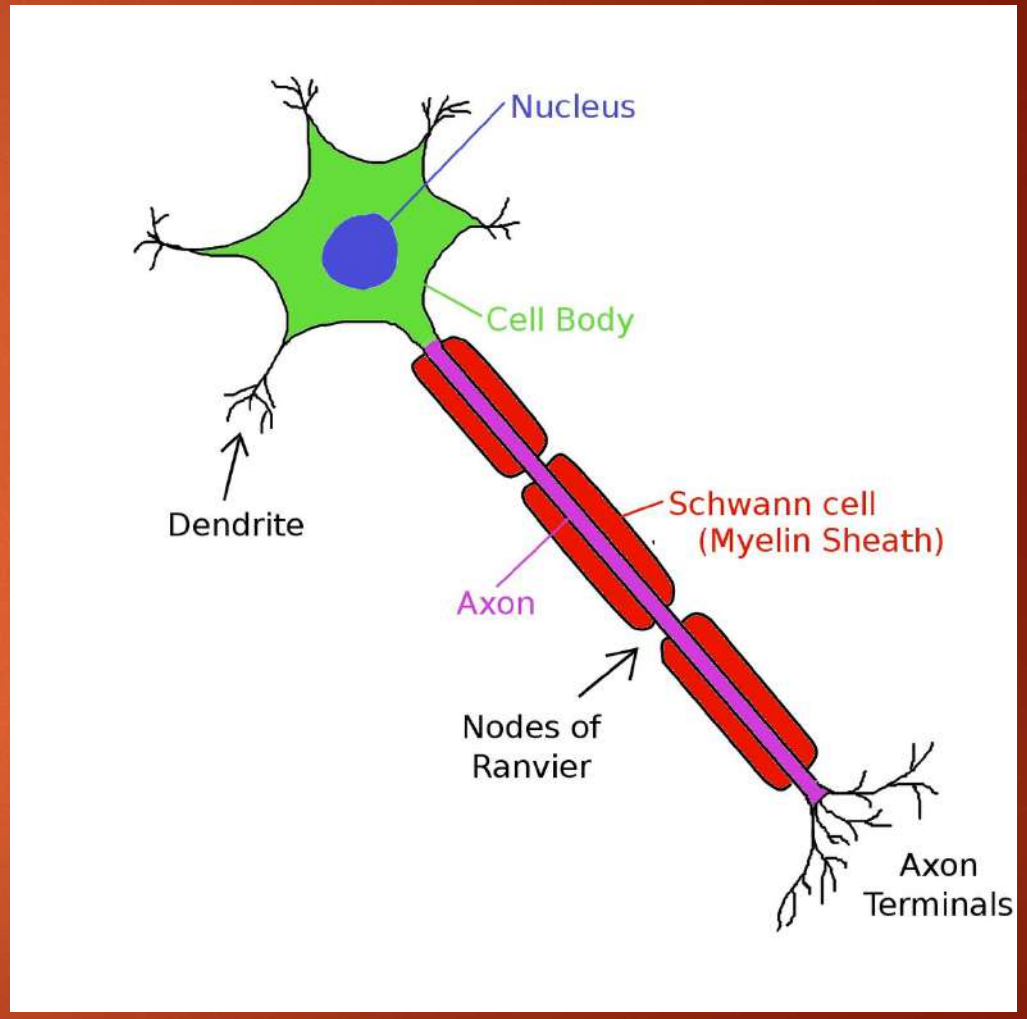
Chapter 3

PART 3

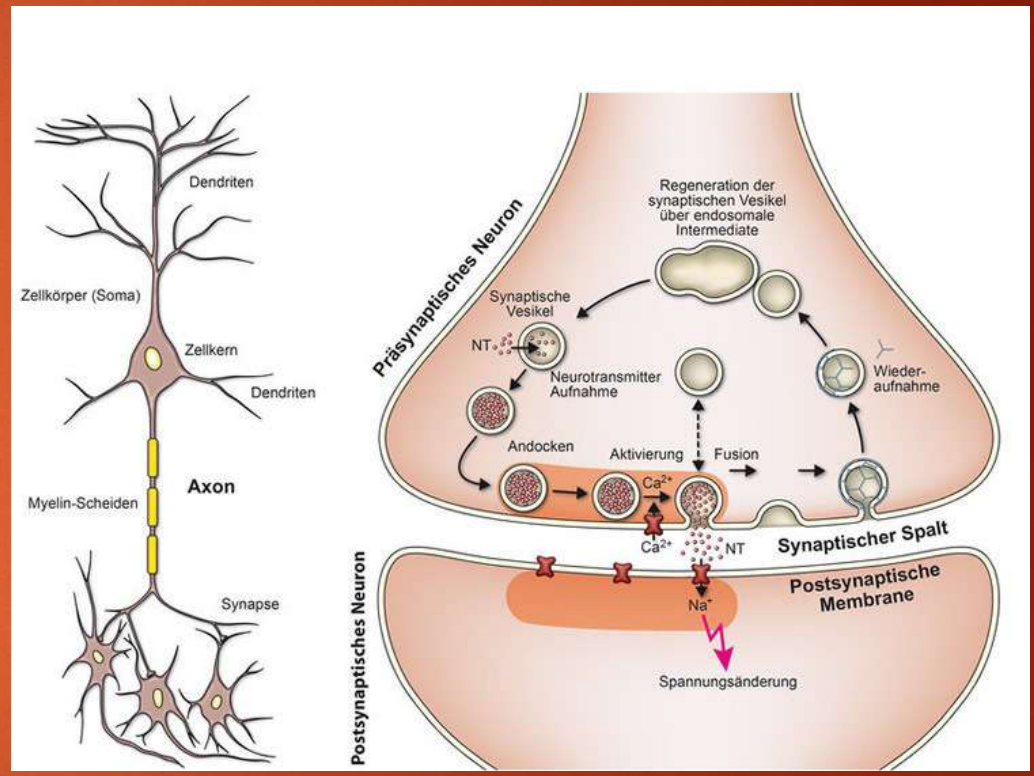
I. Brain Communication

- Our brain is composed of millions of nerve cells called neurons. These form the network of our brain that controls everything in our bodies and our thoughts.
- The neuron has a cell body called the soma, and off of that are branches called dendrites. The dendrites receive messages from the other nerve cells and pass them along.



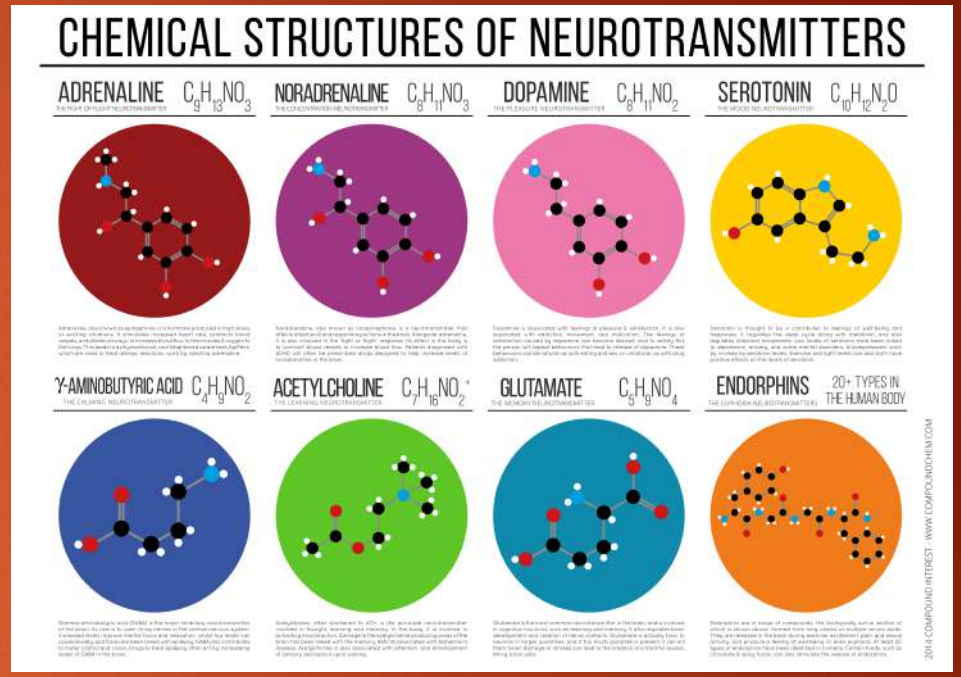
I. Brain Communication

- The electrical signal travels from the soma down a long fiber called the axon. The axon ends in branches that connect to dendrites of other neurons.
- The axon and dendrite don't actually touch, there is a small space in between. This area is called the synapse.



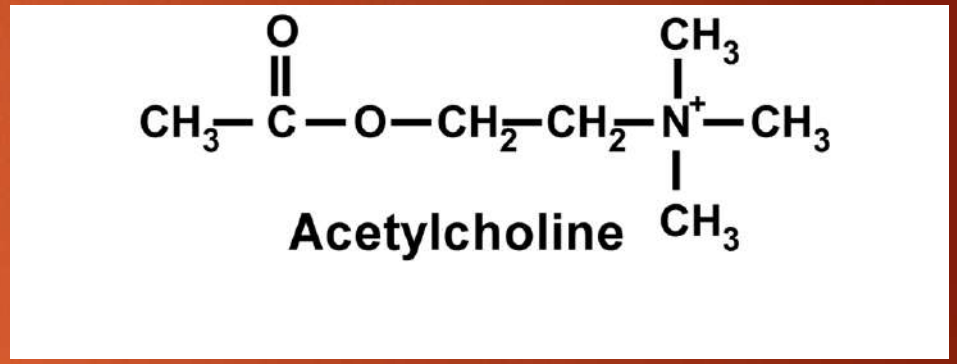
I. Brain Communication

- Since electricity cannot travel across open space, there must be another way to transfer the impulse from one cell to the next.
- At the end of the axon are vesicles, which are small chambers. In the chambers are neurotransmitters, chemicals that send different signals to the next nerve cell.
- The dendrites have receptors that only receive certain neurotransmitters.



I. Brain Communication

- For example, acetylcholine is the neurotransmitter that allows our brains to control movement. When we want to move our finger, the neurons release Ach and it signals the muscles to move.
- If you block Ach transmission, then you are paralyzed. It also has a role in memory.

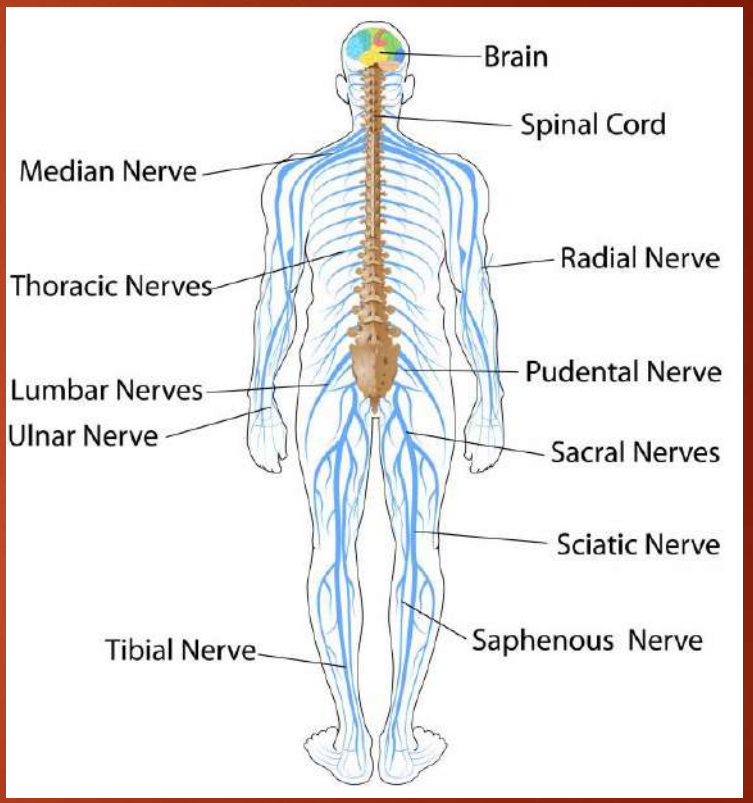


I. Brain Communication

- Dopamine is another neurotransmitter that controls bodily movements, and a deficiency in dopamine is a major cause of Parkinson's disease.
- Endorphins are the body's natural pain killer and mood enhancer.
- When the neurons fire, it is an all or nothing response. Nerves don't sort of fire, it is either yes or no.

II. The Central and Peripheral nervous systems

- Our nervous system has two parts to it: the central nervous system and the peripheral nervous system.
- The central nervous system is comprised of the brain and spinal cord. It is the decision maker for the body.
- The peripheral nervous system is the rest of the nerves in the body, and they send and receive messages from the brain.



II. The Central and Peripheral nervous systems

- Reflexes are controlled in the spinal cord. So when you pull your hand away from a flame without thinking about it, that is controlled by neurons in the spinal cord.
- The peripheral nervous system is actually comprised of two parts as well: the somatic system and the autonomic system.

II. The Central and Peripheral nervous systems

- The somatic system gives us conscious control of our body. It has motor neurons and sensory neurons that connect to the large muscles that we use to move our body.
- The autonomic system controls those actions that we do not have to think about to do. We don't concentrate to digest our food, but we do choose to chew the food first.

II. The Central and Peripheral nervous systems

- The autonomic system also has two parts to it. The first part uses energy when faced with emergency. This is the sympathetic nervous system.
- The second part calms you down and stores energy, this is called the parasympathetic nervous system.

In your notebook

- Create a drawing of how neurons communicate with each other, labeling the different parts needed: dendrite, soma, axon, synapse, neurotransmitter.