

Neuron's Softball: Catch and Communicate

Purpose: To demonstrate chemical communication in the brain using only two neurons, principles of neurotransmitter release by a presynaptic neuron, reception of neurotransmitter by the postsynaptic neuron, and principles of drug action.

Materials: Cardboard, tennis ball, softball, gloves, string, paint, markers, poster, and six kids.

Procedure: Explain neuron communication making an analogy with the elements of human communication (Sender, Message, Media, Receiver, Noise). Select six kids and locate them on the stage as shown in Figure 1. One is the electrical impulse (1), one is the calcium (2), one is the vesicle (3), one is the drug (4), and the remaining two are receptors (5,6). The electrical impulse pulls a string that opens a door in the presynaptic terminal. Once the door is open, calcium comes into the neuron and tells the vesicle to throw the neurotransmitter to a receptor in the postsynaptic terminal. The drug tries to prevent the receptors from catching the neurotransmitter. The kids repeat the process until they clearly understand how neurons communicate. Finally, we ask the kids to come up with ideas of how other drugs could affect the communication process; and they implement their ideas in the game sequence.

Issues: Calcium voltage-gated channels are not mechanically opened. Vesicles release neurotransmitter by exocytosis. There are many vesicles in a presynaptic terminal and many receptors in a postsynaptic terminal. There are other ways drugs interfere with this communication.

Lesson Plan: Children will learn how neurons communicate with each other. The kids will be guided the first time they perform the process. To test their understanding of the topic, they will be asked to repeat the process by themselves.

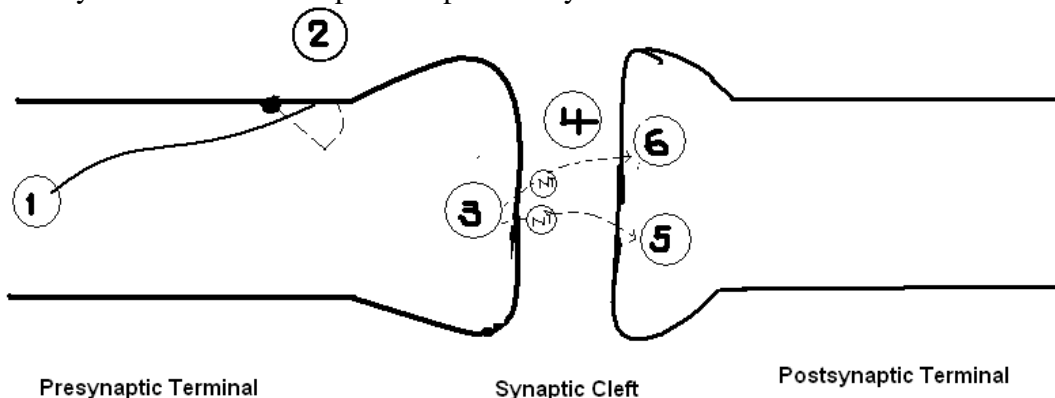


Figure 1. Distribution of kids on the stage: (1) Electric Stimulus, (2) Calcium molecule, (3) NT vesicle, (4) Drug, (5) and (6) Receptors.