

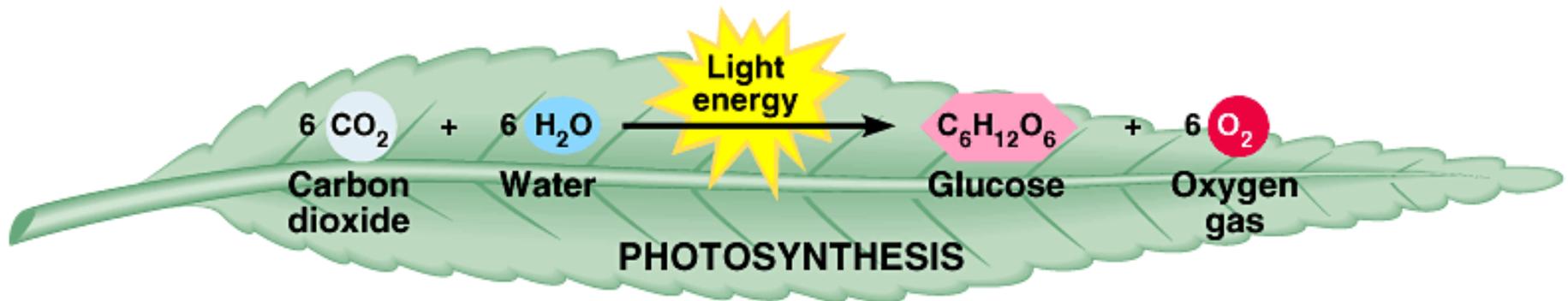
Review Session #3

Excretion

Nervous System

Immune System

The metabolic activities of living cells produce waste materials.

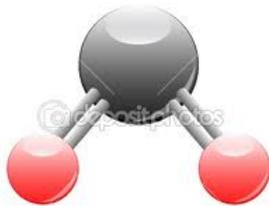


EXCRETION - is the life process by which the wastes of metabolism are removed from the body.



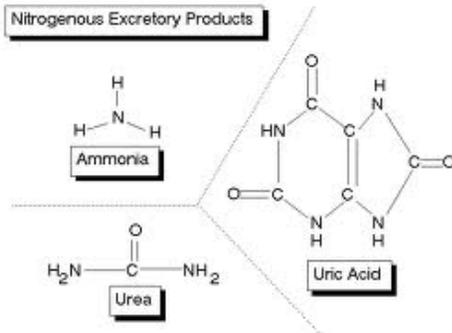
The metabolic wastes that are removed are

WATER



CARBON DIOXIDE

MINERAL SALTS

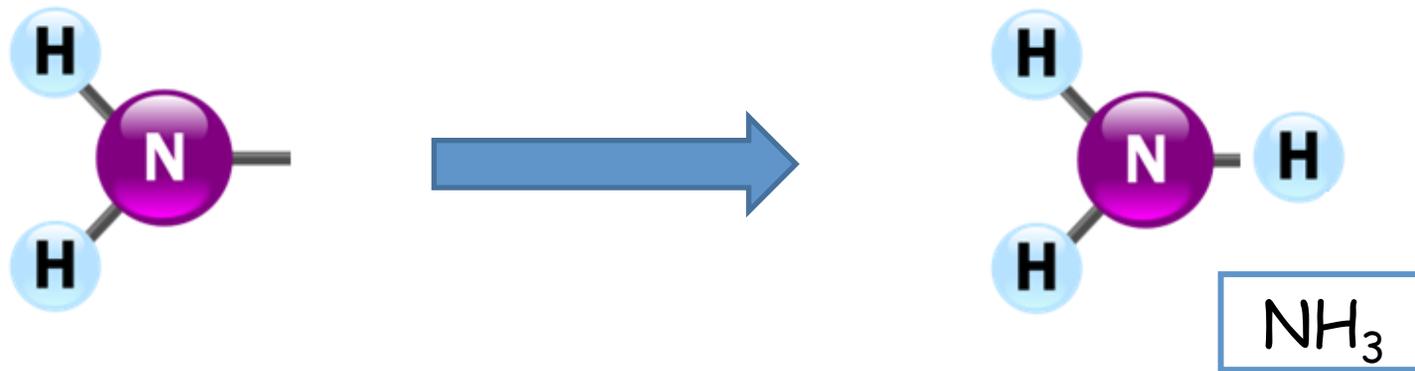


NITROGENOUS WASTES

(OXYGEN)

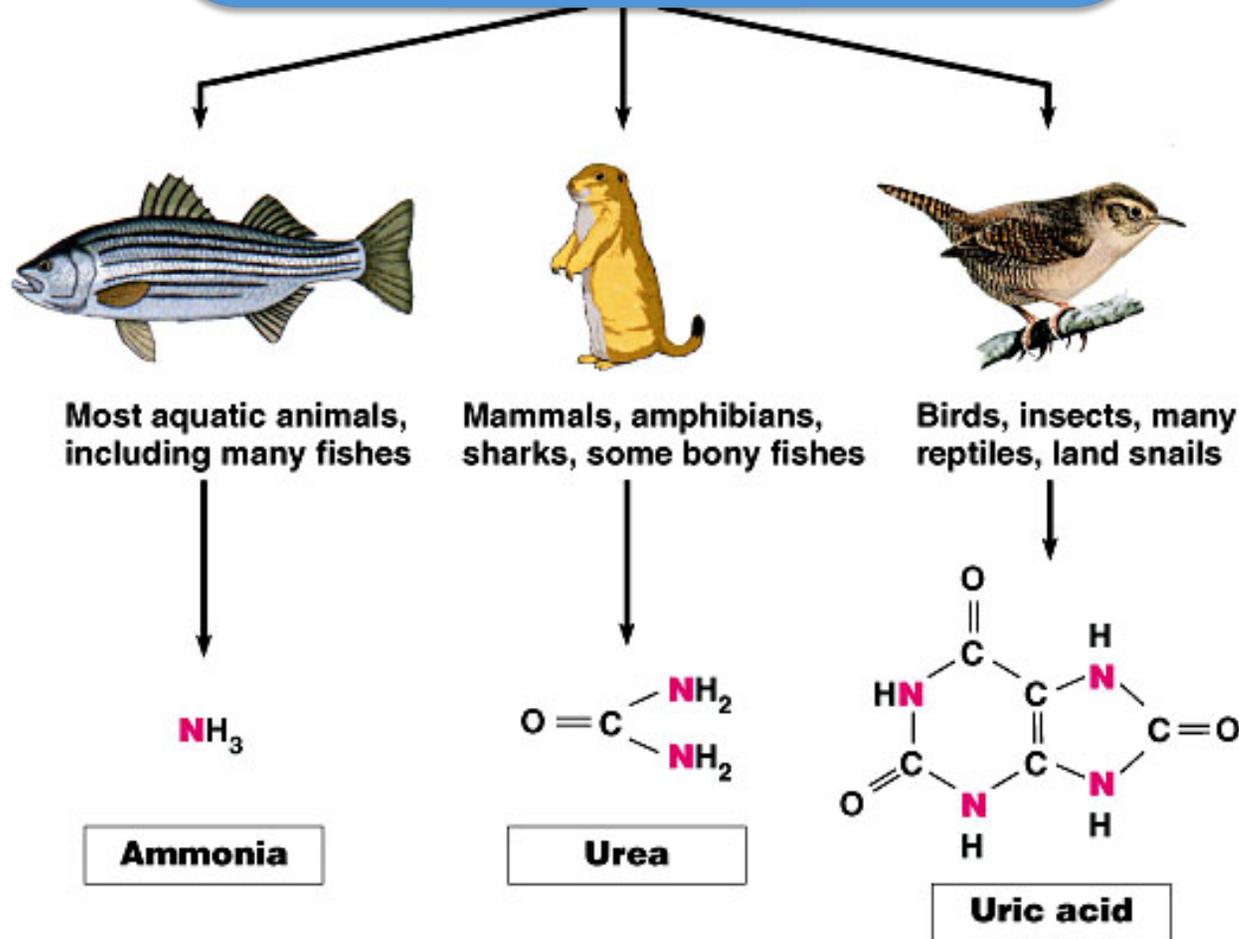


Waste can be converted into AMMONIA.
Ammonia is a toxic substance.

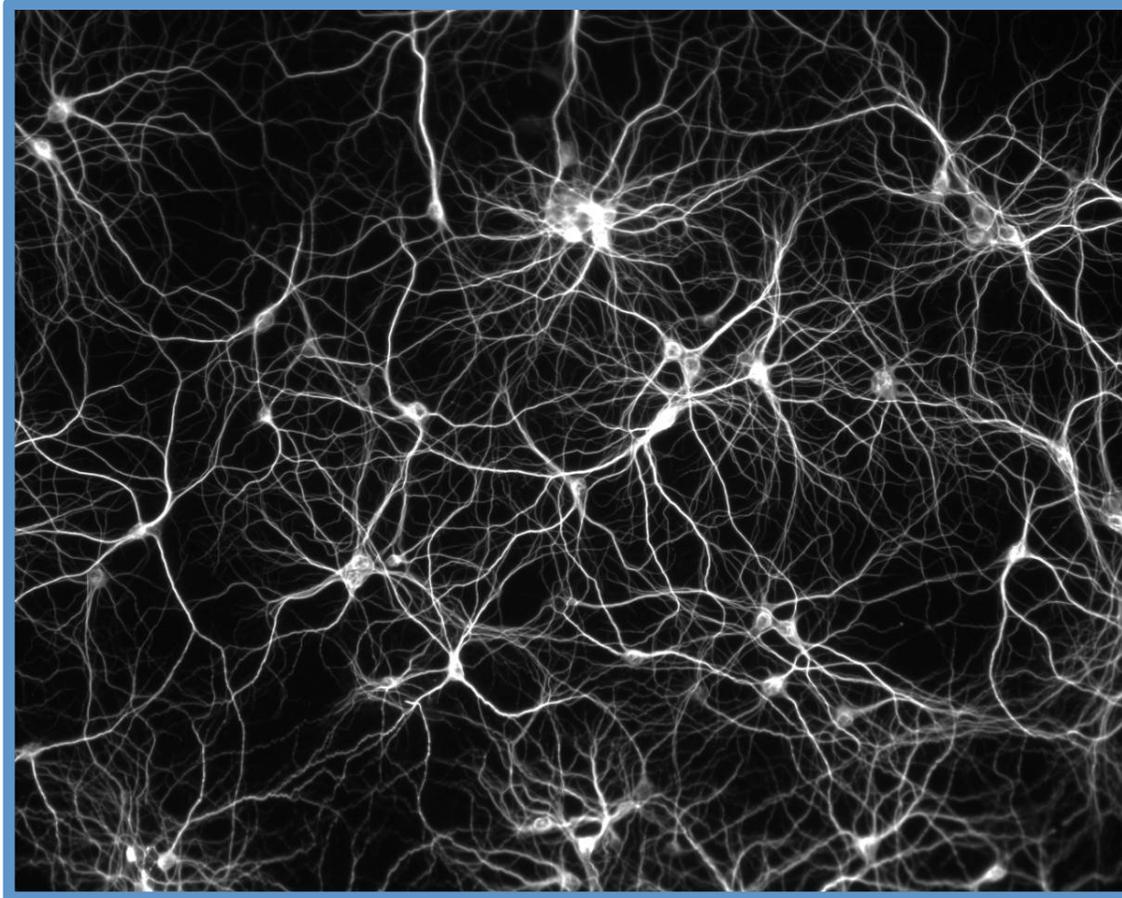


Ammonia must be washed out of and away from organisms immediately so they aren't poisoned.

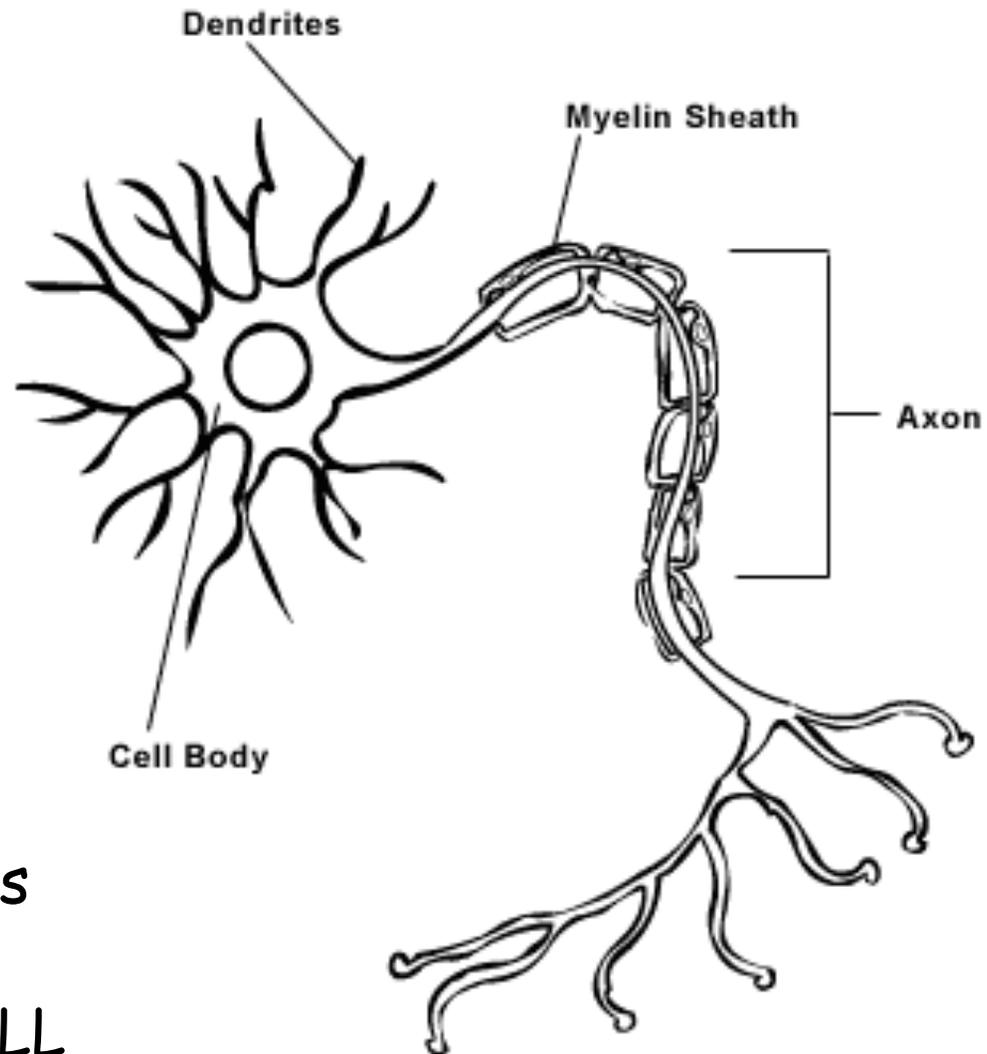
Food



Nerve cells are called NEURONS.
They are highly specialized for the transmission of signals from one part of the body to another.

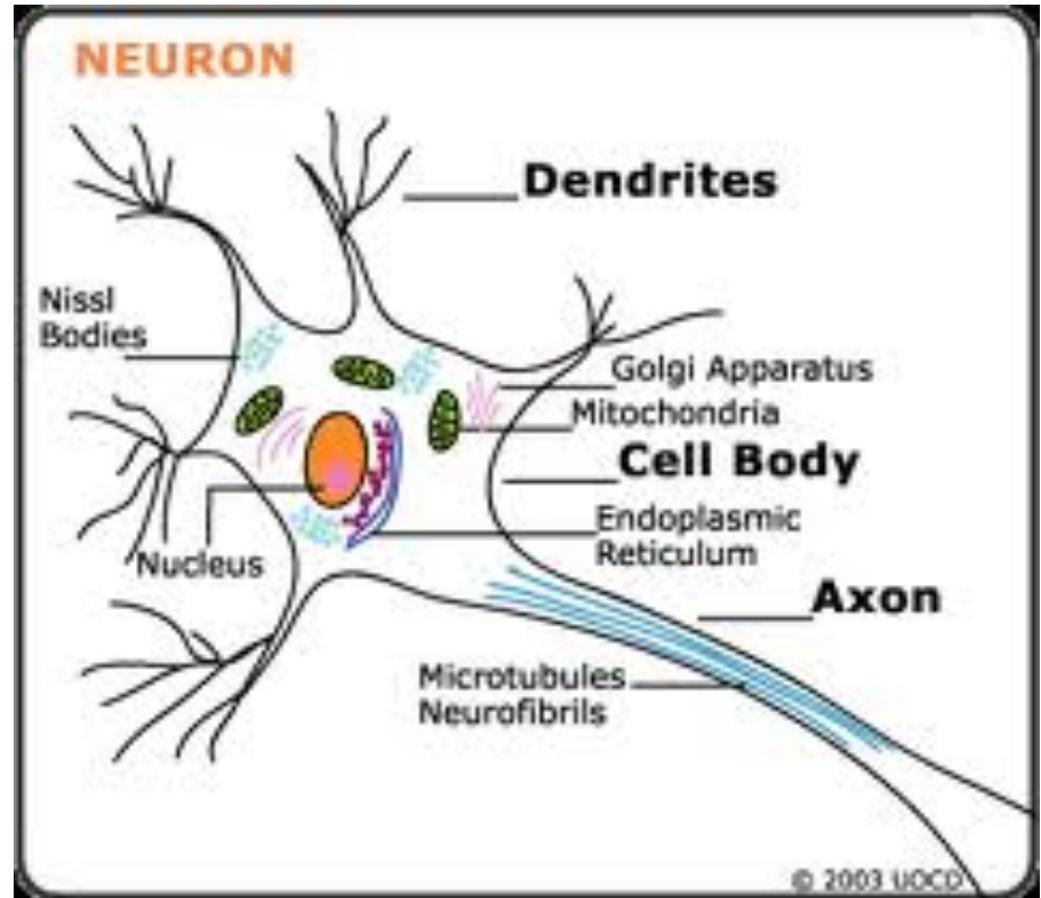


The signal a nerve cell carries is called an IMPULSE.



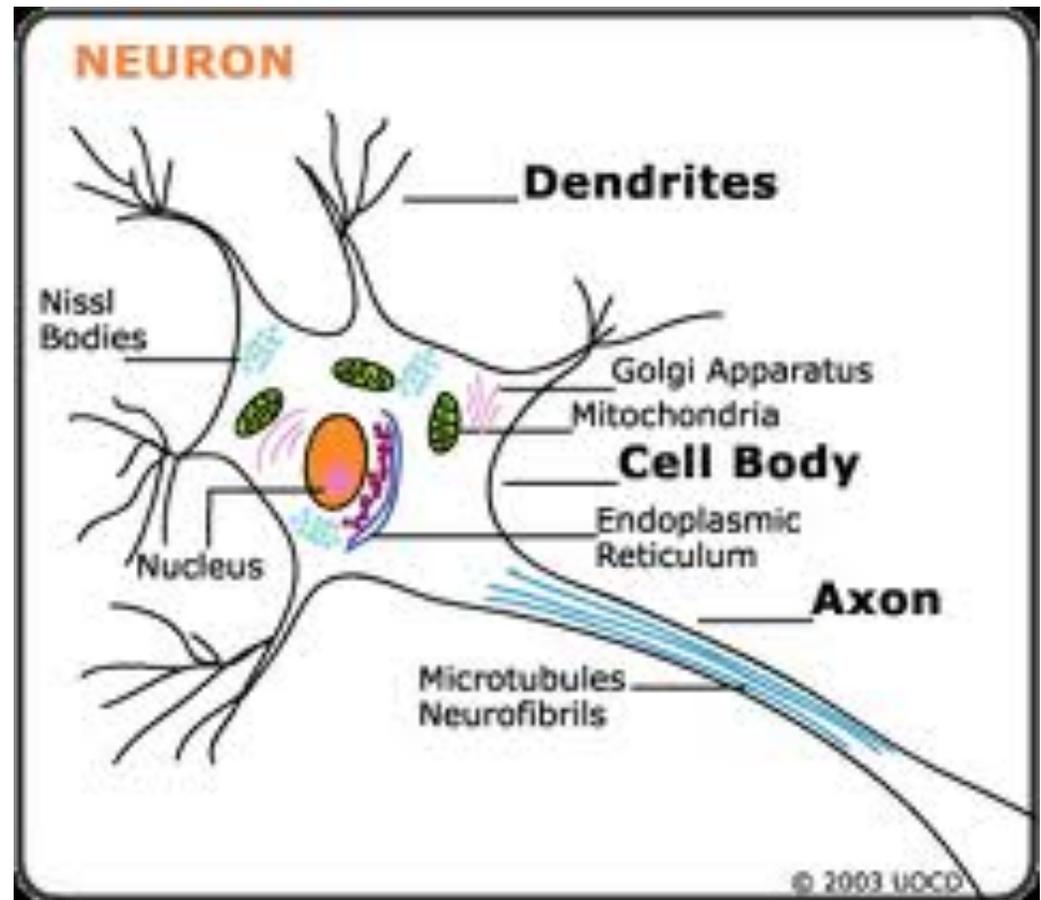
The three main parts
of a neuron are
The DENDRITES, CELL
BODY,
and AXON.

The **CELL BODY** contains the cell's nucleus, mitochondria, and other organelles.

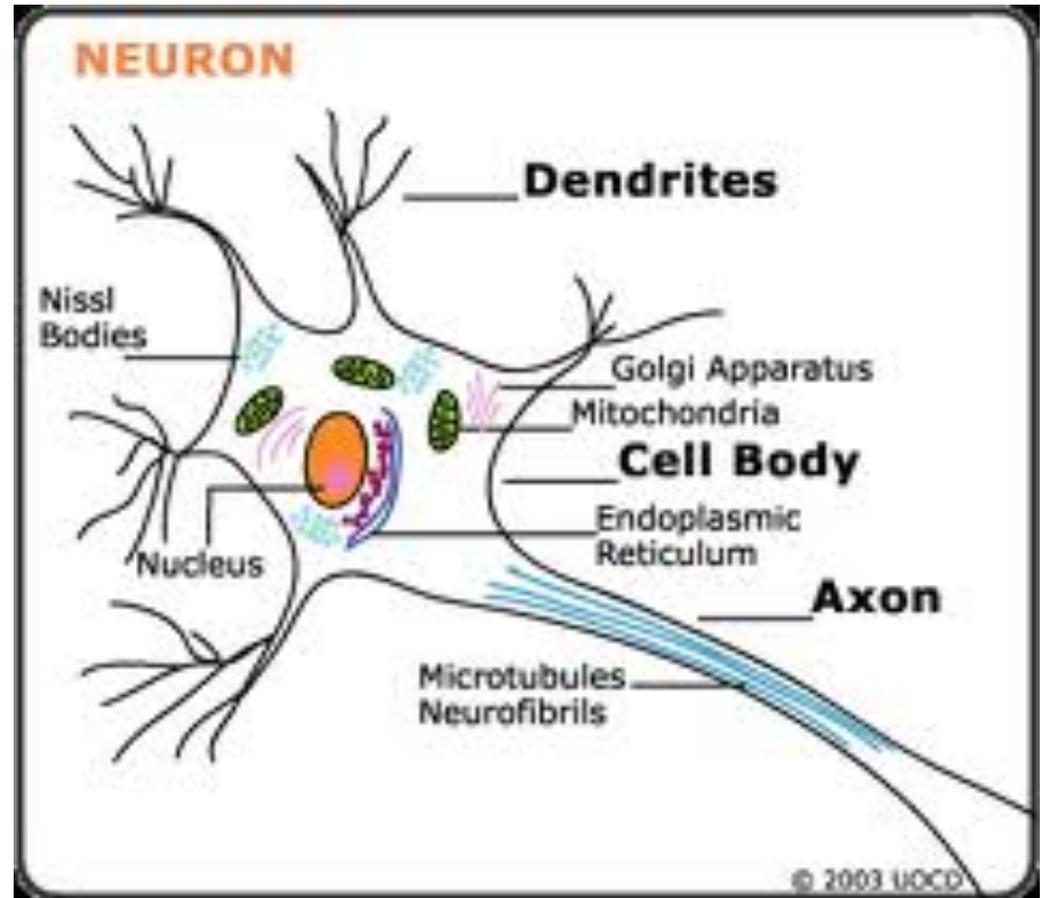


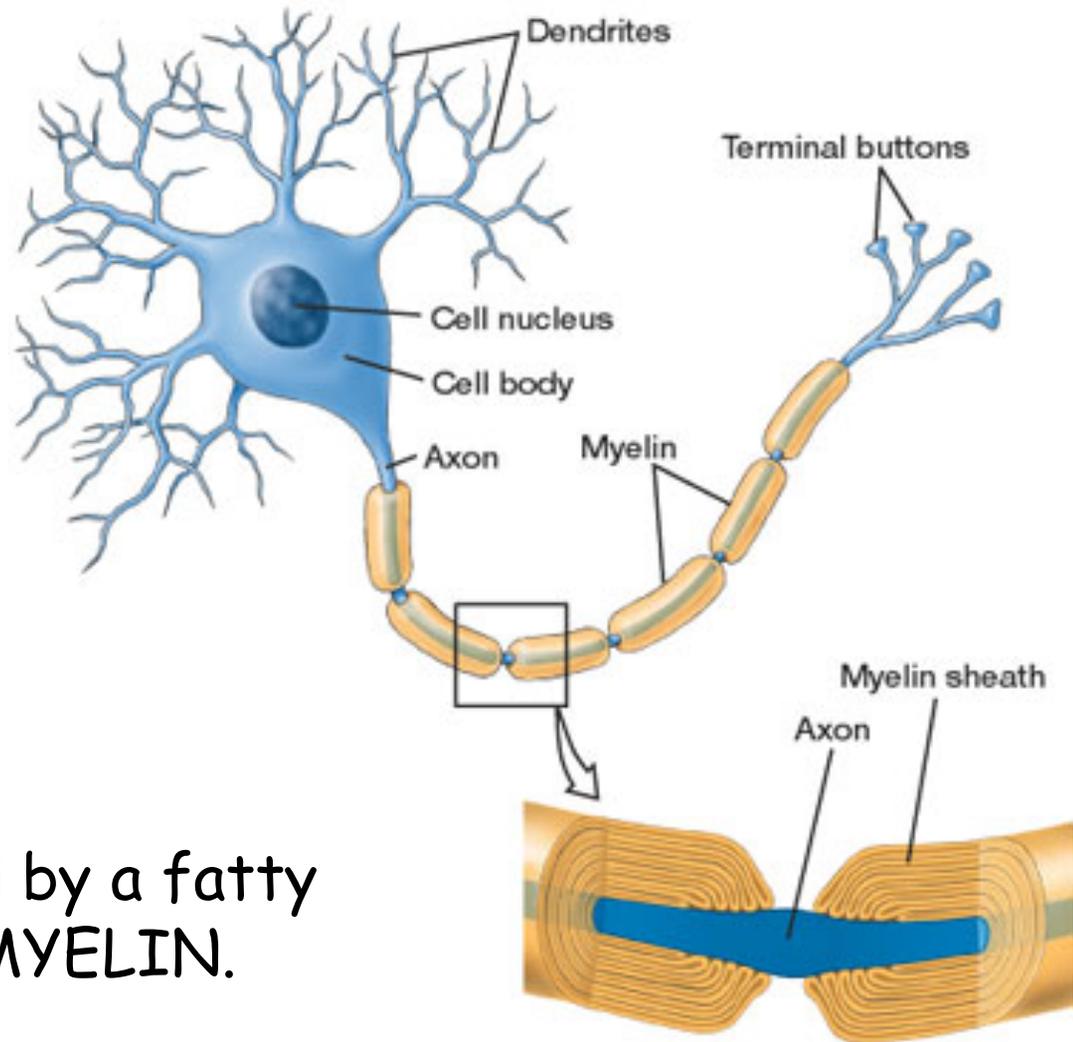
DENDRITES are the sensors.

They have branches for receiving impulses.



The **AXON** carries impulses away from the cell body to another cell.

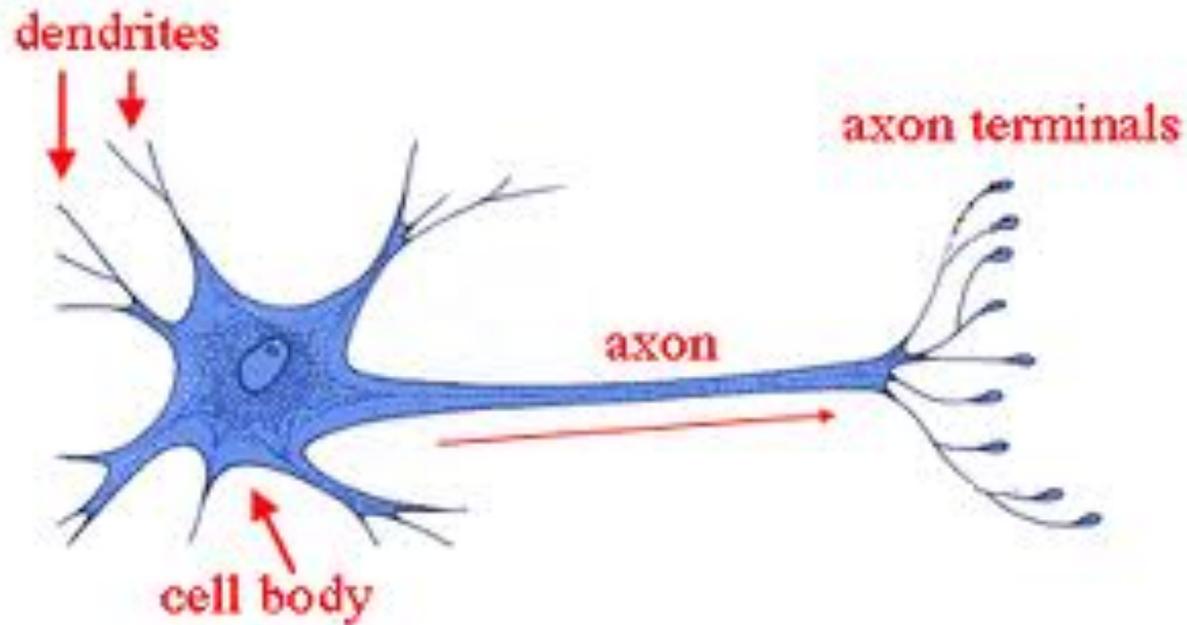




The axon is insulated by a fatty substance called **MYELIN**.

The myelin sheath increases the strength and speed of impulses passing along the axon.

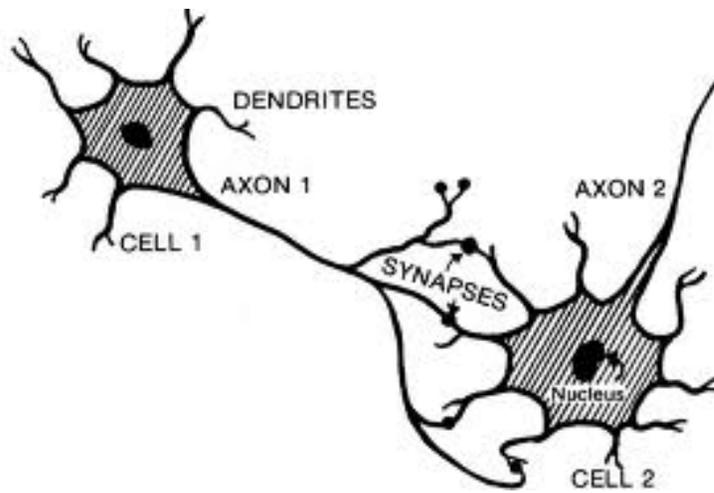
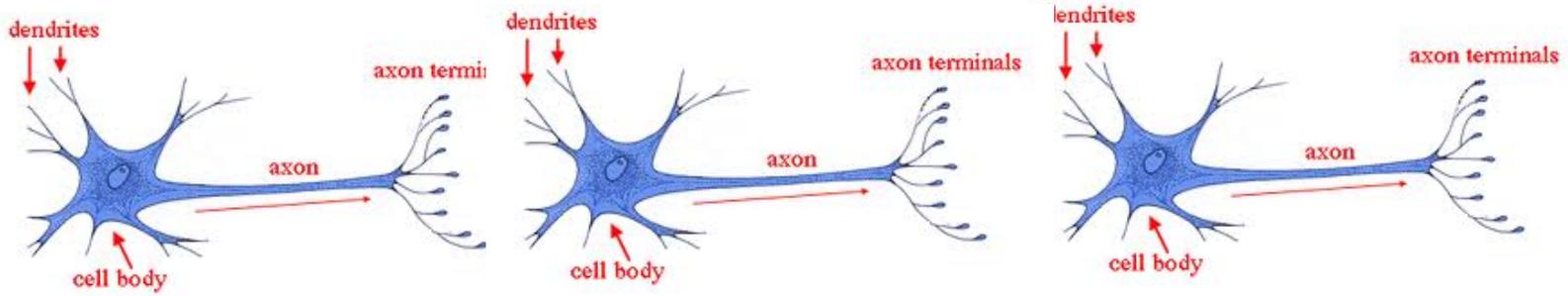
An IMPULSE is an electric signal passed through the axon.

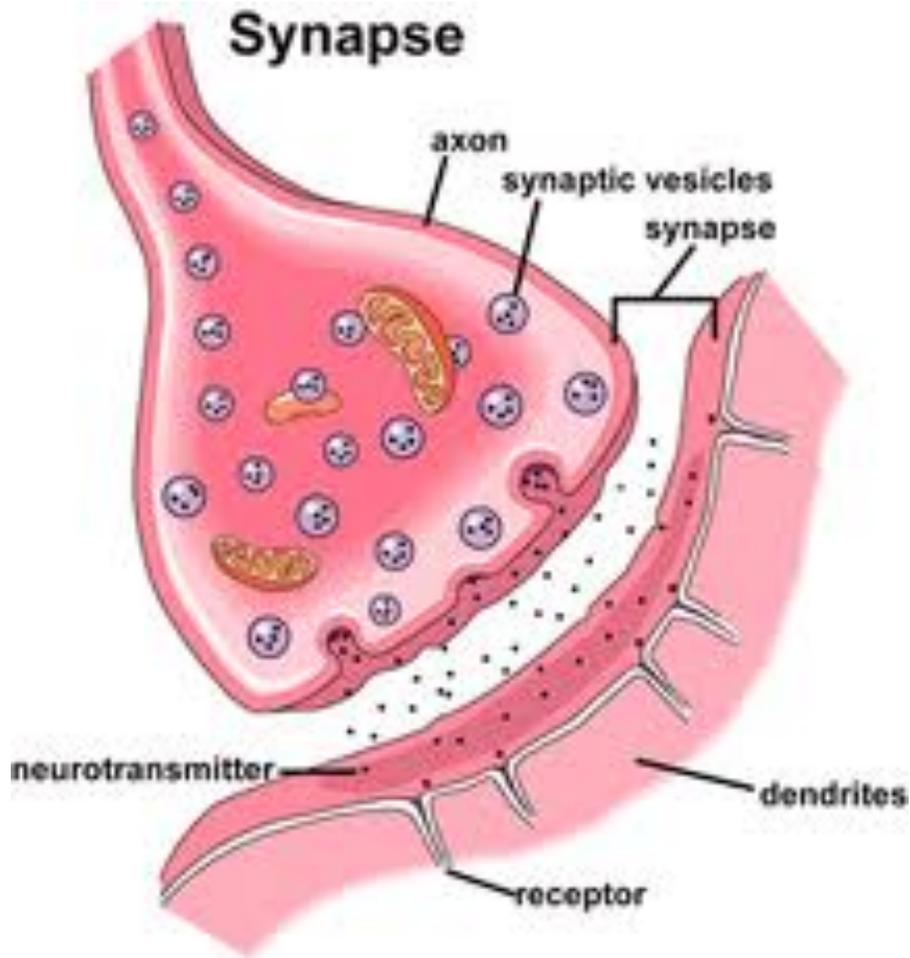


IMPULSE PATH

Dendrites → Cell Body → Axon → Terminal Branches

Dendrites Cell Body Axon Terminal Branches Dendrites Cell Body Axon Terminal Branches Dendrites Cell Body Axon Terminal Branches

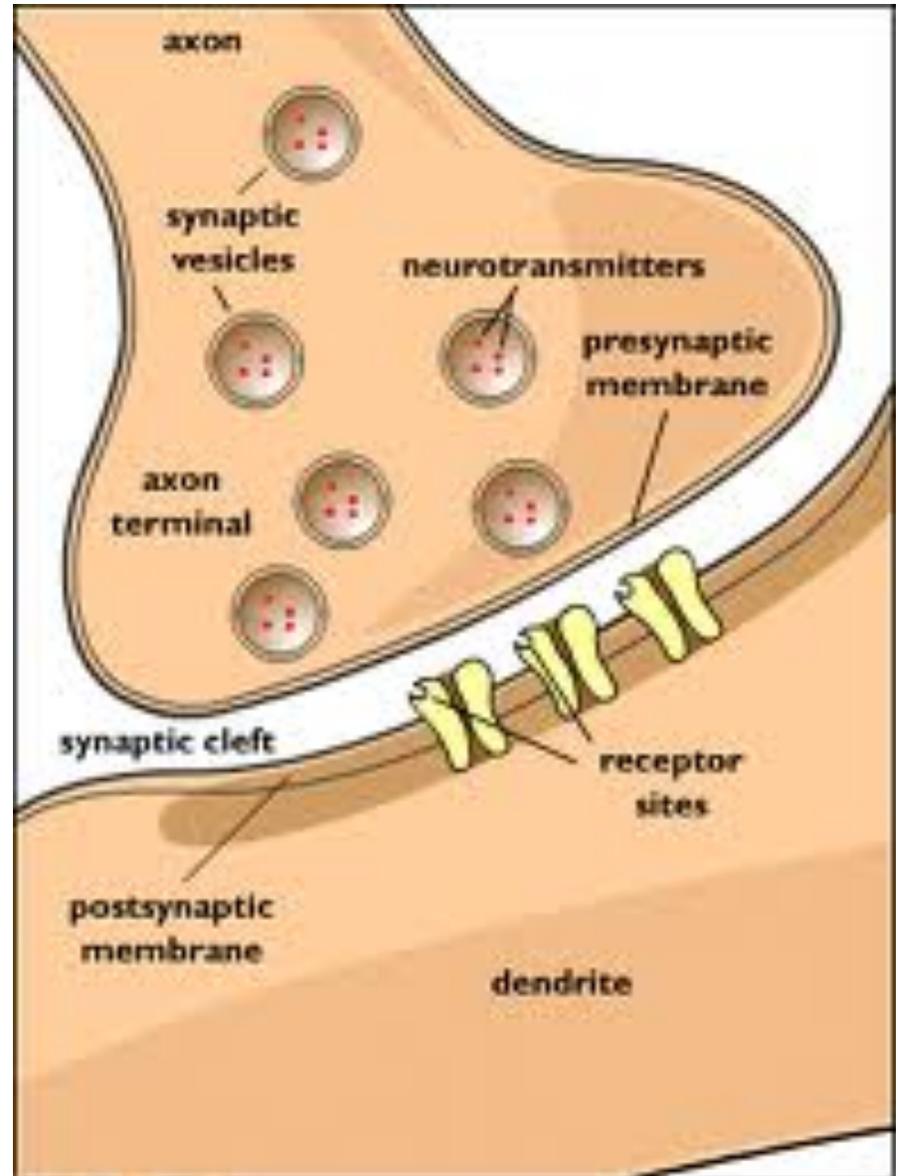




The Synapse is where an impulse passes from one cell to another.

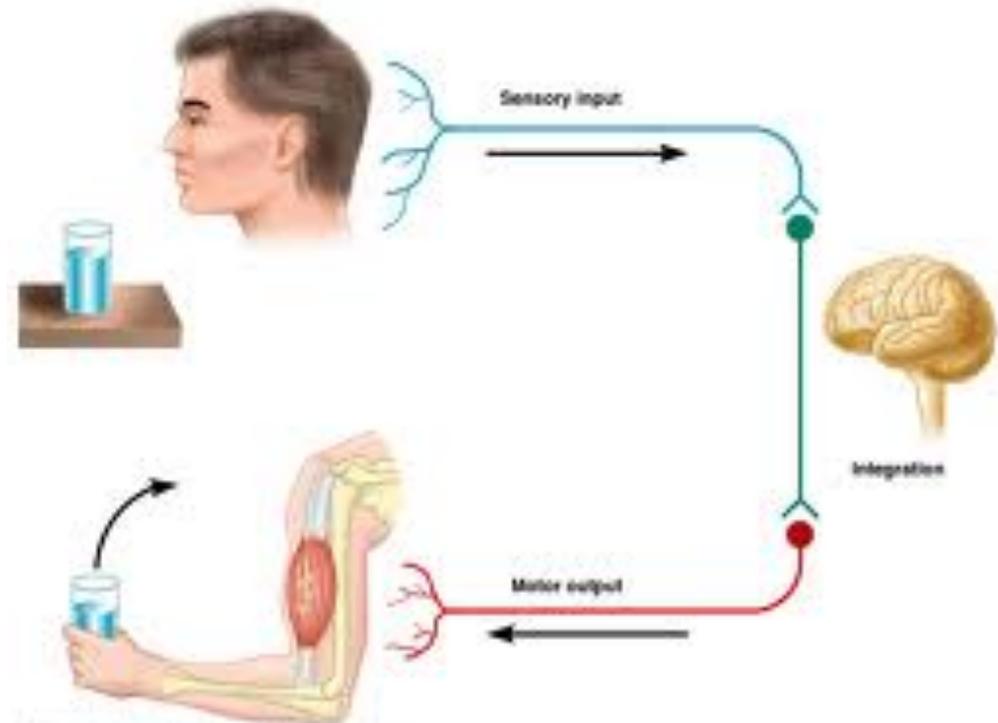
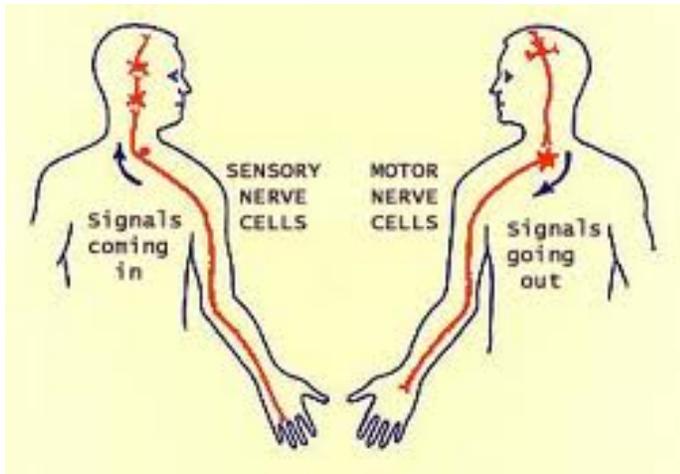
Chemicals called **NEUROTRANSMITTERS** are released to allow the signal to cross the gap.

Receptors must must
match the
neurotransmitter.

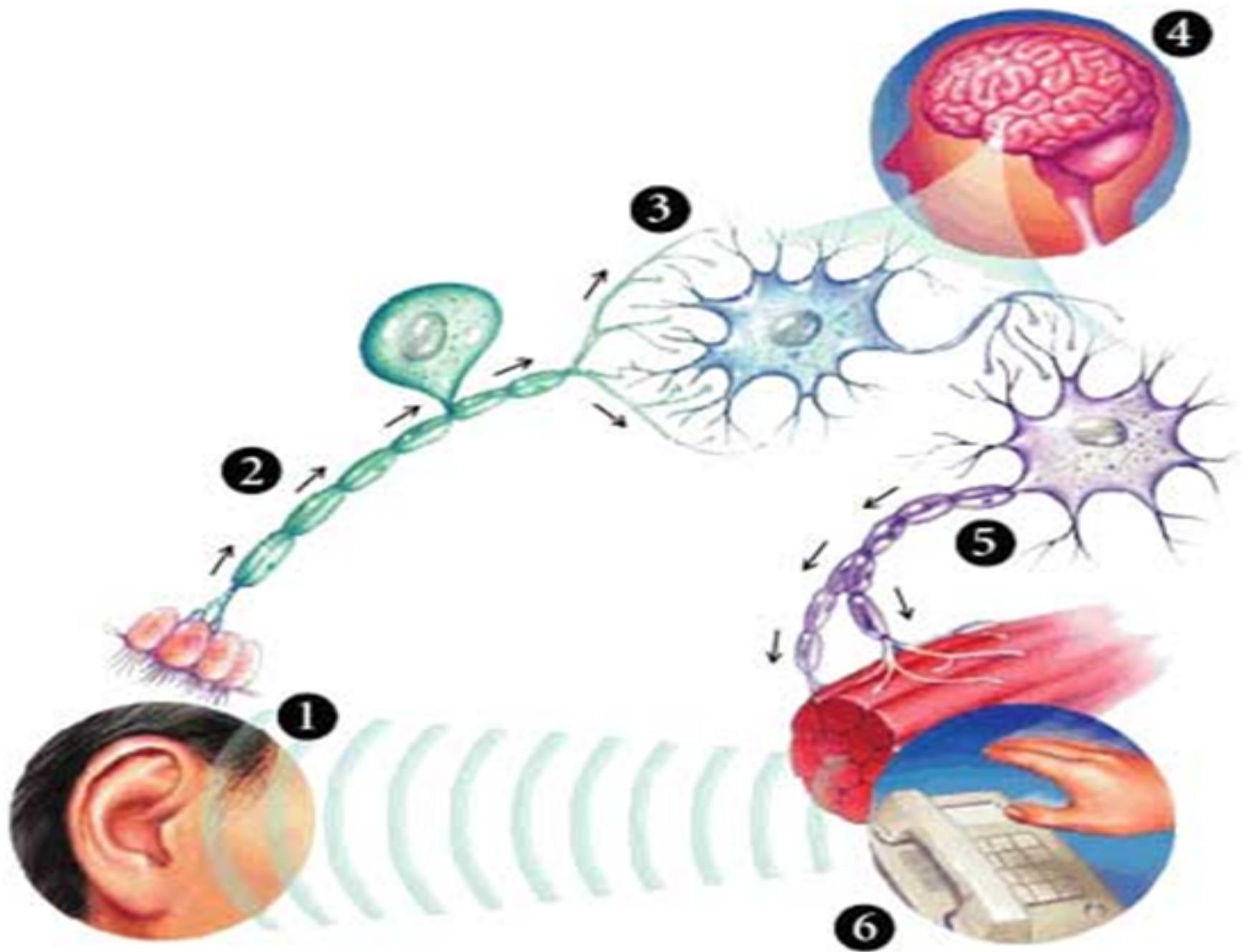


There are three types of neurons;

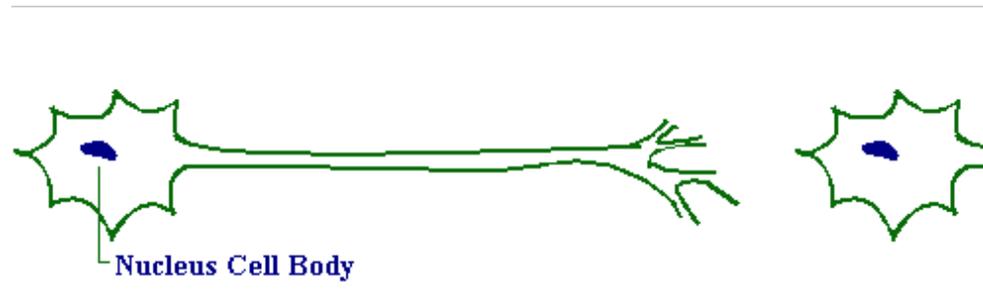
- SENSORY NEURON
- INTERNEURON
- MOTOR NEURON



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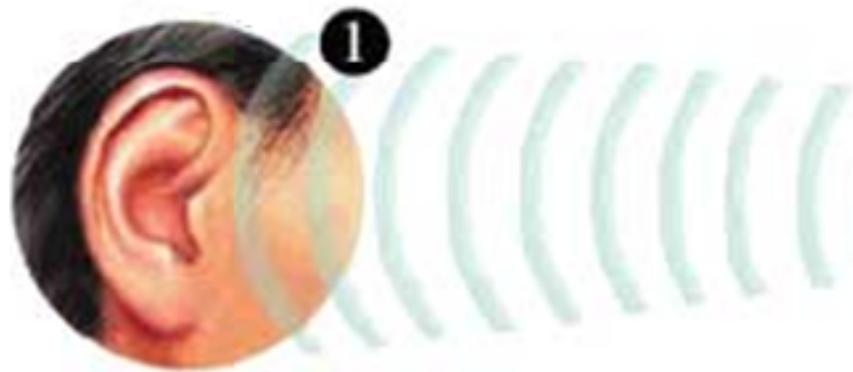


An **IMPULSE** signal is started
when a **RECEPTOR**
receives information from the
somewhere.

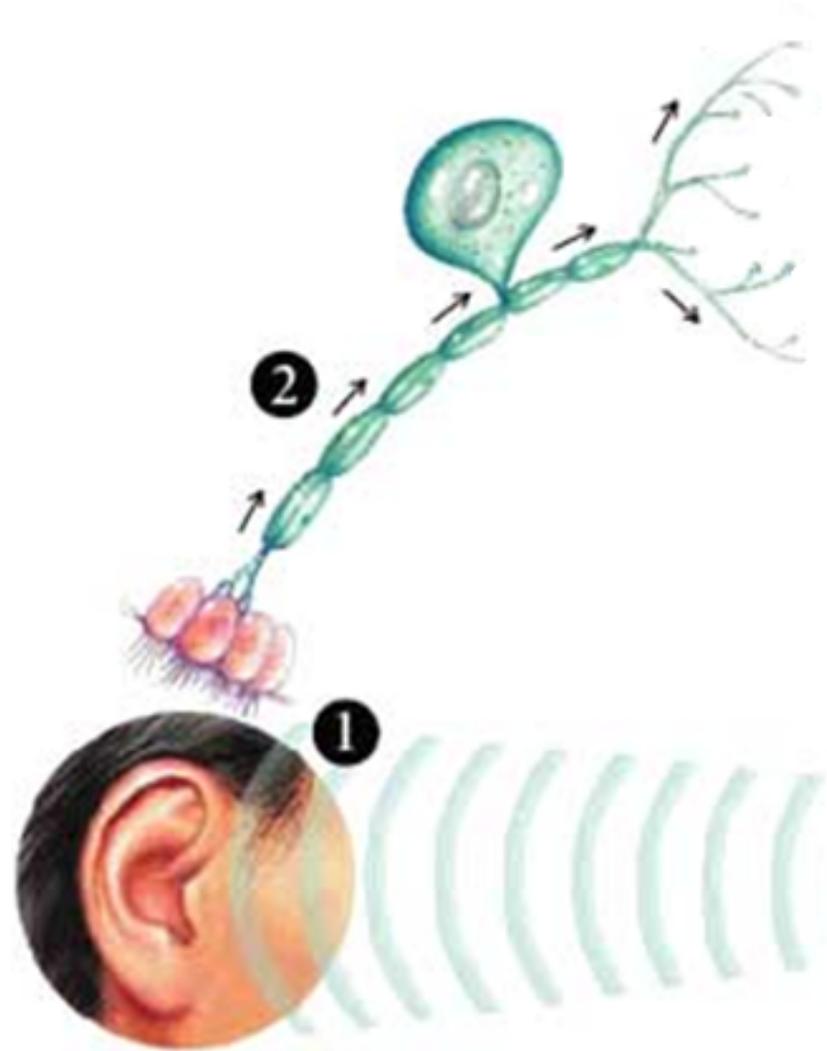


1. A RECEPTOR receives information from the outside environment.

This information is called a STIMULUS.

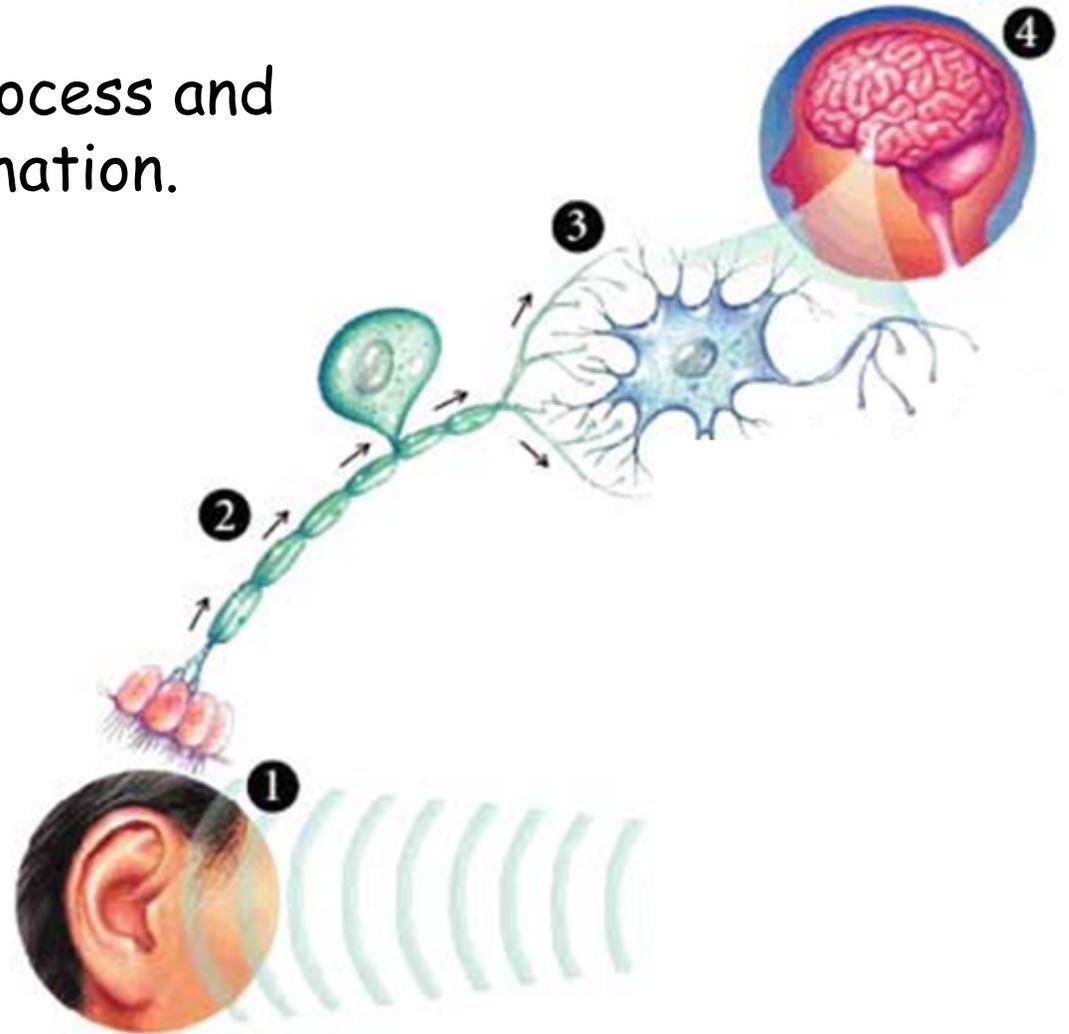


2. The stimulus initiates an impulse along a **SENSORY NEURON**.



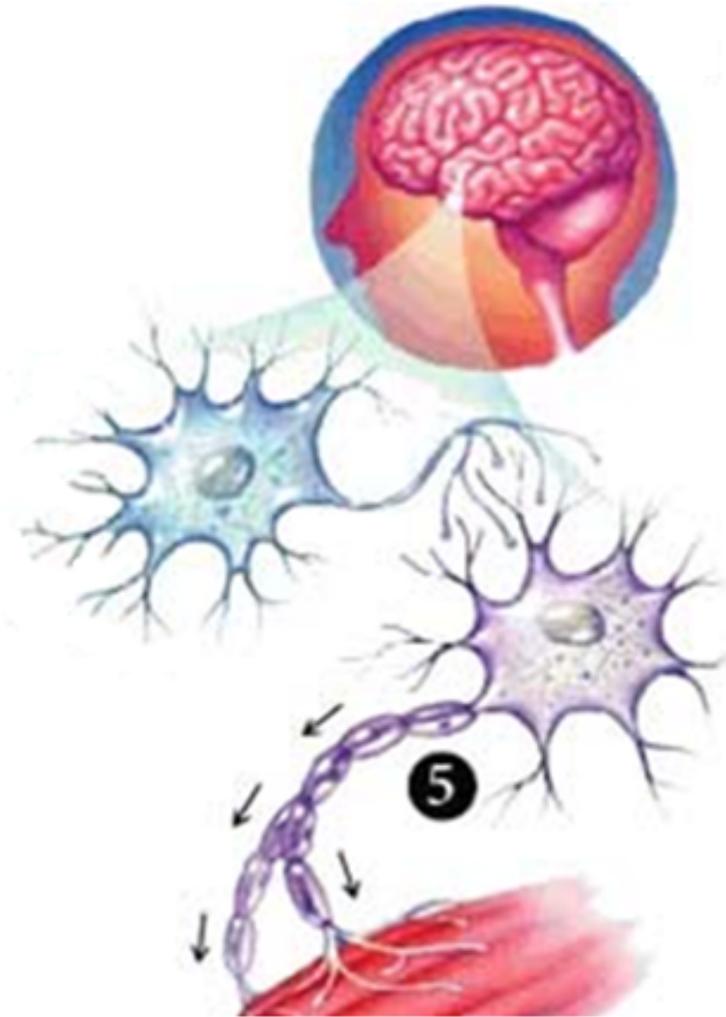
3. An impulse reaches the brain,
where it crosses to an
INTERNEURON.

4. The interneurons process and
decipher the information.



A new impulse is started in the brain.

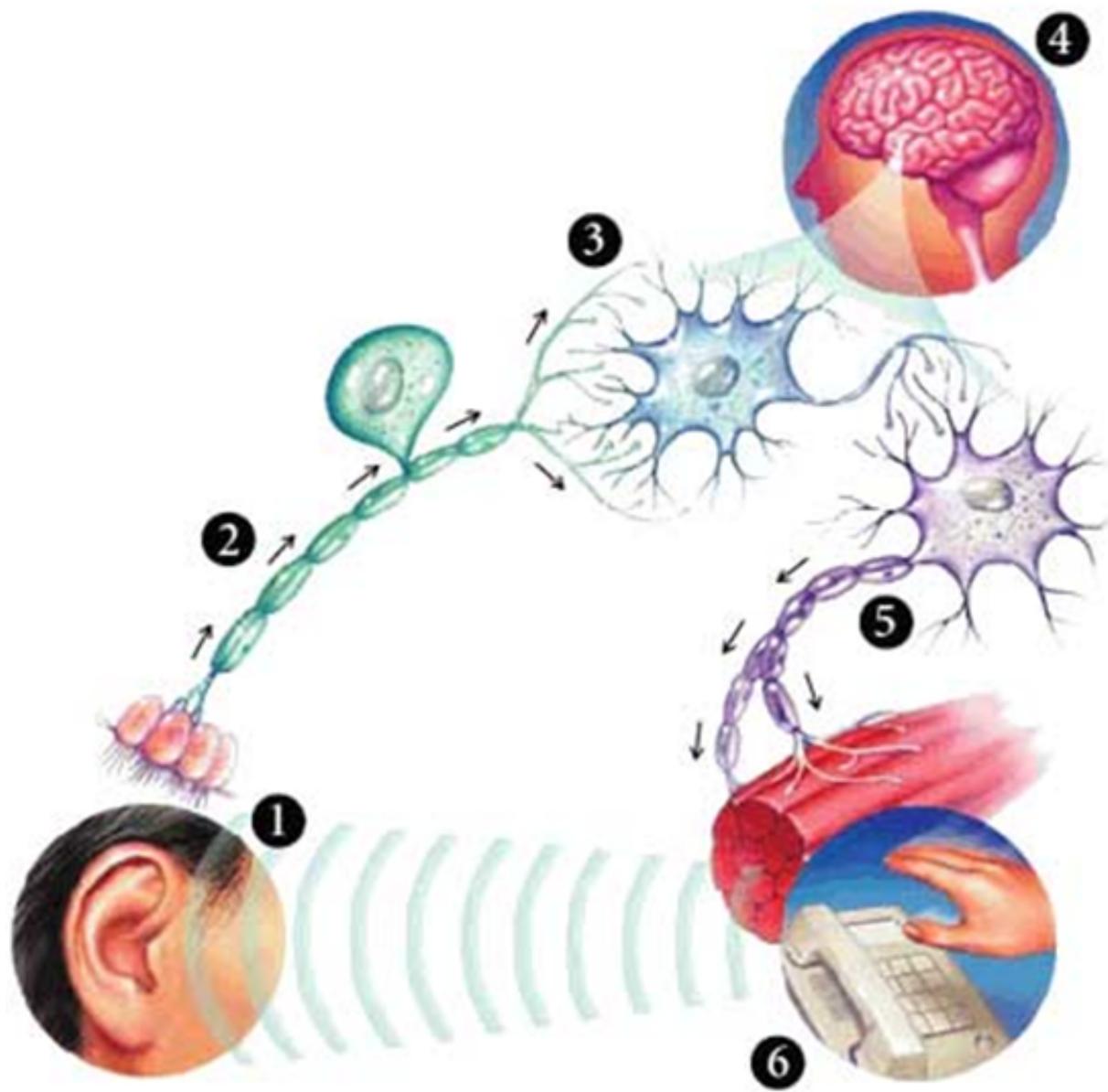
5. The new impulse travels along a **MOTOR NEURON** to a muscle that will respond.

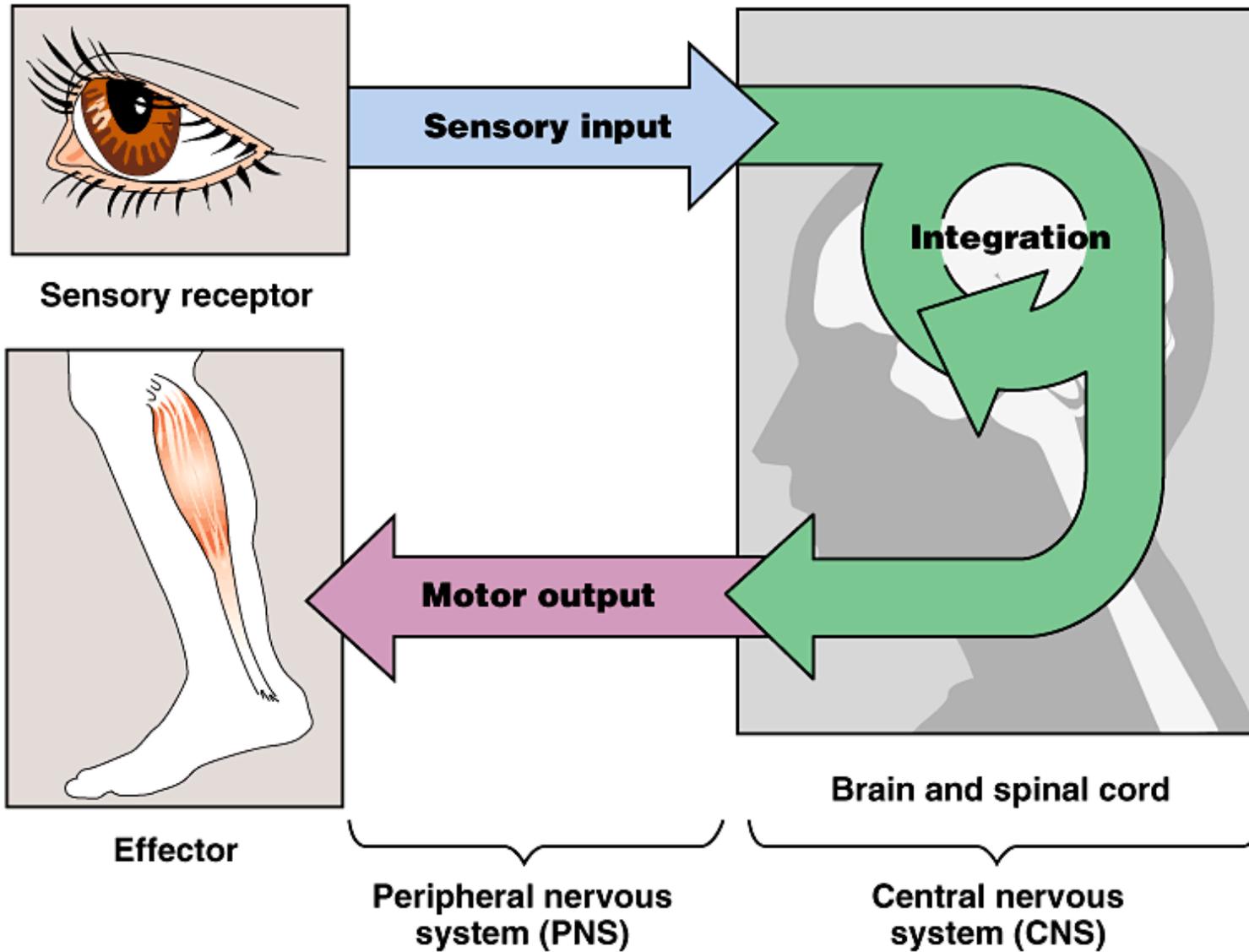


6. Muscles and glands that respond to impulses are called **EFFECTORS**.

In order to respond to the stimulus muscles contract or glands secrete.



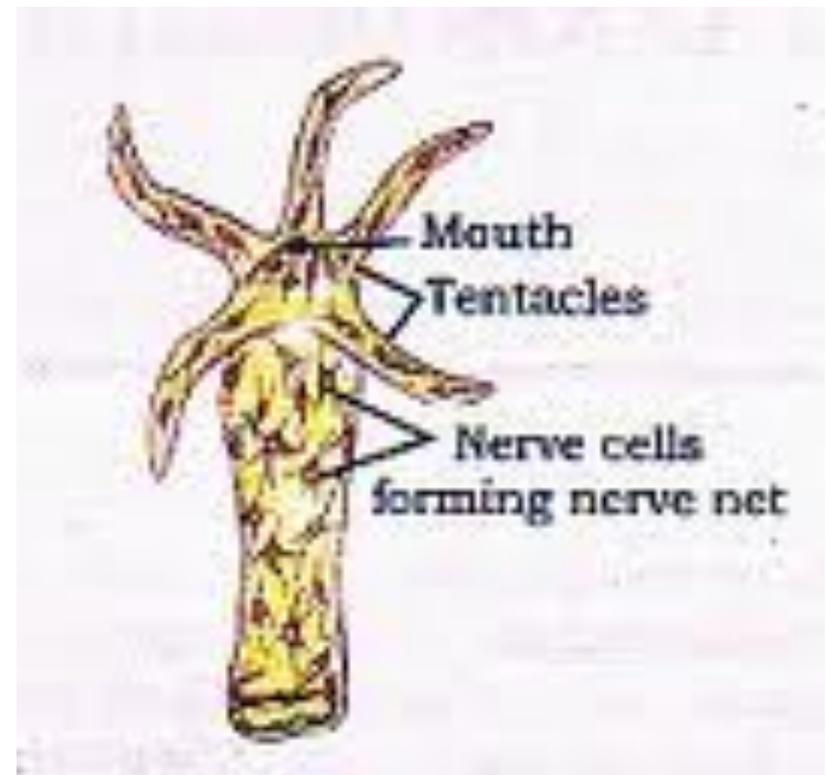




In the HYDRA, impulses do not follow a direct pathway.

The hydra has a NERVE NET of interconnected neurons.

When the hydra is in danger, its entire body responds by contracting.



More advanced animals have a
CENTRAL NERVOUS SYSTEM
that shows CEPHALIZATION -
the development of a head with a brain.

A CENTRAL NERVOUS SYSTEM includes

1. BRAIN
2. NERVE CORD
3. BRANCHING NERVES
4. SENSE ORGANS

Muscles and Bones

LOCOMOTION is the ability to move from place to place.



Almost all animals are capable of some form of locomotion. Such organisms are said to be MOTILE.

Motile - the ability to move

Why is locomotion important?

Locomotion increases an organism's chance to survive.



[Massive Migrations](#)

It can improve an organism's chances of finding food.

It can improve an organism's chances of finding a good place to live.



It improves an organism's chances of avoiding predators and other dangers.

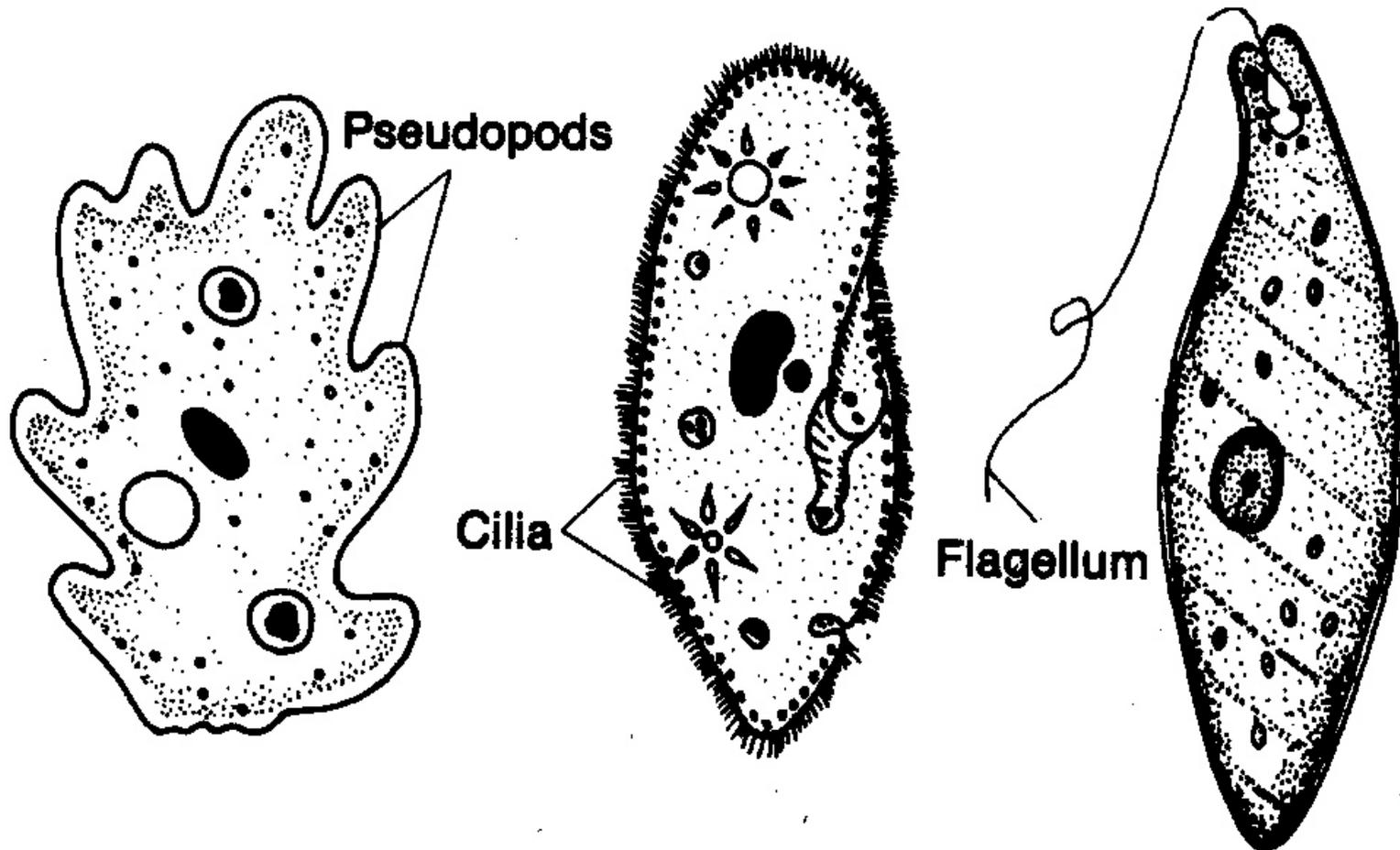


[Cheetah Chase](#)

It improves an organism's chances of finding a mate.

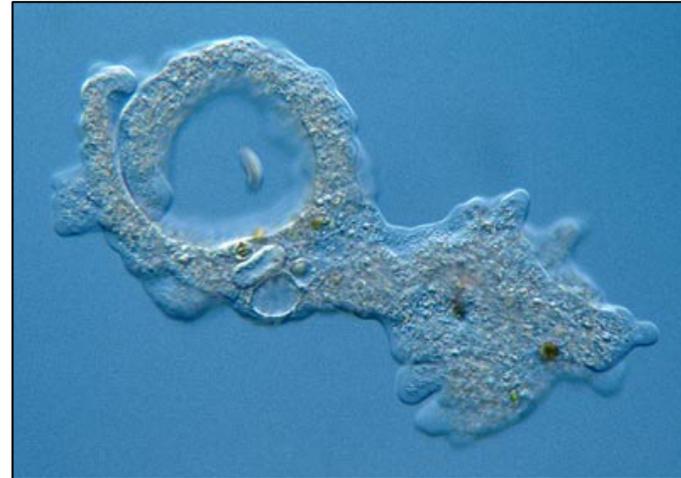


There are three basic forms of locomotion among protists.



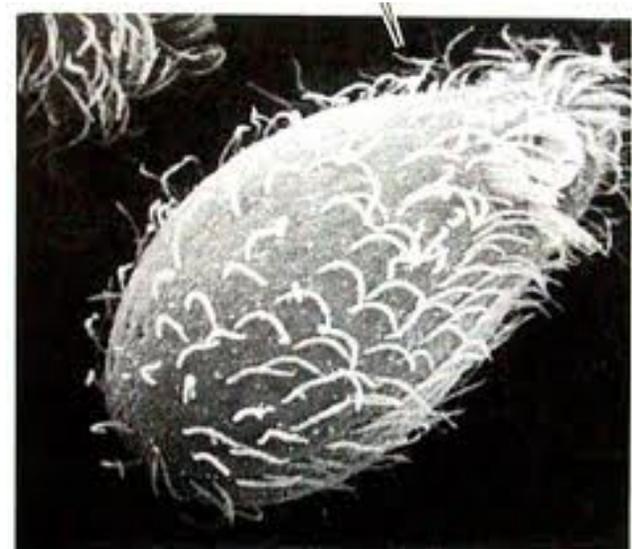
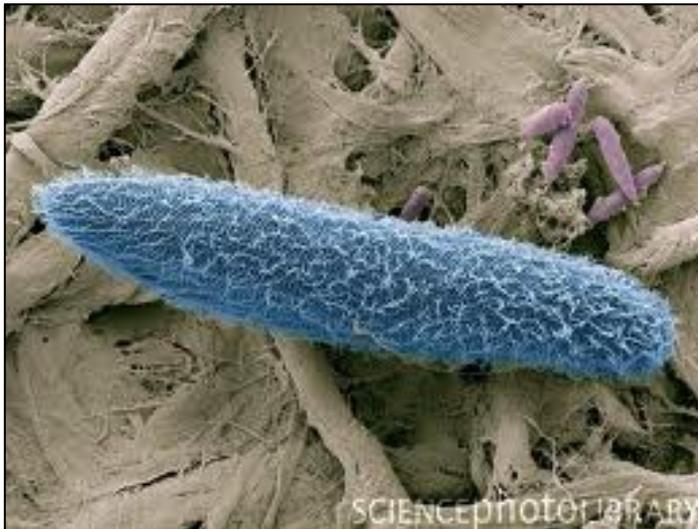
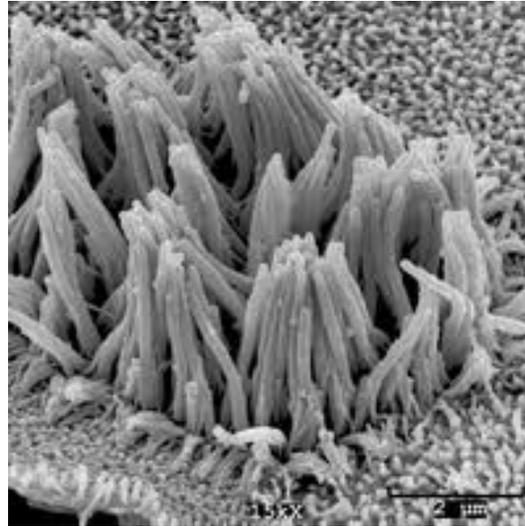
Can you name these Protists ?

In the ameba, the cell cytoplasm flows into extensions of the cell called PSEUDOPODS.



[Cilia and Flagella](#)

In the paramecium, *CILIA* wave back and forth in a coordinated way, moving the cell through the water.

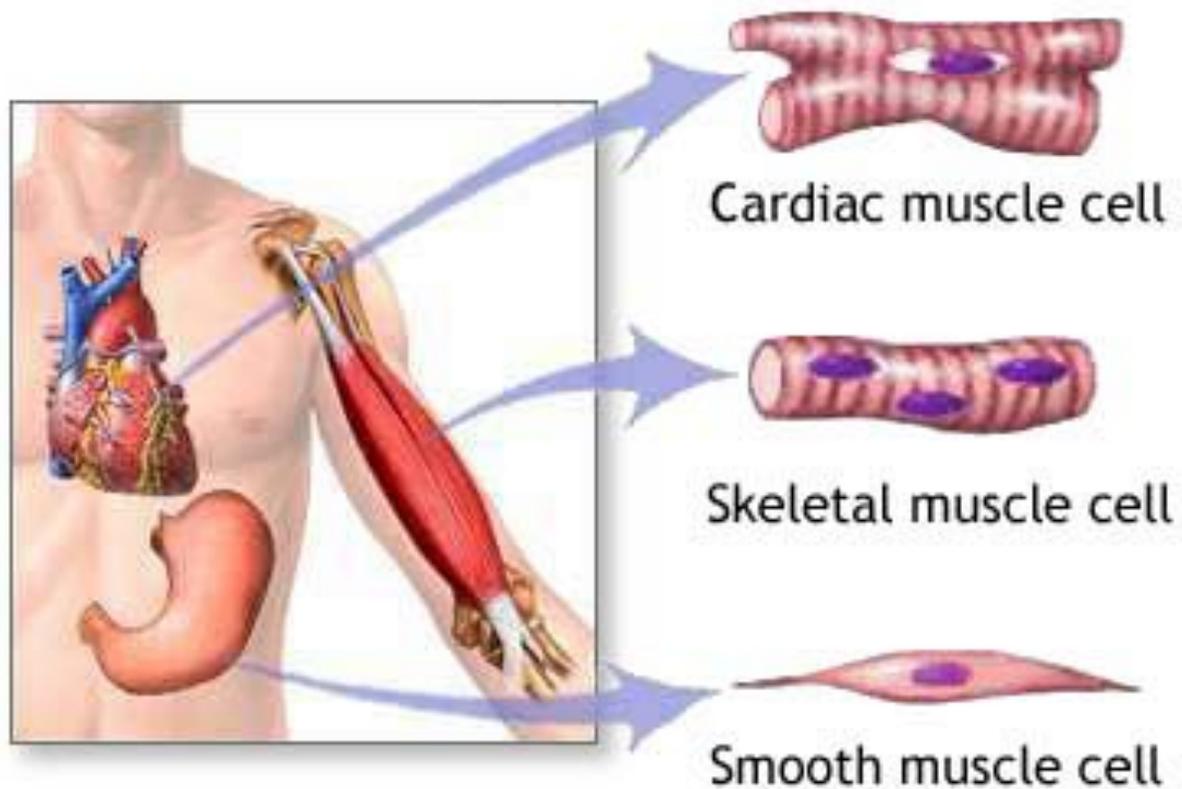


The HYDRA is generally a SESSILE organism.

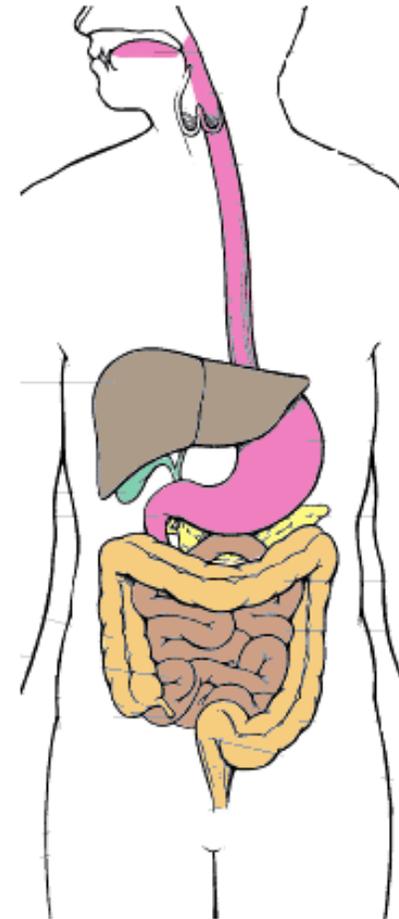
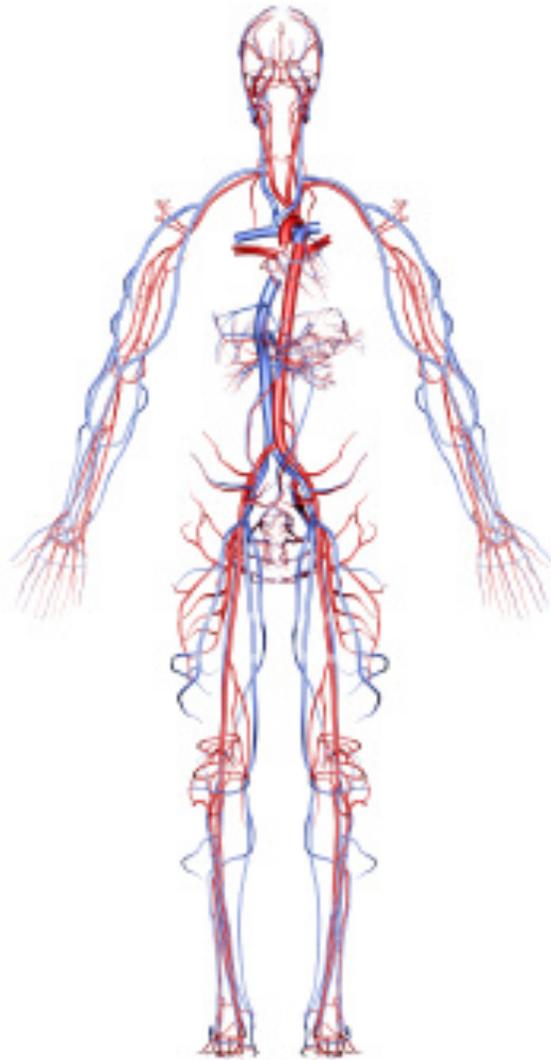
Sessile - tends to remain in one place fastened to a plant stem or another structure.



There are three types of muscle in the human body: skeletal muscle, smooth muscle, and cardiac muscle.



SMOOTH MUSCLE is found in the walls of the digestive organs and arteries, as well as in other internal organs.



CARDIAC MUSCLE is found only in the heart.



It is not under our control.
It is in-voluntary.



Humans and other mammals
have internal skeletons
called **ENDOSKELETONS**.

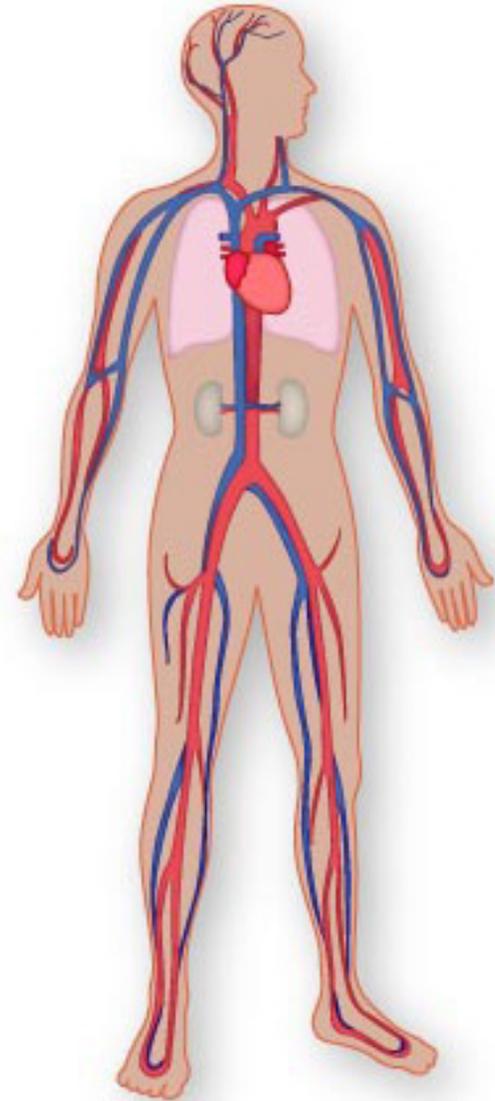
They are made of
BONE
CARTILAGE and
CONNECTIVE TISSUES.



Immunity

TRANSPORT is the absorption and distribution of materials throughout the body.

In humans, these materials are dissolved in the blood which is moved by the circulatory system.



Many substances are transported in the plasma including

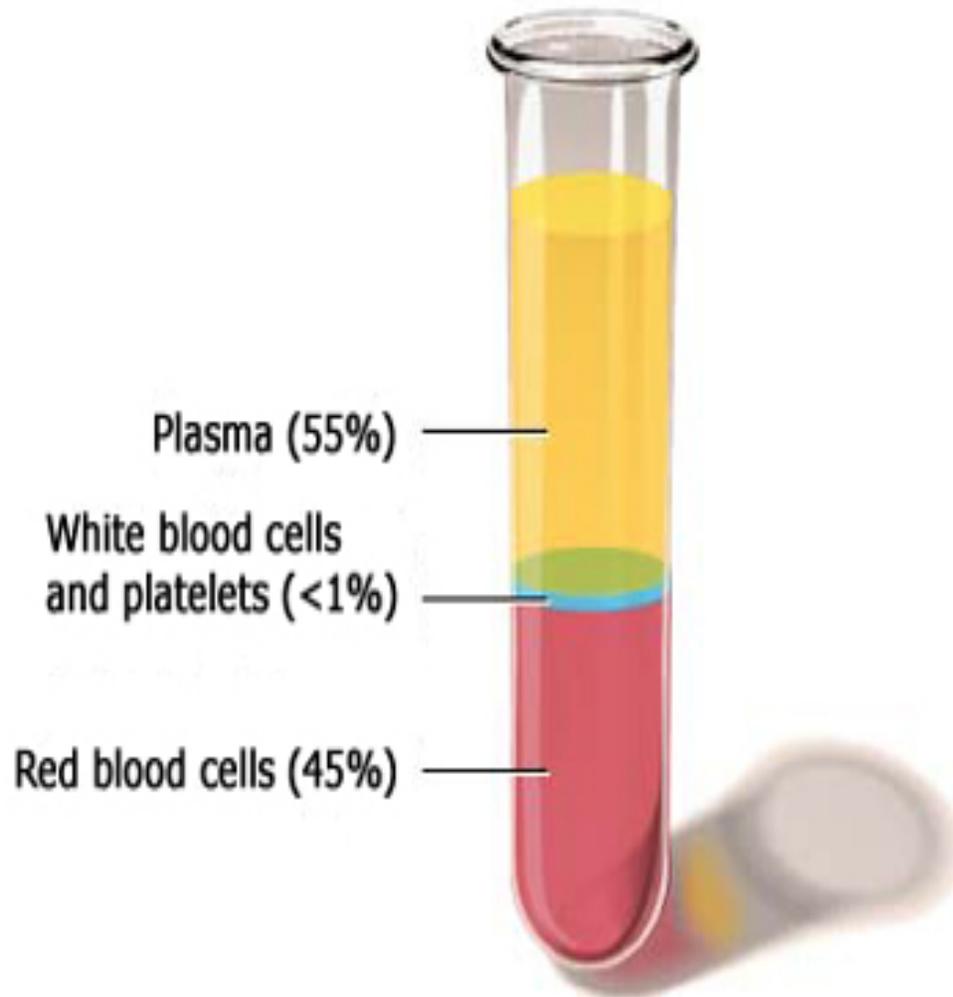
NUTRIENTS

WASTES

GASES

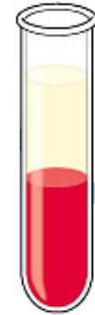
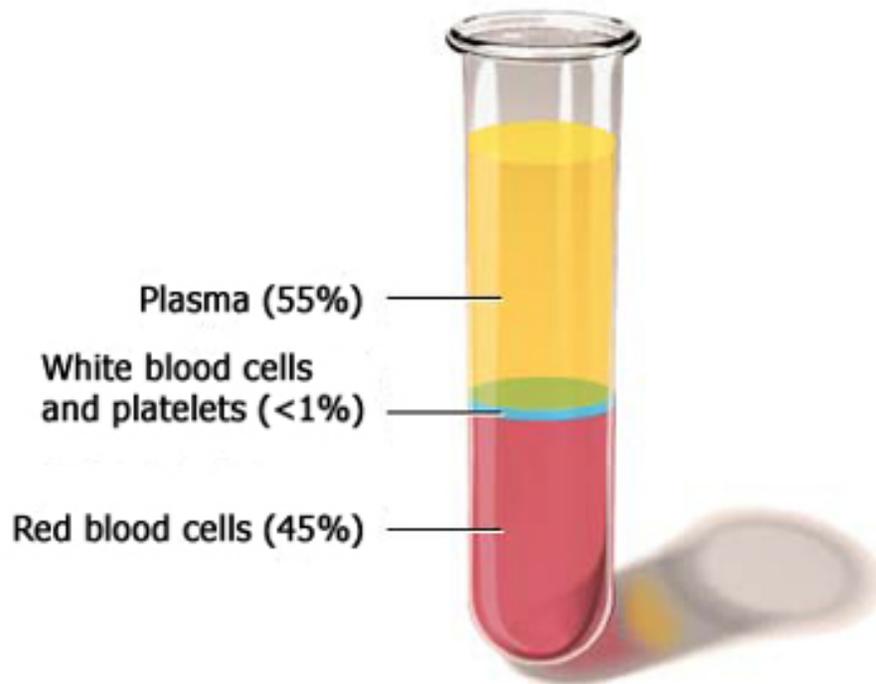
HORMONES

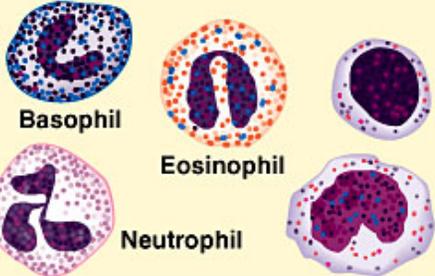
ANTIBODIES.



45% of the blood is made up of the cellular elements:

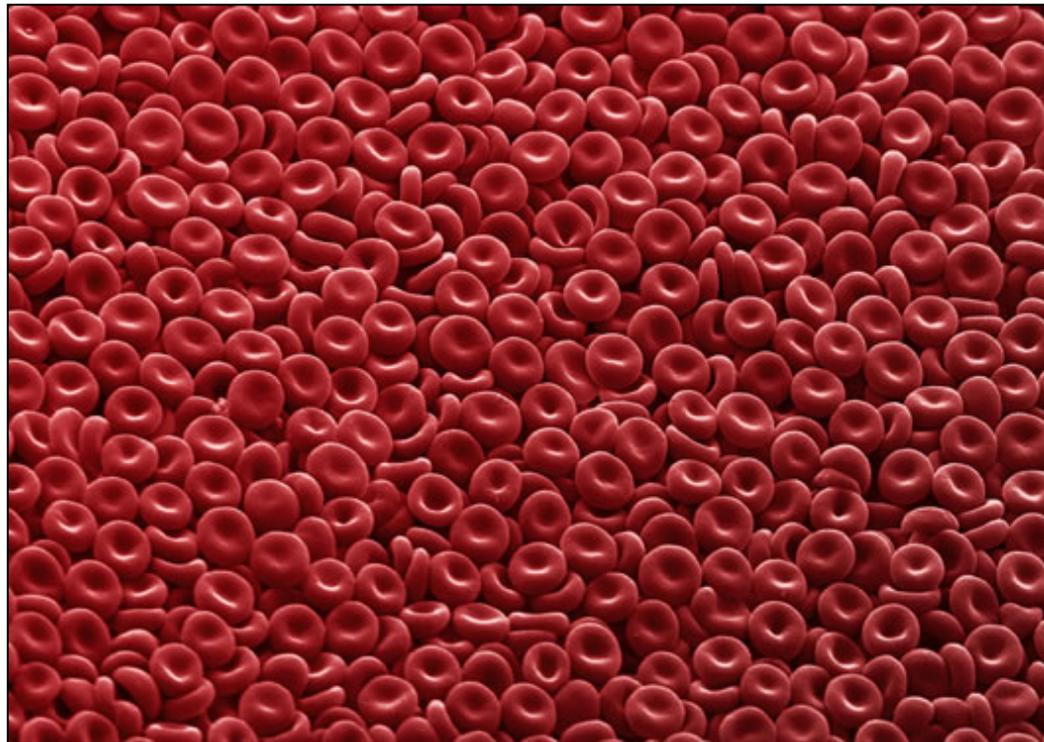
RED BLOOD CELLS
WHITE BLOOD CELLS
and PLATELETS.



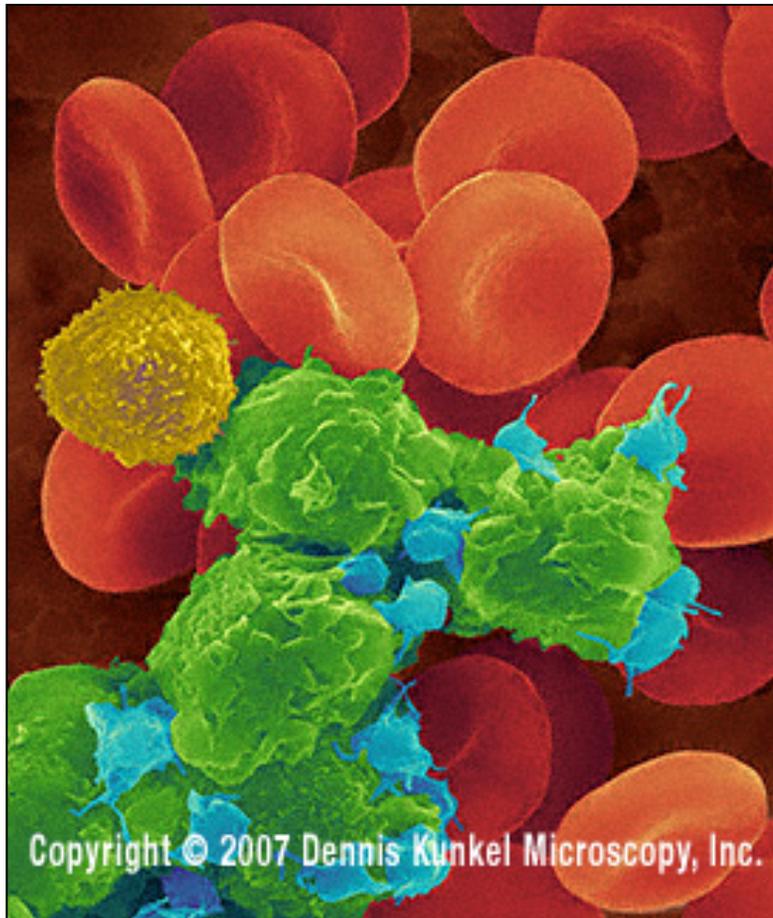
Cellular elements 45%		
Cell type	Number (per mm ³ of blood)	Functions
Erythrocytes (red blood cells) 	5–6 million	Transport of oxygen (and carbon dioxide)
Leukocytes (white blood cells) 	5,000–10,000	Defense and immunity
Platelets 	250,000–400,000	Blood clotting

RED BLOOD CELLS
are the most numerous of the blood cells.

They contain the red pigment **HEMOGLOBIN**,
which carries oxygen between the lungs and the body tissues.



The parts that are involved in clotting the blood are called PLATELETS.



The platelets are shown
in blue.

When blood vessels break, blood is released.

To stop the loss of blood, a blood clot forms,
blocking the wound.

