

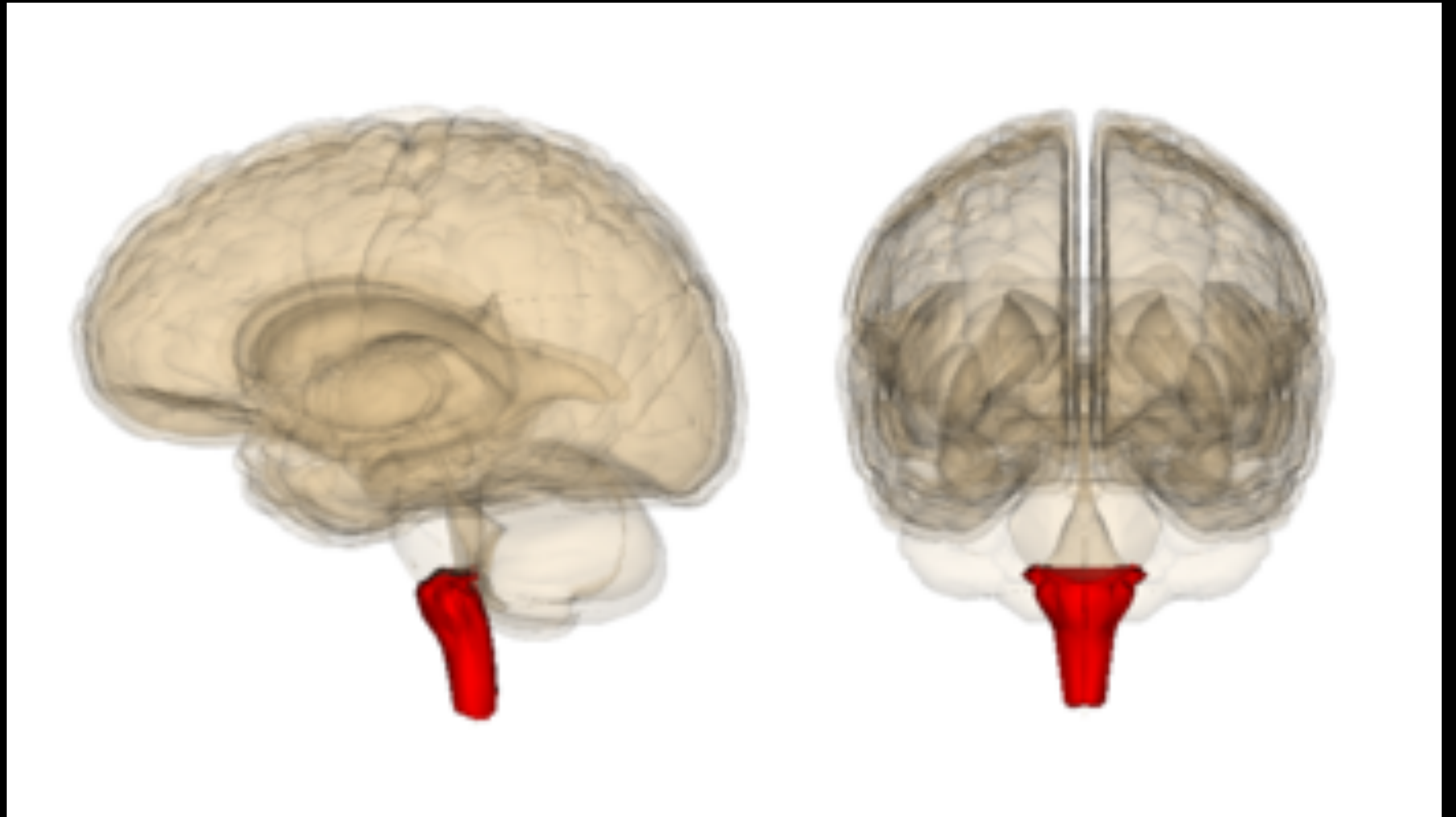


Brain and Behavior

Leyly Marban

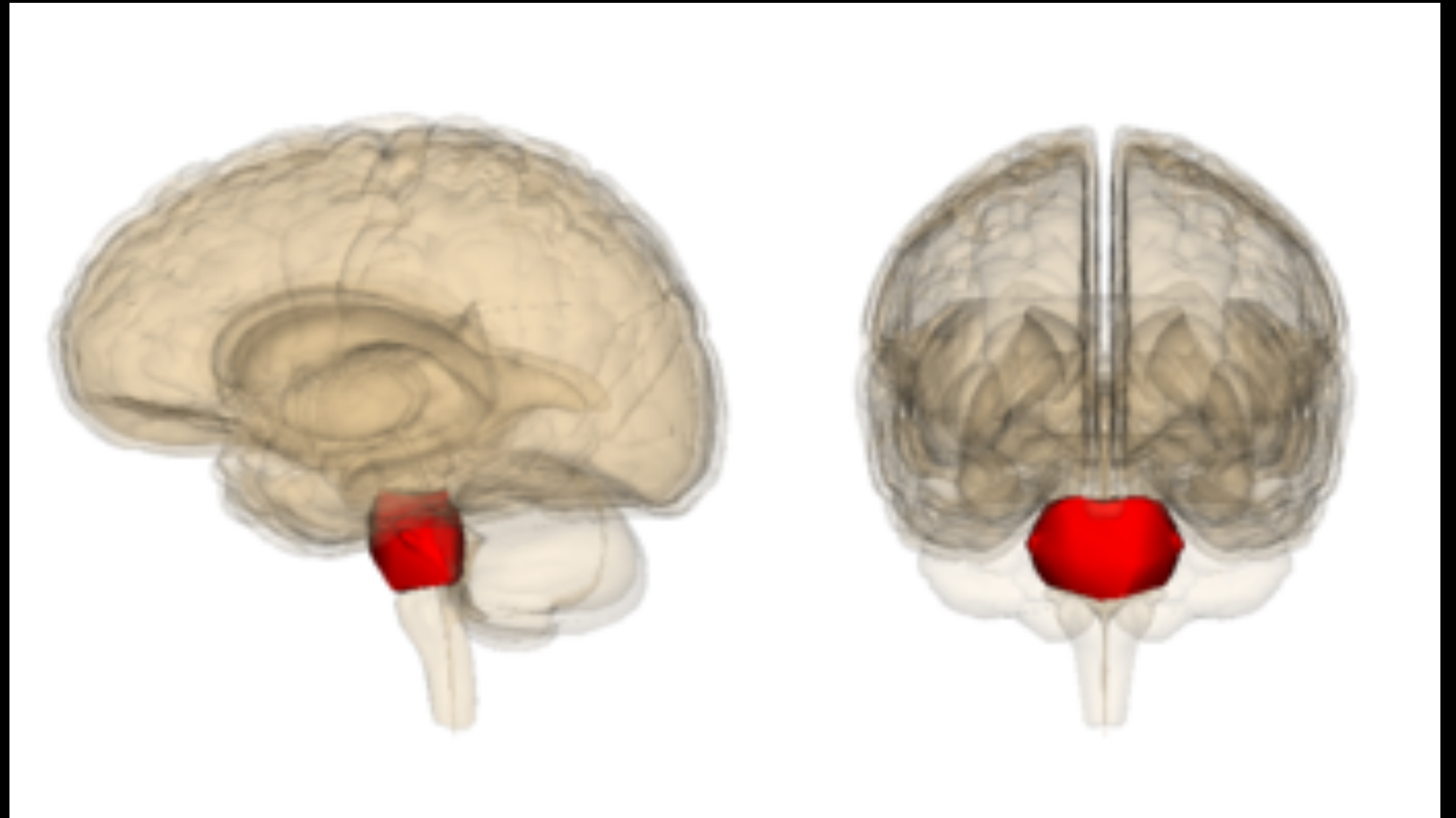
Medulla

The **medulla** controls the autonomic functions such as breathing, and heartbeat. These are things a person does not need to think about but which happen without conscious effort.



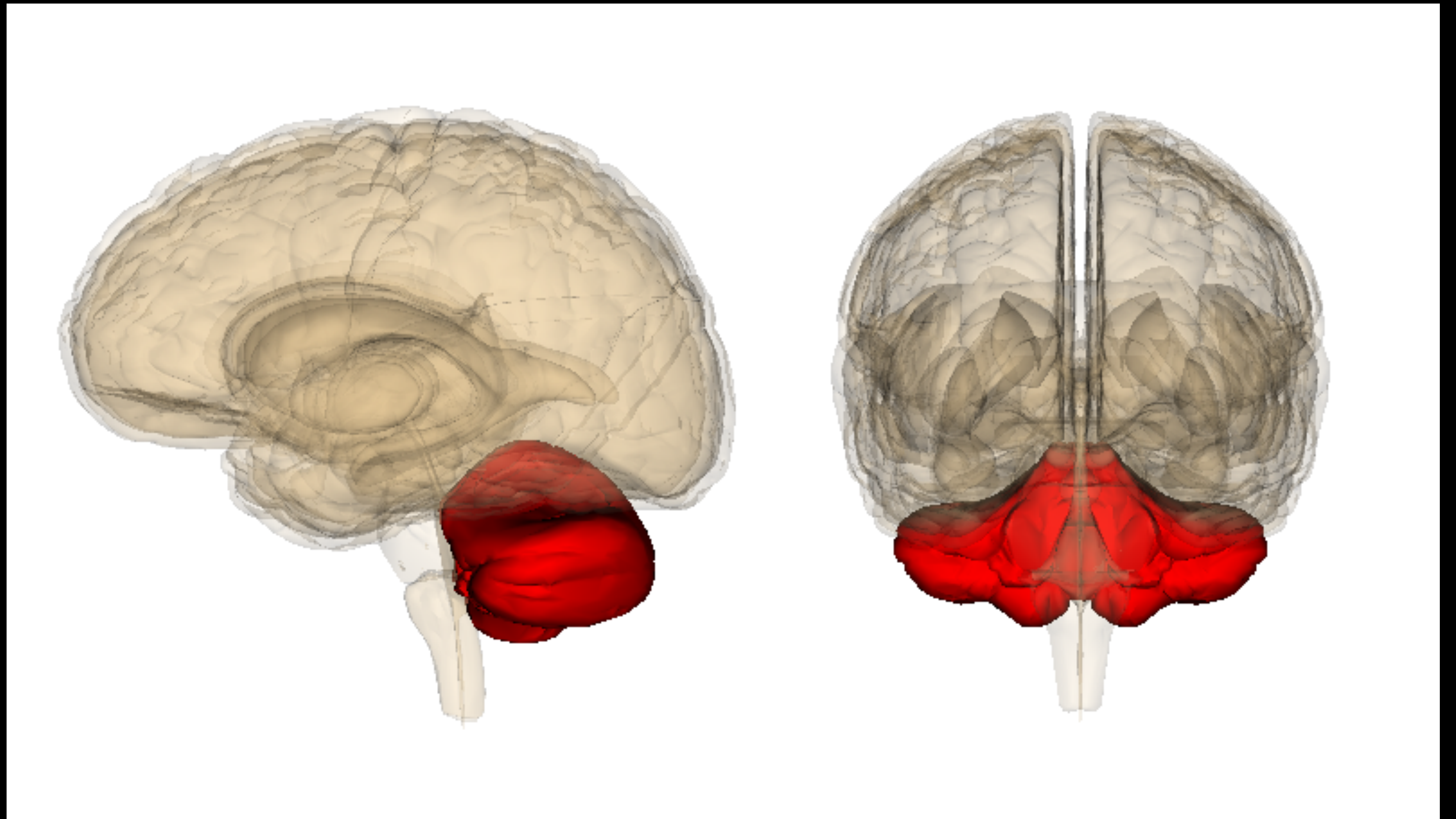
Pons

The **pons** is a knob on the brain stem. It is part of the autonomic nervous system, and relays sensory information between the cerebellum and cerebrum.



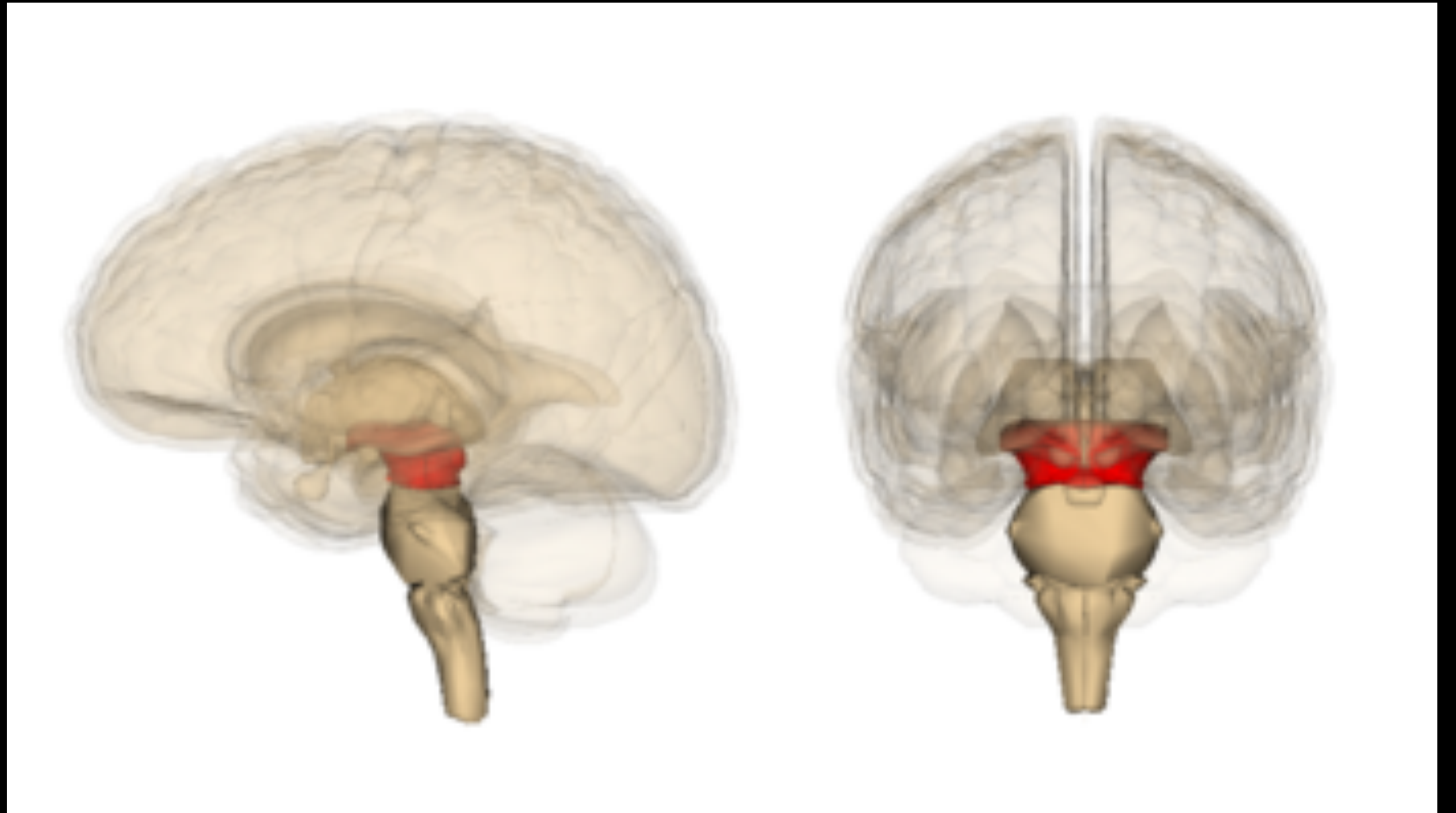
Cerebellum

The **cerebellum** plays an important role in coordinating sensory perception and motor output. It compares what the cerebrum tells the body to do with what the body actually does and makes adjustments.



Midbrain

The **midbrain** relays information to higher centers of the brain. It plays an important role in reward, addiction, and movement.



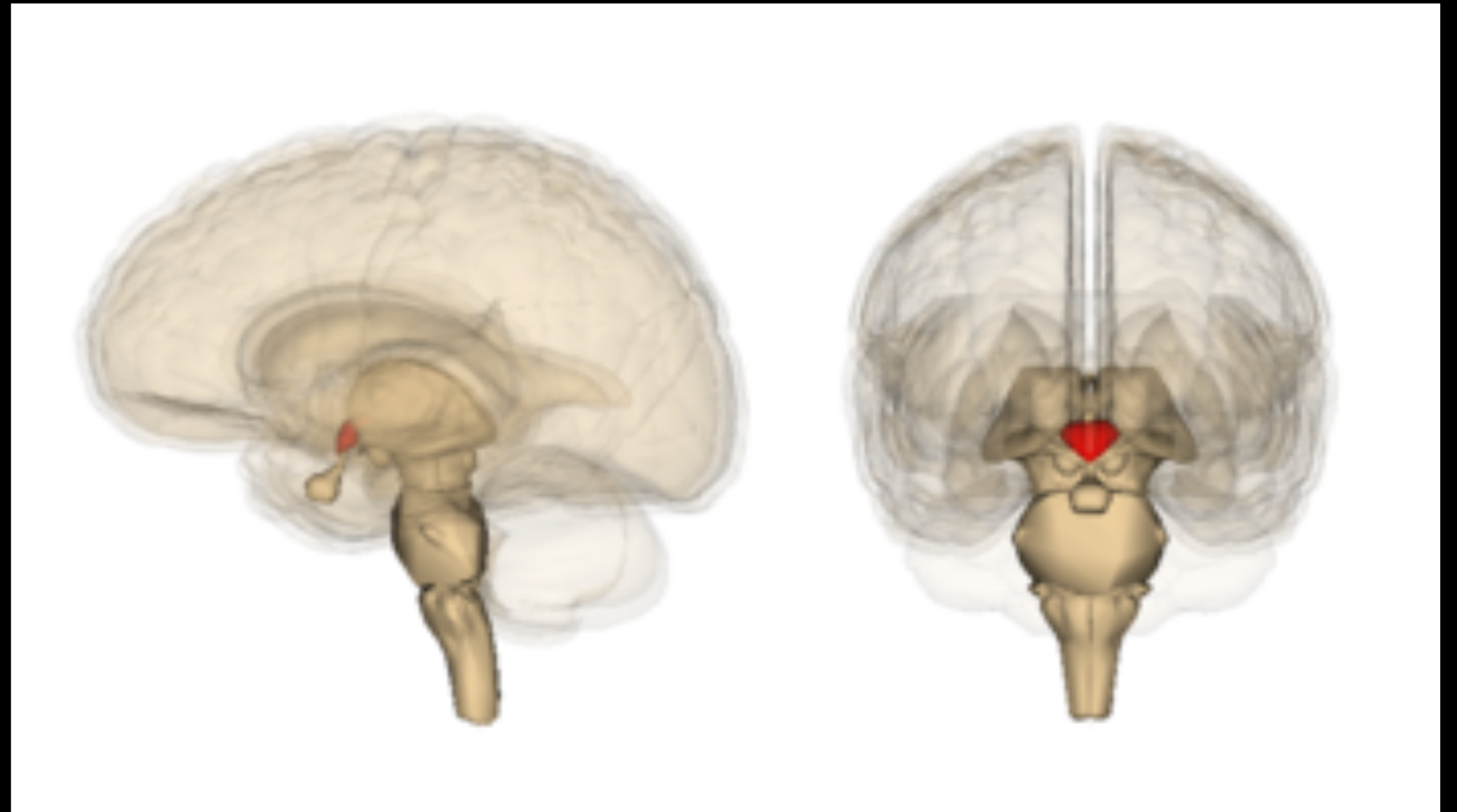
Thalamus

The **thalamus** can be thought of as a relay station for nerve impulses carrying sensory information into the brain. It receives these sensory inputs as well as inputs from other parts of the brain and determines which of these signals to forward to the cerebral cortex.



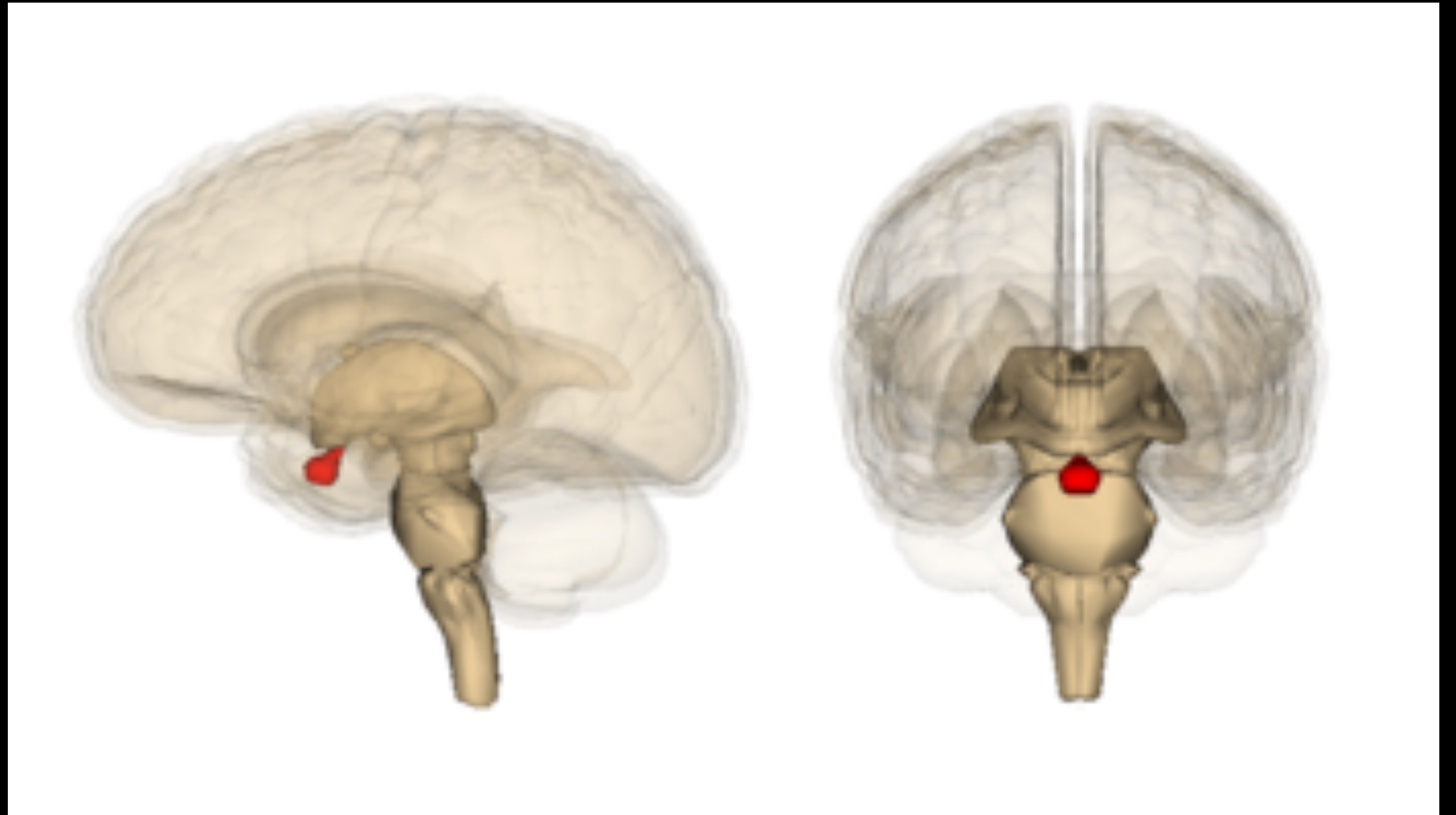
Hypothalamus

The **hypothalamus** links the nervous system to the endocrine system by stimulating the secretion of hormones from the pituitary gland.



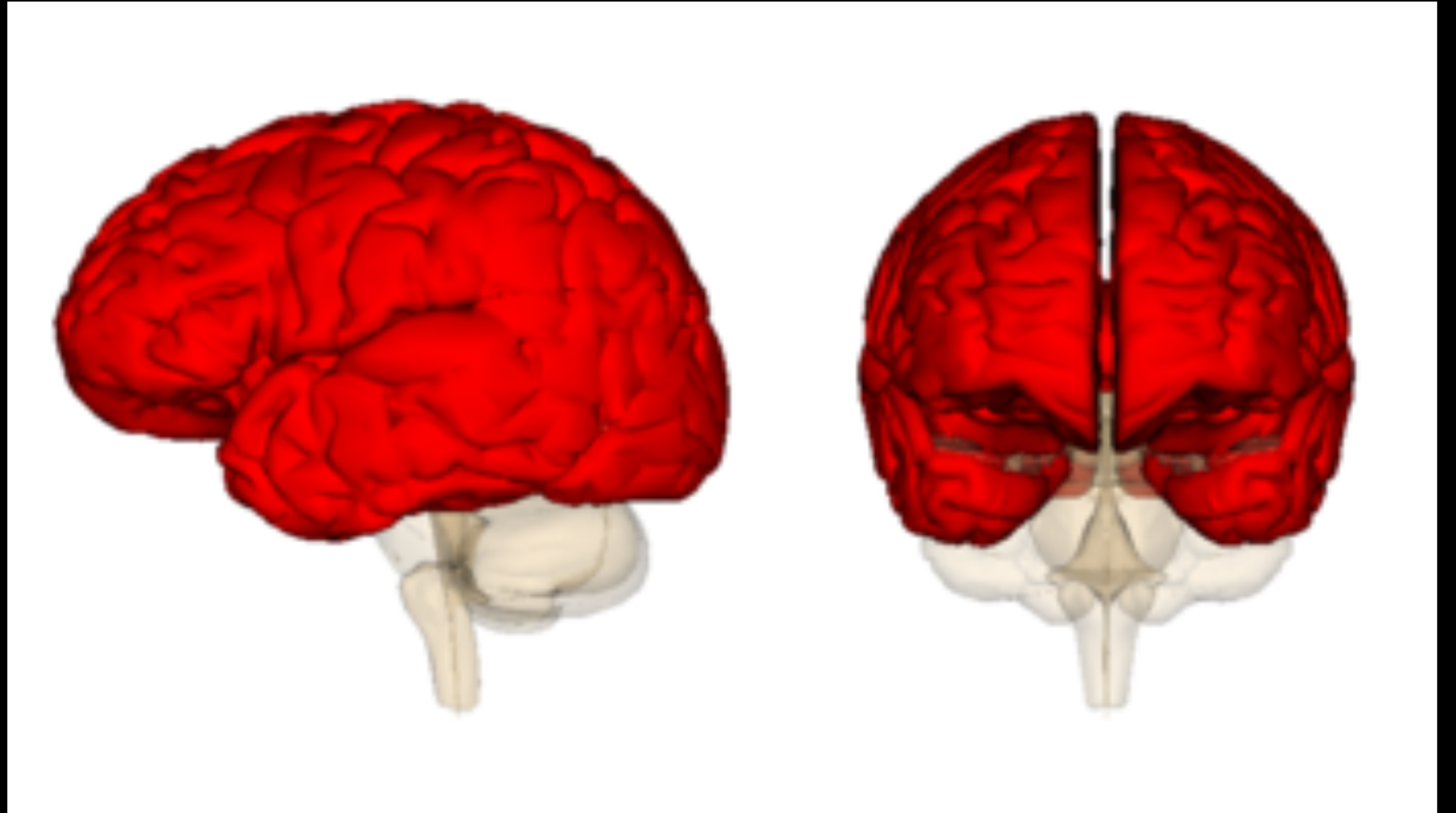
Pituitary Gland

The **pituitary gland** secretes hormones regulating a wide variety of bodily activities, including hormones that stimulate other endocrine glands.



Cerebrum

The **cerebrum** is where *thinking* occurs. This is the area of the brain responsible for language, memory, and emotion, as well as motor control and the sense of smell.

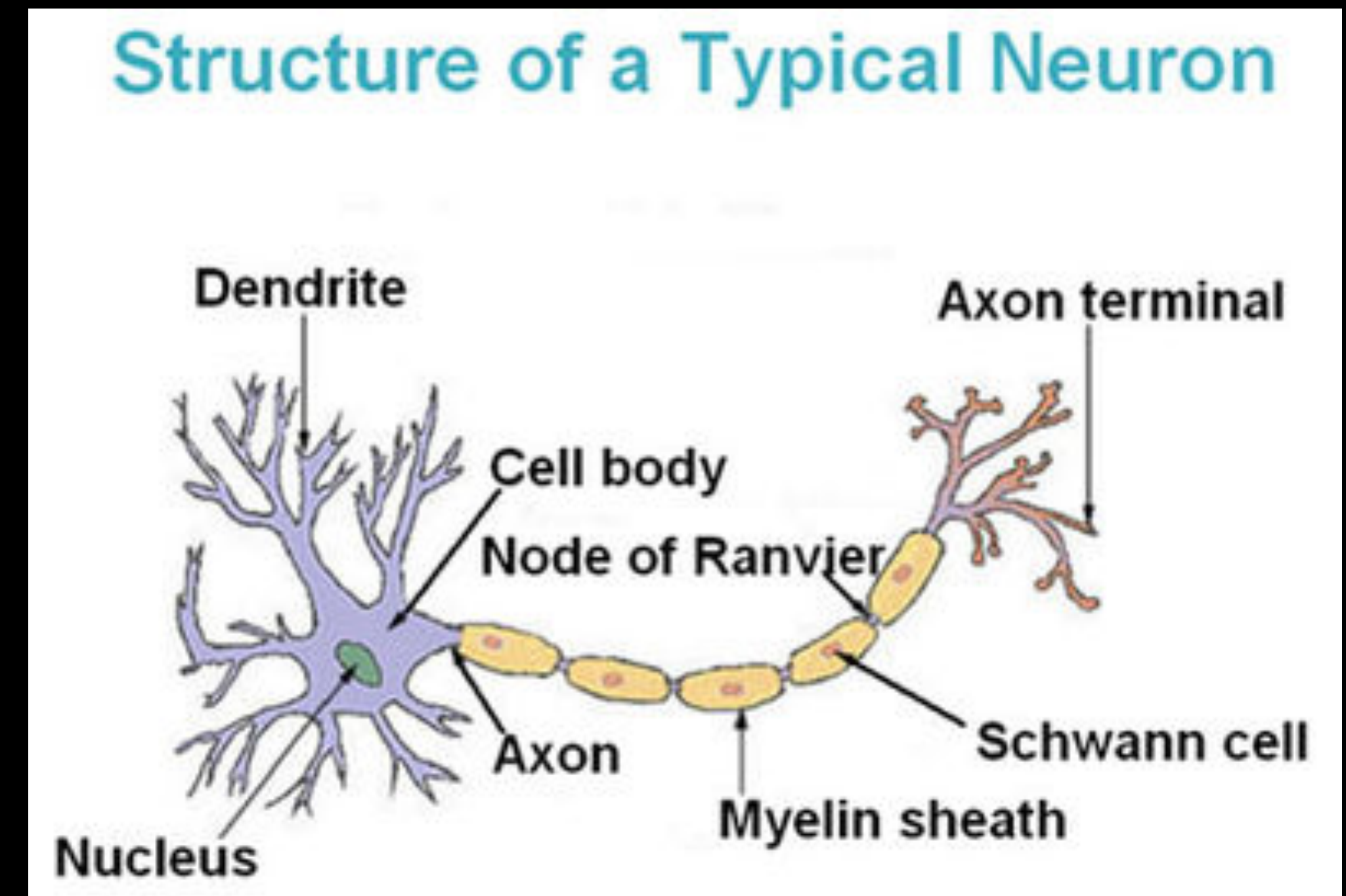


Axons & Neurons

Neurons (also called nerve cells) are a major class of cells in the nervous system. In vertebrates, they are found in the brain, the spinal cord and elsewhere in the nervous system. Neurons are discrete cells which communicate with each other via specialized junctions. Information enters the neuron primarily through the **dendrites** and exits through the **axon**.

Neurons communicate with one another and to other cells through synapses, where the axon terminal of one cell connects to a dendrite of another.

Axons carry electrical signals from a neuron to the dendrite of another neuron. However, an axon cannot transmit these electrical signals directly to a dendrite - it needs a synapse to do this. The synapse converts the electrical impulse to a chemical reaction, which releases different types of chemicals called *neurotransmitters*. These neurotransmitters travel across the synapse and cause other chemical reactions which generate electricity in the dendrite.



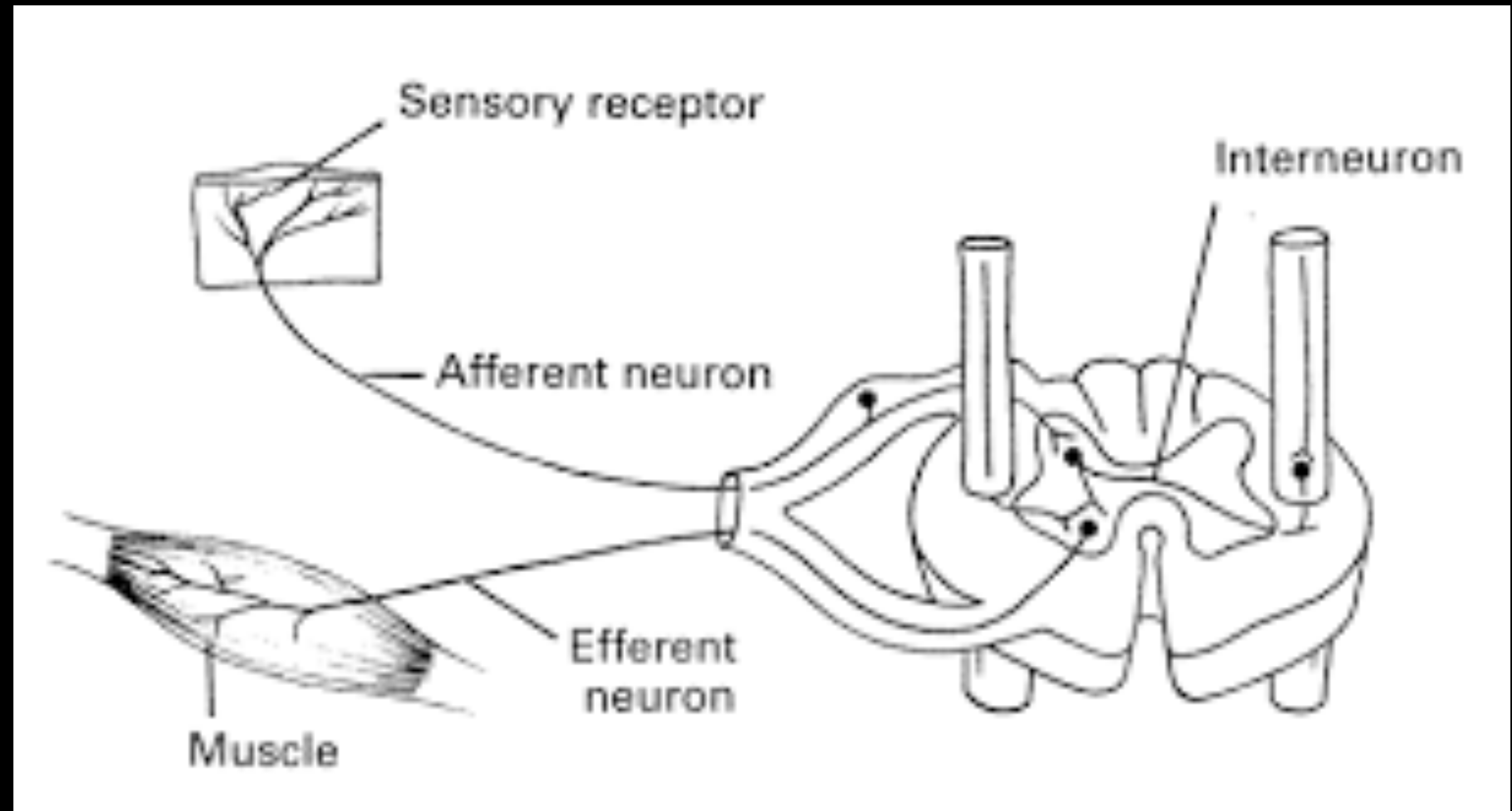
Reflex

A simple reflex is entirely automatic and involves no learning.

1. Sensory neurons in the stimulated body part send a signal to the spinal cord.
2. Within the spinal cord a reflex arc switches the signal straight back to the muscles of the body (in this case the arm or the leg)
3. to a motor neuron; contraction of the muscle occurs (the arm or leg jerks upwards).

Only three nerve cells are involved, and the brain is only aware of the response after it has taken place.

The deep tendon reflexes provide information on how well of the central and peripheral nervous systems are working. Generally, decreased reflexes indicate a problem in the peripheral nervous system. Lively or exaggerated reflexes indicate a problem in the central nervous system.



Sensory neuron & Adaptation Neuron

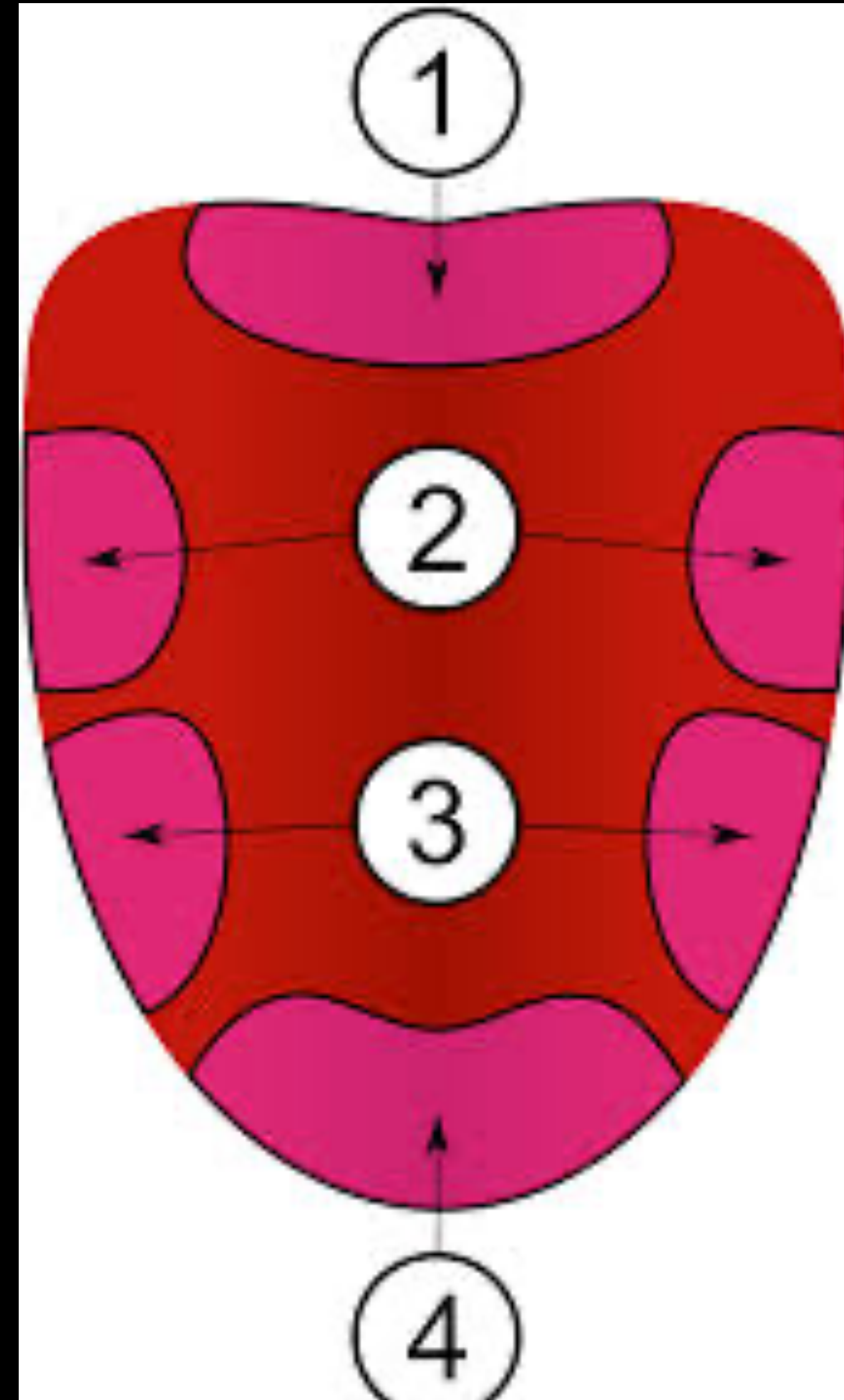
Sensory neurons are nerve cells within the nervous system responsible for converting external stimuli from the organism's environment into internal electrical impulses. For example, some sensory neurons respond to tactile stimuli and can activate motor neurons in order to achieve muscle contraction. Such connections between sensory and motor neurons underlie motor reflex loops and several forms of involuntary behavior, including pain avoidance. In humans, such reflex circuits are commonly located in the spinal cord.

Neural adaptation is a change over time in the responsiveness of the sensory system to a constant stimulus. It is usually experienced as a change in the stimulus. For example, if you rest your hand on a table, you immediately feel the table's surface on your skin. Within a few seconds, however, you cease to feel the table's surface. The sensory neurons stimulated by the table's surface respond immediately, but then respond less and less until they may not respond at all; this is neural adaptation.

Taste

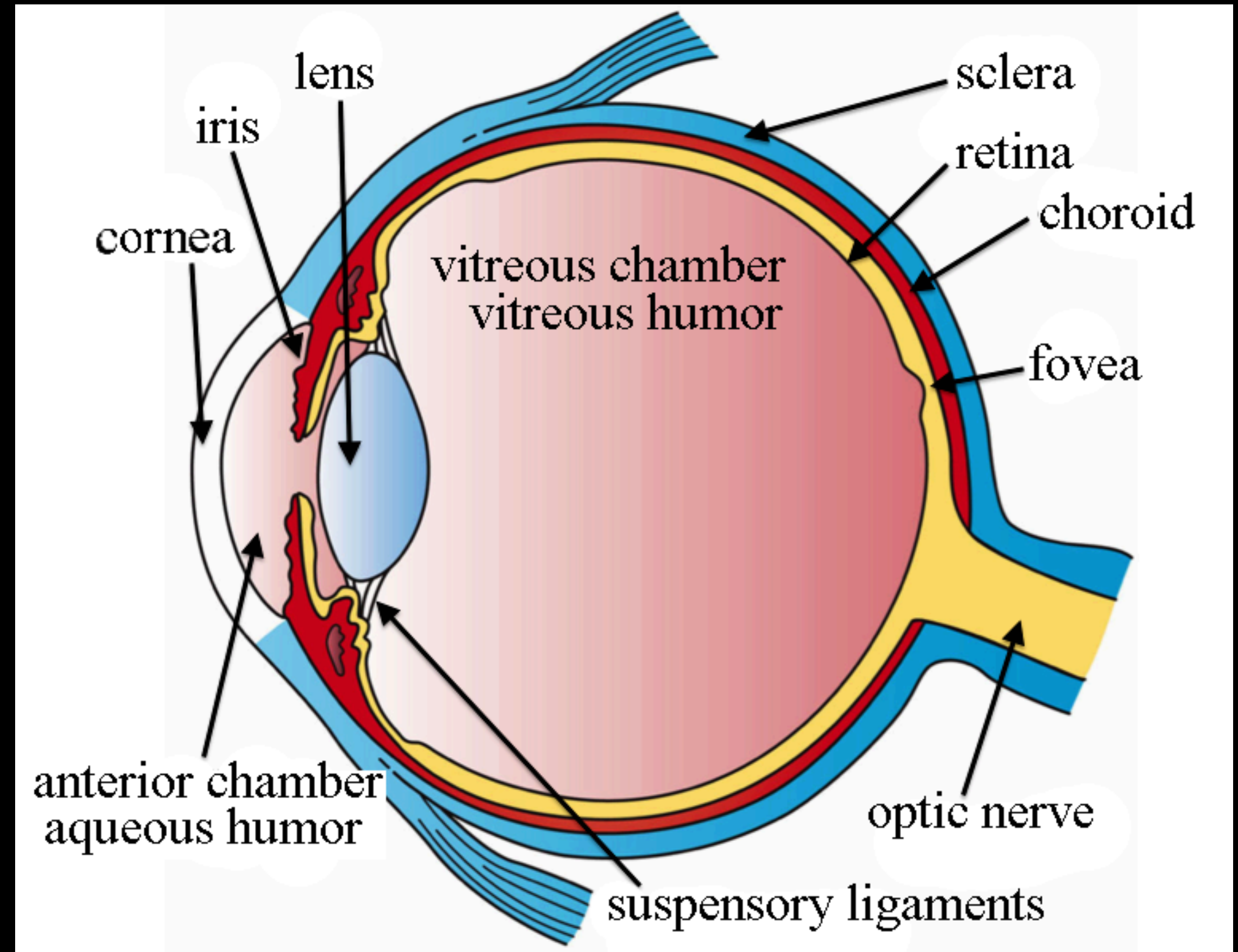
Both the sense of taste and the sense of smell detect the chemical composition of a substance through *chemoreceptors*. Taste is detected by the tongue in solids and in liquids, while smell is detected by the nose in airborne substances.

There is much debate in the scientific community as to whether the "taste map" is a real phenomenon or not.



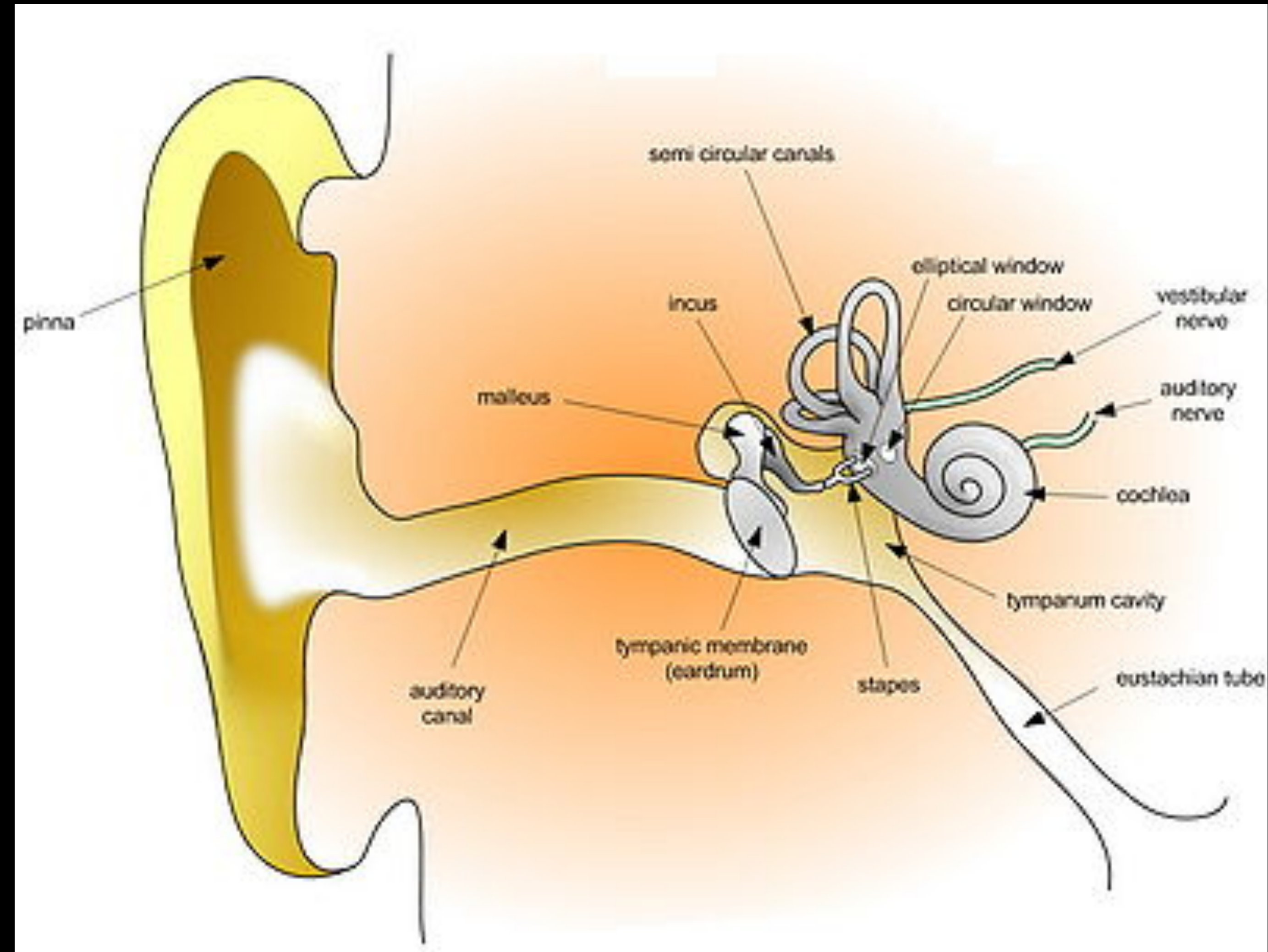
Eye COME BACK

The retina is a thin layer of cells at the back of the eyeball; it is the part of the eye which converts light into nervous signals. The retina contains photoreceptor cells (rods and cones) which receive the light; the resulting neural signals then undergo complex processing by other neurons of the retina, and are further processed in the retinal ganglion cells whose axons form the optic nerve. The retina not only detects light, it also plays a significant part in visual perception. The optic disc is a point on the retina where the optic nerve pierces it to connect to the nerve cells inside the retina. No photosensitive cells exist at this point, and it is therefore "blind"



Ear

- The **outer ear** is the external portion of the ear and includes the eardrum. The pinna, which is the external portion of the ear, captures the sound and transfers them through the auditory canal to the eardrum, which vibrates and transfers the sound to the tiny bones in the middle ear.
- The **middle ear** includes the ossicles (three tiny bones), two muscle tendons, and two nerve bundles. The Eustachian tube connects from the chamber of the middle ear to the back of the pharynx to equalize the pressure. That's why you can feel your ears "pop" when descending on an airplane.
- The **inner ear** comprises both the organ of hearing (the cochlea) and the labyrinth or vestibular apparatus, the organ of balance located in the inner ear that consists of three semicircular canals and the vestibule. Within the cochlea are located three canals: the tympanic canal, the vestibular canal, and the middle canal. When sound strikes the cochlea, the fluid inside is moved. This fluid stimulates the organ of Corti, located within the middle canal, to interpret the sound and send the information through the auditory nerve to the brain.



Protect your Brain

1. **Wear a helmet.** Many work and recreational activities can subject a person to head injury. It is best to not take chances - wear a helmet when it's called for! Do not enter a hard-hat area without a hardhat. Put on your helmet *every* time you ride your bike, go rock climbing, play football, or paddle a kayak. Why risk it?
2. **Exercise your brain.** The more you use your brain, the better it works. The saying "practice makes perfect" is very true. Any activity that involves the brain can be improved with practice.
3. Get plenty of fresh air. Your brain needs oxygen.
4. **Say "No" to drugs.** Most of the illegal "street drugs" are popular because they affect the way people feel. The only way they can do this is by affecting the brain, and these effects are never harmless. Drugs can do permanent damage to the brain.
5. **Eat healthy food.** Junk foods cloud the brain. Healthy foods are just as good for the brain as they are for the body.

Alzheimers
Disease

Mulple Sclerosis

Epilepsy

Major
Depression

Down syndrome

Huntington's
Disease

Quadriplegic

Paraplegic

Luke 14	Mathew 14	Mark 8	Mathew 16
2 Corinthians 7:1	1 Peter 1:13-16	1 Thesalonians 4:3-8	