other possible fate for neurotransmitters is reuptake by the pre-synpatic neuron and reuse when the next action potential is generated.

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