

How is the Nervous System Organized?

Chapter 3-Neuroscience:
The Brain and Behavior

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Class Objectives:

- ψ Identify and define the structures of the neuron
- ψ Identify and discuss the role of neurotransmitters on behavior

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The Neuron

- The _____ is the basic building block of the nervous system
- They are often grouped in bundles called nerves.

3



4 parts of the neuron

1. _____
are specialized to receive signals from neighboring neurons and carry them back to the cell body

- Thin, bushy-like structures _____

Relays the information into the cell body

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The Neuron

2. The Cell body contains the _____

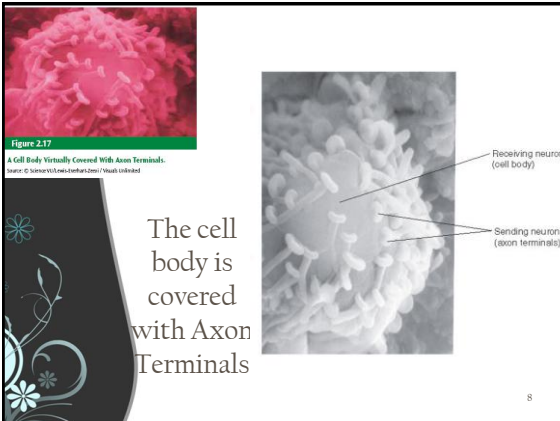
- The cell body relays the information down to the axon

The structure of a neuron

3. Axon: A thin, long structure that transmits signals from the cell body to the axon terminal.

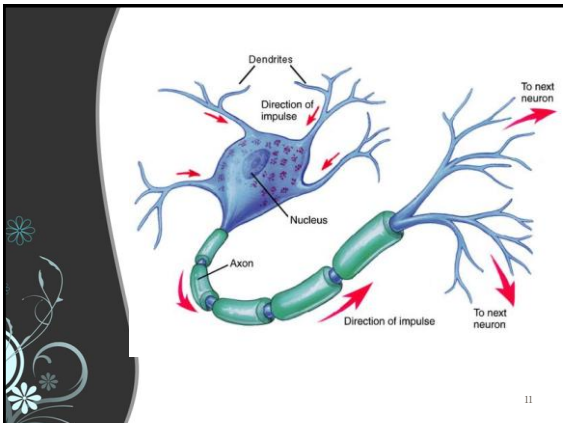
4. Axon Terminal is the last step for the relay of information inside the neuron.





Once the information hits the terminal, it is transmitted outside the cell by

How do Neurons Communicate?




The Electrical Part

_____ is an electrical current sent down the axon.

This current causes the neuron to “fire”

➤ This is an _____ process



Action potentials travel down the axon like a wave of energy

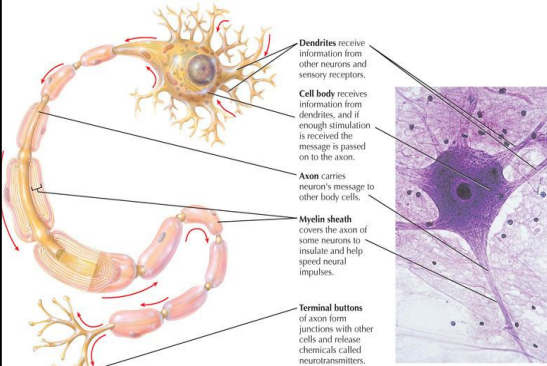
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Synaptic transmission

- The Synapse is the space between neurons
 - The _____
- Information must be transmitted across the synapse to other neurons via the neurotransmitters.
- This is an _____

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Let's Review!



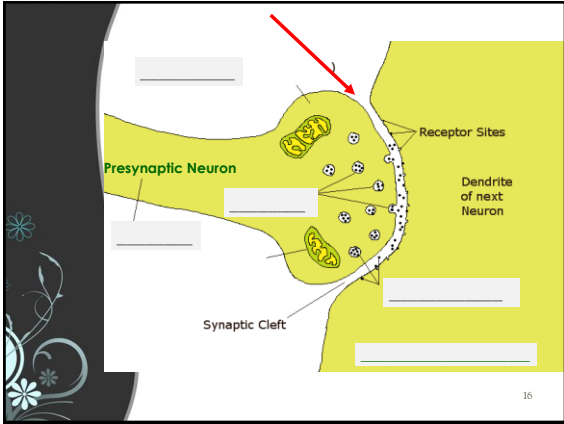
Dendrites receive information from other neurons and sensory receptors.

Cell body receives information from dendrites, and if enough stimulation is received the message is passed on to the axon.

Axon carries neuron's message to other body cells.

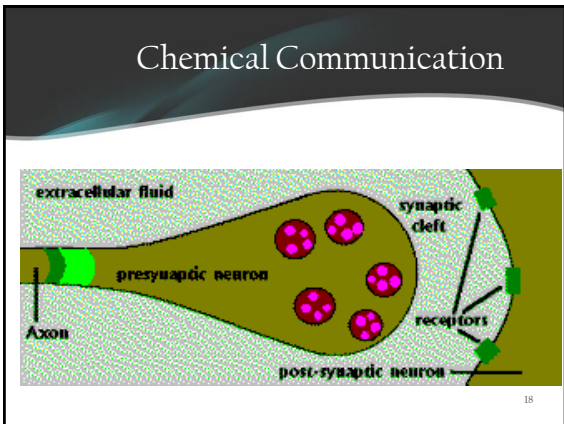
Myelin sheath covers the axon of some neurons to insulate and help speed neural impulses.

Terminal buttons of axon form junctions with other cells and release chemicals called neurotransmitters.



The Chemical Part

- _____ are chemical substances that reside in the axon terminals
- They communicate to other neurons by _____ on neighboring neurons
- The communication between neurons is _____



Synaptic Transmission

- The neurotransmitters are released from the vesicles and then attach to receptors located on the postsynaptic neuron.
- These neurotransmitters are in contact with the dendrite of the postsynaptic neuron only briefly.

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Neurotransmitters

- At least 50 different types of neurotransmitters have been identified
 - Acetylcholine
 - GABA
 - Serotonin
 - Dopamine
 - Norepinephrine
 - Endorphins

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_____ (ACH)

- Activates motor neurons controlling

- Contributes to the _____

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Neurotransmitters

- Gamma-aminobutyric acid (_____)
is involved in experiences of

- Serotonin is involved in sleep and

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Dopamine

- Contributes to control of voluntary movements, _____

- Too much dopamine has been associated with

- Too little dopamine has been associated with

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Norepinephrine

- Involved in arousal reactions, especially important for vigilance

- _____

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How do drugs effect behavior?

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Drugs Impact on the Brain

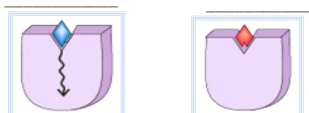
- Common drugs can alter the _____

- Some drugs can mimic/facilitate the action of the neurotransmitters while others can block the action of the neurotransmitter.

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Agonists versus Antagonists

- _____
mimic or facilitate the actions of a neurotransmitter
- Antagonists _____



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Next Class...

The Brain

- How do the neurons work together?
 - The Central Nervous System
 - The Peripheral Nervous System

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